

Colusa-Sacramento River State Recreation Area

Preliminary General Plan and Draft Program Environmental Impact Report



February 5, 2016

APPENDICES



APPENDICES



LIST OF APPENDICES

#	Name
A	RESERVED
B	<p><u>6. Federal Endangered and Threatened Species that occur or may be affected by projects in the counties and/or USGS 7 ½ minute quads you requested</u> by US Fish and Wildlife Service Sacramento Office. March 11, 2014.</p> <p><u>7- 11. California Natural Diversity Database (CNDDB)</u> by the California Department of Fish and Wildlife. March 11, 2014.</p> <p><u>12- 13. Inventory of Rare and Endangered Plants</u>. Colusa (546A) Quad by the California Native Plant Society. March 17, 2014.</p> <p><u>14+. Colusa-Sacramento River SRA Vegetation Restoration and Recreation Improvements Project—Delineation of Wetlands and Other Waters of the US</u> report by DWR. Addendum. 2007.</p>
C	<u>Cooperative Interagency Agreement between the Department of Parks and Recreation and The Department of Water Resources for Mitigation at the Colusa State Recreation Area</u> , 2008
D	USFWS Land Management MOU, December 2004
E	<u>Memorandum of Agreement Regarding the Sacramento River Conservation Area</u> , 1999
F	<u>City of Colusa 2011 Operating Agreement</u>
G	City of Colusa Construction Operating Agreement (COA), including Amendment No. 1, 2006
H	<u>Riparian Habitat Restoration Plan Ward Unit/ Colusa-Sacramento River State Recreation Area</u> (Plant composition of riparian forest mitigation sites) by The Nature Conservancy, 2007.
I	Historic Resources Report by The Department of Parks and Recreation, 2015
J	Environmental Noise Assessment, January 2015
K	<p>1- 28. Transportation Study, November 2014</p> <p>29+. Transportation Study Technical Appendix</p>
L	Colusa-Sacramento River SRA Parkwide and Core Area Concept Studies
M	Standard Project Requirements
N	<p>56. Riparian Forest Restoration Plan, Borrow Area and Shop Area, November 2000</p> <p>57. Letter from DPR to The Reclamation Board, 1975</p> <p>58. Colusa SRA Borrow Area: Elderberry, Fox, Wetland, 2015</p>

U.S. Fish & Wildlife Service

Sacramento Fish & Wildlife Office



Federal Endangered and Threatened Species that Occur in
or may be Affected by Projects in the Counties and/or
U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 140311123638

Database Last Updated: September 18, 2011

Quad Lists

Listed Species

Invertebrates

- Branchinecta conservatio
Conservancy fairy shrimp (E)
- Branchinecta lynchi
vernal pool fairy shrimp (T)
- Desmocerus californicus dimorphus
valley elderberry longhorn beetle (T)
- Lepidurus packardii
Critical habitat, vernal pool tadpole shrimp (X)
vernal pool tadpole shrimp (E)

Fish

- Acipenser medirostris
green sturgeon (T) (NMFS)
- Hypomesus transpacificus
delta smelt (T)
- Oncorhynchus mykiss
Central Valley steelhead (T) (NMFS)
Critical habitat, Central Valley steelhead (X) (NMFS)
- Oncorhynchus tshawytscha
Central Valley spring-run chinook salmon (T) (NMFS)
Critical Habitat, Central Valley spring-run chinook (X) (NMFS)
Critical habitat, winter-run chinook salmon (X) (NMFS)
winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

- Ambystoma californiense
California tiger salamander, central population (T)
- Rana draytonii
California red-legged frog (T)

Reptiles

- Thamnophis gigas
giant garter snake (T)

Birds

- Strix occidentalis caurina
northern spotted owl (T)

Plants

- Cordylanthus palmatus
palmate-bracted bird's-beak (E)

Candidate Species

Birds

Coccyzus americanus occidentalis
Western yellow-billed cuckoo (C)

B2

Quads Containing Listed, Proposed or Candidate Species:

MERIDIAN (545B)
GRIMES (545C)
COLUSA (546A)
WILLIAMS (546B)
CORTINA CREEK (546C)
ARBUCKLE (546D)
SANBORN SLOUGH (561C)
MAXWELL (562C)
MOULTON WEIR (562D)

County Lists

Colusa County

Listed Species

Invertebrates

Branchinecta conservatio
Conservancy fairy shrimp (E)

Branchinecta lynchi
vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus
valley elderberry longhorn beetle (T)

Lepidurus packardii
Critical habitat, vernal pool tadpole shrimp (X)
vernal pool tadpole shrimp (E)

Syncaris pacifica
California freshwater shrimp (E)

Fish

Acipenser medirostris
green sturgeon (T) (NMFS)

Hypomesus transpacificus
delta smelt (T)

Oncorhynchus mykiss
Central Valley steelhead (T) (NMFS)
Critical habitat, Central Valley steelhead (X) (NMFS)
Northern California steelhead (T) (NMFS)

Oncorhynchus tshawytscha
Central Valley spring-run chinook salmon (T) (NMFS)
Critical Habitat, Central Valley spring-run chinook (X) (NMFS)
Critical habitat, winter-run chinook salmon (X) (NMFS)

Critical habitat, winter-run chinook salmon (A) (NMFS)
winter-run chinook salmon, Sacramento River (E) (NMFS)



Amphibians

Ambystoma californiense
California tiger salamander, central population (T)
Critical habitat, CA tiger salamander, central population (X)

Rana draytonii
California red-legged frog (T)

Reptiles

Thamnophis gigas
giant garter snake (T)

Birds

Strix occidentalis caurina
northern spotted owl (T)

Plants

Chamaesyce hooveri
Hoover's spurge (T)

Cordylanthus palmatus
palmate-bracted bird's-beak (E)

Neostapfia colusana
Colusa grass (T)

Orcuttia pilosa
hairy Orcutt grass (E)

Sidalcea keckii
Keck's checker-mallow (=checkerbloom) (E)

Tuctoria greenei
Greene's tuctoria (=Orcutt grass) (E)

Candidate Species

Birds

Coccyzus americanus occidentalis
Western yellow-billed cuckoo (C)

Mammals

Martes pennanti
fisher (C)

Key:

(E) Endangered - Listed as being in danger of extinction.

(T) Threatened - Listed as likely to become endangered within the foreseeable future.

(P) Proposed - Officially proposed in the Federal Register for listing as endangered or threatened.

(NMFS) Species under the Jurisdiction of the [National Oceanic & Atmospheric Administration Fisheries Service](#). Consult with them directly about these species.

Critical Habitat - Area essential to the conservation of a species.

(PX) Proposed Critical Habitat - The species is already listed. Critical habitat is being proposed for it.

(C) Candidate - Candidate to become a proposed species.

(V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.

(X) Critical Habitat designated for this species

B4

Important Information About Your Species List

How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute quads. The United States is divided into these quads, which are about the size of San Francisco.

The animals on your species list are ones that occur within, or may be affected by projects within, the quads covered by the list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents.
- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regardless of whether they appear on a quad list.

Plants

Any plants on your list are ones that have actually been observed in the area covered by the list. Plants may exist in an area without ever having been detected there. You can find out what's in the surrounding quads through the California Native Plant Society's online [Inventory of Rare and Endangered Plants](#).

Surveying

Some of the species on your list may not be affected by your project. A trained biologist and/or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We recommend that your surveys include any proposed and candidate species on your list. See our [Protocol](#) and [Recovery Permits](#) pages.

For plant surveys, we recommend using the [Guidelines for Conducting and Reporting Botanical Inventories](#). The results of your surveys should be published in any environmental documents prepared for your project.

Your Responsibilities Under the Endangered Species Act

All animals identified as listed above are fully protected under the Endangered Species Act of 1973, as amended. Section 9 of the Act and its implementing regulations prohibit the take of a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two



procedures:

- If a Federal agency is involved with the permitting, funding, or carrying out of a project that may result in take, then that agency must engage in a formal [consultation](#) with the Service.

During formal consultation, the Federal agency, the applicant and the Service work together to avoid or minimize the impact on listed species and their habitat. Such consultation would result in a biological opinion by the Service addressing the anticipated effect of the project on listed and proposed species. The opinion may authorize a limited level of incidental take.

- If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, then you, the applicant, should apply for an incidental take permit. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project.

Should your survey determine that federally listed or proposed species occur in the area and are likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the project's direct and indirect impacts to listed species and compensates for project-related loss of habitat. You should include the plan in any environmental documents you file.

Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as critical habitat. These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Boundary descriptions of the critical habitat may be found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our [Map Room](#) page.

Candidate Species

We recommend that you address impacts to candidate species. We put plants and animals on our candidate list when we have enough scientific information to eventually propose them for listing as threatened or endangered. By considering these species early in your planning process you may be able to avoid the problems that could develop if one of these candidates was listed before the end of your project.

Species of Concern

The Sacramento Fish & Wildlife Office no longer maintains a list of species of concern. However, various other agencies and organizations maintain lists of at-risk species. These lists provide essential information for land management planning and conservation efforts. [More info](#)

Wetlands

If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands,

please contact Mark Littlefield of this office at (916) 414-6520.



Updates

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be June 09, 2014.



Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database



Query Criteria: Quad is (Colusa (3912221) or Moulton Weir (3912231) or Maxwell (3912232) or Williams (3912222) or Arbuckle (3912211) or Grimes (3912118) or Meridian (3912128) or Sanborn Slough (3912138) or Cortina Creek (3912212))

Colusa State Recreation Area, General Plan supporting document 9-Quad search

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
<i>Agelaius tricolor</i> tricolored blackbird	G2G3 S2	None None	ABC_WLBCC-Watch List of Birds of Conservation Concern BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_EN-Endangered USFWS_BCC-Birds of Conservation Concern	30 105	429 S:25	0	2	1	0	13	9	22	3	12	11	2
<i>Astragalus tener var. ferrisiae</i> Ferris' milk-vetch	G2T1 S1	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive	40 60	18 S:2	0	0	0	0	2	0	2	0	0	2	0
<i>Athene cunicularia</i> burrowing owl	G4 S2	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	170 285	1850 S:3	0	0	0	0	0	3	3	0	3	0	0
<i>Atriplex cordulata var. cordulata</i> heartscale	G3T2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	50 50	68 S:1	0	0	0	0	0	1	0	1	1	0	0
<i>Atriplex depressa</i> brittlescale	G2 S2	None None	Rare Plant Rank - 1B.2	45 60	61 S:3	0	1	0	0	0	2	2	1	3	0	0
<i>Atriplex joaquinana</i> San Joaquin spearscale	G2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	50 175	109 S:4	0	0	0	0	0	4	3	1	4	0	0
<i>Atriplex persistens</i> vernal pool smallscale	G2 S2	None None	Rare Plant Rank - 1B.2	150 150	41 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Branchinecta lynchi</i> vernal pool fairy shrimp	G3 S2S3	Threatened None	IUCN_VU-Vulnerable	45 45	611 S:1	1	0	0	0	0	0	0	1	1	0	0
<i>Branta hutchinsii leucopareia</i> cackling (=Aleutian Canada) goose	G5T3 S2	Delisted None		45 52	19 S:4	0	0	0	0	0	4	4	0	4	0	0
<i>Brasenia schreberi</i> watershield	G5 S2	None None	Rare Plant Rank - 2B.3	50 50	33 S:1	0	0	0	0	1	0	1	0	0	1	0



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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
<i>Buteo swainsoni</i> Swainson's hawk	G5 S2	None Threatened	ABC_WLBCC-Watch List of Birds of Conservation Concern BLM_S-Sensitive IUCN_LC-Least Concern USFS_S-Sensitive USFWS_BCC-Birds of Conservation Concern	30 125	2394 S:67	0	6	4	0	0	57	11	56	67	0	0
<i>California macrophylla</i> round-leaved filaree	G2 S2	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive		155 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Chloropyron palmatum</i> palmate-bracted salty bird's-beak	G1 S1	Endangered Endangered	Rare Plant Rank - 1B.1	40 60	26 S:9	1	6	1	0	1	0	1	8	8	1	0
<i>Cicindela hirticollis abrupta</i> Sacramento Valley tiger beetle	G5TH SH	None None		50 50	6 S:1	0	0	0	0	1	0	1	0	0	0	1
<i>Circus cyaneus</i> northern harrier	G5 S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern	60 60	43 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Coastal and Valley Freshwater Marsh</i> Coastal and Valley Freshwater Marsh	G3 S2.1	None None		50 50	60 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Coccyzus americanus occidentalis</i> western yellow-billed cuckoo	G5T3Q S1	Proposed Threatened Endangered	BLM_S-Sensitive USFS_S-Sensitive USFWS_BCC-Birds of Conservation Concern	45 200	119 S:9	0	0	0	0	0	9	9	0	9	0	0
<i>Cuscuta obtusiflora var. glandulosa</i> Peruvian dodder	G5T4T5 SH	None None	Rare Plant Rank - 2B.2		6 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Desmocerus californicus dimorphus</i> valley elderberry longhorn beetle	G3T2 S2	Threatened None		40 60	201 S:6	0	1	0	0	0	5	6	0	6	0	0
<i>Egretta thula</i> snowy egret	G5 S4	None None	IUCN_LC-Least Concern	90 90	15 S:1	0	1	0	0	0	0	0	1	1	0	0
<i>Emys marmorata</i> western pond turtle	G3G4 S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_VU-Vulnerable USFS_S-Sensitive	60 60	1137 S:1	0	1	0	0	0	0	0	1	1	0	0



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Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Great Valley Cottonwood Riparian Forest Great Valley Cottonwood Riparian Forest	G2 S2.1	None None		45 70	56 S:7	2	2	3	0	0	0	7	0	7	0	0
Great Valley Mixed Riparian Forest Great Valley Mixed Riparian Forest	G2 S2.2	None None		40 70	68 S:9	1	5	2	0	0	1	9	0	9	0	0
Great Valley Willow Scrub Great Valley Willow Scrub	G3 S3.2	None None		55 55	18 S:2	1	0	1	0	0	0	2	0	2	0	0
Grus canadensis tabida greater sandhill crane	G5T4 S2	None Threatened	BLM_S-Sensitive CDFW_FP-Fully Protected USFS_S-Sensitive	50 50	604 S:1	0	0	0	0	0	1	1	0	1	0	0
Haliaeetus leucocephalus bald eagle	G5 S2	Delisted Endangered	BLM_S-Sensitive CDF_S-Sensitive CDFW_FP-Fully Protected IUCN_LC-Least Concern USFS_S-Sensitive USFWS_BCC-Birds of Conservation Concern	55 55	316 S:1	0	0	1	0	0	0	0	1	1	0	0
Heteranthera dubia water star-grass	G5 S1	None None	Rare Plant Rank - 2B.2	55 75	9 S:2	0	0	0	0	0	2	2	0	2	0	0
Hibiscus lasiocarpus var. occidentalis woolly rose-mallow	G5T2 S2	None None	Rare Plant Rank - 1B.2	50 90	173 S:13	0	2	0	0	0	11	13	0	13	0	0
Lasiurus blossevillii western red bat	G5 S3?	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive WBWG_H-High Priority	50 60	119 S:4	0	0	0	0	0	4	0	4	4	0	0
Lasiurus cinereus hoary bat	G5 S4?	None None	IUCN_LC-Least Concern WBWG_M-Medium Priority	50 60	235 S:4	0	0	0	0	0	4	0	4	4	0	0
Lasthenia glabrata ssp. coulteri Coulter's goldfields	G4T3 S2.1	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive	50 50	89 S:1	0	0	0	0	0	1	1	0	1	0	0



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California Natural Diversity Database



Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
<i>Laterallus jamaicensis coturniculus</i> California black rail	G4T1 S1	None Threatened	ABC_WLBCC-Watch List of Birds of Conservation Concern BLM_S-Sensitive CDFW_FP-Fully Protected IUCN_NT-Near Threatened USFWS_BCC-Birds of Conservation Concern	60 60	241 S:1	0	1	0	0	0	0	1	0	1	0	0
<i>Layia septentrionalis</i> Colusa layia	G2 S2.2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	60 60	46 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Lepidurus packardii</i> vernal pool tadpole shrimp	G3 S2S3	Endangered None	IUCN_EN-Endangered	45 330	274 S:3	1	0	0	0	0	2	2	1	3	0	0
<i>Melospiza melodia</i> song sparrow ("Modesto" population)	G5 S3?	None None	CDFW_SSC-Species of Special Concern	50 50	92 S:3	0	0	0	0	0	3	3	0	3	0	0
<i>Myotis ciliolabrum</i> western small-footed myotis	G5 S2S3	None None	BLM_S-Sensitive IUCN_LC-Least Concern WBWG_M-Medium Priority	50 50	81 S:1	0	0	0	0	0	1	0	1	1	0	0
<i>Myotis yumanensis</i> Yuma myotis	G5 S4?	None None	BLM_S-Sensitive IUCN_LC-Least Concern WBWG_LM-Low- Medium Priority	50 50	256 S:1	0	0	0	0	0	1	0	1	1	0	0
<i>Navarretia leucocephala ssp. bakeri</i> Baker's navarretia	G4T2 S2	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive	60 60	58 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Nycticorax nycticorax</i> black-crowned night heron	G5 S3	None None	IUCN_LC-Least Concern	90 90	25 S:1	0	1	0	0	0	0	0	1	1	0	0
<i>Pandion haliaetus</i> osprey	G5 S3	None None	CDF_S-Sensitive CDFW_WL-Watch List IUCN_LC-Least Concern	70 75	482 S:3	0	0	1	0	0	2	0	3	3	0	0
<i>Perognathus inornatus inornatus</i> San Joaquin pocket mouse	G4T2T3 S2S3	None None	BLM_S-Sensitive		109 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Plegadis chihi</i> white-faced ibis	G5 S1	None None	CDFW_WL-Watch List IUCN_LC-Least Concern	40 75	20 S:2	0	2	0	0	0	0	1	1	2	0	0



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Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
<i>Riparia riparia</i> bank swallow	G5 S2S3	None Threatened	BLM_S-Sensitive IUCN_LC-Least Concern	30 60	296 S:20	0	4	1	0	0	15	2	18	20	0	0
<i>Spirinchus thaleichthys</i> longfin smelt	G5 S1	Candidate Threatened	CDFW_SSC-Species of Special Concern	40 40	45 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Thamnophis gigas</i> giant garter snake	G2G3 S2S3	Threatened Threatened	IUCN_VU-Vulnerable	35 125	268 S:28	6	4	1	0	0	17	12	16	28	0	0
<i>Trichocoronis wrightii</i> var. <i>wrightii</i> Wright's trichocoronis	G4T3 S1	None None	Rare Plant Rank - 2B.1	25 25	9 S:1	0	0	0	0	0	1	1	0	1	0	0



Inventory of Rare and Endangered Plants - 7th edition

B12

interface

v 7-14jan 1-8-14

Status: search results - Mon, Mar. 17, 2014 15:11 ET c

{QUADS_123} =~ m/546A|562C|562D|545B|545C|561C|546B|546C|546D|

Search

Tip: Lathyrus Astragalus returns species from both genera. [\[all tips and help.\]](#) [\[search history\]](#)

Your Quad Selection: **Colusa (546A) 3912221**, Maxwell (562C) 3912232, Moulton Weir (562D) 3912231, Meridian (545B) 3912128, Grimes (545C) 3912118, Sanborn Slough (561C) 3912138, Williams (546B) 3912222, Cortina Creek (546C) 3912212, Arbuckle (546D) 3912211

Hits 1 to 16 of 16

Requests that specify topo quads will return only Lists 1-3.

To save selected records for later study, click the ADD button.



ADD checked items to Plant Press

check all

check none

Selections will appear in a new window.

open	save	hits	scientific	common	family	CNPS
	<input type="checkbox"/>	1	<u>Astragalus tener</u> var. <u>ferrisiae</u>	Ferris' milk-vetch	Fabaceae	List 1B.1
	<input type="checkbox"/>	1	<u>Atriplex cordulata</u> var. <u>cordulata</u>	heartscale	Chenopodiaceae	List 1B.2
	<input type="checkbox"/>	1	<u>Atriplex depressa</u>	brittlescale	Chenopodiaceae	List 1B.2
	<input type="checkbox"/>	1	<u>Atriplex joaquinana</u>	San Joaquin spearscale	Chenopodiaceae	List 1B.2
	<input type="checkbox"/>	1	<u>Atriplex persistens</u>	vernal pool smallscale	Chenopodiaceae	List 1B.2
	<input type="checkbox"/>	1	<u>Brasenia schreberi</u>	watershield	Cabombaceae	List 2B.3
	<input type="checkbox"/>	1	<u>California macrophylla</u>	round-leaved filaree	Geraniaceae	List 1B.1
	<input type="checkbox"/>	1	<u>Chloropyron palmatum</u>	palmate-bracted bird's-beak	Orobanchaceae	List 1B.1
	<input type="checkbox"/>	1	<u>Cuscuta obtusiflora</u> var. <u>glandulosa</u>	Peruvian dodder	Convolvulaceae	List 2B.2
	<input type="checkbox"/>	1	<u>Heteranthera dubia</u>	water star-grass	Pontederiaceae	List 2B.2
	<input type="checkbox"/>	1	<u>Hibiscus lasiocarpus</u> var. <u>occidentalis</u>	woolly rose-mallow	Malvaceae	List 1B.2
	<input type="checkbox"/>	1	<u>Lasthenia glabrata</u> ssp. <u>coulteri</u>	Coulter's goldfields	Asteraceae	List 1B.1
	<input type="checkbox"/>	1	<u>Layia septentrionalis</u>	Colusa layia	Asteraceae	List 1B.2
	<input type="checkbox"/>	1	<u>Myosurus minimus</u> ssp. <u>apus</u>	little mousetail	Ranunculaceae	List 3.1
	<input type="checkbox"/>	1	<u>Navarretia leucocephala</u> ssp.	Baker's navarretia	Polemoniaceae	List

<u>bakeri</u> 					1B.1
	<input type="checkbox"/>	1	<u>Trichocoronis wrightii</u> var. <u>wrightii</u>	Wright's trichocoronis	Asteraceae
					List 2B.1

To save selected records for later study, click the ADD button.



ADD checked items to Plant Press

check all

check none

Selections will appear in a new window.

No more hits.



Addendum to the *Colusa-Sacramento River State Recreation Area Vegetation Restoration and Recreation Improvements Project—Delineation of Wetlands and Other Waters of the United States (SPK 2007-02228)*

The Department of Water Resources (DWR) plans to construct riparian forest mitigation for impacts due to the Tisdale Bypass Channel Rehabilitation Project. The mitigation project site, near the city of Colusa, is located east of the Sacramento River between the river and a Sacramento River Flood Control levee. The Mitigation Site at Colusa-Sacramento River State Recreation Area for the Tisdale Bypass Channel Rehabilitation Project (Colusa SRA) is a 139.4-acre site that is within a designated floodway as defined by the State Reclamation Board. The Colusa SRA activities will require a Nationwide Permit (NWP) 27—Stream and Wetland Restoration Activities, from the Army Corps of Engineers (USACE) for compliance with section 404 of the Clean Water Act (CWA). As part of the permit application (SPK 2007-02228), DWR submitted a Preliminary Delineation of Waters of the US, including Wetlands (JSA, 2007).

For purposes of Section 404 of the CWA, the lateral limits of jurisdiction over non-tidal water bodies extend to the ordinary high water mark (OHWM). The location of the OHWM is usually determined by evaluating the physical characteristics of the site, though other methods may be used to determine ordinary high water events which occur on a regular or frequent basis (Regulatory Guidance Letter No. 05-05). Because the project area has been under cultivation in recent years, physical evidence of the OHWM is not available at the site. Recent computer modeling conducted by DWR used stream gage records and flood predictions to indicate the OHWM at the site.

DWR used the USACE Comprehensive Study Hydrologic Engineering Center River Analysis System (HEC-RAS) model of the Sacramento River to analyze the effect of the 5-year return flow from river mile (RM) 144.25 to RM 147.75. Based on a 5-year return flow of 50,700 cfs at the USGS Colusa gage, the HEC-RAS model indicated the right bank of the Sacramento River will overtop starting at RM 147.75 as shown in Figure 1. The model assumes steady state flow and NGVD 29 datum. The computed HEC-RAS water elevation was 65.0 ft at RM 147.75, whereas the existing bank elevation is 64.8 ft.

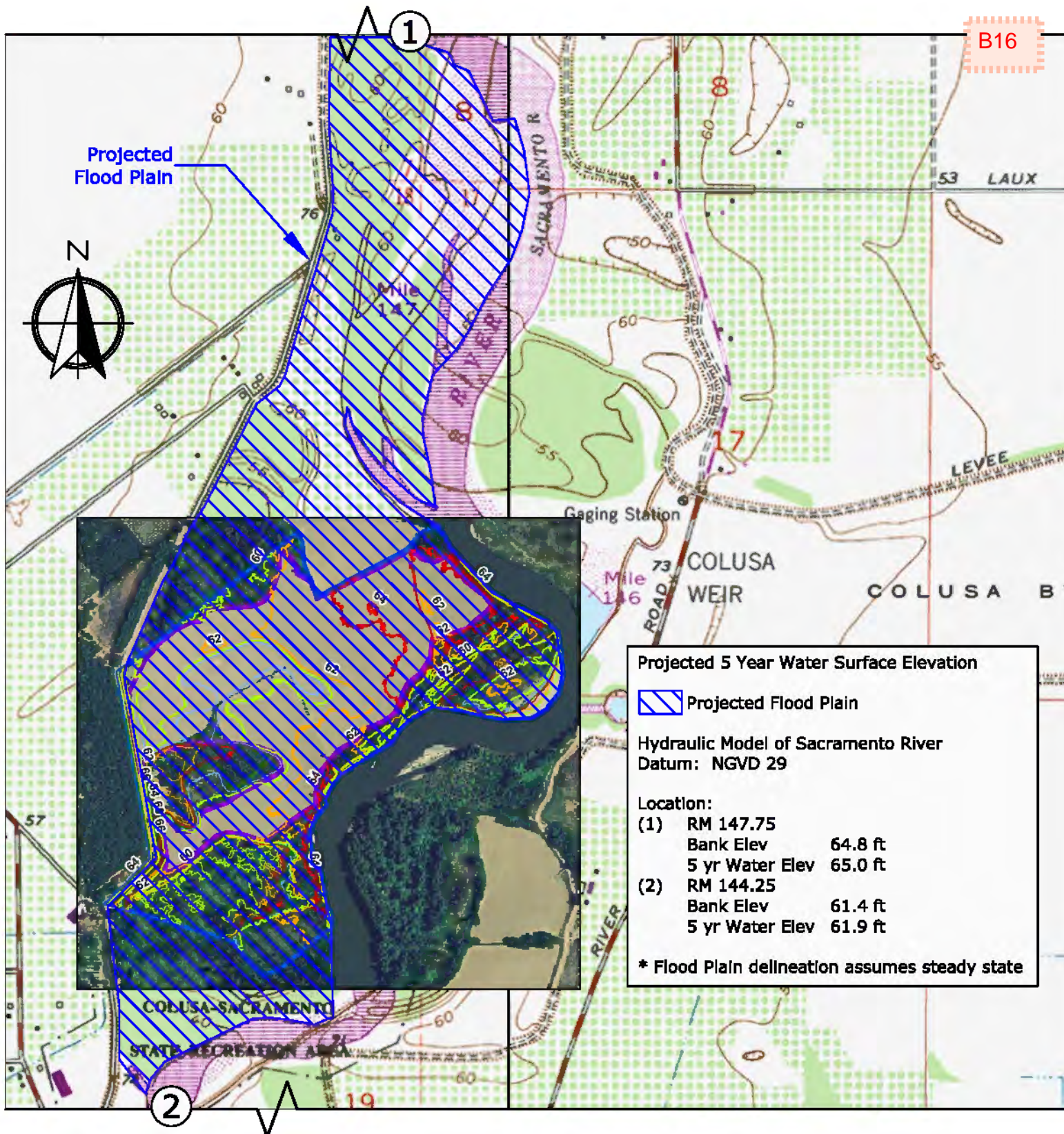
The model also shows that the bank will overtop downstream of the inlet at RM 144.4. At RM 144.25, the computed water elevation was 61.9 ft, whereas the existing bank elevation is 61.4 ft. This information corresponds with the “backwater flooding” referred to in the original wetland delineation.

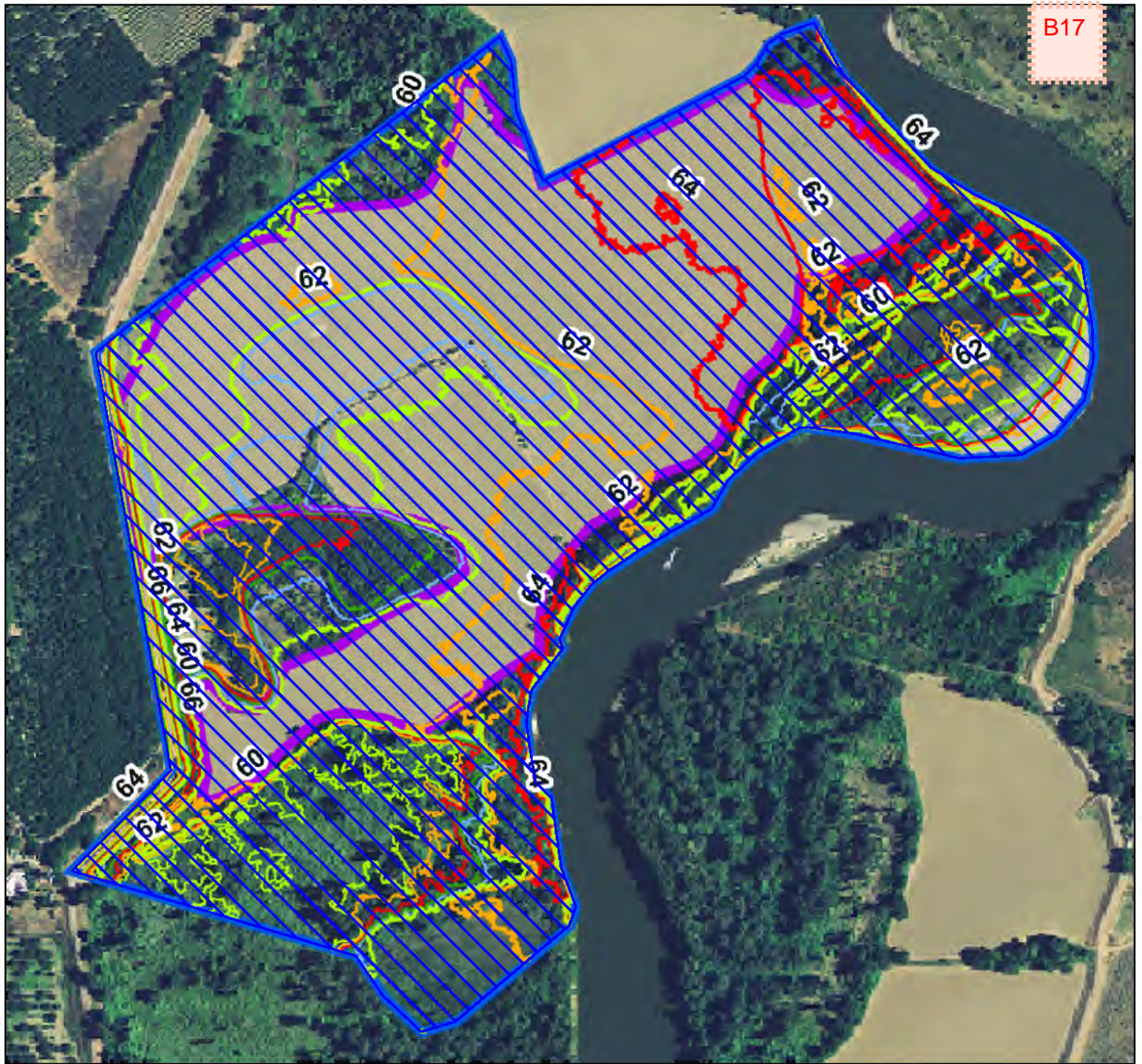
The new map of the jurisdictional area (Figure 1a), drawn to reflect this additional hydrology information, shows that the entire project area is a floodplain likely to be inundated with a 5-year return flow.

References

USACE 2005. Regulatory Guidance Letter No. 05-05. Subject: Ordinary High Water Mark Identification

JSA 2007. Colusa-Sacramento River State Recreation Area Vegetation Restoration and Recreation Improvements Project—Delineation of Wetlands and Other Waters of the United States





 Projected Flood Plain

Datum: NGVD 29
Projected Water Elevation: 65.0 ft

Contour Map by Jones & Stokes

* Flood Plain delineation assumes steady state

**Ward Tract
5 Year Return Flow
Projected Flood Plain**



**CALIFORNIA
DEPARTMENT of WATER RESOURCES
DIVISION of FLOOD MANAGEMENT**

SCALE: 1" = 650'

FIGURE 1a.



2008-0003369

Recording Requested by and
When Recorded Mail to:

California Department of Water Resources
Division of Engineering
Real Estate Branch
Paul Farris, Chief
1416 Ninth Street, Room 425
Sacramento, California 95814

Recorded
Official Records
County of
Colusa
KATHLEEN MORAN
Clerk-Recorder

REC FEE 0.00

RG
03:20PM 14-Jul-2008 Page 1 of 20

This Space for Recorder's Use Only

APN 015-070-136-000

R-50580

DWR Parcel No.

MNA-06-01 Unit A-F

**COOPERATIVE INTERAGENCY AGREEMENT
BETWEEN
THE DEPARTMENT OF PARKS AND RECREATION
AND
THE DEPARTMENT OF WATER RESOURCES
FOR
MITIGATION AT THE COLUSA STATE RECREATION AREA**

This Cooperative Agreement (Agreement) is made and entered into this 7th day of MAY, 2008, by and between the DEPARTMENT OF WATER RESOURCES, (DWR) and the DEPARTMENT OF PARKS AND RECREATION (PARKS):

RECITALS

WHEREAS, the Central Valley Flood Protection Board is responsible for controlling flooding along the Sacramento and San Joaquin Rivers and their tributaries, including the Tisdale Bypass, which is owned by the Sacramento-San Joaquin Drainage District;

WHEREAS, DWR is responsible for maintaining many flood control areas in the State, including the Tisdale Bypass;

WHEREAS, as outlined in both the U.S. Army Corps of Engineers permit SPK-2007-37-SA, dated September 12, 2007, and the Department of Fish and Game Stream Alteration Agreement dated May 17, 2007 for the Tisdale Bypass rehabilitation project, DWR is obligated to compensate for impacts to riparian forest at the Tisdale Bypass through mitigation;

WHEREAS, DWR and PARKS have identified 139 acres of lands owned by PARKS that are suitable for the establishment and maintenance of a habitat mitigation area (Mitigation Lands), including riparian forest;

WHEREAS, the Mitigation Lands are a part of the Colusa-Sacramento River State Recreation Area (SRA), approximately one mile north of Colusa on the west bank

STATE OF CALIFORNIA
OFFICIAL BUSINESS

Exempt - Document entitled to free
recording pursuant to Gov't Code Sec. 8103

of the Sacramento River at River Mile 145.5, and are part of a 238-acre parcel called the Ward Tract, which is identified on the Colusa County Assessor's Roll as Assessor's Parcel Number 015-070-136-000;

WHEREAS, the Master Plan for the SRA envisions conversion of the area comprising the Mitigation Lands from its current agricultural use to a riparian forest and meadow;

WHEREAS, the Mitigation Lands include approximately eighteen (18) acres in excess of the amount of riparian forest that DWR is required to restore as mitigation; and

WHEREAS, DWR proposes, with PARKS' concurrence, to improve the Mitigation Lands and apply the excess mitigation credit to activities associated with maintenance of the Sacramento River Flood Control Project;

WHEREAS, the following improvements desired by Parks are mutually beneficial to PARKS and DWR for security and access purposes: (i) access roads; (ii) trails; (iii) signage; and (iv) security gating and fencing at the entrance to the Mitigation Lands;

WHEREAS, DWR is willing to assist PARKS in its efforts to improve the existing facilities at the SRA and PARKS is amenable to DWR receiving mitigation credit for improvements made to the Mitigation Lands pursuant to this Agreement;

WHEREAS, PARKS desires to hold the Mitigation Lands for mitigation habitat in perpetuity subject to certain covenants, terms, and conditions set forth in this Agreement;

NOW, THEREFORE, in consideration of these recitals and the mutual promises set forth herein, DWR and PARKS agree as follows:

I. COVENANTS, TERMS AND CONDITIONS

A. Consistent with the obligation to compensate for the Tisdale Bypass Project's impact to riparian vegetation, DWR agrees to construct or make the following improvements on the Mitigation Lands:

1. Establish the riparian forest and monitor it for ten years or until the success criteria described in the Habitat Mitigation and Monitoring Plan are met, whichever period is longer (Establishment Period);
2. Establish the meadow habitat and perform periodic mowing in perpetuity;
3. Develop access corridors as identified by PARKS;
4. Develop signage as mutually agreed upon with PARKS; and
5. Develop security gate(s) and fencing at the entrance to the Mitigation Lands as mutually agreed upon with PARKS.

Collectively, items A.1 through A.5 are hereafter referred to as "Restoration Activities." The Restoration Activities will take place in the areas and manner depicted on Exhibit A, attached and incorporated into this Agreement.

B. PARKS will allow DWR employees and agents access to the Mitigation Lands for construction and maintenance related to implementation of this Agreement and to undertake periodic inspections of the activities described in item I.A. above. Such access will be along roads and trails mutually agreed upon by DWR and PARKS, and such entry onto PARKS land shall be coordinated with PARKS prior to entry. These access rights will include the right to allow staff from the United States Army Corps of Engineers, Department of Fish and Game, and Central Valley Flood Protection Board to enter the Mitigation Lands to inspect the riparian and meadow habitat as needed, if accompanied by DWR staff, upon giving PARKS written notice at least two (2) business days prior to entry.

Except as expressly provided for in this Agreement, DWR shall not unreasonably interfere with PARKS' programs or activities. Neither this right of entry, nor any other provision of this Agreement, shall be interpreted to mean that PARKS assumes any responsibility for liability or claims of third parties arising out of the activities of DWR, its agents or invitees, including the United States Army Corps of Engineers, Department of Fish and Game and the Central Valley Flood Protection Board, on PARKS land.

C. DWR will contract for and manage Restoration Activities and Maintenance Activities on the Mitigation Lands during the Establishment Period. Restoration Activities will include: the planting of trees, shrubs, and other vegetation; the maintenance, preservation and retention of vegetative growth desirable for mitigation purposes; the clearing and removing of vegetation incompatible with DWR's mitigation plans; the excavating and removing of earth for mitigation purposes; the placing or depositing of earth and sediment for mitigation purposes; and the installing, operating and maintaining of an irrigation system and any other improvements necessary for mitigation purposes. As part of Restoration Activities, DWR will install and maintain transplants, seeds, and seedlings of plant species native to the SRA; install temporary browse protection boxes for the purpose of limiting herbivore damage during the period when plants are becoming established; perform necessary maintenance activities; install informational and educational signs in the Mitigation Lands; and install an irrigation pump with the necessary electrical facilities to provide water supply to the Mitigation Lands. "Maintenance Activities" during the Establishment Period will include: weed control through mowing, disking, hand pulling, string trimming and herbicide; irrigation by overhead spray, drip, or hand watering from hose or truck; repair and replacement of all irrigation system components, browse protection boxes, and signs; and removal of all non-organic above ground infrastructure, including all signs, fences, posts, boxes, staples, stakes, pipes, emitters, and valve boxes. DWR will use its best efforts to ensure that construction of the Restoration Activities begins no earlier than October 1, 2008.

D. For the duration of the Establishment Period, DWR will be responsible for monitoring the survival and condition of vegetation on the Mitigation Lands as described in Paragraph I(A) and 1(C) above and for reporting the results of monitoring to the appropriate agencies in accordance with the approved Habitat Mitigation and Monitoring Plan.

E. After the Establishment Period, PARKS will take responsibility for maintenance of the biological integrity and function of the Mitigation Lands in perpetuity, except for the periodic mowing of meadow habitat, which DWR will perform in perpetuity.

F. DWR's right to utilize the Mitigation Lands will be nonexclusive and will not be a leasehold or possessory interest.

G. PARKS will not undertake or authorize any use of the Mitigation Lands that is inconsistent with the terms and purposes of this Agreement, provided, however, PARKS shall have the right to otherwise use the Mitigation Lands in any manner, including for the following activities:

1. The development and maintenance of picnic and primitive camping sites (including table and fire ring);
2. The installation and maintenance of primitive toilet facilities;
3. Public and PARKS access to picnic, camping and toilet facilities via an unpaved road and parking areas;
4. Trails with interpretive signs that loop around the perimeter and through the Mitigation Lands for public recreation and access to the Sacramento River.

H. DWR, its successors, assignees and agents will have the right to maintain the Mitigation Lands as a habitat area in accordance with this Agreement.

II. EFFECTIVE DATE & TERM

This Agreement will be effective and commence as of the date last written above and will remain in effect in perpetuity.

III. ACTION

Nothing in this Agreement will be construed to entitle PARKS or DWR to bring any action against the other for injury to or change in the Mitigation Lands, except when such injury or damage is caused by a failure of the other party to implement this Agreement in a reasonable manner.

IV. GOVERNING LAW

The interpretation and performance of the terms of this Agreement will be governed by the laws of the State of California.

V. NOTICE

Any notice, demand, request, consent, or approval that either party hereto may or is required to give the other pursuant to this Agreement will be in writing and will be either personally delivered or sent by mail, addressed as follows:

TO DWR:

California Department of Water Resources
Chief, Division of Flood Management
3301 El Camino Avenue
Sacramento, California 95821

California Department of Water Resources
Chief, Real Estate Branch
1416 Ninth Street, Room 415
Sacramento, California 95814

TO PARKS:

California Department of Parks and Recreation
District Superintendent
Northern Buttes District
400 Glen Drive
Oroville, California 95966

Either party may change the address to which subsequent notice and/or other communications can be sent by giving written notice designating a change of address to the other party, which will be effective upon receipt.

VI. COMPLIANCE WITH LAWS

Both parties will observe and comply with all applicable Federal, State, and County laws, regulations and ordinances.

VII. INDEMNIFICATION

PARKS will indemnify and hold harmless DWR, its officers, directors, agents, and employees from and against all demands, claims, actions, liabilities, losses, damages, and costs, including reasonable attorneys' fees, arising out of or resulting from the performance of this Agreement and caused in whole or in part by the negligence or willful misconduct of PARKS' officers, directors, agents, employees, volunteers, contractors, and/or subcontractors.

DWR will indemnify, and hold harmless PARKS, its officers, directors, agents, and employees from and against all demands, claims, actions, liabilities, losses, damages and costs, including reasonable attorneys' fees, arising out of or resulting from the performance of this Agreement and caused in whole or in part by the negligence or willful misconduct of DWR's officers, directors, agents, employees, volunteers, contractors, and/or subcontractors.

It is the intention of PARKS and DWR that the provisions of this paragraph be interpreted to impose on each party responsibility to the other for the acts of their respective officers, directors, agents, employees, volunteers, contractors, and subcontractors. It is also the intention of PARKS and DWR that, where comparative fault is determined to have been contributory, principles of comparative fault will be followed and each party will bear the proportionate cost of any damage attributable to the fault of that party, its officers, directors, agents, employees, volunteers, contractors, and/or subcontractors.

VIII. ASSIGNMENT

None of the Parties to this Agreement may transfer or assign its rights under this Agreement without the express written consent of the other party.

IX. DISPUTE RESOLUTION

In the event of a dispute concerning the interpretation of this Agreement or its application to specific facts, either party to this Agreement may file a "Notice of Dispute" with the director, executive officer or other chief executive of the other party. The Notice of Dispute must detail the nature of the dispute and propose a resolution. The parties will then, in good faith, attempt to negotiate a resolution of the dispute. If the parties are unable to resolve the dispute, the parties will each present a written description of the dispute and of its position on the dispute to the California Resources Agency Secretary ("Secretary") for decision and resolution. The determination of the Secretary will be final, unless one of the parties determines to pursue a judicial remedy before a court of competent jurisdiction.

X. AMENDMENT AND WAIVER

Except as provided herein, no alteration, amendment, variation, or waiver of the terms of this Agreement will be valid unless made in writing and signed by both parties. Waiver by either party of any default, breach or condition precedent will not be construed as a waiver of any other default, breach or condition precedent, or any other right hereunder. Any agreement between DWR and PARKS to interpret any provision of this Agreement in the agreed upon way shall be made in writing and signed by both parties.

XI. SUCCESSORS

This Agreement will bind the successors of PARKS and DWR in the same manner as if they were expressly named.

XII. INTERPRETATION

This Agreement will be deemed to have been prepared equally by both of the parties, and the Agreement and its individual provisions will not be construed or interpreted more favorably for one party on the basis that the other party prepared it.

XIII. PRIOR AGREEMENTS

This Agreement constitutes the entire contract between PARKS and DWR regarding the subject matter of this Agreement. Any prior agreements, whether oral or written, between PARKS and DWR regarding the subject matter of this Agreement are hereby terminated effective immediately upon full execution of this Agreement.

XIV. PARTIES TO AGREEMENT

PARKS and DWR are the only parties to this Agreement. This Agreement will not create any rights in any person, entity, or organization not a party hereto; nor may any third party maintain any lawsuit for personal injuries, injunction, property damages, or breach of this Agreement.

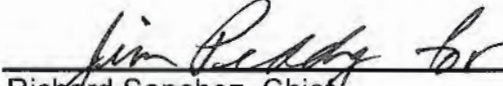
XV. NO JOINT LIABILITY

Except as specifically provided for herein, nothing in this Agreement shall be construed as giving either DWR or PARKS the right or ability to bind the other or to create any joint liability with regard to, or as a result of, the activities undertaken by each party to implement this Agreement.


XVI. DUPLICATE COUNTERPARTS

This Agreement may be executed in duplicate counterparts and will be deemed executed when it has been signed by both parties.

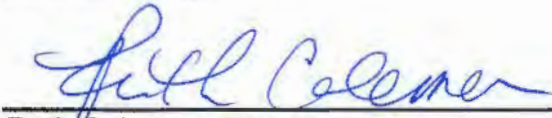
DEPARTMENT OF WATER RESOURCES


Richard Sanchez, Chief
Division of Engineering

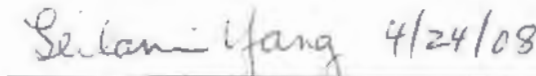
Approved as to Legal form and Sufficiency:


Karin G. Shine, Staff Counsel III
Office of the Chief Counsel

DEPARTMENT OF PARKS AND RECREATION


Ruth Coleman, Director

Approved as to Legal form and Sufficiency:


Leilani Yang, Staff Counsel

CALIFORNIA ALL-PURPOSE CERTIFICATE OF ACKNOWLEDGMENT

State of California

County of SACRAMENTO

On 5-2-08 before me, SONIA A. WINDTBERG, NOTARY PUBLIC,
(Here insert name and title of the officer)

personally appeared RUTH COLEMAN,

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Sonia A. Windtberg
Signature of Notary Public



(Notary Seal)

ADDITIONAL OPTIONAL INFORMATION

DESCRIPTION OF THE ATTACHED DOCUMENT

(Title or description of attached document)

(Title or description of attached document continued)

Number of Pages _____ Document Date _____

(Additional information)

CAPACITY CLAIMED BY THE SIGNER

- ☐ Individual (s)
☐ Corporate Officer

(Title)

- ☐ Partner(s)
☐ Attorney-in-Fact
☐ Trustee(s)
☐ Other _____

INSTRUCTIONS FOR COMPLETING THIS FORM

Any acknowledgment completed in California must contain verbiage exactly as appears above in the notary section or a separate acknowledgment form must be properly completed and attached to that document. The only exception is if a document is to be recorded outside of California. In such instances, any alternative acknowledgment verbiage as may be printed on such a document so long as the verbiage does not require the notary to do something that is illegal for a notary in California (i.e. certifying the authorized capacity of the signer). Please check the document carefully for proper notarial wording and attach this form if required.

- State and County information must be the State and County where the document signer(s) personally appeared before the notary public for acknowledgment.
- Date of notarization must be the date that the signer(s) personally appeared which must also be the same date the acknowledgment is completed.
- The notary public must print his or her name as it appears within his or her commission followed by a comma and then your title (notary public).
- Print the name(s) of document signer(s) who personally appear at the time of notarization.
- Indicate the correct singular or plural forms by crossing off incorrect forms (i.e. he/she/they, is /are) or circling the correct forms. Failure to correctly indicate this information may lead to rejection of document recording.
- The notary seal impression must be clear and photographically reproducible. Impression must not cover text or lines. If seal impression smudges, re-seal if a sufficient area permits, otherwise complete a different acknowledgment form.
- Signature of the notary public must match the signature on file with the office of the county clerk.
 - ❖ Additional information is not required but could help to ensure this acknowledgment is not misused or attached to a different document.
 - ❖ Indicate title or type of attached document, number of pages and date.
 - ❖ Indicate the capacity claimed by the signer. If the claimed capacity is a corporate officer, indicate the title (i.e. CEO, CFO, Secretary).
- Securely attach this document to the signed document

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

State of California

County of SACRAMENTO

On MAY 7, 2008 before me, WESLEY M. DOTE, NOTARY PUBLIC

Date

Here Insert Name and Title of the Officer

personally appeared JIM PEDDY

Name(s) of Signer(s)

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

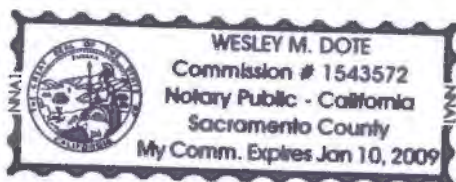
I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature

Signature of Notary Public

Place Notary Seal Above



OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

Description of Attached Document

Title or Type of Document: COOPERATING INTERAGENCY AGREEMENT

Document Date: MAY 7, 2008 Number of Pages: 7

Signer(s) Other Than Named Above: _____

Capacity(ies) Claimed by Signer(s)

Signer's Name: _____

- ☐ Individual
☐ Corporate Officer — Title(s): _____
☐ Partner — ☐ Limited ☐ General
☐ Attorney in Fact
☐ Trustee
☐ Guardian or Conservator
☐ Other: _____

Signer Is Representing: _____

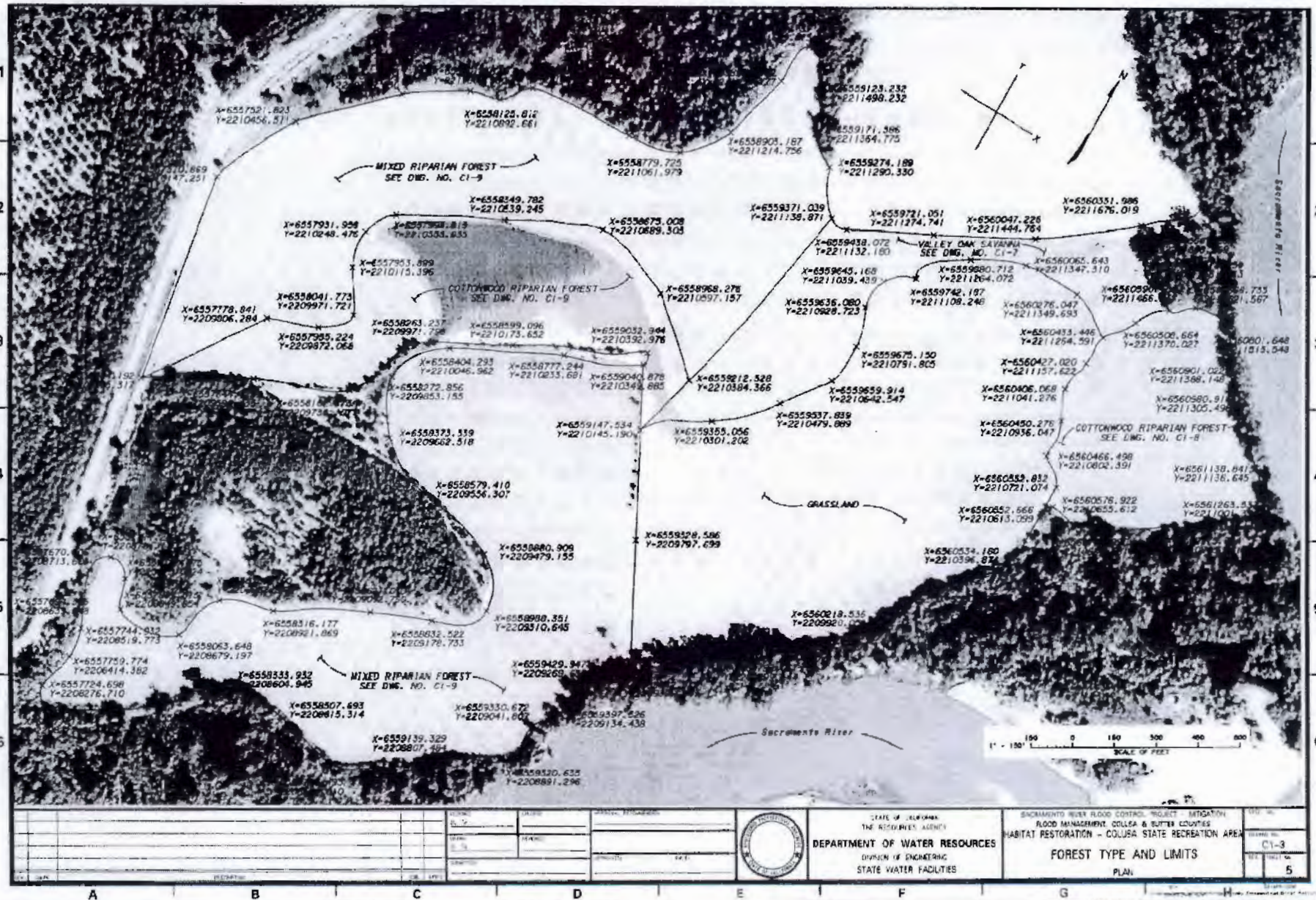
RIGHT THUMBPRINT
OF SIGNER
Top of thumb here

Signer's Name: _____

- ☐ Individual
☐ Corporate Officer — Title(s): _____
☐ Partner — ☐ Limited ☐ General
☐ Attorney in Fact
☐ Trustee
☐ Guardian or Conservator
☐ Other: _____

Signer Is Representing: _____

RIGHT THUMBPRINT
OF SIGNER
Top of thumb here



All that real property situated in Sections 17, 18, 19, and 20, Township 16 North, Range 1 West, M.D.M., County of Colusa, State of California, being a portion of the Lands of the State of California, Department of Parks and Recreation as said lands are described in that certain Grant Deed recorded in Document Number 2007-0000520 of Official Records of said county, said property being described as follows:

MNA-06-01 UNIT A

COMMENCING at a found 5/8 inch rebar and aluminum cap stamped "LS 5712", as shown on a Record of Survey, filed on August 10, 1994 in Book 5 of Surveys, at Page 58, Official Records of said county;
thence from said point of commencement North 49°05'40" East 753.27 feet to a found 5/8 inch iron pipe and tack with tag stamped "RE 6563", as shown on said Record of Survey;

thence North 04°35'41" West 894.77 feet to the Point of Beginning;

THENCE FROM SAID POINT OF BEGINNING the following twenty-eight (28) courses:

- 1) North 09° 18' 50" West 761.98 feet;
- 2) North 22° 57' 57" East 209.92 feet;
- 3) North 30° 46' 11" East 134.98 feet;
- 4) North 46° 22' 48" East 381.25 feet;
- 5) along a curve to the right, having a radius of 400.00 feet, through a central angle of 13° 04' 26", an arc length of 91.27 feet;
- 6) North 59° 27' 14" East 148.71 feet;
- 7) along a curve to the right, having a radius of 200.00 feet, through a central angle of 17° 06' 54", an arc length of 59.74 feet;
- 8) North 76° 34' 08" East 52.22 feet;
- 9) along a curve to the left, having a radius of 80.00 feet, through a central angle of 41° 47' 57", an arc length of 58.36 feet;
- 10) North 34° 46' 11" East 51.43 feet;
- 11) along a curve to the right, having a radius of 80.00 feet, through a central angle of 45° 08' 12", an arc length of 63.02 feet;
- 12) along a compound curve to the right, having a radius of 1000.00 feet, through a central angle of 06° 41' 07", an arc length of 116.68 feet;
- 13) North 86° 35' 30" East 319.81 feet;
- 14) along a curve to the left, having a radius of 230.00 feet, through a central angle of 50° 51' 58", an arc length of 204.19 feet;
- 15) North 35° 43' 32" East 79.08 feet;
- 16) along a curve to the left, having a radius of 150.00 feet, through a central angle of 19° 51' 02", an arc length of 51.97 feet;
- 17) North 15° 52' 30" East 236.51 feet;
- 18) along a curve to the left, having a radius of 150.00 feet, through a central angle of 31° 08' 48", an arc length of 81.54 feet;
- 19) along a reverse curve to the right, having a radius of 63.00 feet, through a central angle of 73° 09' 05", an arc length of 80.43 feet;
- 20) along a compound curve to the right, having a radius of 35.00 feet, through a central angle of 82° 48' 01", an arc length of 50.58 feet;

- 21) South 39° 19' 12" East 56.60 feet;
- 22) along a curve to the right, having a radius of 400.00 feet, through a central angle of 28° 01' 02", an arc length of 195.60 feet;
- 23) along a reverse curve to the left, having a radius of 80.00 feet, through a central angle of 24° 58' 17", an arc length of 34.87 feet;
- 24) South 36° 16' 27" East 3.54 feet;
- 25) South 54° 29' 53" East 54.73 feet;
- 26) along a curve to the left, having a radius of 200.00 feet, through a central angle of 13° 27' 19", an arc length of 46.97 feet;
- 27) along a reverse curve to the right, having a radius of 20.00 feet, through a central angle of 43° 11' 47", an arc length of 15.08 feet; and
- 28) South 24° 45' 24" East 214.44 feet to a found 5/8 inch rebar and aluminum cap stamped "LS 5712", as shown on said record of survey, said point being on the southerly terminus of a line labeled "S18° 26' 00" E 372.00'" as said line is shown on said record of survey, said point also being designated herein as Point "A";

thence from said point the following eighteen (18) courses:

- 1) South 11° 24' 17" West 373.46 feet;
- 2) South 13° 37' 27" West 348.06 feet to a point designated herein as Point "B";
- 3) North 48° 18' 57" West 305.02 feet;
- 4) North 58° 51' 14" West 36.50 feet;
- 5) North 67° 57' 27" West 190.35 feet;
- 6) along a curve to the left, having a radius of 200.00 feet, through a central angle of 46° 02' 52", an arc length of 160.74 feet;
- 7) South 65° 59' 40" West 131.13 feet;
- 8) South 62° 04' 15" West 238.16 feet;
- 9) South 66° 01' 52" West 69.86 feet;
- 10) South 61° 14' 39" West 236.44 feet;
- 11) along a curve to the left, having a radius of 180.00 feet, through a central angle of 94° 47' 19", an arc length of 297.79 feet;
- 12) South 33° 32' 41" East 142.86 feet;
- 13) along a curve to the right, having a radius of 50.00 feet, through a central angle of 79° 27' 53", an arc length of 69.35 feet;
- 14) along a compound curve to the right, having a radius of 350.00 feet, through a central angle of 26° 46' 58", an arc length of 163.61 feet;
- 15) South 72° 42' 11" West 97.45 feet;
- 16) along a curve to the left, having a radius of 40.00 feet, through a central angle of 39° 42' 26", an arc length of 27.72 feet;
- 17) South 32° 59' 45" West 204.97 feet; and
- 18) South 35° 50' 21" West 286.92 feet to the point of beginning.

Containing 29.90 Acres, more or less.

MNA-06-01 UNIT B

Beginning at the aforementioned Point "A";

THENCE FROM SAID POINT OF BEGINNING, along the general northerly line of said lands the following four (4) courses:

- 1) North 62° 34' 37" East 660.28 feet;
- 2) North 66° 09' 37" East 158.64 feet to a found 5/8 inch rebar and aluminum cap stamped "LS 5712", as shown on said record of survey;
- 3) North 77° 24' 16" East 274.63 feet to a found 5/8 inch rebar and aluminum cap stamped "LS 5712", as shown on said record of survey; and
- 4) North 08° 32' 54" West 110.31 feet to a found 5/8 inch rebar and aluminum cap stamped "LS 5712", as shown on said record of survey;

thence leaving said general northerly line the following thirty-four (34) courses:

- 1) South 71° 24' 11" East 110.72 feet;
- 2) along a curve to the right, having a radius of 100.00 feet, through a central angle of 29° 44' 52", an arc length of 51.92 feet;
- 3) South 41° 39' 19" East 92.76 feet;
- 4) South 43° 53' 39" East 26.54 feet;
- 5) along a curve to the left, having a radius of 27.00 feet, through a central angle of 28° 04' 37", an arc length of 13.23 feet to a point designated herein as Point "C";
- 6) South 55° 36' 40" West 33.13 feet;
- 7) along a curve to the left, having a radius of 120.00 feet, through a central angle of 31° 39' 35", an arc length of 66.31 feet;
- 8) South 23° 57' 06" West 44.26 feet;
- 9) South 27° 41' 27" West 28.52 feet;
- 10) South 42° 30' 10" West 72.69 feet;
- 11) South 26° 52' 45" West 15.69 feet;
- 12) North 55° 02' 37" West 102.10 feet;
- 13) along a curve to the left, having a radius of 150.00 feet, through a central angle of 31° 36' 17", an arc length of 82.74 feet;
- 14) North 86° 38' 54" West 89.98 feet;
- 15) along a curve to the left, having a radius of 450.00 feet, through a central angle of 35° 33' 07", an arc length of 279.22 feet;
- 16) South 57° 47' 59" West 152.25 feet;
- 17) along a curve to the left, having a radius of 100.00 feet, through a central angle of 25° 36' 43", an arc length of 44.70 feet;
- 18) South 32° 11' 16" West 32.29 feet;
- 19) along a curve to the left, having a radius of 30.00 feet, through a central angle of 57° 22' 53", an arc length of 30.04 feet;
- 20) South 25° 11' 37" East 11.24 feet;
- 21) along a non-tangent curve to the left, the center of which bears radially South 04° 13' 21" East, having a radius of 115.00 feet, through a central angle of 57° 55' 36", an arc length of 116.27 feet;
- 22) along a compound curve to the left, having a radius of 160.00 feet, through a central angle of 59° 12' 54", an arc length of 165.36 feet;

- 23) along a reverse curve to the right, having a radius of 120.00 feet, through a central angle of $25^{\circ} 26' 38''$, an arc length of 53.29 feet;
- 24) along a compound curve to the right, having a radius of 1000.00 feet, through a central angle of $08^{\circ} 27' 51''$, an arc length of 147.73 feet;
- 25) along a compound curve to the right, having a radius of 100.00 feet, through a central angle of $29^{\circ} 33' 48''$, an arc length of 51.60 feet;
- 26) South $32^{\circ} 06' 26''$ West 29.16 feet;
- 27) South $45^{\circ} 59' 52''$ West 24.28 feet;
- 28) South $36^{\circ} 09' 54''$ West 181.63 feet;
- 29) South $41^{\circ} 21' 34''$ West 86.40 feet;
- 30) along a curve to the right, having a radius of 500.00 feet, through a central angle of $22^{\circ} 04' 07''$, an arc length of 192.58 feet;
- 31) South $63^{\circ} 25' 40''$ West 79.90 feet;
- 32) along a curve to the left, having a radius of 200.00 feet, through a central angle of $31^{\circ} 11' 02''$, an arc length of 108.85 feet;
- 33) South $32^{\circ} 14' 33''$ West 23.32 feet to a point designated herein as Point "D"; and
- 34) North $15^{\circ} 12' 09''$ East 247.85 feet to a point on the easterly line of the above described Unit "A";

thence along said easterly line the following two (2) courses:

- 1) North $13^{\circ} 37' 27''$ East 348.06 feet; and
- 2) North $11^{\circ} 24' 17''$ East 373.46 feet to the point of beginning.

Containing 9.51 Acres, more or less.

MNA-06-01 UNIT C

Beginning at the aforementioned Point "C";

THENCE FROM SAID POINT OF BEGINNING the following thirty-six (36) courses:

- 1) along a non-tangent curve to the left, the center of which bears radially North $18^{\circ} 01' 45''$ East, having a radius of 27.00 feet, through a central angle of $69^{\circ} 28' 23''$, an arc length of 32.74 feet;
- 2) North $38^{\circ} 33' 21''$ East 30.58 feet;
- 3) along a curve to the right, having a radius of 80.00 feet, through a central angle of $36^{\circ} 56' 22''$, an arc length of 51.58 feet;
- 4) North $75^{\circ} 29' 43''$ East 10.85 feet;
- 5) along a curve to the right, having a radius of 165.00 feet, through a central angle of $29^{\circ} 56' 38''$, an arc length of 86.23 feet;
- 6) along a compound curve to the right, having a radius of 70.00 feet, through a central angle of $37^{\circ} 58' 50''$, an arc length of 46.40 feet;
- 7) South $36^{\circ} 34' 49''$ East 149.29 feet;
- 8) along a curve to the left, having a radius of 200.00 feet, through a central angle of $07^{\circ} 48' 13''$, an arc length of 27.24 feet;
- 9) South $44^{\circ} 23' 02''$ East 47.17 feet;
- 10) South $48^{\circ} 30' 19''$ East 35.79 feet;
- 11) South $45^{\circ} 37' 33''$ East 39.47 feet;

- 12) South 41° 34' 41" East 152.83 feet;
- 13) South 48° 27' 52" East 175.00 feet;
- 14) along a curve to the right, having a radius of 65.00 feet, through a central angle of 106° 13' 08", an arc length of 120.50 feet;
- 15) South 57° 45' 17" West 54.00 feet;
- 16) South 62° 51' 36" West 187.61 feet;
- 17) along a curve to the left, having a radius of 800.00 feet, through a central angle of 09° 09' 03", an arc length of 127.77 feet;
- 18) South 53° 42' 34" West 139.45 feet;
- 19) along a curve to the right, having a radius of 200.00 feet, through a central angle of 50° 33' 56", an arc length of 176.51 feet;
- 20) North 75° 43' 30" West 35.05 feet;
- 21) along a curve to the left, having a radius of 35.00 feet, through a central angle of 96° 20' 29", an arc length of 58.85 feet;
- 22) South 07° 56' 01" West 13.85 feet;
- 23) North 00° 05' 37" East 97.11 feet;
- 24) along a curve to the left, having a radius of 60.00 feet, through a central angle of 56° 54' 21", an arc length of 59.59 feet;
- 25) North 56° 48' 44" West 57.38 feet;
- 26) along a curve to the right, having a radius of 30.00 feet, through a central angle of 62° 27' 04", an arc length of 32.70 feet;
- 27) North 05° 38' 20" East 56.93 feet;
- 28) along a curve to the left, having a radius of 50.00 feet, through a central angle of 29° 58' 35", an arc length of 26.16 feet;
- 29) North 24° 20' 15" West 51.27 feet;
- 30) North 28° 31' 19" West 56.65 feet;
- 31) along a curve to the right, having a radius of 120.00 feet, through a central angle of 49° 20' 43", an arc length of 103.35 feet;
- 32) North 20° 49' 24" East 37.38 feet;
- 33) North 07° 10' 17" East 59.51 feet;
- 34) North 08° 18' 30" West 37.51 feet;
- 35) along a curve to the right, having a radius of 50.00 feet, through a central angle of 35° 11' 16", an arc length of 30.71 feet; and
- 36) North 26° 52' 45" East 5.68 feet to a point on the easterly line of the above described Unit "B";

thence along said easterly line the following six (6) courses:

- 1) North 26° 52' 45" East 15.69 feet;
- 2) North 42° 30' 10" East 72.69 feet;
- 3) North 27° 41' 27" East 28.52 feet;
- 4) North 23° 57' 06" East 44.26 feet;
- 5) along a curve to the right, having a radius of 120.00 feet, through a central angle of 31° 39' 35", an arc length of 66.31 feet; and
- 6) North 55° 36' 40" East 33.13 feet to the point of beginning.

