Appendix A

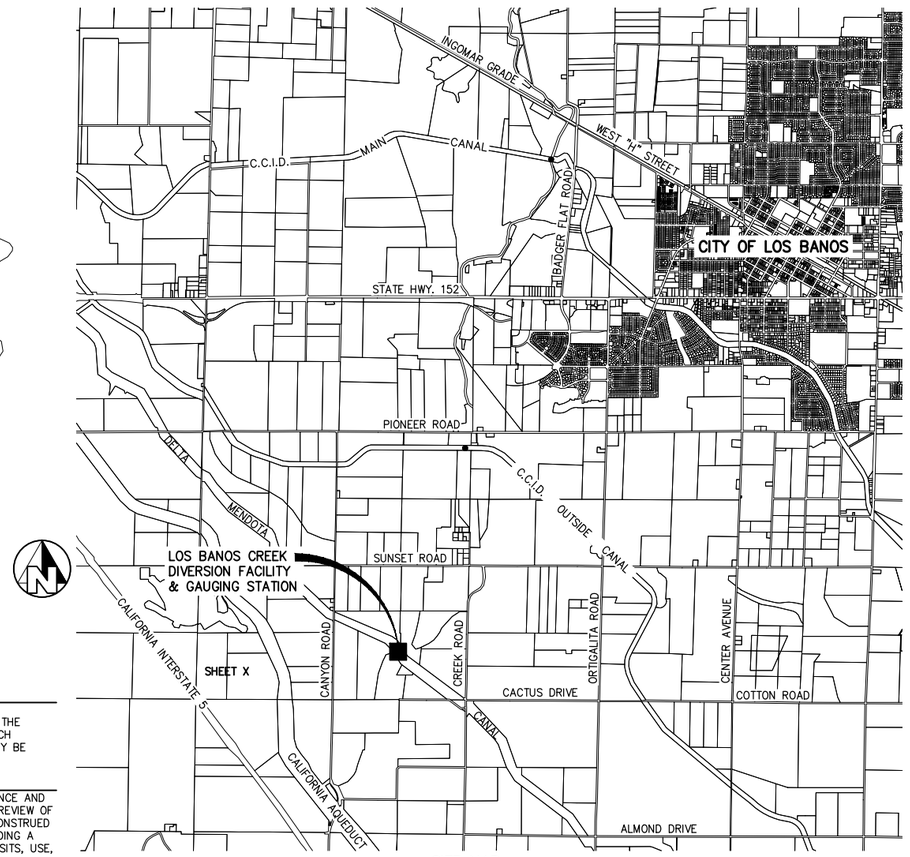
Proposed Construction Designs

SAN JOAQUIN RIVER EXCHANGE CONTRACTORS WATER AUTHORITY

MERCED COUNTY, CALIFORNIA

LOS BANOS CREEK WMP
LBC-DMC CONNECTION

VICINITY MAP



SITE MAP

SPECIAL NOTE

WHERE UNDERGROUND AND SURFACE STRUCTURES ARE SHOWN ON THE PLANS, THE LOCATIONS, DEPTH AND DIMENSIONS OF STRUCTURES ARE BELIEVED TO BE REASONABLY CORRECT, BUT ARE NOT GUARANTEED. SUCH STRUCTURES ARE SHOWN FOR THE INFORMATION OF THE CONTRACTOR, BUT INFORMATION SO GIVEN IS NOT TO BE CONSTRUED AS A REPRESENTATION THAT SUCH STRUCTURES WILL, IN ALL CASES, BE FOUND WHERE SHOWN, OR THAT THEY REPRESENT ALL OF THE STRUCTURES WHICH MAY BE ENCOUNTERED.

SITE SAFETY AND PROTECTION NOTES

THE DUTY OF THE ENGINEER, OWNER OR ITS AGENTS TO CONDUCT CONSTRUCTION REVIEW OF THE CONTRACTOR'S PERFORMANCE AND THE UNDERTAKING OF INSPECTIONS OR THE GIVING OF INSTRUCTIONS AS AUTHORIZED HEREIN IS NOT INTENDED TO INCLUDE REVIEW OF THE ADEQUACY OF THE CONTRACTOR'S SAFETY MEASURES IN, ON, OR NEAR THE CONSTRUCTION SITE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF THE ACTUAL CONSTRUCTION NOR MAKE THE ENGINEER, OWNER OR ITS AGENTS RESPONSIBLE FOR PROVIDING A SAFE PLACE FOR THE PERFORMANCE OF WORK BY THE CONTRACTOR, SUBCONTRACTORS, OR SUPPLIERS, OR FOR ACCESS, VISITS, USE, WORK, TRAVEL OR OCCUPANCY BY ANY PERSON.

THE CONTRACTOR SHALL HAVE AT THE WORK SITE, COPIES OR SUITABLE EXTRACTS OF CONSTRUCTION SAFETY ORDERS, ISSUED BY CAL-OSHA. CONTRACTOR SHALL COMPLY WITH PROVISIONS OF THESE AND ALL OTHER APPLICABLE LAWS, ORDINANCES AND REGULATIONS. THE CONTRACTOR MUST COMPLY WITH PROVISIONS OF THE SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION, PROMULGATED BY THE SECRETARY OF LABOR UNDER SECTION 107 OF THE CONTRACT WORK HOURS AND SAFETY STANDARDS ACT, AS SET FORTH IN TITLE 29 C.F.R.

TO PROTECT THE LIVES AND HEALTH OF CONTRACTOR'S EMPLOYEES UNDER THE CONTRACT, THE CONTRACTOR SHALL COMPLY WITH ALL PERTINENT PROVISIONS OF THE "MANUAL OF ACCIDENT PREVENTION IN CONSTRUCTION" ISSUED BY THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA, INC., AND SHALL MAINTAIN AN ACCURATE RECORD OF ALL CASES OF DEATH, OCCUPATIONAL DISEASE, AND INJURY REQUIRING MEDICAL ATTENTION OR CAUSING LOSS OF TIME FROM WORK, ARISING OUT OF AND IN THE COURSE OF EMPLOYMENT OR WORK UNDER THE CONTRACT.

THE CONTRACTOR ALONE SHALL BE RESPONSIBLE FOR THE SAFETY, EFFICIENCY, AND ADEQUACY OF CONTRACTOR'S FACILITIES, APPLIANCES, AND METHODS AND FOR ANY DAMAGE, WHICH MAY RESULT FROM THEIR FAILURE OR THEIR IMPROPER CONSTRUCTION, MAINTENANCE OR OPERATION.

THE CONTRACTOR AGREES THAT IT SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNER, PROVOST & PRITCHARD CONSULTING GROUP, AND THEIR RESPECTIVE AGENTS HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF OWNER, ENGINEER, OR THEIR RESPECTIVE AGENTS.

THE OWNER AND ITS AGENTS' SITE RESPONSIBILITIES ARE LIMITED SOLELY TO THE ACTIVITIES OF THEIR EMPLOYEES ON SITE. THESE RESPONSIBILITIES SHALL NOT BE INFERRED BY ANY PARTY TO MEAN THAT THE OWNER OR ITS AGENTS HAVE RESPONSIBILITY FOR SITE SAFETY. SAFETY IN, ON, OR ABOUT THE SITE IS THE SOLE AND EXCLUSIVE RESPONSIBILITY OF THE CONTRACTOR ALONE. THE CONTRACTOR'S METHODS OF WORK PERFORMANCE, SUPERINTENDENCE AND THE CONTRACTOR'S EMPLOYEES, AND SEQUENCING OF CONSTRUCTION ARE ALSO THE SOLE AND EXCLUSIVE RESPONSIBILITIES OF THE CONTRACTOR ALONE.

TOPOGRAPHY NOTE

TOPOGRAPHY SHOWN IS COMPLETED BY FIELD SURVEYS CONDUCTED IN JUNE 2012 PROVIDED BY PROVOST & PRITCHARD CONSULTING GROUP.

PROJECT BENCHMARK

NGS STATION "X 1235 RESET"(PID-AC5729)
BRASS DISK MONUMENT IN HEADWALL, 26.4' SOUTH OF THE EDGE OF PAVEMENT FOR STATE ROUTE 152, 4.35 MILES EAST OF INTERSTATE 5.
ELEVATION = 138.297'(NAVD88)

SITE BENCHMARK

CONTROL POINT #1
NAIL & SHINER IN DIRT, LOCATED NEAR THE NORTHWEST CORNER OF THE DMC & LOS BANOS CREEK INTERSECTION, BEHIND THE GUARD RAIL.
ELEVATION = 180.67'(NAVD88)

ABBREVIATIONS

ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS	HWL	HIGH WATER LEVEL
BM	BENCHMARK	IN	INCH
BTM	BOTTOM	INV	INVERT
CFS	CUBIC FEET PER SECOND	LBS	POUNDS
℄	CENTERLINE	LF	LINEAR FEET
CLR	CLEARANCE	NTS	NOT TO SCALE
CMP	CORRUGATED METAL PIPE	OSHA	OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION
CONT	CONTINUOUS	O&M	OPERATIONS & MAINTENANCE
CY	CUBIC YARDS	(P)	PROPOSED
DIA, ø	DIAMETER	PI	POINT OF INTERSECTION
DWG	DRAWING	ℙ	PROPERTY LINE
(E)	EXISTING	RST	RECTANGULAR STRUCTURAL TUBING
EA	EACH	R/W	RIGHT OF WAY
EF	EACH FACE	S=	SLOPE
EG	EXISTING GRADE	SF	SQUARE FEET
EL, ELEV	ELEVATION	STA	STATION
EW	EACH WAY	STL	STEEL
FG	FINISHED GRADE	TBM	TEMPORARY BENCHMARK
℄, FL	FLOW LINE	TOE	TOE OF SLOPE
FT	FOOT/FEET	TOP	TOP OF SLOPE
GB	GRADE BREAK	TS	TOP OF STRUCTURE
HORIZ	HORIZONTAL	TYP	TYPICAL
HP	HINGE POINT	VERT	VERTICAL

SYMBOLS

SYMBOL (EXISTING / PROPOSED)	DESCRIPTION
XX	REVISION
X	CONSTRUCTION CALLOUT
# / SHT	DETAIL NUMBER / SHEET NUMBER — DETAIL CALLOUT
	EMBANKMENT ARROW
DWS= XXX.XX	DESIGN WATER SURFACE
XXX.X± FG MATCH (E)	SPOT ELEVATION DESCRIPTION — SPOT ELEVATION
	SECTION VIEW

SHEET INDEX

PRELIMINARY
NOT FOR CONSTRUCTION
7/9/13

No.	REVISION	BY	DATE

LOS BANOS CREEK WMP
LBC-DMC CONNECTION
SAN JOAQUIN RIVER EXCHANGE CONTRACTORS WATER AUTHORITY
MERCED COUNTY, CALIFORNIA

COVER SHEET

PROVOST & PRITCHARD
CONSULTING GROUP
An Employee Owned Company
1120 WEST I STREET, SUITE C
LOS BANOS, CALIFORNIA 93635
209/826-1885 FAX 209/826-1675
www.ppeng.com

DESIGN ENGINEER:	G.W. ROGERS
LICENSE NO:	32121
DRAFTED BY:	D. MORENO
CHECKED BY:	T. PAYNE
SCALE:	AS SHOWN
DATE:	----
JOB NO:	349512
DWG. NO:	
SHEET	1 OF __

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811 Know what's below. Call before you dig.

WARNING
POWER LINES OVERHEAD

SCALE IN FEET
0 10 20 40

CONSTRUCTION NOTES

1. CONCRETE LINED CHANNEL SECTION. SEE 3/3
2. EXISTING 40' WIDE SWING GATE CONSTRUCTED FROM STD. STEEL PIPE AND HOLLOW STRUCTURAL STEEL. RELOCATE GATE TO ③. MATCH SIZE OF EXISTING FOOTINGS.
3. PROPOSED LOCATION FOR 40' WIDE SWING GATE.

(E) CONTROL BLDG.

DMC

10'x6' BOX CULVERT

APPROXIMATE RIGHT-OF-WAY LINE FOR DMC

6-INCH GAS LINE

LOS BANOS CREEK

(E) ELECTRICAL / SCADA VAULT

(E) CREEK CULVERTS (6 EACH)

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LOS BANOS CREEK WMP
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GENERAL PLAN

PROVOST & PRITCHARD CONSULTING ENGINEERING GROUP
An Employee Owned Company
1120 WEST I STREET, SUITE C
LOS BANOS, CALIFORNIA 93635
209/829-1885 FAX 209/829-1675
www.provostpritchard.com

DESIGN ENGINEER: G.W. ROGERS
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DWG. NO:
SHEET 2 OF __

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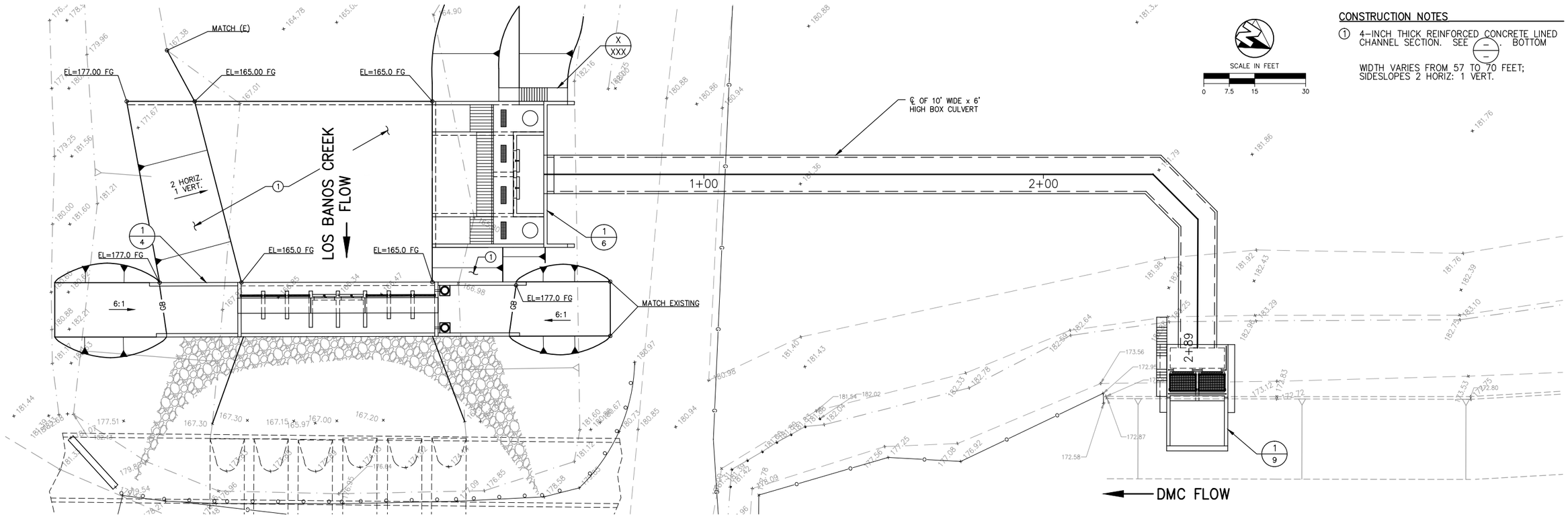

CONSTRUCTION NOTES

1. 4-INCH THICK REINFORCED CONCRETE LINED CHANNEL SECTION. SEE (—) BOTTOM WIDTH VARIES FROM 57 TO 70 FEET; SIDESLOPES 2 HORIZ: 1 VERT.

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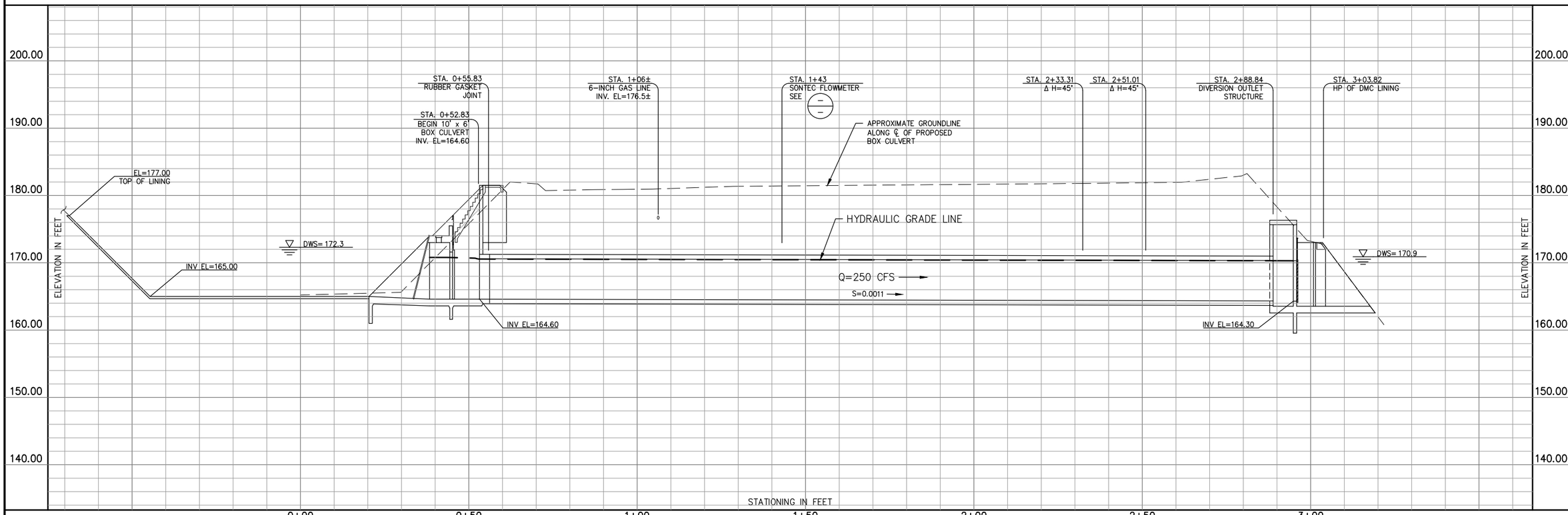

LOS BANOS CREEK WMP
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MERCED COUNTY, CALIFORNIA

BOX CULVERT
BOX CULVERT PLAN & PROFILE

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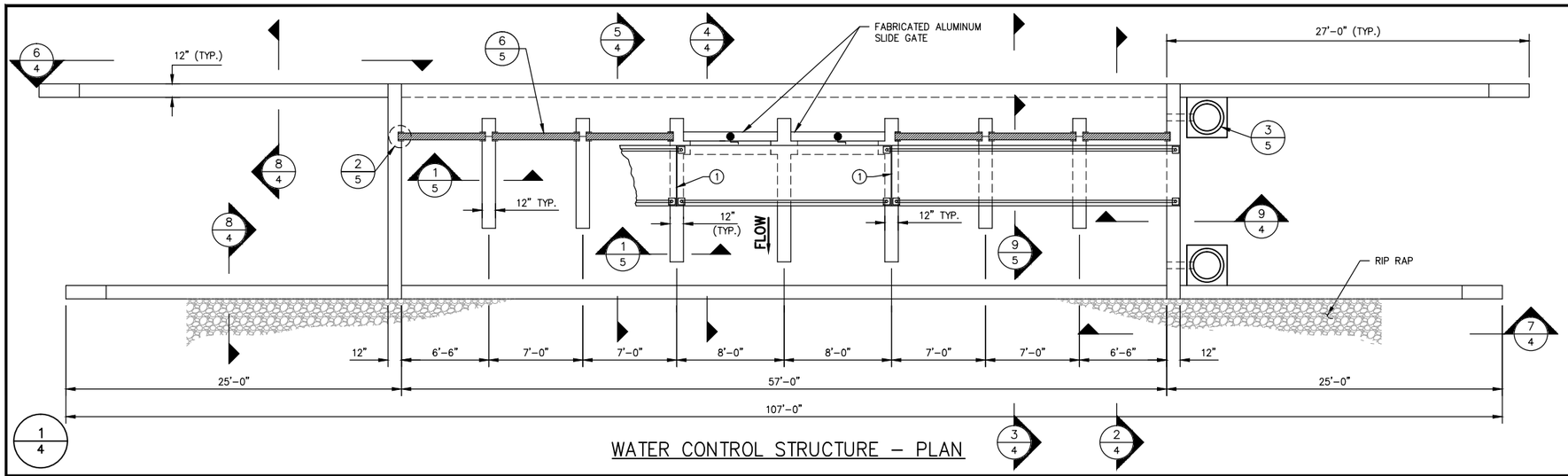

WATER CONTROL STRUCTURE – PLAN

ESTIMATED QUANTITES

REINFORCED CONCRETE	130 C.Y.
REINFORCING STEEL	17,000 LBS.
MISCELLANEOUS METAL	2,400 LBS.
FABRICATED ALUMINUM GATES	2 EA.
STOP LOG PANELS	6 EA.

CONSTRUCTION NOTES

① COLD JOINT LOCATION IN WALKWAY.

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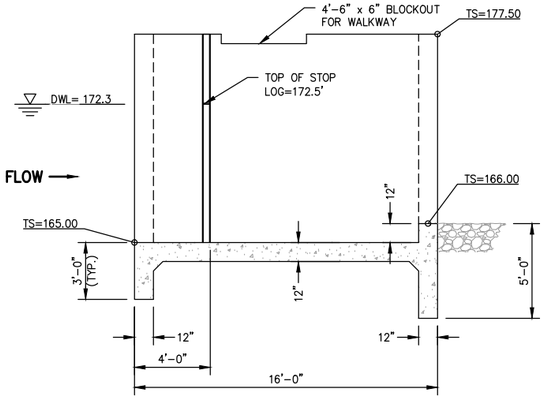
7/9/13

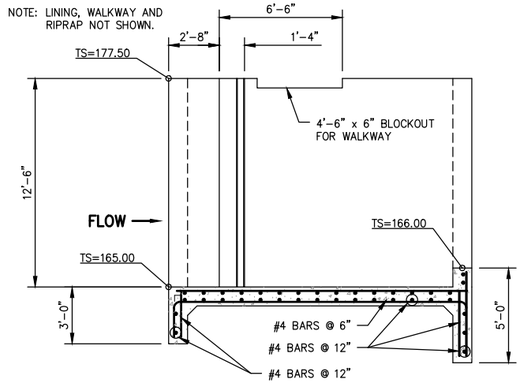
No.	REVISION	BY	DATE

NOTE: LINING, WALKWAY AND REINFORCING STEEL NOT SHOWN.