Containing 10.95 Acres, more or less.

MNA-06-01 UNIT D

Beginning at the aforementioned Point "D";

THENCE FROM SAID POINT OF BEGINNING, along the general southerly line of the above described Unit B the following twenty-two (22) courses:

- 1) North 32° 14' 33" East 23.32 feet;
- 2) along a curve to the right, having a radius of 200.00 feet, through a central angle of 31° 11' 02", an arc length of 108.85 feet;
- 3) North 63° 25' 40" East 79.90 feet;
- 4) along a curve to the left, having a radius of 500.00 feet, through a central angle of 22° 04' 07", an arc length of 192.58 feet;
- 5) North 41° 21' 34" East 86.40 feet;
- 6) North 36° 09' 54" East 181.63 feet;
- 7) North 45° 59' 52" East 24.28 feet;
- 8) North 32° 06' 26" East 29.16 feet;
- 9) along a curve to the left, having a radius of 100.00 feet, through a central angle of 29° 33' 48", an arc length of 51.60 feet;
- 10) along a compound curve to the left, having a radius of 1000.00 feet, through a central angle of 08° 27' 51", an arc length of 147.73 feet;
- 11) along a compound curve to the left, having a radius of 120.00 feet, through a central angle of 25° 26' 38", an arc length of 53.29 feet;
- 12) along a reverse curve to the right, having a radius of 160.00 feet, through a central angle of 59° 12' 54", an arc length of 165.36 feet;
- 13) along a compound curve to the right, having a radius of 115.00 feet, through a central angle of 57° 55' 36", an arc length of 116.27 feet;
- 14) North 25° 11' 37" West 11.24 feet;
- 15) along a curve to the right, having a radius of 30.00 feet, through a central angle of 57° 22' 53", an arc length of 30.04 feet;
- 16) North 32° 11' 16" East 32.29 feet;
- 17) along a curve to the right, having a radius of 100.00 feet, through a central angle of 25° 36' 43", an arc length of 44.70 feet;
- 18) North 57° 47' 59" East 152.25 feet;
- 19) along a curve to the right, having a radius of 450.00 feet, through a central angle of 35° 33' 07", an arc length of 279.22 feet;
- 20) South 86° 38' 54" East 89.98 feet;
- 21) along a curve to the right, having a radius of 150.00 feet, through a central angle of 31° 36' 17", an arc length of 82.74 feet; and
- 22) South 55° 02' 37" East 102.10 feet to a point on the westerly line of the above described Unit "C";

thence along said westerly line the following fourteen (14) courses:

- 1) South 26° 52' 45" West 5.68 feet;
- 2) along a curve to the left, having a radius of 50.00 feet, through a central angle of 35° 11' 16", an arc length of 30.71 feet;
- 3) South 08° 18' 30" East 37.51 feet;
- 4) South 07° 10' 17" West 59.51 feet;
- 5) South 20° 49' 24" West 37.38 feet;

- 6) along a curve to the left, having a radius of 120.00 feet, through a central angle of $49^{\circ} 20' 43''$, an arc length of 103.35 feet;
 - 7) South $28^{\circ} 31' 19''$ East 56.65 feet;
 - 8) South $24^{\circ} 20' 15''$ East 51.27 feet;
 - 9) along a curve to the right, having a radius of 50.00 feet, through a central angle of $29^{\circ} 58' 35''$, an arc length of 26.16 feet;
 - 10) South $05^{\circ} 38' 20''$ West 56.93 feet;
 - 11) along a curve to the left, having a radius of 30.00 feet, through a central angle of $62^{\circ} 27' 04''$, an arc length of 32.70 feet;
 - 12) South $56^{\circ} 48' 44''$ East 57.38 feet;
 - 13) along a curve to the right, having a radius of 60.00 feet, through a central angle of $56^{\circ} 54' 21''$, an arc length of 59.59 feet; and
 - 14) South $00^{\circ} 05' 37''$ West 97.11 feet;
- thence leaving said westerly line the following fifteen (15) courses:
- 1) South $00^{\circ} 05' 37''$ West 137.69 feet;
 - 2) along a curve to the right, having a radius of 200.00 feet, through a central angle of $47^{\circ} 23' 45''$, an arc length of 165.44 feet;
 - 3) South $47^{\circ} 29' 22''$ West 131.08 feet;
 - 4) along a curve to the left, having a radius of 300.00 feet, through a central angle of $29^{\circ} 14' 02''$, an arc length of 153.07 feet;
 - 5) South $18^{\circ} 15' 21''$ West 58.56 feet;
 - 6) along a curve to the right, having a radius of 450.00 feet, through a central angle of $40^{\circ} 22' 42''$, an arc length of 317.13 feet;
 - 7) South $58^{\circ} 38' 02''$ West 95.48 feet;
 - 8) along a curve to the left, having a radius of 1000.00 feet, through a central angle of $07^{\circ} 36' 55''$, an arc length of 132.91 feet;
 - 9) South $51^{\circ} 01' 08''$ West 263.91 feet;
 - 10) along a curve to the left, having a radius of 300.00 feet, through a central angle of $17^{\circ} 01' 38''$, an arc length of 89.15 feet;
 - 11) South $33^{\circ} 59' 30''$ West 54.78 feet;
 - 12) along a curve to the right, having a radius of 50.00 feet, through a central angle of $51^{\circ} 31' 13''$, an arc length of 44.96 feet;
 - 13) South $85^{\circ} 30' 41''$ West 31.01 feet;
 - 14) North $27^{\circ} 31' 19''$ West 463.96 feet; and
 - 15) North $27^{\circ} 31' 15''$ West 391.83 feet to the point of beginning.

Containing 35.20 Acres, more or less.

MNA-06-01 UNIT E

Beginning at the aforementioned Point "B", said point being on the westerly line of the above described Unit "B";

THENCE FROM SAID POINT OF BEGINNING, along said westerly line

South $15^{\circ} 12' 09''$ West 247.85 feet;

thence leaving said westerly line the following twelve (12) courses:

- 1) North $27^{\circ} 31' 15''$ West 278.31 feet;

- 2) South 60° 36' 47" West 734.74 feet;
- 3) along a curve to the left, having a radius of 200.00 feet, through a central angle of 97° 42' 16", an arc length of 341.05 feet;
- 4) South 37° 05' 30" East 118.47 feet;
- 5) along a curve to the left, having a radius of 200.00 feet, through a central angle of 44° 50' 54", an arc length of 156.55 feet;
- 6) North 81° 56' 24" West 35.49 feet;
- 7) along a curve to the left, having a radius of 1000.00 feet, through a central angle of 07° 58' 09", an arc length of 139.09 feet;
- 8) North 89° 54' 33" West 521.79 feet;
- 9) along a curve to the left, having a radius of 80.00 feet, through a central angle of 22° 52' 57", an arc length of 31.95 feet;
- 10) along a compound curve to the left, having a radius of 1000.00 feet, through a central angle of 09° 12' 26", an arc length of 160.70 feet;
- 11) South 58° 00' 04" West 132.52 feet;
- 12) South 52° 02' 53" West 56.44 feet to the southerly most corner of the above described Unit "A";

thence along the southerly line of said Unit "A" the following sixteen (16) courses:

- 1) North 35° 50' 21" East 286.92 feet;
- 2) North 32° 59' 45" East 204.97 feet;
- 3) along a curve to the right, having a radius of 40.00 feet, through a central angle of 39° 42' 26", an arc length of 27.72 feet;
- 4) North 72° 42' 11" East 97.45 feet;
- 5) along a curve to the left, having a radius of 350.00 feet, through a central angle of 26° 46' 58", an arc length of 163.61 feet;
- 6) along a compound curve to the left, having a radius of 50.00 feet, through a central angle of 79° 27' 53", an arc length of 69.35 feet;
- 7) North 33° 32' 41" West 142.86 feet;
- 8) along a curve to the right, having a radius of 180.00 feet, through a central angle of 94° 47' 19", an arc length of 297.79 feet;
- 9) North 61° 14' 39" East 236.44 feet;
- 10) North 66° 01' 52" East 69.86 feet;
- 11) North 62° 04' 15" East 238.16 feet;
- 12) North 65° 59' 40" East 131.13 feet;
- 13) along a curve to the right, having a radius of 200.00 feet, through a central angle of 46° 02' 52", an arc length of 160.74 feet;
- 14) South 67° 57' 27" East 190.35 feet;
- 15) South 58° 51' 14" East 36.50 feet; and
- 16) South 48° 18' 57" East 305.02 feet to the Point of Beginning;

Containing 16.63 Acres, more or less.

MNA-06-01 UNIT F

Beginning at the aforementioned Point "D", said point being on the southwesterly line of the above described Unit "D";

THENCE FROM SAID POINT OF BEGINNING, along said southwesterly line the following two (2) courses:

- 1) South 27° 31' 15" East 391.83 feet; and
- 2) South 27° 31' 19" East 463.96 feet;

thence leaving said southwesterly line the following forty-four (44) courses:

- 1) South 85° 30' 46" West 18.27 feet;
- 2) along a non-tangent curve to the left, the center of which bears radially South 04° 29' 17" East, having a radius of 80.00 feet, through a central angle of 49° 23' 52", an arc length of 68.97 feet;
- 3) along a compound curve to the left, having a radius of 200.00 feet, through a central angle of 25° 02' 21", an arc length of 87.40 feet;
- 4) South 11° 04' 30" West 77.53 feet;
- 5) along a curve to the right, having a radius of 250.00 feet, through a central angle of 34° 18' 25", an arc length of 149.69 feet;
- 6) along a reverse curve to the left, having a radius of 80.00 feet, through a central angle of 52° 21' 01", an arc length of 73.09 feet;
- 7) South 06° 58' 06" East 62.49 feet;
- 8) along a curve to the right, having a radius of 70.00 feet, through a central angle of 77° 41' 30", an arc length of 94.92 feet;
- 9) South 70° 43' 24" West 84.58 feet;
- 10) along a curve to the left, having a radius of 500.00 feet, through a central angle of 19° 35' 50", an arc length of 171.02 feet;
- 11) South 51° 07' 34" West 252.05 feet;
- 12) along a curve to the right, having a radius of 155.00 feet, through a central angle of 52° 57' 57", an arc length of 143.29 feet;
- 13) North 75° 54' 29" West 186.95 feet;
- 14) along a curve to the left, having a radius of 380.00 feet, through a central angle of 63° 21' 35", an arc length of 420.22 feet;
- 15) South 40° 43' 56" West 107.28 feet;
- 16) along a curve to the right, having a radius of 300.00 feet, through a central angle of 17° 18' 29", an arc length of 90.63 feet;
- 17) South 58° 02' 25" West 89.14 feet;
- 18) South 65° 29' 18" West 205.86 feet;
- 19) North 45° 57' 34" West 22.03 feet;
- 20) along a curve to the right, having a radius of 70.00 feet, through a central angle of 64° 53' 24", an arc length of 79.28 feet;
- 21) North 18° 55' 51" East 54.41 feet;
- 22) along a curve to the left, having a radius of 250.00 feet, through a central angle of 41° 54' 36", an arc length of 182.87 feet;
- 23) North 22° 58' 46" West 101.82 feet;
- 24) North 19° 17' 56" West 80.39 feet;
- 25) along a curve to the right, having a radius of 66.00 feet, through a central angle of 180° 11' 24", an arc length of 207.56 feet;
- 26) South 19° 06' 32" East 81.64 feet;
- 27) along a curve to the left, having a radius of 65.00 feet, through a central angle of 70° 53' 28", an arc length of 80.42 feet;

- 28) North $90^{\circ} 00' 00''$ East 40.13 feet;
- 29) along a curve to the left, having a radius of 250.00 feet, through a central angle of $25^{\circ} 24' 28''$, an arc length of 110.86 feet;
- 30) along a compound curve to the left, having a radius of 75.00 feet, through a central angle of $55^{\circ} 39' 03''$, an arc length of 72.85 feet;
- 31) North $08^{\circ} 56' 30''$ East 65.38 feet;
- 32) along a curve to the right, having a radius of 150.00 feet, through a central angle of $70^{\circ} 14' 00''$, an arc length of 183.87 feet;
- 33) North $79^{\circ} 10' 30''$ East 75.71 feet;
- 34) along a curve to the left, having a radius of 200.00 feet, through a central angle of $25^{\circ} 19' 34''$, an arc length of 88.40 feet;
- 35) North $53^{\circ} 50' 56''$ East 44.34 feet;
- 36) along a curve to the right, having a radius of 800.00 feet, through a central angle of $11^{\circ} 34' 16''$, an arc length of 161.56 feet;
- 37) North $65^{\circ} 25' 12''$ East 222.82 feet;
- 38) North $71^{\circ} 29' 52''$ East 152.51 feet;
- 39) along a curve to the left, having a radius of 300.00 feet, through a central angle of $11^{\circ} 03' 52''$, an arc length of 57.93 feet;
- 40) along a compound curve to the left, having a radius of 105.00 feet, through a central angle of $91^{\circ} 55' 36''$, an arc length of 168.46 feet;
- 41) North $31^{\circ} 29' 36''$ West 62.73 feet;
- 42) along a curve to the left, having a radius of 200.00 feet, through a central angle of $41^{\circ} 08' 22''$, an arc length of 143.60 feet;
- 43) North $72^{\circ} 37' 57''$ West 100.68 feet; and
- 44) North $81^{\circ} 56' 24''$ West 215.55 feet to a point on the easterly line of the above described Unit E;

thence along said easterly line the following five (5) courses:

- 1) along a curve to the right, having a radius of 200.00 feet, through a central angle of $44^{\circ} 50' 54''$, an arc length of 156.55 feet;
- 2) North $37^{\circ} 05' 30''$ West 118.47 feet;
- 3) along a curve to the right, having a radius of 200.00 feet, through a central angle of $97^{\circ} 42' 16''$, an arc length of 341.05 feet;
- 4) North $60^{\circ} 36' 47''$ East 734.74 feet; and
- 5) South $27^{\circ} 31' 15''$ East 278.31 feet to the Point of Beginning.

Containing 34.82 Acres, more or less.

The basis of bearings for this description is the California Coordinate System, CCS 83 (2007), Zone II. All distances and coordinates cited herein are grid values, which are the basis for the areas shown hereon. To obtain ground values multiply the distances cited herein by 1.00008099.

End of Description



JUL 01 2008



MEMORANDUM OF UNDERSTANDING

between

THE U.S. FISH AND WILDLIFE SERVICE

regarding the

SACRAMENTO RIVER NATIONAL WILDLIFE REFUGE

and

THE CALIFORNIA DEPARTMENT OF FISH AND GAME

regarding the

SACRAMENTO RIVER WILDLIFE AREA

and Feather River Wildlife Area

and

**THE CALIFORNIA DEPARTMENT OF PARKS AND RECREATION
NORTHERN BUTTES DISTRICT**

regarding the

Sacramento River State Parks

I. PARTICIPANTS

This Memorandum of Understanding (MOU) is an agreement for land management purposes between the U.S. Fish and Wildlife Service regarding the Sacramento River National Wildlife Refuge (Service), the California Department of Fish and Game regarding the Sacramento River Wildlife Area and the Feather River Wildlife Area (Department), and the California Department of Parks and Recreation regarding the Sacramento River State Parks (State Parks). In addition to presently owned and managed lands, this MOU will also apply to any future acquisitions by the Service, Department, and State Parks within the designated units.

II. PURPOSE

The purpose of this MOU is to formally document an agreement to mutually manage, monitor, restore and enhance lands managed for fish, wildlife, and plants along the Sacramento and Feather Rivers in Tehama, Butte, Glenn, Colusa, Sutter, and Yuba Counties, California. An additional

purpose is to communicate between agencies regularly to prevent duplicating or prescribing conflicting land management and acquisition efforts and to coordinate endangered species management.

D2

III. AUTHORITY

Fish and Wildlife Coordination Act of 1958, 16 U.S.C. 661.

Migratory Bird Conservation Act, 16 U.S.C. 715i.

Endangered Species Act of 1973, 16 U.S.C. 1531-1544.

IV. SCOPE OF ACTIONS

The affected area includes all lands owned and managed as the Sacramento River National Wildlife Refuge, Sacramento River Wildlife Area, and State Parks located along the Sacramento River and the Feather River Wildlife Area along the Feather River in the designated counties. These lands have been identified in several documents as providing essential habitat for numerous species of fish and wildlife including many threatened and endangered species. The Service, Department, and State Parks mutually agree to manage these lands for the conservation of biological, cultural, and scenic values, and for promoting compatible wildlife-dependent recreational opportunities.

The Service, Department and State Parks agree to cooperate on the following items:

A. General Management:

- Combine efforts to mutually manage, monitor, restore, and enhance fish and wildlife management projects in the designated area.
- Coordinate management between agencies to prevent duplicating or prescribing conflicting management.

B. Public Use:

- Coordinate to provide public use opportunities that are consistent with the goals and needs of the agencies and their respective public.
- Provide clear, non-conflicting, straight-forward information to visitors.
- Cooperate in the development of public use plans. This would include cooperating with signing, brochures, use maps, and regulations.
- Promote mutual environmental education and special event opportunities.

In some instances, an agency may need to change its public use regulations in a specific area to protect natural resources (i.e. sensitive species) and provide a quality outdoor experience for the public. All public use will be offered in a manner that is consistent with land purchase and public trust documents, and is

compatible with Service, Department, and State Parks purposes and missions.

C. Acquisition:

- Coordinate on acquisition plans.
- Prevent duplicate or conflicting acquisition efforts.
- Pursue joint funding opportunities when applicable.



D. Maintenance:

- Coordinate and share maintenance equipment and staff, whenever possible.
- Negotiate transportation and maintenance/repairs of shared equipment.
- Combine maintenance work parties to address specific concerns in a timely manner and to reduce funding needs for joint project.

E. Biological Data:

- **SURVEYS.** Data collection will be coordinated and standardized between agencies whenever possible to strengthen study results and to aid interpreting trends in wildlife and plant populations. Agencies agree to coordinate efforts in research of threatened and endangered species, migratory birds, fish, wildlife (including predators), and plant surveys. Combining funds for a specific contract, arranging for volunteer and staff assistance, and sharing equipment (i.e. boats, ATV, etc.) may facilitate research projects.
- **RESEARCH.** Research needs will be identified and efforts combined to initiate and fund specific research projects.
- **MONITORING.** Monitoring of restoration project sites will be coordinated so that the information is comparable, consistent and complementary. Efforts may be combined to fund and staff specific monitoring components.

F. Permits:

The agencies will communicate and cooperate on permits. Combined or regional environmental documents and permits that could benefit all agencies will be considered. Special-Use Permits will be required for all activities on Service lands and the equivalent required for all activities on Department and State Parks lands.

G. Law Enforcement:

The agencies will communicate and cooperate on law enforcement issues. Efforts will be made to discuss issues, potential problems, needed support and to exchange phone numbers and current staffing information on a regular basis. Signing efforts will be mutually updated and implemented.

H. Coordination:

Formal meetings will be held semi-annually in spring and fall at a minimum. The agencies will alternate hosting and provide agendas and notification for the meeting. The meeting agendas (jointly developed) may be changed under mutual consent of the agencies and additional meetings may be held to discuss specific topics. Suggested agenda topics include:

- Discuss current issues/events
- Provide relevant updates on agency activities
- Highlight a main topic/training opportunity at each meeting
- Set next meeting location, time, and date

V. PROJECT OFFICERS

David Walker, Unit Biologist
Northern California - North Coast Region
California Department of Fish and Game
1760 Bidwell Road
Red Bluff, California 96080
(530) 528-9405

Henry Lomeli, Unit Biologist
California Department of Fish and Game,
1701 Nimbus Road
Rancho Cordova, California 95670
(916) 358-2900

Woody Elliott, Resource Ecologist
Northern Buttes District
Department of Parks and Recreation
400 Glen Drive
Oroville, California 95966-9222
(530) 538-2200

Kelly Moroney
Assistant Refuge Manager
Sacramento River National Wildlife Refuge
U.S. Fish and Wildlife Service
752 County Road 99W
Willows, California 95988
(530) 934-2801

VI. MODIFICATION AND TERMINATION

This MOU agreement may be amended with consent of all agencies. Amendments will be attached to this document after concurrence of the agencies.

D5

This agreement may be terminated as mutually agreed or upon 6 months written notice by any agency.

VII. APPROVAL


This MOU shall be effective on the date all signatures are received and will be in effect for a period of five years. At that time, the MOU may be reviewed, updated, and extended for an additional five-year period.



Don Koch, Regional Manager
Northern California - North Coast Region
California Department of Fish and Game
Redding, California

Date

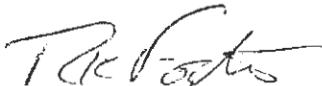
12/13/04



Banky Curtis, Regional Manager
Sacramento Valley - Central Sierra Region
California Department of Fish and Game
Rancho Cordova, California

Date

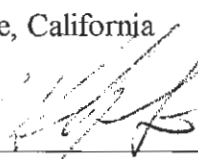
12/13/04



Robert Foster, District Superintendent
Northern Buttes District
Department of Parks and Recreation
Oroville, California

Date

12/14/04



Kevin S. Foerster, Project Leader
Sacramento National Wildlife Refuge Complex
U.S. Fish and Wildlife Service
Willows, California

Date

12/20/2004



Appendix J

MEMORANDUM OF AGREEMENT REGARDING THE SACRAMENTO RIVER CONSERVATION AREA

The original *Sacramento River Conservation Area Handbook* included a proposed Memorandum of Agreement which was intended to incorporate the shared agreement of the various local, State and federal agencies in regard to the conservation program along the river. This Memorandum of Agreement was subsequently signed on behalf of all the Counties in the SRCA and the key State and federal agencies involved in the SRCA. The General Agreements provisions include the commitment of each entity to:

1. Endorse the goals of the *1989 Upper Sacramento River Fisheries and Riparian Habitat Management Plan*.
2. Agree to the goals and principles of the SRCA and the *Handbook*.
3. Agree to maximize coordination and consistency of programs with the *1989 Upper Sacramento River Fisheries and Riparian Habitat Management Plan* and the *Handbook*.
4. Recognize the proposed Conservation Area as delineated and described in the *Handbook*.
5. Recommend and agree to the creation of a nonprofit organization (Now the SRCAF).
6. Agree that any breach of the inner river zone would be addressed quickly with full cooperation.

The Memorandum of Agreement has been signed by the following agencies:

- Butte County
- Colusa County
- Glenn County
- Shasta County
- Sutter County
- Tehama County
- Yolo County
- California Department of Fish and Game
- California Department of Parks and Recreation
- California Department of Water Resources
- California Reclamation Board
- California Resources Agency
- California State Lands Commission
- California Wildlife Conservation Board
- U.S. Army Corps of Engineers
- U.S. Bureau of Land Management
- U.S. Bureau of Reclamation
- U.S. Fish and Wildlife Service

The full text of the Memorandum of Agreement, as provided by the SRCAF, is incorporated in this Appendix J.



MEMORANDUM OF AGREEMENT REGARDING THE SACRAMENTO RIVER CONSERVATION AREA

I. Preamble

Background

In 1986, the California State Legislature passed Senate Bill 1086. The law called for development of a management plan for the Sacramento River and its tributaries to protect, restore, and enhance both fisheries and riparian habitat. The law created an Advisory Council, composed of representatives of state and federal agencies, county supervisors, and landowner, water contractor, commercial and sport fishery, and general wildlife and conservation representatives. The Council and its action teams developed a plan which included a specific and action-oriented fisheries plan, and a more conceptual riparian habitat plan. This plan, the *Upper Sacramento River Fisheries and Riparian Habitat Management Plan*, was published by the State of California Resources Agency in 1989 (*1989 Plan*).

Many of the fisheries action items have since been or are currently being implemented, such as fish bypass structures at diversions on Sacramento River tributaries, and the Shasta Dam temperature control structure. A Riparian Habitat Committee was created in 1993, when the Advisory Council was reconvened by the Secretary of Resources to “complete its earlier work concerning riparian habitat protection and management, including the development of a specific implementation program.”

The Riparian Habitat Committee is an informal and consensus-based planning group. It includes landowner representatives, environmental group leaders, and agency personnel who are working toward on-the-ground implementation of the *1989 Plan*. They have developed *The Sacramento River Conservation Area Handbook (Handbook)* as a guide for riparian habitat management along the Sacramento River. The Committee has worked to ensure that the *Handbook* addresses both the dynamics of riparian ecosystems as well as the realities of local agricultural economies.

Through the work of the Riparian Habitat Committee, the Advisory Council proposes the formation of a largely locally-based nonprofit entity to coordinate implementation of the riparian habitat management and restorations goals and objectives of the *1989 Plan* and *Handbook*. Actions implemented by the nonprofit should also be coordinated with the Central Valley Project Improvement Act, the CALFED Bay-Delta Program, and the U.S. Army Corps of Engineers Sacramento-San Joaquin Basins Comprehensive Study, and other ongoing related activities. The work of this nonprofit organization would be supported by the various agencies and organizations interested in the Sacramento River through this Memorandum of Agreement (MOA).

Goal of the Sacramento River Conservation Area Program



The goal of the Sacramento River Conservation Area Program as outlined in the *1989 Plan* is “to preserve remaining riparian habitat and reestablish a continuous riparian ecosystem along the Sacramento River between Chico and Redding, and reestablish riparian vegetation along the river from Verona to Chico.” The goal will be met in a manner that follows these six guiding principles:

- Utilizes an ecosystem approach that contributes to recovery of threatened and endangered species and is sustainable by natural processes;
- Uses the most effective and least environmentally damaging bank protection techniques to maintain a limited meander, where appropriate;
- Operates within the parameters of local, state and federal flood control and bank protection programs;
- Encourages participation by private landowners and affected local entities that is voluntary, never mandatory;
- Gives full consideration to landowner, public and local government concerns;
- Provides for the accurate and accessible information and education that is key to sound resource management.

II. Purpose of MOA and Disclaimers

The purpose of this MOA is to:

- A. Document broad endorsement by the signatories of the decisions and recommendations made by the Advisory Council embodied in the *1989 Plan*.
- B. Document signatory commitment to support the goals, six principles and *Handbook*.
- C. Improve coordination and cooperation between public agencies in the implementation of the *1989 Plan* and *Handbook*.
- D. Identify the agreements of the signatories and relationships among the signatories and the new nonprofit organization (NPO) in implementing the *1989 Plan* and *Handbook*.
- E. Document signatory support of the establishment of a NPO as described in *Goal, Role and Structure of a Nonprofit Organization* (Attachment A).



- F. Identify the role and responsibilities of the NPO as detailed in Attachment A.

Disclaimers

- A. Nothing in this MOA is intended to expand or limit the legal authority of any signatory, agency, entity or organization. This document does not modify or supersede other existing agreements, programs, MOUs, plans, regulations or executive orders.
- B. Nothing herein alters the existing authorities or responsibilities of any party nor shall be considered as obligating any party in the expenditure of funds or the future payment of money or providing services.
- C. This MOA is intended to embody general principles, and does not create contractual relationships, rights, obligations, duties or remedies between or among signatories.
- D. All activities implemented by the NPO under the *1989 Plan and Handbook*, including site specific agreements, will be in compliance with all applicable existing and future local, state, and federal laws and regulations.
- E. The signatories acknowledge that the California Environmental Quality Act requires consideration of the environmental consequences of an activity as early as feasible in the planning process to enable environmental considerations to influence project program and design. All activities implemented under the *1989 Plan and Handbook* will comply with CEQA and the National Environmental Policy Act (NEPA) on a site-specific basis. The signatories will also consider the appropriateness and potential benefits of programmatic approaches to CEQA and NEPA compliance.

III. Relationship between Signatories and Nonprofit Organization

- A. We will support the NPO in implementing the *1989 Plan and Handbook*, and will work with the NPO on specific projects. We will maximize coordination and consistency of policies and programs with the *1989 Plan and Handbook*.
- B. We will assist the NPO in identifying and obtaining funding sources for the activities of the NPO including, but not limited to, a voluntary land transaction or management program. This program may include activities such as development of site specific land management plans within the inner zone; bank stabilization that is consistent with the *1989 Plan and Handbook*; revegetation of levees and other areas where natural revegetation will not occur; and control of trespass and vandalism.



- C. We will coordinate with the NPO in the land management planning process for lands within the Conservation Area delineated in the *Handbook*.
- D. We will coordinate with the NPO when acquiring lands within the Conservation Area delineated in the *Handbook*.
- E. We will conduct land management practices on public lands within the Sacramento River Conservation Area in a manner that is consistent with the *1989 Plan* and *Handbook*.
- F. We may contract with the NPO.
- G. Signatories will work with the NPO to develop a streamlined/ coordinated permit process for individual project agreements.
- H. Appropriate signatories will participate in a technical advisory committee for the NPO. They will assist the NPO with technical information on issues such as erosion/deposition data, flood control activities, and habitat protection and restoration methods and programs.
- I. Appropriate signatories will work with the NPO to coordinate and maximize law enforcement activities regarding trespass and vandalism along the river and for participating properties within the Conservation Area on both private and public lands.

IV. General Agreements

- A. We endorse the goals of the *1989 Plan*.
- B. We agree to the goals, six principles, and *Handbook*.
- C. We agree to maximize coordination and consistency of the programs and policies of our agencies with the goals, and management objectives in the *1989 Plan* and *Handbook*.
- D. We agree to recognize the proposed Conservation Area as delineated and described in the *Handbook*.
- E. We recommend and agree to the creation of a NPO as detailed in Attachment A. The NPO will oversee implementation of the goals and restoration priorities stated in the *1989 Plan* and *Handbook*.
- F. We agree that any potential breach of the inner zone boundary will be addressed quickly and with our full cooperation. The manner in which the breach will be addressed will depend on the specific site, and may range from the placement of rock or other appropriate material to the acquisition of land.



V. Amendment Process

This MOA may be supplemented, amended, or modified by the written agreement thereto of the signatories.

VI. Signatories

NOTE: Support for this MOA will be solicited and welcomed from each of the governments and agencies below. After signing the MOA, each county participant will appoint two representatives to the board of directors of the proposed nonprofit organization. The participation of four counties is required to ensure a large enough initial board. Italics indicate those state governments and agencies from whom signed support is critical for the success of the program.

Butte County
Colusa County
Glenn County
Shasta County
Sutter County
Tehama County
Yolo County
California Resources Agency
California Department of Fish and Game
Wildlife Conservation Board
California Department of Water Resources
California Department of Parks and Recreation
California Water Commission
The Reclamation Board
California State Lands Commission
California Department of Food and Agriculture
United States Army Corps of Engineers
United States Bureau of Reclamation
United States Fish and Wildlife Service
United States Natural Resource Conservation Service
National Marine Fisheries Service
City of Redding
City of Anderson
City of Red Bluff
City of Tehama
City of Colusa
California Environmental Protection Agency
California Department of Forestry and Fire Protection
California Department of Boating and Waterways
California Department of Conservation
Special Districts (e.g. reclamation, flood control, irrigation districts etc.)
State Water Resources Control Board
Central Valley Regional Water Quality Control Board
United States Environmental Protection Agency
United States Bureau of Land Management
United States Forest Service




In addition to signed support from the above governments and agencies, endorsements will be sought from the following programs and organizations:


Audubon Society
CALFED Bay Delta Program
California Cattlemen's Association
California Farm Bureau Federation
Central Valley Habitat Joint Venture
California Waterfowl Association
CalTrout
Central Valley Flood Control Association
Ducks Unlimited
Family Water Alliance
Friends of the River
The Nature Conservancy
Northern California Water Association
Pacific Coast Federation of Fishermen's Associations
Planning and Conservation League
Riparian Habitat Joint Venture
Sacramento River Discovery Center
Sacramento River Partners
Sacramento River Preservation Trust
Sacramento River Watershed Program
Sacramento Valley Landowners Association
Society for Ecological Restoration, California Chapter
Trust for Public Lands
United Anglers of California

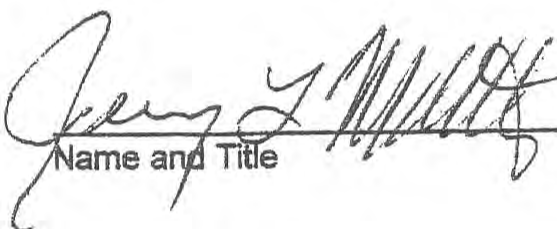
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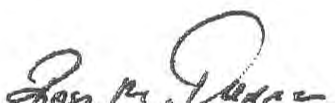
SIGNATURES


Name and Title Denny Bungarz,
Chairman
Glenn County Board of
Agency Supervisors
June 1, 1999
Date


Name and Title Jane Dolan, Chair
Butte County
Agency
May 16, 2000
Date


Name and Title
Shasta County
Agency
JUL 27 1999
Date


Name and Title
Chairman
Colusa County
Agency
June 22, 1999
Date


Name and Title
Ross M. Turner
Chairman
Tehama Co. Board of Supervisors
Agency or Organization
6/30/99
Date


Name and Title
Sutter County
Agency
4/4/00
Date


Name and Title
Yolo County
Agency
May 23, 2000
Date

E9

SIGNATURES

Karl F. Choi, Secretary Resources Agency 12/2/99
Name and Title Agency Date

Robert H. Hunt, Director Dept of Fish & Game 12/2/99 *
Name and Title Agency Date

Kathy Green Dept of State Parks 12/2/99
Name and Title Agency Date

John Schmidt, DIRECTOR Wildlife Conservation Resources 12/2/99
Name and Title Agency Date

Paul J. Walsh Army Corps of Engineers 2 Dec 99
Name and Title Agency Date

Paul D. Thayer CA State Lands Comm. 8/2/99
Executive Officer Agency or Organization Date

Al Wright BLM 10/18/99
Name and Title Agency Date

AL WRIGHT

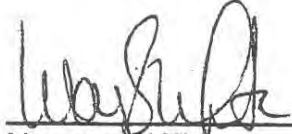
State Director

California Bureau of Land Management

Memorandum of Agreement
Regarding the Sacramento River Conservation Area

E10

SIGNATURES

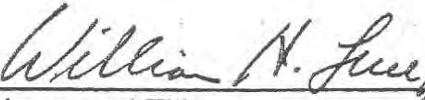


Name and Title

WAYNE S. WHITE
Field Supervisor

Fish & Wildlife Service
Agency

7/14/99
Date



Name and Title

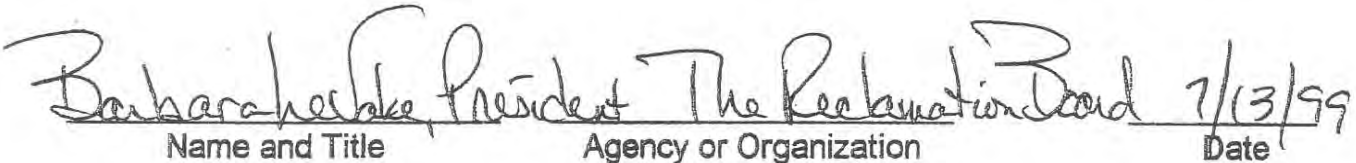
ACTING FOR Regional Director

Bureau of Reclamation

Agency

APR 12 2000

Date



Barbara Herke President The Reclamation Board 7/13/99

Name and Title

Agency or Organization

Date



Name and Title

Department of Water Resources
Agency

12/2/99
Date



Name and Title

CDFA
Agency

2-25-02
Date

Daniel E. Webb
Deputy Secretary

Operating Agreement

with

City of Colusa

for

Colusa-Sacramento River State Recreation Area

STATE OF CALIFORNIA – RESOURCES AGENCY
DEPARTMENT OF PARKS AND RECREATION
CONCESSIONS DIVISION
1416 NINTH STREET, 14TH FLOOR
SACRAMENTO, CA 95814





OPERATING AGREEMENT

for

Colusa-Sacramento River State Recreation Area

INDEX

1.	PREMISES	3
2.	TERM.....	3
3.	USE OF PREMISES	3
4.	CONSIDERATION	5
5.	CONSTRUCTION AND COMPLETION OF IMPROVEMENTS	5
6.	MAINTENANCE OBLIGATIONS OF CITY.....	10
7.	CONCESSIONS.....	10
8.	TAXES	11
9.	RECORDS AND ACCOUNTS.....	11
10.	UTILITIES AND SERVICES.....	12
11.	INSURANCE.....	12
12.	HOLD HARMLESS AGREEMENT.....	14
13.	EMINENT DOMAIN PROCEEDINGS	14
14.	PROHIBITIONS AGAINST ASSIGNING, SUBLETTING	15
15.	NOTICES	15
16.	DEFAULTS AND REMEDIES	15
17.	TERMINATION	16
18.	SURRENDER OF THE PREMISES; HOLDING OVER	17
19.	REAL PROPERTY ACQUISITION.....	17
20.	COMPLIANCE WITH LAWS, RULES, REGULATIONS, AND POLICIES.....	17
21.	NONDISCRIMINATION	18
22.	DISABILITY ACCESS LAWS.....	18
23.	NATIONAL LABOR RELATIONS BOARD CERTIFICATION.....	19
24.	ENVIRONMENTAL AWARENESS AND RESOURCE PROTECTION	19
25.	HAZARDOUS SUBSTANCES	19
26.	SIGNS AND ADVERTISING	21
27.	INTELLECTUAL PROPERTY RIGHTS.....	21

28.	PARTICIPATION IN STATE PARK MARKETING PROGRAMS.....	23
29.	CHILD SUPPORT COMPLIANCE ACT	23
30.	DISPUTES	24
31.	LIMITATION	24
32.	SECTION TITLES	24
33.	AGREEMENT IN COUNTERPARTS	24
34.	INSPECTION	24
35.	SUCCESSORS IN INTEREST.....	24
36.	PARTIAL INVALIDITY.....	25
37.	TIME OF ESSENCE	25
38.	DURATION OF PUBLIC FACILITIES	25
39.	WAIVER OF RIGHTS, CLAIMS, AND AGREEMENT TERMS.....	25
40.	INTERPRETATION OF AGREEMENT	26
41.	INDEPENDENT CONTRACTOR.....	26
42.	MODIFICATIONS AND APPROVAL OF AGREEMENT	26
	EXHIBIT A1 – T HE PREMISES	28
	EXHIBIT A2 – THE PREMISES.....	29
	EXHIBIT B – DPR PROPERTY	30
	EXHIBIT C1 – CITY PROPERTY	31
	EXHIBIT C2 – CITY PROPERTY	32
	EXHIBIT C3 – CITY PROPERTY	33
	EXHIBIT D – COLUSA BOAT LAUNCH FACILITY PROJECT PLAN	34
	EXHIBIT E – ANNUAL REVENUE AND EXPENDITURE REPORT	35
	EXHIBIT F – DRUG-FREE WORKPLACE CERTIFICATION	36



OPERATING AGREEMENT

with

City of Colusa

for

Colusa-Sacramento River State Recreation Area

THIS OPERATING AGREEMENT (Agreement), by and between STATE OF CALIFORNIA, acting through the Department of Parks and Recreation, hereinafter referred to as "**State**", and City of Colusa, hereinafter referred to as "**City**".

WITNESSETH:

WHEREAS, pursuant to the provisions of Section 5080.30, et seq., of the California Public Resources Code, State may enter into an operating agreement with any city, county, district, public agency, or combination thereof of the State of California for the care, maintenance, administration, and control of lands under the jurisdiction of State for the purpose of the state park system; and

WHEREAS, State has acquired for park and recreational purposes certain real properties known as Colusa-Sacramento River State Recreation Area located within Colusa County including a camp ground, day-use area, restrooms, boat launch, roads, parking and infrastructure herinafter referred to as DPR Property, a description of which is attached as **Exhibit B**; and

WHEREAS, City owns and operates certain property adjacent to DPR Property known as Levee Park, Memorial Grove including a historic railroad turntable and benches hereinafter referred to as City Property, a description of which is attached as **Exhibits C1, C2 and C3**; and

WHEREAS, City has applied for a grant ("Grant") from the State of California, Department of Boating and Waterways ("DBW") to construct a Boat Launch Ramp on City Property and an Adjoining Road on DPR and City Property from this Boat Launch Ramp to an entrance station and parking lot on DPR Property; and

WHEREAS, the Grant requires a Construction Operating Agreement during the construction period and a 20-year Operating Agreement between DPR and City for the operation and maintenance of the Boat Launch Ramp, Adjoining Road, and parking lot at the completion of construction; and

WHEREAS, State and City entered into a Construction Operating Agreement on September 11, 2006, for the construction of the Boat Launch Ramp and Adjoining Road.

WHEREAS, Construction Operating Agreement was amended on June 1, 2008 to change the language in the Construction Operating Agreement from the parties intend to enter into a 20-year Operating Agreement at the completion of the project to the parties shall enter into a 20-year Operating Agreement at the completion of the project.

WHEREAS, both parties desire to incorporate this Construction Operating Agreement and Amendment #1 into a single Operating Agreement to include development, operation, control, and maintenance of the day use area, campground, existing boat launch ramp, and shop and service area within Colusa-Sacramento River State Recreation Area by City;

NOW, THEREFORE, in consideration of the mutual covenants hereinafter contained, the parties hereto agree as follows:



1. PREMISES

State authorizes City to develop, operate, control, and maintain portions of Colusa-Sacramento River State Recreation Area as shown in **Exhibits A1 and A2**, attached and hereby made a part hereof, hereafter "Premises". City agrees to accept Premises, including facilities covered by this Agreement, and take the same in their present condition "AS IS" with all faults, and agrees to maintain the same in a safe and tenable condition, and, at any termination of this Agreement, to promptly turn back the same to State in the same or better condition, reasonable wear and tear excepted. State shall not be obligated to make any alterations, additions, or betterments to the Premises except as otherwise provided for in this Agreement. This Agreement is not intended to and does not create any third party rights and in no event shall be relied on by any party other than City and State.

2. TERM

The term of this Agreement shall be for a period of five (5) years and two (2) months and shall commence the first day of the month following approval by the State Department of General Services, but no sooner than November 1, 2011 and shall end on December 31, 2016. Should City hold-over after the expiration of the term of this contract with the express or implied consent of the State, such holding-over shall be deemed to be a tenancy from month-to-month at the herein stated prescribed rent as set forth in this contract subject otherwise to all the terms and conditions of this contract.

3. USE OF PREMISES

City agrees to develop, operate, control, and maintain the Premises as a public park with a day use area, campground, picnic grounds, a boat launching facility (when the water is high enough to launch boats safely), shop and service facility, and related concessions for the use and enjoyment of the general public. Development and operation of the Premises shall be conducted in accordance with all applicable State general planning principles, State Commission policies and all federal, state, and local government statutes, laws, and regulations.

- A. Camping and Day Use Fees: City may charge camping and day use fees consistent with State's fees. Rates and fees must be approved in writing by State.
- B. Reservations:
1. All reservations made more than 48 hours prior to arrival date shall be taken by the State's state-wide reservation service provider.
 2. Fees shall be collected by said provider and routed to City monthly.
 3. Reservation requirements may be changed upon written approval by State.
 4. No more than one campsite may be held off the reservation system. No other campsites may be removed from the reservation system for any period of time without approval by State.
 5. City shall comply with State's reservation service contract requirements and State's reservation services rules, policies, and regulations.
- C. Security: City shall require all employees and volunteers in positions of special trust to undergo a background check, including references and fingerprints, to ensure that the individual does not pose a risk to the public. The background check may be similar to the California Department of Justice's Live Scan Program. City shall be responsible for covering all costs associated with said background checks. Any criminal offenses that have a nexus to said job should be considered as a basis for rejection from hire.
- D. Resources: City must adhere to all natural and cultural resource regulations as mandated by local, state and federal laws. These include the Federal and State Threatened Species Act, the Historic Preservation Act, and the California Environmental Quality Act.
- E. Year Round Operation: City shall operate the park year round unless a request to operate seasonally is approved in writing by State.
- F. Upon written permission by State, City may improve the Premises by constructing and operating park related facilities that are in compliance with the

park's general plan. These facilities shall not adversely affect the use and enjoyment of the Premises by the public.

G. City may adopt rules and regulations for the use and enjoyment of the Premises by the public. Any such rules and regulations adopted by City shall conform to and be consistent with the rules and regulations adopted by State and generally applicable to the California State Park system. The Premises shall not be used for any purpose other than those permitted by this Agreement.

H. City shall not use or permit the Premises to be used in whole or in part during the term of this Agreement for any purpose other than as herein set forth without the prior written consent of the State.

4. CONSIDERATION

In consideration of the services to be performed by City pursuant to this Agreement, State hereby authorizes the use of the Premises by City on a rent-free basis on the condition that City exert a good faith effort in performing the terms and conditions of this Agreement. In the event that City fails to perform in good faith, the Premises shall revert back to the State, at State's option, and State shall have the right to pursue any other remedies available under this Agreement and/or otherwise available by law.

Any income to City derived from its control and operation of Premises for services, benefits, or accommodation to the general public, or otherwise, shall be used only for the maintenance, operation, administration, improvement, or development of lands and/or facilities located within Colusa-Sacramento River State Recreation Area. Any such portion of income as may exceed costs and expenses described in this paragraph shall be remitted to State in accordance with Section 5080.32 (b)(2) of the California Public Resource Code.

5. CONSTRUCTION AND COMPLETION OF IMPROVEMENTS

A. Boat Launch Ramp and Adjoining Road

1. Location: The Boat Launch Ramp shall be located on City Property contiguous to the Colusa-Sacramento River State Recreation

Area. The Adjoining Road to be constructed between the Boat Launch Ramp and existing entrance station and parking lot shall be constructed on DPR and City Property. A visual description of which is attached as **Exhibit D**. The parties agree to enter into any and all necessary agreements to allow the Adjoining Road, once constructed, to be located on both DPR property and City property.

2. Planning, Permitting, Design, and Construction: City shall undertake and be responsible for the planning (including environmental review under CEQA), permitting, design, and construction of the Project.

a. Planning: City shall serve as the Lead and Responsible Agency as applicable for purposes of compliance with CEQA for the Project.

b. Permitting: City shall undertake and be responsible for obtaining all required permits for meeting CEQA and construction of the Project.

c. Design and Construction: Following receipt of necessary permits for the construction, City shall prepare detailed specifications for the drawings and other construction contract documents), conduct the bidding process and, subject to concurrence by the DPR, select the contractor to construct the Project. City shall provide supervision and inspection of the construction with assistance from DPR in regard to conformance with the specifications for the Project. City shall require that indemnity and insurance requirements for any construction contracts contain a provision naming DPR as an indemnitee or additional named insured at no added cost to DPR. In no event shall DPR's approval, concurrence, or inspections for conformance with conceptual plans of the Project relieve City from responsibility for accurate and complete working drawings and other construction documents and for proper supervision and completion of the work. City shall make the final determination to the contents of working

drawings, construction specification and other construction documents, and shall carry out the construction functions in accordance with law pertaining to City in such activities.

3. Costs: Both parties anticipate that DBW will fund the planning, design and construction costs of the Project, and City will provide necessary costs to meet CEQA and obtain required permits. In the event that DBW or City fails to provide or obtain sufficient funding, as described above, nothing herein shall obligate or make responsible DPR for any costs associated with the Project.

4. Operation and Maintenance: The responsibilities and costs of the Parties of operation and maintenance of the Boat Launch Ramp, the Adjoining Road, and parking lot shall be acknowledged in the Operating Agreement to be entered into by the Parties after completion of the Project and prior to the expiration of this Agreement.

B. Cooperation

Both parties agree to cooperate in the planning, design, and construction related to the Project. Such cooperation may include, but is not limited to, applications for permits, grants and loans.

C. Employees, Consultants, Agents, Contractors and Subcontractors

1. City may engage consultants or contract administration personnel as subcontractors to perform, administer, or coordinate any task governed by this Agreement and the attachments hereto. Nothing in this Agreement shall be construed as preventing either party from utilizing as many employees as deemed necessary for the proper and efficient execution of this Agreement.

2. All third party contracts and or subcontracts executed in furtherance of this Agreement shall follow any and all Federal or State laws regarding contracting, as applicable, and shall contain the following provisions:

a. The contractor or subcontractor (hereafter referred to as Contractor) shall procure and maintain, at its own cost, comprehensive general liability insurance from an acceptable

insurance provider in an amount not less than one million dollars (\$1,000,000) per person for any one claim, and an aggregate limitation of two million dollars (\$2,000,000) for any number of claims arising from any one incident, covering all claims for injuries against persons or damage to property resulting from any employee's actions in the performance of Contractor's obligations under any authorized contract pursuant to this Agreement.

b. The Contractor agrees to indemnify, defend and hold harmless the State, its officers, agents and employees from any and all claims and losses accruing or resulting to any and all contractors, subcontractors, materialmen, laborers and any other person, firm or corporation furnishing or supplying work services, materials or supplies in connection with the performance of this contract, and from any and all claims and losses accruing or resulting to any person, firm or corporation who may be injured or damaged by the Contractor in the performance of the contract.

D. At no cost or expense to State, City may undertake new construction, reconstruction, alteration, and maintenance to enhance public recreation facilities subject to prior written approval by State. In the event that City desires to make modifications, improvements, or additions to the Premises or any part of the Premises, including changes to structural design, landscape design, or interior or exterior fixtures, design, and/or furnishings, (collectively "Alteration(s)"), written approval by State shall be obtained prior to the commencement of any Alterations. State shall dictate the plan approval process. All modifications and additions shall be made in accordance with State's standards for construction and completion of improvements. Further, all Alterations shall be made in accordance with State's general planning principles and with all applicable state and federal laws, rules and regulations.

E. Once prior approvals, permits, etc., have been received as required herein above, and the work on any Alteration has begun, City shall prosecute to

completion with reasonable diligence all approved Alterations. All work shall be

F12

performed in a professional manner, and will comply substantially with plans and specifications submitted to State as required herein and with all applicable governmental permits, laws, ordinances, and regulations. It shall be the responsibility of City, at its own cost and expense, to obtain all licenses, permits, security, and other approvals necessary for the construction of approved Alterations. City shall comply with public bidding requirements as set forth in the California Public Contract Code.

F. For all Alterations erected on the Premises by City, upon completion of construction, City shall (1) record a Notice of Completion, with a copy provided to the State; (2) provide State with a complete set of "as-built" plans for all improvements in a format reasonably acceptable to State; (3) submit evidence that all improvements are clear of any mechanic's liens or stop notices; (4) submit a verified accounting of the cost for Alterations, excluding equipment and trade fixtures that are the personal property of City; and (5) submit a verified report demonstrating full compliance with the pertinent state and federal accessibility laws, including but not limited to, the Americans with Disabilities Act of 1990, Titles II.

G. Title to all Alterations existing or hereafter erected on Premises, regardless of who constructs such improvements, shall immediately become State's property, and, upon termination of this Agreement, all improvements shall become part of the realty and title to the Premises and shall vest in State, without compensation to City. City agrees never to assail, contest, or resist said title. The foregoing notwithstanding, State may elect, by notice to City, that City must remove any Alterations that are peculiar to City's use of the Premises and are not normally required or used by State and/or future occupants of the Premises. In this event, City shall bear the cost of restoring the Premises to their condition prior to the installment of the Alterations.

6. MAINTENANCE OBLIGATIONS OF CITY

A. During the term of this Agreement and at City's own cost and expense, City shall maintain and operate the Premises including equipment, personal property, and Alterations or improvements of any kind that may be erected, installed, or placed thereon in a clean, safe, wholesome, and sanitary condition free of trash, garbage, or obstructions of any kind. During the term of this Agreement it shall be City's responsibility to insure that the Premises are maintained to the satisfaction of State. All construction, operation, and maintenance shall be in accordance with all laws, codes, regulations, ordinances, and generally accepted industry standards pertaining to such work.

B. Should City fail, neglect, or refuse to undertake and complete any required maintenance, State shall have the right to perform such maintenance or repairs for the City. In this event, City shall promptly reimburse State for the cost thereof, provided, however, that State shall first give City ten (10) days written notice of its intention to perform such maintenance or repairs. State shall not be obligated to make any repairs to or maintain any improvement on the Premises. City hereby expressly waives the right to make repairs at the expense of the State and the benefit of Sections 1941 and 1942 of the California Civil Code relating thereto, if there be any. State has made no representations respecting the condition of the Premises, except as specifically set forth in this Agreement.

C. State reserves the right to enter the Premises for inspection and work related to its care and maintenance during the term hereof, provided that State shall give City reasonable written notice of its intention to do any of the work herein mentioned before such work is undertaken.

7. CONCESSIONS

Subject to prior written approval by State, City may grant concessions in or upon the Premises consistent with the requirements of State under Sections 5080.33 and 5080.34 of the California Public Resources Code. All concession contracts shall be subject to the requirements of the California Public Resources Code Section 5080.20 and shall be assumable and/or subject to termination by State, at State's sole discretion,

F14

in the event this Agreement is terminated by its terms. No concessions that exploit public lands for commercial purpose shall be granted by City. Further, all concession agreements shall be made subject to audit by State. State shall have the right, through its representative and at all reasonable times, to examine and copy all working papers supporting Concessionaire's annual financial statement. In addition, the State, acting through its representative, may conduct additional independent reviews of the concession operations upon written notification of such intent to City.

8. TAXES

City, by signing this Agreement, acknowledges that occupancy interest and rights to do business on State property may create a possessory interest as that term is defined in Revenue and Taxation Code Section 107.6, which possessory interest may subject a concessionaire to liability for the payment of property taxes levied on such possessory interest. City and/or any concessionaire engaged by City shall pay all lawful taxes, assessments, or charges that may be levied by the State, County, City, or any tax or assessment levying body at any time upon any interest in or created by this Agreement, or any possessory right that City and/or any concessionaire may have in or to the Premises covered hereby or the improvements thereon, by reason of City and/or any concessionaire's use or occupancy thereof or otherwise, as well as all taxes, assessments, and charges on goods, merchandise, fixtures, appliances, equipment, and property owned by City and/or any concessionaire in or about the Premises.

9. RECORDS AND ACCOUNTS

A. At all times during the term of this Agreement, City shall keep separate, true, and complete books, records, and accounts of all income and fees received and all expenditures made by City in relation to concessions, events, special services, and all other matters incident to the development, control, and operation of the Premises. City shall report said income and expenditures to State in accordance with **Exhibit E**, Annual Revenue and Expenditure Report, or in a similar format acceptable to State on an annual basis, which annual report shall be submitted for the period commencing July 1st and ending June 30th of

each reporting year, and shall be filed with State no later than the following September 30th. In addition, within forty-five (45) days of the expiration or termination of this Agreement, City shall submit to State a statement of income and expenditures for the period of operation not previously reported, prepared as set forth above.

B. City shall provide State with an annual attendance report to include a reasonable monthly estimate of the number of visitors and vehicles to Colusa-Sacramento River State Recreation Area. Such annual report shall be submitted concurrent with the Annual Revenue and Expenditure Report.

C. The books, records, and accounts applying to the operation of the Premises and kept by City shall be open for audit or inspection by State at all reasonable times. All records shall be kept by City for a period of at least four (4) years. City shall be subject to State's audit requirements and remedies as set forth herein.

10. UTILITIES AND SERVICES

City shall be responsible for all expenses resulting from utilities supplied to the Premises. City shall be responsible for distribution systems and all related expenses within the Premises.

11. INSURANCE

A. Liability Insurance: At its sole expense, City agrees to maintain in force during the term of this Agreement comprehensive general liability insurance, insuring against claims for injuries to persons or property occurring in, upon, or about Premises. The insurance shall have limits of not less ONE MILLION DOLLARS (\$1,000,000) for injuries to person or persons; not less than ONE MILLION DOLLARS (\$1,000,000) for property damage. Said limits shall be per occurrence.

B. Fire Insurance: Fire insurance with extended coverage endorsements thereon on all improvements located on the Premises, whether furnished by State or constructed upon the Premises by City and/or any concessionaire, in an

F16

amount equal to the full replacement cost and/or value thereof. This policy shall contain a replacement cost endorsement naming the City and/or any concessionaire as the insured provided that if there is a lender on the security of the improvements so insured, the proceeds of any such policy or policies may be made payable to such lender.

C. State agrees that City, at City's option, may self-insure the coverages required by this Section.

D. Each policy of liability insurance shall contain additional named insured endorsements in the name of the State of California, through its Department of Parks and Recreation, as to all insurable interests of the State including, but not limited to, the Premises and all contents as follows:

- 1) State of California, its officers, employees, and servants are included as additional insured but only insofar as operations and facilities under this Agreement are concerned;
- 2) The insurer shall not cancel or reduce the insured's coverage without thirty (30) days prior written notice to State.

E. No cancellation provision in any insurance policy shall diminish the responsibility of the City to furnish continuous insurance throughout the term of the Agreement. Each policy shall be underwritten to the satisfaction of the State. A signed Certificate of Insurance, with each endorsement required, including but not limited to State's additional insured endorsement, shall be submitted to State at the time this Agreement is executed, showing that the required insurance has been obtained. Further, at least thirty (30) days prior to the expiration of any such policy, City shall submit to State a signed and completed Certificate of Insurance, with all endorsements required by this Section, showing, to the satisfaction of State, that such insurance coverage has been renewed or extended. Within fifteen (15) days of State's request, City shall furnish State with a signed and complete copy of the required policy and/or evidence of self-insurance.

F. City agrees to impose the foregoing insurance requirements on any and all concessionaires and shall require that State be named as an additional

insured on all policies. Failure to provide any of the required insurance and/or endorsements shall constitute a material breach of this Agreement.

12. HOLD HARMLESS AGREEMENT

City shall indemnify, hold harmless, and defend State, its officers, agents, and employees against any and all claims, demands, damages, costs, expenses, or liability costs, (including but not limited to attorney fees, experts fees, and costs of suit), arising indirectly or directly out of the development, operation, or maintenance of the Premises by City, or in any way related to the performance of this Agreement by City, by reason of its acts or omissions relating to the Premises and/or its obligation pursuant to this Agreement and/or by reason of injury, death, property damage, or any claim arising from the alleged violations of any state or federal law, statute, or regulations, including but not limited to the Americans with Disabilities Act of 1990 Titles I, II and III ["ADA"], however caused or alleged to have been caused, provided, however, in no event shall City be obligated to defend or indemnify State with respect to the sole negligence or willful misconduct of State, its employees, or agents (excluding City herein, or any of its concessionaires).

In the event State is named as co-defendant in a legal action under the provisions of the Government Code Section 810 et seq., and served with process of such legal action, State shall immediately notify City of such fact and City shall represent State in such legal action as provided herein unless State undertakes to represent itself as co-defendant in such legal action, in which event State shall bear its own litigation costs, expenses, and attorney fees.

In the event judgment is entered against State and City because of the concurrent negligence of State and City, their officers, agents, or employees, an apportionment of the liability to pay such judgment shall be made by a court of competent jurisdiction. Neither party shall request a jury apportionment.

13. EMINENT DOMAIN PROCEEDINGS

If the Premises or any portion thereof is taken by proceedings in eminent domain, State shall receive the entire award for such taking.

**14. PROHIBITIONS AGAINST ASSIGNING, SUBLETTING**

This Agreement and/or any interest therein or thereunder shall not be assigned, delegated, mortgaged, hypothecated, or transferred by City without obtaining the prior written consent of State.

15. NOTICES

Any notice and/or report required to be given or that may be given by either party to the other shall be deemed to have been fully given when made in writing and deposited in the United States Postal Service, postage prepaid, and addressed as follows:

State:	Department of Parks and Recreation Northern Buttes District Office 400 Glen Drive Oroville, CA 95966 530-538-2200
Operator:	City of Colusa 425 Webster Street Colusa, CA 95932 530-458-4740
Copy to:	Department of Parks and Recreation Concession and Reservations Division P.O. Box 942896 Sacramento, California 94296-0001

16. DEFAULTS AND REMEDIES

Any failure by a party to this Agreement to observe or perform a provision of this Agreement, where such failure continues for thirty (30) days after written notice of such failure, shall constitute a default and breach of this Agreement. However, if the nature of the default is such that it cannot be reasonably cured within the thirty (30) day period, the offending party shall not be deemed to be in default if an effective cure is commenced within the thirty (30) day period and thereafter diligently prosecuted to

completion. Upon an event of default by State, City shall have the right to terminate this Agreement by providing written notice to State.

Upon an event of default by City, State shall have the right to terminate this Agreement and obtain immediate possession of the Premises at any time by written notice to City. In such event, State shall be entitled to all rights and remedies at law and/or in equity, including but not limited to, costs and expenses incurred by State in recovering possession of and/or restoring the Premises, and compensation for all detriment proximately caused by City's failure to perform its obligations under this Agreement.

17. TERMINATION

A. Notwithstanding the provisions of Section 16, DEFAULTS AND REMEDIES, either party may terminate this Agreement for any reason. The party who wishes to terminate the Agreement shall give written notice of its intention no later than Thirty (30) days before the scheduled termination date. Such notice shall be given in writing and shall be effective on the date given in the notice as the scheduled date for the termination of the Agreement.

B. In the event that the State is the party choosing to terminate the Agreement, the State shall pay to City on the termination date a sum of money equal to the depreciated cost of the improvements installed or constructed upon the Premises by the City with the following exceptions, (a) improvements erected with funds realized through income from the Premises, and (b) improvements the cost of which City has been paid or reimbursed by State through grants or other sources. It is expressly understood that the reimbursement provisions are not applicable where State terminates this Agreement for any breach on the part of City. In the event of breach, bankruptcy, insolvency, abandonment, or termination of Agreement upon City's request, the reimbursement provisions shall not apply and shall not be considered an obligation of the State.

C. State may not commence termination proceedings until such time as the funds required for such termination and reimbursement have been obtained

through appropriations by the Legislature and through the normal budgeting process of the State.

18. SURRENDER OF THE PREMISES; HOLDING OVER

A. Surrender: On expiration or within thirty (30) days after earlier termination of this Agreement, City shall surrender the Premises to State with all fixtures, improvements, and Alterations in good condition, except for fixtures, improvements, and Alterations that City is obligated to remove. City shall remove all of its personal property and shall perform all restoration required by the terms of this Agreement within the above stated time unless otherwise agreed to in writing.

If City fails to surrender the Premises to State on the expiration, assignment, or within thirty (30) days after earlier termination of the term as required by this Section, City shall hold State harmless for all damages resulting from City's failure to surrender the Premises.

B. Holding Over: After the expiration or earlier termination of the term and if City remains in possession of the Premises with State's express consent, such possession by City shall be deemed to be a temporary tenancy terminable on thirty (30) days written notice given at any time by either party. All provisions of this agreement except those pertaining to the term shall apply to the temporary tenancy.

19. REAL PROPERTY ACQUISITION

It is understood and agreed to by the parties that all applications for real property rights, appurtenant to the Premises, shall be made in the name of and on behalf of State, and shall be subject to the prior written approval of State.

20. COMPLIANCE WITH LAWS, RULES, REGULATIONS, AND POLICIES

City and its officers, agents and employees shall comply with all applicable laws, rules, regulations, and orders existing during the term of this Agreement, including obtaining and maintaining all necessary permits and licenses. City acknowledges and

warrants that it is, or will make itself, through its responsible managers, knowledgeable of all pertinent laws, rules, ordinances, regulations, or other requirements having the force of law affecting the operation of the Premises, including but not limited to laws affecting health and safety, hazardous materials, pest control activities, historical preservation, environmental impacts, and building standards.

21. NONDISCRIMINATION

Pursuant to Public Resources Code Section 5080.34, this Agreement and every contract on lands that are subject to this Agreement shall expressly prohibit discrimination against any person because of sex, sexual orientation, race, color, religious creed, marital status, ancestry, national origin, medical condition, age (40 and above), and disability (mental and physical) including HIV and AIDS.

City shall comply with the provisions of the Fair Employment and Housing Act (Gov. Code, §12900 et seq.) and the applicable regulations promulgated thereunder (Cal. Code Regs, tit. 2, §7285.0 et seq.). The applicable regulations of the Fair Employment and Housing Commission implementing Government Code, §12990 (a)-(f), are incorporated into this agreement by reference and made a part hereof as if set forth in full (Cal. Code Regs, tit. 2, §7285.0 et seq.). City shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other agreement. City shall include the non-discrimination and compliance provisions of this clause in all contracts to perform work under and/or in connection with this Agreement.

In the event of violation of this Section, State will have the right to terminate this agreement, and any loss of revenue sustained by the State by reason thereof shall be borne and paid for by City.

22. DISABILITY ACCESS LAWS

With regard to all operations and activities that are the responsibility of City under this Agreement, and without limiting City's responsibility under this Agreement for compliance with all laws, City shall be solely responsible for complying with the requirements of the Americans with Disabilities Act of 1990 (ADA) (Public Law 101-336,

F22

commencing at Section 12101 of Title 42, United States Code, including Titles I, II, and III of that law), the Rehabilitation Act of 1973, and all related regulations, guidelines, and amendments to both laws.

With regard to facilities for which City is responsible for operation, maintenance, construction, restoration, or renovation under this Agreement, City also shall be responsible for compliance with Government Code Section 4450, et seq., Access to Public Buildings by Physically Handicapped Persons, and Government Code Section 7250, et seq., Facilities for Handicapped Persons, and any other applicable laws, regulations, guidelines and successor statutes. Such compliance shall be at City's sole cost and expense. Written approval from State is required prior to implementation of any plans to comply with accessibility requirements.

23. NATIONAL LABOR RELATIONS BOARD CERTIFICATION

By signing this Agreement, City does hereby swear, under penalty of perjury, that no more than one final, unappealable finding of contempt of court by a federal court has been issued against City within the two-year period immediately preceding the date of this Agreement because of City's failure to comply with a federal court order that City shall comply with an order of the National Labor Relations Board.

24. ENVIRONMENTAL AWARENESS AND RESOURCE PROTECTION

City shall comply with State's resource management and preservation mandates in the conduct of all activities that impact cultural, natural, or scenic resources. These mandates include the California Public Resources Code Sections 5024 and 5097 et seq., State's Resource Management Directives, and the United States Secretary of the Interior's Guidelines for Historic Preservation.

25. HAZARDOUS SUBSTANCES

- A. On the Premises City shall not:
- 1) keep, store, or sell any goods, merchandise, or materials that are in any way explosive or hazardous;
 - 2) carry on any offensive or dangerous trade, business, or occupation;

3) use or operate any machinery or apparatus that shall injure the Premises or adjacent buildings in any way; or

4) do anything other than is provided for in this Agreement.

B. Nothing in this Section shall preclude City from bringing, keeping, or using on or about said Premises such materials, supplies, equipment, and machinery as is appropriate or customary in the care, maintenance, administration, and control of parklands. Gasoline, oils, and all other materials considered under law or otherwise to be hazardous to health and safety shall be stored, handled, and dispensed as required by present or future regulations and laws.

C. City shall comply with all laws, federal, state, or local, existing during the term of this Agreement pertaining to the use, storage, transportation, and disposal of any hazardous substance, as that term is defined in such applicable law. In the event the State or any of its affiliates, successors, principals, employees, or agents should incur any liability, cost, or expense, including attorney's fees and costs, as a result of the City's illegal use, storage, transportation, or disposal of any hazardous substance, including any petroleum derivative, City shall protect, indemnify, defend, and hold harmless any of these individuals against such liability. Where City is found to be in breach of this provision due to the issuance of a government order directing City to cease and desist any illegal action in connection with a hazardous substance, or to remediate a contaminated condition directly caused by City or any person acting under City's direct control or authority, City shall be responsible for all costs and expenses of complying with such order including any and all expenses imposed on or incurred by the State in connection with or in response to such government order.

D. Notwithstanding the foregoing, in the event a government order is issued naming City, or City incurs any liability during or after the term of the Agreement in connection with contamination that preexisted the City's obligations and occupancy under this Agreement, or prior agreements or that were not directly caused by City, the State shall be solely responsible as between City and State

F24

for all expenses and efforts in connection therewith, and State shall reimburse City for all reasonable expenses actually incurred by City therewith.

E. All pest control activities, chemical and non-chemical, shall be approved by State prior to action by the City. City or the pest control business acting on behalf of City shall submit a DPR 191, Pest Control Recommendation, or equivalent to State for approval. State has fourteen (14) days to approve or deny the request. State review and approval shall be solely for compliance with State's policies and in no way shall relieve City or its contractors, employees, agents, or representatives from compliance with all laws and regulations concerning such activities, nor from carrying out the work in a workmanlike manner.

City or the pest control business acting on behalf of City shall submit a report of completed work for each pest management action to the State no later than seven (7) days after performance of the work. The report may be submitted on a DPR 191, Pest Control Recommendation, or equivalent.

26. SIGNS AND ADVERTISING

No signs, logos, names, placards, or advertising matter shall be inscribed, painted, or affixed upon Premises, or circulated or published without prior written approval of the State. Approval will be granted only when said signs or advertising is consistent with the purposes of this Agreement.

27. INTELLECTUAL PROPERTY RIGHTS

Any names, logos, trademarks, and/or copyrights developed during and/or pursuant to this Agreement that in any way associate, identify, or implicate an affiliation with California State Parks shall be approved by State for use, shall belong to State upon creation, and shall continue in State's exclusive ownership upon termination of this Agreement.

Any works developed by City pursuant to this Agreement, including all related copyrights and other proprietary rights therein, shall belong to State upon creation, and shall continue in State's exclusive ownership upon termination of this Agreement.

These works shall include, but are not limited to, all drawings, designs, reports, specifications, notes, and other work developed in the performance of this Agreement. Upon request, City shall deliver to State the disk or tape that contains the design files of any work that is performed with the assistance of Computer Aided Design and Drafting Technology, and shall specify the supplier of the software and hardware necessary to use said design files. City intends and agrees to assign to State all rights, title, and interest in and to such materials as well as all related copyrights and other proprietary rights therein, unless otherwise agreed to in writing.

City warrants that it is the sole exclusive owner and has the full right, power, and authority over all tangible and intangible property deliverable to State in connection with this Agreement, and that title to such materials conveyed to State shall be delivered free and clear of all claims, liens, charges, judgments, settlements, encumbrances, or security interests.

City agrees not to incorporate into or make any deliverables dependent upon any original works of authorship or Intellectual Property Rights of third parties without (1) obtaining State's prior written permission, and (2) granting to or obtaining for State a nonexclusive, royalty-free, paid-up, irrevocable, perpetual, world-wide license to use, reproduce, sell, modify, publicly and privately perform, publicly and privately display, and distribute, for any purpose whatsoever, any such prior works.

City further warrants that all deliverables do not infringe or violate any patent, copyright, trademark, trade secret, or any other intellectual property rights of any person, entity, or organization. City agrees to execute any documents reasonably requested by State in connection with securing State's registration of patent and/or copyrights or any other statutory protection in such work product including an assignment of copyright in all deliverables. City further agrees to incorporate these provisions into all of its contracts with architects, engineers, and other consultants or contractors.

City, at its sole expense, shall hold harmless, protect, defend, and indemnify State against any infringement action and/or dispute brought by a third party in connection with any deliverable hereunder. City shall pay all costs, expenses, losses,

damages, judgments, and claims including reasonable attorney's fees, expert witness fees, and other costs.

F26

28. PARTICIPATION IN STATE PARK MARKETING PROGRAMS

City acknowledges that State has an established advertising and marketing program designed to promote additional revenue for the State and to deliver a consistent and positive image to the public. City agrees to cooperate in this program in the manner described below without compensation from the State for such cooperation.

- A. City agrees to honor all statewide graphic standards, licensing, and merchandising agreements entered into with corporate sponsors of the Department of Parks and Recreation.
- B. City agrees to place on the Premises any advertising that the State approves under this program. Any advertising approved by the State under this program will be placed at State's expense.
- C. City agrees to rent or sell, along with all other items of merchandise that are part of the City's normal and customary inventory, any item of merchandise that the State approves under this program, provided that City is authorized to sell or rent it under the terms of the Agreement, and the City receives reasonable compensation for its sale.

29. CHILD SUPPORT COMPLIANCE ACT

- A. City recognizes the importance of child and family support relating to child and family support enforcement, including, but not limited to, disclosure of information and compliance with earnings assignment orders, as obligations and shall fully comply with all applicable state and federal laws provided in Chapter 8 (commencing with section 5200) of Part 5 of Division 9 of the Family Code.
- B. To the best of its knowledge, City is fully complying with the earnings assignment orders of all employees and is providing the names of all new employees to the New Hire Registry maintained by the California Employment Development Department.

30. DISPUTES

City shall continue with any and all responsibilities under this Agreement during any dispute.

31. LIMITATION

This Agreement is subject to all valid and existing contracts, leases, licenses, encumbrances, and claims of title that may affect Premises.

32. SECTION TITLES

The Section titles in this Agreement are inserted only as a matter of convenience and reference and in no way define, limit, or describe the scope or intent of this Agreement or in any way affect this Agreement.

33. AGREEMENT IN COUNTERPARTS

This Agreement may be executed in counterparts, each of which shall be deemed an original.

34. INSPECTION

State or its authorized representative shall have the right at all reasonable times to inspect the Premises to determine compliance with the provisions of this Agreement.

35. SUCCESSORS IN INTEREST

Unless otherwise provided in this Agreement, the terms, covenants, and conditions contained herein shall apply to and bind the heirs, successors, executors, administrators, and assigns of all the parties hereto, all of who shall be jointly and severally liable hereunder.

**36. PARTIAL INVALIDITY**

If any term, covenant, condition, or provision of this Agreement is held by a court of competent jurisdiction to be invalid, void, or unenforceable, the remainder of the provisions hereof shall remain in full force and effect and shall in no way be affected, impaired, or invalidated thereby.

37. TIME OF ESSENCE

Time shall be of the essence in the performance of this Agreement.

38. DURATION OF PUBLIC FACILITIES

By entering into this Agreement, State makes no stipulation as to the type, size, location, or duration of public facilities to be maintained at this unit, or the continuation of State ownership thereof, nor does the State guarantee the accuracy of any financial or other factual representation that may be made regarding the Premises.

39. WAIVER OF RIGHTS, CLAIMS, AND AGREEMENT TERMS

Unless otherwise provided by this Agreement, no waiver by either party at any time of any of the terms, conditions, or covenants of this Agreement shall be deemed as a waiver at any time thereafter of the same or of any other term, condition, or covenant herein contained, nor of the strict and prompt performance thereof. No delay, failure, or omission of the State to re-enter the Premises or to exercise any right, power, or privilege, or option arising from any breach, nor any subsequent acceptance of rent then or thereafter accrued shall impair any such right, power, privilege, or option, or be construed as a waiver of such breach or relinquishment of any right or acquiescence therein. No notice to the City shall be required to restore or revive time as of the essence after the waiver by the State of any breach. No option, right, power, remedy, or privilege of the State shall be construed as being exhausted by the exercise thereof in one or more instances. The rights, powers, options, and remedies given to the State by this Agreement shall be deemed cumulative.

40. INTERPRETATION OF AGREEMENT

This Agreement is made under and is subject to the laws of the State of California in all respects as to interpretation, construction, operation, effect, and performance.

41. INDEPENDENT CONTRACTOR

In the performance of this Agreement, City and the agents and employees of City shall act in an independent capacity and not as officers or employees or agents of the State.

42. MODIFICATIONS AND APPROVAL OF AGREEMENT

This Agreement contains and embraces the entire Agreement between the parties hereto and neither it nor any part of it may be changed, altered, modified, limited, or extended orally or by any Agreement between the parties unless such Agreement be expressed in writing, signed, and acknowledged by the State and City or their successors in interest.

Notwithstanding any of the provisions of this Agreement, the parties may hereafter, by mutual consent expressed in writing, agree to modifications thereof, additions thereto, or terminations thereof, which are not forbidden by law. This Agreement, amendments, modifications, or termination thereof shall not be effective until approved by State's relevant control agencies.

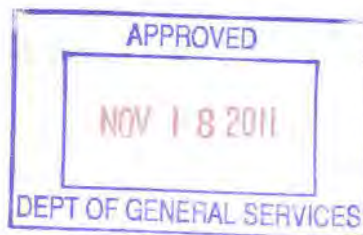
F30

IN WITNESS WHEREOF, the parties have executed this Agreement the day and year first above written.

CITY OF COLUSA

Signed: Thomas ReischeName: Thomas ReischeTitle: MayorDate: 10/5/2011STATE OF CALIFORNIA
CALIFORNIA PARKS AND RECREATIONSigned: for Ruth ColemanName: Ruth ColemanTitle: DirectorDate: 10/31/11

APPROVED:



DEPARTMENT OF GENERAL SERVICES:

A handwritten signature in blue ink, appearing to be "L. M. D.", written over the "DEPARTMENT OF GENERAL SERVICES:" label.

EXHIBIT A1 – THE PREMISES

F31

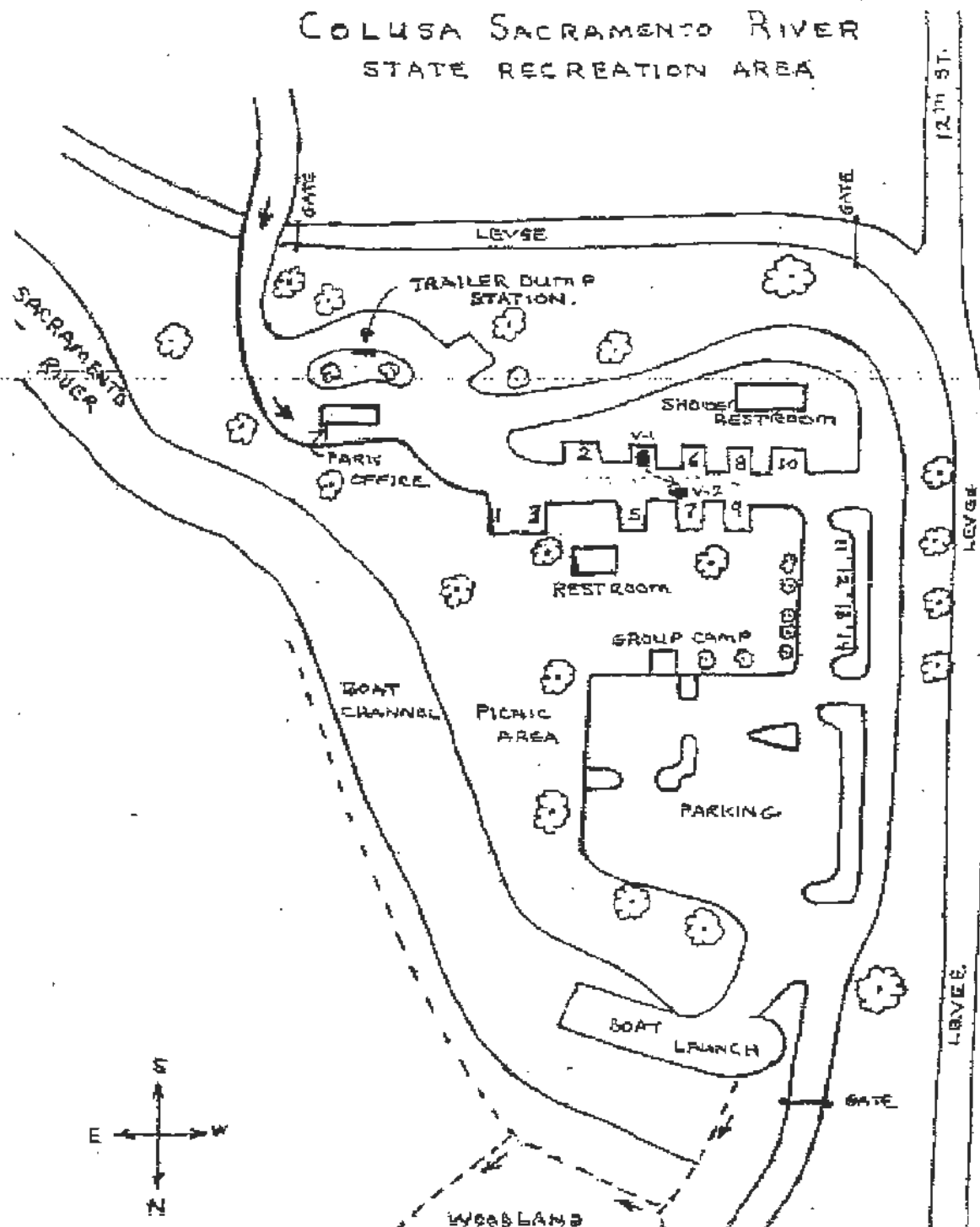
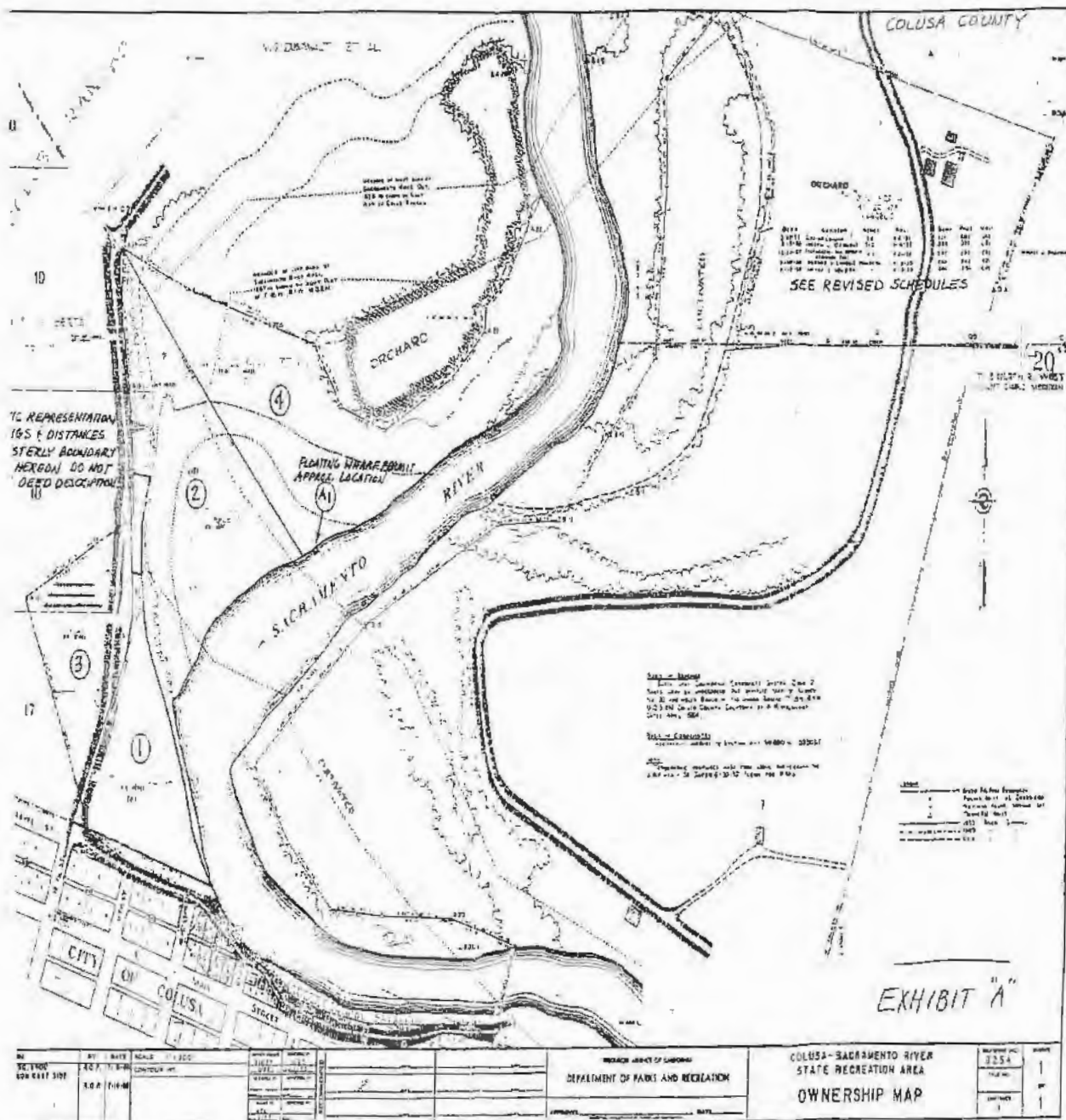


EXHIBIT A2 – THE PREMISES



F33

EXHIBIT B - DPR PROPERTY

F34

EXHIBIT C1 - CITY PROPERTY

RECORDING REQUESTED BY 1009

AND WHEN RECORDED MAIL TO

MAIL ADDRESS

MAIL ORDER NO. Escrow No.

MAIL TAX STATEMENTS TO

SPACE ABOVE THIS LINE FOR RECORDER'S USE

The undersigned declares

☐ Documentary transfer tax \$ 100.00 (100.00)

☐ Computed on full value of property conveyed, or

☐ Computed on full value less liens and encumbrances remaining thereon at time of sale.

Signature of declarant or agent determining tax—firm name

Corporation Grant Deed

WESTERN TITLE FORM NO. 102

FOR VALUE RECEIVED, DELTA LINES, INC., a corporation, successor by merger to Sacramento River Warehouse Company, a corporation, formerly Sacramento Transportation Company, a corporation

GRANTS to CITY OF COLUSA,

all that real property situate in the City of Colusa,

County of Colusa,

State of California, described as follows:

Parcels Nos. 1, 2, 3 and 4 as shown on that certain Parcel Map showing a division of portions of Blocks 2, 3, 7 and portion of area northerly of Block 5 of the City of Colusa, said parcel map being filed on July 16, 1976 in Book 1 of Parcel Maps at page 163.

RECEIVED

MAR 9 - 1977

CITY OF COLUSA

IN WITNESS WHEREOF, said corporation has executed these presents by its officers thereunto duly authorized, this 10th day of February, 1977.

DELTA LINES, INC.

By [Signature] VICE - President

By [Signature] Secretary

STATE OF CALIFORNIA

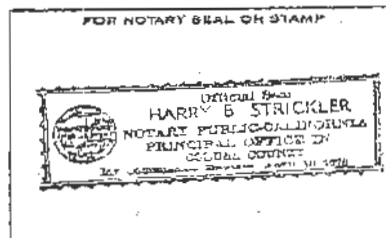
County of Colusa

On February 10, 1977, before me, HARRY B. STRICKLER

Notary Public, in and for said State, personally appeared G. Dwyer

known to me to be the VICE President and the Secretary of the corporation that executed the within instrument, and also known to me to be the persons who executed it on behalf of such corporation, and acknowledged to me that such corporation executed the same, and further acknowledged to me that such corporation executed the within instrument pursuant to its by-laws or a resolution of its Board of Directors.

[Signature]
Notary Public

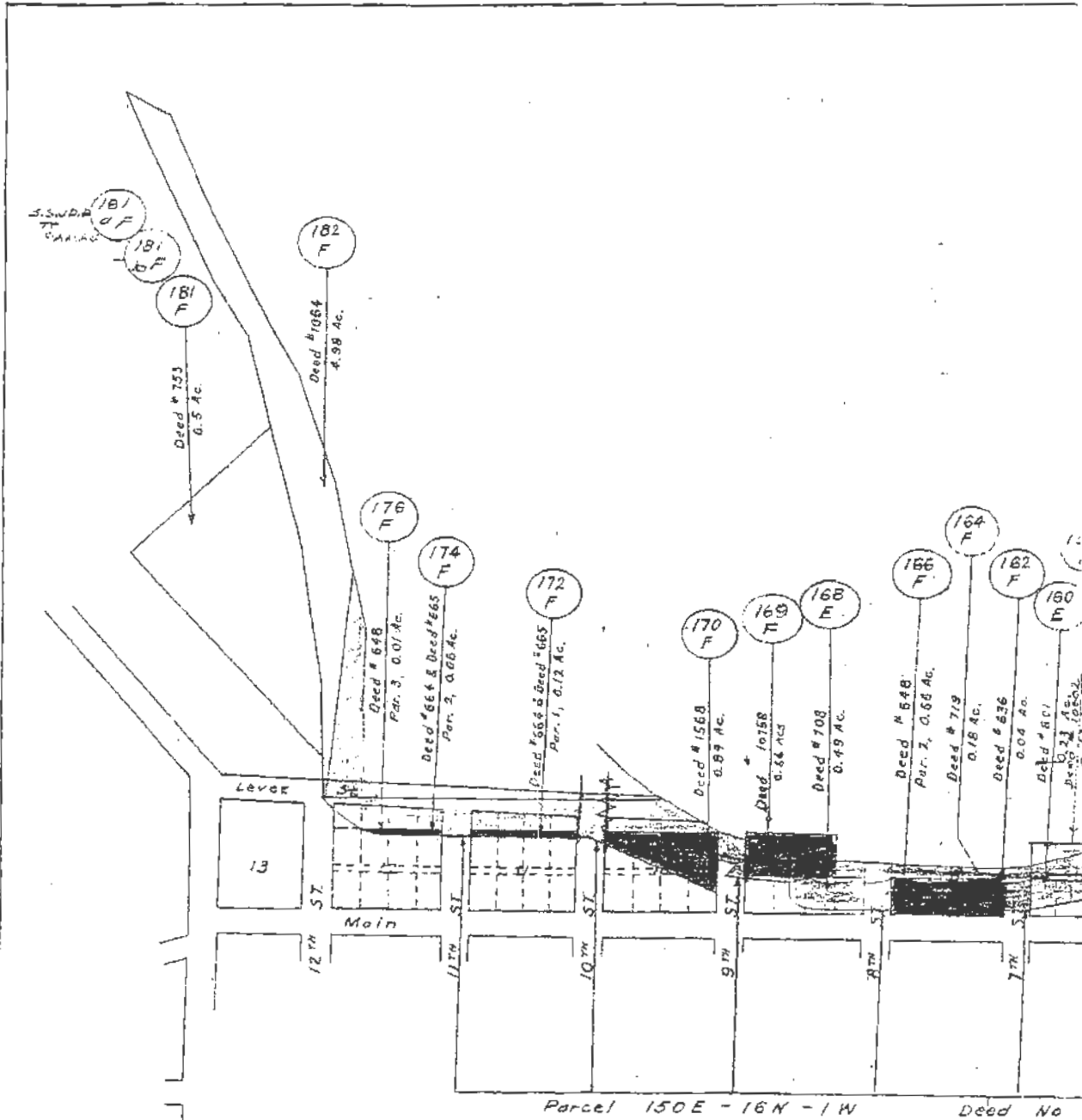


MAIL TAX STATEMENTS AS DIRECTED ABOVE

EXHIBIT C2 – CITY PROPERTY

Scale 1" = 400'

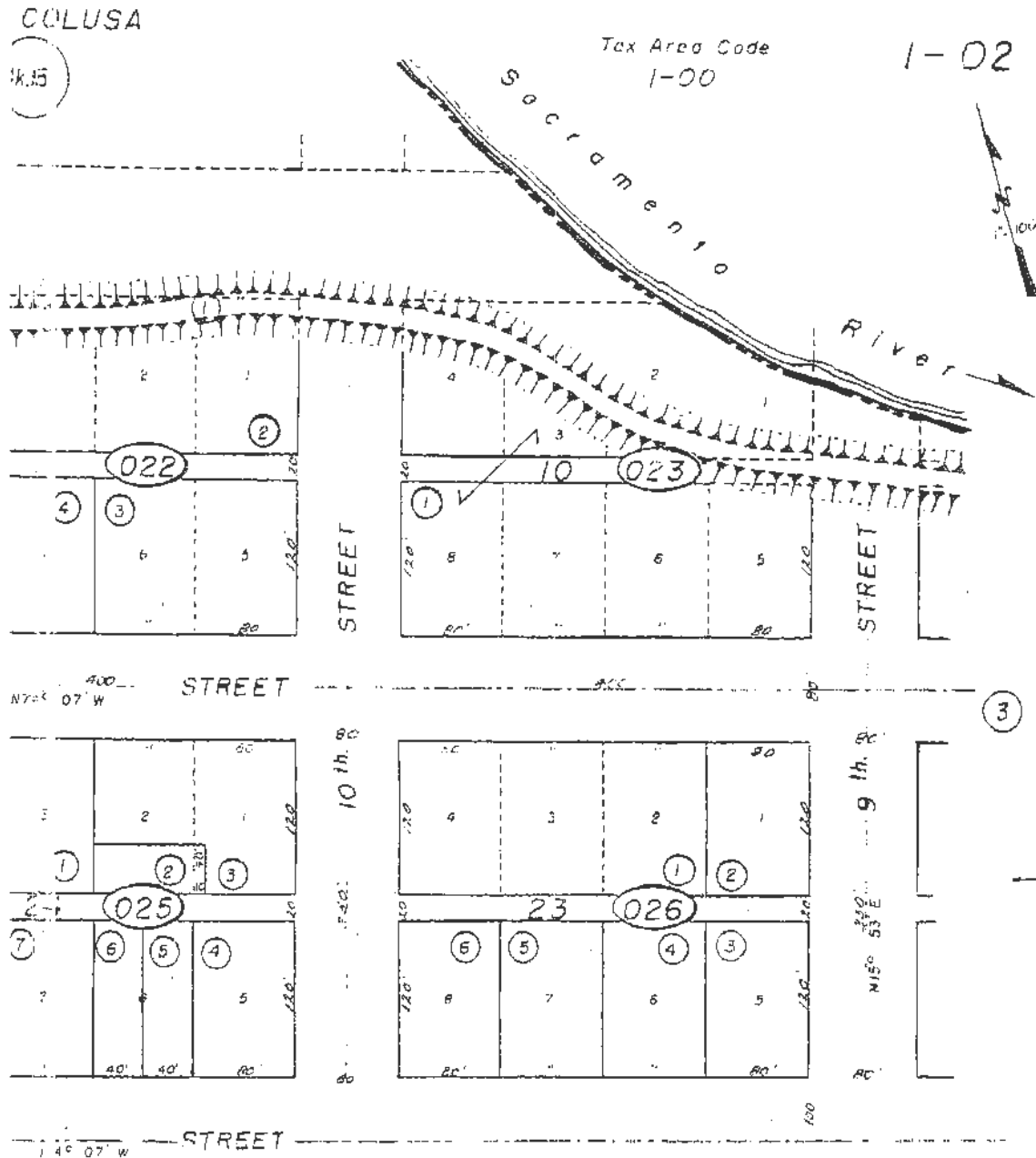
COLUSA



F35

EXHIBIT C3 – CITY PROPERTY

F36



7

NOTE - Assessor's clock Numbers Shown in Ellipses
Deer Park's Parcel Numbers Shown in Circles

CITY OF COLUSA
Assessor's Map Bk. 1- Pg. 2
County of Colusa, Calif.
1970

EXHIBIT D – COLUSA BOAT LAUNCH FACILITY PROJECT PLAN

F37

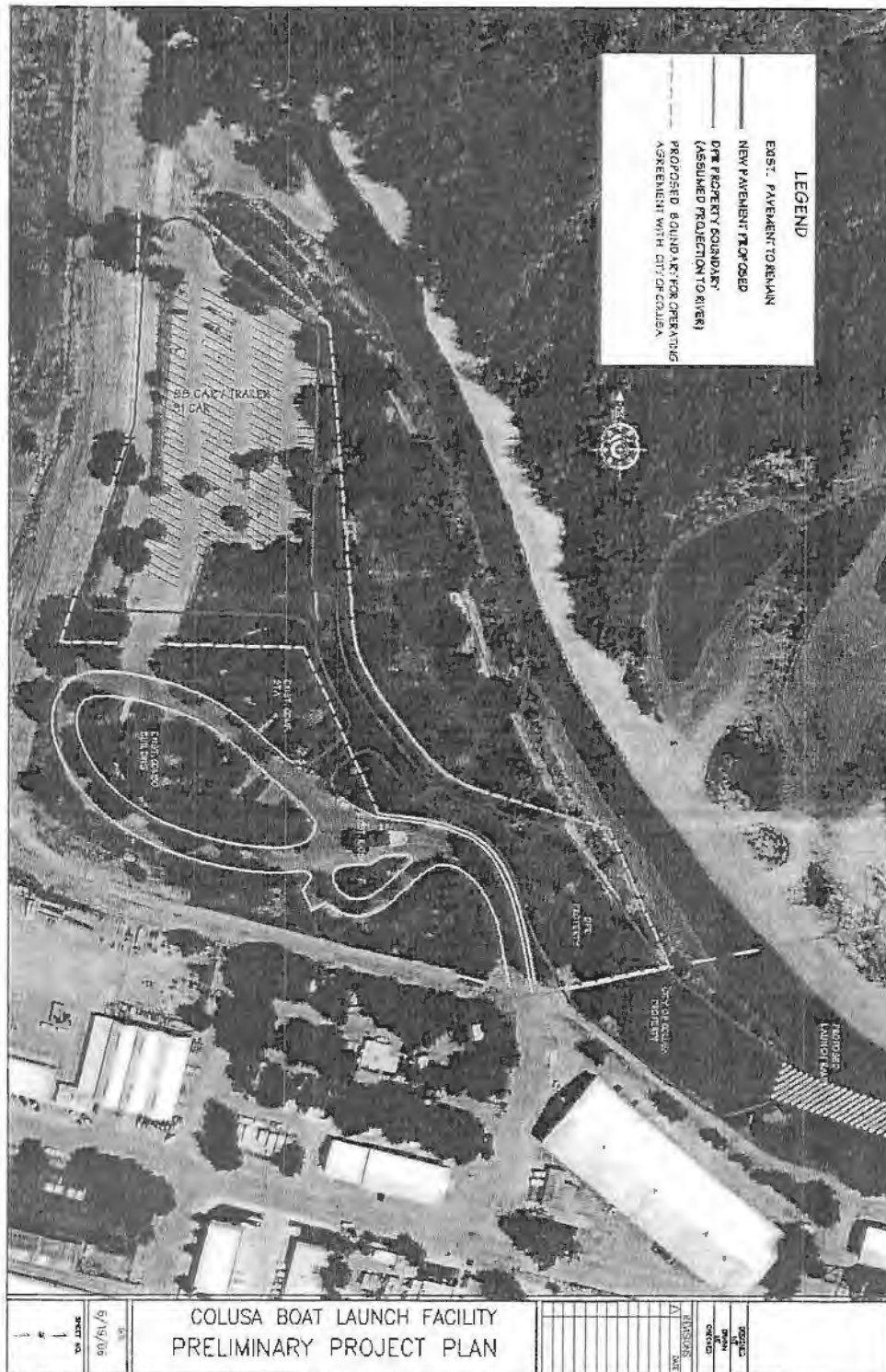


EXHIBIT E – ANNUAL REVENUE AND EXPENDITURE REPORT

F38

Annual Revenue and Expenditure Report

Operating Agreements

Park Unit: Colusa-Sacramento River State Recreation AreaOperating Agency: City of Colusa

State's Fiscal Year: _____ to _____

Estimated Total Visitors: _____

	Revenue	Expenditures	Balance
Visitor Entrance Fees			
Separate Parking Fees			
Concession A			
Concession B			
Concession C			
Special Events			
Miscellaneous Revenue			
Total Annual Revenue			
Salaries & Wages			
Maintenance & Housekeeping			
Utilities			
Capital Improvement Projects			
Miscellaneous Expenses			
Total Annual Expenditures			
Grand Totals			

Preparer Name _____ Date _____

Phone Number _____

F39

EXHIBIT F – DRUG-FREE WORKPLACE CERTIFICATION

STATE OF CALIFORNIA

DRUG-FREE WORKPLACE CERTIFICATION

STD. 21 (Rev. 12/83)(CA ST. PKS. EXCEL 4/9/1999)

CERTIFICATION

I, the official named below, hereby swear that I am duly authorized to legally to bind the contractor or grant recipient to the certification described below. I am fully aware that this certification, executed on the date below, is made under penalty of perjury under the laws of the State of California.

CONTRACTOR/BIDDER FIRM NAME

City of Colusa

BY (Authorized Signature)



PRINTED NAME AND TITLE OF PERSON SIGNING

Thomas Reische

TITLE

Mayor

CONTRACTOR/BIDDER FIRM'S MAILING ADDRESS

425 Webster Street, Colusa, California 95932

FEDERAL ID NUMBER

DATE EXECUTED

TELEPHONE NUMBER (include Area Code)

(530) 458-4740

The contractor or grant recipient named above hereby certifies compliance with Government Code Section 8355 in matters relating to providing a drug-free workplace. The above named contractor or grant recipient will:

1. Publish a statement notifying employees that unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance is prohibited and specifying actions to be taken against employees for violations, as required by Government Code Section 8355(a).
2. Establish a Drug-Free Awareness Program as required by Government Code Section 8355(b), to inform employees about all of the following:
 - (a) The dangers of drug abuse in the workplace,
 - (b) The person's or organization's policy in maintaining a drug-free workplace,
 - (c) Any available counseling, rehabilitation and employee assistance programs, and
 - (d) Penalties that may be imposed upon employees for drug abuse violations.
3. Provide as required by Government Code Section 8355(c), that everyone who works on the proposed contract or grant:
 - (a) Will receive a copy of the company's drug-free workplace policy statement, and
 - (b) Will agree to abide by the terms of the company's statement as a condition of employment on the contract or grant.

4. At the election of the contractor or grantee, from and after the "Date Executed" and until

(NOT TO EXCEED 36 MONTHS), the state will regard this certificate as valid for all contracts or grants entered into between the contractor or grantee and this state agency without requiring the contractor or grantee to provide a new and individual certificate for each contract or grant. If the contractor or grantee elects to fill in the blank date, then the terms and conditions of this certificate shall have the same force, meaning, effect and enforceability as if a certificate were separately, specifically, and individually provided for each contract or grant between the contractor or grantee and this state agency.

**Construction Operating Agreement
Between
California Department of Parks and Recreation
And
The City of Colusa
For
Design and Construction of a Boat Launch Ramp
And
Adjoining Road to Existing Entrance Station and Parking Lot**



This Construction Operating Agreement ("Agreement") is entered into between the State of California, Department of Parks and Recreation ("DPR") and the City of Colusa ("City") (collectively the "Parties") for the planning, permitting, design and construction of a Boat Launch Ramp on City property and an Adjoining Road on DPR and City property from this Boat Launch Ramp to an existing entrance station and parking lot on DPR property (the "Project"). In addition to this Agreement, it is the intent of the Parties to enter into a 20-year operating agreement for operation and maintenance of the Boat Launch Ramp, Adjoining Road, and parking lot at the completion of the Project and prior to the expiration of this Agreement.

RECITALS

WHEREAS, DPR owns and operates certain property at Colusa-Sacramento State Recreation Area including 63 acres of camping, day-use, restrooms, boat launch, roads, parking and infrastructure hereinafter referred to as "DPR Property", a description of which is attached as Exhibit A; and

WHEREAS, City owns and operates certain property adjacent to the DPR Property known as Levee Park, Memorial Grove including a historic railroad turntable and benches hereinafter referred to as "City Property", a description of which is attached as Exhibit B; and

WHEREAS, City has applied for a grant ("Grant") from the State of California, Department of Boating and Waterways ("DBW") to construct a Boat Launch Ramp on City Property and an Adjoining Road on DPR and City Property from this Boat Launch Ramp to an entrance station and parking lot on DPR Property; and

WHEREAS, The Grant requires a Construction Operating Agreement during the construction period and a 20-year operating agreement between DPR and City at the completion of construction; and

WHEREAS, DPR and City agree to enter into this Agreement to meet the requirements of the Grant and define their respective responsibilities regarding the Project; and

WHEREAS; Pursuant to Public Resources Code section 5080.30, DPR may enter into agreements with public agencies for the care, maintenance, administration and control of lands under the jurisdiction of the public agency or DPR for the purposes of the California State Park System; and

WHEREAS, It is the intent of the Parties, once the Project is complete and prior to the expiration of this Agreement, to enter into a 20-year operating agreement for the operation and maintenance of the Boat Launch Ramp, the Adjoining Road, and parking lot; and

NOW THEREFORE, in consideration of the foregoing, the Parties hereto desire to cooperate and mutually agree as follows:

COVENANTS

I. EFFECTIVE DATE

This Agreement shall be dated and effective as of the date upon which both parties have executed this Agreement.

II. TERM

The term of this Agreement shall commence on the date of execution of this Agreement by the Parties and end on December 31, 2016.

III. BOAT LAUNCH RAMP AND ADJOINING ROAD

A. LOCATION: The Boat Launch Ramp shall be located on City Property contiguous to the Colusa-Sacramento River State Recreation Area. The Adjoining Road to be constructed between the Boat Launch Ramp and existing entrance station and parking lot shall be constructed on DPR and City Property. A visual description of which is attached as Exhibit C. The Parties agree to enter into any and all necessary agreements to allow the Adjoining Road, once constructed, to be located on both DPR property and City property.

B. PLANNING, PERMITTING, DESIGN, AND CONSTRUCTION: City shall undertake and be responsible for the planning (including environmental review under CEQA), permitting, design, and construction of the Project.

1. PLANNING: City shall serve as the Lead and Responsible Agency as applicable for purposes of compliance with CEQA for the Project.

2. PERMITTING: City shall undertake and be responsible for obtaining all required permits for meeting CEQA and construction of the Project.

3. DESIGN AND CONSTRUCTION: Following receipt of necessary permits for the construction, City shall prepare detailed specifications for the Project. City shall prepare the bid materials (including, without limitation, working drawings and other construction contract documents), conduct the bidding process and, subject to concurrence by the DPR, select the contractor to construct the Project. City shall provide supervision and inspection of the construction with assistance from DPR in regard to conformance with the specifications for the Project. City shall require that indemnity and insurance requirements for any construction contracts contain a provision naming DPR as an indemnitee or additional named insured at no added cost to DPR. In no event shall DPR's approval, concurrence, or inspections for conformance with conceptual plans of the Project relieve City from responsibility for accurate and complete working drawings and other construction documents and for proper supervision and completion of the work. City shall make the final determination as to the contents of working drawings, construction specifications and other construction documents, and shall carry out the construction functions in accordance with law pertaining to City in such activities.

C. COSTS: The Parties anticipate that DBW will fund the planning, design and construction costs of the Project, and City will provide necessary costs to meet CEQA and obtain required permits. In the event that DBW or City fails to provide or obtain sufficient funding, as described above, nothing herein shall obligate or make responsible DPR for any costs associated with the Project.

D. OPERATION and MAINTENANCE: The responsibilities and costs of the Parties of operation and maintenance of the Boat Launch Ramp, the Adjoining Road, and parking lot shall be acknowledged in the operating agreement to be entered into by the Parties after completion of the Project and prior to the expiration of this Agreement.

IV. COOPERATION

The Parties agree to cooperate in the planning, design, and construction related to the Project. Such cooperation may include, but is not limited to, applications for permits, grants and loans.

V. RIGHTS OF ENTRY AND ACCESS

City has a right to enter DPR's Property for the construction of the Project. Accordingly, DPR shall provide access to City's, employees, agents, contractors, and subcontractors to DPR's Property 24 hours a day, 7 days a week, provided that such access shall not unreasonably interfere with DPR's programs and/or

activities, for the construction of the Project. City shall coordinate its access to DPR's Property with DPR, which access shall not be unreasonably withheld. DPR, at its discretion, may require City to obtain a Right of Entry permit from DPR.

VI. OWNERSHIP OF IMPROVEMENTS

Upon completion of any and all improvements, any and all improvements shall become part of the realty and title to the premises shall vest in the respective landowner. Upon completion of the Project, a Notice of Completion shall be recorded with the appropriate county and a copy of same shall be provided to DPR.

VII. EMPLOYEES, CONSULTANTS, AGENTS, CONTRACTORS and SUBCONTRACTORS

A. City may engage consultants or contract administration personnel as subcontractors to perform, administer, or coordinate any task governed by this Agreement and the attachments hereto. Nothing in this Agreement shall be construed as preventing either party from utilizing as many employees as deemed necessary for the proper and efficient execution of this Agreement.

B. All third party contracts and or subcontracts executed in furtherance of this Agreement shall follow any and all Federal or State laws regarding contracting, as applicable, and shall contain the following provisions:

1. The contractor or subcontractor (hereafter referred to as Contractor) shall procure and maintain, at its own cost, comprehensive general liability insurance from an acceptable insurance provider in an amount not less than one million dollars (\$1,000,000) per person for any one claim, and an aggregate limitation of two million dollars (\$2,000,000) for any number of claims arising from any one incident, covering all claims for injuries against persons or damage to property resulting from any employee's actions in the performance of Contractor's obligations under any authorized contract pursuant to this Agreement.

2. The Contractor agrees to indemnify, defend and hold harmless the State, its officers, agents and employees from any and all claims and losses accruing or resulting to any and all contractors, subcontractors, materialmen, laborers and any other person, firm or corporation furnishing or supplying work services, materials or supplies in connection with the performance of this contract, and from any and all claims and losses accruing or resulting to any person, firm or corporation who may be injured or damaged by the Contractor in the performance of the contract.

3. Contractor shall provide a certificate evidencing that Contractor has procured the above referenced required insurance, that the State of California has been named as an additional insured, and that a 30-day notice of cancellation, material change, or non-renewal shall be provided, delivered, and approved by the parties prior to the execution of the contract and the commencement of services thereunder. The procuring of such insurance or the delivery of policies or certificates evidencing the same shall not be construed as a limitation of Contractor's obligation to indemnify the parties. Failure to furnish acceptable evidence of insurance or lapse of the policy shall be a material breach and grounds for termination of the contract.

VIII. PUBLIC LIABILITY INSURANCE

At its sole expense, City agrees to maintain in force during the term of this Agreement comprehensive general liability insurance, insuring against claims for injuries to persons or property arising out of or related to the Project. The insurance shall have limits of not less than \$1,000,000 for injuries to person or persons; not less than \$1,000,000 for property damage; and said limits shall be adjusted annually to reflect changes in the prior year's Consumer Price Index ("CPI") for Colusa County (all urban consumers – all items). DPR agrees that City at City's option may self-insure the coverages required by this paragraph.

IX. HOLD HARMLESS AGREEMENT

City shall indemnify, hold harmless, and defend State, its officers, agents, and employees against any and all claims, demands, damages, costs, expenses, or liability costs arising out of or related to the Project, which claims, demands, or causes of action arise under Government Code Section 895.2 or otherwise, except for liability arising out of the concurrent or sole negligence or deliberate act of State, its officers, agents, or employees.

In the event State is named as co-defendant in a legal action, under the provisions of the Government Code Section 810 et seq., and City is served with process of such legal action, then City shall immediately notify State of such fact and shall represent State in such legal action as provided herein unless State undertakes to represent itself as co-defendant in such legal action, in which event State shall bear its own litigation costs, expenses, and attorney's fees.

In the event judgment is entered against State and City because of the concurrent negligence of State and City, their officers, agents, or employees, an apportionment of the liability to pay such judgment shall be made by a court of competent jurisdiction. Neither party shall request a jury apportionment.

X. PROHIBITIONS AGAINST ASSIGNING, SUBLETTING

This Agreement, nor any interest therein or thereunder, shall not be assigned, delegated, mortgaged, hypothecated, or transferred by City without obtaining the prior written consent of State, which shall not be withheld unreasonably.

XI. DEFAULTS AND REMEDIES

Either Party may terminate this Agreement for breach by the other Party upon giving the other Party sixty (60) days prior written notice. In the event of any breach of this Agreement by DPR, City shall notify DPR in writing of such breach, and DPR shall have thirty (30) days to initiate action to cure said breach. In the event of breach of this Agreement by City, DPR shall notify City in writing of said breach, and City shall have thirty (30) days to initiate action to cure such breach.

XII. TERMINATION

Notwithstanding the provisions of Paragraph XI, Defaults and Remedies, the parties, upon mutual consent, may terminate this Agreement for any reason.

XIII. NOTICES

All written notices pursuant to this Agreement shall be addressed as set forth below as either party may hereinafter designate by written notice and shall be personally delivered or sent through the United States mail:

DPR: Robert K. Foster, District Superintendent
California Department of Parks and Recreation
400 Glen Drive
Oroville, CA 95966

City: Joan L. Phillipe, City Manager
City of Colusa
P.O. Box 1063
Colusa, CA 95932

XIV. DESIGNATION OF PRINCIPALS

The following principals of DPR and City are hereby designated as the principals and representatives of the respective parties authorized to act in its behalf with respect to the work specified in this Agreement and to make all decisions in connection therewith:

DPR: Robert K. Foster

City: Joan L. Phillipe

XV. NONDISCRIMINATION



Pursuant to Public Resources Code Section 5080.34, this Agreement prohibits, and every contract on lands that are subject to this Agreement shall expressly prohibit, discrimination against any person because of race, color, religion, sex, marital status, national origin, or ancestry of that person. Attached is Standard Form 17A, Exhibit B, which is incorporated herein.

XVI. LIMITATION

This Agreement is subject to all valid and existing contracts, leases, licenses, encumbrances, and claims of title which may affect Premises.

XVII. PARAGRAPH TITLES

The paragraph titles in this Agreement are inserted only as a matter of convenience and for reference, and in no way define, limit, or describe the scope or intent of this Agreement or in any way affect this Agreement.

XVIII. AGREEMENT IN COUNTERPARTS

This Agreement may be executed in counterparts, each of which shall be deemed an original.

XIX. AGREEMENT IN WRITING

This Agreement contains and embraces the entire Agreement between the Parties hereto and neither it nor any part of it may be changed, altered, modified, limited, or extended orally, or by any Agreement between the parties unless such Agreement be expressed in writing, signed, and acknowledged by DPR and City, or their successors in interest.

XX. INSPECTION

DPR or its authorized representative shall have the right at all reasonable times to inspect the Project to determine if the provisions of this Agreement are being complied with.

XXI. SUCCESSORS IN INTEREST

Unless otherwise provided in this Agreement, the terms, covenants, and conditions contained herein shall apply to and bind the heirs, successors, executors, administrators, and assigns of all the Parties hereto, all of who shall be jointly and severally liable hereunder.

XXII. PARTIAL INVALIDITY

If any term, covenant, condition, or provision of this Agreement is held by a court of competent jurisdiction to be invalid, void, or unenforceable, the remainder of the provisions hereof shall remain in full force and effect and shall in no way be affected, impaired or invalidated thereby.

XXIII. WAIVER OF RIGHTS

The failure of DPR or City to insist upon strict performance of any of the terms, conditions, and covenants in this Agreement shall not be deemed a waiver of any right or remedy that DPR or City may have, and shall not be deemed a waiver of any right or remedy for a subsequent breach or default of the terms, conditions, and covenants herein contained.

XXIV. DISPUTES

This Agreement shall be construed and interpreted, as to both validity and performance of the parties, in accordance with the laws of the State of California and of the United States.

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be duly executed with all the formalities required by law on the respective dates set forth opposite their signatures.

DPR:

Ruth Coleman
Ruth Coleman, Director
Department of Parks and Recreation

Date:

8/24/06

City:

John A. Rogers
Mayor

Date:

7/18/06

APPROVED

SEP 11 2006

DEPT OF GENERAL SERVICES

Alfonso Suen

EXHIBIT B-1

RECORDING REQUESTED BY 1009

AND WHEN RECORDED MAIL TO

NAME: _____ ADDRESS: _____ CITY & STATE: _____

TITLE Order No. _____ Escrow No. _____

MAIL TAX STATEMENTS TO

NAME: _____ ADDRESS: _____ CITY & STATE: _____

RECORDED AT REQUEST OF
City of Colusa
5 MIN. PART 4 p.m.
OFFICIAL RECORDS COLUSA COUNTY, CALIF.
MAR 8 - 1977
Martha Hansen
\$ No Fee Recorder, Colusa County
BOOK 445 PAGE 119

SPACE ABOVE THIS LINE FOR RECORDER'S USE
The undersigned declares
Documentary transfer tax \$ None
☐ Computed on full value of property conveyed, or
☐ Computed on full value less liens and encumbrances
remaining thereon at time of sale.

Signature of declarant or agent determining tax—firm name

G9

Corporation Grant Deed

WESTERN TITLE FORM NO. 102

FOR VALUE RECEIVED, DELTA LINES, INC., a corporation, successor by merger to Sacramento River Warehouse Company, a corporation, formerly Sacramento Transportation Company, a corporation GRANTS to CITY OF COLUSA,

all that real property situate in the City of Colusa,
County of Colusa, State of California, described as follows:

Parcels Nos. 1, 2, 3 and 4 as shown on that certain Parcel Map showing a division of portions of Blocks 2, 3, 7 and portion of area northerly of Block 5 of the City of Colusa, said parcel map being filed on July 16, 1976 in Book 1 of Parcel Maps at page 163.

RECEIVED
MAR 8 - 1977
CITY OF COLUSA

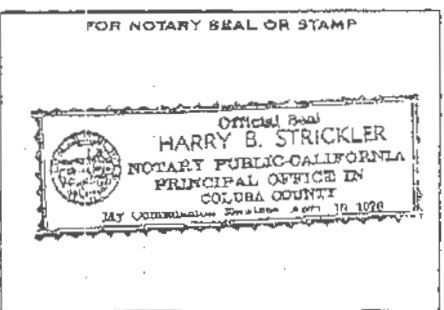
IN WITNESS WHEREOF, said corporation has executed these presents by its officers thereunto duly authorized, this 10th day of February, 1977.

DELTA LINES, INC.
By *[Signature]* VICE-President
By _____ Secretary

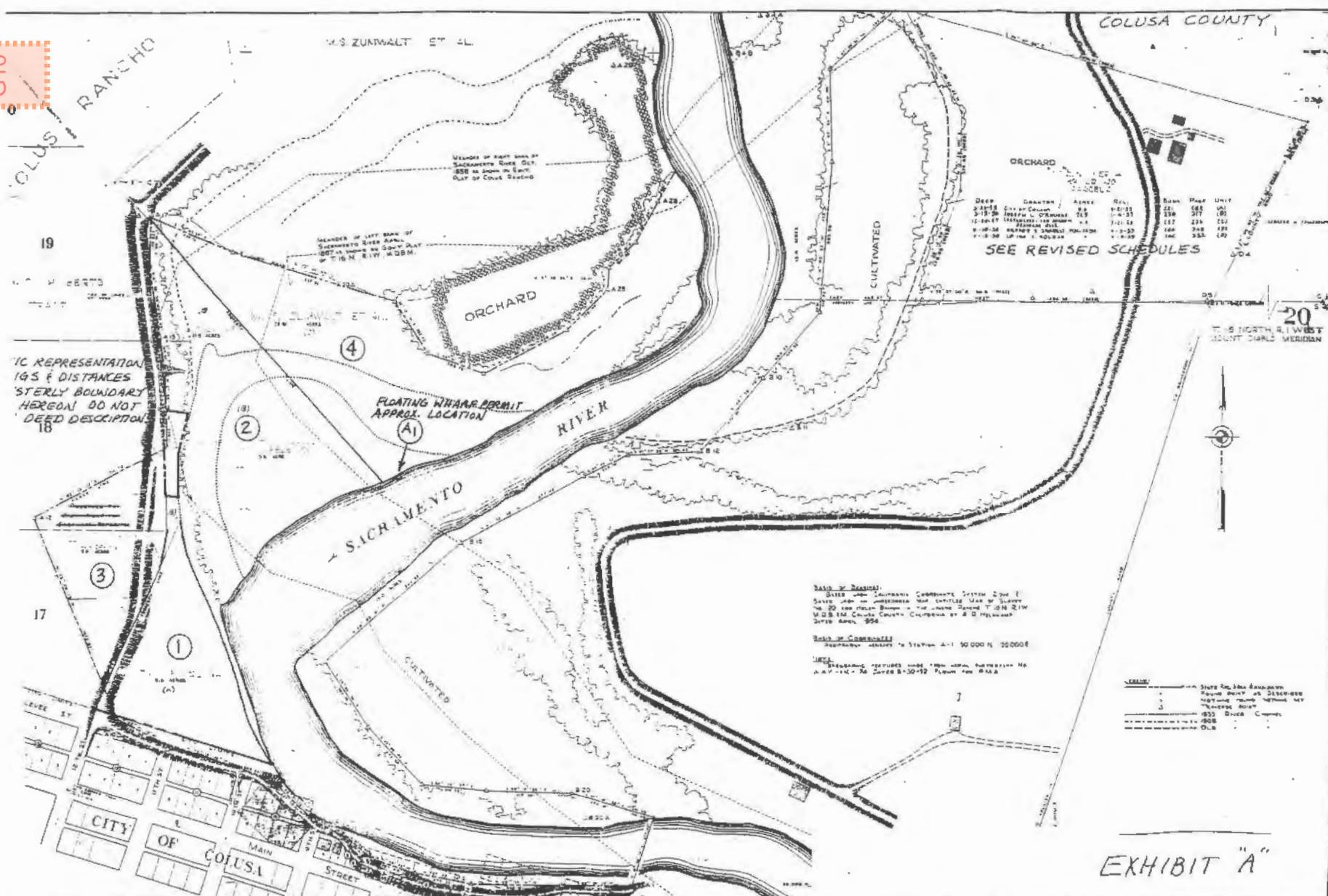
STATE OF CALIFORNIA
County of Colusa ss.
On February 10, 1977, before me, Harry B. Strickler,
Notary Public, in and for said State, personally appeared
G. Dwyer, xxx

known to me to be the Vice President and the Secretary of the corporation that executed the within instrument, and also known to me to be the persons who executed it on behalf of such corporation, and acknowledged to me that such corporation executed the same, and further acknowledged to me that such corporation executed the within instrument pursuant to its by-laws or a resolution of its Board of Directors.

[Signature]
Notary Public



G10



ORCHARD

DEEP	QUANTITY	ACRES	PER	PER	UNIT
2-10-15	City of Colusa	2.5	1-1-15	151	101
3-15-20	Jeffrey L. O'Connell	0.5	1-1-15	151	101
12-20-17	Jeffrey L. O'Connell	1.5	1-1-15	151	101
8-10-16	Jeffrey L. O'Connell	1.5	1-1-15	151	101
1-1-15	Jeffrey L. O'Connell	1.5	1-1-15	151	101

SEE REVISED SCHEDULES

State of Records:
 State of California, Department of Public Works, Division of Highways, Highway 1, Station 1+00 to 1+100, 1954.
State of Commerce:
 Department of Commerce, Division of Marine Fisheries, Marine Fisheries, 1954.
Notes:
 1. This map is based on the 1954 map of the State of California, Department of Public Works, Division of Highways, Highway 1, Station 1+00 to 1+100, 1954.
 2. This map is based on the 1954 map of the State of California, Department of Commerce, Division of Marine Fisheries, Marine Fisheries, 1954.

EXHIBIT "A"

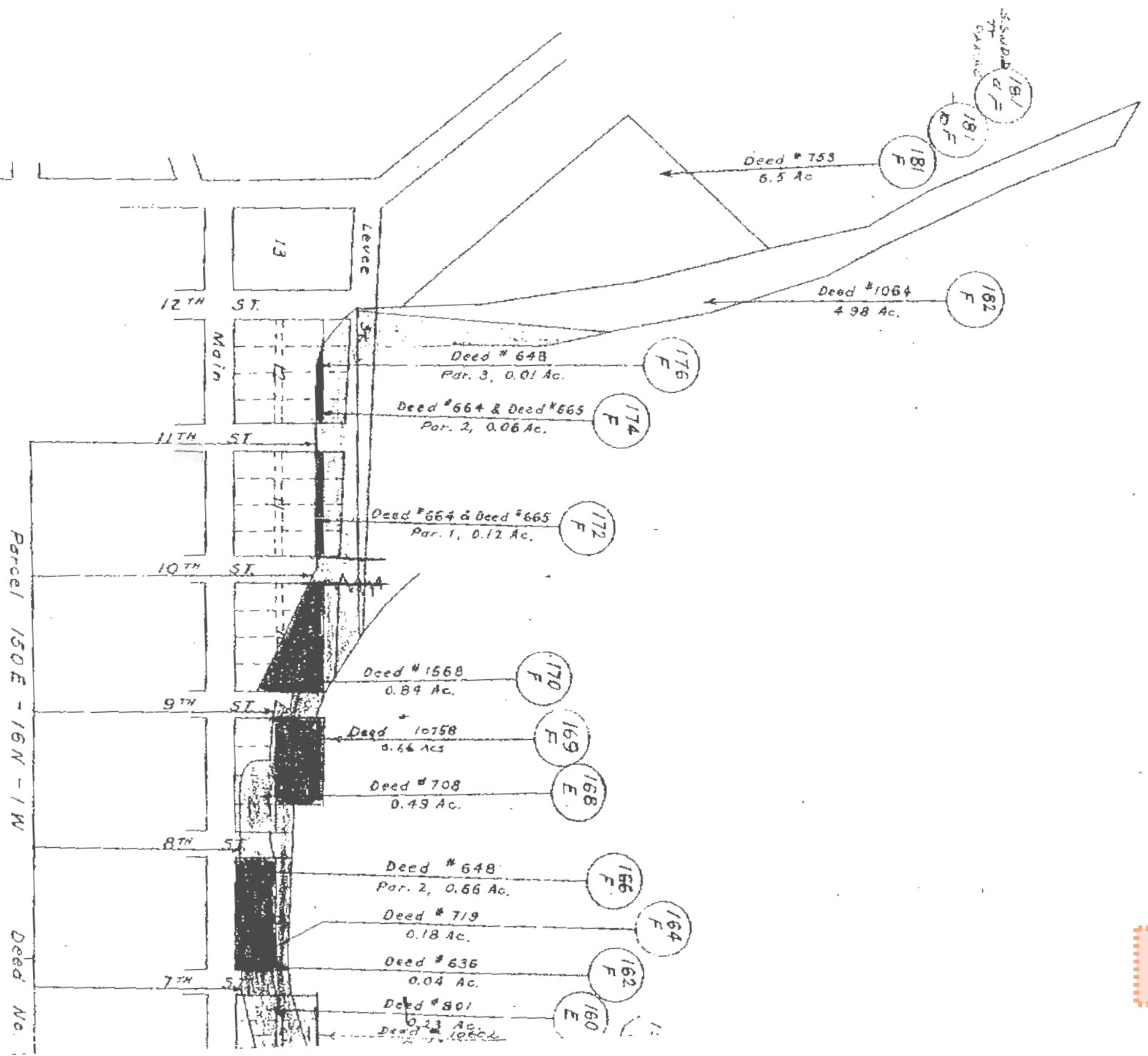
NO. 3400 RGM EAST SIDE	BY A.D.R.	DATE 7-18-58	SCALE 1" = 200'	CONTOUR INT. 10'	APPROVED DATE	SECTION 106 OF CALIFORNIA DEPARTMENT OF PARKS AND RECREATION	COLUSA-SACRAMENTO RIVER STATE RECREATION AREA OWNERSHIP MAP	DEPARTMENT NO. 3254	SHEET 1
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Scale 1" = 400'

COLUSA

EXHIBIT B-2

G11



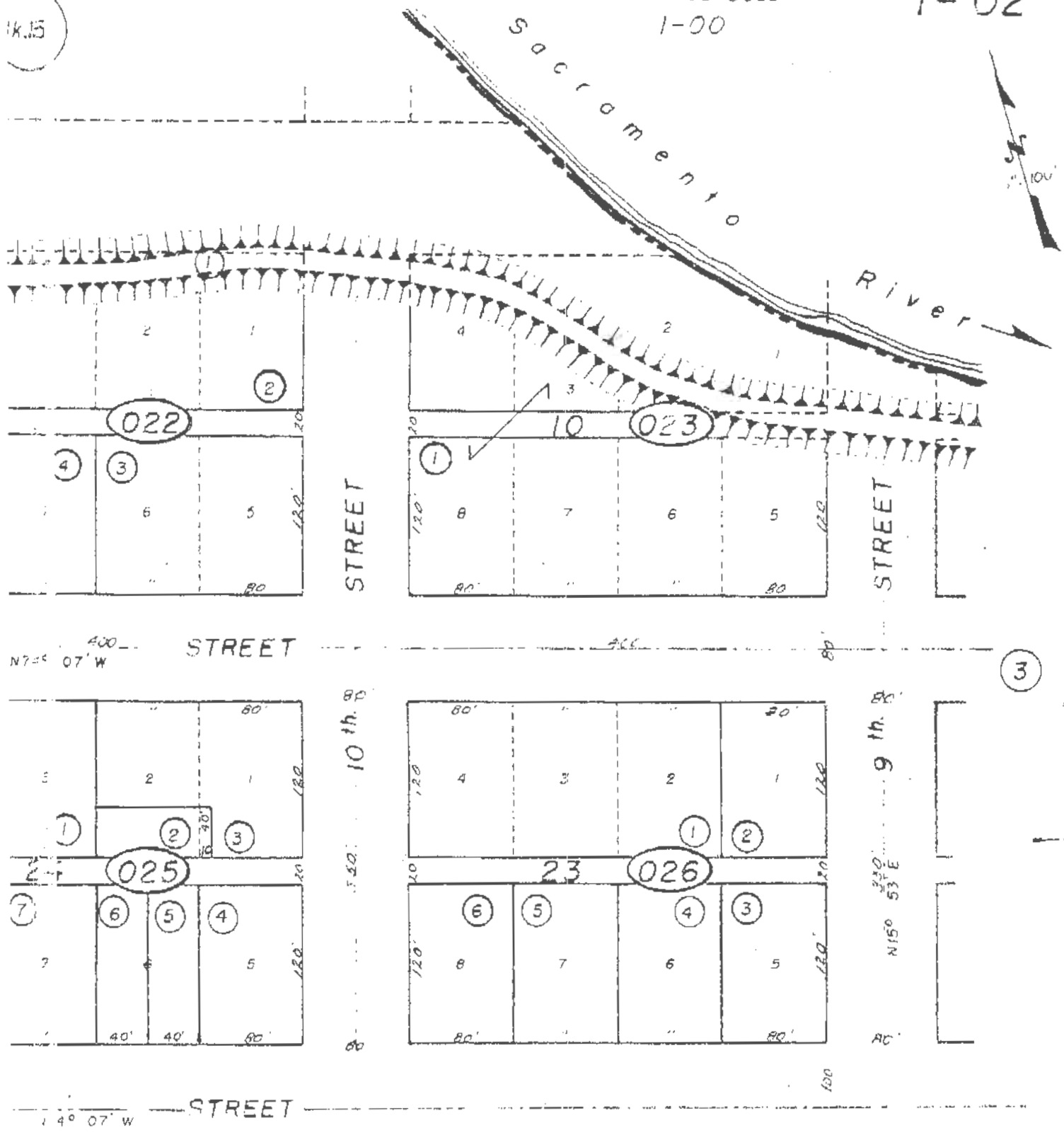
G12

1-02

COLUSA

Tax Area Code
1-00

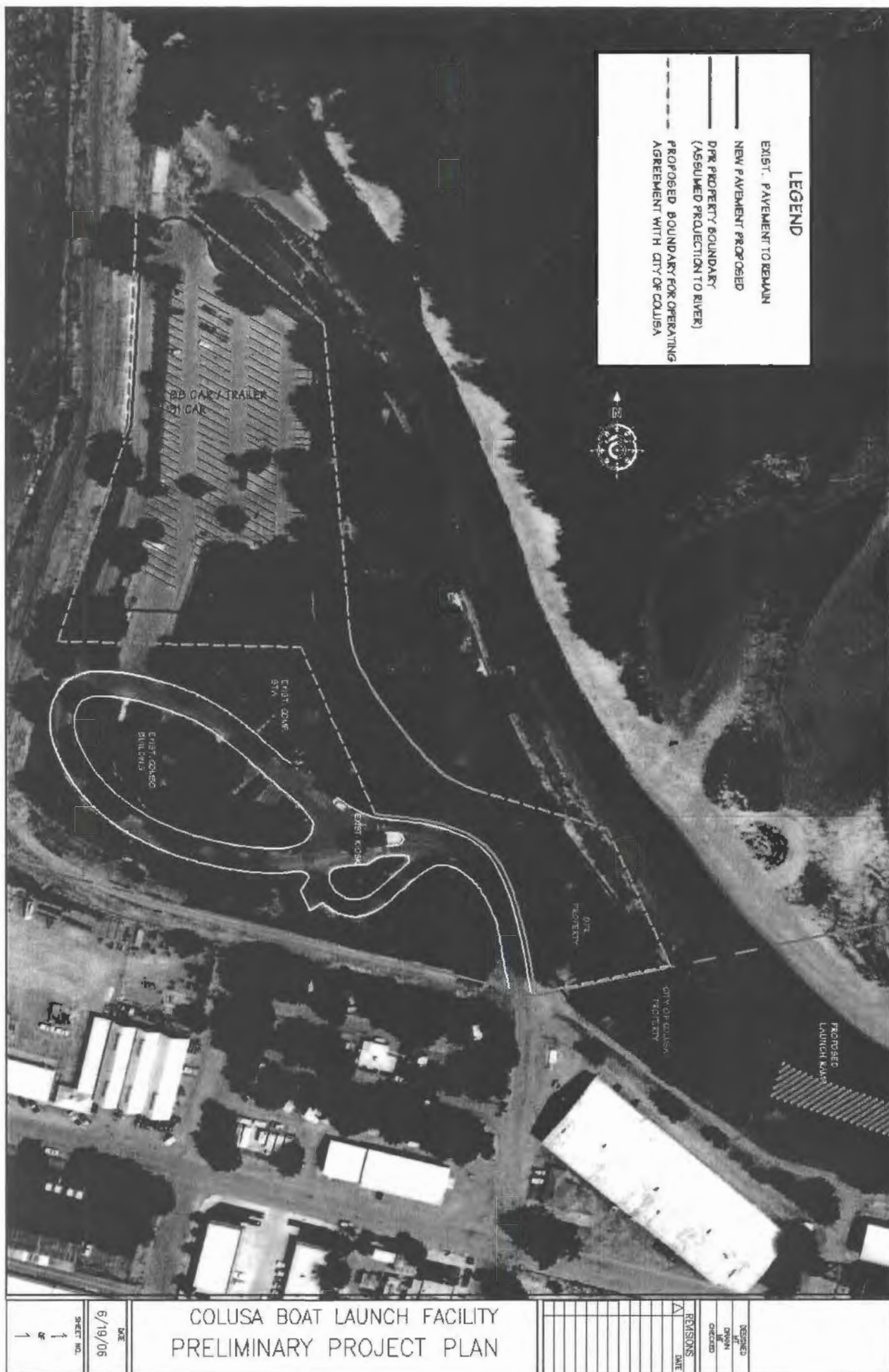
18.15



CITY OF COLUSA
Assessor's Map Bk. 1- Pg. 2
County of Colusa, Calif.
1970

71

NOTE - Assessor's Block Numbers Shown in Ellipses
Assessor's Parcel Numbers Shown in Circles



CONSTRUCTION OPERATING AGREEMENT

BETWEEN

CALIFORNIA DEPARTMENT OF PARKS AND RECREATION

AND

THE CITY OF COLUSA

FOR DESIGN AND CONSTRUCTION OF A BOAT LAUNCH RAMP

AND

ADJOINING ROAD TO EXISTING ENTRANCE STATION AND PARKING LOT

THIS AMENDMENT is made and entered into by and between the STATE OF CALIFORNIA, acting through the Department of Parks and Recreation, hereinafter called "DPR", and the City of Colusa, hereinafter called "City".