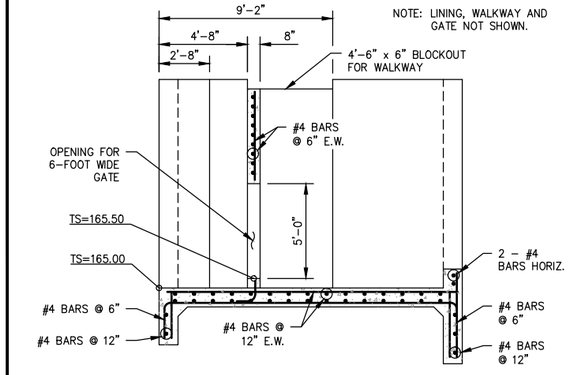
2/4 WATER CONTROL STRUCTURE – SECTION

NOTE: LINING, WALKWAY AND RIPRAP NOT SHOWN.



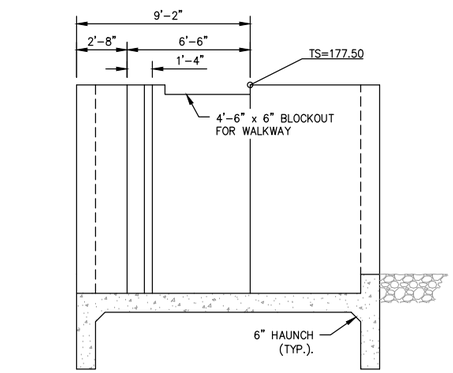
3/4 WATER CONTROL STRUCTURE – SECTION

NOTE: LINING, WALKWAY AND GATE NOT SHOWN.



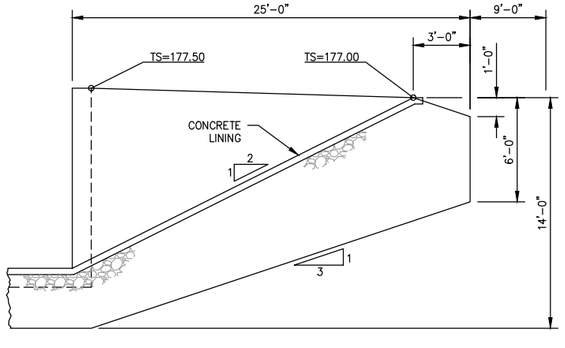
4/4 WATER CONTROL STRUCTURE – SECTION

NOTE: LINING, WALKWAY AND GATE NOT SHOWN.

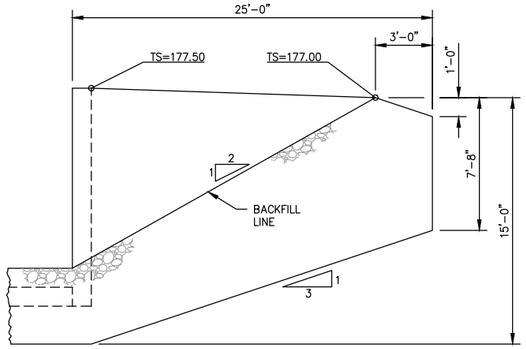


NOTE: SEE 3/4 & 4/4 FOR REINFORCING STEEL.

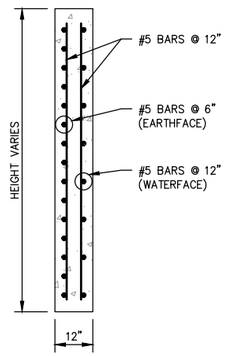
5/4 WATER CONTROL STRUCTURE – SECTION



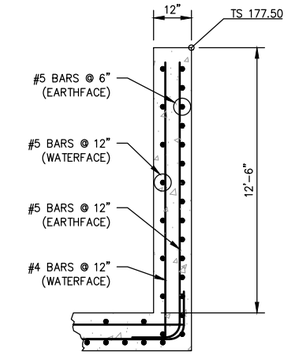
6/4 UPSTREAM ELEVATION VIEW



7/4 DOWNSTREAM ELEVATION VIEW



8/4 WALL SECTION



9/4 WALL SECTION

LOS BANOS CREEK WMP
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SAN JOAQUIN RIVER EXCHANGE CONTRACTORS WATER AUTHORITY
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WATER CONTROL STRUCTURE

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SHEET	4 OF __

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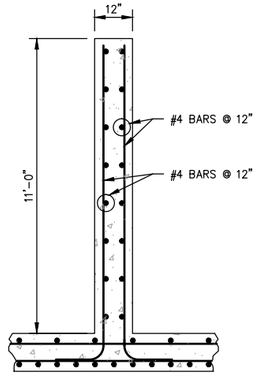
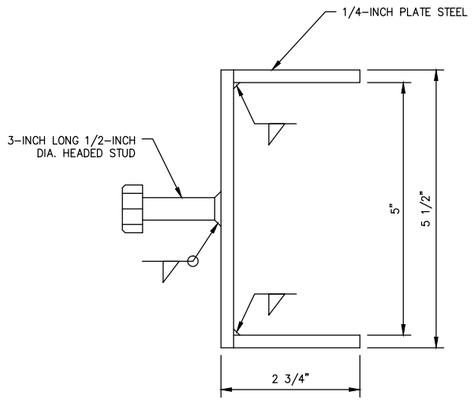
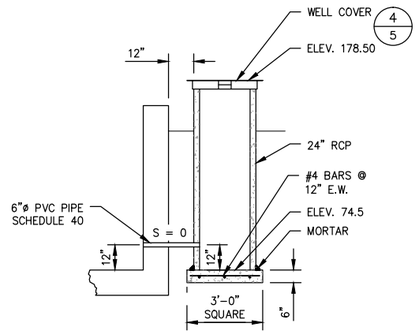


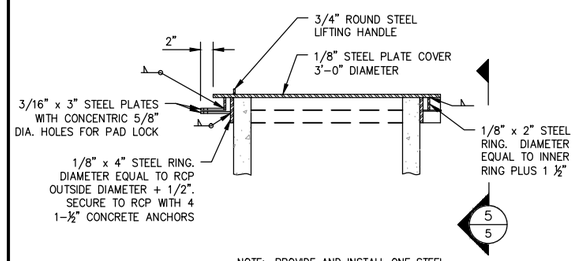
1/5 WALL SECTION



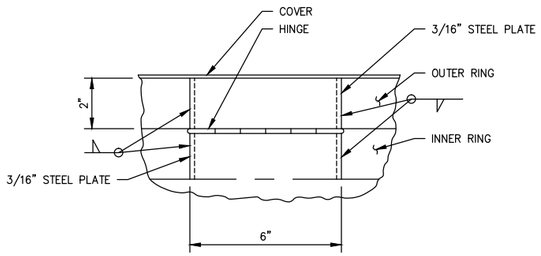
2/5 STOP LOG GUIDE (PLAN)



3/5 STILLING WELL

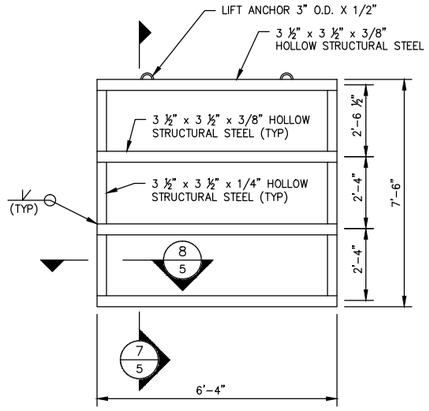


4/5 COVER DETAIL

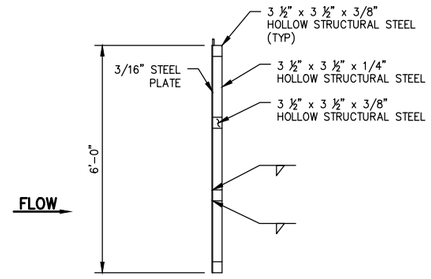


5/5 HINGE DETAIL

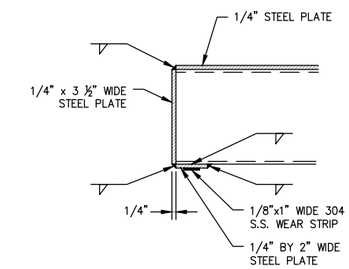
NOTE: STAINLESS STEEL CONTACT STRIPS NOT SHOWN.



6/5 STOP LOG PANEL FOR WATER CONTROL STRUCTURE

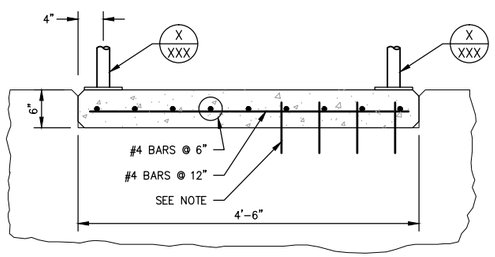


7/5 STOP LOG PANEL SECTION



8/5 STOP LOG PANEL SECTION

NOTE: USE 8-INCH LONG NO. 4 DOWELS AT 6 INCHES O.C. ON SUPPORT WALLS TO PROVIDE CONNECTION BETWEEN DECK AND SUPPORT WALLS.