WITNESSETH:

WHEREAS, a Construction Operating Agreement was entered into on the 11th day of September, 2006, by and between DPR and City for the planning, permitting, design and construction of a Boat Launch Ramp on City property and an Adjoining Road on DPR and City property from this Boat Launch Ramp to an existing entrance station and parking lot on DPR property.

WHEREAS, DPR owns and operates certain property at Colusa-Sacramento State Recreation Area including 63 acres of camping, day-use, restrooms, boat launch, roads, parking and infrastructure.

WHEREAS, City has applied for a grant from the State of California, Department of Boating and Waterways (DBW) to construct a Boat Launch Ramp on City property and an Adjoining Road on DPR and City property from this Boat Launch Ramp to an entrance station and parking lot on DPR property.

WHEREAS, City must operate and maintain the boat launching facility for 20 years after Project construction is complete, including the Boat Launch Ramp, Adjoining Road, parking lot, and entrance station to qualify for grant funds from DBW.

NOW THEREFORE, IT IS MUTALLY AGREED BY AND BETWEEN THE PARTIES HERETO AS FOLLOWS:

Amend Paragraph 1, on Page 1 to read: ". . .In addition to this Agreement, the Parties shall enter into a 20-year operating agreement for operation and maintenance of the Boat Launch Ramp, Adjoining Road, and parking lot at the completion of the Project and prior to the expiration of this Agreement. Agreement terms must comply with Article 7 (Operation of the Project) of the grant agreement between DBW and City."

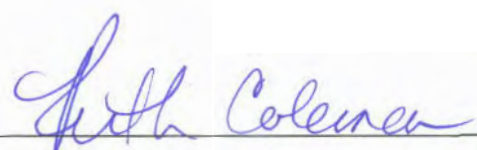
Amend Recital 3, on Page 2 to read: "Per STD 213 and Article 7 of the grant agreement between DBW and City, once the Project is complete and prior to the expiration of this Agreement, the Parties shall enter into a 20-year operating agreement for the operation and maintenance of the Boat Launch Ramp, the Adjoining Road, and parking lot; and"

All other terms and conditions of the concession contract shall remain the same and in full force and effect.

The effective date of this amendment shall be the first day of the month following all required signatures and approval by State as shown below.

This amendment may be executed in counterparts, each of which shall be deemed an original.

IN WITNESS WHEREOF, the parties hereto warrant that they respectively have the requisite authority to execute this instrument binding the named parties for which they sign at the respective dates set forth below.

APPROVED:**CITY OF COLUSA****STATE OF CALIFORNIA****DEPARTMENT OF PARKS AND RECREATION**By: By: Name: Rob HickeyName: Ruth ColemanTitle: City ManagerTitle: DirectorDate: 04/24/08Date: 05-07-08**APPROVED:****DEPARTMENT OF GENERAL SERVICES:**



RIPARIAN HABITAT RESTORATION PLAN

Planting Composition tables



Community Cottonwood Riparian Forest

Phase 1 - Manual Planting

Density (plant by row)	11' x 20'
Density	198
Acres	29.1
Target Planting Date	Spring, Project Year 2
Total Locations	5,762
Total Plants	9,737

Canopy Structure	Species		Frequency	Total
Overstory	<i>Platanus racemosa</i>	Western sycamore	9%	519
	<i>Populus fremontii</i>	Fremont cottonwood	26%	1,498
	<i>Quercus lobata</i>	Valley oak	9%	519
Midstory	<i>Acer negundo</i>	Box elder	13%	749
	<i>Cephalanthus occidentalis</i>	Buttonwillow	6%	346
	<i>Fraxinus latifolia</i>	Oregon ash	5%	288
	<i>Salix exigua</i>	Narrow-leaved willow	3%	173
	<i>Salix gooddingii</i>	Goodding's willow	10%	576
	<i>Salix laevigata</i>	Red willow	3%	173
	<i>Salix lasiolepis</i>	Arroyo willow	3%	173
	<i>Salix lucida</i>	Shining willow	3%	173
	<i>Rosa californica</i>	California rose	2%	115
	<i>Rubus ursinus</i>	California blackberry	5%	288
Understory	<i>Toxicodendron diversilobum</i>	Poison oak	3%	173
			100%	5,243
Herbaceous	<i>Carex barbarae</i>	Santa Barbara sedge	10%	576
	<i>Carex praegracilis</i>	Slender sedge	3%	173
Forbs	<i>Artemisia douglasiana</i>	Mugwort	15%	864
	<i>Euthamia occidentalis</i>	Western goldenrod	10%	576
	<i>Oenothera elata</i>	Primrose	10%	576
	<i>Solidago californica</i>	California goldenrod	10%	576
	<i>Urtica dioecia</i>	Hoary nettle	4%	230
	<i>Aristolochia californica</i>	California pipevine	6%	346
Vines	<i>Clematis ligusticifolia</i>	Clematis	6%	346
	<i>Vitis californica</i>	California grape	4%	230
			78%	4,494

Phase 2 - Direct Understory Seeding

Acres	29.1
Seeding rate (lb/acre)	15
Target Planting Date	December, Project Year 2

Grass Species	Ecotype	Seed Mix
<i>Elymus glaucus</i>	Blue wildrye	Yolo Bypass 30%
<i>Hordeum brachyantherum</i>	California meadow barley	Yolo Bypass 25%
<i>Leymus triticoides</i>	Creeping wildrye	Yolo Bypass 45%
		100%

**Community Mixed Riparian Forest****Phase 1 - Manual Planting**

Density (plant by row)	11' x 20'
Density	198
Acres	64.3
Target Planting Date	Spring, Project Year 2
Total Locations	12,731
Total Plants	22,280

Canopy Structure	Species		Frequency	Total
Overstory	<i>Platanus racemosa</i>	Western sycamore	8%	1,019
	<i>Populus fremontii</i>	Fremont cottonwood	9%	1,146
	<i>Quercus lobata</i>	Valley oak	9%	1,146
Midstory	<i>Acer negundo</i>	Box elder	17%	2,164
	<i>Cephalanthus occidentalis</i>	Buttonwillow	4%	509
	<i>Fraxinus latifolia</i>	Oregon ash	6%	764
	<i>Salix exigua</i>	Narrow-leaved willow	4%	509
	<i>Salix gooddingii</i>	Goodding's willow	4%	509
	<i>Salix laevigata</i>	Red willow	4%	509
	<i>Salix lasiolepis</i>	Arroyo willow	10%	1,273
	<i>Salix lucida</i>	Shining willow	3%	382
	<i>Rosa californica</i>	California rose	4%	509
	<i>Rubus ursinus</i>	California blackberry	10%	1,273
Understory shrubs	<i>Toxicodendron diversilobum</i>	Poison oak	8%	1,019
			100%	12,731
Herbaceous	<i>Carex barbarae</i>	Santa Barbara sedge	10%	1,273
	<i>Carex praegracillis</i>	Slender sedge	10%	1,273
Forbs	<i>Artemisia douglasiana</i>	Mugwort	18%	2,292
	<i>Euthamia occidentalis</i>	Western goldenrod	10%	1,273
	<i>Oenothera elata</i>	Primrose	5%	637
	<i>Lotus purshianus</i>	Lotus	2%	255
	<i>Solidago californica</i>	California goldenrod	10%	1,273
	<i>Urtica dioecia</i>	Hoary nettle	2%	255
Vines	<i>Aristolochia californica</i>	California pipevine	2%	255
	<i>Clematis ligusticifolia</i>	Clematis	2%	255
	<i>Vitis californica</i>	California grape	4%	509
			75%	9,549

Phase 2 - Direct Understory Seeding

Acres	64.3
Seeding rate (lb/acre)	15
Target Planting Date	December, Project Year 2

Grass Species		Ecotype	Seed Mix
<i>Elymus glaucus</i>	Blue wildrye	Yolo Bypass	30%
<i>Hordeum brachyantherum</i>	California meadow barley	Yolo Bypass	25%
<i>Leymus triticoides</i>	Creeping wildrye	Yolo Bypass	45%
			100%

Community**Valley Oak Savanna****Phase 1 - Manual Planting**

Density (plant by row)	11' x 40'
Density	99
Acres	10.5
Target Planting Date	Spring, Project Year 2
Total Locations	1,040
Total Plants	2,079

Canopy Structure	Species		Frequency	Total
Overstory	<i>Platanus racemosa</i>	Western sycamore	12%	125
	<i>Quercus lobata</i>	Valley oak	40%	416
Midstory	<i>Acer negundo</i>	Box elder	12%	125
Understory	<i>Baccharus pilularis</i>	Coyote brush	11%	114
	<i>Rosa californica</i>	California rose	10%	104
	<i>Rubus ursinus</i>	California blackberry	10%	104
	<i>Toxicodendron diversilobum</i>	Poison oak	5%	52
			100%	1040
Herbaceous	<i>Carex barbarae</i>	Santa Barbara sedge	20%	208
	<i>Muhlenbergia rigens</i>	Deergrass	5%	52
Forbs	<i>Artemisia douglasiana</i>	Mugwort	20%	208
	<i>Euthamia occidentalis</i>	Western goldenrod	10%	104
	<i>Urtica dioecia</i>	Hoary nettle	5%	52
	<i>Oenothera hookeri</i>	Primrose	5%	52
	<i>Solidago californica</i>	California goldenrod	10%	104
Vines	<i>Aristolochia californica</i>	California pipevine	10%	104
	<i>Clematis ligusticifolia</i>	Clematis	10%	104
	<i>Vitis californica</i>	California grape	5%	52
			100%	1040

Phase 2 - Direct Understory Seeding

Acres	10.5
Seeding rate (lb/acre)	15
Target Planting Date	December, Project Year 2

Grass Species		Ecotype	Seed Mix
<i>Elymus glaucus</i>	Blue wildrye	Yolo Bypass	20%
<i>Hordeum brachyantherum</i>	California meadow barley	Yolo Bypass	25%
<i>Leymus triticoides</i>	Creeping wildrye	Yolo Bypass	20%
<i>Nasella pulchra</i>	Purple needlegrass	Llano Seco Ranch	35%
			100%

Community**Grassland (29.2 acres) and Campground (6.3 acres)**

Phase 1 Grass Seeding

Acres 35.5
Seeding rate (lb/acre) 15
Target Planting Date December, Project Year 2

Grass Species		Ecotype	Seed Mix
<i>Elymus glaucus</i>	Blue wildrye	Yolo Bypass	35%
<i>Hordeum brachyantherum</i>	California meadow barley	Yolo Bypass	35%
<i>Leymus triticoides</i>	Creeping wildrye	Yolo Bypass	30%
			100%

Phase 2 Forb Seeding

Target Planting Date December, Project Year 3

Forb Species		Ecotype	Seeding Rate (lbs/acre)
<i>Artemisia douglasiana</i>	Mugwort	Sacramento River	1
<i>Euthamia occidentalis</i>	Western goldenrod	Sacramento River	1
<i>Oenothera hirsuta</i>	Evening primrose	Sacramento River	0.5
<i>Lotus purshianus</i>	Lotus	Sacramento River	0.5
<i>Solidago californica</i>	California goldenrod	Sacramento River	1
<i>Urtica dioica</i>	Stinging nettle	Sacramento River	0.5

**Colusa-Sacramento River SRA Day Use, Campground, and Maintenance Areas
Historical Evaluation and Determination of Eligibility Report**



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California State Parks

Northern Service Center

Date: March 9, 2015



Table of Contents

Purpose	1
Eligibility Criteria	1
Historic Significance/Determination of Eligibility	1
Historic Evaluation	2
Colusa City Dump: 1868-1955	2
Colusa County Boat Club: 1946-1955	3
California State Parks' Initial Acquisition and Development: 1955-1959.....	3
Day Use Picnic Area Development: 1961-1964	4
Maintenance Shop Area Development-1960-1966	6
Island Campground Improvements and Use: 1964-1976	7
Consolidation of Picnic and Campground Activities: 1976-77	7
Additional Improvements and Changes: 1976-1990	8
Transition from State to City Parks Management: 2011 to Present	9
Conclusion:	10
Works Cited	11

Purpose

This report is meant to augment and update a 14-year-old inventory and analysis of the existing California State Parks-related structures within the Colusa-Sacramento State Recreational Area's Day Use and Campground areas. The purpose of which it is to place these structures within the context of the Park Unit's historical development in order to determine if they are eligible for listing on the National Register of Historic Places and/or the California Register of Historic Resources as part of a historic landscape.

Eligibility Criteria

In order to determine if the fore-mentioned structures are potentially eligible for inclusion in either registers, they must meet certain criteria placed within the context of their historical development. For example, are they (A) associated with an event, or series of events that have made a significant contribution to the broad patterns of history; (B) has an unequivocal association with the lives of people significant in the past; (C) embody the distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components may lack individual distinction; or (D) has yielded or may be likely to yield information important to history or prehistory.

While any or all of the structures may be eligible under one or more criteria within a certain historical context, they must have retained enough of the physical character-defining features that existed during their period of historic significance. While alterations over time or historic changes in use may in themselves have historical, cultural, or architectural significance; the structures must retain enough integrity of location, design, setting, materials, workmanship, feeling, and association with any or all of the criteria in order to be eligible.

If the structures have not retained sufficient physical integrity to meet the criteria for listing in the National Register, they may still be eligible for listing in the California Register if it maintains the potential to yield significant scientific or historical information, or other specific data.¹

Historic Significance/Determination of Eligibility

Although the Colusa-Sacramento River State Recreation Area is associated with California State Parks expansion in the Northern Buttes District during the mid-to-late postwar period, over 40 years of flooding, alterations, and additions since 1976 have impacted the Park's ability to

¹ United States, National Park Service, *How to Apply the National Register Criteria for Evaluation*. *National Register Bulletin 15*. (Washington, D. C.: U.S. Department of the Interior, 1990; Revised 1998) 3; California State Parks [CSP], Office of Historic Preservation, *Instructions for Nominating Historical Resources to the National Register of Historical Resources* (Sacramento: Author, August 1997), 3 and 52; and CSP, Office of Historic Preservation, *Technical Assistance Series #7: How to Nominate a Resource to the California Register of Historical Resources* (Sacramento: Author, August 29, 2002), 11.

convey an intact designed landscape associated with its early historical development and operation.

The only exception may be the maintenance shop building. Further research will be necessary to determine if it embodies the characteristics of a distinct type, period, and method of construction or is the only surviving example of an interlocking flat galvanized metal panel-constructed building in a California State Park.

While the Colusa Bridge swing mechanism is listed on the Historic American Engineering Record as a unique example of early 20th century bridge engineering, it is not listed on any city, county, state or national registers of historic properties.

Historic Evaluation

Colusa City Dump: 1868-1955

Between approximately 1868 and 1955, the City of Colusa utilized 7 acres of land on what is now the Colusa-Sacramento River SRA as a garbage dump. Situated only 26 feet above the nearby river bank, the dump occupied a roughly right triangle-shaped parcel of land west and northwest of an S-shaped curve of the Sacramento River before it travels past the town of Colusa. The 74-foot high gravel-paved Roberts Ditch Levee road runs along the dump site's northwesterly and southeasterly perimeters. The Sacramento River's western banks were approximately 285 yards closer than they are now along the dump site's southeasterly to northwesterly perimeter. The latter extended some 430 yards to a point where it met a narrow water channel. The narrow remnant of an earlier river channel, it continued in a northwesterly direction some 40 yards where it met the site of a single-lane boat launching ramp that was in operation from the late-1940s to mid-1950s. The channel continued for another 600 feet to a dead end. At this point a 18"-diameter pump intake pipe transferred water from the channel approximately 20 feet up to the Roberts Ditch pump house, which conveyed the water into a concrete-lined irrigation ditch along the levy. The latter continued through a 36"-diameter concrete culvert under the levy road, then out into an irrigation ditch along the levee's western base.²

Prior to the California Department of Parks and Recreation [DPR]'s acquisition, a small rectangular caretakers shack stood approximately in the location of the existing comfort station. The caretaker reportedly would instruct the public as to where to dump their trash. Intentional or spontaneously ignited fires were frequent occurrences. Periodic flooding may

² CSP, *Colusa-Sacramento State Recreation Area, Unit History: 1806-1990 (1990)*, 111, 196 and 205; California Division of Beaches and Parks [CDBP], *Colusa-Sacramento River State Recreation Area*, Drawing No. 3400 (April 28, 1955, revised July 3, 1957), sheet 1 of 1; CDBP, *Colusa-Sacramento River State Park, General Topography*, Drawing No. 3637 (October 1956), sheets 1- 3 of 5; and CDBP, *Colusa-Sacramento River State Park, Bank Correction & Boat Launching Ramp Improvement*, Drawing No. 7980 (November 19, 1963), sheet 1 of 1.

have also helped disperse the trash, along with nests of rats and hogs from a nearby farm. Receding flood waters often created pools that served as breeding grounds for warms of mosquitoes.³

Colusa County Boat Club: 1946-1955

Situated roughly half-way between the dump caretakers shack and the boat launching ramp (in the middle of the current boat launching parking lot) was a smaller wood-frame shack, which may have served a local boat club. Northeast of the boat ramp stood a single-lane wooden bridge that provided vehicular access to an undeveloped excess parking area in a large undeveloped area across the channel. Other dirt roads paved dirt roads provided automobile access to a paved parking area slightly northeast of the frame shack and boat ramp. Two roads traveled south from the boat ramp along the former shoreline and around the dump area to the dump's entrance.⁴

The original boat ramp and channel dates to the park unit's earliest recorded recreational use. After World War II, large numbers of returning veterans and their families sought out various weekend and/or vacation activities in established recreational areas. Many joined local hunting, boating, or fishing clubs. Among these was the Colusa County Boat Club, which petitioned the city of Colusa to install a single lane automobile boat launching ramp on the channel north of the city dump in 1946.⁵ Although the exact date of the boat launching ramp is unknown, by the mid-1950s, club members and other boaters were actively using the ramp to participate in several annual "water shows and pot luck picnics" along the Sacramento River. More notably, a July 17, 1955 flyer announced that the boat club would be holding an event at the "Colusa Boat Landing," the "The Future Home of The State Park."⁶

California State Parks Initial Acquisition and Developmental: 1955-1959

Interest in transforming the "historic" city dump into a riverine recreational park began five years earlier, when the Colusa Chamber of Commerce appointed a proposal for the creation of a committee to present a proposal to the Colusa City Council. Although the Council approved the plan in principle, it asked for County and State participation in the funding process. Apparently, the State of California Division of Beaches and Parks [California State Parks] decided to acquire the 7-acre parcel from the city and develop it as a State Park in August 1955.

³ CDBP, *General Topography*, sheet 1 of 5; *Unit History*, 76; and Hanover Environmental Services, Inc., *Environmental Site Assessment, Colusa-Sacramento River State Recreation Area: Phase I* [prepared for the Nature Conservancy, Chico, California] (November 1, 2005), 10.

⁴ *General Topography*, Drawing No. 3637, sheets 2-5 of 5; CDBP, *Colusa-Sacramento River State Recreation Area, General Development Study '65*, Drawing No. 6469 (February 4, 1964), sheet 1 of 1; and Brandy Pustejovsky, *Colusa City Dump* [Recordation Forms] (October 2008), 2.

⁵ *Unit History*, 90; and Alexander D. Bevil, *Mt. San Jacinto State Park*, National Register of Historic Places Nomination No. 13000416 (January 17, 2013; Listed June 25, 2013), Section 8, 37-38.

⁶ Colusa County Boat Club, *Water Show and Pot Luck Picnic* [flyer], Colusa County Archives (c. July 15, 1955).

Although the State acquired an additional 57 acres of adjoining farmland, the new State park remained undeveloped for the next three years. During which time, it experienced at least four floods. Indeed, when California State Parks [CSP] surveyed the future acquisition in August 1956, the area north of the boat launching channel could not be surveyed due to “high water.”⁷

CSP’s first recorded attempt to improve the park began on June 27, 1959, when Parks staff began planting approximately 322 trees and shrubs. Many of which appear to be still standing. Other park improvements installed between 1959 and the park unit’s July 31, 1961 official opening, included the existing entrance check station and office, comfort station, 2-lane concrete boat launching ramp, as well as an asphalt-covered circulation road, and shared parking areas for a thirty-two (32) unit day use picnic area and boat launching ramp. Additional improvements included the removal of the bridge northwest of the new boat launching ramp and filling in a 200’-long section of the side channel. Two 4’-diameter culverts beneath the filled in section connected the bifurcated channel. Automobile campers could now travel over a single-lane graveled road that connected the boat launching ramp parking area to the “Island Campground:” an additional overnight parking area associated with a 20-unit automobile campground. Situated between it and the river channel, the campground reportedly contained four (4) single-unit comfort stations tied into new leach lines in its northern and western areas. Secondary lanes allowed visitors to drive their boat trailers into the new boat ramp from the campground or the boat launching parking lot.⁸

Day Use Picnic Area Development Period: 1961-1964

While plans for secondary park improvements at Colusa-Sacramento River SP began in 1958, they were not implemented until 1961. They included the development of a day use picnic area around the new comfort station. Improvements included the installation of three (3) single 9’ x 11’ and four (4) 9’ x 22’ double standard-pattern concrete picnic tables on poured-in-place rectangular concrete pads along the Sacramento River shoreline, which, at the time, was approximately 530 feet closer than it is today. The smaller rectangular picnic tables had single 40”-diameter concrete camp grills, while the larger had two. Although 1961 landscape plans indicate that approximately 31’ x 9’ rectangular-shaped shelters provided cover over three of the dual picnic table pads along the shore, it is not known if their design followed that proposed

⁷ *Unit History*, 96, 101, 103 and 104; and *Drawing No. 3637*, sheet 3 of 5.

⁸ *Ibid.*, 105, 109-111; *Drawing No. 3637*, sheet 3 of 5; CDBP, *Colusa-Sacramento River State Park, Day Use Area, Roads, Parking, and Office*, *Drawing No. 7981* (February 27, 1961), sheet 2 of 3; CDBP, *Colusa-Sacramento River State Recreation Area, Bank Correction & Boat Launching Ramp Improvement*, *Drawing No. 7980* (November 19, 1963), sheet 1 of 1, and *General Development Study ’65*, sheet 1.

the CSP Architectural Unit. A 1958 preliminary drawing shows a rectangular 30' x 10' chevron-shaped slat-roofed picnic ramada sheltering three (3) wooden picnic tables.⁹

The 1961 landscape plans indicate that there were no ramada shelters over an additional five (5) 9' x 22' and two (2) 9' x 11 standard-pattern concrete picnic tables on poured-in-place rectangular concrete pads ran in a reversed question mark pattern along the northwestern parking areas eastern perimeters. Nor was there a ramada shelter over a chevron-shaped poured-in-place group picnic pad situated in the day use picnic area's southwest corner. Each of the chevron's 42' x 9' wings contained four (4) wooden picnic tables. A single table sat at the chevron's 9'-square apex. Adjacent to the apex' western perimeter were two 40"-diameter concrete camp grills and a drinking fountain with a hose bib. Five (5) additional drinking fountain/hose bib fixtures, along with eleven (11) 30"-diameter garbage can bases were placed along the lines of picnic tables.¹⁰

Prior to the 1959-1961 landscape improvements, Parks staff removed a concrete block-constructed rectangular building and an "old well" resting on a concrete slab some 23 feet above the 1959-1961 river bank.¹¹

Although members of local Boy Scouts Troop 32 and the boat club participated in a flag-raising ceremony officially opening the new Park office on July 31, 1961, the Park was not dedicated until May 30, 1964. On that day, Governor Edmund G. Brown, speaking before a crowd of over 5,500 visitors, praised the citizens of Colusa for working hard to create the Park out of a former city dump. After which, the Colusa Junior Chamber of Commerce sponsored a boat rally, sky diving exhibitions, parade, and barbecue. Sitting about 50 feet south of the entry check station/office building is a large stone boulder on which is mounted a bronze plaque dedicating the Park to . . .

. . . the belief that the earth's
great treasures of natural
resources and beauty are for
the enjoyment of all.¹²

⁹ CDBP, *Colusa-Sacramento River State Park, Preliminary Picnic Ramada*, Drawing No. 4275 (October 29, 1958), sheet 1 of 1.

¹⁰ CDBP, *Colusa-Sacramento River State Park, Picnic Units and Landscaping*, Drawing No. 10108 (December 20, 1961), sheet 1 of 4; and CDPR, *Colusa-Sacramento River S.R.A., Topography, Proposed Areas of Development*, Drawing No. 15322 (June 8, 1976), sheet 1 of 4.

¹¹ CDBP, *General Topography*, sheet 1.

¹² *Unit History*, 109 and 114-116, 123.

Maintenance Shop Area Development-1955-1961

Construction during the initial 1960 to 1964 development period also occurred outside the main day use/boat launching area. On September 27, 1961, State Parks Ranger Al Murray traveled south to San José State College where he assisted in disassembling and relocating a former R.O.T.C. building to the Park. Between November and December, 1961, Division Architect Bill Hart directed a work crew to reassemble the 64' x 20' steel structure as a replacement c. 1955-built maintenance shop building in the park unit's utility area located southwest of the levee. Although it is a relatively simple plain-looking structure, the recycled R.O.T.C. building displays some interesting construction details. Divided into two sections, the lower half consists of standard-size hollow concrete block half-walls. Above these is a series of uniform-width interlocking vertical flat galvanized metal panels. Bolted to one another as well as to the concrete block walls' upper blocks, the metal panel walls are also bolted to a front gable roof. This is also constructed of interlocking galvanized metal panels bolted to one another as well as to what appears to tubular steel trusses hidden above a dropped acoustic fiberboard panel ceiling. The metal panels' heavy gauge allows the walls and roof to be assembled and bolted together as one structural unit.¹³

While the maintenance shop building has retained most of its original character, it has been subject to alterations as it was adapted to meet the Park's needs. A roll-up galvanized steel garage door has replaced an original sliding vertical interlocking galvanized steel panel garage door. Aluminum slider windows have replaced original metal-framed multi-light windows. A metal-covered wood-frame ramada provides shade in front of the southeast corner entry door. Additional post-1961 additions include a similar shade structure used as a multi-bay car cover adjacent to the shop's northeast façade. Just north of this is a standardized pre-fabricated wood panel storage shed.¹⁴

The last structure in line is a small 1966-built 8' x 10' storage shed. Used currently as a hazardous materials storage locker, it is also constructed of interlocking vertical galvanized steel panels bolted together and to concrete block half-walls. However, while it may resemble the larger structure, it has a relatively new rolled asphalt-covered wood-frame roof. It is not known at this time if this roof replaced an earlier bolted galvanized steel panel roof.¹⁵

¹³ *Unit History*, 110 and 154; *Development Study '65*, Drawing No. 6469, sheet 1; California Department of Parks and Recreation [CDPR], Photograph Collection, *Colusa-Sacramento State Recreational Area, Maintenance Building* (January-February, 1962); and Robert Robinson, Associate Civil Engineer, California State Parks, Southern Service Center, Interview with Alexander D. Bevil (February 27, 2015).

¹⁴ CDPR, Photograph Collection, *Colusa-Sacramento State Recreational Area, Maintenance Building*.

¹⁵ *Unit History*, 135; CDPR, *Facility Inventory Listing: District 157-Upper Valley District, Unit 140-Colusa-Sacramento River SRA* (July 6, 1998), 1.

Island Campground Improvements and Use: 1964-1976

The 1958-1961 Park improvements were initially part of the first of three planned phases of visitor-oriented infrastructural improvements at the Park. A 1964 General Development Study for the renamed State Recreational Area focused primarily in developing the “Island Campground” area. The study called for two additional automobile campgrounds north of the existing 20-unit campground, and the installation of boat mooring floats at each campground for “boat campers.” In addition, the road leading from the former campground would extend past the new campgrounds to a new 53-car parking lot associated with a large picnic area. Both the new picnic and campgrounds would have two portable comfort stations tied into leach lines. A series of shoreline trails would provide visitor access to the river for recreational boating, fishing, or swimming activities. Periodically, volunteer City of Colusa maintenance crews would oil and pave the Park’s automobile circulation roads.¹⁶

The siting of a state recreational area along a historically unpredictable river channel would become consistently problematic. As early as 1958 winter floodwaters closed the temporary Park office three times; the longest period lasting nine weeks. Winter rains caused the river to overrun its banks and flood the Park in 1964 and 1965. Likewise, spring flooding delayed the installation of the 20-unit campground’s new mooring float and scheduled 1967 seasonal opening until July 25.¹⁷

Consolidation of Picnic and Campground Activities: 1976-1977

Perennial flooding precipitated the eventual abandonment of CSP’s plans to develop the Park’s Island Campground area. Between 1976 and 1977 CSP planned and installed a new 10-unit automobile campground in the day use picnic area’s southwest lawn area. In order to extend the new campground’s linear access road from the park entry check station/office to an existing parking lot, CSP removed the chevron-shaped group picnic area. In addition, to accommodate the new campers, CSP erected a new 200 Series combination building in the Park’s southwest area near the existing automobile circulation road.¹⁸

Like the Park’s smaller comfort station, and entry station/office, the combination shower and bathroom building’s design was based on standard plans that CSP’s Architectural Unit designed during the mid-1950s to early 1960s.¹⁹ During this period, California and other state and federal

¹⁶ *Unit History*, 111 and 136, 139, 143 and 146; and *Development Study ’65*, Drawing No. 6469, sheet 1.

¹⁷ *Unit History*, 104, 114-116, 118.

¹⁸ CDPR, *Colusa-Sacramento River S.R.S., Campground Development*, Drawing No. 15551 (December 16, 1976), sheet 1 of 20; *Ibid.*, *Campground Development, General Layout*, Drawing No. 15551 (December 16, 1976), sheet 2 of 20; *Ibid.*, *Campground Development, Removal-Protection-Work Limits*, Drawing No. 15551 (December 16, 1976), sheet 3 of 20; and *Facility Inventory Listing*, 1.

¹⁹ Robert Uhte, *Combination Building “A”*, Drawing No. 3365 (January 1955), sheet 1 of 2; Robert Uhte, *Comfort Station*, Drawing No. (unknown) (December 7, 1955), sheet A-1; Folsom [sic], *Park Office*, Drawing No. 4375P (January 17, 1959), sheet 1 of 1; CDPR, *Colusa-Sacramento River S.R.S., Campground Development, 200 Series*

parks experienced an ever-increasing demand from staff and the public alike for to replace outmoded or inadequate facilities, yet still meet a minimum level of traditional pre-War rusticity. Offsetting this was the challenge to reduce costs due to postwar increases in labor and materials. In response, the Architectural Unit's lead designer Robert F. Uhte and his staff produced hundreds of "Modern" yet functional buildings and structures for the postwar generation. Influenced by national trends, particularly the National Park Service's Mission 66 Vision and the emerging national Contemporary Minimalistic Modern style, the designs, according to Uhte, were "simple, unassuming, functional constructs that supposed to "fit in" but not necessarily blend in with the surrounding area." In order to cut materials and construction costs, these *Park Contemporary style* constructs exhibited standardized minimalistic and unassuming design features, using regionally available standardized pre-manufactured building materials to cut costs.²⁰

Additional Improvements and Changes: 1976-1990

In addition to the new campground and combination building, other changes occurred at Colusa-Sacramento River SRA between 1976 and 1990.

- Over 192 1-gallon sized shrubs and 29 5-gallon sized trees were planted within the 1976-planned 10-unit campground as well as near the entry station/office building. Only two species, Toyon and California Live oak, were native plants.²¹
- The entry station/office building's low broadly overhanging roof was replaced with one with steeper pitch and taller tympanums. In addition, the landscaped island on which the structure stood was substantially reduced in length. Finally, the original metal flagpole has been shifted about three feet north of its original location.²²
- A new "rock roof" replaced the comfort station's original roof in January 1980.²³
- Introduction of a Camp Host's mobile home in the park unit's southeastern corner between the levee and shoreline sometime between June 1976 and April 1982.²⁴
- In October 1980, as mitigation for the replacement of the historic Colusa Bridge, the County of Colusa relocated the bridge's center swing mechanism to the Park. Located some 85 feet east of the Park's main 10th and Levee Streets entrance, and southwest of the Camp Host RV trailer, it is a County historical monument; it is all that remains of the

Shower Building, Floor Plan & Elevations, Drawing No. 15551 (December 16, 1976), sheet 14 of 20; and Carol Roland, Phd., *Final Assessments of Park Rustic Buildings and Structures in the California State Park System, Survey and Evaluation* (December 2003), 22.

²⁰ Rebecca Allen and James D. Newland, *Architectural Overview of Buildings and Structures Constructed between 1942-1965 in California State Parks and Beaches* [Prepared for CDPR] (Past Forward, December 1998), 13, 24-25 and Appendix A: *Additional Oral Interviews*, 2 and 4; and Bevil, *Mt. San Jacinto State Park*, Section 8, 42-43.

²¹ CDPR, *Colusa-Sacramento River S.R.S., Campground Development, Planting Plan*, Drawing No. 15551 (December 16, 1976), sheet 12 of 20.

²² CDPR, Photograph Collection, *Colusa-Sacramento State Recreational Area, Entry Station/Office* (July 31, 1961).

²³ *Unit History*, 135.

²⁴ CDPR, *Colusa-Sacramento River S.R.A., Topography, Proposed Areas of Development*, Drawing No. 15322 (June 8, 1976), sheet 1 of 4; and *Unit History*, 152.

structural steel girder vehicular bridge that spanned the Sacramento River at the end of Bridge Street from 1901 to 1979. The mechanism is not listed on either the National or California Registers.²⁵

- In April 1981 Parks staff torn down the picnic area's shade ramadas. They were never replaced.²⁶
- Parks staff installed twelve (12) new campsites with tables and stoves in the small parking lot north of the combination building in December 1981.²⁷
- The split-rail perimeter fence along the river was removed and replaced in April 1984.²⁸
- In 1987 a local Eagle Scout candidate assembled new precut picnic tables with attached food lockers as his community service project.²⁹
- Sometime during the late 1990s, CSP replaced the campground's wooden picnic tables with modern standardized concrete picnic tables.³⁰

Transition from State to City Parks Management: 2011 to Present

Faced with impending budget cuts, in May 2011, the CSP announced a plan to close up to 70 of its 279 parks. One such park was the Colusa-Sacramento River State Recreation Area. In response, the City of Colusa agreed to extend its administration of the adjacent Colusa Levee Scenic Park to include the State recreation area. As a result, the Park's day use picnic area, campground, and boat launching ramp have remained open, when not submerged by seasonal flooding.³¹

Seasonal flooding has been and continues to plague the Park's operations. Rain storms and ensuing flood waters washed away perimeter split-rail fencing, uprooted trees, deposited debris, and forced the Park's closure.³² During a particularly extensive March 1983 flood event, 90% of the entire Park was under water.³³ Undaunted, on one occasion local townspeople

²⁵ *Unit History*, 136-137; Colusa County Board of Supervisors, *Colusa Bridge Historical Monument Inscription*, 1980; Daniel W. Klar, *Colusa Bridge at Sacramento River, Colusa County, California*, Historic American Engineering Record, HAER CAL, 6-Colu, 3 (Washington, D.C.: U.S. Department of the Interior, U.S. National Park Service, August 1979), <http://www.loc.gov/pictures/collection/hh/item/ca0114/>, accessed March 4, 2015; and U.S. National Park Service, *National Register of Historic Places, National Register Documentation on Listed Properties, Colusa County* (Washington, D.C.: U.S. Department of the Interior, 2015), n.p.

²⁶ *Unit History*, 139.

²⁷ *Unit History*, 141.

²⁸ *Unit History*, 196.

²⁹ *Unit History*, 204.

³⁰ Tim Higginson, California State Parks, Park Maintenance Chief III, Northern Buttes District, E-mail Communication with Alexander D. Bevil, March 4, 2015.

³¹ City of Colusa, City Parks, *Colusa Levee Scenic Park*, http://www.cityofcolusa.com/recreation__tourism/city_parks/, accessed March 4, 2015; and Bill Paxson, "Colusa-Sacramento River State Recreation Area Is Still Open," in *Sites and Sights along the Sacramento River, and Throughout the Sacramento Valley* (February 7, 2012), <http://sactoriver.blogspot.com/2012/02/colusa-sacramento-river-state.html>, accessed March 4, 2015.

³² *Unit History*, *passim*, pp 123-201.

³³ *Unit History*, 165.

brought lawn chairs and fishing poles to pull catfish out the flooded picnic area. During another flood event, U.S. Fish and Wildlife personnel netted twelve Chinook salmon over the same area.³⁴

Seasonal flooding has also resulted in the need for CSP to constantly dredge the boat channel leading to the boat launching ramp. During a February 1980 flood event, debris clogged the channel forcing the ramp's closure for nearly a month. Even during calmer times, the boat channel would constantly clog up with silt.³⁵

Conclusion

The Colusa-Sacramento River State Recreation Area development is associated with California State Parks expansion during the mid-to-late postwar period. However, only three structures, the entry station/office building, Comfort Station, and boat launching ramp, are representative of that period. Examples of the early stages of the 1954-1965 Park Contemporary style, their design, style, and materials embody the distinctive austere minimalist approach that CSP's Architectural Unit developed to cope with post-war material, labor, and funding shortages. However, these attributes alone do not qualify them for inclusion in a potential California or National Register-eligible historic district. Neither do they have enough historic significance as stand-alone buildings. In addition, over 40 years of flooding, alterations, and additions since 1976 have impacted the Park's ability to convey an intact designed landscape associated with its early historical development and operation.

The only exception may be the maintenance shop building. Although relocated to the park in 1961, it appears to embody the characteristics of a distinct type, period, and method of construction. Further research will be necessary to determine if it is the only surviving example of an interlocking flat galvanized metal panel-constructed building in a California State Park.

Although a nearby bronze "Historical Monument" plaque states that the Colusa Bridge's swing mechanism was "nominated for inclusion on the Federal Register in 1978," it may be referring to its 1980 "inclusion" in the Historic American Engineering Record. It is not listed as a City, County, State, or Nationally significant historic resource. While it may be a unique example of early 20th century bridge engineering, there are surviving operating examples still in use along the Sacramento and American Rivers. Because the mechanism has been relocated from its original location, it has lost its integrity of association and feeling with its historic design, materials, and association of place and site.

³⁴ *Unit History*, 135 and 165.

³⁵ *Unit History*, 135 and 169.

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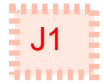
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***COLUSA-SACRAMENTO RIVER SRA
GENERAL PLAN EIR
ENVIRONMENTAL NOISE ASSESSMENT
COLUSA, CALIFORNIA***



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INTRODUCTION

This report presents the noise assessment completed for the Colusa-Sacramento River State Recreation Area General Plan EIR. The project proposes various recreational improvements that include new camping facilities, trails, parking lots, boat launch, restrooms, park access roads, and a group interpretive/event facility in Colusa, California.

The Setting Section of this report presents the fundamentals of environmental noise and vibration, a discussion of policies and standards applicable to the project, and the results of the ambient noise monitoring survey made at the project site. The Impacts and Mitigation Measures Section of the report provides an evaluation of the potential significance of project-related noise and vibration impacts, and where necessary, mitigation to reduce significant impacts to less-than-significant levels.

SETTING

Fundamentals of Environmental Noise

Noise may be defined as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. The objectionable nature of sound could be caused by its *pitch* or its *loudness*. *Pitch* is the height or depth of a tone or sound, depending on the relative rapidity (*frequency*) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. *Loudness* is intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with the height of an ocean wave in that it is a measure of the amplitude of the sound wave.

In addition to the concepts of pitch and loudness, there are several noise measurement scales which are used to describe noise in a particular location. A *decibel (dB)* is a unit of measurement which indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a ten-fold increase in acoustic energy, while 20 decibels is 100 times more intense, 30 decibels is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10 decibel increase in sound level is perceived as approximately a doubling of loudness over a fairly wide range of intensities. Technical terms are defined in Table 1.

There are several methods of characterizing sound. The most common in California is the *A-weighted sound level (dBA)*. This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Representative outdoor and indoor noise levels in units of dBA are shown in Table 2. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This *energy-equivalent sound/noise descriptor* is called L_{eq} . The most common averaging period is hourly, but L_{eq} can describe any series of noise events of arbitrary duration.

The scientific instrument used to measure noise is the *sound level meter*. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends upon the distance the receptor is from the noise source. Close to the noise source, the models are accurate to within about plus or minus 1 to 2 dBA.

Since the sensitivity to noise increases during the evening and at night -- because excessive noise interferes with the ability to sleep -- 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The *Community Noise Equivalent Level (CNEL)* is a measure of the cumulative noise exposure in a community, with a 5 dB penalty added to evening (7:00 pm - 10:00 pm) and a 10 dB addition to nocturnal (10:00 pm - 7:00 am) noise levels. The *Day/Night Average Sound Level (L_{dn} or DNL)* is essentially the same as CNEL, with the exception that the evening time period is dropped and all occurrences during this three-hour period are grouped into the daytime period.

Fundamentals of Groundborne Vibration

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One is the *Peak Particle Velocity (PPV)* and another is the *Root Mean Square (RMS)* velocity. The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. The RMS velocity is defined as the average of the squared amplitude of the signal. The PPV and RMS vibration velocity amplitudes are used to evaluate human response to vibration. In this section, a PPV descriptor with units of mm/sec or in/sec is used to evaluate construction generated vibration for building damage and human complaints. Table 3 displays the reactions of people and the effects on buildings that continuous vibration levels produce. The annoyance levels shown in Table 3 should be interpreted with care since vibration may be found to be annoying at much lower levels than those shown, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying.

Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage. In high noise environments, which are more prevalent where groundborne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows.

Construction activities can cause vibration that varies in intensity depending on several factors. The use of pile driving and vibratory compaction equipment typically generate the highest construction related groundborne vibration levels. Because of the impulsive nature of such activities, the use of the PPV has been routinely used to measure and assess groundborne vibration and almost exclusively to assess the potential of vibration to induce structural damage and the degree of annoyance for humans.

The two primary concerns with construction-induced vibration, the potential to damage a structure, and the potential to be perceptible to and therefor possibly annoy people, are evaluated against different vibration limits. Studies have shown that the threshold of perception for average persons is in the range of 0.008 to 0.012 in/sec PPV. Human perception to vibration varies with the individual and is a function of physical setting and the type of vibration. Persons exposed to elevated ambient vibration levels such as people in an urban environment may tolerate a higher vibration level.

Structural damage can be classified as cosmetic only, such as minor cracking of building elements, or may threaten the integrity of the building. Safe vibration limits that can be applied to assess the potential for damaging a structure vary by researcher and there is no general consensus as to what amount of vibration may pose a threat for structural damage to the building. Construction-induced vibration that can be detrimental to the building is very rare and has only been observed in instances where the structure is at a high state of disrepair and the construction activity occurs immediately adjacent to the structure.

TABLE 1 Definition of Acoustical Terms Used in this Report

Term	Definition
Decibel, dB	A unit describing, the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20 micro Pascals.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micro Pascals (or 20 micro Newtons per square meter), where 1 Pascal is the pressure resulting from a force of 1 Newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g., 20 micro Pascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and Ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period.
L_{max} , L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
L_{01} , L_{10} , L_{50} , L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day/Night Noise Level, L_{dn} or DNL	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 pm and 7:00 am.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 pm to 10:00 pm and after addition of 10 decibels to sound levels measured in the night between 10:00 pm and 7:00 am.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Source: Handbook of Acoustical Measurements and Noise Control, Harris, 1998.

TABLE 2 Typical Noise Levels in the Environment

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110 dBA	Rock band
Jet fly-over at 1,000 feet		
	100 dBA	
Gas lawn mower at 3 feet		
	90 dBA	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	80 dBA	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	70 dBA	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	60 dBA	
		Large business office
Quiet urban daytime	50 dBA	Dishwasher in next room
Quiet urban nighttime	40 dBA	Theater, large conference room
Quiet suburban nighttime	30 dBA	
		Library
Quiet rural nighttime	20 dBA	Bedroom at night, concert hall
		Broadcast/recording studio
	10 dBA	
	0 dBA	

Source: Technical Noise Supplement (TeNS), Caltrans, September 2013.

TABLE 3 Reactions of People and Damage to Buildings from Continuous or Frequent Intermittent Vibration Levels

J7

Velocity Level, PPV (in/sec)	Human Reaction	Effect on Buildings
0.01	Barely perceptible	No effect
0.04	Distinctly perceptible	Vibration unlikely to cause damage of any type to any structure
0.08	Distinctly perceptible to strongly perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
0.1	Strongly perceptible	Virtually no risk of damage to normal buildings
0.3	Strongly perceptible to severe	Threshold at which there is a risk of damage to older residential dwellings such as plastered walls or ceilings
0.5	Severe - Vibrations considered unpleasant	Threshold at which there is a risk of damage to newer residential structures

Source: Transportation- and Construction Vibration Guidance Manual, California Department of Transportation, September 2013.

Regulatory Criteria – Noise

The State of California, the County of Colusa, and the City of Colusa have established plans and policies designed to limit noise exposure at noise sensitive land uses. These plans and policies are contained in the following documents: (1) the California Environmental Quality Act (CEQA) Guidelines, Appendix G, (2) the California State Parks Planning Handbook, (3) the County of Colusa Noise Element of the 2030 General Plan and the County Municipal Code, and (4) The City of Colusa Noise Element of the General Plan and the City Municipal Code. Although the State of California is not subject to the regulations and policies adopted by local agencies, state agencies normally endeavor to comply with these regulations and policies so they are included in this analysis to provide guidance on quantitative significance thresholds, where appropriate.

State CEQA Guidelines. The CEQA contains guidelines to evaluate the significance of effects of environmental noise attributable to a proposed project. CEQA asks the following applicable questions. Would the project result in:

- (a) Exposure of persons to or generation of noise levels in excess of standards established in the local General Plan or Noise Ordinance, or applicable standards of other agencies?
- (b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?
- (c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?
- (d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

- (e) For a project located within an airport land use plan or, where such a plan has not been adopted within two miles of a public airport or public use airport, exposure of people residing or working in the project area to excessive noise levels?
- (f) For a project within the vicinity of a private airstrip, exposure of people residing or working in the project area to excessive noise levels?

Of these guidelines, items (a), (b), (c), and (d) are applicable to the proposed project. Guidelines (e) and (f) are not applicable because the project is not located in the vicinity of any public use airport or private airstrips.

California State Parks Planning Handbook. The General Plan Content and Format Guidelines chapter of the Handbook contains an aesthetic resources section that contains a description and analysis of the sensory impressions that are considered significant to the visitor experience. The applicable items in this section are as follows:

Auditory Resources (required). Items for this section include:

- Positive sounds (waves, breeze through trees, waterfalls, other natural sounds)
- Negative sounds (loud radios, generators, loud speakers, vehicle sounds, road noise, commercial building noises, air conditioning units, other artificial sounds)

County of Colusa 2030 General Plan. The County of Colusa Noise Element of the General Plan includes goals, objectives, policies and action items that seek to reduce community exposure to excessive noise levels through the establishment of noise level standards for a variety of land uses. The goals and policies applicable to the subject project are as follows:

Goal N-1: Protect people from the harmful and annoying effects of exposure to excessive noise.

Policy N 1-1: New proposed stationary noise sources shall not result in noise levels that exceed the standards of Table N-1 (Table 4 of this report), as measured immediately within the property line of lands designated for noise-sensitive uses.

Policy N 1-2: Ensure that noise sources do not interfere with sleep by applying an interior maximum noise level criterion (L_{\max}) of 45 dBA in sleeping areas, for sensitive receptors.

Policy N 1-4: Noise created by new mobile sources near existing noise-sensitive land uses shall not exceed noise levels specified in Table N-2 (Table 5 of this report).

Policy N 1-5: The following criteria shall be used to determine the significance, for projects required by the California Environmental Quality Act to analyze noise impacts, of roadway noise impacts for roadway improvement, development, and other projects that increase roadway noise:

- Where existing traffic noise levels are less than 60 dBA L_{dn} at the outdoor activity areas of noise-sensitive uses, a +5 dB L_{dn} increase in roadway noise levels will be considered significant; and

- Where existing traffic noise levels range between 60 and 65 dB L_{dn} at the outdoor activity areas of noise-sensitive uses, a +3 dB L_{dn} increase in roadway noise levels will be considered significant; and
- Where existing traffic noise levels are greater than 65 dB L_{dn} at the outdoor activity areas of noise-sensitive uses, a +1.5 dB L_{dn} increase in roadway noise levels will be considered significant.

Policy N 1-12: Where noise mitigation measures are required to achieve the standards of Tables 4 or 5, the emphasis of such measures shall be placed upon site planning and project design. The use of noise barriers shall be considered a means of achieving the noise standards only after all other practical design-related noise mitigation measures have been considered and integrated into the project. Landscaped berms shall be considered as a preferred mitigation option over sound walls.

Policy N 1-13: An acoustical analysis shall be prepared and submitted to the county according to the requirements of Table N-3 (not shown) when:

- Noise sensitive land uses are proposed in areas exposed to existing or projected noise levels exceeding the Table 4 (stationary) or Table 5 (mobile) noise level standards.
- A proposed project has the potential to create new noise levels exceeding the noise level standards of Table 4 or Table 5.

Policy N 1-15: As part of the review of new development projects, consider vibration impacts and require mitigation to reduce any significant adverse impacts to the maximum extent feasible and practical.

Policy N 1-16: In making a determination of impact under the California Environmental Quality Act (CEQA), a significant impact will occur if the project results in an exceedance of the noise level standards contained in the Noise Element, or the project will result in an increase in ambient noise levels by more than 3 dB.

Policy N 1-17: Require use of site design measures, such as the use of building design and orientation, buffer space, use of berms, and noise attenuation measures applied to the noise source, to reduce impacts to the maximum extent feasible and practical before mitigating noise impacts through use of sound walls. The use of sound walls or noise barriers to attenuate noise from existing noise sources is discouraged, but may be allowed if the wall is architecturally incorporated into the project design, blends into the natural landscape, and does not adversely affect significant public view corridors.

Table 4: Table N-1 of the County of Colusa Noise Element of the General Plan

TABLE N-1 EXTERIOR AND INTERIOR NOISE LEVEL PERFORMANCE STANDARDS FOR PROJECTS AFFECTED BY OR INCLUDING NON-TRANSPORTATION NOISE SOURCES																											
TYPE OF USE	INTERIOR NOISE LEVEL STANDARD	EXTERIOR NOISE LEVEL, LEQ 1																									
		DAYTIME (7 A.M. TO 10 P.M.)	NIGHTTIME (10 P.M. TO 7 A.M.)																								
All sensitive land uses	45 dB L _{max}	55 dB	45 dB																								
New residential affected by existing seasonal agricultural noise	40 dB L _{dn}	NA	NA																								
<p>¹ Exterior noise level standard to be applied at the property line of the receiving land use or at a designated outdoor activity area (at the discretion of the Planning Director) of the new development. For mixed-use type projects, the exterior noise level standard may be waived (at the discretion of the Planning Director) if the project does not include a designated activity area and mitigation of property line noise is not practical. In this case, the interior standard would still apply.</p> <p>Each of the exterior noise levels specified above shall be lowered by five dB for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises (e.g., humming sounds, outdoor speaker systems). These noise level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwellings).</p> <p>The County can impose noise level standards that are more restrictive than those specified above based upon determination of existing low ambient noise levels.</p> <p>Notes:</p> <p><i>Fixed noise sources which are typically of concern include, but are not limited to the following:</i></p> <table><tr><td>Air Compressors</td><td>Generators</td></tr><tr><td>Blowers</td><td>Grinders</td></tr><tr><td>Boilers</td><td>Heavy Equipment</td></tr><tr><td>Cooling Towers/Evaporative Condensers</td><td>Lift Stations</td></tr><tr><td>Conveyor Systems</td><td>Outdoor Speakers</td></tr><tr><td>Cutting Equipment</td><td>Pile Drivers</td></tr><tr><td>Drill Rigs</td><td>Pump Stations</td></tr><tr><td>Emergency Generators</td><td>Rice Dryers</td></tr><tr><td>HVAC Systems</td><td>Steam Turbines</td></tr><tr><td>Fans</td><td>Steam Valves</td></tr><tr><td>Gas or Diesel Motors</td><td>Transformers</td></tr><tr><td>Gas Wells</td><td>Welders</td></tr></table> <p><i>The types of uses which may typically produce the noise sources described above include but are not limited to: various industrial and agricultural facilities, trucking operations, tire shops, auto maintenance shops, metal fabricating shops, shopping centers, drive-up windows, car washes, loading docks, public works projects, batch plants, bottling and canning plants, recycling centers, electric generating stations, race tracks, landfills, sand and gravel operations, and athletic fields.</i></p>				Air Compressors	Generators	Blowers	Grinders	Boilers	Heavy Equipment	Cooling Towers/Evaporative Condensers	Lift Stations	Conveyor Systems	Outdoor Speakers	Cutting Equipment	Pile Drivers	Drill Rigs	Pump Stations	Emergency Generators	Rice Dryers	HVAC Systems	Steam Turbines	Fans	Steam Valves	Gas or Diesel Motors	Transformers	Gas Wells	Welders
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Fans	Steam Valves																										
Gas or Diesel Motors	Transformers																										
Gas Wells	Welders																										

Source: Colusa County 2030 General Plan

Table 5: Table N-2 of the County of Colusa Noise Element of the General Plan

TABLE N-2 MAXIMUM ALLOWABLE NOISE EXPOSURE TRANSPORTATION NOISE SOURCES			
LAND USE	OUTDOOR ACTIVITY AREAS ¹ LDN / CNEL, DB	INTERIOR SPACES	
		LDN / CNEL, DB	LEQ, DB2
Residential	60 ³	45	--
Residential – Interstate 5 corridor	65	45	--
Transient Lodging	60 ⁴	45	--
Hospitals, Nursing Homes	60 ³	45	--
Theaters, Auditoriums, Music Halls	--	--	35
Churches, Meeting Halls	60 ³	--	40
Office Buildings	--	--	45
Schools, Libraries, Museums	--	--	45
Playgrounds, Neighborhood Parks	70	--	--
¹ Outdoor activity areas for residential developments are considered to be the back yard patios or decks of single family dwellings, and the patios or common areas where people generally congregate for multi-family development. Outdoor activity areas for non-residential developments are considered to be those common areas where people generally congregate, including pedestrian plazas, seating areas and outside lunch facilities. Where the location of outdoor activity areas is unknown, the exterior noise level standard shall be applied to the property line of the receiving land use or at a distance of 100 feet from an existing or proposed building envelope. ² As determined for a typical worst-case hour during periods of use. ³ Where it is not possible to reduce noise in outdoor activity areas to 60 dB L _{dn} /CNEL or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB L _{dn} /CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table. ⁴ In the case of hotel/motel facilities or other transient lodging, outdoor activity areas such as pool areas may not be included in the project design. In these cases, only the interior noise level criterion will apply. Note: Where a proposed use is not specifically listed on this table, the use shall comply with the noise exposure standards for the nearest similar use as determined by the Planning Department. Commercial and industrial uses have not been listed because such uses are not considered to be particularly sensitive to noise exposure.			

Source: Colusa County 2030 General Plan

County of Colusa Municipal Code. The County's Municipal Code contains a Noise Ordinance that limits noise levels during construction activities and at adjacent properties. Sections 13-6 and 13-7 of the Municipal Code outlines property noise limits and Section 13-8 outlines construction noise limits. The applicable Municipal Code sections are presented below:

13-6 General restrictions – Noise limits.

- (a) No Person shall produce, suffer, or allow to be produced on any public or private property sounds at a level in excess of those enumerated in Table No. 1 (Table 6 of this report), when measured at its property plane of the nearest property.
- (b) No person shall produce, suffer, or allow to be produced on any multi-family residential property sounds at a level in excess of those enumerated in Table 6, when measured inside any dwelling unit on the same property or twenty feet from the outside of the dwelling unit in which the noise source or sources may be located.
- (c) Notwithstanding any other provision of this section, no person shall produce, suffer, or allow to be produced any sound on any private or public property which is audible to a person within any dwelling unit, except the dwelling unit in which the sound source or sources are located and which is occupied or controlled by the person controlling such source, unless the permission, either written or verbal, of the occupants of all affected dwelling units has been obtained. During the hours of nine a.m. through ten p.m., Sunday through Thursday, and nine a.m. through twelve-thirty a.m. the following day, Friday and Saturday, such permission shall be presumed to be granted by occupant of all affected dwelling units; provided, that any affected person may withdraw such consent at any time. Such withdrawal of consent may be accomplished by either verbal or written request to the person causing, or allowing, such sound to be made, or by making such request to the county sheriff's department, who shall then notify the person causing, or allowing, such sound to be made. The provisions of this subsection shall not apply to any sound generated upon a common use portion of any multiple-family dwelling between the hours of nine a.m. through ten p.m., Sunday through Thursday, and nine a.m. through twelve-thirty a.m. the following day, Friday and Saturday, except to the extent that such sound is audible within any dwelling unit not located upon the same property.

Table 6: Table No. 1 of the County of Colusa Municipal Code

Table No. 1	
Land Use and Time Period	Maximum Noise Level (dBA)
Residential	
9 p.m. – 7 a.m.	50 (dBA)
7 a.m. – 9 p.m.	55 (dBA)
Agricultural/Commercial/Industrial	
10 p.m. – 7 a.m.	55 (dBA)
7 a.m. – 10 p.m.	60 (dBA)
High Noise Traffic Corridor – Anytime	65 (dBA)

* Determination of which land use and time period applies to a noise source shall be based upon the affected (complainant's) property land use. Decibel levels shall be measured at the affected (complainant's) property plane at the point closest to the noise source. The high noise traffic corridors include the following: Highway 20 and Interstate 5. The land uses as shown in the above table are defined using the county general plan.

Source: Chapter 13 (Noise Regulations) of the County of Colusa Municipal Code

13-7 General restrictions – Maximum noise limit.

No person shall produce, suffer, or allow to be produced in any location a noise level of more than twenty dBA above the limit, but not greater than eighty dBA, on Table 6 measured at the property plane. This section constitutes an absolute noise limitation applicable notwithstanding any other provision of this chapter, or any exception, exemption or waiver provided therefrom, except that the provisions of this section shall not apply to those activities referred to in section 13-8 (a) through (d), or to emergencies.

13-8 General restrictions – Special provisions.

- (a) **Power Tools.** The operation of power tools for noncommercial purposes shall be exempt from the provisions of sections 13-6 (a), (b) and (c) and 13-7 between the hours of eight a.m. and eight p.m.; provided, that such operations shall be subject to the provisions of section 13-17. For purposes of this section, a noncommercial use shall be a use for which a business license is not required pursuant to chapter 10.
- (b) **Construction and Landscape Maintenance Equipment.** Notwithstanding any other provision of this chapter, between the hours of seven a.m. and seven p.m. on Mondays through Fridays, and between the hours of eight a.m. and eight p.m. on Saturdays and Sundays, construction, alteration, repair, or maintenance activities which are authorized by valid county permit or business license, carried out by employees or contractors of the county, or private activities not requiring a permit shall be allowed if they meet at least one of the following noise limitations:
 - (1) No individual piece of equipment produces a noise level exceeding eighty-three dBA at a distance of twenty-five feet. If the device is housed within a structure on the property, the measurement shall be made outside the structure at a distance as close to twenty feet from the equipment as possible.
 - (2) The noise level at any point outside of the property plane of the project does not exceed eighty-six dBA.
- (A) The provisions of subsections (b) (1) and (2) of this section shall not be applicable to impact tools and equipment; provided, that such impact tools and equipment shall have intake and exhaust mufflers recommended by manufacturers thereof and approved by the director of public works as best accomplishing maximum noise attenuation, and that pavement breakers and jackhammers shall also be equipped with acoustically attenuating shields or shrouds recommended by the manufacturers thereof and approved by the director of public works as best accomplishing maximum noise attenuation. In the absence of manufacturer's recommendations, the director of public works may prescribe such means of accomplishing maximum noise attenuations as he/she may determine to be in the public interest. Construction projects located more than two hundred feet from existing homes may request a special use permit to begin work at six a.m. on weekdays from June 15th until September 1st. No percussion type tools (such as ramsets or jackhammers) can be used before seven a.m. The permit shall be revoked if any noise complaint is received by the sheriff's department.

- (B) No Individual powered blower shall produce a noise level exceeding seventy dBA measured at a distance of fifty feet.
- (C) No powered blower shall be operated within a one-hundred foot radius of another powered blower simultaneously.
- (D) On single-family residential property, the seventy dBA at fifty feet restriction shall not apply if operated for less than ten minutes per occurrence.

(c) Air Conditioners and Similar Equipment. Air conditioners, pool pumps and similar equipment are exempt from this chapter, provided they are in good working order.

City of Colusa General Plan. The City of Colusa Noise Element of the General Plan outlines goals, policies, and implementing actions to protect Colusa residents from excessive noise levels that are annoying to the senses and detrimental to public health. The goals and policies applicable to the subject project are as follows:

Goal N-1: The City shall implement the noise standards in Table 7.3 (Table 7 of this report) for new uses affected by traffic and airport (mobile) noise and in Table 7.4 (Table 8 of this report) for new uses affected by non-transportation (stationary) noise sources.

Policy N-1.3: Where noise attenuation is required to meet the standards of this Element, an emphasis shall be placed on site planning and project design, including, but not limited to, building orientation, setbacks, landscaping, and building construction practices.

Policy N-1.4: The use of sound walls shall be considered as a last resort to achieve the noise standards, after other practical design-related noise mitigation measures have been fully integrated into the project.

Policy N-1.6: The City shall apply the noise standards in Table 7 and Table 8 to both new noise-sensitive land uses and new noise-generating land uses, with the responsibility for noise mitigation placed on the new use.

Goal N-2: To minimize noise generated by construction activities.

Policy N-2.1: The City shall regulate and control noise associated with construction activities to reduce impacts on nearby sensitive receptors.

Implementing Action N-2.1.a: Ordinance and Regulation Review and Update

The City will update its Noise Ordinance to include provisions that are specific to temporary construction noise. These include, but are not limited to the following:

- Construction activities will be limited to the hours stipulated in Chapter 11A Noise Regulation of the City of Colusa City Code.
- All internal combustion engines used in conjunction with construction and landscaping will be muffled according to the equipment manufacturer's requirements.

Table 7: Table 7.3 of the City of Colusa Noise Element of the General Plan**TABLE 7.3
NOISE STANDARDS FOR NEW USES AFFECTED BY TRAFFIC AND AIRPORT NOISE**

New Land Use	Outdoor Activity Area - L_{dn}	Interior - L_{dn} /Peak Hour L_{eq} ¹	Notes
All residential	60-65	45	2, 3, 4, 8
Transient lodging	65	45	5
Hospitals and nursing homes	60	45	6
Theaters and auditoriums	---	35	
Churches, meeting halls, schools, and libraries	60	40	
Office buildings	65	45	7
Commercial buildings	65	50	7
Playgrounds and parks	70	---	
Industry	65	50	7

Notes:

1. For traffic noise in the City of Colusa, L_{dn} and peak-hour L_{eq} values are estimated to be approximately similar. Interior noise level standards are applied in noise-sensitive areas of the various land uses, with windows and doors in the closed positions.
2. Outdoor activity areas for single-family residential uses are defined as back yards. For large parcels or residences with no clearly defined outdoor activity area, the standard shall be applicable within a 100-foot radius of the residence.
3. For multi-family residential uses, the exterior noise level standard shall be applied at the common outdoor recreation area, such as at pools, play areas, or tennis courts. Where such areas are not provided in multi-family residential uses, the standards shall be applied at individual patios and balconies of the development.
4. Where it is not possible to reduce noise in outdoor activity areas to 60 dB L_{dn} or less using a practical application of the best available noise reduction measures, an exterior noise level of up to 65 dB L_{dn} may be allowed—provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.
5. Outdoor activity areas of transient lodging facilities include swimming pool and picnic areas.
6. Hospitals are often noise-generating uses. The exterior noise level standards for hospitals are applicable only at clearly identified areas designated for outdoor relaxation by either hospital staff or patients.
7. Only the exterior spaces of these uses designated for employee or customer relaxation are considered sensitive.

Source: City of Colusa Noise Element of the General Plan

Table 8: Table 7.4 of the City of Colusa Noise Element of the General Plan

TABLE 7.4
NOISE STANDARDS FOR NEW USES AFFECTED BY NON-TRANSPORTATION NOISE

New Land Use	Outdoor Activity Area – L _{eq}		Interior - L _{eq}	Notes
	Daytime	Night-Time	Day & Night	
All Residential	50	45	35	1, 2, 7
Transient Lodging	55	---	40	3
Hospitals & Nursing Homes	50	45	35	4
Theaters & Auditoriums	---	---	35	
Churches, Meeting Halls, Schools, Libraries, etc.	55	---	40	
Office Buildings	55	---	45	5, 6
Commercial Buildings	55	---	45	5, 6
Playgrounds, Parks, etc.	65	---	---	6
Light Industry	65	65	50	5

Notes:

1. Outdoor activity areas for single-family residential uses are defined as backyards. For large parcels or residences with no clearly defined outdoor activity area, the standard shall be applicable within a 100-foot radius of the residence.
2. For multi-family residential uses, the exterior noise level standard shall be applied at the common outdoor recreation area, such as at pools, play areas or tennis courts. Where such areas are not provided, the standards shall be applied at individual patios and balconies of the development.
3. Outdoor activity areas of transient lodging facilities include swimming pool and picnic areas, and are not commonly used during nighttime hours.
4. Hospitals are often noise-generating uses. The exterior noise level standards for hospitals are applicable only at clearly identified areas designated for outdoor relaxation by either hospital staff or patients.
5. Only the exterior spaces of these uses designated for employee or customer relaxation have any degree of sensitivity to noise.
6. The outdoor activity areas of office, commercial, and park uses are not typically utilized during nighttime hours.
7. It may not be possible to achieve compliance with this standard at residential uses located immediately adjacent to loading dock areas of commercial uses while trucks are unloading. The daytime and nighttime noise level standards applicable to loading docks shall be 55 and 50 dB Leq, respectively.
8. General: The Table 7.2 standards shall be reduced by 5 dB for sounds consisting primarily of speech or music, and for recurring impulsive sounds.
9. If the existing ambient noise level exceeds the standards of Table 7.4, then the noise level standards shall be increased at 5 dB increments to encompass the ambient.

Source: City of Colusa Noise Element of the General Plan

City of Colusa Municipal Code. The City's Municipal Code contains a Noise Ordinance that limits noise levels during construction activities and at adjacent properties. Sections 11A-2 of the Municipal Code outlines property noise limits and Section 11A-3 outlines construction noise limits. The applicable Municipal Code sections are presented below:

Sec. 11A-2 – Prohibition against excessive noise.

Notwithstanding any other provision of this chapter, it is unlawful for any person to willfully make, create, maintain or continue, or cause to be made or continued, directly or indirectly any loud, raucous or excessive noise within the city which because of its volume, duration or character causes discomfort to a reasonable person or normal sensitivities. In addition, it is unlawful for any person to make, create, maintain or continue, or cause to be made or continued, directly or indirectly any noise in a manner prohibited by the provisions of this chapter.

The factors which should be considered in determining whether a violation of this section exists include the following:

1. The sound level of the objectionable noise.
2. The sound level of the ambient noise.
3. The proximity of the noise to residential property.
4. The zoning of the area.
5. The population density of the area.
6. The time of day or night.
7. The duration of the noise.
8. Whether the noise is recurrent, intermittent, or constant.
9. Whether the noise is produced by an industrial, commercial or noncommercial activity.
10. Whether the nature of the noise is usual or unusual.

Sec. 11A-3. – Construction noise.

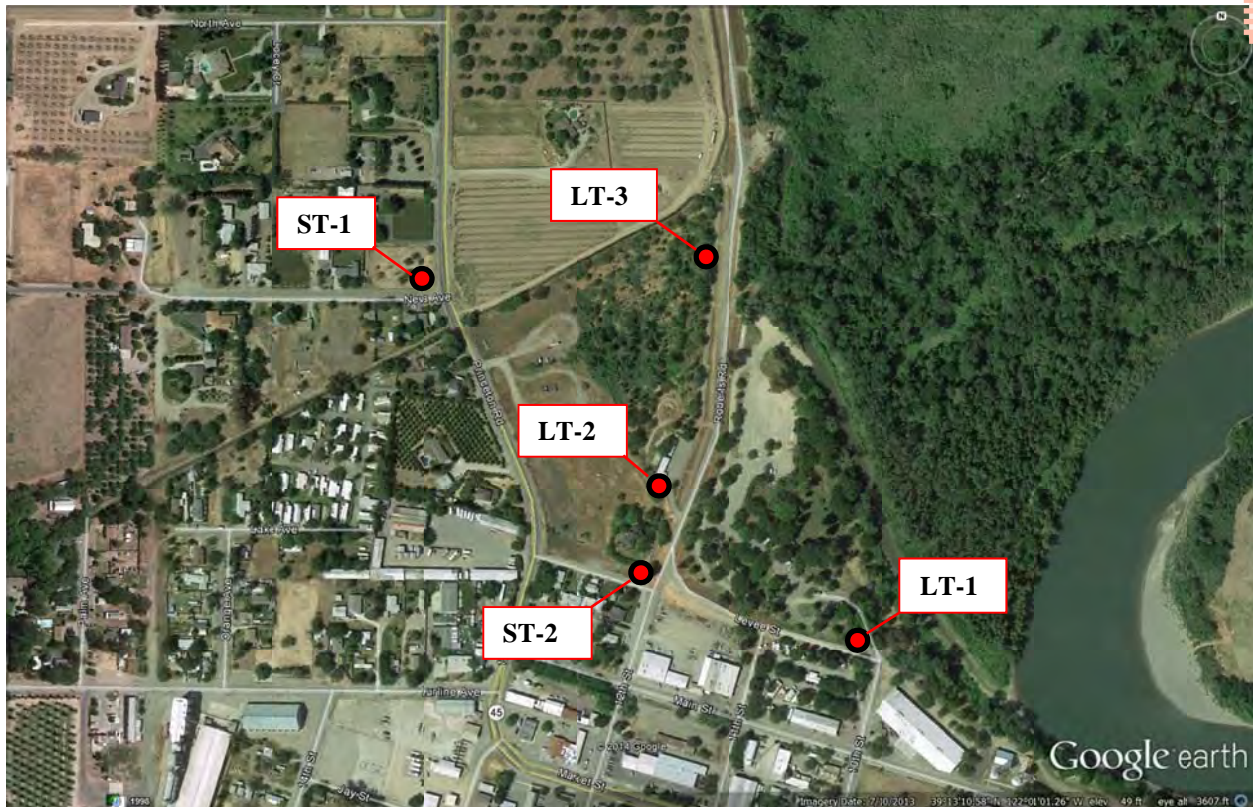
No person shall perform construction work or any construction related activity between the hours of 7:00 p.m. and 7:00 a.m. on weekdays, or between 7:00 p.m. and 8:00 a.m. on Saturdays and Sundays. For the purposes of this chapter, the term “construction” shall mean any site preparation, assembly, erection, substantial repair, alteration, demolition or similar action, for or on any private property, public or private right-of-way, streets, structures, utilities, facilities, or other similar property.

Existing Noise Environment

The Colusa-Sacramento River State Recreation Area (Park) is located on the west side of the Sacramento River adjoining the north edge of the City of Colusa, in Colusa County. Noise sensitive receptors in the vicinity of the Park include residents of the City of Colusa living near the intersection of 12th Street and Levee Street and in the Highstreet Trailer Court, a mobile home community located south of Levee Street between 10th Street and 11th Street; and, several residents of Colusa County living along Roberts Road between Levee Street and Princeton Road (State Route 45). As noted in the Existing Conditions chapter of the General Plan, the soundscape includes the natural sounds of wind in the vegetation, the river, birds, insects, and frogs; and, human sounds resulting from vehicular traffic and watercraft, seasonal agricultural activities, Park maintenance, and the Park visitors.

A noise monitoring survey was conducted between December 9 and December 10, 2014 to quantify existing noise conditions at the Park and at noise sensitive receptors in the vicinity. Sounds from Park activities were limited to maintenance activities because of the time of the year. The collected noise data represents the ambient noise environment at nearby receptors. The noise survey included three unattended long-term noise measurements (LT-1, LT-2, and LT-3) and two attended short-term measurements (ST-1 and ST-2). Noise measurement locations are shown in Figure 1. Results from the long-term measurements are summarized in Figures 2-4 and results from the short term measurements are summarized in Table 9.

FIGURE 1 Noise Measurement Locations



Long-term noise measurement LT-1 was located at the northern end of 10th Street adjacent to the entrance to the Park across Levee Street from the Highstreet Trailer Court. Noise levels measured at this site were primarily the result of local and distant traffic. Hourly average noise levels typically ranged from 48 to 57 dBA L_{eq} during the day and from 36 to 47 dBA L_{eq} at night. The calculated day-night average noise level at this location was 53 dBA L_{dn} .

Long-term noise measurement LT-2 was located on the south side of the Park maintenance facility west of Roberts Road. Other existing land uses located in the vicinity include a single family residence to the south. The predominant noise source at this location was distant traffic noise on Princeton Road. Daytime hourly average noise levels ranged from 47 to 53 dBA L_{eq} , while nighttime average noise levels ranged from 37 to 47 dBA L_{eq} . The 24-hour average noise level at this site was 52 dBA L_{dn} .

Long-term noise measurement LT-3 was located along Roberts Road opposite the northern portion of the Riparian Recreation area. Other existing land uses located in the vicinity include a single family residence to the north. The predominant noise source at this location was distant traffic noise on Princeton Road. Daytime hourly average noise levels ranged from 45 to 51 dBA L_{eq} , while nighttime average noise levels ranged from 34 to 44 dBA L_{eq} . The 24-hour average noise level at this site was 50 dBA L_{dn} .

Figure 2: Noise Levels at LT-1
North end of 10th Street near Park Entrance, 70 feet from Levee Street
December 9 - 10, 2014 (Tuesday - Wednesday)

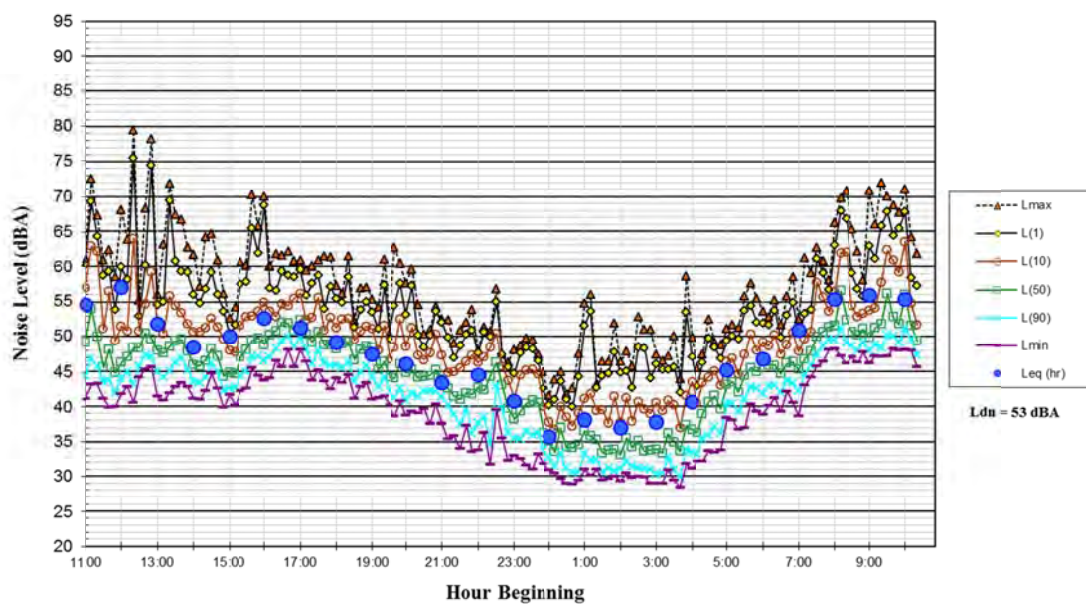
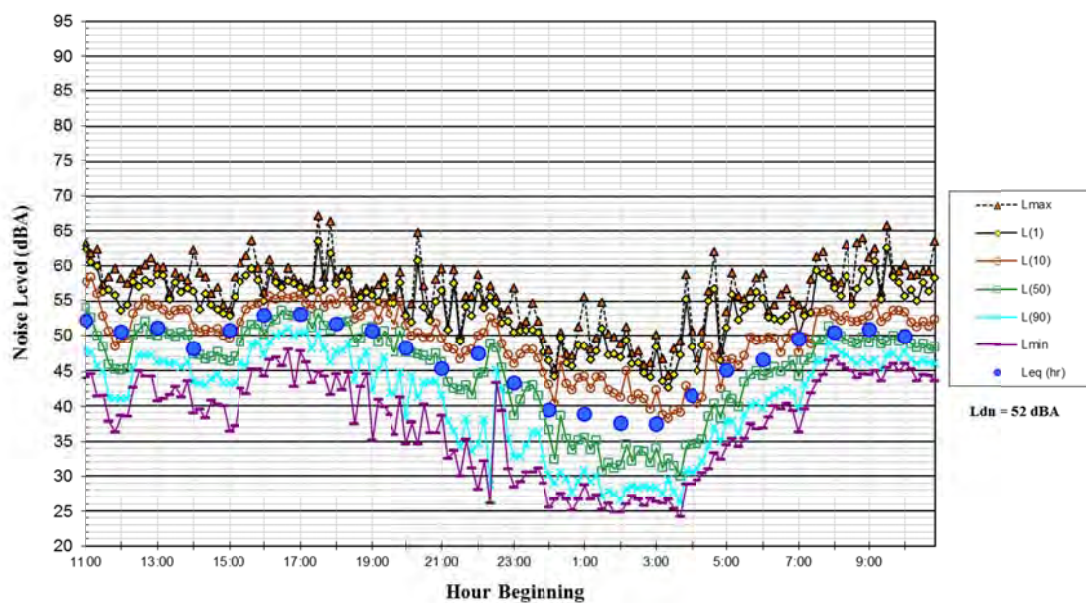
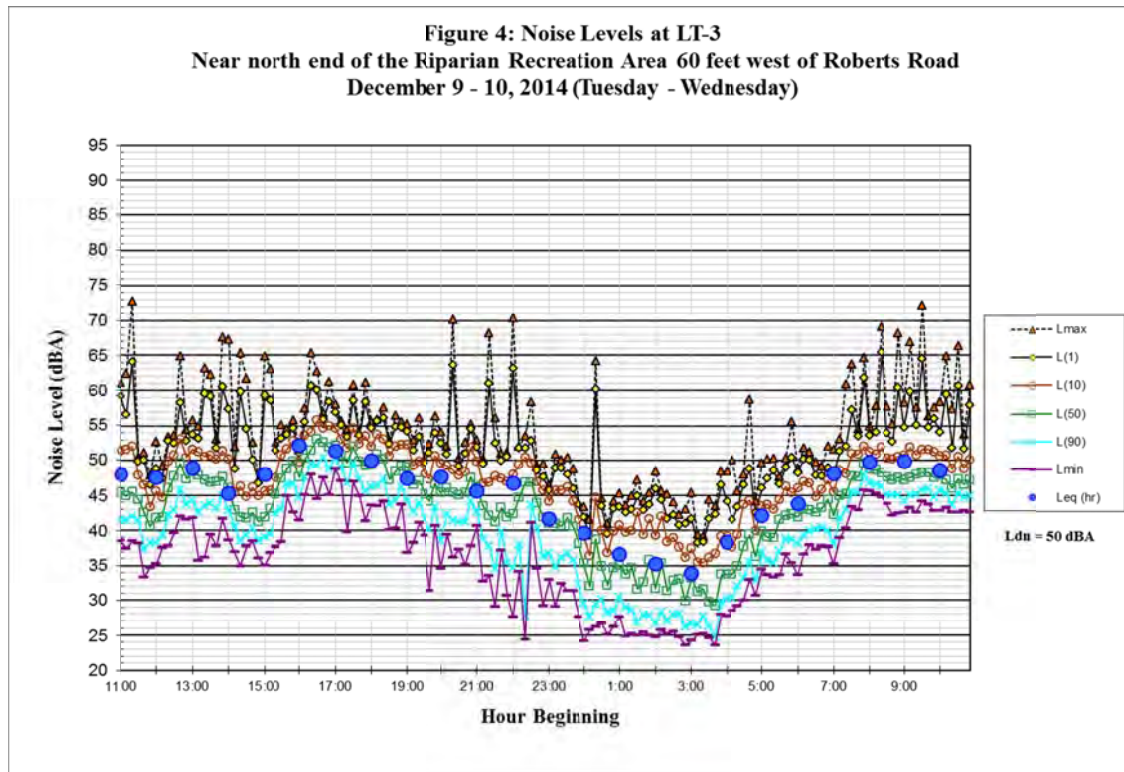


Figure 3: Noise Levels at LT-2
South of Park Maintenance Facility 130 feet from Roberts Road
December 9 - 10, 2014 (Tuesday - Wednesday)





Two attended short-term noise measurements were made to complete the noise monitoring survey. Short-term noise measurement ST-1 was located along Neva Avenue about 125 feet west of Princeton Road. The ten-minute average noise level was 61 dBA L_{eq} . Short-term noise measurement ST-2 was located at the corner of Levee and 12th Streets. The ten-minute average noise level was 52 dBA L_{eq} .

TABLE 9 Summary of Short-Term Noise Measurement Data

Noise Measurement Location	L_{max}	$L_{(1)}$	$L_{(10)}$	$L_{(50)}$	$L_{(90)}$	L_{eq}	L_{dn}
ST-1: ~ 125 feet west of Princeton Road (SR 45), on Neva Road. (12/9/14, 1:10 p.m. – 1:20 p.m.)	75	71	64	57	45	61	62
ST-2: ~ 60 feet northwest of the intersection of 12 th Street and Levee Street. (12/9/2014, 1:30 p.m. -1:40 p.m.)	63	61	56	50	45	52	53

Note: L_{dn} at the short-term site approximated by correlating the noise data to noise data collected at the long-term site during a corresponding time period.

NOISE IMPACTS AND MITIGATION MEASURES

Significance Criteria

Appendix G of the CEQA Guidelines states that a project would normally be considered to result in a significant noise impact if noise levels generated by the project conflict with adopted environmental standards or plans, if the project would generate excessive groundborne vibration

levels, or if ambient noise levels at sensitive receptors would be substantially increased over a permanent, temporary, or periodic basis. The following criteria were used to evaluate the significance of environmental noise and vibration if the implementation of the Park General Plan:

- Expose persons to or generate noise levels that would exceed applicable noise standards presented in the local General Plan, Municipal Code, or conflict with the California State Parks Planning Handbook. The Colusa City and County General Plan identifies park land uses compatible in noise environments up to 65 to 70 dBA L_{dn} . The Planning Handbook requires the description of natural and man-made sounds in the General Plan. An appropriate goal for the noise level in a State Recreation Area is 60 dBA L_{dn} . Impacts resulting from the generation of noise levels are assessed under the third bullet.
- Expose persons to excessive vibration levels. Groundborne vibration levels due to project construction activities exceeding 0.3 in/sec PPV would have the potential to result in cosmetic damage to normal buildings.
- Substantially increase noise levels at existing sensitive receptors resulting from traffic and onsite operational noise. In noise environments less than 60 dBA L_{dn} the County General Plan identifies an increase in noise of 5 dBA L_{dn} or greater to cause a significant impact. Noise resulting from onsite park activities that would exceed County of Colusa stationary noise standards at sensitive receptors located within the County (55 dBA L_{eq} daytime, 45 dBA L_{eq} nighttime) or City of Colusa stationary noise source standards at sensitive receptors located in the City (50 dBA L_{eq} daytime and 45 dBA L_{eq} nighttime) would result in a significant noise impact.
- Result in temporary construction-related noise that would occur outside the allowable hours identified in the local municipal codes or exceed allowable limits specified in the local municipal codes.

Impact 1: Noise and Land Use Compatibility. The noise environment throughout the Park is compatible with the existing uses and those uses that would occur within the Park after implementation of the General Plan. **This is a less-than-significant impact.**

The Preferred Alternative Plan allows the following existing and new facilities within the designated Management Zones, as follows:

MANAGEMENT ZONE	ALLOWABLE FACILITIES and IMPROVEMENTS	New (N), As Existing (AE) or Increased Intensity (II)
RESTORATION/ RECREATION	Vehicle circulation on unpaved roads	N
	Group primitive campground (20-50 tents)	N
	Day use vehicle parking in 3 lots (25-35 spaces)	N
	Multi-use trails and picnic sites (8-12 sites)	N
RIPARIAN RECREATION	Human-powered boat launch near day use parking	N
	Interpretive and fishing access trails, and picnic sites (8-12 sites)	II
	Boat-in primitive campground (3-8 tents)	II
	Group primitive campground (20-50 tents)	N
LEVEE OVERLAY	Roads and trails	II
SOUTHWEST	Maintenance yard	AE
	Individual and small group developed campground with RV hookups, and/or cabins (30-40 +2 host sites)	N
	Access control facilities such as an entrance station	N
CHANNEL	Boat ramp	AE
SOUTHEAST	Individual and large group developed campground (10-20 sites)	AE
	Individual picnic sites (12-20 sites)	II
	Boat trailer parking (50- 60 spaces)	AE
	Day use vehicle /enroute RV parking lot (30-50 spaces)	AE
	Restrooms	AE
	Multi-use trails and paths	II
	Outdoor event facility	N
	Access control facilities such as an entrance station	AE
OFF-SITE	Access control facilities such as an entrance station	N
	City of Colusa motorboat ramp (2 lane) in city park	*N

*Potential impacts of the motorboat ramp proposed by the City of Colusa where the channel meets the Sacramento River in the City Park has been evaluated under a separate environmental review process.

The credible worst case noise exposure to sensitive areas within the Park would occur nearest to existing roads and development. The measured noise levels at the Park perimeter ranged from 50 dBA L_{dn} to 53 dBA L_{dn} . The noise survey did not identify the presence of any intrusive noises that would have a significant adverse effect upon visitors to the Park. The primarily natural soundscape is a benefit to this Park. The noise environment is clearly compatible with the existing and planned uses. This is a less-than-significant impact.

Mitigation Measure 1: None Required.

Impact 2: Construction Vibration. Vibration levels generated during construction activities may be perceptible at neighboring land uses, but would not be excessive or cause cosmetic or structural damage to buildings. **This is a less-than-significant impact.**

The construction of the project may generate perceptible vibration when heavy equipment or impact tools (e.g. jackhammers, etc.) are used in areas adjoining developed properties. For structural damage, the California Department of Transportation recommends a vibration limit of 0.5 in/sec PPV for buildings structurally sound and designed to modern engineering standards, 0.3 in/sec PPV for buildings that are found to be structurally sound but where structural damage is a major concern, and a conservative limit of 0.08 in/sec PPV for ancient buildings or buildings that are documented to be structurally weakened. No ancient buildings or buildings that are documented to be structurally weakened adjoin the project site. Therefore, groundborne vibration levels exceeding 0.3 in/sec PPV would have the potential to result in a significant vibration impact.

Construction activities would include demolition of existing structures, grading, site preparation work, paving of new roads and parking lots, and new building framing and finishing. Table 10 presents typical vibration levels that could be expected from construction equipment at a distance of 25 feet. Pile driving would not occur for this project. Project construction activities such as drilling, the use of jackhammers, rock drills and other high-power or vibratory tools, and rolling stock equipment (tracked vehicles, compactors, etc.) may generate substantial vibration in the immediate vicinity of the work area. Vibratory rollers typically generate vibration levels of 0.210 in/sec PPV and jackhammers typically generate vibration levels of 0.035 in/sec PPV at a distance of 25 feet. Vibration levels would be below the 0.3 in/sec PPV threshold, ranging from 0.008 to 0.050 in/sec PPV at the nearest receptors 115 feet west of the proposed new vehicle entrance. Vibration generated by construction activities near the common property line of the site would at times be perceptible; however, groundborne vibration from short term project construction would cause a less-than-significant impact upon structures and residents in the project vicinity.

TABLE 10 Vibration Source Levels for Construction Equipment

Equipment		PPV at 25 ft. (in/sec)	Approximate L _v at 25 ft. (VdB)
Pile Driver (Impact)	upper range	1.158	112
	typical	0.644	104
Pile Driver (Sonic)	upper range	0.734	105
	typical	0.170	93
Clam shovel drop		0.202	94
Hydromill (slurry wall)	in soil	0.008	66
	in rock	0.017	75
Vibratory Roller		0.210	94
Hoe Ram		0.089	87
Large bulldozer		0.089	87
Caisson drilling		0.089	87
Loaded trucks		0.076	86
Jackhammer		0.035	79

Small bulldozer	0.003	58
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Source: Transit Noise and Vibration Impact Assessment, United States Department of Transportation, Office of Planning and Environment, Federal Transit Administration, May 2006.

Mitigation Measure 2: None Required.

Impact 3a: Project-Generated Traffic Noise. Project-generated traffic would not substantially increase ambient noise levels at receptors in the project vicinity. **This is a less-than-significant impact.**

Traffic data provided by *Fehr and Peers* in the Transportation Study for the project were reviewed to calculate potential project-related traffic noise level increases along roadways serving the Park. These data included turning movement counts at four intersections for existing conditions and projections for future conditions after implementation of the Plan. Roadway link volumes were calculated based on the turning movement data and compared to existing conditions in order to calculate the anticipated noise level increase under each scenario, and the project's relative contribution under each scenario.

The Plan proposes to construct an all-park vehicle entry point and entrance station, conceptually at 12th Street and Levee Road. The most affected receptors are residences located near the intersection of 12th and Levee Streets. The existing noise level at these residences is 52 dBA L_{dn}. With the implementation of the plan, the weekday noise level at these residences is calculated to increase to 53 to 54 dBA L_{dn} and the weekend noise level is calculated to increase to 54 to 55 dBA L_{dn}. The increase would be less than 5 dBA, and noise levels would remain within the range compatible with residences. Noise levels along other area roadways serving the project are anticipated to increase by less than 1 dBA L_{dn} as a result of the implementation of the General Plan. The project would not result in a substantial increase in traffic noise at sensitive receivers in the vicinity of the Park. The impact is less-than-significant.

Mitigation Measure 3a: None required.

Impact 3b: Cumulative Traffic Noise. Traffic volumes along roadways serving the project area will increase as a result of cumulative growth planned in and around the City of Colusa. Significant cumulative traffic noise impacts are not anticipated. **This is a less-than-significant impact.**

The project would result in a significant cumulative traffic noise impact if existing sensitive receptors would be exposed to cumulative traffic noise level increases greater than 5 dBA L_{dn} above existing traffic noise levels and if the project would make a “cumulatively considerable” contribution to the overall traffic noise increase. A “cumulatively considerable” contribution would be defined as an increase of 1 dBA L_{dn} or more attributable solely to the proposed project.

The future noise level at the most affected receptors along 12th Street assuming increased traffic from implementation of the Park General Plan and cumulative growth is calculated to be 54 dBA L_{dn} on weekdays and 55 dBA L_{dn} on weekends, an increase of about 2 dBA – 3 dBA above the existing level. The cumulative increase in traffic noise levels along other area roadways is also

calculated to be less than 3 dBA. The cumulative traffic noise increase would not be considered substantial. The impact is less-than-significant.

Impact 3c: Park Activities Noise. Noise from Park activities would not exceed local regulations or result in a substantial increase at residences in the area. **This is a less-than-significant impact.**

Allowable facilities and improvements in the Restoration Recreation and Riparian Recreation areas located in the northern portion of the Park include vehicular circulation on unpaved roads, 20 – 50 primitive campsites in the Restoration Recreation area, new multi-use trails, 3 – 8 boat-in campsites in the Riparian Recreation area, and parking. The nearest sensitive receptor is a single residence along Roberts Road near the western edge of the Riparian Recreation area where Roberts Road turns northwest towards its intersection with SR 45. Noise from vehicle circulation and campers in the Park will be buffered by distance and the acoustical shielding provided by the levee. The Park has established Quiet Hours from 10 p.m. to 6 a.m. While intermittently audible, activities in these Park areas that would be implemented by the new General Plan would not cause a measurable change in noise levels in the vicinity.

The Preferred Alternative proposes to convert the public road on the levee to a controlled-access park road and bikeway. The bikeway conforms to the Colusa County Bikeway Master Plan. These activities are not expected to cause a quantitative or qualitative change to the soundscape in the area.

In the Southwest area, located on the west side of Roberts Road, the Park Maintenance Yard would remain as existing at its current location. A new individual and small group developed campground with RV hookups, and/or cabins is planned with up to 40 sites and 2 host sites. The nearest sensitive receptors are a rural residence located in the County about 50 feet north of the boundary of the Southwest area, and a residence located in the City of Colusa about 250 feet to the south of the nearest location where new facilities could be constructed. Noise sources associated with new camp sites include campsite activities including conversations and music. Electric power is proposed at all sites within this campground, so the use of generators will not be allowed. As noted above, the Park Quiet Hours are from 10 p.m. to 6 a.m., and generators may be run from 10 a.m. to 8 p.m. Generators used in camping typically generate noise levels ranging from 55 to 60 dBA at a distance of 7 meters, or about 23 feet (the standard reference distance for small generators). At a distance of 50 feet the level would be reduced by about 7 dBA, to a level of up to 53 dBA. If one assumed 10 generators were operating simultaneously at approximately this distance from the nearest receptor, the level would be increased to 63 dBA. The generator noise is calculated to exceed the daytime noise limits established by the City (50 dBA L_{eq}) or the County (55 dBA L_{eq}), and would substantially exceed existing levels in the area. Other camping related noises would be lower and intermittent, and would, therefore, not measurably contribute to project generated noise in the Southwest area. Banning the use of generators would ensure that daytime noise limits established by the City and County would not be exceeded. Existing restrictions on noise would minimize noise effects resulting in a less-than-significant impact.

The Southeast area would also include a new outdoor event center, as existing individual and large group campground (10 – 20 sites), boat trailer parking, (50 – 60 spaces), day use vehicle/RV enroute parking lot (50 – 60 spaces), restrooms, increased intensity individual picnic sites and multi-use trails and paths. These facilities are located behind the levee that separates the Park from the surrounding area. The nearest sensitive receptors are City of Colusa residents of the Highstreet Trailer Court located between 10th Street and 11th Street, about 50 feet from the Park's southern boundary. Other nearby sensitive receptors include City of Colusa residents located near the intersection of 12th and Levee Streets, about 175 feet from the proposed Park entrance. Uses in this area currently include the Park Headquarters, group and individual camping (14 sites), the picnic area, and parking and circulation. Other activities in this area of the Park are not anticipated to measurably increase noise levels above existing levels at sensitive receptors due to the attenuation of noise provided by distance and the levee.

Potential impacts of the motorboat ramp proposed by the City of Colusa where the channel meets the Sacramento River in the City Park has been evaluated under a separate environmental review process.

Impact 4: Temporary Construction Noise. Noise-generating construction activities are anticipated to result in temporary increases in noise at adjacent sensitive receptors. The impact would be considered **less-than-significant**, recognizing the duration of exterior construction activities, that the construction contractor will implement construction noise control best management practices at the site, and that construction activities will be conducted during hours allowed in the City Municipal Code.

Noise impacts resulting from construction depend upon the noise generated by various pieces of construction equipment, the timing and duration of noise-generating activities, and the distance between construction noise sources and noise sensitive areas. Construction noise impacts primarily result when construction activities occur during noise-sensitive times of the day (e.g., early morning, evening, or nighttime hours), the construction occurs in areas immediately adjoining noise sensitive land uses, or when construction lasts over extended periods of time.

Construction activities generate considerable amounts of noise, especially during earth moving activities when heavy equipment is used. The highest maximum noise levels generated by project construction would typically range from about 90 to 95 dBA L_{max} at a distance of 50 feet from the noise source. Typical hourly average construction-generated noise levels are about 81 to 88 dBA L_{eq} measured at a distance of 50 feet from the center of the site during busy construction periods (e.g., earth moving equipment, impact tools, etc.). Hourly average noise levels generated by the construction of new park features would range from about 65 to 88 dBA L_{eq} measured at a distance of 50 feet, depending upon the amount of activity at the site. Construction-generated noise levels drop off at a rate of about 6 dBA per doubling of the distance between the source and receptor. Shielding by buildings or terrain often result in lower construction noise levels at distant receptors.

The total duration of construction will vary per specific project that is implemented as part of future park enhancements. Construction phases would include demolition, grading, trail

construction, and paving. Noise generated by construction activities would temporarily elevate noise levels at adjacent noise sensitive receptors, but this would be considered a less-than-significant impact, assuming that construction activities are conducted in accordance with the provisions of the City of Colusa Municipal City Code and with the implementation of construction best management practices.

The following best management practices are assumed to be included in the project:

- Pursuant to the Municipal Code, restrict noise-generating activities at the construction site or in areas adjacent to the construction site to the hours of 7:00 a.m. to 7:00 p.m., Monday through Friday and 8:00 a.m. to 7:00 p.m. on Saturday and Sundays.
- Noise from individual pieces of construction equipment shall comply with the limits set forth in the Municipal Code.
- Equip all internal combustion engine driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment.
- Unnecessary idling of internal combustion engines should be strictly prohibited.
- Utilize “quiet” air compressors and other stationary noise sources where technology exists.
- Route all construction traffic to and from the project site via designated truck routes where possible. Prohibit construction related heavy truck traffic in residential areas where feasible.
- Control noise from construction workers’ radios to a point where they are not audible at existing residences bordering the project site.
- The contractor shall prepare and submit to the City for approval a detailed construction plan identifying the schedule for major noise-generating construction activities.
- Designate a “disturbance coordinator” who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator will determine the cause of the noise complaint (e.g., starting too early, bad muffler, etc.) and will require that reasonable measures warranted to correct the problem be implemented. Conspicuously post a telephone number for the disturbance coordinator at the construction site and include in it the notice sent to neighbors regarding the construction schedule.

With the incorporation of these standard practices, the noise impact resulting from project construction would be considered less-than-significant.

Mitigation 5: No additional measures are required.

DRAFT

Transportation Study for the **COLUSA-SACRAMENTO RIVER STATE RECREATION AREA GENERAL PLAN –**

November 2014



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TABLE OF CONTENTS

1. Introduction	1
Project Description	1
Study Intersections	3
Data Collection	3
State and Local Regulations	3
Standards of Significance	4
Analysis Methodology	5
2. Existing Conditions	7
Internal Transportation Facilities	7
External Transportation Facilities	8
Regional Roadway Network	9
Intersection Operations	10
3. Existing Plus Project Conditions	13
Project Description	13
Trip Generation	13
Trip Distribution	15
Intersection Operations	17
Bicycle and Pedestrian Facilities	19
Transit Facilities	19
4. Cumulative Conditions	20
Traffic Forecasts	20
Cumulative No Project Intersection Operations	22
Cumulative Plus Project Intersection Operations	22
Bicycle and Pedestrian Facilities	23
Transit Facilities	24

LIST OF FIGURES

Figure 1: Peak Hour Traffic Volumes and Lane Configurations – Existing Conditions.....	12
Figure 2: Peak Hour Traffic Volumes and Lane Configurations – Existing Plus Project Conditions	18
Figure 3: Peak Hour Traffic Volumes and Lane Configurations – Cumulative No Project Conditions	21
Figure 4: Peak Hour Traffic Volumes and Lane Configurations – Cumulative Plus Project Conditions	25

LIST OF TABLES

Table 1 Intersection Level of Service Criteria	6
Table 2 Intersection Level of Service – Existing Conditions	11
Table 3 Project Trip Generation	15
Table 4 Weekday Trip Distribution	16
Table 5 Intersection Level of Service – Existing PLUS Project Conditions	17
Table 6 Intersection Level of Service – Cumulative No Project Conditions.....	22
Table 7 Intersection Level of Service – cumulative Plus Project Conditions.....	23

APPENDICES

- Appendix A: Existing Conditions Level of Service Calculations
- Appendix B: Existing Plus Project Conditions Level of Service Calculations
- Appendix C: Cumulative Conditions Level of Service Calculations

1. INTRODUCTION

Incorporated on the southwestern bank of the Sacramento River in 1868, the town of Colusa expanded southward and developed along a system of gridded streets. Initially, the Sacramento River served as the primary transportation artery for the town. However, in 1885, a narrow gauge railroad line, known as the Colusa & Lake Railroad, linked Colusa to the Southern Pacific Railroad. The Southern Pacific Railroad eventually built its own branch line extending to the town, and in 1913, the Northern Electric Railway began service between Colusa and Marysville. The opening of the railroad link eastward to Marysville siphoned away passenger traffic from the Colusa & Lake Railroad, which was dismantled in 1918. Eventually, the Southern Pacific and the Northern Electric Railways also suspended rail service to Colusa, with the last train departing Colusa on the Southern Pacific line in 1985.

The Colusa-Sacramento River State Recreation Area (SRA) lies at the heart of the town's historic and present day transportation systems. The Park stretches along the western bank of the Sacramento River, and abuts the northern edge of the gridded system of streets that crisscross the center of Colusa. Train tracks once ran along Main Street, about three hundred feet south of the Park's current main entrance. And today, two state highways serve as Colusa's primary transportation arteries, State Routes 20 and 45, which intersect two blocks south of the current main entrance of the Park at 10th Street and Market Street.

This study analyzes the potential impacts of the proposed Colusa-Sacramento River SRA General Plan upon the surrounding transportation system. The impact analysis conducted for this study evaluated the roadway, transit, bicycle, and pedestrian components of the overall transportation system under the following scenarios:

- Existing Conditions
- Existing Plus Project Conditions
- Cumulative Conditions
- Cumulative Plus Project Conditions

PROJECT DESCRIPTION

The General Plan represents a long-term (approximately 20 years) vision for the future of the Colusa-Sacramento River SRA. The Preferred Alternative Plan includes numerous enhancements

to existing components of the park, in addition to new facilities, all of which are intended to improve the visitor experience within the Colusa-Sacramento River SRA. Components of the Preferred Plan include the following:

- **Development of Camping Facilities:**

- Group Primitive Campground (Restoration/Recreation Zone): 20-50 Tents
- Group Primitive Campground (Riparian Recreation Zone): 20-50 Tents
- Developed Campground/Cabins (Southwest Zone): up to 40 Sites +2 Host Sites
- Developed Campground (Southeast Zone): 10-20 Camp Sites
- Boat-in Primitive Campground (Riparian Recreation Zone): 3-8 Tents

- **Improved Boat Launch Facilities:**

- Human-powered boat launches (Riparian Recreation Zone and Channel Zone)
- New City of Colusa motorboat ramp (2 lane) located on City property, with access and boat trailer parking located within SRA

- **New Visitor Amenities:**

- New individual picnic sites (12-20 sites), outdoor event facility, and restrooms located in the Southeast Zone.

- **New Trails and Paths:**

- New multi-use trails and paths in the Restoration/Recreation Zone and Southeast Zone to provide recreation opportunities for visitors and improve visitor access in these sections of the park.
- New interpretive and fishing access trails in the Riparian Recreation Zone
- New on-street bike route on levee from existing boat ramp north
- New off-street bike path on levee from existing boat ramp south and east

- **New Vehicle Entry and Entrance Station:**

- New vehicle entry point and entrance station located on 12th Street, two blocks west of the current vehicular entry point.

STUDY INTERSECTIONS

Study intersections were selected based on the expected travel characteristics associated with the project (i.e., project location and amount of project trips), as well as the susceptibility of nearby intersections to increased traffic due to implementation of the project. The following four intersections were studied as part of the transportation analysis:

1. Main Street/13th Street
2. Lurline Avenue/13th Street
3. Market Street/12th Street
4. Market Street/10th Street

DATA COLLECTION

To provide a baseline for the intersection analysis, traffic counts were conducted at the four study intersections. The counts occurred on Thursday, November 21, 2013 during the AM (7:00 AM – 9:00 AM) and PM (4:00 PM – 6:00 PM) peak periods of the surrounding roadway system within Colusa. During the counts, weather conditions were dry and local schools were in full session. Pedestrians and bicyclists were also counted at each of the study intersections.

Each intersection's peak hour within the peak period was used for the analysis. For the majority of study intersections, the counts indicate that the AM peak hour is between 7:30 AM and 8:30 AM and the PM peak hour is between 4:30 PM and 5:30 PM.

STATE AND LOCAL REGULATIONS

City of Colusa

The current City of Colusa General Plan (October 2007) is "a long term policy guide for the physical, economic, and environmental growth of the City. It is comprised of goals, policies, and implementation programs which are based on an assessment of current and future needs and available resources." Policy CIR-1.1 of the City of Colusa General Plan specifies that the City will strive to achieve at least a LOS C throughout the City. This policy provides exemptions for downtown intersections along State Route 20/45 where LOS D is established as the minimum acceptable LOS.

Caltrans

- **Guide for the Preparation of Traffic Impact Studies:** Caltrans' *Guide for the Preparation of Traffic Impact Studies* (December 2002) provides guidance on the evaluation of traffic impacts to State highway facilities. The document outlines when a traffic impact study is needed and what should be included in the scope of the study.
- **Transportation Corridor Concept Report (State Route 20):** *The State Route 20 Transportation Corridor Concept Report* (Caltrans 2009) is a long range planning document that identifies existing route conditions and future needs, including existing and forecasted travel data and a concept level of service standard. The document addresses mobility need over the next 20 years. Segment 3 is the portion of SR 20 that is in the City of Colusa. The corridor's concept standard LOS is D in rural areas and E in urban areas. This corridor segment currently operates at LOS E and the 20-year forecast LOS is F under no build conditions and E under the Concept LOS. The Conceptual plan is to support the expansion of existing parallel arterials or construct new parallel arterials designed to relieve the congestion of SR 20.
- **Transportation Corridor Concept Report (State Route 45):** *The State Route 45 Transportation Corridor Concept Report* (Caltrans 2014) is a long range planning document that identifies existing route conditions and future needs, including existing and forecasted travel data and a concept level of service standard. The document addresses mobility need over the next 20 years. Segment 3 is the portion of SR 45 that is in the City of Colusa. The segment's concept standard LOS is D. This corridor segment currently operates at LOS D and is forecast to operate at LOS D in the 2031 horizon year.

STANDARDS OF SIGNIFICANCE

In accordance with CEQA, the lead agency evaluates the effects of a proposed project to determine if they could result in significant adverse impacts on the environment. The standards of significance in this analysis are based upon the current practices of the City of Colusa, documented within the City of Colusa General Plan (2007). Under CEQA, the City of Colusa and Caltrans are the local responsible agencies.

Policy CIR-1.1 of the City of Colusa General Plan specifies that the City will strive to achieve at least a LOS C throughout the City. This policy provides exemptions for downtown intersections along SR 20/45 where LOS D is established as the minimum acceptable LOS. The Caltrans Transportation Concept Corridor Reports for SR 20 and SR 45 identify a concept of LOS for the

segments located within the study area. For the purposes of this analysis, an impact is considered significant if implementation of the project would result in any of the following:

Therefore, all four study intersections are located along SR 20 or SR 45, and LOS D is acceptable at these locations.

For the purposes of this analysis, an impact is considered significant if implementation of the project would result in any of the following:

1. Cause an intersection in along SR 20/45 that currently operates (or is projected to operate) at LOS D or better to degrade to LOS E or worse.
2. Increase the average delay by five percent or more at an intersection in Colusa that currently operates (or is projected to operate) at an unacceptable LOS E or F.
3. Eliminate or adversely affect an existing bikeway, pedestrian facility, or transit facility in a way that would discourage its use.

ANALYSIS METHODOLOGY

All intersections were analyzed using procedures and methodologies contained in the *Highway Capacity Manual* (HCM) (Transportation Research Board, 2010). These methodologies were applied using Synchro¹ (Version 8), a traffic operations analysis software package.

The HCM methodologies determine a level of service (LOS) for each study intersection. Level of service is a qualitative measure of traffic operating conditions whereby a letter grade, from A (the best) to F (the worst), is assigned. These grades represent the perspective of drivers and are an indication of the comfort and convenience associated with driving. In general, LOS A represents free-flow conditions with no congestion, and LOS F represents severe congestion and delay under stop-and-go conditions. Table 1 presents the intersection LOS thresholds.

¹ Trafficware, 2013

TABLE 1
INTERSECTION LEVEL OF SERVICE CRITERIA

Level of Service	Description	Average Control Delay (seconds per vehicle)	
		Signalized Intersections ¹	Unsignalized Intersections ²
A	Represents free flow. Individual users are virtually unaffected by others in the traffic stream.	≤ 10	≤ 10
B	Stable flow, but the presence of other users in the traffic stream begins to be noticeable.	> 10 to 20	> 10 to 15
C	Stable flow, but the operation of individual users becomes significantly affected by interactions with others in the traffic stream.	> 20 to 35	> 15 to 25
D	Represents high-density, but stable flow.	> 35 to 55	> 25 to 35
E	Represents operating conditions at or near the capacity level.	> 55 to 80	> 35 to 50
F	Represents forced or breakdown flow.	> 80	> 50

Source: *Highway Capacity Manual* (Transportation Research Board 2010).

Detailed Intersection Analysis Assumptions and Methodologies

The following assumptions and methodologies were applied during the analysis of study intersections:

- Per HCM procedures, the level of service (LOS) for signalized and all-way stop-controlled intersections was based on the average control delay for all vehicles.
- November 2013 pedestrian counts were incorporated into the analysis.
- The Market Street/10th Street signalized intersection was analyzed using the most up-to-date traffic signal timing plan provided by Caltrans.
- Peak hour factors (PHF) measured in 2013 were assumed for all existing and cumulative scenarios.

2. EXISTING CONDITIONS

This chapter describes the physical and operational characteristics of the transportation system within the study area.

INTERNAL TRANSPORTATION FACILITIES

The Park's main entrance road (see image to right) extends from the northern terminus of 10th Street, and proceeds past the entrance station where vehicles are required to stop and pay a fee for access to the Park. From the entrance station, the roadway continues past a campground and an 85-space parking lot before ending at a boat ramp. From this point, an unpaved trail stretches to the northeast, providing pedestrian access to the Riparian Vegetation Management Zone of the Park.



The southernmost portion of Roberts Road, which runs along the crown of the levee that separates the Southeast and Southwest Management Zones, also provides access to the Habitat Restoration and Riparian Vegetation Management Zone. Roberts Road begins at the northern



terminus of 12th Street, and ramps up onto the crown of the levee (see image below). Just north of this point, a short paved driveway branches off of Robert's Road and descends the levee embankment, providing access to the Park's maintenance yard. While the maintenance yard is located on the opposite side of the levee from the previously discussed main entrance road, no direct roadway connection exists

between the two, and use of roadways outside of the Park boundary is required for vehicles to travel between these areas. Robert's Road, which is maintained by Colusa County, continues northward from the maintenance yard along the crown of the levee and connects to an unpaved levee maintenance road that provides vehicular, bicycle, and pedestrian access to the northern portion of the Park. This roadway is currently gated and not accessible to the public. North of this point, Roberts Road continues for approximately a quarter mile before connecting to SR 45.

EXTERNAL TRANSPORTATION FACILITIES

The central portion of Colusa, which abuts the Park's southern boundary, is served by a gridded system of streets. Blocks on this grid are relatively small, 350 feet by 400 feet, which results in a high level of accessibility for motor vehicles, bicyclists, and pedestrians. Gridded street systems help to disperse vehicular traffic by providing multiple paths to the same destination, and also increase the desirability of walking and bicycling.

However, within the vicinity of the park, many blocks lack continuous sidewalks on one or both sides of the roadway. The sidewalk system is incomplete in many areas and features gaps that limit the desirability of pedestrian travel and may pose challenges to access for those with disabilities. The two blocks of 10th Street located north of Market Street, which link the center of Colusa to the Park's main entrance, have no sidewalk on the east side of the roadway. The west side of this segment has a partial sidewalk with a gap on the block immediately north Market Street (see image to right), and no sidewalk north of Main Street. As shown in the image, relatively wide sidewalks are provided at the Market Street/10th Street intersection. This intersection provides ADA-compliant signalized crosswalks on three of the four approaches (all but the eastern approach, which does not have a crosswalk), and includes a raised pedestrian island on Market Street that increases pedestrian safety and comfort. Many of these features, including textured crosswalks, were installed during a recent improvement project constructed in 2010 that included signalization of the intersection.



Two state highways, State Route 20 (SR 20) and State Route 45 (SR 45) converge at the Market Street/10th Street intersection, and serve as the two primary transportation arteries that link the Park and Colusa to the surrounding region. Within the vicinity of the Park, SR 20 runs north/south on 10th Street and east/west on Market Street; SR 45 runs east/west on Market Street (concurrent with SR 20 east of 10th Street) and north/south on 13th Street (north of Market Street).



A nine-foot wide paved bicycle and pedestrian trail runs atop the crown of the levee from the Park's entrance (see image to left) and extends through the adjacent Colusa Levee Scenic Park, operated by the City of Colusa and located immediately north of Downtown Colusa along the Sacramento River. This serves as the only facility dedicated to pedestrian and/or bicycle travel that provides access to the Park.

Colusa County Transit operates bus service on fixed-time routes between Colusa and Williams, Arbuckle, Grimes, Meridian, Maxwell, Princeton, Stonyford, and Yuba City that with stops scheduled on a dial-a-ride basis. These services do not operate on a fixed route within Colusa, and therefore no transit facilities or amenities such as designated bus stops or shelters exist in the vicinity of the Park.

REGIONAL ROADWAY NETWORK

The characteristics of key regional roadway facilities in the vicinity of the Colusa-Sacramento River SRA are described in greater detail below:

- **State Route 20** is a generally east-west route that connects Colusa to points west including Williams, Clear Lake, and Willits before terminating at State Route 1 just south of the coastal town of Fort Bragg. To the east of Colusa, SR 20 continues to Yuba City, Marysville, Grass Valley, and Nevada City before terminating at Interstate 80 in the Sierra Nevada Mountains. Within the study area, SR 20 runs north/south on 10th Street (south

of Market Street) and east/west on Market Street (east of 10th Street). SR 20 has two travel lanes south of Market Street with a posted speed limit of 35 miles per hour and four travel lanes east of 10th Street with a posted speed limit of 30 miles per hour.

- **State Route 45** is a generally north-south route connecting Colusa to Glenn and Hamilton City to the north, before terminating at State Route 32, and to Knights Landing to the south before terminating at State Route 113. Within the study area, SR 45 runs east/west on Market Street (concurrent with SR 20 east of 10th Street) and north/south on 13th Street (north of Market Street). SR 45 has a posted speed limit of 35 miles per hour east of 10th Street, and a posted speed limit of 40 miles per hour west of 10th Street. The portion of the route within the study area features two travel lanes west of 11th Street and four travel lanes east of 11th Street.

INTERSECTION OPERATIONS

Figure 1 displays the existing AM and PM weekday peak hour traffic volumes, as well as the current lane configurations and traffic controls present at each of the four study intersections. Table 2 summarizes the existing peak hour intersection operations at the study intersections (refer to separate Appendix A for detailed calculations). As shown, all study intersections operate on average at LOS A during both peak hours, with the exception of Market Street/10th Street, which operates at an average of LOS B during both peak hours.

Overall, the existing roadway system within the area that provides access to the Colusa-Sacramento River SRA can be characterized as operating efficiently with low levels of delay. Motorists do not experience substantial vehicle queues, and conditions are generally at free-flow during peak hours. Delays experienced by motorists waiting to turn from side streets onto SR 45 are modest, with motorists making left turns from 12th Street onto SR 45 experiencing the highest delay within the study area (16 seconds during the AM and PM peak hours).

TABLE 2
INTERSECTION LEVEL OF SERVICE – EXISTING CONDITIONS

Intersection	Control	AM Peak Hour		PM Peak Hour	
		Delay ¹	LOS	Delay ¹	LOS
1. 13 th Street (SR 45) / Main Street	Side-Street Stop	1(11)	A(B)	1(11)	A(B)
2. 13 th Street (SR 45) / Lurline Avenue	Side-Street Stop	2(12)	A(B)	2(11)	A(B)
3. Market Street (SR 45) / 12 th Street	Side-Street Stop	1(16)	A(C)	1(16)	A(C)
4. Market Street (SR 45/SR 20) / 10 th Street (SR 20)	Traffic Signal	13	B	15	B

Note: 1. For signalized intersections, average intersection delay is reported in seconds per vehicle for all approaches. For side-street stop controlled intersections, the delay and LOS for the most-delayed individual movement is shown in parentheses next to the average intersection delay and LOS.

Source: Fehr & Peers, 2014



1. Main St/13th St	2. Lurline Ave/13th St	3. Market St/12th St	4. Market St/10th St
<p>251 (251) 19 (14)</p> <p>24 (27) 9 (11)</p> <p>233 (283) 9 (3)</p>	<p>9 (13) 252 (252)</p> <p>17 (7) 50 (70)</p> <p>51 (55) 225 (280)</p>	<p>0 (1) 1 (1) 5 (8)</p> <p>2 (6) 278 (327) 7 (12)</p> <p>3 (6) 309 (319) 5 (2)</p> <p>5 (7) 4 (0) 13 (7)</p>	<p>2 (8) 9 (16) 0 (6)</p> <p>3 (5) 184 (242) 68 (82)</p> <p>0 (1) 199 (240) 112 (99)</p> <p>115 (96) 7 (14) 124 (117)</p>

- Study Intersection
 Turn Lane
 Traffic Signal
 AM (PM) Peak Hour Traffic Volume
 Stop Sign

Figure 1

Peak Hour Traffic Volumes
and Lane Configurations -
Existing Conditions



3. EXISTING PLUS PROJECT CONDITIONS

This chapter discusses the conditions of the transportation system under Existing Plus Project conditions.

PROJECT DESCRIPTION

As discussed in Section 1, the Colusa-Sacramento River SRA General Plan includes numerous enhancements to existing components of the park as well as proposed new facilities. Specific components of the Preferred Alternative Plan likely to generate additional motor vehicle trips include new visitor amenities, new camping facilities, and improved boat launch facilities.

TRIP GENERATION

This section documents the expected trip generation characteristics of the General Plan. Due to the Colusa-Sacramento River SRA's proximity to downtown Colusa, peak demand on the transportation system surrounding both parks occurs during the weekday AM and PM peak commute periods. For this reason, the transportation analysis focuses upon these two time periods, as the susceptibility of the system to impacts during these periods is greater than during off-peak periods when the system has higher levels of available capacity. Although the number of trips associated with the proposed project will likely be higher on the weekend, the higher levels of available transportation system capacity on weekends reduce the likelihood of impacts, associated with the proposed project during this time period. Therefore the trip generation estimates presented in this section are for the weekday AM and PM peak hours.

Documentation provided by California State Parks provides a range of intensities for planned facilities/improvements. In all cases, the trip generation estimate incorporates the higher end of the range to ensure a conservative analysis of potential project impacts. Build-out of the preferred project alternative would include the following trip-generating components:

- Development of camping facilities:²
 - Group Primitive Campground (Riparian Recreation Zone) – 50 Tents

² Does not include boat-in camp sites proposed for the Riparian Recreation Zone as it is assumed that these sites would not generate motor vehicle trips.

- Group Primitive Campground (Restoration/Recreation Zone) – 50 Tents
- Developed Campground/Cabins (Southwest Zone) – 42 Camp Sites
- Developed Campground (Southeast Zone) – 20 Camp Sites
- Boat launch facilities:
 - Human-powered boat launches (Riparian Recreation Zone and Channel Zone)
 - New City of Colusa motorboat ramp (2 lane) located on City property, with access and boat trailer parking located within State Park
- Day use (unrelated to boat launch):
 - All other day trips to park, including utilization of picnic areas, trails, etc.

The methods used to calculate the trip generation potential of Park's components differ. The trip generation potential of the proposed camping facilities and day use areas of the Park are based upon rates documented in *Trip Generation* (Institute of Transportation Engineers, 2012). The trip generation estimate for camping facilities assumes an occupancy rate of 75 percent. Given that the Park would have up to 162 total camp sites accessible by motor vehicle, this would result in a total of 122 occupied camp sites.

The trip generation potential of the boat launch facilities is based upon data developed by the Department of Boating and Waterways documented in the grant approval for the proposed boat ramp improvements. This document indicates that the boat launch facilities are projected to handle 9,000 annual boat launches, which equates to an average of 25 boat launches per day.

Table 3 presents the resulting trip generation estimate for the Colusa SRA General Plan's preferred alternative. As shown in Table 3, the project is estimated to generate 51 trips during the AM peak hour and 58 trips during the PM peak hour on a typical weekday.

TABLE 3
PROJECT TRIP GENERATION

Land Use	Quantity	ITE Land Use Code	Trip Rates		Trips					
			AM Peak Hour	PM Peak Hour	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
Campground	122 occupied camp sites	416	0.21	0.27	9	17	26	21	12	33
Boat Launch	--	--	--	--	4	1	5	2	3	5
Day Use (unrelated to boat launch)	20 picnic sites	413	--	--	16	4	20	10	10	20
Net External Project Trips Made by Vehicle					29	22	51	33	25	58

Note:

¹ Trip rates for campground and day use facilities obtained from *Trip Generation* (ITE, 2012).

Source: *Fehr & Peers, 2014.*

TRIP DISTRIBUTION

The distribution of project trips was estimated using the following sources and analytical techniques:

- Traffic assignment using the City of Colusa Travel Demand Model, initially developed for the *City of Colusa Streets & Roadways Master Plan* (2009).
- Review of existing travel patterns within the study area using traffic counts collected in November 2013.
- Relative travel time/speed comparisons between the project and key travel corridors for various routes.

Table 4 displays the expected distribution of inbound and outbound project trips to/from the Colusa-Sacramento River SRA estimated using the above sources and techniques. Project trips

were assigned to the study intersections in accordance with the trip generation and distribution methodologies discussed in this section.

TABLE 4
WEEKDAY TRIP DISTRIBUTION

Gateway	% of Project Trips	
	AM Peak Hour	PM Peak Hour
To/from the north via SR 45	31%	31%
To/from the west via Lurline Avenue	8%	8%
To/from the south via 12 th Street	2%	2%
To/from the south via SR 20	24%	24%
To/from the east via SR 45	36%	36%

Source: Fehr & Peers, 2014.

INTERSECTION OPERATIONS

The Existing Plus Project scenario assumes full build-out of the Preferred Plan and layers the additional trips generated by the Colusa-Sacramento River SRA on top of existing 2013 trip levels using the previously discussed trip distribution estimates. Figure 2 displays the Existing Plus Project traffic volumes, and Table 5 summarizes the results of the intersection analysis.

As shown in Table 5, with the addition of the traffic associated with the proposed project, all study intersections would continue to operate at an average of LOS B or better and would experience no degradation in level of service from existing conditions (refer to separate Appendix B for detailed calculations). Therefore, all project specific impacts to the study intersections are considered ***less than significant***.

TABLE 5
INTERSECTION LEVEL OF SERVICE – EXISTING PLUS PROJECT CONDITIONS

Intersection	Control	Existing				Existing Plus Project			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Delay ¹	LOS	Delay ¹	LOS	Delay ¹	LOS	Delay ¹	LOS
1. 13 th Street (SR 45) / Main Street	Side-Street Stop	1(11)	A(B)	1(11)	A(B)	1(11)	A(B)	1(11)	A(B)
2. 13 th Street (SR 45) / Lurline Avenue	Side-Street Stop	2(12)	A(B)	2(11)	A(B)	2(12)	A(B)	2(11)	A(B)
3. Market Street (SR 45) / 12 th Street	Side-Street Stop	1(16)	A(C)	1(16)	A(C)	1(16)	A(C)	1(17)	A(C)
4. Market Street (SR 45/SR 20) / 10 th Street (SR 20)	Traffic Signal	13	B	15	B	13	B	16	B

Note: 1. For signalized intersections, average intersection delay is reported in seconds per vehicle for all approaches. For side-street stop controlled intersections, the delay and LOS for the most-delayed individual movement is shown in parentheses next to the average intersection delay and LOS.

Source: Fehr & Peers, 2014



1. Main St/13th St	2. Lurline Ave/13th St	3. Market St/12th St	4. Market St/10th St
<p>254 (255) 25 (20)</p> <p>31 (35) 10 (12)</p> <p>233 (283) 10 (5)</p> <p>13th St</p> <p>Main St</p>	<p>10 (14) 255 (256)</p> <p>18 (9) 51 (71)</p> <p>52 (56) 225 (280)</p> <p>13th St</p> <p>Lurline Ave</p>	<p>1 (2) 1 (1) 18 (23)</p> <p>19 (26) 278 (327) 7 (12)</p> <p>7 (11) 309 (319) 5 (2)</p> <p>5 (7) 5 (1) 13 (7)</p> <p>12th St</p> <p>Market St</p>	<p>2 (8) 9 (16) 0 (6)</p> <p>3 (5) 194 (254) 68 (82)</p> <p>0 (1) 207 (249) 117 (105)</p> <p>122 (104) 7 (14) 124 (117)</p> <p>10th St</p> <p>Market St</p>

- Study Intersection
 Turn Lane
 Traffic Signal
 AM (PM) Peak Hour Traffic Volume
 Stop Sign

Figure 2
Peak Hour Traffic Volumes
and Lane Configurations -
Existing Plus Project Conditions



BICYCLE AND PEDESTRIAN FACILITIES

Implementation of the proposed project would not eliminate or adversely affect existing bicycle or pedestrian facilities. The project includes various improvements to bicycle and pedestrian facilities, including the construction of new multi-use trails, construction of an off-street Class I bicycle facility, and implementation of an on-street bicycle route. Conversion of Roberts Road from a public roadway to a park roadway, a component of the project, would also facilitate the implementation of the planned Class I bicycle facility along this roadway which is included in the *City of Colusa Bikeway Master Plan* (2012). Therefore, project-specific impacts to bicycle or pedestrian facilities are considered ***less than significant***.

TRANSIT FACILITIES

Implementation of the proposed project would not eliminate or adversely affect existing transit operations or facilities. Therefore, project-specific impacts to transit facilities are considered ***less than significant***.

4. CUMULATIVE CONDITIONS

This chapter discusses the cumulative conditions of the transportation system with and without implementation of the proposed project. The cumulative conditions analysis considers future planned developments and transportation improvements within the vicinity of the Colusa-Sacramento River SRA.

TRAFFIC FORECASTS

The City of Colusa Travel Demand Model, initially developed for the *City of Colusa Streets & Roadways Master Plan* (2009) was used to forecast cumulative (year 2030) traffic volumes. The cumulative version of this model reflects planned land use growth both within the City of Colusa as well as within the surrounding region. The model also incorporates planned improvements to the surrounding transportation system. While the City of Colusa has approved the *Downtown Colusa Economic Development Plan*, which envisions increased levels of land development within the study area immediately south of the Park boundary, full build-out of the land uses as envisioned in this plan are not included in the model as specific development projects have not yet been approved and are not considered reasonably foreseeable.

Figure 3 displays the Cumulative No Project lane configurations and traffic volumes at each of the study intersections. As shown, all lane configurations and traffic controls at the study intersection are identical to existing conditions as no roadway improvement projects are currently planned within the study area.

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1. Main St/13th St	2. Lurline Ave/13th St	3. Market St/12th St	4. Market St/10th St
<p>300 (350) 20 (20) 30 (30) 10 (15) 310 (380) 10 (5)</p>	<p>10 (15) 300 (350) 20 (10) 60 (90) 70 (70) 300 (370)</p>	<p>5 (5) 5 (5) 10 (10) 5 (10) 350 (420) 10 (15) 5 (10) 360 (430) 10 (5) 10 (10) 5 (5) 15 (10)</p>	<p>5 (10) 10 (20) 5 (10) 5 (10) 240 (300) 100 (120) 5 (10) 230 (300) 140 (150) 140 (140) 10 (20) 140 (150)</p>

- 1 Study Intersection
- Turn Lane
- Traffic Signal
- AM (PM) Peak Hour Traffic Volume
- Stop Sign

Figure 3
Peak Hour Traffic Volumes
and Lane Configurations -
Cumulative No Project Conditions



CUMULATIVE NO PROJECT INTERSECTION OPERATIONS

Table 6 summarizes traffic operations at the study intersections under Cumulative No Project conditions (refer to separate Appendix C for detailed calculations). As shown in Table 6, minimal increases in vehicle delay are forecasted to occur by the year 2030. All study intersections are expected to continue to operate at LOS D or better under cumulative conditions during both peak hours.

TABLE 6
INTERSECTION LEVEL OF SERVICE – CUMULATIVE NO PROJECT CONDITIONS

Intersection	Control	AM Peak Hour		PM Peak Hour	
		Delay ¹	LOS	Delay ¹	LOS
1. 13 th Street (SR 45) / Main Street	Side-Street Stop	1(11)	A(B)	1(13)	A(B)
2. 13 th Street (SR 45) / Lurline Avenue	Side-Street Stop	2(13)	A(B)	2(11)	A(B)
3. Market Street (SR 45) / 12 th Street	Side-Street Stop	1(17)	A(C)	1(19)	A(C)
4. Market Street (SR 45/SR 20) / 10 th Street (SR 20)	Traffic Signal	16	B	17	B

Note: 1. For signalized intersections, average intersection delay is reported in seconds per vehicle for all approaches. For side-street stop controlled intersections, the delay and LOS for the most-delayed individual movement is shown in parentheses next to the average intersection delay and LOS.

Source: Fehr & Peers, 2014

CUMULATIVE PLUS PROJECT INTERSECTION OPERATIONS

Figure 4 displays the Cumulative Plus Project traffic volumes, and Table 7 summarizes traffic operations at each of study intersections (refer to separate Appendix C for detailed calculations). As shown in Table 7, the addition of traffic associated with the proposed project does not alter the level of service at any study location from Cumulative No Project conditions. Therefore, all cumulative impacts to study intersections are considered ***less than significant***.

TABLE 7
INTERSECTION LEVEL OF SERVICE – CUMULATIVE PLUS PROJECT CONDITIONS

Intersection	Control	Cumulative No Project				Cumulative Plus Project			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Delay ¹	LOS	Delay ¹	LOS	Delay ¹	LOS	Delay ¹	LOS
1. 13 th Street (SR 45) / Main Street	Side-Street Stop	1(11)	A(B)	1(13)	A(B)	1(12)	A(B)	1(13)	A(B)
2. 13 th Street (SR 45) / Lurline Avenue	Side-Street Stop	2(13)	A(B)	2(11)	A(B)	2(13)	A(B)	2(13)	A(B)
3. Market Street (SR 45) / 12 th Street	Side-Street Stop	1(17)	A(C)	1(19)	A(C)	2(19)	A(C)	2(25)	A(C)
4. Market Street (SR 45/SR 20) / 10 th Street (SR 20)	Traffic Signal	16	B	17	B	16	B	17	B

Note: 1. For signalized intersections, average intersection delay is reported in seconds per vehicle for all approaches. For side-street stop controlled intersections, the delay and LOS for the most-delayed individual movement is shown in parentheses next to the average intersection delay and LOS.

Source: Fehr & Peers, 2014

Evaluation of 12th Street Traffic Volumes

As previously discussed, implementation of the proposed project includes construction of a new vehicle entry point and entrance station located on 12th Street, two blocks west of the current vehicular entry point. This new entry, in combination with future land development projects, would increase traffic volumes on the segment of 12th Street north of Market Street. This roadway is classified as a local street in the *City of Colusa Streets & Roadways Master Plan* (2009), and currently has residential frontage. Based on the Cumulative Plus Project forecasts, this roadway segment is expected to carry approximately 900 daily trips by the year 2030.

While the *City of Colusa General Plan EIR* (2007) does not contain daily roadway segment volume thresholds for local roadways, other local jurisdictions within the region have adopted thresholds for roadway segment performance, including Sacramento County and the City of Sacramento. According to the *Sacramento County Traffic Impact Analysis Guidelines* (2004), two-lane residential collector roadways with frontage may carry up to 4,800 cars per day while maintaining LOS C operations (the LOS threshold used by the City of Colusa). According to the

City of Sacramento's guidelines (*City of Sacramento 2030 General Plan*, 2009), two-lane local streets (i.e., primarily residential roadways) may carry up to 4,000 cars per day while maintaining LOS C operations. Therefore, 12th Street, with an estimated total cumulative volume of 900 daily trips, is expected to continue to operate well under the identified capacities for local roadways under all scenarios.

BICYCLE AND PEDESTRIAN FACILITIES

Implementation of the proposed project would not eliminate or adversely affect existing or planned bicycle and pedestrian facilities. The project includes various improvements to bicycle and pedestrian facilities, including the construction of new multi-use trails, construction of an off-street Class I bicycle facility, and implementation of an on-street bicycle route. Conversion of Roberts Road from a public roadway to a park roadway, a component of the project, would also facilitate the implementation of the planned Class I bicycle facility along this roadway which is included in the *City of Colusa Bikeway Master Plan* (2012). Therefore, cumulative impacts to bicycle or pedestrian facilities are considered ***less than significant***.

TRANSIT FACILITIES

Implementation of the proposed project would not eliminate or adversely affect existing or planned transit operations or facilities. Therefore, cumulative impacts to transit facilities are considered ***less than significant***.