9/5 DECK SECTION

PRELIMINARY
NOT FOR CONSTRUCTION
7/9/13

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LOS BANOS CREEK WMP
LBC-DMC CONNECTION
SAN JOAQUIN RIVER EXCHANGE CONTRACTORS WATER AUTHORITY
MERCED COUNTY, CALIFORNIA

WATER CONTROL STRUCTURE DETAILS

PROVOST & PRITCHARD
CIVIL ENGINEERS & LAND SURVEYORS
An Employee Owned Company
1120 WEST I STREET, SUITE C
LOS BANOS, CALIFORNIA 93635
209/829-1685 FAX 209/829-1675
www.provost.com

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JOB NO: 349512
DWG. NO:
SHEET 5 OF __

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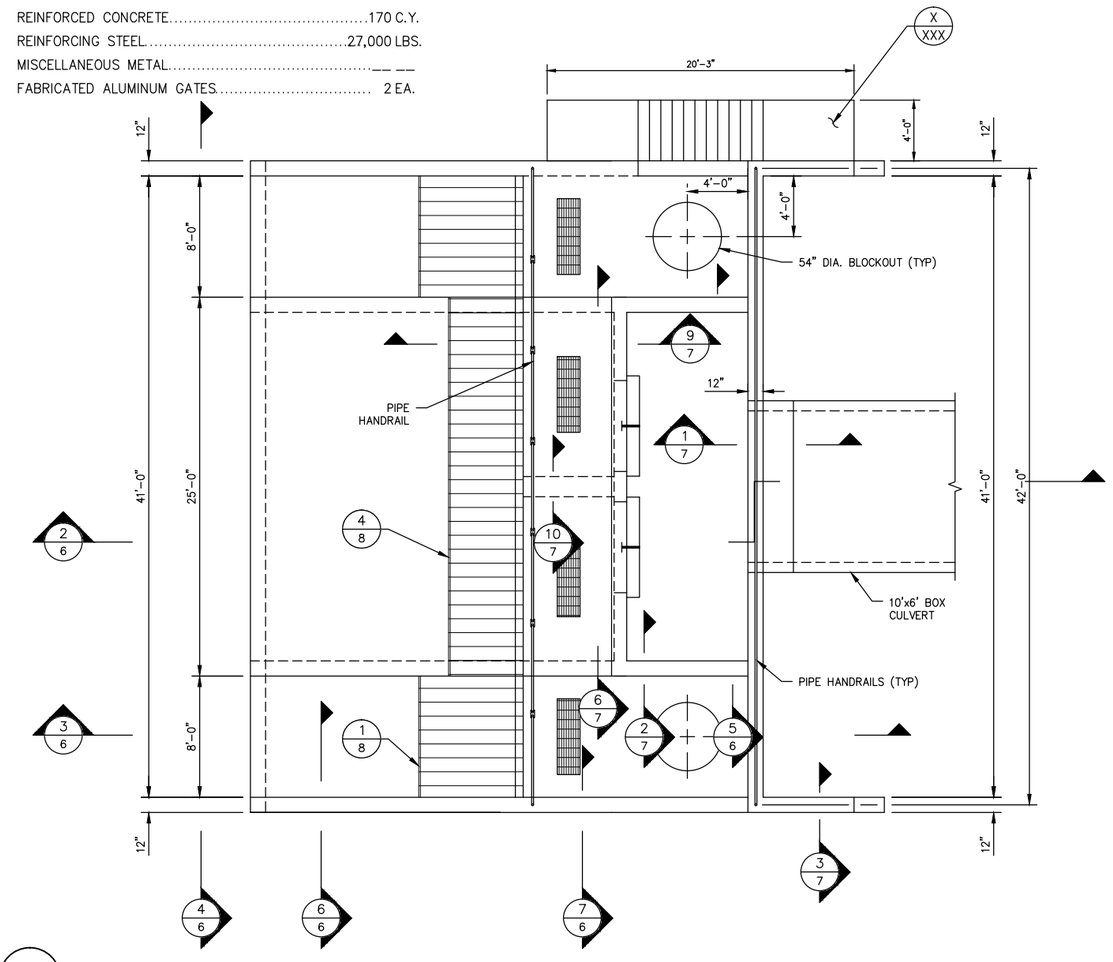
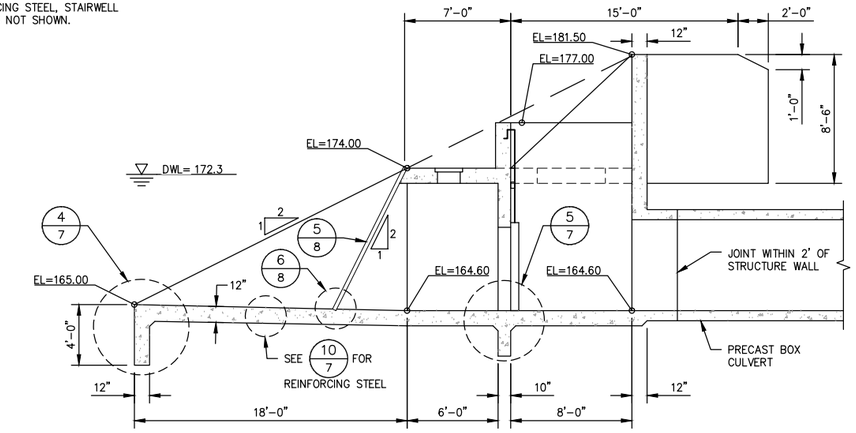
ESTIMATED QUANTITES

REINFORCED CONCRETE.....170 C.Y.
REINFORCING STEEL.....27,000 LBS.
MISCELLANEOUS METAL.....
FABRICATED ALUMINUM GATES..... 2 EA.



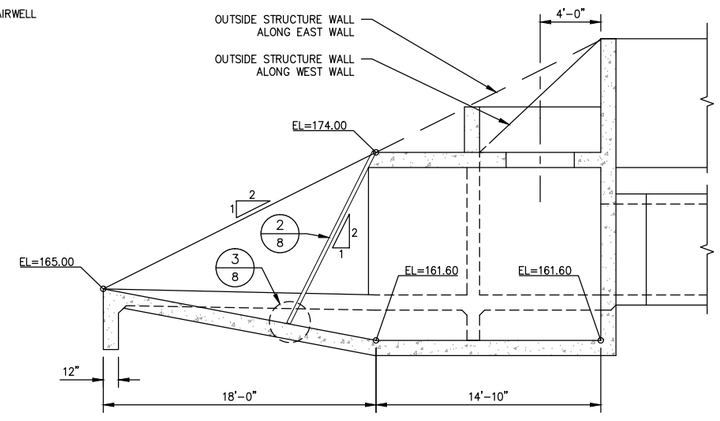
1/6 STRUCTURE PLAN

NOTE: REINFORCING STEEL, STAIRWELL AND HANDRAILS NOT SHOWN.



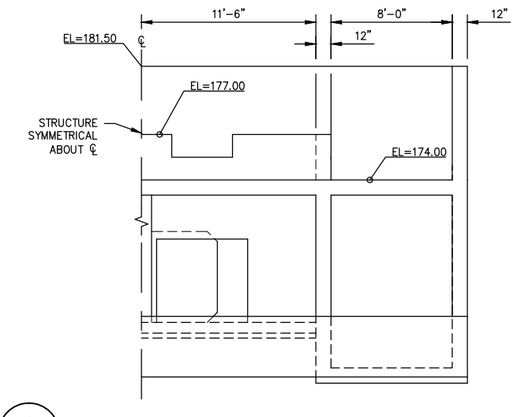
2/6 STRUCTURE SECTION

NOTE: REINFORCING STEEL, STAIRWELL AND HANDRAILS NOT SHOWN.



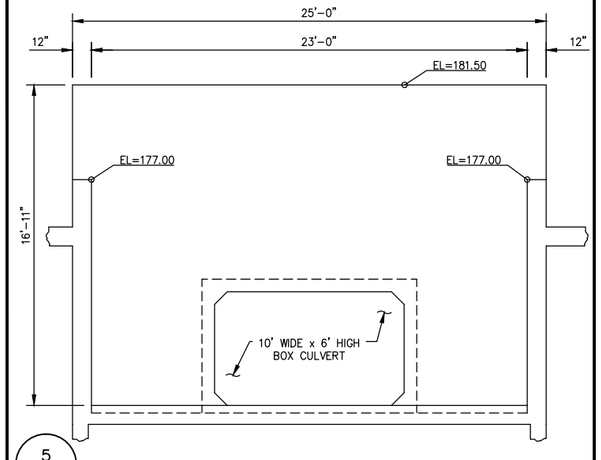
3/6 STRUCTURE SECTION

NOTE: TRASHRACK, GATE AND HANDRAILS NOT SHOWN.

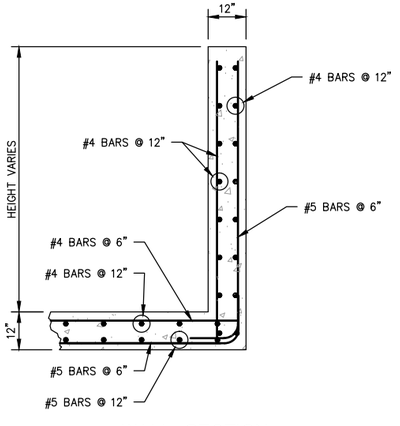


4/6 STRUCTURE ELEVATION

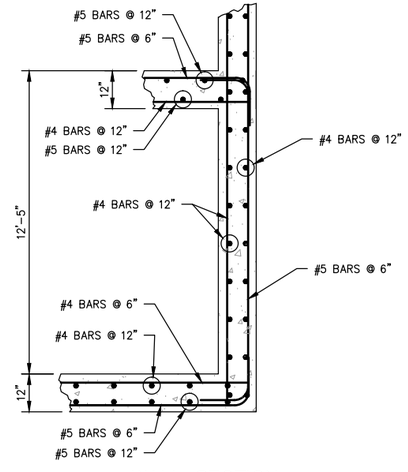
NOTE: REINFORCING STEEL AND HANDRAILS NOT SHOWN.



5/6 STRUCTURE SECTION



6/6 WALL SECTION



7/6 WALL SECTION

PRELIMINARY
NOT FOR CONSTRUCTION
7/9/13

No.	REVISION	BY	DATE

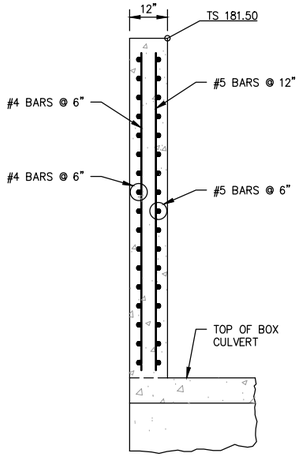
LOS BANOS CREEK WMP
LBC-DMC CONNECTION
SAN JOAQUIN RIVER EXCHANGE CONTRACTORS WATER AUTHORITY
MERCED COUNTY, CALIFORNIA

DIVERSION STRUCTURE

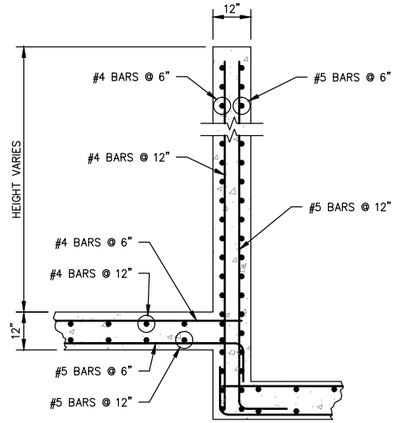
PROVOST & PRITCHARD
CONSULTING ENGINEERS
An Employee Owned Company
1120 WEST I STREET, SUITE C
LOS BANOS, CALIFORNIA 93635
209/826-1885 FAX 209/826-1975
www.provostpritchard.com

DESIGN ENGINEER: G.W. ROGERS
LICENSE NO: 32121
DRAFTED BY: D. MORENO
CHECKED BY: T. PAYNE
SCALE: AS SHOWN
DATE: ----
JOB NO: 349512
DWG. NO:
SHEET 6 OF __

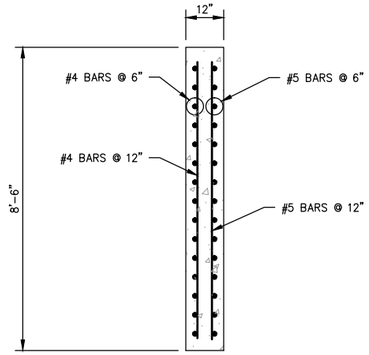
7/9/2013 3:03 PM I:\Clients\Ypreswa-349512\3-bc water resources mgmt plan\DWG\SHEET\349512-DT-DIVERSION STRUCTURE.dwg -David Moreno



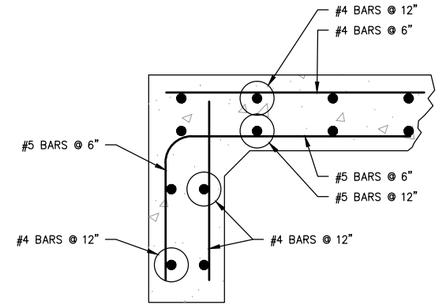
1/7 WALL SECTION



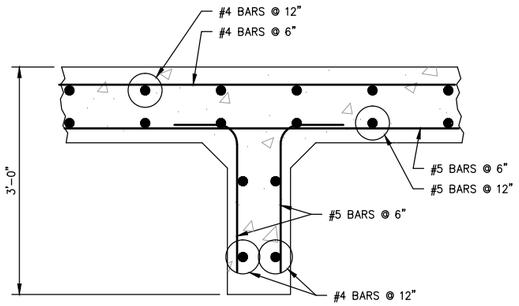
2/7 WALL SECTION



3/7 WALL SECTION

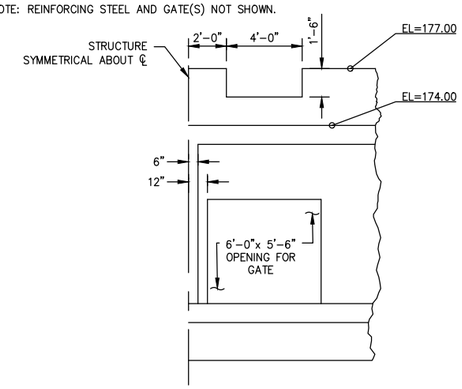


4/7 FOOTING REINFORCING

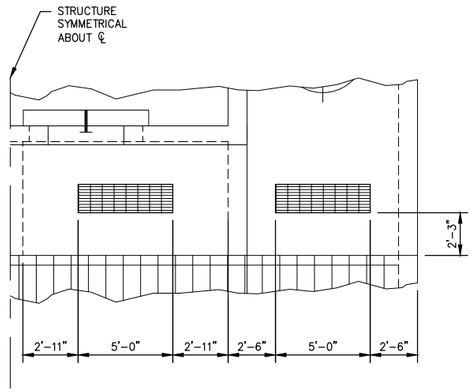


5/7 FOOTING REINFORCING

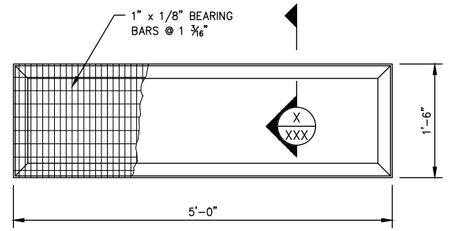
NOTE: REINFORCING STEEL AND GATE(S) NOT SHOWN.



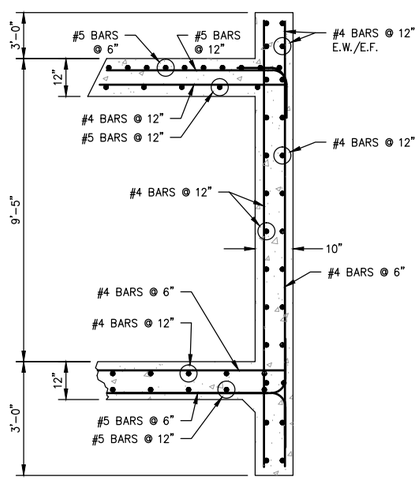
6/7 STRUCTURE SECTION



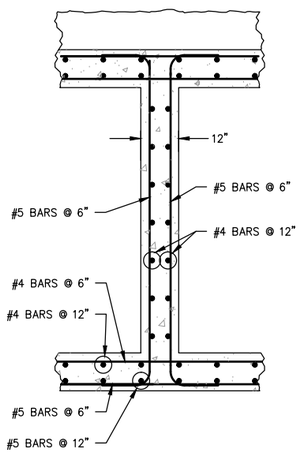
7/7 DECK GRATING



8/7 GRATING AND FRAME

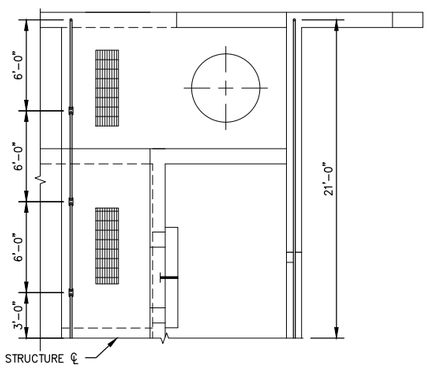


9/7 WALL SECTION



10/7 WALL SECTION

NOTE: HANDRAILS SYMMETRICAL ABOUT ℄ OF STRUCTURE.



11/7 HANDRAIL PLAN

PRELIMINARY
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7/9/13

No.	REVISION	BY	DATE

LOS BANOS CREEK WMP
LBC-DMC CONNECTION
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DIVERSION STRUCTURE DETAILS

PROVOST & PRITCHARD
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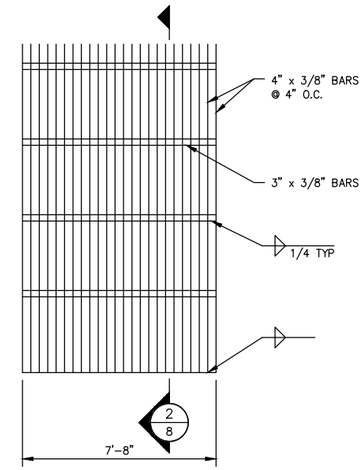
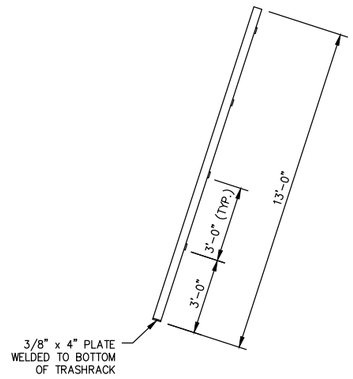
1120 WEST I STREET, SUITE C
LOS BANOS, CALIFORNIA 93635
209/829-1685 FAX 209/829-1675
www.provost.com

DESIGN ENGINEER: G.W. ROGERS
LICENSE NO: 32121
DRAFTED BY: D. MORENO
CHECKED BY: T. PAYNE
SCALE: AS SHOWN
DATE: ----
JOB NO: 349512
DWG. NO:
SHEET 7 OF __

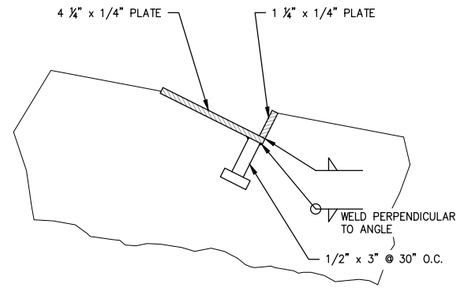
7/9/2013 3:03 PM I:\clients\ylecnc-3495\349512b3-lbc water resources mgmt plan\DWG\SHEET\349512-DT-MISC2.dwg -David Moreno



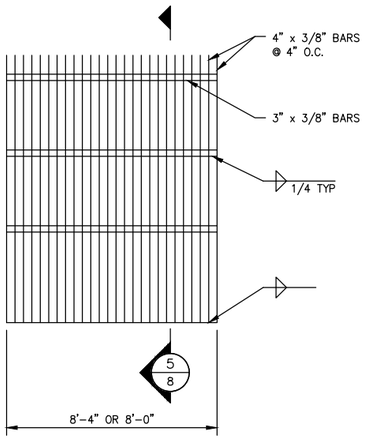
1/8 TRASHRACK PLAN – (2 REQUIRED)