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1. Main St/13th St	2. Lurline Ave/13th St	3. Market St/12th St	4. Market St/10th St
<p>303 (354) 26 (26)</p> <p>37 (38) 11 (16)</p> <p>310 (380) 11 (7)</p> <p>13th St</p> <p>Main St</p>	<p>11 (16) 303 (354)</p> <p>21 (12) 61 (91)</p> <p>71 (71) 300 (370)</p> <p>13th St</p> <p>Lurline Ave</p>	<p>6 (6) 5 (5) 23 (25)</p> <p>9 (15) 360 (430) 10 (5)</p> <p>10 (10) 6 (6) 15 (10)</p> <p>12th St</p> <p>Market St</p>	<p>5 (10) 10 (20) 5 (10)</p> <p>5 (10) 238 (309) 145 (156)</p> <p>147 (148) 10 (20) 140 (150)</p> <p>10th St</p> <p>Market St</p>

- 1 Study Intersection
- Turn Lane
- Traffic Signal
- AM (PM) Peak Hour Traffic Volume
- Stop Sign

Figure 4
Peak Hour Traffic Volumes
and Lane Configurations -
Cumulative Plus Project Conditions



Appendix A:

Existing Conditions

Intersection Level of Service Calculations

Intersection						
Int Delay, s/veh	0.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	9	24	233	9	19	251
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	25	240	9	20	259
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	543	245	0	0	249	0
Stage 1	245	-	-	-	-	-
Stage 2	298	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	501	794	-	-	1317	-
Stage 1	796	-	-	-	-	-
Stage 2	753	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	492	794	-	-	1317	-
Mov Cap-2 Maneuver	492	-	-	-	-	-
Stage 1	796	-	-	-	-	-
Stage 2	739	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	10.6	0	0.5			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	680	1317	-	
HCM Lane V/C Ratio	-	-	0.05	0.015	-	
HCM Control Delay (s)	-	-	10.6	7.8	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.2	0	-	

Intersection						
Int Delay, s/veh	2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	17	50	51	225	252	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	40	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	19	55	56	247	277	10
Major/Minor	Minor2	Major1			Major2	
Conflicting Flow All	641	282	287	0	-	0
Stage 1	282	-	-	-	-	-
Stage 2	359	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	439	757	1275	-	-	-
Stage 1	766	-	-	-	-	-
Stage 2	707	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	420	757	1275	-	-	-
Mov Cap-2 Maneuver	420	-	-	-	-	-
Stage 1	766	-	-	-	-	-
Stage 2	676	-	-	-	-	-
Approach	EB	NB			SB	
HCM Control Delay, s	11.5	1.5			0	
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1275	-	629	-	-	
HCM Lane V/C Ratio	0.044	-	0.117	-	-	
HCM Control Delay (s)	8	-	11.5	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.4	-	-	

Intersection									
Int Delay, s/veh	0.7								
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	3	309	5	7	278	2	5	4	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	100	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	347	6	8	312	2	6	4	15
Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	315	0	0	353	0	0	687	687	350
Stage 1	-	-	-	-	-	-	357	357	-
Stage 2	-	-	-	-	-	-	330	330	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1245	-	-	1206	-	-	361	370	693
Stage 1	-	-	-	-	-	-	661	628	-
Stage 2	-	-	-	-	-	-	683	646	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1245	-	-	1206	-	-	358	367	693
Mov Cap-2 Maneuver	-	-	-	-	-	-	358	367	-
Stage 1	-	-	-	-	-	-	659	626	-
Stage 2	-	-	-	-	-	-	677	642	-
Approach	EB			WB			NB		
HCM Control Delay, s	0.1			0.2			12.5		
HCM LOS	B								
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	
Capacity (veh/h)	504	1245	-	-	1206	-	-	347	
HCM Lane V/C Ratio	0.049	0.003	-	-	0.007	-	-	0.019	
HCM Control Delay (s)	12.5	7.9	-	-	8	-	-	15.6	
HCM Lane LOS	B	A	-	-	A	-	-	C	
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.1	

Intersection			
Int Delay, s/veh			
Movement	SBL	SBT	SBR
Vol, veh/h	5	1	0
Conflicting Peds, #/hr	0	0	0
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	-	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	89	89	89
Heavy Vehicles, %	2	2	2
Mvmt Flow	6	1	0
Major/Minor	Minor2		
Conflicting Flow All	695	689	313
Stage 1	329	329	-
Stage 2	366	360	-
Critical Hdwy	7.12	6.52	6.22
Critical Hdwy Stg 1	6.12	5.52	-
Critical Hdwy Stg 2	6.12	5.52	-
Follow-up Hdwy	3.518	4.018	3.318
Pot Cap-1 Maneuver	357	369	727
Stage 1	684	646	-
Stage 2	653	626	-
Platoon blocked, %			
Mov Cap-1 Maneuver	344	366	727
Mov Cap-2 Maneuver	344	366	-
Stage 1	682	642	-
Stage 2	633	624	-
Approach	SB		
HCM Control Delay, s	15.6		
HCM LOS	C		
Minor Lane/Major Mvmt			






















Two Way Analysis cannot be performed on Signalized Intersection.

HCM 2010 Signalized Intersection Capacity Analysis

4: 10th Street & Market Street

Existing Conditions
AM Peak

K35

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	199	112	68	184	3	115	7	124	0	9	2
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A _{pbT})	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	0	229	129	78	211	3	132	8	143	0	10	2
Adj No. of Lanes	1	2	1	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	4	660	295	321	1603	23	229	30	530	4	211	42
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.00	0.19	0.19	0.18	0.45	0.45	0.13	0.35	0.35	0.00	0.14	0.14
Ln Grp Delay, s/veh	0.0	15.3	15.8	15.2	7.0	7.0	18.4	0.0	10.1	0.0	0.0	16.0
Ln Grp LOS		B	B	B	A	A	B		B			B
Approach Vol, veh/h		358			292			283			12	
Approach Delay, s/veh		15.5			9.2			14.0			16.0	
Approach LOS		B			A			B			B	
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Case No	2.0	3.0	2.0	4.0	2.0	4.0	2.0	4.0				
Phs Duration (G+Y+Rc), s	11.3	12.6	9.0	10.0	0.0	23.9	0.0	19.0				
Change Period (Y+Rc), s	3.5	4.6	3.5	4.0	3.5	4.6	3.5	4.0				
Max Green (Gmax), s	16.5	35.4	16.5	11.0	11.5	35.4	11.5	29.0				
Max Allow Headway (MAH), s	1.8	2.5	1.8	3.5	0.0	2.5	0.0	3.5				
Max Q Clear (g _{c+I1}), s	3.6	5.1	5.0	2.2	0.0	3.5	0.0	4.9				
Green Ext Time (g _e), s	0.0	0.7	0.0	0.2	0.0	0.7	0.0	0.4				
Prob of Phs Call (p _c)	0.97	1.00	0.79	0.86	0.00	1.00	0.00	0.97				
Prob of Max Out (p _x)	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00				
Left-Turn Movement Data												
Assigned Mvmt	1		3		5		7					
Mvmt Sat Flow, veh/h	1774		1774		1774		1774					
Through Movement Data												
Assigned Mvmt		2		4		6		8				
Mvmt Sat Flow, veh/h		3539		1508		3573		85				
Right-Turn Movement Data												
Assigned Mvmt		12		14		16		18				
Mvmt Sat Flow, veh/h		1583		302		51		1511				
Left Lane Group Data												
Assigned Mvmt	1	0	3	0	5	0	7	0				
Lane Assignment	(Prot)		(Prot)		(Prot)		(Prot)					
Lanes in Grp	1	0	1	0	1	0	1	0				

HCM 2010 Signalized Intersection Capacity Analysis

4: 10th Street & Market Street

Existing Conditions **K36**
AM Peak

Grp Vol (v), veh/h	78	0	132	0	0	0	0	0
Grp Sat Flow (s), veh/h/ln	1774	0	1774	0	1774	0	1774	0
Q Serve Time (g_s), s	1.6	0.0	3.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	1.6	0.0	3.0	0.0	0.0	0.0	0.0	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	0	0	0	0	0	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	321	0	229	0	4	0	4	0
V/C Ratio (X)	0.24	0.00	0.58	0.00	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	682	0	682	0	476	0	476	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	15.1	0.0	17.6	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.8	0.0	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	15.2	0.0	18.4	0.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.8	0.0	1.5	0.0	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	0.8	0.0	1.5	0.0	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.14	0.00	0.17	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T				T			
Lanes in Grp	0	2	0	0	0	1	0	0
Grp Vol (v), veh/h	0	229	0	0	0	104	0	0
Grp Sat Flow (s), veh/h/ln	0	1770	0	0	0	1770	0	0
Q Serve Time (g_s), s	0.0	2.4	0.0	0.0	0.0	1.5	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	2.4	0.0	0.0	0.0	1.5	0.0	0.0
Lane Grp Cap (c), veh/h	0	660	0	0	0	794	0	0
V/C Ratio (X)	0.00	0.35	0.00	0.00	0.00	0.13	0.00	0.00
Avail Cap (c_a), veh/h	0	2921	0	0	0	1460	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	15.2	0.0	0.0	0.0	6.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	15.3	0.0	0.0	0.0	7.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	1.2	0.0	0.0	0.0	0.7	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HCM 2010 Signalized Intersection Capacity Analysis

4: 10th Street & Market Street

Existing Conditions

AM Peak



3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	1.2	0.0	0.0	0.0	0.7	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.09	0.00	0.00	0.00	0.02	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		R		T+R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	129	0	12	0	110	0	151
Grp Sat Flow (s), veh/h/ln	0	1583	0	1810	0	1854	0	1596
Q Serve Time (g_s), s	0.0	3.1	0.0	0.2	0.0	1.5	0.0	2.9
Cycle Q Clear Time (g_c), s	0.0	3.1	0.0	0.2	0.0	1.5	0.0	2.9
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	1.00	0.00	0.17	0.00	0.03	0.00	0.95
Lane Grp Cap (c), veh/h	0	295	0	253	0	832	0	560
V/C Ratio (X)	0.00	0.44	0.00	0.05	0.00	0.13	0.00	0.27
Avail Cap (c_a), veh/h	0	1307	0	464	0	1530	0	1079
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	15.5	0.0	16.0	0.0	6.9	0.0	10.0
Incr Delay (d2), s/veh	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.1
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	15.8	0.0	16.0	0.0	7.0	0.0	10.1
1st-Term Q (Q1), veh/ln	0.0	1.4	0.0	0.1	0.0	0.8	0.0	1.3
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	1.4	0.0	0.1	0.0	0.8	0.0	1.3
%ile Storage Ratio (RQ%)	0.00	0.31	0.00	0.01	0.00	0.03	0.00	0.04
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 2010 Ctrl Delay	13.1
HCM 2010 LOS	B

Intersection						
Int Delay, s/veh	0.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	11	27	283	3	14	251
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	28	292	3	14	259
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	581	293	0	0	295	0
Stage 1	293	-	-	-	-	-
Stage 2	288	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	476	746	-	-	1266	-
Stage 1	757	-	-	-	-	-
Stage 2	761	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	470	746	-	-	1266	-
Mov Cap-2 Maneuver	470	-	-	-	-	-
Stage 1	757	-	-	-	-	-
Stage 2	751	-	-	-	-	-
Approach	WB		NB		SB	
HCM Control Delay, s	11		0		0.4	
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	638	1266	-	
HCM Lane V/C Ratio	-	-	0.061	0.011	-	
HCM Control Delay (s)	-	-	11	7.9	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.2	0	-	

Intersection						
Int Delay, s/veh	1.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	7	70	55	280	252	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	40	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	76	60	304	274	14
Major/Minor	Minor2	Major1			Major2	
Conflicting Flow All	705	281	288	0	-	0
Stage 1	281	-	-	-	-	-
Stage 2	424	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	403	758	1274	-	-	-
Stage 1	767	-	-	-	-	-
Stage 2	660	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	384	758	1274	-	-	-
Mov Cap-2 Maneuver	384	-	-	-	-	-
Stage 1	767	-	-	-	-	-
Stage 2	629	-	-	-	-	-
Approach	EB	NB			SB	
HCM Control Delay, s	10.9	1.3			0	
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1274	-	696	-	-	
HCM Lane V/C Ratio	0.047	-	0.12	-	-	
HCM Control Delay (s)	8	-	10.9	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.4	-	-	

Intersection									
Int Delay, s/veh	0.7								
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	6	319	2	12	327	6	7	0	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	100	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	336	2	13	344	6	7	0	7
Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	351	0	0	338	0	0	723	725	337
Stage 1	-	-	-	-	-	-	349	349	-
Stage 2	-	-	-	-	-	-	374	376	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1208	-	-	1221	-	-	342	352	705
Stage 1	-	-	-	-	-	-	667	633	-
Stage 2	-	-	-	-	-	-	647	616	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1208	-	-	1221	-	-	337	347	705
Mov Cap-2 Maneuver	-	-	-	-	-	-	337	347	
Stage 1	-	-	-	-	-	-	664	630	-
Stage 2	-	-	-	-	-	-	638	609	-
Approach	EB			WB			NB		
HCM Control Delay, s	0.1			0.3			13.2		
HCM LOS	B								
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	
Capacity (veh/h)	456	1208	-	-	1221	-	-	352	
HCM Lane V/C Ratio	0.032	0.005	-	-	0.01	-	-	0.03	
HCM Control Delay (s)	13.2	8	-	-	8	-	-	15.5	
HCM Lane LOS	B	A	-	-	A	-	-	C	
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1	






















Intersection			
Int Delay, s/veh			
Movement	SBL	SBT	SBR
Vol, veh/h	8	1	1
Conflicting Peds, #/hr	0	0	0
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	-	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	95	95	95
Heavy Vehicles, %	2	2	2
Mvmt Flow	8	1	1
Major/Minor	Minor2		
Conflicting Flow All	726	724	347
Stage 1	373	373	-
Stage 2	353	351	-
Critical Hdwy	7.12	6.52	6.22
Critical Hdwy Stg 1	6.12	5.52	-
Critical Hdwy Stg 2	6.12	5.52	-
Follow-up Hdwy	3.518	4.018	3.318
Pot Cap-1 Maneuver	340	352	696
Stage 1	648	618	-
Stage 2	664	632	-
Platoon blocked, %			
Mov Cap-1 Maneuver	332	347	696
Mov Cap-2 Maneuver	332	347	-
Stage 1	645	611	-
Stage 2	654	629	-
Approach	SB		
HCM Control Delay, s	15.5		
HCM LOS	C		
Minor Lane/Major Mvmt			

Two Way Analysis cannot be performed on Signalized Intersection.

HCM 2010 Signalized Intersection Capacity Analysis

4: 10th Street & Market Street

Existing Conditions **K43**
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	240	99	82	242	5	96	14	117	6	16	8
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A _{pbT})	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	1	258	106	88	260	5	103	15	126	6	17	9
Adj No. of Lanes	1	2	1	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	332	672	301	328	667	13	205	42	356	20	164	87
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.19	0.19	0.19	0.18	0.19	0.19	0.12	0.25	0.25	0.01	0.14	0.14
Ln Grp Delay, s/veh	14.1	15.2	15.2	15.0	15.4	15.4	18.4	0.0	13.4	24.0	0.0	15.9
Ln Grp LOS	B	B	B	B	B	B	B		B	C		B
Approach Vol, veh/h		365			353			244			32	
Approach Delay, s/veh		15.2			15.3			15.5			17.4	
Approach LOS		B			B			B			B	
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Case No	2.0	3.0	2.0	4.0	2.0	4.0	2.0	4.0				
Phs Duration (G+Y+Rc), s	11.4	12.7	8.4	10.1	11.5	12.6	4.0	14.5				
Change Period (Y+Rc), s	3.5	4.6	3.5	4.0	3.5	4.6	3.5	4.0				
Max Green (Gmax), s	16.5	35.4	16.5	11.0	11.5	35.4	11.5	29.0				
Max Allow Headway (MAH), s	1.8	2.5	1.8	3.5	1.8	2.5	1.8	3.5				
Max Q Clear (g _c +I1), s	3.8	4.7	4.3	2.5	2.0	4.7	2.1	5.1				
Green Ext Time (g _e), s	0.0	0.8	0.0	0.2	0.0	0.8	0.0	0.4				
Prob of Phs Call (p _c)	0.98	1.00	0.70	0.87	1.00	1.00	0.07	0.96				
Prob of Max Out (p _x)	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00				
Left-Turn Movement Data												
Assigned Mvmt	1		3		5		7					
Mvmt Sat Flow, veh/h	1774		1774		1774		1774					
Through Movement Data												
Assigned Mvmt		2		4		6		8				
Mvmt Sat Flow, veh/h		3539		1148		3552		171				
Right-Turn Movement Data												
Assigned Mvmt		12		14		16		18				
Mvmt Sat Flow, veh/h		1583		608		68		1438				
Left Lane Group Data												
Assigned Mvmt	1	0	3	0	5	0	7	0				
Lane Assignment	(Prot)		(Prot)		(Prot)		(Prot)					
Lanes in Grp	1	0	1	0	1	0	1	0				

HCM 2010 Signalized Intersection Capacity Analysis

4: 10th Street & Market Street

Existing Conditions

PM Peak

K44

Grp Vol (v), veh/h	88	0	103	0	1	0	6	0
Grp Sat Flow (s), veh/h/ln	1774	0	1774	0	1774	0	1774	0
Q Serve Time (g_s), s	1.8	0.0	2.3	0.0	0.0	0.0	0.1	0.0
Cycle Q Clear Time (g_c), s	1.8	0.0	2.3	0.0	0.0	0.0	0.1	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	0	0	0	0	0	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	328	0	205	0	332	0	20	0
V/C Ratio (X)	0.27	0.00	0.50	0.00	0.00	0.00	0.30	0.00
Avail Cap (c_a), veh/h	687	0	687	0	479	0	479	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	14.9	0.0	17.7	0.0	14.1	0.0	20.9	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.7	0.0	0.0	0.0	3.1	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	15.0	0.0	18.4	0.0	14.1	0.0	24.0	0.0
1st-Term Q (Q1), veh/ln	0.9	0.0	1.1	0.0	0.0	0.0	0.1	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	0.9	0.0	1.2	0.0	0.0	0.0	0.1	0.0
%ile Storage Ratio (RQ%)	0.16	0.00	0.13	0.00	0.00	0.00	0.02	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T				T			
Lanes in Grp	0	2	0	0	0	1	0	0
Grp Vol (v), veh/h	0	258	0	0	0	129	0	0
Grp Sat Flow (s), veh/h/ln	0	1770	0	0	0	1770	0	0
Q Serve Time (g_s), s	0.0	2.7	0.0	0.0	0.0	2.7	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	2.7	0.0	0.0	0.0	2.7	0.0	0.0
Lane Grp Cap (c), veh/h	0	672	0	0	0	332	0	0
V/C Ratio (X)	0.00	0.38	0.00	0.00	0.00	0.39	0.00	0.00
Avail Cap (c_a), veh/h	0	2942	0	0	0	1471	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	15.1	0.0	0.0	0.0	15.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.0	0.3	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	15.2	0.0	0.0	0.0	15.4	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	1.3	0.0	0.0	0.0	1.3	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HCM 2010 Signalized Intersection Capacity Analysis

4: 10th Street & Market Street

Existing Conditions

PM Peak



3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	1.3	0.0	0.0	0.0	1.4	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.10	0.00	0.00	0.00	0.04	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		R		T+R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	106	0	26	0	136	0	141
Grp Sat Flow (s), veh/h/ln	0	1583	0	1756	0	1851	0	1609
Q Serve Time (g_s), s	0.0	2.5	0.0	0.5	0.0	2.7	0.0	3.1
Cycle Q Clear Time (g_c), s	0.0	2.5	0.0	0.5	0.0	2.7	0.0	3.1
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	1.00	0.00	0.35	0.00	0.04	0.00	0.89
Lane Grp Cap (c), veh/h	0	301	0	251	0	348	0	398
V/C Ratio (X)	0.00	0.35	0.00	0.10	0.00	0.39	0.00	0.35
Avail Cap (c_a), veh/h	0	1316	0	453	0	1538	0	1096
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	15.0	0.0	15.9	0.0	15.2	0.0	13.2
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.1	0.0	0.3	0.0	0.2
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	15.2	0.0	15.9	0.0	15.4	0.0	13.4
1st-Term Q (Q1), veh/ln	0.0	1.1	0.0	0.3	0.0	1.4	0.0	1.4
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	1.1	0.0	0.3	0.0	1.4	0.0	1.4
%ile Storage Ratio (RQ%)	0.00	0.24	0.00	0.03	0.00	0.05	0.00	0.05
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 2010 Ctrl Delay	15.4
HCM 2010 LOS	B

Appendix B:
Existing Plus Project Conditions
Intersection Level of Service Calculations

Intersection						
Int Delay, s/veh	1.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	10	31	233	10	25	254
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	32	240	10	26	262
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	558	245	0	0	251	0
Stage 1	245	-	-	-	-	-
Stage 2	313	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	491	794	-	-	1314	-
Stage 1	796	-	-	-	-	-
Stage 2	741	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	480	794	-	-	1314	-
Mov Cap-2 Maneuver	480	-	-	-	-	-
Stage 1	796	-	-	-	-	-
Stage 2	724	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	10.6	0	0.7			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	685	1314	-	
HCM Lane V/C Ratio	-	-	0.062	0.02	-	
HCM Control Delay (s)	-	-	10.6	7.8	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-	

Intersection							
Int Delay, s/veh	2						
Movement	EBL	EBR		NBL	NBT	SBT	SBR
Vol, veh/h	18	51		52	225	255	10
Conflicting Peds, #/hr	0	0		0	0	0	0
Sign Control	Stop	Stop		Free	Free	Free	Free
RT Channelized	-	None		-	None	-	None
Storage Length	0	-		40	-	-	-
Veh in Median Storage, #	0	-		-	0	0	-
Grade, %	0	-		-	0	0	-
Peak Hour Factor	91	91		91	91	91	91
Heavy Vehicles, %	2	2		2	2	2	2
Mvmt Flow	20	56		57	247	280	11
Major/Minor	Minor2		Major1		Major2		
Conflicting Flow All	648	286		291	0	-	0
Stage 1	286	-		-	-	-	-
Stage 2	362	-		-	-	-	-
Critical Hdwy	6.42	6.22		4.12	-	-	-
Critical Hdwy Stg 1	5.42	-		-	-	-	-
Critical Hdwy Stg 2	5.42	-		-	-	-	-
Follow-up Hdwy	3.518	3.318		2.218	-	-	-
Pot Cap-1 Maneuver	435	753		1271	-	-	-
Stage 1	763	-		-	-	-	-
Stage 2	704	-		-	-	-	-
Platoon blocked, %					-	-	-
Mov Cap-1 Maneuver	415	753		1271	-	-	-
Mov Cap-2 Maneuver	415	-		-	-	-	-
Stage 1	763	-		-	-	-	-
Stage 2	672	-		-	-	-	-
Approach	EB		NB		SB		
HCM Control Delay, s	11.6		1.5		0		
HCM LOS	B						
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR		
Capacity (veh/h)	1271	-	621	-	-		
HCM Lane V/C Ratio	0.045	-	0.122	-	-		
HCM Control Delay (s)	8	-	11.6	-	-		
HCM Lane LOS	A	-	B	-	-		
HCM 95th %tile Q(veh)	0.1	-	0.4	-	-		

Intersection									
Int Delay, s/veh	1.1								

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	7	309	5	7	278	19	5	5	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	100	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	347	6	8	312	21	6	6	15

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	334	0	0	353	0	0	706	715	350
Stage 1	-	-	-	-	-	-	366	366	-
Stage 2	-	-	-	-	-	-	340	349	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1225	-	-	1206	-	-	351	356	693
Stage 1	-	-	-	-	-	-	653	623	-
Stage 2	-	-	-	-	-	-	675	633	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1225	-	-	1206	-	-	346	351	693
Mov Cap-2 Maneuver	-	-	-	-	-	-	346	351	-
Stage 1	-	-	-	-	-	-	649	619	-
Stage 2	-	-	-	-	-	-	668	629	-

Approach	EB	WB	NB
HCM Control Delay, s	0.2	0.2	12.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	485	1225	-	-	1206	-	-	341
HCM Lane V/C Ratio	0.053	0.006	-	-	0.007	-	-	0.066
HCM Control Delay (s)	12.8	8	-	-	8	-	-	16.3
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.2

Intersection

Int Delay, s/veh

Movement	SBL	SBT	SBR
Vol, veh/h	18	1	1
Conflicting Peds, #/hr	0	0	0
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	-	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	89	89	89
Heavy Vehicles, %	2	2	2
Mvmt Flow	20	1	1

Major/Minor	Minor2		
Conflicting Flow All	715	708	323
Stage 1	339	339	-
Stage 2	376	369	-
Critical Hdwy	7.12	6.52	6.22
Critical Hdwy Stg 1	6.12	5.52	-
Critical Hdwy Stg 2	6.12	5.52	-
Follow-up Hdwy	3.518	4.018	3.318
Pot Cap-1 Maneuver	346	360	718
Stage 1	676	640	-
Stage 2	645	621	-
Platoon blocked, %			
Mov Cap-1 Maneuver	331	355	718
Mov Cap-2 Maneuver	331	355	-
Stage 1	672	636	-
Stage 2	622	617	-

Approach SB

HCM Control Delay, s	16.3
HCM LOS	C

Minor Lane/Major Mvmt

Two Way Analysis cannot be performed on Signalized Intersection.






















HCM 2010 Signalized Intersection Capacity Analysis

4: 10th Street & Market Street

Existing Plus Project Conditions

AM Peak

K52

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	207	117	68	194	3	122	7	124	0	9	2
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A _{pbT})	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	0	238	134	78	223	3	140	8	143	0	10	2
Adj No. of Lanes	1	2	1	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	4	657	294	321	1601	22	234	30	533	4	210	42
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.00	0.19	0.19	0.18	0.45	0.45	0.13	0.35	0.35	0.00	0.14	0.14
Ln Grp Delay, s/veh	0.0	15.4	16.0	15.3	7.0	7.0	18.5	0.0	10.1	0.0	0.0	16.1
Ln Grp LOS		B	B	B	A	A	B		B			B
Approach Vol, veh/h		372			304			291			12	
Approach Delay, s/veh		15.6			9.1			14.1			16.1	
Approach LOS		B			A			B			B	
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Case No	2.0	3.0	2.0	4.0	2.0	4.0	2.0	4.0				
Phs Duration (G+Y+Rc), s	11.3	12.6	9.2	10.0	0.0	23.9	0.0	19.2				
Change Period (Y+Rc), s	3.5	4.6	3.5	4.0	3.5	4.6	3.5	4.0				
Max Green (Gmax), s	16.5	35.4	16.5	11.0	11.5	35.4	11.5	29.0				
Max Allow Headway (MAH), s	1.8	2.5	1.8	3.5	0.0	2.5	0.0	3.5				
Max Q Clear (g _{c+I1}), s	3.6	5.2	5.2	2.2	0.0	3.6	0.0	4.9				
Green Ext Time (g _e), s	0.0	0.7	0.0	0.2	0.0	0.7	0.0	0.4				
Prob of Phs Call (p _c)	0.97	1.00	0.81	0.86	0.00	1.00	0.00	0.97				
Prob of Max Out (p _x)	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00				
Left-Turn Movement Data												
Assigned Mvmt	1		3		5		7					
Mvmt Sat Flow, veh/h	1774		1774		1774		1774					
Through Movement Data												
Assigned Mvmt		2		4		6		8				
Mvmt Sat Flow, veh/h		3539		1508		3576		85				
Right-Turn Movement Data												
Assigned Mvmt		12		14		16		18				
Mvmt Sat Flow, veh/h		1583		302		48		1511				
Left Lane Group Data												
Assigned Mvmt	1	0	3	0	5	0	7	0				
Lane Assignment	(Prot)		(Prot)		(Prot)		(Prot)					
Lanes in Grp	1	0	1	0	1	0	1	0				

HCM 2010 Signalized Intersection Capacity Analysis

4: 10th Street & Market Street

Existing Plus Project Conditions

AM Peak

K53

Grp Vol (v), veh/h	78	0	140	0	0	0	0	0
Grp Sat Flow (s), veh/h/ln	1774	0	1774	0	1774	0	1774	0
Q Serve Time (g_s), s	1.6	0.0	3.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	1.6	0.0	3.2	0.0	0.0	0.0	0.0	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	0	0	0	0	0	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	321	0	234	0	4	0	4	0
V/C Ratio (X)	0.24	0.00	0.60	0.00	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	679	0	679	0	474	0	474	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	15.1	0.0	17.6	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.9	0.0	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	15.3	0.0	18.5	0.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.8	0.0	1.6	0.0	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	0.8	0.0	1.6	0.0	0.0	0.0	0.0	0.0
%ile Storage Ratio (RQ%)	0.14	0.00	0.18	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T				T			
Lanes in Grp	0	2	0	0	0	1	0	0
Grp Vol (v), veh/h	0	238	0	0	0	110	0	0
Grp Sat Flow (s), veh/h/ln	0	1770	0	0	0	1770	0	0
Q Serve Time (g_s), s	0.0	2.5	0.0	0.0	0.0	1.6	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	2.5	0.0	0.0	0.0	1.6	0.0	0.0
Lane Grp Cap (c), veh/h	0	657	0	0	0	792	0	0
V/C Ratio (X)	0.00	0.36	0.00	0.00	0.00	0.14	0.00	0.00
Avail Cap (c_a), veh/h	0	2908	0	0	0	1454	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	15.3	0.0	0.0	0.0	7.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	15.4	0.0	0.0	0.0	7.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	1.2	0.0	0.0	0.0	0.8	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HCM 2010 Signalized Intersection Capacity Analysis

4: 10th Street & Market Street

Existing Plus Project Conditions

AM Peak

K54

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	1.2	0.0	0.0	0.0	0.8	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.09	0.00	0.00	0.00	0.03	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		R		T+R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	134	0	12	0	116	0	151
Grp Sat Flow (s), veh/h/ln	0	1583	0	1810	0	1854	0	1596
Q Serve Time (g_s), s	0.0	3.2	0.0	0.2	0.0	1.6	0.0	2.9
Cycle Q Clear Time (g_c), s	0.0	3.2	0.0	0.2	0.0	1.6	0.0	2.9
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	1.00	0.00	0.17	0.00	0.03	0.00	0.95
Lane Grp Cap (c), veh/h	0	294	0	252	0	830	0	563
V/C Ratio (X)	0.00	0.46	0.00	0.05	0.00	0.14	0.00	0.27
Avail Cap (c_a), veh/h	0	1301	0	462	0	1524	0	1074
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	15.6	0.0	16.1	0.0	7.0	0.0	10.0
Incr Delay (d2), s/veh	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.1
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	16.0	0.0	16.1	0.0	7.0	0.0	10.1
1st-Term Q (Q1), veh/ln	0.0	1.4	0.0	0.1	0.0	0.8	0.0	1.3
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	1.5	0.0	0.1	0.0	0.8	0.0	1.3
%ile Storage Ratio (RQ%)	0.00	0.32	0.00	0.01	0.00	0.03	0.00	0.04
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 2010 Ctrl Delay	13.2
HCM 2010 LOS	B

Intersection

Int Delay, s/veh 1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	12	35	283	5	20	255
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	36	292	5	21	263

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	598	294	0
Stage 1	294	-	-
Stage 2	304	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	465	745	-
Stage 1	756	-	-
Stage 2	748	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	456	745	-
Mov Cap-2 Maneuver	456	-	-
Stage 1	756	-	-
Stage 2	734	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.1	0	0.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	641	1264	-
HCM Lane V/C Ratio	-	-	0.076	0.016	-
HCM Control Delay (s)	-	-	11.1	7.9	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	9	71	56	280	256	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	40	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	77	61	304	278	15

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	712	286	293
Stage 1	286	-	-
Stage 2	426	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	399	753	1269
Stage 1	763	-	-
Stage 2	659	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	380	753	1269
Mov Cap-2 Maneuver	380	-	-
Stage 1	763	-	-
Stage 2	627	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.1	1.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1269	-	678	-	-
HCM Lane V/C Ratio	0.048	-	0.128	-	-
HCM Control Delay (s)	8	-	11.1	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.4	-	-

Intersection

Int Delay, s/veh 1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	11	319	2	12	327	26	7	1	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	100	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	336	2	13	344	27	7	1	7

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	372	0	0	338	0	0	745	757	337
Stage 1	-	-	-	-	-	-	360	360	-
Stage 2	-	-	-	-	-	-	385	397	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1186	-	-	1221	-	-	330	337	705
Stage 1	-	-	-	-	-	-	658	626	-
Stage 2	-	-	-	-	-	-	638	603	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1186	-	-	1221	-	-	323	330	705
Mov Cap-2 Maneuver	-	-	-	-	-	-	323	330	-
Stage 1	-	-	-	-	-	-	651	620	-
Stage 2	-	-	-	-	-	-	628	597	-

Approach	EB	WB	NB
HCM Control Delay, s	0.3	0.3	13.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	433	1186	-	-	1221	-	-	334
HCM Lane V/C Ratio	0.036	0.01	-	-	0.01	-	-	0.082
HCM Control Delay (s)	13.6	8.1	-	-	8	-	-	16.7
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.3

Intersection

Int Delay, s/veh

Movement	SBL	SBT	SBR
Vol, veh/h	23	1	2
Conflicting Peds, #/hr	0	0	0
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	-	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	95	95	95
Heavy Vehicles, %	2	2	2
Mvmt Flow	24	1	2

Major/Minor	Minor2		
Conflicting Flow All	747	744	358
Stage 1	383	383	-
Stage 2	364	361	-
Critical Hdwy	7.12	6.52	6.22
Critical Hdwy Stg 1	6.12	5.52	-
Critical Hdwy Stg 2	6.12	5.52	-
Follow-up Hdwy	3.518	4.018	3.318
Pot Cap-1 Maneuver	329	343	686
Stage 1	640	612	-
Stage 2	655	626	-
Platoon blocked, %			
Mov Cap-1 Maneuver	320	336	686
Mov Cap-2 Maneuver	320	336	-
Stage 1	634	605	-
Stage 2	641	620	-

Approach SB

HCM Control Delay, s	16.7
HCM LOS	C

Minor Lane/Major Mvmt



Two Way Analysis cannot be performed on Signalized Intersection.























HCM 2010 Signalized Intersection Capacity Analysis

4: 10th Street & Market Street

Existing Plus Project Conditions

PM Peak

K60

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	249	105	82	254	5	104	14	117	6	16	8
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A _{pbT})	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	1	268	113	88	273	5	112	15	126	6	17	9
Adj No. of Lanes	1	2	1	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	330	667	298	327	664	12	213	43	362	20	164	87
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.19	0.19	0.19	0.18	0.19	0.19	0.12	0.25	0.25	0.01	0.14	0.14
Ln Grp Delay, s/veh	14.2	15.4	15.5	15.2	15.6	15.6	18.4	0.0	13.3	24.1	0.0	16.0
Ln Grp LOS	B	B	B	B	B	B	B		B	C		B
Approach Vol, veh/h		382			366			253			32	
Approach Delay, s/veh		15.4			15.5			15.6			17.6	
Approach LOS		B			B			B			B	
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Case No	2.0	3.0	2.0	4.0	2.0	4.0	2.0	4.0				
Phs Duration (G+Y+Rc), s	11.4	12.7	8.7	10.1	11.5	12.6	4.0	14.8				
Change Period (Y+Rc), s	3.5	4.6	3.5	4.0	3.5	4.6	3.5	4.0				
Max Green (Gmax), s	16.5	35.4	16.5	11.0	11.5	35.4	11.5	29.0				
Max Allow Headway (MAH), s	1.8	2.5	1.8	3.5	1.8	2.5	1.8	3.5				
Max Q Clear (g _c +I1), s	3.8	4.8	4.5	2.6	2.0	4.9	2.1	5.1				
Green Ext Time (g _e), s	0.0	0.8	0.0	0.2	0.0	0.8	0.0	0.4				
Prob of Phs Call (p _c)	0.99	1.00	0.74	0.87	1.00	1.00	0.07	0.96				
Prob of Max Out (p _x)	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00				
Left-Turn Movement Data												
Assigned Mvmt	1		3		5		7					
Mvmt Sat Flow, veh/h	1774		1774		1774		1774					
Through Movement Data												
Assigned Mvmt		2		4		6		8				
Mvmt Sat Flow, veh/h		3539		1148		3556		171				
Right-Turn Movement Data												
Assigned Mvmt		12		14		16		18				
Mvmt Sat Flow, veh/h		1583		608		65		1438				
Left Lane Group Data												
Assigned Mvmt	1	0	3	0	5	0	7	0				
Lane Assignment	(Prot)		(Prot)		(Prot)		(Prot)					
Lanes in Grp	1	0	1	0	1	0	1	0				

HCM 2010 Signalized Intersection Capacity Analysis

4: 10th Street & Market Street

Existing Plus Project Conditions

PM Peak

K61

Grp Vol (v), veh/h	88	0	112	0	1	0	6	0
Grp Sat Flow (s), veh/h/ln	1774	0	1774	0	1774	0	1774	0
Q Serve Time (g_s), s	1.8	0.0	2.5	0.0	0.0	0.0	0.1	0.0
Cycle Q Clear Time (g_c), s	1.8	0.0	2.5	0.0	0.0	0.0	0.1	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	0	0	0	0	0	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	327	0	213	0	330	0	20	0
V/C Ratio (X)	0.27	0.00	0.52	0.00	0.00	0.00	0.30	0.00
Avail Cap (c_a), veh/h	683	0	683	0	476	0	476	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	15.0	0.0	17.7	0.0	14.2	0.0	21.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.7	0.0	0.0	0.0	3.1	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	15.2	0.0	18.4	0.0	14.2	0.0	24.1	0.0
1st-Term Q (Q1), veh/ln	0.9	0.0	1.2	0.0	0.0	0.0	0.1	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	0.9	0.0	1.3	0.0	0.0	0.0	0.1	0.0
%ile Storage Ratio (RQ%)	0.16	0.00	0.14	0.00	0.00	0.00	0.02	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T				T			
Lanes in Grp	0	2	0	0	0	1	0	0
Grp Vol (v), veh/h	0	268	0	0	0	136	0	0
Grp Sat Flow (s), veh/h/ln	0	1770	0	0	0	1770	0	0
Q Serve Time (g_s), s	0.0	2.8	0.0	0.0	0.0	2.9	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	2.8	0.0	0.0	0.0	2.9	0.0	0.0
Lane Grp Cap (c), veh/h	0	667	0	0	0	331	0	0
V/C Ratio (X)	0.00	0.40	0.00	0.00	0.00	0.41	0.00	0.00
Avail Cap (c_a), veh/h	0	2925	0	0	0	1463	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	15.3	0.0	0.0	0.0	15.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.0	0.3	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	15.4	0.0	0.0	0.0	15.6	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	1.4	0.0	0.0	0.0	1.4	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HCM 2010 Signalized Intersection Capacity Analysis

4: 10th Street & Market Street

Existing Plus Project Conditions

PM Peak

K62

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	1.4	0.0	0.0	0.0	1.4	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.10	0.00	0.00	0.00	0.05	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		R		T+R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	113	0	26	0	142	0	141
Grp Sat Flow (s), veh/h/ln	0	1583	0	1756	0	1851	0	1609
Q Serve Time (g_s), s	0.0	2.7	0.0	0.6	0.0	2.9	0.0	3.1
Cycle Q Clear Time (g_c), s	0.0	2.7	0.0	0.6	0.0	2.9	0.0	3.1
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	1.00	0.00	0.35	0.00	0.04	0.00	0.89
Lane Grp Cap (c), veh/h	0	298	0	250	0	346	0	405
V/C Ratio (X)	0.00	0.38	0.00	0.10	0.00	0.41	0.00	0.35
Avail Cap (c_a), veh/h	0	1309	0	451	0	1530	0	1089
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	15.2	0.0	16.0	0.0	15.3	0.0	13.1
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.1	0.0	0.3	0.0	0.2
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	15.5	0.0	16.0	0.0	15.6	0.0	13.3
1st-Term Q (Q1), veh/ln	0.0	1.2	0.0	0.3	0.0	1.5	0.0	1.4
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	1.2	0.0	0.3	0.0	1.5	0.0	1.4
%ile Storage Ratio (RQ%)	0.00	0.26	0.00	0.03	0.00	0.05	0.00	0.05
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 2010 Ctrl Delay	15.6
HCM 2010 LOS	B

Appendix C:

Cumulative Conditions

Intersection Level of Service Calculations

Intersection

Int Delay, s/veh 0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	10	30	310	10	20	300
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	31	320	10	21	309

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	676	325	0	0	330	0
Stage 1	325	-	-	-	-	-
Stage 2	351	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	419	716	-	-	1229	-
Stage 1	732	-	-	-	-	-
Stage 2	713	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	410	716	-	-	1229	-
Mov Cap-2 Maneuver	410	-	-	-	-	-
Stage 1	732	-	-	-	-	-
Stage 2	698	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.4	0	0.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	603	1229	-
HCM Lane V/C Ratio	-	-	0.068	0.017	-
HCM Control Delay (s)	-	-	11.4	8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

Intersection							
Int Delay, s/veh	2.1						
Movement	EBL	EBR		NBL	NBT	SBT	SBR
Vol, veh/h	20	60		70	300	300	10
Conflicting Peds, #/hr	0	0		0	0	0	0
Sign Control	Stop	Stop		Free	Free	Free	Free
RT Channelized	-	None		-	None	-	None
Storage Length	0	-		40	-	-	-
Veh in Median Storage, #	0	-		-	0	0	-
Grade, %	0	-		-	0	0	-
Peak Hour Factor	91	91		91	91	91	91
Heavy Vehicles, %	2	2		2	2	2	2
Mvmt Flow	22	66		77	330	330	11
Major/Minor	Minor2		Major1		Major2		
Conflicting Flow All	819	335		341	0	-	0
Stage 1	335	-		-	-	-	-
Stage 2	484	-		-	-	-	-
Critical Hdwy	6.42	6.22		4.12	-	-	-
Critical Hdwy Stg 1	5.42	-		-	-	-	-
Critical Hdwy Stg 2	5.42	-		-	-	-	-
Follow-up Hdwy	3.518	3.318		2.218	-	-	-
Pot Cap-1 Maneuver	345	707		1218	-	-	-
Stage 1	725	-		-	-	-	-
Stage 2	620	-		-	-	-	-
Platoon blocked, %					-	-	-
Mov Cap-1 Maneuver	323	707		1218	-	-	-
Mov Cap-2 Maneuver	323	-		-	-	-	-
Stage 1	725	-		-	-	-	-
Stage 2	581	-		-	-	-	-
Approach	EB		NB		SB		
HCM Control Delay, s	12.9		1.5		0		
HCM LOS	B						
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR		
Capacity (veh/h)	1218	-	545	-	-		
HCM Lane V/C Ratio	0.063	-	0.161	-	-		
HCM Control Delay (s)	8.2	-	12.9	-	-		
HCM Lane LOS	A	-	B	-	-		
HCM 95th %tile Q(veh)	0.2	-	0.6	-	-		

Intersection									
Int Delay, s/veh	1.1								

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	5	360	10	10	350	5	10	5	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	100	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	404	11	11	393	6	11	6	17

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	399	0	0	416	0	0	845	842	410
Stage 1	-	-	-	-	-	-	421	421	-
Stage 2	-	-	-	-	-	-	424	421	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1160	-	-	1143	-	-	283	301	642
Stage 1	-	-	-	-	-	-	610	589	-
Stage 2	-	-	-	-	-	-	608	589	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1160	-	-	1143	-	-	273	297	642
Mov Cap-2 Maneuver	-	-	-	-	-	-	273	297	-
Stage 1	-	-	-	-	-	-	607	586	-
Stage 2	-	-	-	-	-	-	591	583	-

Approach	EB	WB	NB
HCM Control Delay, s	0.1	0.2	15.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	390	1160	-	-	1143	-	-	322
HCM Lane V/C Ratio	0.086	0.005	-	-	0.01	-	-	0.07
HCM Control Delay (s)	15.1	8.1	-	-	8.2	-	-	17
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0.2

Intersection			
Int Delay, s/veh			
Movement	SBL	SBT	SBR
Vol, veh/h	10	5	5
Conflicting Peds, #/hr	0	0	0
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	-	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	89	89	89
Heavy Vehicles, %	2	2	2
Mvmt Flow	11	6	6
Major/Minor	Minor2		
Conflicting Flow All	852	846	396
Stage 1	419	419	-
Stage 2	433	427	-
Critical Hdwy	7.12	6.52	6.22
Critical Hdwy Stg 1	6.12	5.52	-
Critical Hdwy Stg 2	6.12	5.52	-
Follow-up Hdwy	3.518	4.018	3.318
Pot Cap-1 Maneuver	280	299	653
Stage 1	612	590	-
Stage 2	601	585	-
Platoon blocked, %			
Mov Cap-1 Maneuver	266	295	653
Mov Cap-2 Maneuver	266	295	-
Stage 1	609	584	-
Stage 2	577	582	-
Approach	SB		
HCM Control Delay, s	17		
HCM LOS	C		
Minor Lane/Major Mvmt			

Two Way Analysis cannot be performed on Signalized Intersection.






















HCM 2010 Signalized Intersection Capacity Analysis

4: 10th Street & Market Street

Cumulative No Project Conditions

AM Peak

K69

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	230	140	100	240	5	140	10	140	5	10	5
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A _{pbT})	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	6	264	161	115	276	6	161	11	161	6	11	6
Adj No. of Lanes	1	2	1	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	322	648	290	320	645	14	243	28	404	20	164	89
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.14	0.27	0.27	0.01	0.14	0.14
Ln Grp Delay, s/veh	14.8	16.0	16.9	16.0	16.3	16.3	19.2	0.0	13.3	24.6	0.0	16.3
Ln Grp LOS	B	B	B	B	B	B	B		B	C		B
Approach Vol, veh/h		431			397			333			23	
Approach Delay, s/veh		16.3			16.2			16.2			18.5	
Approach LOS		B			B			B			B	
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs		1	2	3	4	5	6	7	8			
Case No		2.0	3.0	2.0	4.0	2.0	4.0	2.0	4.0			
Phs Duration (G+Y+Rc), s		11.4	12.6	9.5	10.4	11.5	12.6	4.0	15.9			
Change Period (Y+Rc), s		3.5	4.6	3.5	4.0	3.5	4.6	3.5	4.0			
Max Green (Gmax), s		16.5	35.4	16.5	11.0	11.5	35.4	11.5	29.0			
Max Allow Headway (MAH), s		1.8	2.5	1.8	3.5	1.8	2.5	1.8	3.5			
Max Q Clear (g _c +I1), s		4.5	6.1	5.8	2.4	2.1	5.0	2.1	5.9			
Green Ext Time (g _e), s		0.0	0.8	0.1	0.3	0.0	0.8	0.0	0.4			
Prob of Phs Call (p _c)		0.99	1.00	0.86	0.91	1.00	1.00	0.07	0.99			
Prob of Max Out (p _x)		0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00			
Left-Turn Movement Data												
Assigned Mvmt		1		3		5		7				
Mvmt Sat Flow, veh/h		1774		1774		1774		1774				
Through Movement Data												
Assigned Mvmt			2		4		6		8			
Mvmt Sat Flow, veh/h			3539		1135		3542		102			
Right-Turn Movement Data												
Assigned Mvmt			12		14		16		18			
Mvmt Sat Flow, veh/h			1583		619		77		1496			
Left Lane Group Data												
Assigned Mvmt		1	0	3	0	5	0	7	0			
Lane Assignment		(Prot)		(Prot)		(Prot)		(Prot)				
Lanes in Grp		1	0	1	0	1	0	1	0			

HCM 2010 Signalized Intersection Capacity Analysis

4: 10th Street & Market Street

Cumulative No Project Conditions

AM Peak



Grp Vol (v), veh/h	115	0	161	0	6	0	6	0
Grp Sat Flow (s), veh/h/ln	1774	0	1774	0	1774	0	1774	0
Q Serve Time (g_s), s	2.5	0.0	3.8	0.0	0.1	0.0	0.1	0.0
Cycle Q Clear Time (g_c), s	2.5	0.0	3.8	0.0	0.1	0.0	0.1	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	0	0	0	0	0	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	320	0	243	0	322	0	20	0
V/C Ratio (X)	0.36	0.00	0.66	0.00	0.02	0.00	0.30	0.00
Avail Cap (c_a), veh/h	666	0	666	0	464	0	464	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	15.8	0.0	18.0	0.0	14.8	0.0	21.6	0.0
Incr Delay (d2), s/veh	0.3	0.0	1.2	0.0	0.0	0.0	3.1	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	16.0	0.0	19.2	0.0	14.8	0.0	24.6	0.0
1st-Term Q (Q1), veh/ln	1.2	0.0	1.8	0.0	0.1	0.0	0.1	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	1.2	0.0	1.9	0.0	0.1	0.0	0.1	0.0
%ile Storage Ratio (RQ%)	0.22	0.00	0.21	0.00	0.01	0.00	0.02	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T				T			
Lanes in Grp	0	2	0	0	0	1	0	0
Grp Vol (v), veh/h	0	264	0	0	0	138	0	0
Grp Sat Flow (s), veh/h/ln	0	1770	0	0	0	1770	0	0
Q Serve Time (g_s), s	0.0	2.9	0.0	0.0	0.0	3.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	2.9	0.0	0.0	0.0	3.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	648	0	0	0	322	0	0
V/C Ratio (X)	0.00	0.41	0.00	0.00	0.00	0.43	0.00	0.00
Avail Cap (c_a), veh/h	0	2850	0	0	0	1425	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	15.9	0.0	0.0	0.0	15.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.0	0.0	0.3	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	16.0	0.0	0.0	0.0	16.3	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	1.4	0.0	0.0	0.0	1.5	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HCM 2010 Signalized Intersection Capacity Analysis

4: 10th Street & Market Street

Cumulative No Project Conditions

AM Peak

K71

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	1.4	0.0	0.0	0.0	1.5	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.10	0.00	0.00	0.00	0.05	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		R		T+R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	161	0	17	0	144	0	172
Grp Sat Flow (s), veh/h/ln	0	1583	0	1754	0	1849	0	1599
Q Serve Time (g_s), s	0.0	4.1	0.0	0.4	0.0	3.0	0.0	3.9
Cycle Q Clear Time (g_c), s	0.0	4.1	0.0	0.4	0.0	3.0	0.0	3.9
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	1.00	0.00	0.35	0.00	0.04	0.00	0.94
Lane Grp Cap (c), veh/h	0	290	0	253	0	336	0	432
V/C Ratio (X)	0.00	0.56	0.00	0.07	0.00	0.43	0.00	0.40
Avail Cap (c_a), veh/h	0	1275	0	439	0	1489	0	1055
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	16.3	0.0	16.2	0.0	16.0	0.0	13.1
Incr Delay (d2), s/veh	0.0	0.6	0.0	0.0	0.0	0.3	0.0	0.2
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	16.9	0.0	16.3	0.0	16.3	0.0	13.3
1st-Term Q (Q1), veh/ln	0.0	1.7	0.0	0.2	0.0	1.5	0.0	1.7
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	1.8	0.0	0.2	0.0	1.6	0.0	1.7
%ile Storage Ratio (RQ%)	0.00	0.40	0.00	0.02	0.00	0.05	0.00	0.06
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 2010 Ctrl Delay	16.3
HCM 2010 LOS	B

Intersection						
Int Delay, s/veh	0.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	15	30	380	5	20	350
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	31	392	5	21	361
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	796	394	0	0	397	0
Stage 1	394	-	-	-	-	-
Stage 2	402	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	356	655	-	-	1162	-
Stage 1	681	-	-	-	-	-
Stage 2	676	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	348	655	-	-	1162	-
Mov Cap-2 Maneuver	348	-	-	-	-	-
Stage 1	681	-	-	-	-	-
Stage 2	660	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	12.8	0	0.4			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	506	1162	-	
HCM Lane V/C Ratio	-	-	0.092	0.018	-	
HCM Control Delay (s)	-	-	12.8	8.2	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-	

Intersection							
Int Delay, s/veh	2						
Movement	EBL	EBR		NBL	NBT	SBT	SBR
Vol, veh/h	10	90		70	370	350	15
Conflicting Peds, #/hr	0	0		0	0	0	0
Sign Control	Stop	Stop		Free	Free	Free	Free
RT Channelized	-	None		-	None	-	None
Storage Length	0	-		40	-	-	-
Veh in Median Storage, #	0	-		-	0	0	-
Grade, %	0	-		-	0	0	-
Peak Hour Factor	92	92		92	92	92	92
Heavy Vehicles, %	2	2		2	2	2	2
Mvmt Flow	11	98		76	402	380	16
Major/Minor	Minor2		Major1		Major2		
Conflicting Flow All	943	389		397	0	-	0
Stage 1	389	-		-	-	-	-
Stage 2	554	-		-	-	-	-
Critical Hdwy	6.42	6.22		4.12	-	-	-
Critical Hdwy Stg 1	5.42	-		-	-	-	-
Critical Hdwy Stg 2	5.42	-		-	-	-	-
Follow-up Hdwy	3.518	3.318		2.218	-	-	-
Pot Cap-1 Maneuver	291	659		1162	-	-	-
Stage 1	685	-		-	-	-	-
Stage 2	575	-		-	-	-	-
Platoon blocked, %					-	-	-
Mov Cap-1 Maneuver	272	659		1162	-	-	-
Mov Cap-2 Maneuver	272	-		-	-	-	-
Stage 1	685	-		-	-	-	-
Stage 2	537	-		-	-	-	-
Approach	EB		NB		SB		
HCM Control Delay, s	12.7		1.3		0		
HCM LOS	B						
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR		
Capacity (veh/h)	1162	-	577	-	-		
HCM Lane V/C Ratio	0.065	-	0.188	-	-		
HCM Control Delay (s)	8.3	-	12.7	-	-		
HCM Lane LOS	A	-	B	-	-		
HCM 95th %tile Q(veh)	0.2	-	0.7	-	-		

Intersection

Int Delay, s/veh 1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	10	430	5	15	420	10	10	5	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	100	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	453	5	16	442	11	11	5	11

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	453	0	0	458	0	0	960	960	455
Stage 1	-	-	-	-	-	-	476	476	-
Stage 2	-	-	-	-	-	-	484	484	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1108	-	-	1103	-	-	236	257	605
Stage 1	-	-	-	-	-	-	570	557	-
Stage 2	-	-	-	-	-	-	564	552	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1108	-	-	1103	-	-	226	251	605
Mov Cap-2 Maneuver	-	-	-	-	-	-	226	251	-
Stage 1	-	-	-	-	-	-	564	551	-
Stage 2	-	-	-	-	-	-	546	544	-

Approach	EB	WB	NB
HCM Control Delay, s	0.2	0.3	17.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	310	1108	-	-	1103	-	-	274
HCM Lane V/C Ratio	0.085	0.01	-	-	0.014	-	-	0.077
HCM Control Delay (s)	17.7	8.3	-	-	8.3	-	-	19.2
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0.2

Intersection

Int Delay, s/veh

Movement	SBL	SBT	SBR
Vol, veh/h	10	5	5
Conflicting Peds, #/hr	0	0	0
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	-	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	95	95	95
Heavy Vehicles, %	2	2	2
Mvmt Flow	11	5	5

Major/Minor	Minor2		
Conflicting Flow All	963	958	447
Stage 1	479	479	-
Stage 2	484	479	-
Critical Hdwy	7.12	6.52	6.22
Critical Hdwy Stg 1	6.12	5.52	-
Critical Hdwy Stg 2	6.12	5.52	-
Follow-up Hdwy	3.518	4.018	3.318
Pot Cap-1 Maneuver	235	257	612
Stage 1	568	555	-
Stage 2	564	555	-
Platoon blocked, %			
Mov Cap-1 Maneuver	223	251	612
Mov Cap-2 Maneuver	223	251	-
Stage 1	562	547	-
Stage 2	543	549	-

Approach SB

HCM Control Delay, s	19.2
HCM LOS	C

Minor Lane/Major Mvmt

Two Way Analysis cannot be performed on Signalized Intersection.






















HCM 2010 Signalized Intersection Capacity Analysis

4: 10th Street & Market Street

Cumulative No Project Conditions

PM Peak

K76

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	300	150	120	300	10	140	20	150	10	20	10
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A _{pbT})	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	11	323	161	129	323	11	151	22	161	11	22	11
Adj No. of Lanes	1	2	1	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	322	644	288	321	634	22	237	51	373	36	175	87
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.13	0.26	0.26	0.02	0.15	0.15
Ln Grp Delay, s/veh	14.9	16.4	17.0	16.2	16.7	16.7	19.1	0.0	13.8	23.1	0.0	16.3
Ln Grp LOS	B	B	B	B	B	B	B		B	C		B
Approach Vol, veh/h		495			463			334			44	
Approach Delay, s/veh		16.6			16.6			16.2			18.0	
Approach LOS		B			B			B			B	
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Case No	2.0	3.0	2.0	4.0	2.0	4.0	2.0	4.0				
Phs Duration (G+Y+Rc), s	11.5	12.6	9.4	10.6	11.5	12.6	4.4	15.6				
Change Period (Y+Rc), s	3.5	4.6	3.5	4.0	3.5	4.6	3.5	4.0				
Max Green (Gmax), s	16.5	35.4	16.5	11.0	11.5	35.4	11.5	29.0				
Max Allow Headway (MAH), s	1.8	2.5	1.8	3.5	1.8	2.5	1.8	3.5				
Max Q Clear (g _c +I1), s	4.8	6.1	5.6	2.7	2.2	5.7	2.3	6.2				
Green Ext Time (g _e), s	0.0	1.0	0.0	0.3	0.0	1.0	0.0	0.5				
Prob of Phs Call (p _c)	1.00	1.00	0.84	0.94	1.00	1.00	0.13	0.99				
Prob of Max Out (p _x)	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00				
Left-Turn Movement Data												
Assigned Mvmt	1		3		5		7					
Mvmt Sat Flow, veh/h	1774		1774		1774		1774					
Through Movement Data												
Assigned Mvmt		2		4		6		8				
Mvmt Sat Flow, veh/h		3539		1173		3493		194				
Right-Turn Movement Data												
Assigned Mvmt		12		14		16		18				
Mvmt Sat Flow, veh/h		1583		586		119		1419				
Left Lane Group Data												
Assigned Mvmt	1	0	3	0	5	0	7	0				
Lane Assignment	(Prot)		(Prot)		(Prot)		(Prot)					
Lanes in Grp	1	0	1	0	1	0	1	0				

HCM 2010 Signalized Intersection Capacity Analysis

4: 10th Street & Market Street

Cumulative No Project Conditions

PM Peak

K77

Grp Vol (v), veh/h	129	0	151	0	11	0	11	0
Grp Sat Flow (s), veh/h/ln	1774	0	1774	0	1774	0	1774	0
Q Serve Time (g_s), s	2.8	0.0	3.6	0.0	0.2	0.0	0.3	0.0
Cycle Q Clear Time (g_c), s	2.8	0.0	3.6	0.0	0.2	0.0	0.3	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	0	0	0	0	0	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	321	0	237	0	322	0	36	0
V/C Ratio (X)	0.40	0.00	0.64	0.00	0.03	0.00	0.31	0.00
Avail Cap (c_a), veh/h	664	0	664	0	463	0	463	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	15.9	0.0	18.1	0.0	14.9	0.0	21.3	0.0
Incr Delay (d2), s/veh	0.3	0.0	1.1	0.0	0.0	0.0	1.8	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	16.2	0.0	19.1	0.0	14.9	0.0	23.1	0.0
1st-Term Q (Q1), veh/ln	1.4	0.0	1.7	0.0	0.1	0.0	0.1	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	1.4	0.0	1.8	0.0	0.1	0.0	0.1	0.0
%ile Storage Ratio (RQ%)	0.25	0.00	0.20	0.00	0.02	0.00	0.04	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T				T			
Lanes in Grp	0	2	0	0	0	1	0	0
Grp Vol (v), veh/h	0	323	0	0	0	163	0	0
Grp Sat Flow (s), veh/h/ln	0	1770	0	0	0	1770	0	0
Q Serve Time (g_s), s	0.0	3.6	0.0	0.0	0.0	3.7	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	3.6	0.0	0.0	0.0	3.7	0.0	0.0
Lane Grp Cap (c), veh/h	0	644	0	0	0	321	0	0
V/C Ratio (X)	0.00	0.50	0.00	0.00	0.00	0.51	0.00	0.00
Avail Cap (c_a), veh/h	0	2844	0	0	0	1422	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	16.2	0.0	0.0	0.0	16.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.0	0.0	0.5	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	16.4	0.0	0.0	0.0	16.7	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	1.7	0.0	0.0	0.0	1.8	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HCM 2010 Signalized Intersection Capacity Analysis

4: 10th Street & Market Street

Cumulative No Project Conditions

PM Peak



3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	1.8	0.0	0.0	0.0	1.8	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.13	0.00	0.00	0.00	0.06	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		R		T+R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	161	0	33	0	171	0	183
Grp Sat Flow (s), veh/h/ln	0	1583	0	1759	0	1842	0	1612
Q Serve Time (g_s), s	0.0	4.1	0.0	0.7	0.0	3.7	0.0	4.2
Cycle Q Clear Time (g_c), s	0.0	4.1	0.0	0.7	0.0	3.7	0.0	4.2
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	1.00	0.00	0.33	0.00	0.06	0.00	0.88
Lane Grp Cap (c), veh/h	0	288	0	262	0	334	0	424
V/C Ratio (X)	0.00	0.56	0.00	0.13	0.00	0.51	0.00	0.43
Avail Cap (c_a), veh/h	0	1272	0	439	0	1480	0	1061
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	16.4	0.0	16.3	0.0	16.3	0.0	13.5
Incr Delay (d2), s/veh	0.0	0.6	0.0	0.1	0.0	0.4	0.0	0.3
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	17.0	0.0	16.3	0.0	16.7	0.0	13.8
1st-Term Q (Q1), veh/ln	0.0	1.7	0.0	0.3	0.0	1.8	0.0	1.8
2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	1.8	0.0	0.4	0.0	1.9	0.0	1.9
%ile Storage Ratio (RQ%)	0.00	0.40	0.00	0.04	0.00	0.06	0.00	0.06
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 2010 Ctrl Delay	16.5
HCM 2010 LOS	B

Intersection

Int Delay, s/veh 1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	11	37	310	11	26	303
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	38	320	11	27	312

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	691	325	0	0	331	0
Stage 1	325	-	-	-	-	-
Stage 2	366	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	410	716	-	-	1228	-
Stage 1	732	-	-	-	-	-
Stage 2	702	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	399	716	-	-	1228	-
Mov Cap-2 Maneuver	399	-	-	-	-	-
Stage 1	732	-	-	-	-	-
Stage 2	683	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.5	0	0.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	606	1228	-
HCM Lane V/C Ratio	-	-	0.082	0.022	-
HCM Control Delay (s)	-	-	11.5	8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-

Intersection							
Int Delay, s/veh	2.2						
Movement	EBL	EBR		NBL	NBT	SBT	SBR
Vol, veh/h	21	61		71	300	303	11
Conflicting Peds, #/hr	0	0		0	0	0	0
Sign Control	Stop	Stop		Free	Free	Free	Free
RT Channelized	-	None		-	None	-	None
Storage Length	0	-		40	-	-	-
Veh in Median Storage, #	0	-		-	0	0	-
Grade, %	0	-		-	0	0	-
Peak Hour Factor	91	91		91	91	91	91
Heavy Vehicles, %	2	2		2	2	2	2
Mvmt Flow	23	67		78	330	333	12
Major/Minor	Minor2		Major1		Major2		
Conflicting Flow All	825	339		345	0	-	0
Stage 1	339	-		-	-	-	-
Stage 2	486	-		-	-	-	-
Critical Hdwy	6.42	6.22		4.12	-	-	-
Critical Hdwy Stg 1	5.42	-		-	-	-	-
Critical Hdwy Stg 2	5.42	-		-	-	-	-
Follow-up Hdwy	3.518	3.318		2.218	-	-	-
Pot Cap-1 Maneuver	342	703		1214	-	-	-
Stage 1	722	-		-	-	-	-
Stage 2	618	-		-	-	-	-
Platoon blocked, %					-	-	-
Mov Cap-1 Maneuver	320	703		1214	-	-	-
Mov Cap-2 Maneuver	320	-		-	-	-	-
Stage 1	722	-		-	-	-	-
Stage 2	578	-		-	-	-	-
Approach	EB		NB		SB		
HCM Control Delay, s	13		1.6		0		
HCM LOS	B						
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR		
Capacity (veh/h)	1214	-	538	-	-		
HCM Lane V/C Ratio	0.064	-	0.167	-	-		
HCM Control Delay (s)	8.2	-	13	-	-		
HCM Lane LOS	A	-	B	-	-		
HCM 95th %tile Q(veh)	0.2	-	0.6	-	-		

Intersection									
Int Delay, s/veh	1.6								
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	9	360	10	10	350	22	10	6	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	100	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	404	11	11	393	25	11	7	17
Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	418	0	0	416	0	0	864	870	410
Stage 1	-	-	-	-	-	-	430	430	-
Stage 2	-	-	-	-	-	-	434	440	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1141	-	-	1143	-	-	274	290	642
Stage 1	-	-	-	-	-	-	603	583	-
Stage 2	-	-	-	-	-	-	600	578	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1141	-	-	1143	-	-	263	285	642
Mov Cap-2 Maneuver	-	-	-	-	-	-	263	285	-
Stage 1	-	-	-	-	-	-	598	578	-
Stage 2	-	-	-	-	-	-	582	572	-
Approach	EB			WB			NB		
HCM Control Delay, s	0.2			0.2			15.6		
HCM LOS							C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	
Capacity (veh/h)	376	1141	-	-	1143	-	-	292	
HCM Lane V/C Ratio	0.093	0.009	-	-	0.01	-	-	0.131	
HCM Control Delay (s)	15.6	8.2	-	-	8.2	-	-	19.2	
HCM Lane LOS	C	A	-	-	A	-	-	C	
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0.4	

Intersection

Int Delay, s/veh

Movement	SBL	SBT	SBR
Vol, veh/h	23	5	6
Conflicting Peds, #/hr	0	0	0
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	-	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	89	89	89
Heavy Vehicles, %	2	2	2
Mvmt Flow	26	6	7

Major/Minor	Minor2		
Conflicting Flow All	870	864	406
Stage 1	428	428	-
Stage 2	442	436	-
Critical Hdwy	7.12	6.52	6.22
Critical Hdwy Stg 1	6.12	5.52	-
Critical Hdwy Stg 2	6.12	5.52	-
Follow-up Hdwy	3.518	4.018	3.318
Pot Cap-1 Maneuver	272	292	645
Stage 1	605	585	-
Stage 2	594	580	-
Platoon blocked, %			
Mov Cap-1 Maneuver	256	287	645
Mov Cap-2 Maneuver	256	287	-
Stage 1	600	579	-
Stage 2	567	575	-

Approach SB

HCM Control Delay, s	19.2
HCM LOS	C

Minor Lane/Major Mvmt

Two Way Analysis cannot be performed on Signalized Intersection.






