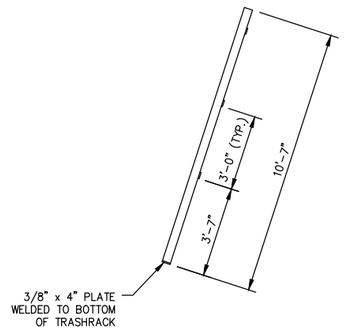
2/8 TRASHRACK SECTION



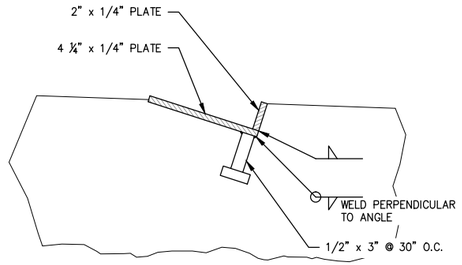
3/8 TRASHRACK BLOCKOUT



4/8 (2 REQUIRED 8'-4", 1 REQUIRED 8'-0")
TRASHRACK PLAN



5/8 TRASHRACK SECTION



6/8 TRASHRACK BLOCKOUT

PRELIMINARY
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7/9/13

No.	REVISION	BY	DATE

LOS BANOS CREEK WMP
LBC-DMC CONNECTION
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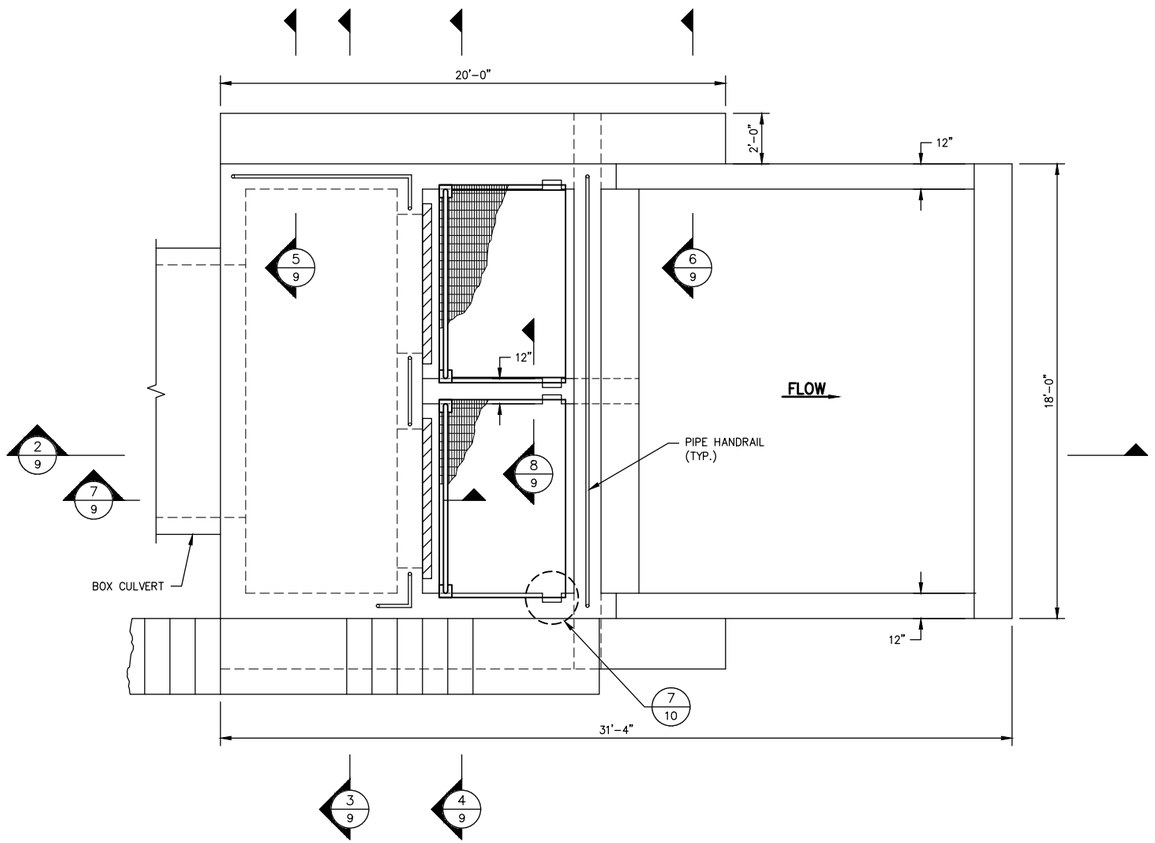
DESIGN ENGINEER: G.W. ROGERS
LICENSE NO: 32121
DRAFTED BY: D. MORENO
CHECKED BY: T. PAYNE
DATE: ----
JOB NO: 349512

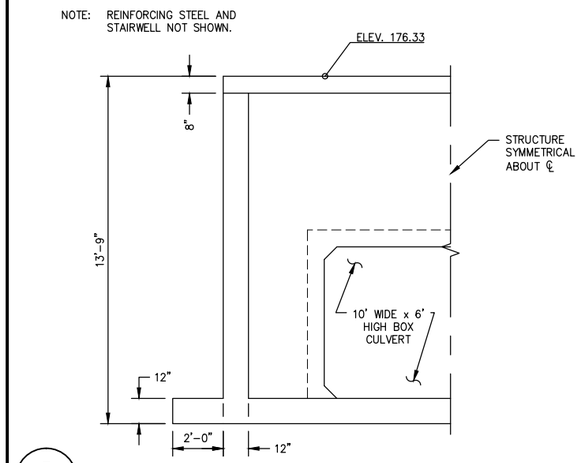
0 1
ORIGINAL SCALE SHOWN IS IN INCHES. ADJUST SCALE FOR REDUCED OR ENLARGED PLANS.

SHEET 8 OF __

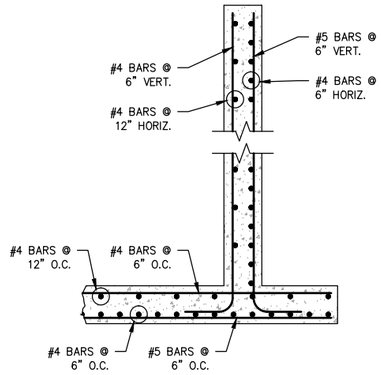
7/9/2013 3:04 PM I:\Clients\Fresno-3495\349512b3-lbc water resources mgmt plan\DWG\SHEET\349512-DT-INLET_TRASHRACK.dwg -David Moreno



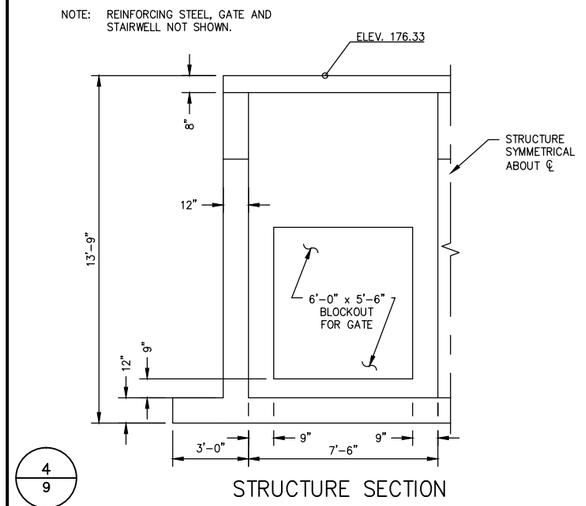
1/9 OUTLET STRUCTURE – PLAN



3/9 STRUCTURE SECTION



6/9 WALL SECTION



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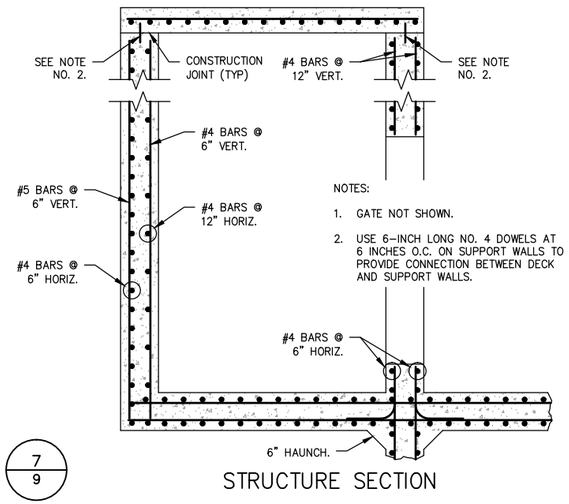
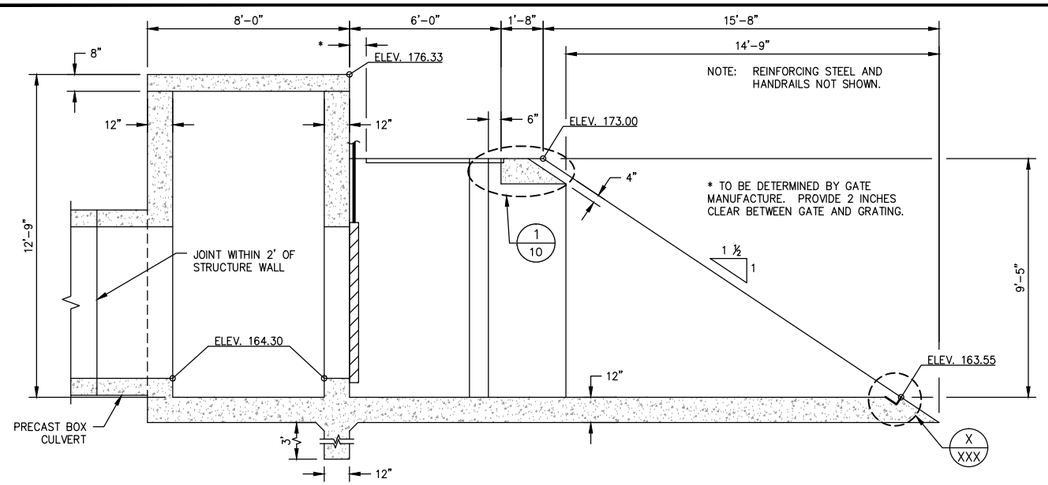
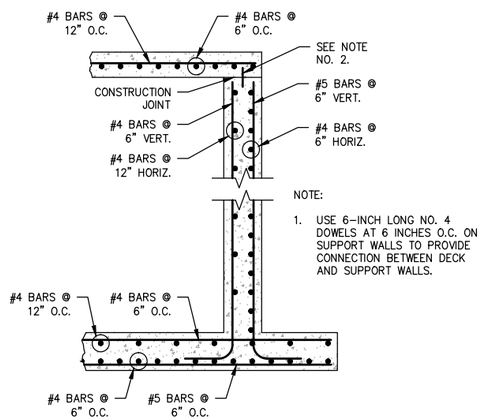


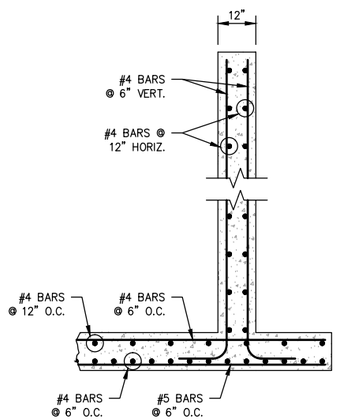
7/9 STRUCTURE SECTION



2/9 OUTLET STRUCTURE – SECTION



5/9 WALL SECTION



8/9 WALL SECTION

PRELIMINARY
NOT FOR CONSTRUCTION
7/9/13

No.	REVISION	BY	DATE

LOS BANOS CREEK WMP
LBC–DMC CONNECTION
SAN JOAQUIN RIVER EXCHANGE CONTRACTORS WATER AUTHORITY
MERCED COUNTY, CALIFORNIA

DIVERSION OUTLET STRUCTURE

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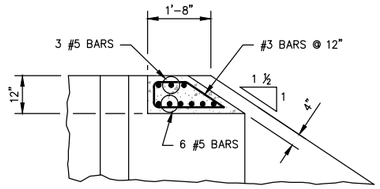
www.provost.com

DESIGN ENGINEER: G.W. ROGERS	
LICENSE NO: 32121	
DRAFTED BY: D. MORENO	CHECKED BY: T. PAYNE
SCALE: AS SHOWN	
DATE: ----	
JOB NO: 349512	
DWG. NO:	
SHEET 9 OF __	

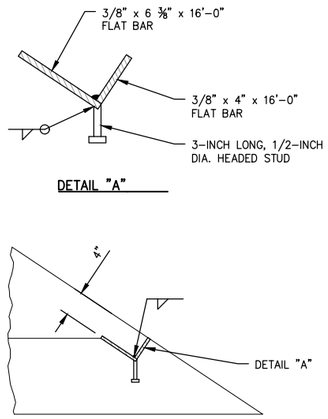
7/9/2013 3:04 PM I:\Clients\Merced-349\349512b3-lbc water resources mgmt plan\DWG\SHEET\349512-DT-OUTLET_STRUCTURE.dwg -David Moreno

NOTE: HANDRAILS NOT SHOWN.



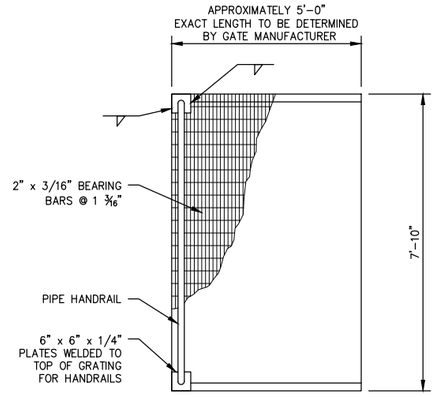
1/10

BEAM SECTION



2/10

FUTURE TRASHRACK ANGLE



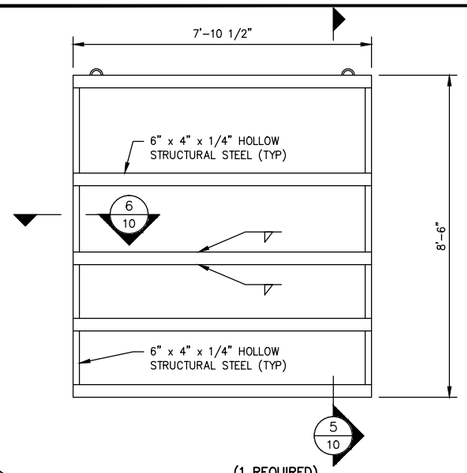
(2 REQUIRED)

3/10

GRATING

ESTIMATED QUANTITES

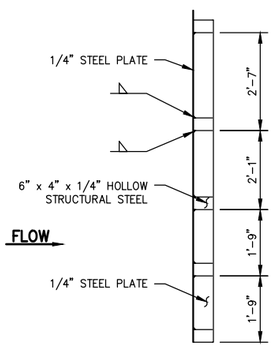
REINFORCED CONCRETE..... 60 C.Y.
REINFORCING STEEL.....10,000 LBS.
MISCELLANEOUS METAL..... ___ LBS.
STOP LOG PANELS..... _ EA.



(1 REQUIRED)

4/10

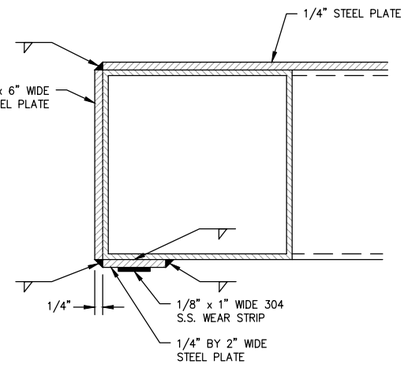
STOP LOG PANEL FOR DIVERSION OUTLET STRUCTURE



5/10

STOP LOG PANEL SECTION

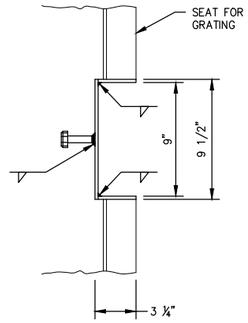
NOTE: NOTCH SIDERAILS OF STOP LOG GUIDES TO ALLOW GRATING TO EXTEND ACROSS GUIDE.



6/10

STOP LOG PANEL SECTION

NOTE: NOTCH SIDERAILS OF STOP LOG GUIDES TO ALLOW GRATING TO EXTEND ACROSS GUIDE.



7/10

STOP LOG GUIDE (PLAN)

PRELIMINARY
NOT FOR CONSTRUCTION
7/9/13

No.	REVISION	BY	DATE

LOS BANOS CREEK WMP
LBC-DMC CONNECTION
SAN JOAQUIN RIVER EXCHANGE CONTRACTORS WATER AUTHORITY
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DIVERSION OUTLET STRUCTURE DETAILS

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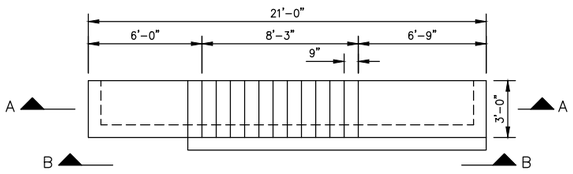
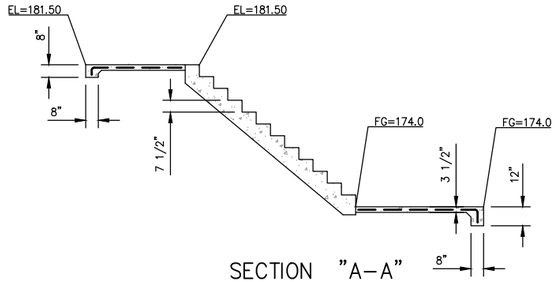
DESIGN ENGINEER: G.W. ROGERS	
LICENSE NO: 32121	
DRAFTED BY: D. MORENO	CHECKED BY: T. PAYNE
SCALE: AS SHOWN	
DATE: ----	
JOB NO: 349512	
DWG. NO:	
SHEET 10 OF __	

7/9/2013 3:05 PM I:\Clients\ejreca~3495\349512b3-lbc water resources mgmt plan\DWG\SHEET\349512-DT-OUTLET_STRUCTURE_DET.dwg -David Moreno



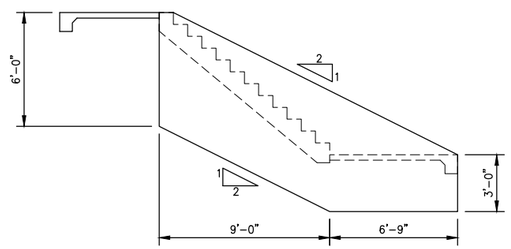
PLAN

NOTE: HANDRAILS NOT SHOWN.

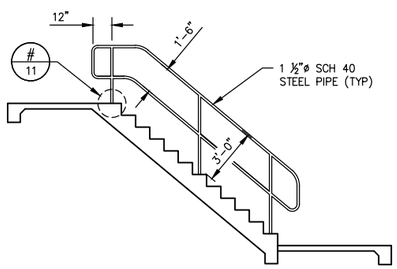


SECTION "A–A"

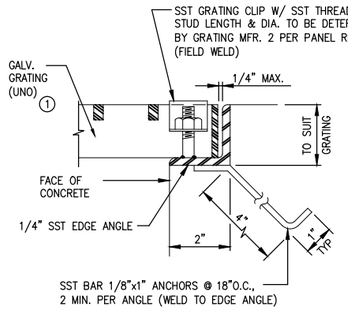
NOTE: HANDRAILS NOT SHOWN.



SECTION "B–B"



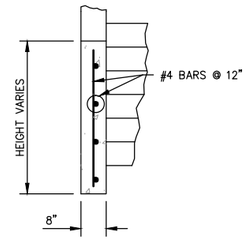
1/11 STAIRWELL & HANDRAIL DETAILS



NOTES:

1. GRATING AND FRAMING IN PUMPSTATION TO BE 316L SST.

11 GRATING EDGE SUPPORT



4/11 STAIRWELL WALL SECTION

PRELIMINARY
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7/9/13

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LBC-DMC CONNECTION
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MERCED COUNTY, CALIFORNIA

MISCELLANEOUS DETAILS

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209/829-1885 FAX 209/829-1675
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DESIGN ENGINEER: G.W. ROGERS
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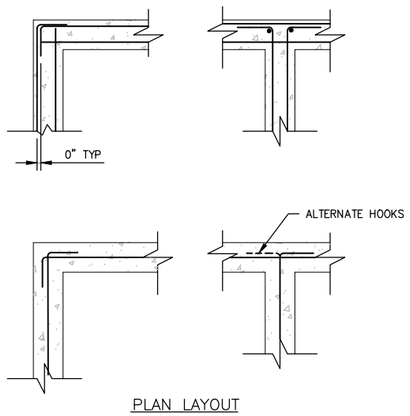
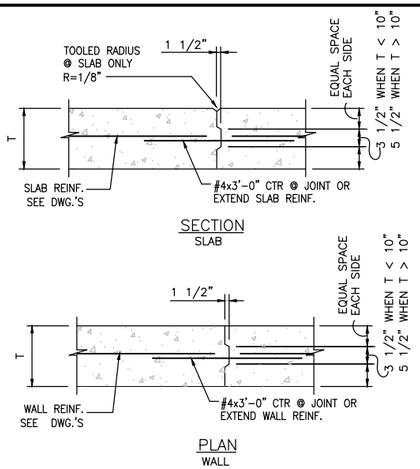
0 1
ORIGINAL SCALE SHOWN IS IN INCHES. ADJUST SCALE FOR REDUCED OR ENLARGED PLANS.
SHEET 11 OF __

7/9/2013 3:05 PM I:\Clients\ybecwo-3495\349512b3-lbc water resources mgmt plan\DWG\SHEET\349512-DT-MISC3.dwg -David Moreno



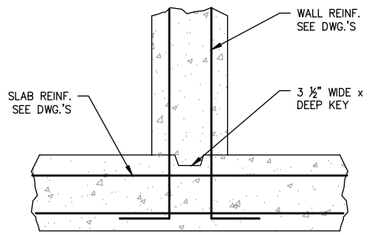
1/12

HORIZONTAL REINFORCEMENT AT WALL INTERSECTION



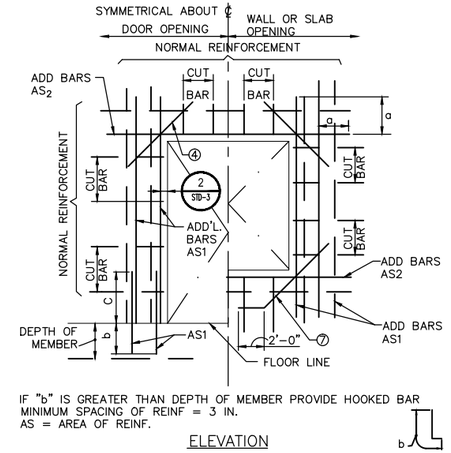
2/12

CONSTRUCTION JOINTS SLABS & WALLS



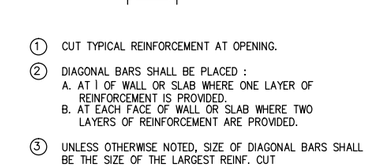
3/12

CONSTRUCTION JOINT WALL TO SLAB



4/12

ADDITIONAL REINFORCEMENT AT RECTANGULAR OPENINGS (TYP.)



BAR SIZE	"Y" GRADE 60
#4	12"
#5	15"
#6	18"
#7	24"
#8	30"

① CUT TYPICAL REINFORCEMENT AT OPENING.

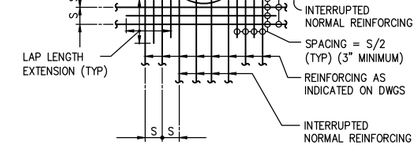
② DIAGONAL BARS SHALL BE PLACED :
A. AT 1 OF WALL OR SLAB WHERE ONE LAYER OF REINFORCEMENT IS PROVIDED.
B. AT EACH FACE OF WALL OR SLAB WHERE TWO LAYERS OF REINFORCEMENT ARE PROVIDED.

③ UNLESS OTHERWISE NOTED, SIZE OF DIAGONAL BARS SHALL BE THE SIZE OF THE LARGEST REINF. CUT

④ USE THIS DETAIL FOR ALL CIRC. OPENINGS 4" THROUGH 11" UNLESS NOTED OTHERWISE ON THE STRUCT. DWGS.

5/12

ADDITIONAL REINFORCEMENT AT CIRCULAR OPENINGS (TYP.)



6/12

ADDITIONAL REINFORCEMENT AT CIRCULAR OPENINGS (TYP.)