HCM 2010 Signalized Intersection Capacity Analysis

4: 10th Street & Market Street

Cumulative Plus Project Conditions

AM Peak

K84

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	238	145	100	250	5	147	10	140	5	10	5
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A _{pbT})	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	6	274	167	115	287	6	169	11	161	6	11	6
Adj No. of Lanes	1	2	1	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	322	646	289	320	644	13	246	28	407	20	164	89
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.14	0.27	0.27	0.01	0.14	0.14
Ln Grp Delay, s/veh	14.8	16.1	17.1	16.1	16.4	16.4	19.3	0.0	13.3	24.7	0.0	16.3
Ln Grp LOS	B	B	B	B	B	B	B		B	C		B
Approach Vol, veh/h		447			408			341			23	
Approach Delay, s/veh		16.5			16.3			16.3			18.5	
Approach LOS		B			B			B			B	
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Case No	2.0	3.0	2.0	4.0	2.0	4.0	2.0	4.0				
Phs Duration (G+Y+Rc), s	11.4	12.6	9.6	10.4	11.5	12.6	4.0	16.0				
Change Period (Y+Rc), s	3.5	4.6	3.5	4.0	3.5	4.6	3.5	4.0				
Max Green (Gmax), s	16.5	35.4	16.5	11.0	11.5	35.4	11.5	29.0				
Max Allow Headway (MAH), s	1.8	2.5	1.8	3.5	1.8	2.5	1.8	3.5				
Max Q Clear (g _c +I1), s	4.5	6.2	6.0	2.4	2.1	5.2	2.1	5.9				
Green Ext Time (g _e), s	0.0	0.9	0.1	0.3	0.0	0.9	0.0	0.4				
Prob of Phs Call (p _c)	0.99	1.00	0.87	0.91	1.00	1.00	0.07	0.99				
Prob of Max Out (p _x)	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00				
Left-Turn Movement Data												
Assigned Mvmt	1		3		5		7					
Mvmt Sat Flow, veh/h	1774		1774		1774		1774					
Through Movement Data												
Assigned Mvmt		2		4		6		8				
Mvmt Sat Flow, veh/h		3539		1135		3545		102				
Right-Turn Movement Data												
Assigned Mvmt		12		14		16		18				
Mvmt Sat Flow, veh/h		1583		619		74		1496				
Left Lane Group Data												
Assigned Mvmt	1	0	3	0	5	0	7	0				
Lane Assignment	(Prot)		(Prot)		(Prot)		(Prot)					
Lanes in Grp	1	0	1	0	1	0	1	0				

HCM 2010 Signalized Intersection Capacity Analysis

4: 10th Street & Market Street

Cumulative Plus Project Conditions

AM Peak

K85

Grp Vol (v), veh/h	115	0	169	0	6	0	6	0
Grp Sat Flow (s), veh/h/ln	1774	0	1774	0	1774	0	1774	0
Q Serve Time (g_s), s	2.5	0.0	4.0	0.0	0.1	0.0	0.1	0.0
Cycle Q Clear Time (g_c), s	2.5	0.0	4.0	0.0	0.1	0.0	0.1	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	0	0	0	0	0	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	320	0	246	0	322	0	20	0
V/C Ratio (X)	0.36	0.00	0.69	0.00	0.02	0.00	0.30	0.00
Avail Cap (c_a), veh/h	664	0	664	0	463	0	463	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	15.8	0.0	18.1	0.0	14.8	0.0	21.6	0.0
Incr Delay (d2), s/veh	0.3	0.0	1.3	0.0	0.0	0.0	3.1	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	16.1	0.0	19.3	0.0	14.8	0.0	24.7	0.0
1st-Term Q (Q1), veh/ln	1.2	0.0	1.9	0.0	0.1	0.0	0.1	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	1.2	0.0	2.0	0.0	0.1	0.0	0.1	0.0
%ile Storage Ratio (RQ%)	0.22	0.00	0.22	0.00	0.01	0.00	0.02	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T				T			
Lanes in Grp	0	2	0	0	0	1	0	0
Grp Vol (v), veh/h	0	274	0	0	0	143	0	0
Grp Sat Flow (s), veh/h/ln	0	1770	0	0	0	1770	0	0
Q Serve Time (g_s), s	0.0	3.0	0.0	0.0	0.0	3.2	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	3.0	0.0	0.0	0.0	3.2	0.0	0.0
Lane Grp Cap (c), veh/h	0	646	0	0	0	321	0	0
V/C Ratio (X)	0.00	0.42	0.00	0.00	0.00	0.45	0.00	0.00
Avail Cap (c_a), veh/h	0	2843	0	0	0	1422	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	16.0	0.0	0.0	0.0	16.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.0	0.0	0.4	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	16.1	0.0	0.0	0.0	16.4	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	1.5	0.0	0.0	0.0	1.5	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HCM 2010 Signalized Intersection Capacity Analysis

4: 10th Street & Market Street

Cumulative Plus Project Conditions

AM Peak

K86

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	1.5	0.0	0.0	0.0	1.6	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.11	0.00	0.00	0.00	0.05	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		R		T+R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	167	0	17	0	150	0	172
Grp Sat Flow (s), veh/h/ln	0	1583	0	1754	0	1850	0	1599
Q Serve Time (g_s), s	0.0	4.2	0.0	0.4	0.0	3.2	0.0	3.9
Cycle Q Clear Time (g_c), s	0.0	4.2	0.0	0.4	0.0	3.2	0.0	3.9
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	1.00	0.00	0.35	0.00	0.04	0.00	0.94
Lane Grp Cap (c), veh/h	0	289	0	253	0	336	0	435
V/C Ratio (X)	0.00	0.58	0.00	0.07	0.00	0.45	0.00	0.40
Avail Cap (c_a), veh/h	0	1272	0	438	0	1486	0	1052
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	16.5	0.0	16.3	0.0	16.1	0.0	13.1
Incr Delay (d2), s/veh	0.0	0.7	0.0	0.0	0.0	0.3	0.0	0.2
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	17.1	0.0	16.3	0.0	16.4	0.0	13.3
1st-Term Q (Q1), veh/ln	0.0	1.9	0.0	0.2	0.0	1.6	0.0	1.7
2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	1.9	0.0	0.2	0.0	1.7	0.0	1.7
%ile Storage Ratio (RQ%)	0.00	0.42	0.00	0.02	0.00	0.05	0.00	0.06
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 2010 Ctrl Delay	16.4
HCM 2010 LOS	B

Intersection

Int Delay, s/veh 1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	16	38	380	7	26	354
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	39	392	7	27	365

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	814	395	0	0	399	0
Stage 1	395	-	-	-	-	-
Stage 2	419	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	347	654	-	-	1160	-
Stage 1	681	-	-	-	-	-
Stage 2	664	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	337	654	-	-	1160	-
Mov Cap-2 Maneuver	337	-	-	-	-	-
Stage 1	681	-	-	-	-	-
Stage 2	645	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.9	0	0.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	511	1160	-
HCM Lane V/C Ratio	-	-	0.109	0.023	-
HCM Control Delay (s)	-	-	12.9	8.2	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0.1	-

Intersection						
Int Delay, s/veh	2.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	12	91	71	370	354	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	40	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	100	78	407	389	18
Major/Minor	Minor2	Major1			Major2	
Conflicting Flow All	961	398	407	0	-	0
Stage 1	398	-	-	-	-	-
Stage 2	563	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	284	652	1152	-	-	-
Stage 1	678	-	-	-	-	-
Stage 2	570	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	265	652	1152	-	-	-
Mov Cap-2 Maneuver	265	-	-	-	-	-
Stage 1	678	-	-	-	-	-
Stage 2	531	-	-	-	-	-
Approach	EB	NB			SB	
HCM Control Delay, s	13.1	1.3			0	
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1152	-	557	-	-	
HCM Lane V/C Ratio	0.068	-	0.203	-	-	
HCM Control Delay (s)	8.4	-	13.1	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0.2	-	0.8	-	-	

Intersection									
Int Delay, s/veh	1.7								
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	15	430	5	15	420	30	10	6	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	100	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	483	6	17	472	34	11	7	11
Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	506	0	0	489	0	0	1049	1059	486
Stage 1	-	-	-	-	-	-	520	520	-
Stage 2	-	-	-	-	-	-	529	539	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1059	-	-	1074	-	-	205	224	581
Stage 1	-	-	-	-	-	-	539	532	-
Stage 2	-	-	-	-	-	-	533	522	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1059	-	-	1074	-	-	194	217	581
Mov Cap-2 Maneuver	-	-	-	-	-	-	194	217	-
Stage 1	-	-	-	-	-	-	530	523	-
Stage 2	-	-	-	-	-	-	513	514	-
Approach	EB	WB				NB			
HCM Control Delay, s	0.3	0.3				19.9			
HCM LOS	C								
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	
Capacity (veh/h)	270	1059	-	-	1074	-	-	221	
HCM Lane V/C Ratio	0.108	0.016	-	-	0.016	-	-	0.183	
HCM Control Delay (s)	19.9	8.5	-	-	8.4	-	-	24.9	
HCM Lane LOS	C	A	-	-	A	-	-	C	
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-	-	0.7	

Intersection

Int Delay, s/veh

Movement	SBL	SBT	SBR
Vol, veh/h	25	5	6
Conflicting Peds, #/hr	0	0	0
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	-	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	89	89	89
Heavy Vehicles, %	2	2	2
Mvmt Flow	28	6	7

Major/Minor	Minor2		
Conflicting Flow All	1051	1044	489
Stage 1	522	522	-
Stage 2	529	522	-
Critical Hdwy	7.12	6.52	6.22
Critical Hdwy Stg 1	6.12	5.52	-
Critical Hdwy Stg 2	6.12	5.52	-
Follow-up Hdwy	3.518	4.018	3.318
Pot Cap-1 Maneuver	205	229	579
Stage 1	538	531	-
Stage 2	533	531	-
Platoon blocked, %			
Mov Cap-1 Maneuver	192	222	579
Mov Cap-2 Maneuver	192	222	-
Stage 1	529	523	-
Stage 2	508	522	-

Approach SB

HCM Control Delay, s	24.9
HCM LOS	C

Minor Lane/Major Mvmt



Two Way Analysis cannot be performed on Signalized Intersection.






















HCM 2010 Signalized Intersection Capacity Analysis

4: 10th Street & Market Street

Cumulative Plus Project Conditions

PM Peak

K92

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	309	156	120	312	10	148	20	150	10	20	10
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A _{pbT})	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	11	355	179	138	359	11	170	23	172	11	23	11
Adj No. of Lanes	1	2	1	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	320	639	286	319	632	19	245	51	381	35	178	85
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.14	0.27	0.27	0.02	0.15	0.15
Ln Grp Delay, s/veh	15.0	16.8	17.6	16.5	17.2	17.2	19.5	0.0	13.8	23.3	0.0	16.4
Ln Grp LOS	B	B	B	B	B	B	B		B	C		B
Approach Vol, veh/h		545			508			365			45	
Approach Delay, s/veh		17.1			17.0			16.5			18.1	
Approach LOS		B			B			B			B	
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Case No	2.0	3.0	2.0	4.0	2.0	4.0	2.0	4.0				
Phs Duration (G+Y+Rc), s	11.5	12.6	9.6	10.6	11.5	12.6	4.4	15.9				
Change Period (Y+Rc), s	3.5	4.6	3.5	4.0	3.5	4.6	3.5	4.0				
Max Green (Gmax), s	16.5	35.4	16.5	11.0	11.5	35.4	11.5	29.0				
Max Allow Headway (MAH), s	1.8	2.5	1.8	3.5	1.8	2.5	1.8	3.5				
Max Q Clear (g _c +I1), s	5.1	6.6	6.1	2.7	2.2	6.2	2.3	6.5				
Green Ext Time (g _e), s	0.0	1.1	0.1	0.3	0.0	1.1	0.0	0.5				
Prob of Phs Call (p _c)	1.00	1.00	0.88	0.95	1.00	1.00	0.13	0.99				
Prob of Max Out (p _x)	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00				
Left-Turn Movement Data												
Assigned Mvmt	1		3		5		7					
Mvmt Sat Flow, veh/h	1774		1774		1774		1774					
Through Movement Data												
Assigned Mvmt		2		4		6		8				
Mvmt Sat Flow, veh/h		3539		1192		3506		190				
Right-Turn Movement Data												
Assigned Mvmt		12		14		16		18				
Mvmt Sat Flow, veh/h		1583		570		107		1422				
Left Lane Group Data												
Assigned Mvmt	1	0	3	0	5	0	7	0				
Lane Assignment	(Prot)		(Prot)		(Prot)		(Prot)					
Lanes in Grp	1	0	1	0	1	0	1	0				

HCM 2010 Signalized Intersection Capacity Analysis

4: 10th Street & Market Street

Cumulative Plus Project Conditions

PM Peak



Grp Vol (v), veh/h	138	0	170	0	11	0	11	0
Grp Sat Flow (s), veh/h/ln	1774	0	1774	0	1774	0	1774	0
Q Serve Time (g_s), s	3.1	0.0	4.1	0.0	0.2	0.0	0.3	0.0
Cycle Q Clear Time (g_c), s	3.1	0.0	4.1	0.0	0.2	0.0	0.3	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	0	0	0	0	0	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	319	0	245	0	320	0	35	0
V/C Ratio (X)	0.43	0.00	0.69	0.00	0.03	0.00	0.31	0.00
Avail Cap (c_a), veh/h	660	0	660	0	460	0	460	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	16.2	0.0	18.2	0.0	15.0	0.0	21.4	0.0
Incr Delay (d2), s/veh	0.3	0.0	1.3	0.0	0.0	0.0	1.8	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	16.5	0.0	19.5	0.0	15.0	0.0	23.3	0.0
1st-Term Q (Q1), veh/ln	1.5	0.0	2.0	0.0	0.1	0.0	0.1	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	1.5	0.0	2.1	0.0	0.1	0.0	0.1	0.0
%ile Storage Ratio (RQ%)	0.28	0.00	0.23	0.00	0.02	0.00	0.04	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T				T			
Lanes in Grp	0	2	0	0	0	1	0	0
Grp Vol (v), veh/h	0	355	0	0	0	181	0	0
Grp Sat Flow (s), veh/h/ln	0	1770	0	0	0	1770	0	0
Q Serve Time (g_s), s	0.0	4.1	0.0	0.0	0.0	4.1	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	4.1	0.0	0.0	0.0	4.1	0.0	0.0
Lane Grp Cap (c), veh/h	0	639	0	0	0	319	0	0
V/C Ratio (X)	0.00	0.56	0.00	0.00	0.00	0.57	0.00	0.00
Avail Cap (c_a), veh/h	0	2823	0	0	0	1412	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	16.6	0.0	0.0	0.0	16.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.0	0.0	0.6	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	16.8	0.0	0.0	0.0	17.2	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0

HCM 2010 Signalized Intersection Capacity Analysis

4: 10th Street & Market Street

Cumulative Plus Project Conditions

PM Peak

K94

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	2.0	0.0	0.0	0.0	2.1	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.15	0.00	0.00	0.00	0.07	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		R		T+R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	179	0	34	0	189	0	195
Grp Sat Flow (s), veh/h/ln	0	1583	0	1762	0	1844	0	1612
Q Serve Time (g_s), s	0.0	4.6	0.0	0.7	0.0	4.2	0.0	4.5
Cycle Q Clear Time (g_c), s	0.0	4.6	0.0	0.7	0.0	4.2	0.0	4.5
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	1.00	0.00	0.32	0.00	0.06	0.00	0.88
Lane Grp Cap (c), veh/h	0	286	0	264	0	332	0	432
V/C Ratio (X)	0.00	0.63	0.00	0.13	0.00	0.57	0.00	0.45
Avail Cap (c_a), veh/h	0	1263	0	437	0	1471	0	1053
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	16.8	0.0	16.4	0.0	16.6	0.0	13.5
Incr Delay (d2), s/veh	0.0	0.8	0.0	0.1	0.0	0.6	0.0	0.3
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	17.6	0.0	16.4	0.0	17.2	0.0	13.8
1st-Term Q (Q1), veh/ln	0.0	2.0	0.0	0.4	0.0	2.1	0.0	1.9
2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	2.1	0.0	0.4	0.0	2.2	0.0	2.0
%ile Storage Ratio (RQ%)	0.00	0.46	0.00	0.04	0.00	0.07	0.00	0.07
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary


















HCM 2010 Ctrl Delay	16.9
HCM 2010 LOS	B



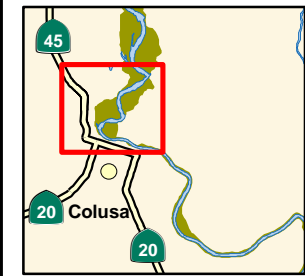
FEHR & PEERS

COLUSA-
SACRAMENTO RIVER
STATE RECREATION AREA
DRAFT GENERAL PLAN
APPENDIX L
PARKWIDE CONCEPT STUDY

Legend

- | | | | |
|---|---------------------------------|---|----------------------------|
|  | Viewpoint |  | Primitive Tent Camp Ground |
|  | Parking |  | Fishing Access |
|  | Picnic Sites |  | Gate |
|  | Recreational Vehicle Campground |  | Interpretive Trail |
|  | Human-Powered Boat Launch |  | Boat Launch |
|  | Entrance Station |  | Levees |
-
- | | |
|---|----------------------|
|  | PAVED ROAD |
|  | TRAIL |
|  | UNPAVED ROAD |
|  | OFF ROAD BIKE TRAIL |
|  | ON STREET BIKE ROUTE |


Map Location, showing
Sacramento River
Conservation Area

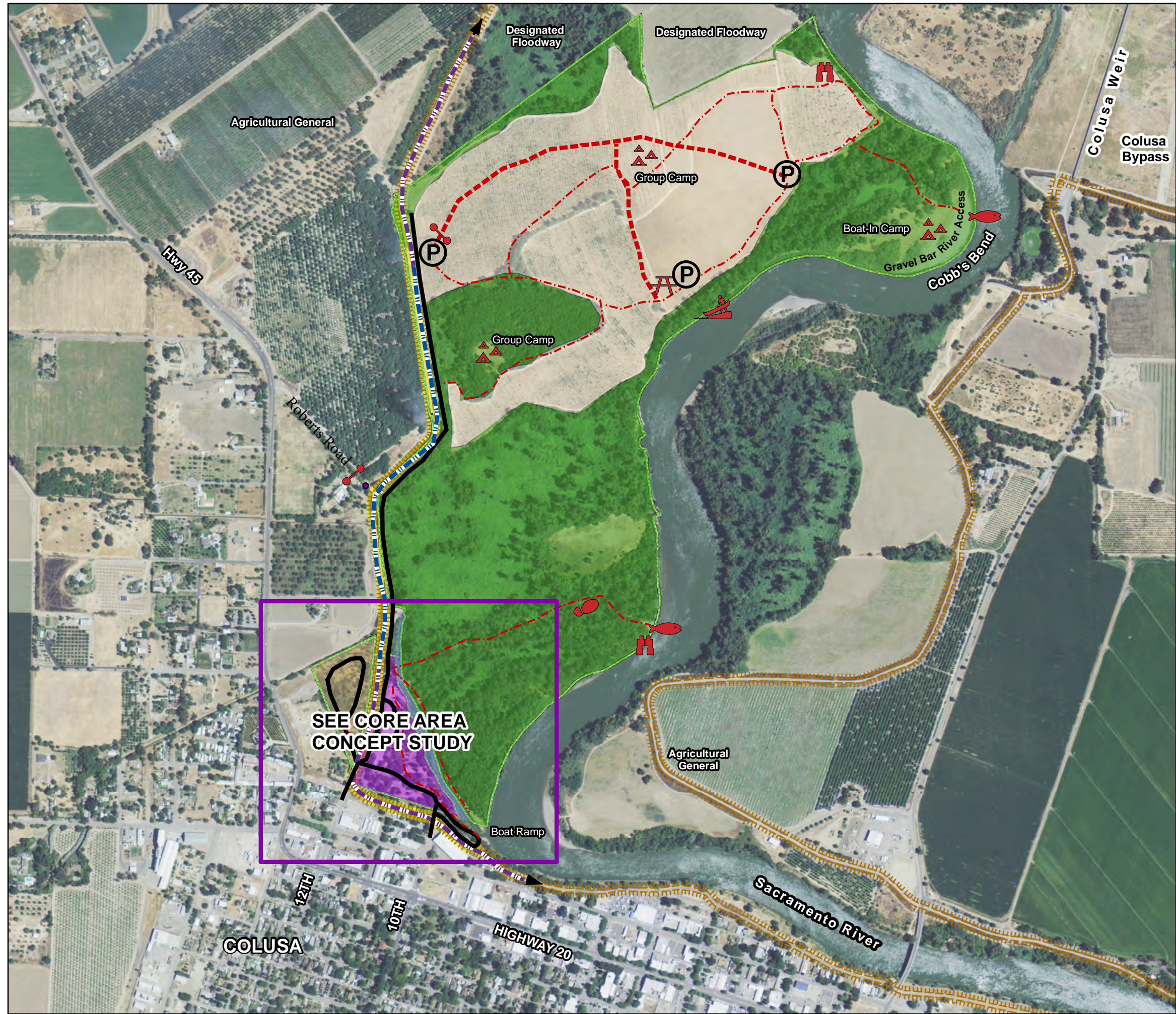


Data Sources:
1) Levees - Sacramento River GIS.
2) Image: NAIP, 2012.
3) Land Use Zones: Colusa County General Plan
Land Use, May 5, 2011, City of Colusa General
Plan, Oct 30, 2007.

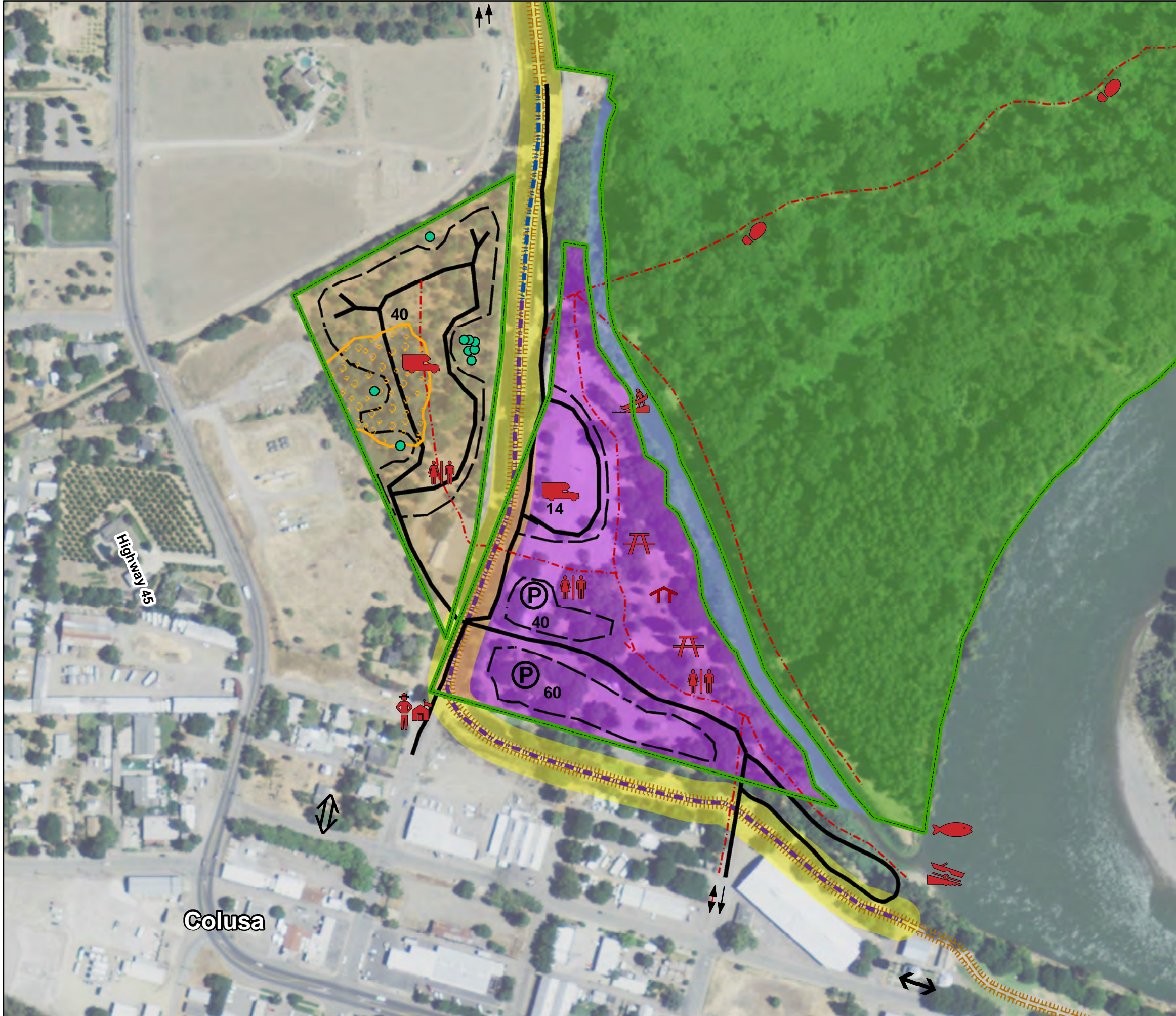
Original Scale
1:9,600
1 inch = 800 feet
Feet
0 400 800 1,200

NOTES:
Parcel boundaries are approximate and should not be considered legal descriptions. Maps are intended for study purposes only.

NORTHERN SERVICE CENTER ----- GENERAL PLAN SECTION	Date: 03/12/2015 California Department of Parks & Recreation DRAFT	
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COLUSA-SACRAMENTO RIVER STATE RECREATION AREA DRAFT GENERAL PLAN APPENDIX L CORE AREA CONCEPT STUDY



LEGEND

Viewpoint

Parking Lot

Picnic Facilities

Recreational Vehicle Campground

Human Powered Boat Launch

PAVED ROAD

TRAIL

UNPAVED ROAD

OFF ROAD BIKE TRAIL

ON STREET BIKE ROUTE

PARKING FACILITY LIMIT

Primitive Tent Camp Ground

Fishing Access

Gate

Interpretive Trail

Entrance Station

Boat Launch

Restroom

Outdoor Event Facility

Levees

Elderberry

Remnant Riparian

Map Location, showing Sacramento River Conservation Area

Data Sources:
1) Levees - Sacramento River GIS.
2) Image: NAIP, 2012

Original Scale
1:2,750
1 inch = 229 feet
Feet

NOTES:
Parcel boundaries are approximate and should not be considered legal descriptions. Maps are intended for study purposes only.

NORTHERN SERVICE CENTER

GENERAL PLAN SECTION

Date: 8/10/2015
California Department of Parks & Recreation
DRAFT

**California Department of Parks and Recreation
Resource Services
STANDARD PROJECT REQUIREMENTS**



General

- Prior to the start of on-site construction work, a [insert who] will consult with the contractor and project manager to identify all resources that must be protected.
- No track-mounted or heavy-wheeled vehicles will be allowed in identified environmentally sensitive areas at any time; foot traffic will only be allowed with specific permission from the State's Representative after clearance from [insert who].
 - At the discretion of [insert who], mechanized vehicles on [insert discipline] resource sites will be restricted to a short term use of rubber tire tractors only. All such vehicles must enter and exit the area via the same route of travel (by backing up). Vehicles are strictly prohibited from turning on the surface of site(s).
- Prior to the start of on-site construction work, a DPR-qualified [insert discipline] Resources Specialist will train construction personnel in [insert discipline] Resource identification and protection procedures.
- Prior to the start of on-site construction work, and at the discretion of a [insert who], a [insert who] will flag and/or fence all [insert discipline or resource] with a buffer of [insert distance] for avoidance during on-site construction activities. The [insert who] will remove the fencing after project completion.
- Prior to any earthmoving activities, a DPR-qualified [insert who] will approve all subsurface work, including the operation of heavy equipment within [insert distance] of the identified Environmentally Sensitive Area (ESA).
- Prior to the start of [insert type] work, [Insert who] will notify the [insert Office name and who] or [insert alternative Office name and who] a minimum of three weeks in advance, unless other arrangements are made, to schedule [insert discipline or resource] monitoring.
- A DPR qualified [insert who] will monitor all ground disturbing phases of this project at his/her discretion.

Cultural Resources

General Cultural Standard Requirements

- If forest thinning activities are required within a culturally sensitive area, downed timber and other forest debris will be removed by aerial suspension; no portion of logs, slash or debris will be dragged across the surface.
- Prior to the start of on-site construction work, the [insert who] will notify the **Cultural Resources Supervisor**, unless other arrangements are made in advance, a minimum of three weeks to schedule a **Cultural Resource Specialist** to monitor work, as necessary, to ensure that removal and reconstruction of historic fabric will occur in a manner consistent with the Secretary of the Interior's Standards.
- Before, during, and after construction, a [Insert who] will photo-document all aspects of the project and will add the photos to the historical records (archives) for the park.
- Prior to the start of on-site construction work, and to the extent not already completed, a [insert who] will map and record all cultural features within the proposed Area of Potential Effects (APE) to a level appropriate to the Secretary of Interior Standards.

Historian's Standard Requirements

- All historic work will comply with the Secretary of the Interior Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings.
 - Historic character will be retained and preserved;
 - where safe, original materials that still maintain structural integrity will be retained; and
 - where replacement is required, materials and features will be replaced “in kind”.
 - A [insert who] familiar with the project site’s cultural/historic resources will monitor all construction activities. All historical resources uncovered during the project will be recorded in place with a photograph and/or drawing showing any new material or recovered and archived, at the discretion of the monitor.
 - Upon completion of the project, [Insert who] will record any modifications to historic buildings or alterations of historic fabric on as-built drawings.

Archaeologist's Standard Requirements

- Prior to the start of any ground-disturbing activities, a DPR-approved archaeologist will complete pre-construction testing to determine specific avoidance areas.
 - If necessary, a DPR-qualified Cultural Resource Specialist will prepare a research design, including appropriate trenching and/or pre-construction excavations
 - Based on preconstruction testing, project design and/or implementation will be altered, as necessary, to avoid impacts to archaeological resources or reduce the impacts to a less than significant level, as determined in consultation with a DPR-qualified archaeologist.
- [Insert who] will manually remove or flush cut vegetation to avoid ground-disturbing activities; removal of roots will not be allowed. In areas lacking appropriate archaeological survey coverage only chemical treatments will be allowed unless archaeological surveys are performed first.
- If **anyone** discovers previously undocumented cultural resources during project construction, work within [insert distance] of the find will be temporarily halted until the archaeologist designs and implements appropriate treatments in accordance with the Secretary of the Interiors Standards and Guidelines for archaeological resource protection.
 - [Insert who] will modify the project to ensure that construction activities will avoid cultural resources upon review and approval of a [insert who].
 - If ground disturbing activities uncover intact cultural features (including but not limited to dark soil containing shellfish, bone, flaked stone, groundstone, or deposits of historic ash), when a DPR Qualified cultural resources specialist is not on-site, [insert who] will contact the DPR State Representative immediately and [insert who] will temporarily halt or divert work within the immediate vicinity of the find a DPR-qualified cultural resources specialist evaluates the find and determines the appropriate treatment and disposition of the cultural resource.
- In the event that human remains are discovered, work will cease immediately in the area of the find and the project manager/site supervisor will notify the appropriate DPR personnel. Any human remains and/or funerary objects will be left in place or returned to the point of discovery and covered with soil. The DPR Sector Superintendent (or authorized representative) will notify the County Coroner, in accordance with §7050.5 of the California Health and Safety Code, and the Native American Heritage Commission (or Tribal Representative). If a Native American

Standard Project Requirements

monitor is on-site at the time of the discovery, the monitor will be responsible for notifying the appropriate Native American authorities. The local County Coroner will make the determination of whether the human bone is of Native American origin.

- If the Coroner determines the remains represent Native American interment, the NAHC in Sacramento and/or tribe will be consulted to identify the most likely descendants and appropriate disposition of the remains. Work will not resume in the area of the find until proper disposition is complete (PRC §5097.98). No human remains or funerary objects will be cleaned, photographed, analyzed, or removed from the site prior to determination.
- If it is determined the find indicates a sacred or religious site, the site will be avoided to the maximum extent practicable. Formal consultation with the State Historic Preservation Office and review by the Native American Heritage Commission/Tribal Cultural representatives will occur as necessary to define additional site mitigation or future restrictions.

Natural Resources

General Biological Resource Standard Project Requirements

- All project activities that could spread **[insert organism]** to new locations will be subject to Best Management Practices developed by **[insert group name]** and available online at **[insert location – i.e. web address]**.
- Prior to the start of on-site construction activities, **[insert who]** will conduct a survey of the project area for **[insert what]**.
- Prior to the start of on-site construction activities, **[insert who]** will determine the minimum area required to complete the work and define the boundaries of the work area on the project drawings and with flagging or fencing on the ground, as appropriate.
- To prevent the spread of noxious weeds, all construction vehicles and equipment will enter and leave the project site free of soil, vegetative matter or other debris that could contain weed seeds.
- All construction will be consistent with the State Parks Trail Manual guidelines.
- At the discretion of **[insert who]**, project activities will be monitored to ensure that impacts to **[insert species name(s)]** are minimized.
- **[Insert who]** will submit a summary report of all collecting activities conducted at **[Insert park name]** to the **[insert District name]** Environmental Scientist upon completion of the project.
- The **[insert who]** will post information signs near project areas with restricted access or closures lasting longer than 3 months. The signs will include the following information:
 - Explanation for and description of the project; and
 - Anticipated completion date.

Plants

- No rare or endangered species will be cut, pruned, pulled back, removed or damaged in any way.
- If **[insert plant species or community]** are located within **[insert number]** feet of the project area, the **[insert what]** will be flagged by **[insert who]**, fenced off prior to the start of on-site construction activities, and completely avoided.
- Best Management Practices (BMPs) to avoid creation of dust will be employed during all construction activities within **[insert distance]** of **[insert species or plant community]**.

Standard Project Requirements

- If **[insert what]** of **[insert species or plant community name]** are discovered within **[insert distance]** of the project area, a **[insert who]** will flag and fence these locations during construction activities to avoid impacts.
- Prior to the start of on-site construction activities and when the plants are in a phenological stage conducive to positive identification (i.e., usually during the blooming period for the species), a **[insert who]** will conduct surveys for special-status plant species throughout the project area.
- Prior to the start of on-site construction activities, a **[insert who]** will flag and fence plant communities (e.g., vegetation series, alliances, or associations) within **[insert number]** feet of the project area to avoid impacts.
- No **[insert what – staging, ground-disturbing, etc.]** will be allowed within **[insert number]** times the diameter-at-breast-height (dbh) of retention trees, unless approved in advance by a DPR-approved biologist, forester, or certified arborist.
- The **[insert who]** will avoid or minimize impacts to federally protected wetlands to the extent practicable by conducting work in upland areas.
- A **[insert who]** will be present during all ground-disturbing activities within the **[insert quantitative area]** of trees.
- Project area will be monitored and maintained by **[insert who]** for up to **[insert time period]**. Including regular watering and replacement planting, as necessary to assure an approximately **[insert percentage]** survival rate.
- Any trenching in a “structural root zone” will be completed by hand; no roots larger than **[insert diameter size]** in diameter will be cut or damaged.
- All herbicides will be handled, applied, and disposed of in accordance with the MSDS Fact Sheet and all local, State, and federal laws.
- To maintain genetic integrity, only plant stock collected within the **[insert area name]** will be used for re-vegetation in the project area.
- **[Insert who]** will employ Best Management Practices (BMPs) for erosion control to avoid runoff of project-related sediments, vehicle fluids, and other liquids into special plant communities.
- The percolation testing will be conducted at a minimum distance of **[insert quantitative distance]** of any significant tree over **[insert number]** DBH.

Wildlife

- **[Insert Name]** will schedule all work between **[insert dates]** to avoid the **[insert species name] [insert what – breeding, maternity, nesting, flight period, etc.]**.
- If work is required during the **[insert what]** season (**[insert dates]**), a **[insert who]** will conduct a survey to identify **[insert what - nest, colony, etc]** within **[insert distance]** of the project area. The survey will be conducted no more than **[insert number]** calendar days prior to the beginning of construction.
- If **[insert what]** are located within **[insert distance]** feet of the project area, no construction will occur within **[insert distance]** of the **[insert what]** during the **[insert what]** season or until the young have fledged, as determined by a DPR-approved biologist.
- If work must occur during the breeding season, the USFWS’s *“Transmittal of Guidance: Estimating the Effects of Auditory and Visual Disturbance to Northern Spotted Owls and Marbled Murrelets in Northwestern California”* (dated July 31, 2006) may be used by a DPR-approved biologist to allow limited construction activities that do not create noise disturbance above ambient levels.

Standard Project Requirements

- If limited activities are allowed during the **[insert species name] [insert what breeding, nesting, etc.]** season, work activities will not begin until **[insert number]** hours after sunrise and will cease **[insert number]** hours before sunset each day.
- Prior to the start of on-site construction activities, a **[insert who]** will train on-site construction personnel on the life history of **[insert species name]**, work constraints, and any other pertinent information related to the species.
- Within **[insert number]** hours prior to the start of construction activities, a **[insert who]** will conduct surveys for **[insert what]** in the project area and up to **[insert number]** feet outside the project boundaries.
- If individuals or other recent signs of **[insert species name]** are observed within **[insert distance]** of the project area, **[insert who]** will be present on the site to monitor during construction activities at his/her discretion.
- Immediately prior to the start of work each morning, **[insert who]** will conduct a visual inspection of the construction zone.
- If **[insert species name]** is found on the project site, work in the vicinity of the animal will be delayed until the species moves out of the site on its own accord, or is temporarily relocated by **[insert agency name - approved or -permitted]** biologist.
- To prevent trapping of **[insert species name]**, all holes and trenches will be covered at the close of each working day with plywood or similar materials, or will include escape ramps constructed of earth fill or wooden planks; all pipes will be capped. A **[insert who]**, or other staff trained by a **[insert who]** will inspect trenches and pipes for **[insert species name]** at the beginning of each workday. If a trapped animal is discovered, they will be released in suitable habitat at least **[insert quantitative distance]** from the project area.
- All field staff will wear protective clothing and equipment while working with **[insert species name]** live animals and handling carcasses.
- Baiting will not occur between **[insert months]** when **[insert sensitive species name]** are present.
- **[Insert who]** will not remove any trees equal to or greater than **[insert number]**-inches dbh unless first inspected by **[insert who]** and determined to be unsuitable as nesting habitat for **[insert species name]**.

Aesthetics

- Projects will be designed to incorporate appropriate park scenic & aesthetic values including the choices for: specific building sites, scope & scale; building and fencing materials and colors; use of compatible aesthetic treatments on pathways, retaining walls or other ancillary structures; location of and materials used in parking areas, campsites and picnic areas; development of appropriate landscaping. The park scenic and aesthetic values will also consider views into the park from neighboring properties.
- **[Insert who]** will store all project-related materials outside of the viewshed of **[insert name of street/place/building]**.
- **[Insert who]** will equip any permanent structure with outdoor light shields that concentrate the illumination downward to reduce direct and reflected light pollution. The direct source of the lighting (bulb, lens, filament, tube, etc) will not be visible off site and the lighting will be installed as low as possible on poles and/or structures to minimize light pollution of the night sky. The candle power of the illumination at ground level will not exceed what is required by any safety or security regulations of any government agency with regulatory oversight.

Air Quality

Standard Project Requirements

- During dry, dusty conditions, all active construction areas will be lightly sprayed with dust suppressant to reduce dust without causing runoff.
- All trucks or light equipment hauling soil, sand, or other loose materials on public roads will be covered or required to maintain at least two feet of freeboard.
- All gasoline-powered equipment will be maintained according to manufacturer's specifications, and in compliance with all State and federal requirements.
- Paved streets adjacent to the Park shall either be swept or washed at the end of each day, or as required, to remove excessive accumulations of silt and/or mud that could have resulted from project-related activities.
- Excavation and grading activities will be suspended when sustained winds exceed 15 miles per hour (mph), instantaneous gusts exceed 25 mph, or when dust occurs from remediation related activities where visible emissions (dust) cannot be controlled by watering or conventional dust abatement controls.

Geology and Soils (erosion)

- After a large earthquake event (i.e., magnitude 5.0 or greater within 50 miles of the project site), [insert who] will inspect all project structures and features for damage, as soon as is possible after the event. Any damaged structures or features will be closed to park visitors, volunteers, residents, contractors, and staff.
- No track-mounted or heavy-wheeled vehicles will be driven through [insert work area name] areas during the rainy season or when soils are saturated to avoid compaction and/or damage to soil structure.
- [Insert who] will develop a rehabilitation plan for the decommissioned trail that includes using brush and trees removed from the new trail alignment for bio-mechanical erosion control (bundling slash and keying it in to fall of trail, filling damaged trails sections with soil and duff removed from the new trail alignment, constructing water bars, and replanting native trees and shrubs).
- [Insert who] will clearly block both ends of the trail and scatter its length with vegetative debris from new trail construction to discourage continued use and degradation of the decommissioned portion of the trail.

Hazards

- Prior to the start of on-site construction activities, [insert who] will inspect all equipment for leaks and regularly inspect thereafter until equipment is removed from the project site. All contaminated water, sludge, spill residue, or other hazardous compounds will be contained and disposed of outside the boundaries of the site, at a lawfully permitted or authorized destination.
- Prior to the start of on-site construction activities, [insert who] will prepare a Spill Prevention and Response Plan (SPRP) as part of the Storm Water Pollution Prevention Plan (SWPPP) for [insert who] approval to provide protection to on-site workers, the public, and the environment from accidental leaks or spills of vehicle fluids or other potential contaminants. This plan will include (but not be limited to);
 - a map that delineates construction staging areas, where refueling, lubrication, and maintenance of equipment will occur;
 - a list of items required in a spill kit on-site that will be maintained throughout the life of the project;
 - procedures for the proper storage, use, and disposal of any solvents or other chemicals used in the restoration process;

- and identification of lawfully permitted or authorized disposal destinations outside of the project site.
- **[Insert who]** will develop a Materials Management Plan to include protocols and procedures that will protect human health and the environment during remediation and/or maintenance activities that cause disturbances to the native soil and/or mine and mill materials causing the potential exposure to metals and dust resulting from materials disturbances. All work will be performed in accordance with a Site Health and Safety Plan. The Materials Management Plan will include the following (where applicable):
 - Requirement that staff will have appropriate training in compliance with 29 CFR, Section 1910.120;
 - Methods to assess risks prior to starting onsite work;
 - Procedures for the management and disposal of waste soils generated during construction activities or other activities that might disturb contaminated soil;
 - Monitoring requirements;
 - Storm water controls;
 - Record-keeping; and,
 - Emergency response plan.
- **[Insert who]** will set up decontamination areas for vehicles and equipment at Park entry/exit points. The decontamination areas will be designed to completely contain all wash water generated from washing vehicles and equipment. Best Management Practices (BMPs) will be installed, as necessary, to prevent the dispersal of wash water beyond the boundaries of the decontamination area, including over-spray.
- Prior to the start of construction, **[insert who]** will develop a Fire Safety Plan for **[insert name]** approval. The plan will include the emergency calling procedures for both the California Department of Forestry and Fire Protection (CDF) and local fire department(s).
- All heavy equipment will be required to include spark arrestors or turbo chargers (which eliminate sparks in exhaust) and have fire extinguishers on-site.
- Construction crews will park vehicles **[insert distance]** from flammable material, such as dry grass or brush. At the end of each workday, construction crews will park heavy equipment over a non-combustible surface to reduce the chance of fire.
- DPR personnel will have a State Park radio at the Park, which allows direct contact with CalFire and a centralized dispatch center, to facilitate the rapid dispatch of control crews and equipment in case of a fire.
- Prior to the start of on-site construction activities, **[insert who]** will clean and repair (other than emergency repairs) all equipment outside the project site boundaries.
- Under dry conditions, a filled water truck and/or fire engine crew will be onsite during activities with the potential to start a fire.
- **[Insert who]** will designate and/or locate staging and stockpile areas within the existing maintenance yard area or existing roads and campsites to prevent leakage of oil, hydraulic fluids, etc. into **[insert where i.e., native vegetation, sensitive wildlife areas, creek, river, stream , etc.]**.

Hydrology

- Prior to the start of construction involving ground-disturbing activities, **[insert who]** will prepare and submit a Storm Water Pollution Prevention Plan (SWPPP) for DPR approval that identifies temporary Best Management Practices (BMPs) (e.g., tarping of any stockpiled materials or soil; use of silt fences, straw bale barriers, fiber rolls, etc.) and permanent (e.g., structural containment, preserving or planting of vegetation) for use in all construction areas to reduce or eliminate the discharge of soil, surface water runoff, and pollutants during all excavation,

Standard Project Requirements

grading, trenching, repaving, or other ground-disturbing activities. The SWPPP will include BMPs for hazardous waste and contaminated soils management and a Spill Prevention and Control Plan (SPCP), as appropriate.

- All heavy equipment parking, refueling, and service will be conducted within designated areas outside of the 100-year floodplain to avoid water course contamination.
- The project will comply with all applicable water quality standards as specified in the **[insert WQCB name]** Basin Plan.
- All construction activities will be suspended during heavy precipitation events (i.e., at least 1/2-inch of precipitation in a 24-hour period) or when heavy precipitation events are forecast.
- If construction activities extend into the rainy season (**[insert dates]**) or if an un-seasonal storm is anticipated, **[insert who]** will properly winterize the site by covering (tarping) any stockpiled materials or soils and by constructing silt fences, straw bale barriers, fiber rolls, or other structures around stockpiles and graded areas.
- **[Insert who]** will install appropriate energy dissipators at water discharge points, as appropriate.

Traffic

- Prior to the start of on-site construction activities that would result in **[insert number]** or more vehicle trips during peak hours (7:00 a.m. to 9:00 a.m. or 4:00 p.m. to 6:00 p.m.) for a period exceeding 6 months in duration, **[insert who]** will prepare a Traffic Impact Study (TIS) for submittal and approval by **[insert who]**. The TIS will include, but will not be limited to:
 - Description of traffic inducing actions;
 - Types of vehicles anticipated;
 - Approximate traffic volumes on/ offsite and roadways to be used;
 - Existing Traffic Counts;
 - Analysis of Project Action traffic volume impacts on intersections and traffic index; and
 - Any other TIS requirements as outlined in the appropriate jurisdiction's guidance on TIS preparation
- Prior to delivery and/or removal of project-related equipment or materials that could impede or block access to driveways, cross streets, or street parking, **[insert name]** will coordinate with the local jurisdictions to develop and implement traffic control measures.

Noise

- Temporary or permanent noise barriers such as berms or walls will be used, as appropriate, to reduce noise levels.
- Internal combustion engines used for project implementation will be equipped with a muffler of a type recommended by the manufacturer. Equipment and trucks used for Project-related activities will utilize the best available noise control techniques (e.g., engine enclosures, acoustically attenuating shields or shrouds, intake silencers, ducts, etc.) whenever necessary.
- **[Insert who]** will locate stationary noise sources and staging areas as far from potential sensitive noise receptors, as possible. If they must be located near potential sensitive noise receptors, stationary noise sources will be muffled or shielded, and/or enclosed within temporary sheds.
- Construction activities will generally be limited to the daylight hours, Monday – Friday. If work during weekends or holidays is required, no work will occur on those days before **[insert time]** a.m. or after **[insert time]** p.m. (check contract docs for time restrictions)
- Internal combustion engines used for any purpose at the job site will be equipped with a muffler of a type recommended by the manufacturer. Equipment and trucks used for

Standard Project Requirements

construction will utilize the best available noise control techniques (e.g. engine enclosures, acoustically-attenuating shields, or shrouds, intake silencers, ducts, etc.) whenever necessary.

M9

State of California

Department of Parks and Recreation

**Riparian Forest Restoration Plan
Borrow Area and Shop Area,
Colusa-Sacramento River State Recreation Area**

November 14, 2000

**By James Dempsey
Environmental Services Intern
Northern Buttes District**

APPROVED:

Kathryn V. Foley
Kathryn Foley, District Superintendent

11/22/00
Date

H. Woody Elliott
H. Woody Elliott, District Resource Ecologist

11-17-00
Date

Figure 1.2 shows a flat field, and the 1976 topographical map (Map 1.3), there must have been substantial excavation from the site. Soil survey holes show that much of the site has been filled three feet deep with fill material (unsorted gravelly sand with glass shards and iron artifacts). Given that the 1976 topography is still largely accurate today, the extent of excavation was 2-3 feet deeper than indicated by the depression drawn on Map 1.3. According to Fua (1982), "The depressed condition of the area was caused by previous removal of earth for highway construction" (Appendix A1.3-3). In 1975, an amendment (Appendix A1.1-6) was made to the deed to delete the excavation and access rights held by the Reclamation Board, ending the status of the site as a borrow pit.

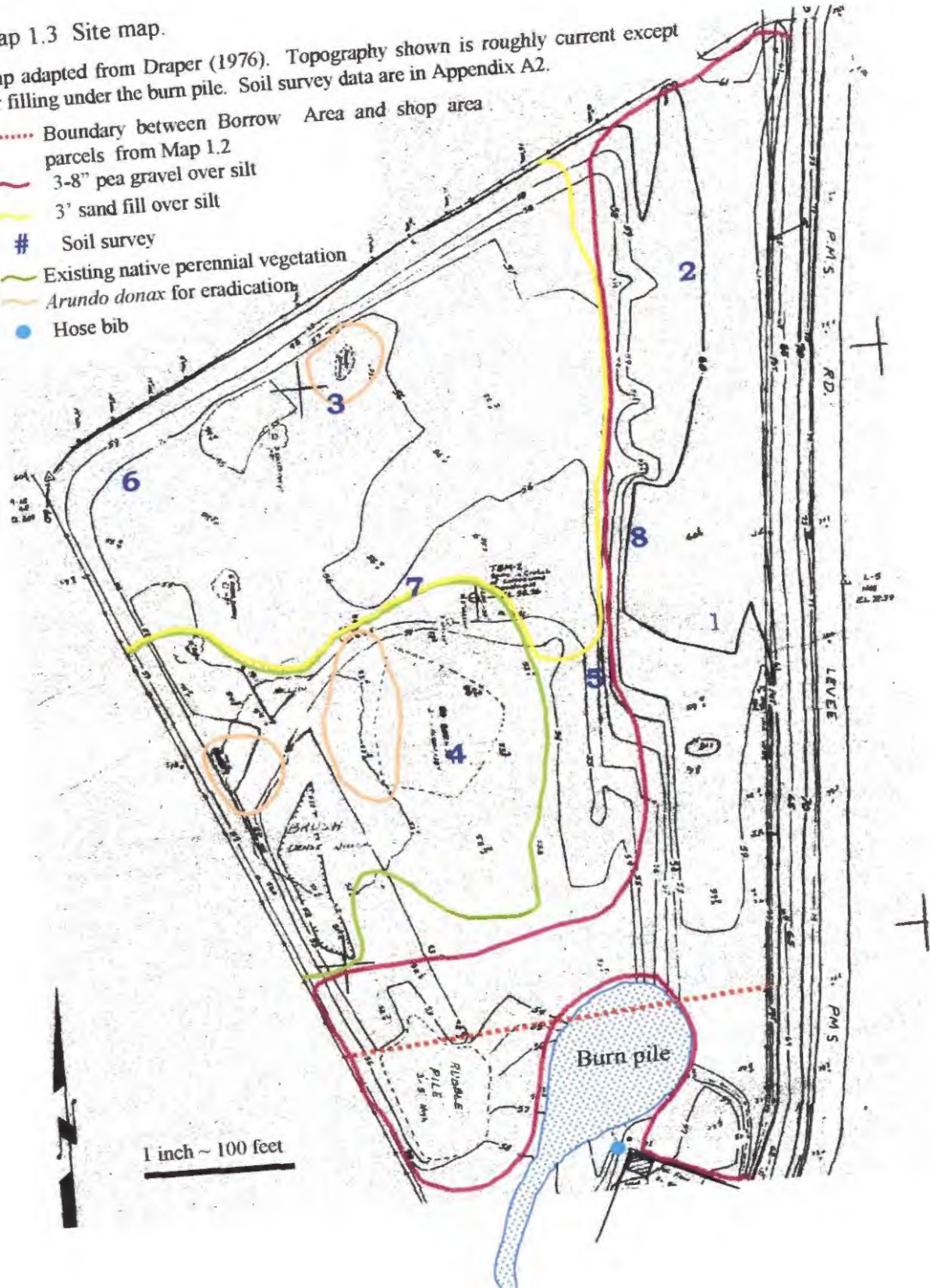
Figure 1.2 Aerial photo dated 9-6-37 (DWR, flight no. AAY-77-25).



Map 1.3 Site map.

Map adapted from Draper (1976). Topography shown is roughly current except for filling under the burn pile. Soil survey data are in Appendix A2.

- Boundary between Borrow Area and shop area.
- 3-8" pea gravel over silt
- 3' sand fill over silt
- # Soil survey
- Existing native perennial vegetation
- *Arundo donax* for eradication
- Hose bib



From September 1983 until Spring 1988, the City of Colusa held a Temporary Use Permit with the California Department of Parks and Recreation to dispose of wood chips, fall leaves from street sweepings, and soil within the depression area delineated by elevation 58 feet shown on Map 1.3 (Appendix A1.3-4). The area was described as “low and marshy” by the Colusa County Environmental Health Department (Fua, 1982), and the idea was to provide the least expensive means for the City to dispose of its organic debris as well as allow the State to reclaim the area for use as additional park area (Appendix A1.3-9). The materials dumped could have been “7500 yd³ fall leaf season 4-6” dirt fill over rolled and compacted leaves” or 3000-5000 yd³ per year of leaves and wood chips, not including soil cover (Appendices A1.3-8 and A1.3-9). The recent soil survey indicates that the organic matter has completely decomposed. It may be seen as the black organic in a sand matrix 12 inches thick in holes 3 and 6 (Map 1.3).

In 1988 the California Waste Management Board became concerned that this may be a Solid Waste Facility operating without a Permit (Appendix A1.3-12). The City decided to end the disposal rather than go through the expense of obtaining the permit (Appendix 1.3-13). The California Integrated Waste Management Board eventually determined that the City’s dumping of leaf, wood, and soil did not constitute a solid waste landfill as defined in the Public Resources Code, Section 46027 (Appendix A1.3-15).

Map 1.3 shows a large area of the site adjacent to the levee covered with three to ten inches deep with pea gravel for a total of perhaps 1600 yd³. The gravel appears to be deliberately spread in a strip parallel to the levee. But Levee authorities claim no knowledge of the pea gravel (Tippin, 2000). The pea gravel has been there since at least 1984 (Dragoo, 2000 and Coronado, 2000). Possibly it was placed during the original construction of the SRA facilities (Appendix A1.4-2).

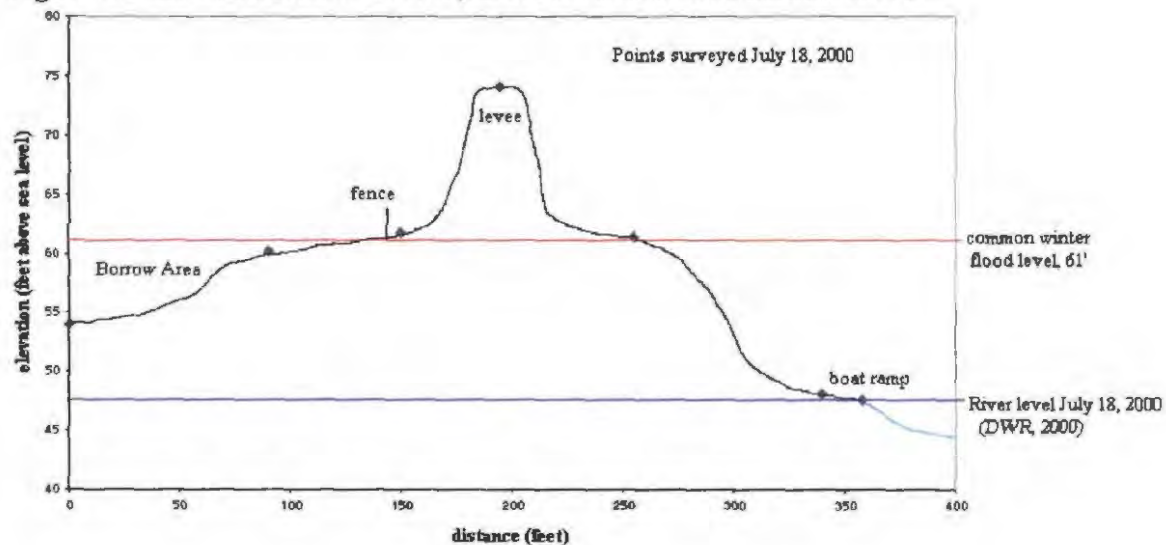
2 Current Conditions

2.1 Site Description – Physical Environment.

The Borrow Area covers 5 acres, and the adjacent unused portion of the shop area considered for revegetation covers about ½ acre (Map 1.3). Native soil consists of recent loamy silt to fine sand river deposits. It is well drained but for the winter high water table which inundates a small portion of the site most years. Topography of the site may be described as a swale, limited to 0-3 % slopes with a total relief of 11 feet over the site. The surface elevation lays between 51 and 62 feet above sea level which is within 10 feet above the summer river level (approximate groundwater level) and below typical winter flood levels (Figure 2.1 and Table 2.1).

The immediate water table is influenced by seepage under the levee from the Sacramento River to the East and possibly by infrequent localized seepage from the Roberts Irrigation Company Ditch along the north property boundary. In early 1997, almost the entire site was inundated up to the shop building footings (elevation 58 feet) from where it drained away southward. During the past 3 winters, no standing water was noticed (Henderson, 2000).

Figure 2.1 Elevation cross-section, Borrow Area to Sacramento River.



A common river flood level of 61 feet, shown in Figure 2.1 and Table 2.1, gives an idea of the Borrow Area elevation in relation to high water levels of the Sacramento River. The elevation difference between the river level at the nearby Colusa river gauging station on Colusa Bridge (Map 1.1) and the river level at the SRA boat ramp (Figure 1.1) is less than one foot. The “Monitor Stage” at the Colusa gauging station is 63.0 feet, which is the river level that may produce over-bank flows sufficient to cause minor flooding of low-lying lands and local roads. At “Flood Stage” of 70.0 feet, over-bank flows cause considerable inundation of land and roads and/or significant hazard to life and property.

Table 2.1. Record of Sacramento River level above 61 feet above sea level (') at Colusa Bridge, 1997 to present (DWR, 2000).

Year	Dates above 61' Level	Days above 61' Level	Peak Level this Period
2000	2/12 – 3/15	Total 32 to date	65.64'
1999		Total 31	
	3/26	1	61.55'
	2/17 - 3/13	25	64.37'
	2/08 - 2/12	5	64.86'
1998		Total 46	
	3/22 – 4/09	19	65.82'
	1/13 – 3/08	27	68.32'
1997		Total 44	
	12/04 – 12/05	2	62.22'
	12/01 – 12/02	2	63.25'
	(1996) – 2/09	40	68.65'

Details of soil substrate areas are discussed in Section 1.3 and shown on Map 1.3. Soil survey data are in Appendix A2. There is a water hose bib (a ¾" line with 45 psi and a flow of 10 gpm) on the west side of the SRA shop, which may be used for irrigation.

2.2 Site Description – Biological.

Currently, the site (Map 1.3) is covered by approximately 4½ acres of mostly non-native grasses and annual forbs. One acre is occupied by a copse of mature cottonwoods at the low point of the swale, native blackberry, poison oak, several recently girdled black walnut trees, and three large patches of *Arundo donax*, which are being treated with glyphosate herbicide (Round-Up). Several young valley oaks grow in the north part of the pea gravel area.

Figure 1.2 shows the English walnut trees in an orchard overhanging the north boundary of the site. A little-used industrial storage yard with compacted soils covered by annual weeds occupies the property to the west. The Sacramento River Flood Control Project west setback levee right-of-way forms the east boundary of the site. It is maintained denuded of vegetation except for a black walnut at the boundary fence. Across the levee from the Borrow Area is the parking lot and access for the SRA day use area and boat ramp, planted with several ornamental tree species. Also across the levee from the Borrow Area at the north end is a section of mature cottonwood riparian forest along the dredged channel that connects the Roberts Ditch Irrigation Company ditch to the Sacramento River at Arnold Bend.

2.3 Permits required.

The State Reclamation Board no longer holds excavation nor access rights, according to the 1975 deed amendment (Appendix A1.1-6). Although mineral rights are retained by the Reclamation Board, this has no bearing on the Riparian Forest Restoration Plan (Fong, 2000). Correspondence is attached in Appendix A3.

The State Board of Reclamation requires an encroachment permit if trees are planted in a designated floodway. No encroachment permit is required for this site, since it is not within a designated floodway. It is located outside of the Sacramento River Flood Control Project west setback levee.

To apply herbicides, an Operator/Site Identification Number is required by the County Agricultural Commissioner's Office. Trained DPR employees are currently qualified to apply herbicide at Colusa-Sacramento River SRA with the appropriate monthly report of herbicide usage to the County Agricultural Commissioner's Office.

3 Goals and Objectives

Goals:

- 1) To bring the Borrow Area within the umbrella of stated conservation and recreation policies and functions of the Colusa-Sacramento River State Recreation Area and the California State Park System (see Section 4, Justification).
- 2) To restore natural ecosystem processes to the site, contributing to cumulative rivershed effects such as water quality and habitat for endangered species.
- 3) To augment the natural setting for public enjoyment and relaxation.

Objectives:

To reestablish native riparian forest to the site and eliminate weedy exotic plants.

4 Justification

4.1 California Department of Parks and Recreation policy.

Resource Management Directives - May 1979

"A. Environmental Resources.

1831 Ever since its beginnings, the California State Park system has been oriented toward preserving and safeguarding elements of the natural and cultural environment. It has now become apparent that the natural environment of California is in jeopardy from urbanization, industrialization, exploitation of resources, pollution, etc. Human influences are extensive, pervasive, and devastating to the natural environment: they are felt throughout California, regardless of the locales of the actions producing them, and irrespective of management and use practices on specific parcels of land. In short, the simple interplay of ecological factors no longer produces a natural biological relationship. It is important to remember that human influences arise from developments or manipulation of the environment, and from overprotection from fire and other natural factors.

(26) IT IS AN OBJECTIVE OF THE DEPARTMENT TO IDENTIFY THE TOTAL FRAMEWORK OF ENVIRONMENTAL AND ECOLOGICAL FACTORS INFLUENCING THE LANDS OF THE STATE PARK SYSTEM, INCLUDING THOSE ARISING FROM HUMAN ACTIVITIES, AND TO PROMULGATE AND APPLY RESOURCE MANAGEMENT TECHNIQUES REQUIRED TO NEGATE DELETERIOUS HUMAN INFLUENCES, AND TO ACHIEVE THE ENVIRONMENTAL OBJECTIVES ESTABLISHED FOR THE SYSTEM.

1831.1 Vegetation.

The most conspicuous and dynamic single element in natural landscape is usually the vegetation. This is generally true regardless of whether the dominant vegetation is forest, chaparral, grassland, or a combination of types. Accordingly, vegetation is usually the primary object of environmental management programs in units of the State Park System. However, wildlife is important, is recognized, and its protection is provided for in every plan for environmental resource management.

Vegetation may be the primary object of preservation efforts in a park system unit, or it may provide a suitable background and environment for other dominant resources. In either case, it is essential to distinguish at the beginning of any management undertaking whether the vegetation is in a climax condition or is at some sub-climax stage. If the latter, it is important to note the direction and speed with which the vegetation is moving through the process of plant succession.

It will not be assumed, as was done in the earlier years of the State Park System, that vegetation and associated biological elements will remain in, or attain, satisfactory condition, if left alone and merely protected from destructive influences.

(29) IN THE STATE PARK SYSTEM, PERPETUATION OF VALUES IN TODAY'S ENVIRONMENT MAY REQUIRE A PURPOSEFUL GUIDING OF DYNAMIC

ECOLOGICAL FACTORS THAT ARE CONSTANTLY UNDERGOING A SUCCESSIONAL TREND THROUGH THE INTERACTION OF NATURAL AND EXTRANEEOUS FORCES. THIS GUIDANCE MAY NOT ALWAYS INVOLVE SIMPLY THE STATIC PROTECTION OF THE FEATURES OR ELEMENTS THAT HAPPEN TO BE A PART OF THE EXISTING ENVIRONMENT IN ANY PARTICULAR PERIOD OF TIME.

Nature is dynamic and ever changing, in many instances, particularly in response to human influences, natural processes work rapidly and inexorably toward destruction or elimination of the special conditions, which are recognized as constituting State Park system quality. In some circumstances, natural succession will, within a few years, eliminate the values, which constitute the major reason for establishment of a park system unit.

(30) FOLLOWING CAREFUL CONSULTATION WITH THE PUBLIC AND WITH COOPERATING AGENCIES, THE DEPARTMENT SHALL IDENTIFY, IN THE INDIVIDUAL RESOURCE ELEMENTS, THE VALUES THAT CONSTITUTE SIGNIFICANT PARK SYSTEM RESOURCES. THESE VALUES SHALL BE EXPRESSED IN TERMS OF ECOLOGICAL FACTORS, SUCCESSIONAL TRENDS, AND RELATED RECREATIONAL OPPORTUNITIES.

Once the values have been identified, it is time to establish a management program for each unit that sets forth the measures and techniques to be used to ensure their perpetuation. In some instances, this will require an active and continuous management program to preserve certain sub-climax conditions, and to prevent them from disappearing. In other cases, a gradual or long-range program will be required to ensure that a climax association will perpetuate itself, and will not be disrupted by direct or indirect human activities. In still other instances, the purpose of a unit may be such that the management program may permit natural successional changes to take place with a minimum of interference.

(31) IN CARRYING OUT THE PROVISIONS OF THE RESOURCE ELEMENTS FOR UNITS OF THE STATE PARK SYSTEM, IT IS AN OBJECTIVE OF THE DEPARTMENT TO APPLY CREATIVE AND EFFECTIVE TECHNIQUES OF ENVIRONMENTAL RESOURCE MANAGEMENT FOUND BY SCIENTIFIC ANALYSIS TO BE REQUIRED TO ACHIEVE THE PROTECTION AND PERPETUATION OF THE VALUES AROUND WHICH THE UNITS ARE BUILT. ”

4.2 Other pertinent State of California policy.

Restoring this land to riparian habitat meets several CALFED (Calfed, 2000) and California Senate Bill 1086 objectives (Sacramento River Advisory Council, 2000):

- Provides habitat for threatened or endangered species (Swainson's hawk, western yellow-billed cuckoo, wood ducks, neotropical migratory birds, valley elderberry longhorn beetles), which promotes recovery and establishment of self-sustaining populations and minimizes the need for future endangered species listings.

- Promotes ecosystem processes, which support natural aquatic and terrestrial residents of these forests. For example, improving groundwater quality by providing a buffer zone of pollutant immobilization and nutrient uptake around the River, displacing and suppressing non-native plants, etc.
- Increases the area and quality of riparian habitat and the continuity of the riparian corridor.
- Eliminates and helps to prevent reestablishment of non-native weeds.

5 Methods and Materials

The restoration plan includes eliminating weedy exotic plants, options of dealing with the pea gravel, clearing, planting, installing an irrigation system, and evaluating plant establishment. Follow-up includes inspection of the irrigation line function, invasive weed control to ensure establishment and eradicate *Arundo donax*, and evaluation of the project.

5.1 Eliminating exotic weeds.

A few woody exotics are slated to be eliminated in fall 2000 by a girdling treatment and left standing as dying snags for future wildlife habitat. *Arundo donax* eradication is a three-year process of repeated glyphosate herbicide ("RoundUp") treatment in the fall with no subsequent mechanical removal, which apparently stimulates new growth (Atkinson, 2000). *Arundo* was sprayed in June 2000, and on November 01 all remaining green leaves appeared sickly and unlikely to survive. Spring 2001 emergence of regrowth is anticipated.

5.2 Clearing.

Just before planting, the planting areas may be mowed with a flail mower. On some of the site, the mower operator will need scouting ahead for manual removal of hard obstacles, such as concrete. The *Arundo donax* patch should not be mowed.

Controlled burning is another possibility for clearing prior to planting.

5.3 Planting

5.3.1 Plant materials

Since the soil is moist close to the surface on much of the site and the water table is likely accessible to deep-rooting plants as suggested by Figure 2.1, some of the earlier successional riparian species which need a permanent water source (phreatophytes, such as willow and cottonwood) could become established.

Plants are chosen based on soil texture, depth to the water table capillary zone, natural riparian community composition (Conard et.al., 1977; Barbour and Major, 1977), and likelihood of later natural establishment. For example, birds attracted to the inplanted trees should easily seed in understory plants such as grape, native blackberry, pipevine, and poison oak. These do not need to be planted.

A total of 604 plants are distributed at a spacing of 15 feet, allowing 20 feet from the levee fence for mowing (fire control) and 15 feet from the other property bounds (Map 5.1). The site is divided into three planting areas based on soil type and proximity to existing forested areas.

A cottonwood riparian forest mix is proposed along a band from the existing cottonwood copse on the site towards the existing mature cottonwood forest across the levee north of the boat ramp. The plant list for this cottonwood community is Table 5.1

Map 5.1 Planting layout.

Plant codes are listed in Tables 5.1, 5.2, and 5.3.

- Borrow Area and shop area parcel boundaries, where they vary from the fence line (Larson, 1961)
- fence line and shop yard (Draper, 1976)
- - - planting area boundaries
- hose bib

Features traced from aerial photo of 5/18/99:

- burn pile road
- various non-weedy perennials
- valley oak
- walnut
- cottonwood
- *Arundo donax*
- debris

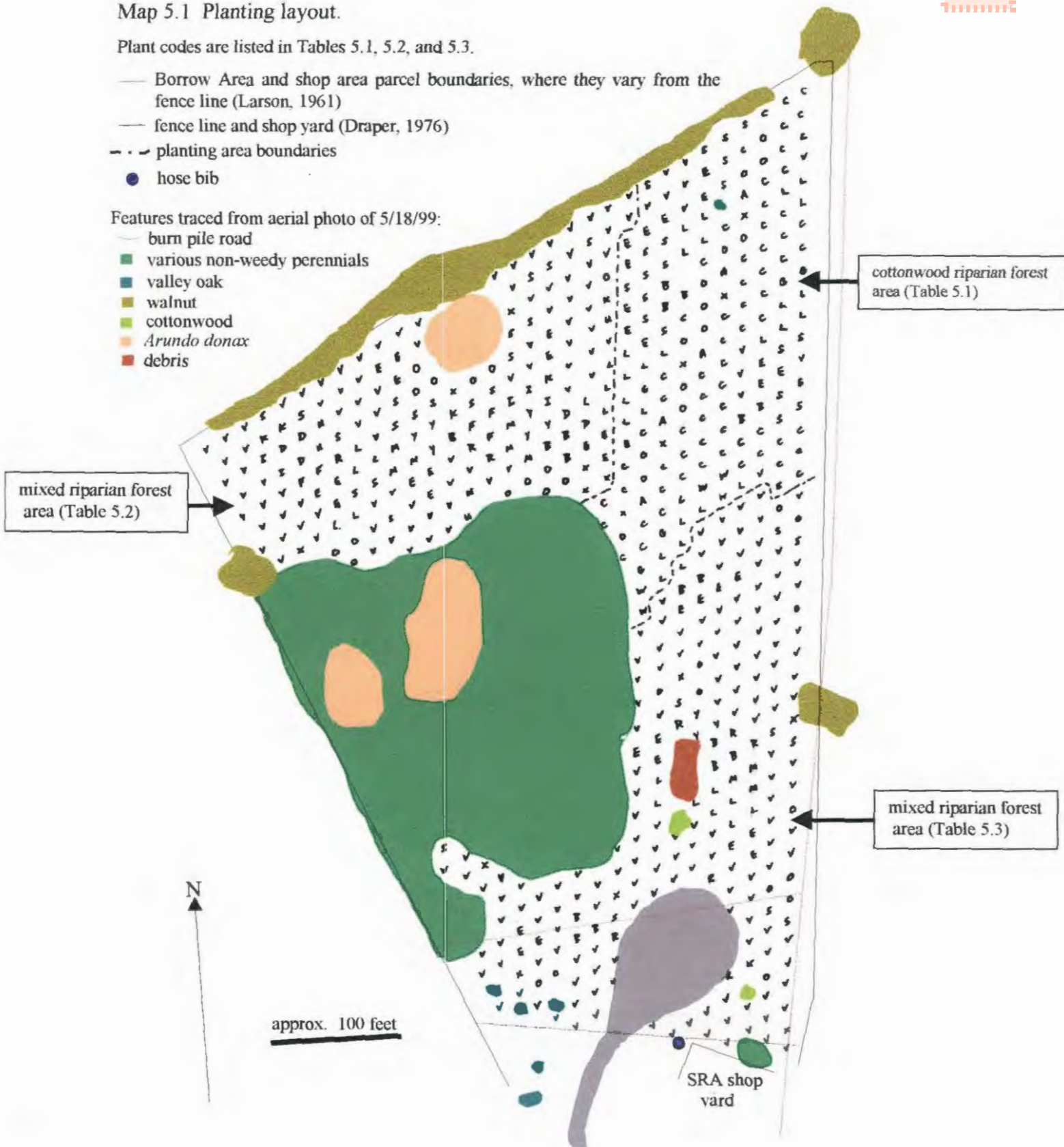


Table 5.1 Planting list for the cottonwood riparian forest planting area.

Species	Common Name	Plant Code	Number of Plants (Acorns)
<i>Populus fremontii</i>	Fremont cottonwood	C	65
<i>Salix lasiolepis</i>	Arroyo willow	L	27
<i>Plantanus racemosa</i>	California sycamore	S	21
<i>Fraxinus latifolia</i>	Oregon ash	O	14
<i>Sambucus mexicana</i>	Blue elderberry	E	13
<i>Quercus lobata</i>	Valley oak	V	12 (x2)
<i>Salix goodingii</i>	Black willow	G	5
<i>Cephalanthus occidentalis</i> var. <i>cal.</i>	Buttonbush	B	5
<i>Salix exigua</i>	Sandbar willow	W	5
<i>Alnus rhombifolia</i>	White alder	A	5
<i>Acer negundo</i> var. <i>californicum</i>	Box elder	X	5
			Total: 177

The other two planting areas are for mixed riparian forest dominated by valley oak. The sandy fill area will favor more drought- or sand-tolerant species such as California sycamore and *Baccharis* sp. . The plant list for this area is Table 5.2. Table 5.3 lists the plants proposed for the remaining area. Map 5.1 is a layout of the 604 plants, at a spacing of roughly 15 feet, allowing 20 feet from the levee fence for mowing (fire control) and 15 feet from the other property bounds.

Table 5.2 Planting list for the mixed riparian forest area in the sandy fill.

Species	Common Name	Plant Code	Number of Plants (Acorns)
<i>Quercus lobata</i>	valley oak	V	95
<i>Plantanus racemosa</i>	California sycamore	S	18
<i>Fraxinus latifolia</i>	Oregon ash	O	14
<i>Sambucus mexicana</i>	blue elderberry	E	14
<i>Salix lasiolepis</i>	arroyo willow	L	9
<i>Cephalanthus occidentalis</i>	buttonbush	B	7
<i>Acer negundo</i> var. <i>calif.</i>	box elder	X	7
<i>Baccharis pilularis</i> ssp. <i>consang.</i>	coyote bush	Y	6
<i>Baccharis salicifolia</i>	mulefat	M	6
<i>Aesculus californica</i>	California buckeye	K	5
<i>Cercis occidentalis</i>	California redbud	D	5
<i>Quercus wislizenii</i>	interior live oak	I	5 (x2)
<i>Rhamnus californica</i>	California coffeeberry	F	5
<i>Umbellularia californica</i>	California bay	U	5
<i>Rosa californica</i>	wild rose	R	3
			Total: 203

Table 5.3 Planting list for the mixed riparian forest area out of the sandy fill.

Species	Common Name	Plant Code	Number of Plants (Acorns)
<i>Quercus lobata</i>	valley oak	V	153 (x2)
<i>Fraxinus latifolia</i>	Oregon ash	O	13
<i>Sambucus mexicana</i>	blue elderberry	E	13
<i>Plantanus racemosa</i>	California sycamore	S	9
<i>Salix lasiolepis</i>	arroyo willow	L	9
<i>Cephalanthus occidentalis</i>	buttonbush	B	8
<i>Acer negundo</i> var. <i>californicum</i>	box elder	X	7
<i>Rosa californica</i>	wild rose	R	6
<i>Baccharis pilularis</i> ssp. <i>consanq.</i>	coyote bush	Y	3
<i>Baccharis salicifolia</i>	mulefat	M	3
			Total: 224

5.3.2 Planting methods.

The *Quercus* acorns may be planted in the manner described by Motz (1996)

Populus fremontii and the three *Salix* species may be planted at some cost savings by using dormant hardwood cuttings in January or February only. Details on collecting material and planting are included in Appendix 4.

Plant protectors such as “blue-x” tubes should be used with the *Quercus* acorns and the dormant hardwood cuttings, to maintain humidity and protect from herbicide spray, among other benefits. The other plants may be planted together with open-ended milk cartons buried around the seedlings, which can protect from herbicide as well as rodent damage, at low cost. Wire screens may be needed to prevent deer browsing damage.

Herbicide application might be reduced or eliminated by using a suitable biodegradable weed-suppressant mulch, such as sisal mats (recycled from mattresses). Additional benefits include conservation of moisture and reduction of rodent habitat and damage. Cardboard (flattened corrugated boxes) may be used as a less expensive alternative, overlapped to form a four to six foot diameter ring around each seedling, allowing irrigation emitters a space to percolate through the center, or placed underneath. The cardboard would last for 2-3 years if uncovered, and may be held in place with grass sod staples or geotextile stakes.

5.4 Irrigation.

The groundwater table is probably within ten feet of the surface over much of the site, and the soil survey found July moisture within the upper two feet of the silt soils (Map 1.3 and Appendix A2). However, plants would not get established in the sandy fill soil area without irrigation. Irrigating will be cost-effective insurance for establishment over

the entire site. The water faucet located at the shop building is convenient and adequate, so it should not be difficult to install a drip irrigation system, watering 1.5 gallons per plant two or three times a week from May to October. The drip irrigation system would require regular monitoring for rodent damage and proper flow. Otherwise the system would be automated with a timer/valve.

5.5 Pea gravel alternatives.

The pea gravel layer covering the area adjacent to the levee fence inhibits natural regeneration of many native riparian plants, so removal would be desirable. Tilling the gravel into the underlying silt would make little difference unless the gravel were mixed uniformly to a depth of two to three feet. This would be impractical. The gravel could be dealt with in some combination of three ways:

Pea gravel alternative 1: No action.

This alternative can take advantage of the existing gravel as mulch during establishment. However, natural regeneration of most natives would continue to be inhibited and weeds would prevail in the long run.

Pea gravel alternative 2: Limited removal after establishment.

Initially plant seedlings into the gravel as is –with seedling bases level with the native soil level-- and allow space between the planting rows to accommodate machinery for removing gravel after 3 summers of plant establishment. This option takes advantage of the gravel as ‘mulch’ to conserve water and suppress weed competition during establishment, by scaling down the expensive movement of large quantities of heavy material, and by still allowing a significant part of the native substrate to be exposed and available for natural regeneration. By planting in rows separated by 15 feet, 60-80% of the surface could be cleared of gravel.

Pea gravel alternative 3: Removal.

The pea gravel layer ranges from two to ten inches deep over the 100’ by 650’ area. The upper two to five inches of gravel (about 400 cubic yards) is loose and clean, except for the growth of Bermuda grass. The dirtier gravel below amounts to about 1200 yd³, for a total volume of 1600 yd³.

Pea gravel alternative 4: Onsite containment.

Pile the gravel layer in mounds/berms, leaving the rest of the 100’ by 650’ area with the native substrate exposed. Perhaps grading the gravel into an access road along the west boundary fence would help keep this fence clear of growth, a desire of the maintenance staff.

6 Resource Monitoring

The irrigation system would need weekly monitoring during the irrigation season, because rodents may gnaw into the drip lines and the drip emitters may become plugged.

The site would need to be monitored for invasive weeds through the first three summers, including spraying *Arundo donax* patches each fall with glyphosate herbicide. Spot spraying of herbicide will be necessary to eliminate competition and rodent cover, especially if irrigation is used. Weedy growth at the base of planted seedlings encourages rodent habitat and rodents tend to girdle (kill) the seedlings.

Success criteria relate to the stated Objective: plant survival and growth. Plant survival can be documented by comparing a survival census to a planting map after two summers without irrigation. Wildlife variety, use, frequency, and number, as well as forest canopy structure, are subjective or extremely difficult to evaluate in terms of quantifying “success” for this kind of project, so they are not useful as success criteria.

7 Project Budget

\$20,000 has been allocated for this project under the title, “Riparian Habitat Restoration – Shop Parcel” (California Department of Parks and Recreation, Northern Buttes District, Project #MAH197) for fiscal years 1999 – 2001.

Modest savings may accrue by opportunistically using plant overstock and surplus materials from other projects.

Current estimates for various components of this project are listed as follows. Values are approximate and subject to change.

Task .	Labor Costs	Material Costs	Subtotal Cost
Planning	\$3000.	-	\$3000.
Clearing and planting	\$2500.	\$2500.	\$5000.
Irrigation system installation and removal	\$2500.	\$2000.	\$4500.
Pea gravel removal			\$5000.
herbicide spraying, transportation, irrigation system maintenance, incidental			\$2500.
			Total: \$20,000.

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A Appendices

A1 Historical documents.

A1.1 Deed and Amendment.

A1.2 Ownership map.

A1.3 City of Colusa leaf disposal paper trail.

A1.4 Colusa County Library references.

A2 Soil survey data.

A3 Correspondence.

A4 Dormant hardwood cutting collection and planting methods.

JUL 21 1958

1 AGREEMENT FOR THE TRANSFER OF CONTROL AND POSSESSION
2 SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT
3 COLUSA-SACRAMENTO RIVER STATE PARK
4
5

6 THIS AGREEMENT, made and entered into this 20th day
7 of December, 1957, by and between the SACRAMENTO
8 AND SAN JOAQUIN DRAINAGE DISTRICT, acting by and through The
9 Reclamation Board, hereinafter called "District", and the STATE
10 OF CALIFORNIA, acting by and through the State Park Commission,
11 hereinafter called "Commission",
12

13 W I T N E S S E T H:

14 WHEREAS, District has control and possession of
15 certain lands located in the County of Colusa, said lands being
16 hereinafter particularly described; and
17

18 WHEREAS, Commission proposes to acquire additional
19 lands in the County of Colusa for State Park purposes and has
20 applied to District for a transfer of control and possession of
21 the hereinafter described lands; and

22 WHEREAS, District desires to cooperate with Commission
23 and to transfer the control and possession of the hereinafter
24 described property for such park purposes;

25 NOW, THEREFORE, in consideration of the mutual
26 benefits to be derived by each party, and in accordance with
27 established departmental procedure, and pursuant to the provisions
28 of Section 13110 of the Government Code and Section 5005 of the
29 Public Resources Code of the State of California, District hereby
30 transfers to Commission and Commission hereby accepts the control
31 and possession of the following described Parcel 1 of real
property:

PARCEL 1

All that certain real property situate, lying and being in the County of Colusa, State of California, being portions of Lots 17 and 18 of "Amos Roberts Tract", as said lots are delineated and so designated upon the official map or plat of said tract filed in the office of the Recorder of the County of Colusa, California, September 30, 1887, in Book 4 of Patents, Page 80, and more particularly described as follows, to-wit:

Commencing at the intersection of the center lines of 12th and Main Streets in the Town of Colusa, thence N. 16° 00' E., 400.00 feet, more or less, along said center line of 12th Street to the north line of Levee Street; thence S. 74° 00' E., 12.50 feet, more or less, along said north line of Levee Street to the landward right of way line of the west levee of the Sacramento River, as conveyed by L. M. O'Rourke and J. L. O'Rourke, executors of the will of J. J. O'Rourke, deceased, to the Sacramento and San Joaquin Drainage District, dated June 6th, 1939, and recorded in Book 94 of Official Records of Colusa County, at Page 318; thence N. 16° 09' E., 131.74 feet along said levee right of way line to the point of beginning of the herein described tract of land.

Thence from said point of beginning N. 23° 55' W., 884.32 feet; thence N. 61° 38' E., 589.55 feet, more or less, to the above mentioned landward levee right of way line; thence along said levee right of way line the following courses and distances:

S. 3° 56' W., 419.84 feet; S. 8° 08' W., 430.25 feet; and S. 16° 09' W., 253.73 feet, more or less, to the point of beginning and containing 6.5 acres, more or less.

Reserving, however, unto District, its successors and assigns, the perpetual right to excavate and remove earth and other materials from the hereinafter described Parcel 2 of real property for the purpose of constructing, reconstructing, operating, repairing or maintaining any and all works of the Sacramento River Flood Control Project, together with a right over, upon and across the above described Parcel 1 of ingress to and egress from the said Parcel 2 for the purposes recited

herein: Said Parcel 2 of real property is located in Colusa County, State of California, and is described as follows:

PARCEL 2

Beginning at the most westerly corner of the lands conveyed by L. M. O'Rourke and J. L. O'Rourke, executors of the will of J. J. O'Rourke, deceased, to the Sacramento and San Joaquin Drainage District dated June 6, 1939, and recorded in Book 94 of Official Records of Colusa County, at Page 318; thence North 61° 33' East 589.55 feet, more or less, to the landward levee right of way line of the west levee of the Sacramento River; thence along said levee right of way line the following courses and distances; South 3° 56' West 419.84 feet; South 8° 08' West 233.98 feet; thence leaving said right of way line South 84° 34' 30" West 282.04 feet; thence North 23° 55' West 434.32 feet to the point of beginning.

This Transfer of Control and Possession is subject to the following covenants, conditions and reservations:

1. This transfer of control and possession shall be for the uses and purposes incident to the powers and duties granted to Commission by Division 5, Chapter 1 of the Public Resources Code of the State of California as the same now exists or may from time to time be amended, except as same may be inconsistent with the conditions and reservations as recited herein.

2. Commission shall have no control over and shall not be possessed of the minerals, oil and gas contained in the lands described herein, and District shall have the sole right to remove and/or dispose of the same; provided, however, that the surface of said parcel hereinabove described shall not be disturbed except that District may locate an oil, gas or other well thereon at a location satisfactory to it and Commission.

3. Commission hereby accepts Control and Possession of the herein described parcel of land subject to all land, oil,

oil and gas leases, easements, rights of way and encumbrances
which are in existence as of the date of this agreement.

IN WITNESS WHEREOF, the parties hereto have executed
this agreement on the day and year first above written.

SACRAMENTO AND SAN JOAQUIN DRAINAGE
DISTRICT, Acting by and through The
Reclamation Board

By [Signature]
President

By [Signature]
Secretary

STATE OF CALIFORNIA, Acting by and
through its State Park Commission

By [Signature]
J. R. KNOWLAND, Chairman

ATTEST:

[Signature]
J. H. COVINGTON
Executive Secretary



APPROVED:

[Signature] Chief
Division of Administrative Services
DEWEY NELSON
Director of Natural Resources

APPROVED:

JOHN M. PEIRCE
Director of Finance

- 4 -

RECEIVED
DEC 11 1958

STATE OF CALIFORNIA }
COUNTY OF SACRAMENTO }

On this 20th day of December A.D. 1957, before me,

Mary K. Hicks, a Notary Public in and for the said county and State,

duly commissioned and qualified, personally appeared A. R. Galloway, Jr.

and George H. Holmes, known to me to be the President and Assistant Secretary, respectively, of The Reclamation Board of the State of California, and acknowledged to me that they executed the foregoing instrument for and on behalf of The Reclamation Board of the State of California.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal, the day and year in this certificate first above written.

My commission expires
July 22, 1960

16747 11-00 200-000

Mary K. Hicks
Notary Public in and for the County of Sacramento,
State of California

STATE OF CALIFORNIA }
COUNTY OF Alameda }

On this 21st day of May, 1958, before me, Rena Walsh, a Notary Public in and for the County of Alameda, State of California, residing therein, duly commissioned and sworn, personally appeared J. R. Knowland, known to me to be the Chairman of the State Park Commission of the State of California, the body politic and sovereign that executed the within instrument, known to me to be the person who executed the within instrument on behalf of said State of California and acknowledged to me that said State of California executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal on the day and year in this certificate first above written.

16747 11-00 200-000

Rena Walsh
Notary Public in and for the County of
State of California My Commission Expires Oct. 17, 1960

via
Service to Administration

RECORDED AT REQUEST OF
Division of Beaches & Parks
AT 10 MIN. PAST 11 A.M.
OFFICIAL RECORDS COLUSA COUNTY, CALIF.
JUL 21 1958

John Smith
RECORDER FEE \$10.00

Administrative Adviser

DEC 30 1957

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BOOK 257 PAGE 276

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AMENDMENT TO TRANSFER OF CONTROL AND POSSESSION
COLUSA-SACRAMENTO RIVER STATE PARK

W I T N E S S E T H:

WHEREAS, on December 20, 1957 the SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT, acting by and through The Reclamation Board, hereinafter called "District", and the STATE OF CALIFORNIA, acting by and through the State Park Commission (now entitled: Department of Parks and Recreation), hereinafter called "Parks" entered into an agreement transferring control and possession of land more particularly described as "Parcel 1" and "Parcel 2" in the above mentioned document to Parks; and

WHEREAS, District reserved the right to excavate and remove earth and other materials from Parcel 2 needed for constructing, reconstructing, operating, repairing or maintaining any and all works of the Sacramento River Flood Control Project together with a right over, upon and across Parcel 1 of ingress to and egress from the said Parcel 2 for the purposes recited herein; and

WHEREAS, District finds that the rights described above are no longer needed for purposes of the Sacramento River Flood Control Project;

NOW THEREFORE, it is mutually agreed between District and Parks that the right to remove material and the right of access over Parcel 1 as set forth in the Transfer of Control and Possession dated December 20, 1957 and recorded in Book 257, Page 276, Colusa County Records, are hereby deleted.

All other provisions of the said Transfer of Control and Possession remain the same.

///

428-2456

N29

1 IN WITNESS WHEREOF, the parties hereto have executed
2 this agreement on May 14, 1975.

3
4 SACRAMENTO AND SAN JOAQUIN DRAINAGE
5 DISTRICT, Acting by and through The
6 Reclamation Board

7
8 Approved as to legal form and
9 sufficiency:

By William M. Louch
President

10 William M. Louch
11 Chmnsl, Reclamation Board
12 Discharging duties

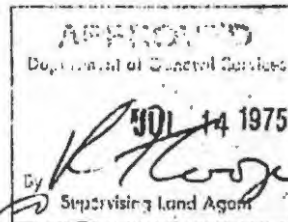
By Ronald H. Harnish
Secretary

13 STATE OF CALIFORNIA, Acting by and
14 through the Department of Parks
15 and Recreation.

16 By Robert R. Hall
17 Director

18
19
20
21
22 Approved as to Legal Form and
23 sufficiency for The Reclamation
24 Board

25
26 William M. Louch
27 Counsel



BOOK 428 PAGE 457


SUBSCRIBING WITNESS

STATE OF CALIFORNIA

COUNTY OF Sacramento

On May 29, 19 75 before me, the undersigned, a Notary Public in and for the State of California, personally appeared Allan I. Wendroff known to me to be the person whose name is subscribed to the within instrument as a witness thereto, who, being by me duly sworn, deposed and said: that he resides in the County of Sacramento, State of California; that he was present and saw Wallace McCormack and Ronald R. Harrington

personally known to him to be the person ☒ described in and whose name are subscribed to the within instrument, execute the same; and that affiant subscribed his name thereto as a witness to said execution.

WITNESS my hand and official seal
 MARJORIE L. SMITH
 NOTARY PUBLIC - CALIFORNIA
 COUNTY OF SACRAMENTO
 My Commission Expires March 8, 1977
 Marjorie L. Smith
 Name (Typed or Printed)
 Notary Public in and for the State of California


Marjorie L. Smith

STATE OF CALIFORNIA

COUNTY OF SACRAMENTO

On this 14th day of MAY, in the year of 1975, before me, NEIL E. O'BRIEN, a Notary Public in and for the State of California, duly commissioned and sworn, personally appeared HERBERT RHODES known to me to be the Director of Parks and Recreation of the State of California and acknowledged to me that he executed the within instrument in the name of and on behalf of the State of California.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal in said County, the day and year first above written.

 NEIL E. O'BRIEN
 NOTARY PUBLIC
 SACRAMENTO COUNTY, CALIFORNIA
 My commission expires March 8, 1976

Neil E. O'Brien
 Notary Public

NOTARY PUBLIC

BOOK 428 PAGE 458

N31

May 23, 1975

RIGHT OF WAY ACQUISITIONb. PROPERTY MANAGEMENT -Amendment to Transfer of Control and Possession, Colusa-Sacramento River State Park.

Mr. Lew Morse said that in 1957 the Reclamation Board transferred a parcel in the City of Colusa to the Department of Parks & Recreation, and in that transfer certain rights were reserved -- the right to excavate and remove material, the right of access and mineral rights. The City of Colusa and the Department of Parks & Recreation wish to develop this site into an all-year campground. Mr. Morse said he had checked with Mr. John Wright, Department of Water Resources, and he follows the opinion these rights, with the exception of the mineral rights, would not be needed; therefore it was Mr. Morse's recommendation that an amendment to the Transfer of Control and Possession document be approved and executed by the Board. The mineral rights are to be retained by the Reclamation Board.

STATE OF CALIFORNIA)
 COUNTY OF SACRAMENTO) ss.
 Office of The Reclamation Board)

I, JOHN V. PAYNE, Assistant Secretary of The Reclamation Board, do hereby certify that the above is a true and correct extract from the Minutes of the meeting of said Board held on May 23, 1975.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the official seal of The Reclamation Board this 27th day of May, 1975.

(Seal)

John V. Payne
 JOHN V. PAYNE, Assistant Secretary
 The Reclamation Board

SRB 016

RECORDED AT REQUEST OF
 State of California

DATE
 July 22, 1975

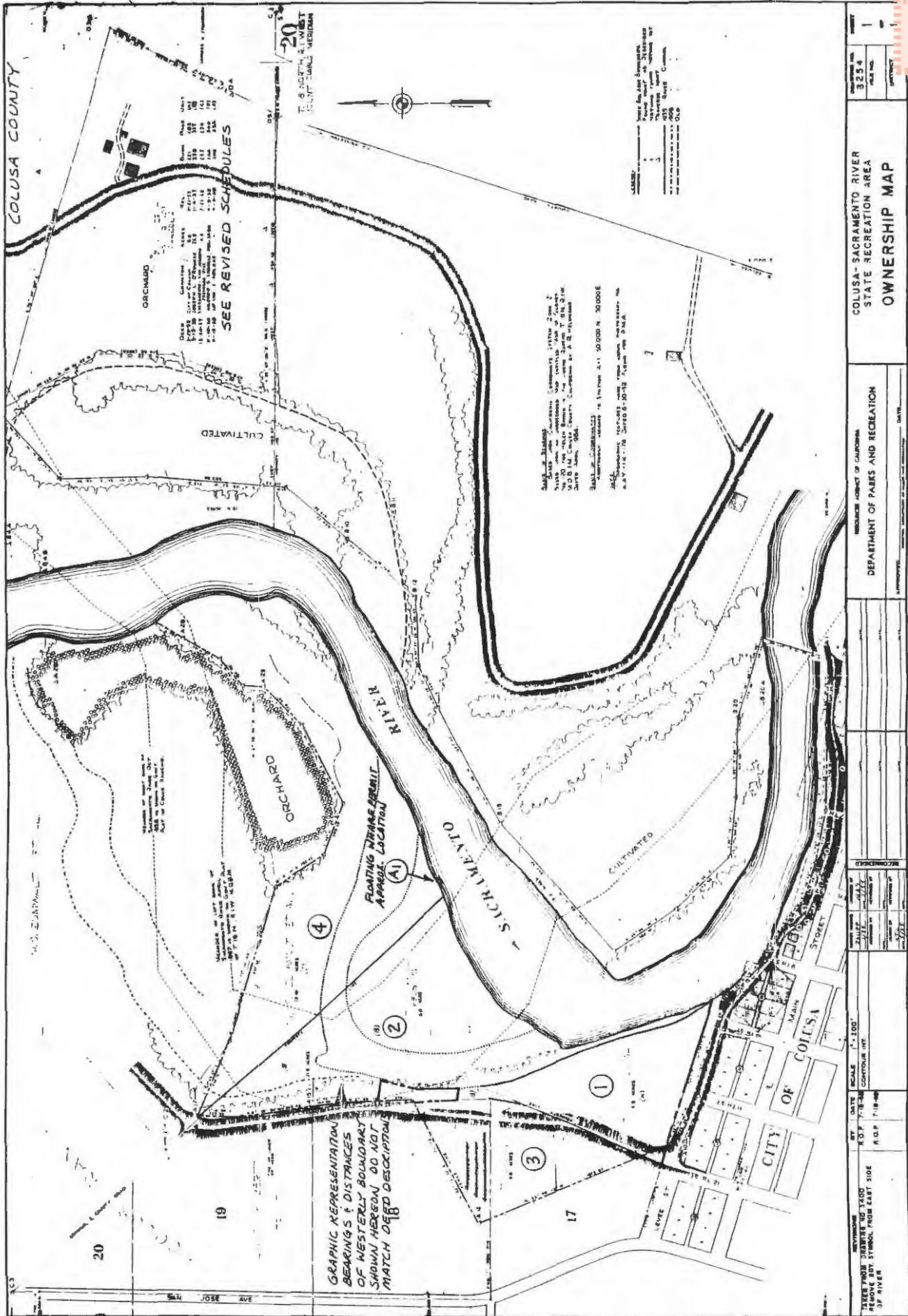
428 Official Records p. 456
 Colusa County, California

INDEXED

1 Min. past 12 P.M. No Fee

2260

Michael J. Simon
 RECORDED BOOK 428 PAGE 459



PROJECT NO. 3254 DATE 11-1-60 SHEET 1	
COLUSA-SACRAMENTO RIVER STATE RECREATION AREA OWNERSHIP MAP	
DEPARTMENT OF PARKS AND RECREATION DIVISION OF LAND MANAGEMENT	DATE BY CHECKED BY APPROVED BY



CITY OF COLUSA

N33

COLUSA, CALIFORNIA 95932 Phone 916-458-4941

From the Office of: Public Works Director
425 Webster
P.O. Box 1063

June 14, 1982

State of California
Department of Parks and Recreation
P.O. Box 2430
Shasta, California 96087

Attention: Mr. Jack Schlotter
Area Manager

Dear Mr. Schlotter:

The City of Colusa requests the cooperative use of approximately four (4) acres of low land west of the levee at the Colusa State Park and north of the Park Maintenance building for dirt and leaf disposal.

The low land area in question will be used for dirt and leaf disposal by the City of Colusa until the low land is filled to its natural ground level.

The City of Colusa will maintain the area in an orderly manner as to not cause an unsightly condition. No uses for disposal by the general public will be permitted without Colusa State Park authorization.

The City will maintain existing roadway from the top of the levee entrance point to the State Maintenance building through to the disposal site.

I have discussed this proposed agreement with the local Park Ranger, Mr. Will Rose, Mr. Kenneth Wilbur, Chief Ranger of the North Valley of Chico and yourself, and all have agreed to the tentative agreement of this disposal site proposal by the City of Colusa.

I wish to thank all of the State Department of Parks and Recreation staff for their cooperation in this proposed agreement with the City of Colusa.

We will be looking forward to hearing from you as soon as possible regarding the specific terms and conditions of this proposed agreement.

If any other information is needed please contact me at (916) 458-4941.

Thank you.

Roy G. Triplett
Public Works Director

A1.3-1

RGT/mw

DEPARTMENT OF PARKS AND RECREATION
Northern Region Headquarters
3033 Cleveland Avenue, Suite 110
Santa Rosa, CA 95401
(707) 576-2185



RECEIVED

SEP 30 1982

CITY OF COLUSA

September 27, 1982

Roy G. Triplett
Public Works Director
City of Colusa
P. O. Box 1063
Colusa, California 95932

Dear Mr. Triplett:

The following is the clarification you requested concerning condition Number 7 of the Temporary Use Permit at Colusa-Sacramento SRA for the dirt and leaf landfill.

The intent of this section is to insure that at the termination of the permit the Permittee will restore the area to the proximate condition prior to the commencement of work, including the condition of access roads, fences, gates, etc., and to insure the removal of all equipment and materials used on the site. It is not intended in any way to require the removal of any of the landfill materials placed in accordance with the other terms of the Permit.

I hope this clarification is adequate for your purposes. Should you need further assistance please call Land Agent Jim Rennie in Santa Rosa at (707) 576-2325.

Sincerely,

Curtis B. Mitchell
Regional Director

RECEIVED N35
OCT 14 1982
CITY OF COLUSA

MEMORANDUM

TO: Larry F. Nash

5 October 1982

FROM: Dan S. Fua

SUBJECT: PROPOSED DISPOSAL SITE FOR LEAVES AND STREET SWEEPINGS, CITY OF COLUSA, COLUSA COUNTY

An inspection of the proposed disposal site for leaves and street sweepings from the City of Colusa was made on 30 September 1982. Mr. Craig King, Colusa County Director of Environmental Health; Mr. Roy Triplet, City of Colusa, Director of Public Works; and Jon Marshack, of our office, accompanied me.

The proposed site is adjacent to the California Department of Parks and Recreation maintenance building, outside the City of Colusa's city limit and owned by the State of California. It is bounded by Highway 45 on the west, Sacramento River levee on the east, the City of Colusa on the south and an orchard on the north. The depressed condition of the area was caused by previous removal of earth for highway construction. The area was previously described by Mr. King as low and marshy. It is presently unused. There are trees surrounding it and vegetation growing in it. The proposal to use the site for disposal of leaves and street sweepings for a year trial basis was considered by City staff as the least costly of all alternatives and could also serve the purpose of refilling the depressed area. Mr. Triplet said the Department of Parks and Recreation had given approval to the City for the use of the site.

Jon and I saw no water quality problem on the use of the site for disposal of leaves and street sweeping for a year and recommend a waiver of permit. The disposed wastes should, however, be capped to prevent rainwater from leaching them. I will be observing this operation to track down conditions and disposal practices that may adversely affect water quality.

DSF:rar

cc: Mr. Craig King, Environmental Health Department, Colusa County
Mr. Roy Triplet, Public Works Department, City of Colusa

DEPARTMENT OF PARKS AND RECREATION

Northern Region Headquarters
3033 Cleveland Avenue, Suite 110
Santa Rosa, California 95401
(707) 576-2185



RECEIVED

JUL 21 1983

CITY OF COLUSA

July 18, 1983

Roy G. Triplett, Public Works Director
City of Colusa
425 Webster, P.O. Box 1063
Colusa, California 95932

Dear Mr. Triplett:

Enclosed is a fully executed copy of the Temporary Use Permit to allow the City of Colusa to utilize a portion of Colusa-Sacramento State Recreation Area as a land fill for dirt and leaf disposal material.

I would like to thank you and your staff for the continued cooperation you have shown in fulfilling the terms of the Permit.

Sincerely,

Curtis B. Mitchell
Regional Director

CBM:JWR:ik

Enclosures

cc: Jack Schlotter, Cascade Area Manager
w/attachments

STATE OF CALIFORNIA - RESOURCES AGENCY
DEPARTMENT OF PARKS AND RECREATION

N37

TEMPORARY USE PERMIT

PERMITTEE:

City of Colusa
425 Webster, P.O. Box 1063
Colusa, California 95932
(Name and Address of Permittee)

Permittee is hereby granted permission to use subject to the conditions set forth below for the period commencing September 1, 1983 and ending November 30, 1987, that portion of Colusa-Sacramento River State Recreation Area as outlined in red on Drawing No. 15322, Sheet No. 3, attached hereto.

This permit is issued for the purpose of providing a landfill consisting of dirt and leaf disposal material as outlined in the letter dated June 14, 1982, attached hereto.

This permit is issued upon the following conditions:

1. That the premises be used only for the purposes specified above.
2. That the exercise of any of the privileges granted in this permit constitutes acceptance of all the conditions of this permit.
3. Permittee, in the exercise of the privileges herein granted, shall at all times comply with all applicable laws, rules and regulations including, but not limited to, rules and regulations for the State Park System now in effect or hereinafter adopted.

4. That no tree or plant shall be cut, injured or disturbed by Permittee without approval of the State. Any tree or slash so cut or removed shall be disposed of in a manner satisfactory to State.

N38

5. This permission is subject to all valid and existing contracts, leases, licenses, encumbrances and claims of title which may affect said property; and the use of the word "grant" herein shall not be construed as a covenant against the existence of any thereof.

6. Permittee hereby waives all claims and recourse against the State of California for loss or damage to persons or property arising from, growing out of, or in any way connected with or incident to this permit. Permittee agrees to indemnify, save harmless, and defend the State of California, its officers, agents, and employees against any and all claims, demands or causes of action that may be brought against the State of California, its officers, agents and employees arising out of, or in any way connected with or incident to this permit.

7. That upon termination of this permit, Permittee shall remove all property and equipment placed by or for Permittee upon said premises, except for dirt and leaf disposal material placed in accordance with the terms and conditions of this Permit, and restore said premises as nearly as possible to the same state and condition they were in prior to Permittee's entry upon said premises; but if Permittee shall fail to do so and in the event Permittee shall not correct such breach within ten (10) days after being requested in writing to do so by State, then State may do so all at Permittee's cost and expense, to be paid by Permittee on demand.

8. The route of ingress, egress and access by Permittee for the purposes herein shall be reasonably designated and redesignated by the State.

9. In its use of the area Permittee shall comply with all State requirements including, but not limited to, parking control and the uses contemplated herein.

10. This permit shall terminate at the end of the period as hereinabove provided except that State reserves the right to terminate at any time during said period upon giving ten (10) days' written notice to Permittee of State's intention to terminate. Upon breach by Permittee of any of the conditions set forth herein, State may terminate the permit immediately by written notice to Permittee.

11. This permit shall not, nor shall any interest therein or thereunder, be assigned, mortgaged, hypothecated or transferred by Permittee whether voluntary or involuntary or by operation of law, nor shall Permittee let or sublet, or grant any license or permit with respect to the use and occupancy of the said premises, or any portion thereof without the written consent of State being first had and obtained.

The terms of the above permit accepted by the Permittee this 29 day of JUNE, 1983

PERMITTEE:

CITY OF COLUSA

By

Roy S. Triplett
Public Works Director

STATE OF CALIFORNIA
DEPARTMENT OF PARKS AND RECREATION
NORTHERN REGION

BY

Curtis B. Mitchell

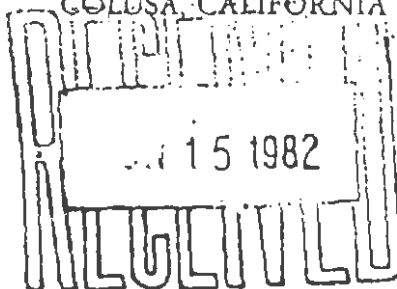
Curtis B. Mitchell
Regional Director



CITY OF COLUSA

N40

COLUSA, CALIFORNIA 95932 • Phone 916-458-4941



From the Office of: Public Works Director
425 Webster
P.O. Box 1063

June 14, 1982

State of California
Department of Parks and Recreation
P.O. Box 2430
Shasta, California 96087

Attention: Mr. Jack Schlotter
Area Manager

AREA MANAGER

V.G. SUPERVISOR

MAINT. SUPERVISOR

ADMIN. SUPERVISOR

UNIT

Dear Mr. Schlotter:

The City of Colusa requests the cooperative use of approximately four (4) acres of low land west of the levee at the Colusa State Park and north of the Park Maintenance building for dirt and leaf disposal.

The low land area in question will be used for dirt and leaf disposal by the City of Colusa until the low land is filled to its natural ground level.

The City of Colusa will maintain the area in an orderly manner as to not cause an unsightly condition. No uses for disposal by the general public will be permitted without Colusa State Park authorization.

The City will maintain existing roadway from the top of the levee entrance point to the State Maintenance building through to the disposal site.

I have discussed this proposed agreement with the local Park Ranger, Mr. Will Rose, Mr. Kenneth Wilbur, Chief Ranger of the North Valley of Chico and yourself, and all have agreed to the tentative agreement of this disposal site proposal by the City of Colusa.

I wish to thank all of the State Department of Parks and Recreation staff for their cooperation in this proposed agreement with the City of Colusa.

We will be looking forward to hearing from you as soon as possible regarding the specific terms and conditions of this proposed agreement.

If any other information is needed please contact me at (916) 458-4941.

Thank you.

Roy B. Triplett
Roy B. Triplett
Public Works Director

RGT/mm

7500 cu yds - FALL LEAF SEASON
4-6" ^{DIRT} FILL OVER ROLLED AND COMPACTED
A13-8



CITY OF COLUSA

N41

COLUSA, CALIFORNIA 95932 • Phone 916-458-4941

From the Office of: Millard C. Totman, Director
Department of Public Works
P.O. Box 1063
425 Webster Street

October 26, 1987

Janet Krug, Director
Department of Environmental Health
P.O. Box 610
Colusa, CA

RE: City of Colusa
Leaf Removal Site

Dear Ms. Krug:

The City of Colusa has a permit, from the State of California Department of Parks and Recreation, to haul and deposit, on approximately four acres of their land lying West of the West (or right) levee of the Sacramento River, the annual leaf removal, wood chips from the City's pruning activities and soil. The object is to fill an existing low level area, with an elevation of 53±, to an elevation of 58, U.S.G.S. datum, thereby allowing the State to reclaim and use the area for additional Park area.

The City must maintain the existing roadway from the top of the levee entrance point to the State Maintenance building through to the disposal site. The area is not open to the use of the public. During approximately 45 days each year there will be from 1½ to 3 truck loads, (36 compacted cubic yards per load) of leaves hauled into the area per day. These leaves are spread and compacted by a Cat 12 and a Cat loader, and a layer of imported soil (approximately 2 to 4 inches deep) is placed over the leaves. The wood chips are brought to the site on an average of one to two truck loads per day for approximately 200 days a year. A truck load consists of approximately 3 uncompacted cubic yards. These are spread with the leaves and covered. There is no sludge, slurry, etc. deposited.

The City's operation is monitored by the State Department of Parks and Recreation, and at the conclusion of the operation the City must restore the area to the proximate

Ms. Janet Krug
October 26, 1987
Page 2

condition prior to the commencement of work, including the condition of access road, fences, gate, etc.

As the area is abuted by an orchard on one side, levee on another and the Park's maintenance yard on the third, it does not create a public nuisance, as there are no nearby residences.

The filling of this low area with clean fill material would be beneficial in the sense that the area could not then be used as an illegal dump and possibly contaminate ground water.

If you have any questions regarding this topic, or if I can provide you with any further information, please do not hesitate to give me a call.

Sincerely,

Millard C. Totman

Millard C. Totman, Director
Department of Public Works

Enc.

JM:jv

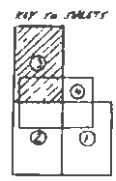
31,800 N

31,000 N

31,000 N
46,800 E

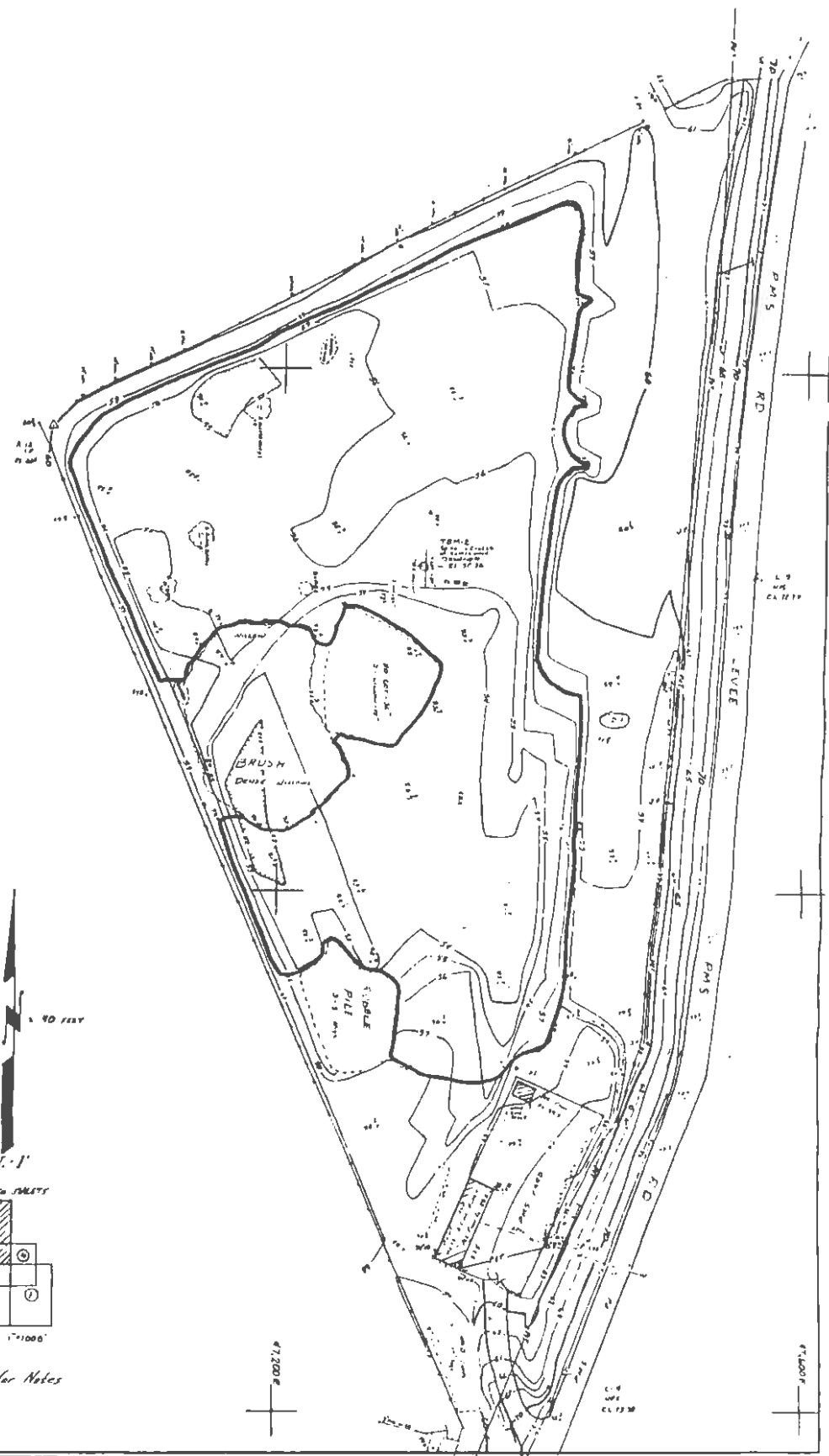
1 inch = 90 feet

C.T. 1'



SCALE 1"=1000'

See Sheet 1 for Notes



COLUSA SACRAMENTO RIVER S. R. A.
TOPOGRAPHY
Proposed Lines of Development

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF PARKS AND RECREATION

APPROVED: *[Signature]* DATE: 6/1/76

REVISIONS

DATE

CHECKED
A. [Signature]

CALIFORNIA WASTE MANAGEMENT BOARD

1020 NINTH STREET, SUITE 300

SAC INYO, CALIFORNIA 95814

AUG 15 1988



Mel Totten, Director
City of Colusa Public Works
425 Webster Street
Colusa, CA 95932

RECEIVED
AUG 16 1988
FBI - COLUSA

RE: Unpermitted Facility

Dear Mr. Totten:

California Waste Management Board (Board) staff recently conducted a review of Board records to determine which facilities in the state were operating without a Solid Waste Facilities Permit (SWFP). The following unpermitted site was identified in the County of Colusa:

06-AA-0005

Colusa State Park

All solid waste facilities, as defined by Title 7.3, Government Code (GC), Section 66720.1, are required by 7.3 GC 66796.30 to obtain a SWFP before initiating operations unless the facility has been exempted from permit requirements pursuant to 7.3 GC 66796.31.

As the operator of record, you are requested to contact your Local Enforcement Agency (LEA), in writing, regarding the operational status of your facility, i.e., active, inactive, closed, etc. by **August 31, 1988**, and to receive additional instructions. Failure to respond may result in enforcement action.

You may contact your Local Enforcement Agency, the Colusa County Department of Environmental Health, by calling Janet Krug at (916) 458-7717.

Sincerely,

John K. Bell, Manager
Monitoring and Compliance
Headquarters

JKB:AM:tk

cc: Bob Kennedy, Director, Inyo County Department of
Environmental Health



CITY OF COLUSA

N45

COLUSA, CALIFORNIA 95932 • Phone 916-458-4941

From the Office of: Director of Public Works
425 Webster Street
P.O. Box 1063

August 22, 1988

Colusa County Environmental Health
251 East Webster Street
Colusa, Ca. 95932

Attention: Mrs. Janet Krug

Re: Leaf Disposal - Colusa State Park

Dear Janet:

The City of Colusa has ceased using the State Park adjacent to Colusa for the dumping of leaves.

After talking with Ken Wilbur from the State Parks, we have decided against going to the expense for the testing requirement, just for the disposal of leaves from the City's trees.

The City stopped our operation there last spring when the State's temporary permit ran out.

Sincerely,

M.T.

M. C. Totman
Director of Public Works

MCT/mw

COUNTY OF COLUSA
PUBLIC HEALTH DEPARTMENT

N46



P.O. Box 610 • 251 E. Webster Street • Colusa, CA 95932

RECEIVED

NOV 9 1988

CITY OF COLUSA

- ☐ Health (916) 458-5177
☐ Child Health & Disability Program (CHDP) 458-5177
☐ California Children Services (CCS) (916) 458-5177
☐ Environmental Health (916) 458-7717
☐ Animal Control (916) 458-4500

November 4, 1988

Mr. John K. Bell, Manager
Monitoring and Compliance, CWMB
1020 Ninth Street, Suite 300
Sacramento, Ca. 95814

Re: Unpermitted Facility - Colusa State Park 06-AA-0005

Dear Mr. Bell:

In August you requested a determination of whether the above referenced facility is a solid waste facility or not and whether it poses a threat to the public health, safety and the environment. You requested a written response no later than August 31, 1988.

I called your office on at least two occasions (8/22 and 9/2) in order to speak to you. When I found that you were not in, I left messages but have not yet received a call back.

I need assistance on this matter. The city provides pick up service for yard trimmings that are laid out by the roadside, and disposes of them at this site. They cannot continue to provide the service if they must haul the trimmings to the Evans Road Landfill. Is it the intent of the law for this type of site to be treated the same as a Class 2 landfill? Is there some method provided for by law where they could be brought into compliance without requiring more staff time than it is worth in order to complete the permit process?

It would not be a problem to list this site in the County Solid Waste Management Plan. An amendment is currently underway to list a proposed brine disposal facility. Must all other aspects of facility permitting be completed or are there some streamlining provisions for "facilities" of this type?

Neither the city or the county want to circumvent the law. The public health, safety and the environment are priorities. However, they would like to continue to provide this service to their citizens if they can afford the permitting process.

I am anxious to get this matter resolved and look forward to your response.

Sincerely,

Janet Krug, R.S.
Janet Krug, R.S.

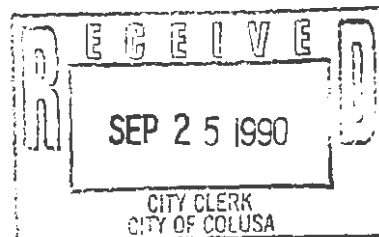
Environmental Health Officer

A1.3-14

CALIFORNIA INTEGRATED WASTE MANAGEMENT BOARD

1020 NINTH STREET, SUITE 300
S MENTO, CALIFORNIA 95814

SEP 20 1990



Mr. Mike Dragoo
California Department of Parks and Recreation
P. O. Box 207
Colusa, CA 95932-0207

SUBJECT: Determination of Alternative Certification for Colusa
State Park, Facility No. 06-AA-0005

Dear Mr. Dragoo:

This letter is in response to the Alternative Certification for Non-Operation or Applicability of Requirements for a Solid Waste Landfill received by this office for the above facility. The alternative certification was submitted in lieu of preparing an initial cost estimate and establishing a financial mechanism for solid waste facility closure and postclosure maintenance.

It is the California Integrated Waste Management Board (Board) staff's determination that the above facility is, by definition, excluded from the above closure and postclosure maintenance requirements because:

- The facility is not a solid waste landfill, as defined in the Public Resources Code, Section 46027.

The above site is, therefore, not a solid waste landfill and is not subject to the requirements of Government Code, Section 66796.22, Closure and Postclosure Maintenance: initial cost estimates and financial assurances.

If you have any questions concerning this determination, please contact Michael Finch of the Closure Branch at (916) 327-9339.

Sincerely,

A handwritten signature in cursive script, appearing to read "George H. Larson".

George H. Larson
Chief Executive Officer

GHL:mof

cc: John Heckman, Colusa County Environmental Health Department
William Crooks, Central Valley Regional Water Quality Control
Board
E. V. Anderson, Board of Equalization
City Council, City of Colusa

Irrigation Company took over the system in 1903, it extended the river branch to a point three miles south of Princeton, with the result that one of the very finest communities of small farmers in the county gathered there. Incidentally, a great injustice was done these people, for they bought their lands with a water right included, and then, by the decision of the supreme court in 1915, were deprived of the water right. They are now forming a district of their own, and will pump water from the river.

The Central Canal itself is sixty feet wide on the bottom, and is made to carry six feet of water. The original contractor was the San Francisco Bridge Company, which had a special excavating machine built to dig the canal. The machine weighed two hundred seventy-five tons and cost fifty thousand dollars. It worked night and day, employing a crew of thirty men during the day and twelve at night, and doing the work of four hundred men. In twenty-two hours it excavated about four thousand cubic yards of earth.

On September 26, 1906, the Central Canal and Irrigation Company, having completed the canal to its intake, began to install a pump to put water into it. The capacity decided upon was one hundred cubic feet a second, capable of irrigating twenty thousand acres. The original district contained one hundred fifty-six thousand five hundred acres.

For several years the Sacramento Valley Irrigation Company has been in financial straits, and has been selling off its lands. Thus the lands are passing back into the hands of individual owners, where they should be, and the strife and turmoil caused by the old Central Irrigation District are almost at an end.

In the year 1888, the year after the passage of the Wright Act, two efforts were made to form districts under that act in the vicinity of Arbuckle and College City. Both attempts failed, and Arbuckle and College City are yet without irrigation.

For over ten years after Central District was launched, the question of irrigation lay dormant in this county; but in 1902 a number of farmers living just northwest of Colusa united and formed the Amos Roberts Ditch Company. They put in a pump and a system of ditches capable of irrigating the fifteen hundred acres in the district. This district was not organized under the Wright Act, but was a cooperative corporation, all profits being absorbed in the shape of lower water rates. The moving spirit in this enterprise, which has been eminently successful from the beginning, was L. L. Hicok, who has been the president of the company since its organization. The first directors, besides Mr. Hicok, were W. C. Roberts, A. E. Potter, W. R. Merrill, and J.

Assessment Office: Bonds to

Steve Spaulding

Thurs./Fri.

John Morton

COLUSA AND GLENN COUNTIES

103

Grover. The present directors are L. L. Hicok, A. E. Potter, J. C. Mogk, George Stafford, and J. S. O'Rourke. Some of the finest fruit and alfalfa in the state are grown under irrigation from this ditch, and the Roberts Ditch Company deserves great credit for the improvement it has made in the appearance of the country about Colusa.

9-18-58

Colusa Park Gravel 'Fill' Job Started

Colusa Park

The hauling of about 36,000 yards of gravel from the Colusa Weir area to the new Colusa-Sacramento River State Park to fill low spots and level the old dump area will begin immediately, Ken Stanley, park supervisor, announced today.

The gravel will be hauled by A. Teichert and Son, Woodland contractors, who will also do the work on the park boat ramp.

Stanley said the boat ramp work will get under way next month — when the ditch in which the ramp is located is not being used for irrigation.

The work is being done under a single contract and is to cost a total of about \$65,000. Work has already started on construction of a comfort station at the park site.

Stanley said the Teichert projects are the first major jobs to be done at the new park.

The boat ramps are not expected to be completed in time for much use prior to the winter rainy season, but are expected to be ready next spring.

Further work at the park depends upon the availability of funds, Stanley said.

Appendix A2. Soil survey data.

Hole numbers correspond to those of Map 1.3.

Field work was done on 07 and 21 July, 2000. Textures by feel (Thien, -).

Hole 1. Bermuda grass cover.

0-8"	gravel	
8-30"	silt	
30-60+"	silty very fine sand	(moist below 30")

Hole 2. Bermuda grass.

0-4"	gravel	
4-12"	organic silt loam	
12-18"	silt loam	
18-44""	silty very fine sand	(moist)
44-54"	silt loam	(moist)
54-60+"	organic loam	(moist)

Hole 3. Open space next to *Arundo donax* patch.

0-6"	gravelly sandy loam	
6-18"	organic gravelly sand	
18-30"	gravelly sand	
30-51"	gravelly sandy loam	(moist; glass shard and organics @ 36")
51-60+"	silt	(moist)

Hole 4. Bermuda grass under Fremont cottonwood.

0-5"	organic loamy fine sand	
5-36"	fine sand	(moist below 20")
36-42+"	silty fine sand	(moist)

Hole 5. Tall, thick dry grass and yellow starthistle.

0-4"	gravel	
4-36+"	silty very fine sand	(moist below 18")

Hole 6. Sparse yellow starthistle.

0-12"	organic gravelly sand	
12-40"	gravelly sand	(Iron oxide horizon <1" thick @ 20")
40-60+"	silt	(moist)

Hole 7. Dry oats and sparse mugwort.

0-2"	organic sand	
2-12"	sand	
12-14"	irregular silt horizon	
14-32"	gravelly sand	(oxidized iron artifacts, e.g. large nail)
32-54"	silty sand	(moist)
54-60+"	silt	(moist)

Hole 8. Bermuda grass.

0-4"	gravel
4-8+"	silt

Appendix A3. Correspondence.

A3.1 Letter to Peter Rabbon, State Reclamation Board, July 26, 2000.

A3.2 Letter from Reclamation District 1004 (Colusa), July 20, 2000.

A3.3 Letter to Jeff Fong, Lands and Rights-of-Way, Department of Water Resources,
September 15, 2000.



N52

Northern Buttes District (NBD)
400 Glenn Drive
Oroville, California 95966
(530) 538-2212

Peter D. Rabbon, General Manager
State Reclamation Board
1416 9th Street, Room 1601
Sacramento, California 95814

July 26, 2000

Dear Mr. Rabbon:

Reforestation Proposal / Permission, Borrow Area of the Colusa-Sacramento River State Recreation Area

Jeffrey Fong in Lands and Rights-Of-Way, DWR, suggested that I write to you (tel. 7/25/00). We would like to reforest a 5 acre parcel within the Colusa-Sacramento River State Recreation Area, which according to the 1957 property deed is a borrow area with excavation rights pertaining to the Sacramento and San Joaquin Drainage District. The site is just outside of the Sacramento River Flood Control Project (SRFCP) West Levee. I have attached copies of the deed and pertinent maps (maps 1 and 2).

We would like to know if the Sacramento and San Joaquin Drainage District, which I understand to now mean the State Reclamation Board, maintains interests in this particular Borrow Area which may prevent or affect DPR reforesting the area, or if the Reclamation Board would want to reserve an interest in reforesting it themselves as a mitigation area.

Based on our examination of the soils on the site (map 3 attached), I would suppose that this Borrow Area is of limited use as a source of borrow material, given the coarse-textured nature of the substrate (very little clay content). The native substrate appears to be silt to very fine sand, and is covered with some overlying coarse fill deposits, including at least 7000 yd³ unsorted gravelly coarse sand and perhaps 900 yd³ pea gravel.

Removal of this pea gravel, and perhaps the sandy fill, would facilitate reforestation efforts. We are not sure whether removal of any of this material may affect the SRFCP West Levee adjacent to the Borrow Area, given a) the Borrow Area becomes inundated to some extent most years during River high water from seepage under the levee, and b) the pea gravel appears to be deliberately spread out over the area adjacent to the levee right-of-way.

In any case, we propose to restore the site to a native riparian forest, and would like to know what interests you may have regarding the property or what permitting process you may require.

Sincerely,

James Dempsey
Environmental Services Intern

Cc: H. Woody Elliott, NBD Senior Staff Resource Ecologist; Kate Foley, NBD Superintendent

Reclamation District No. 1004



July 20, 2000

James Dempsey
State Department of Parks & Recreation
Northern Butte District
400 Glen Drive
Oroville, Ca. 95966

Dear Mr Dempsey:

As per our conversation, I am informing your department that Reclamation District 1004 has no holdings within the Colusa State Park area, nor the shop area. Hopefully this will clear up some of the questions you have concerning that area.

If we can be of any other assistance to you, please feel to give us a call.

Sincerely

Lola Jeffers
District Secretary



Northern Buttes District
400 Glenn Drive
Oroville, California 95966
(530) 538-2200

N54

September 15, 2000

Jeff Fong
Lands and Rights-of-Way
Department of Water Resources
1416 9th Street, Room 425
Sacramento, California 95814

Dear Mr. Fong:

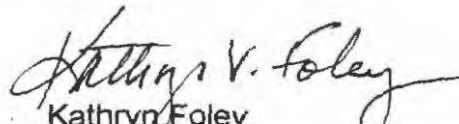
Reforestation Proposal / Permission, Borrow Area of the Colusa-Sacramento
River State Recreation Area

I am writing to follow up your telephone conversation this morning with Woody Elliott, District Resource Ecologist. As promised, the *Draft Riparian Forest Restoration Plan, Borrow Area and Shop Area, Colusa-Sacramento River State Recreation Area* is attached. It includes considerable detail about the site, including information about the soil substrate critical to evaluating the site potential as a borrow pit.

My concern and motivation for this reforestation proposal is that the area, as it currently exists, serves none of the goals nor policy functions of the Colusa-Sacramento River State Recreation Area (SRA) nor of the California Department of Parks and Recreation (DPR). However, DPR carries the burden of maintaining the area.

James Dempsey of my staff, wrote to Peter Rabbon, General Manager of State Reclamation Board on July 26, 2000 at your suggestion to inquire about reforesting the Borrow Area site. I hope the enclosed plan will facilitate Mr. Rabbon's response.

Sincerely,


Kathryn Foley,
District Superintendent

Reply pending
per tel. Oct 16

Enclosure

Cc: W. Elliott, J. Dempsey

Appendix A4. Dormant hardwood cutting collection and planting methods
for *Populus fremontii*, *Salix exigua*, *Salix goodingii*, and *Salix lasiolepis* (Nature Conservancy, 1998; pp. 49-52, 63-77).

Cuttings methodology.

Time: collect hardwood stem-cuttings of dormant one-year old growth during January and February.

Method: hardwood stem-cuttings. Collect cuttings from trees as close to the planting site as possible. Cuttings should be from one year old growth. Often one year old branches can be identified by green stripping which runs the length of the stems.

1. Cut ¾" to 1 ½" diameter branches four to six feet long with pole saws or loppers.
2. Remove all side growth from the collected branches, then cut the branch at a 45 degree angle into 18 to 24 inch long stem-cuttings.
3. The ideal cutting is about three-quarters of an inch in diameter and 18 to 24 inches long.
4. Place the cuttings in five-gallon buckets or thirty-five gallon trash cans. Immerse base of the cuttings in water as soon as possible. Do not submerge completely.
5. Cuttings can be stored this way for several days in a cool, dark place. Replenish or freshen the water daily.
6. Plant the cuttings as soon as possible. Follow the long-term storage recommendations below if cuttings can't be planted immediately.

Supplies Needed: leather gloves, pole saws, loppers, hand pruners, five gallon buckets, thirty-five gallon trash cans and fresh water.

Storage: hardwood stem-cuttings may be stored under a cold (31 degree), moist conditions for several weeks or months. Cuttings may be stored at a commercial cold storage facility which also stores bare-root trees. When removed from cold-storage, the cuttings should be placed into buckets of aerated water to induce root-bed formation (ten days) before planting in the field.

Field planting.

Field planting procedures will depend upon earlier site preparation. Cuttings should be planted into weed free rows. Cuttings are susceptible to desiccation and death before they form new roots and shoots. This can be the result of warm temperatures and lack of rain in February and March. Drying can be reduced by installing plant protectors (discussed below), which will maintain high humidity around the cutting while its roots and shoots are developing. The proper plant protectors have shown to significantly increase the survival of winter planted pole cuttings.

Time: plant dormant hardwood cuttings from January to February.

Method:

1. Dig one foot deep, "V" shaped hole. Break apart large soil clods and remove any remaining weeds.
2. Insert the cutting into the hole with two-thirds of the cutting below the soil surface. Make sure the cutting is "right-side up" with growth buds pointing up.

1. Firmly tamp the replaced soil around the planted cutting to remove air pockets in the soil which could cause the cutting to dry out.
2. Install plant protectors, following manufacturer specifications.
3. Water (½ gallon).

Remarks

Disease can be spread from the parent tree when collecting cuttings. One to two year-old saplings will show infection.

Cuttings will send vigorous new growth from below the soil level which will replace the original cutting and early top-growth. The original cutting and top growth will die with the dead wood persisting for several years. This dead wood may be an entry site for pathogens.

Cottonwood, sandbar willow, Gooding's willow, and arroyo willow have all been planted on several sites with other Mixed Riparian Forest species. Growth monitoring shows that they have done best on medium to fine textured soils when 10' above the water table. They do not become established in coarse soil with the water table at the same depth.

Salix exigua and *lasiolepis*.

Cuttings have been collected in winter, stored, and planted in spring with success, although it is recommended to plant cuttings within a couple of days from collection.

Plant Protectors

1. Protectors should be placed on the seedlings or cuttings at the time of planting into the field. The solid translucent plastic cylinders (blue-x and tube-x) function to retain humidity and to elevate daytime temperatures in early spring. This "greenhouse" climate retains moisture in the soil and in stem cuttings. It also allows for rapid growth earlier in the spring, thereby taking advantage of more favorable soil moisture conditions.
2. Milk cartons are cheap and effective for protection from herbicide drift. They should be used only with vigorously growing seedlings since light enters only from the top, not the sides as with blue-x and tube-x, resulting in relatively dark conditions at the bottom of the carton.

The Reclamation Board
Room 1335
Resources Building
1416 Ninth Street
Sacramento, CA 95814

April 17, 1975

Colusa-Sacramento River
State Recreation Area -
Release of Agreement
Reservation

Attention: Mr. A. E. McCollam, Chief Engineer
and General Manager

By an Agreement for the Transfer of Control and Possession, dated December 20, 1957, between the Sacramento and San Joaquin Drainage District, acting through The Reclamation Board and the State Department of Parks and Recreation, District transferred to Parks, control and possession of Parcel 1, outlined in green on the attached map. However, the District reserved unto themselves, its successors and assigns, the perpetual right to excavate and remove earth and other materials from Parcel 2, outlined in red, and also the right of ingress to and egress from Parcel 2. In addition, the District also retained the right to remove and/or dispose of the minerals, oil and gas contained in Parcel 1.

Parks, at the request of the City of Colusa, is considering the development of an all-year campground within Parcel 1. This area, being on the city side of the levee, should not be affected by the high waters of the Sacramento River during the winter months as the existing park day-use and campgrounds are now affected. The development of the all-year campground would produce additional income for both the park and the merchants in the city from users of this campground. The concept of an all-year campground at this state park is also a recommendation of the Preliminary Sacramento River Boating Trail Report.

For the reasons stated above, Parks requests The Reclamation Board to release to Parks all its interests to Parcel 1. We would be happy to meet with you, or prepare the Transfer Agreement should you concur to this request. Should you have any questions, please contact Bill Kuromoto at 5-4330.

ORIGINAL SIGNED BY
J. LESLIE MCCARGO

Les McCargo, Supervisor
Program Management and
Special Services Branch

Attachment

E-4a/1

LM:BK

cc: Dale Wilson
District 1 (2)

Colusa SRA, Borrow Area: Elderberry, Fox, Wetland

N58

Legend



Borrow Pit area



Remnant Riparian (1 ac)



Elderberry with 20ft buffer



Potential Fox Dens





Sacramento River looking south toward Sutter Buttes. SOURCE: Courtesy of Dennis Dahlin