ADDITIONAL REINFORCING AT CIRCULAR OPENINGS NOTES:

NUMBER OF ADDITIONAL REINFORCING BARS EACH SIDE OF OPENING SHALL BE EQUAL TO 1/2 THE NUMBER OF INTERRUPTED BARS IN EACH LAYER OF REINFORCING.

SIZE OF ADDITIONAL REINFORCING BARS TO EQUAL SIZE OF INTERRUPTED REINFORCING BARS.

PROVIDE STD. HOOKS ON BARS IF LAP LENGTH EXTENSION CANNOT BE OBTAINED OR AT JOINTS OR OTHER OBSTRUCTIONS. PLACE ADDITIONAL BARS IN SAME PLANES AS INTERRUPTED REINF.
SPECIAL OPENING CONDITIONS SHALL BE AS INDICATED ON THE DRAWINGS OR AS DIRECTED BY THE OWNERS REPRESENTATIVE.

ALL REINFORCING TO CLEAR OPENING, PIPE OR FLANGE COLLARS BY 2".

WHEN THE DISTANCE BETWEEN THE OD OF A PIPE OR SLEEVE TO AN INTERSECTING WALL/SLAB OR ADJACENT PIPE OR SLEEVE IS LESS THAN THE SUM OF SPACES NECESSARY TO ACCOMMODATE THE REPLACEMENT REINFORCING AT THE MINIMUM SPACING:
a. INCREASE BAR SIZE BY ONE SIZE.
b. ADD ONLY ADDITIONAL REINFORCING NECESSARY TO MAINTAIN A MINIMUM OF 3 IN. SPACING BETWEEN ADJACENT WALL/SLAB, PIPE OR SLEEVE.

7/12

REINFORCING NOTES

① THIS DETAIL TO BE USED UNLESS NOTED OTHERWISE ON STRUCTURAL DRAWINGS.

② ADDITIONAL REINFORCEMENT AT OPENING: AS_1 AND AS_2 = ½ AREA OF CUT BARS TO BE ADDED ON EACH SIDE OF OPENING.

③ ADDITIONAL REINF. AS_1 AND AS_2 TO BE PLACED:
a) AT 1 OF WALLS OR SLABS WHERE ONE LAYER OF REINFORCEMENT IS PROVIDED.
b) AT EACH FACE OF WALLS OR SLABS WHERE TWO LAYERS OF REINFORCEMENT ARE PROVIDED.

④ PROVIDE DIAGONAL DOWEL FOR EACH LAYER OF REINFORCEMENT (#5 x 3'-0") U.N.O.

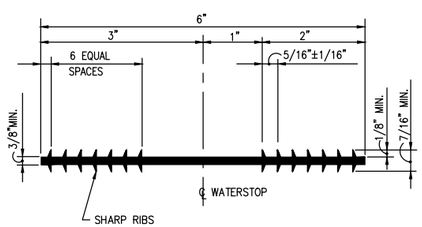
⑤ LOCATE ADDITIONAL REINF. AT ½ SPACE BETWEEN NORMAL BARS NOT CUT.

⑥ WHEN THE DISTANCE BETWEEN OPENING IN WALL OR SLAB AND INTERSECTING WALL OR SLAB IS LESS THAN THE SUM OF SPACES NECESSARY TO ACCOMMODATE THE REPLACEMENT REINFORCING AT THE MINIMUM SPACING:
a. INCREASE BAR SIZE BY ONE SIZE.
b. ADD ONLY ADDITIONAL REINFORCING NECESSARY TO MAINTAIN A MINIMUM OF 3 IN. SPACING BETWEEN ADJACENT WALL, SLAB, PIPE OR SLEEVE.

⑦ 1-#5 DIAG. BAR E.F. AT SQUARE OR RECTANGULAR OPENINGS ONLY. HOOK ONLY IF UNABLE TO OBTAIN LAP.

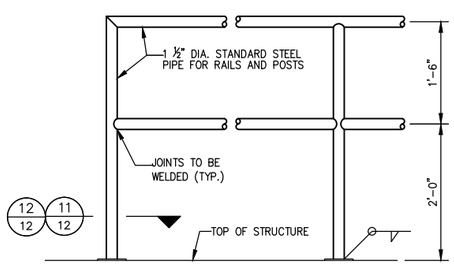
8/12

NOTES FOR ADDITIONAL REINFORCEMENT AT RECTANGULAR OPENINGS (TYP.)



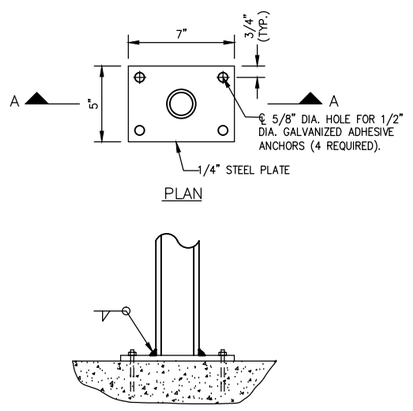
9/12

PVC FLATSTRIP WATERSTOP AT CONSTRUCTION JOINTS



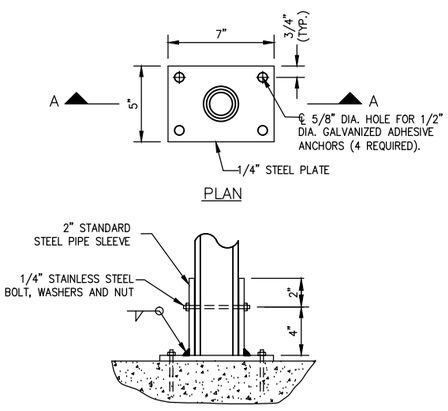
10/12

PIPE HANDRAILS



11/12

POST CONNECTION – NON REMOVABLE POST



12/12

POST CONNECTION – REMOVABLE POST

PRELIMINARY
NOT FOR CONSTRUCTION
7/9/13

No.	REVISION	BY	DATE

LOS BANOS CREEK WMP
LBC-DMC CONNECTION
SAN JOAQUIN RIVER EXCHANGE CONTRACTORS WATER AUTHORITY
MERCED COUNTY, CALIFORNIA

MISCELLANEOUS DETAILS

PROVOST & PRITCHARD
ENGINEERING GROUP, INC.
An Employee Owned Company
1120 WEST I STREET, SUITE C
LOS BANOS, CALIFORNIA 93635
209/829-1885 FAX 209/829-1675
www.provostpritchard.com

DESIGN ENGINEER: G.W. ROGERS
LICENSE NO: 32121
DRAFTED BY: D. MORENO
CHECKED BY: T. PAYNE
DATE: ----
JOB NO: 349512

0 1
ORIGINAL SCALE SHOWN IS IN INCHES. ADJUST SCALE FOR REDUCED OR ENLARGED PLANS.

SHEET 12 OF __

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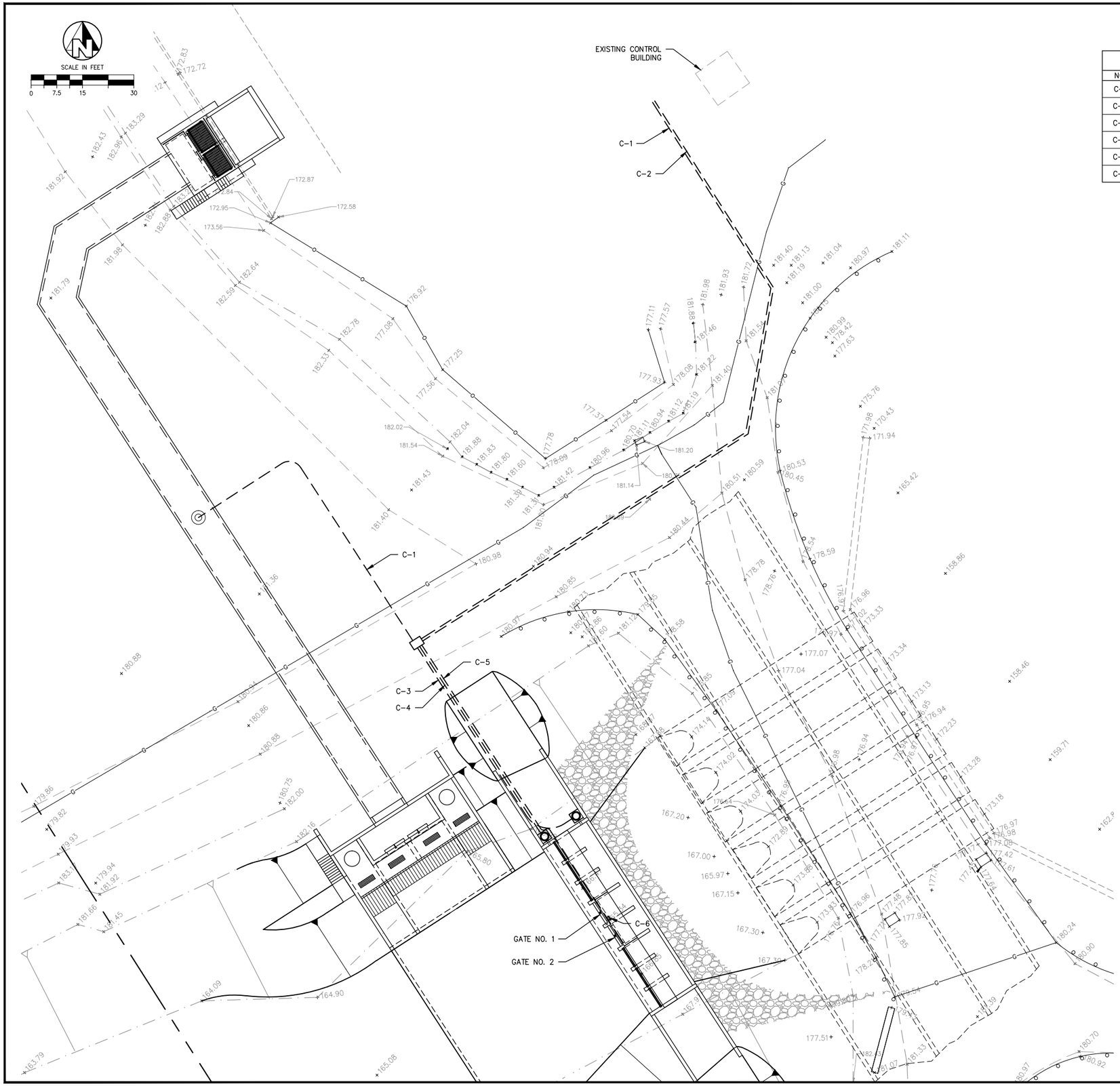

CONDUIT AND CABLE SCHEDULE						
NO.	SIZE	TYPE	CONTENT	FROM	TO	PURPOSE
C-1	1.5"	R/P	MANUFACTURER FURNISHED	BOX CULVERT FLOW SENSOR	FLOW METER	SENSOR SIGNAL
C-2	1.5"	R/P		ELECTRICAL BOX 1		LEVEL AND GATE POSITION
C-3	1"	R/P		ELECTRICAL BOX 1	UPSTREAM LEVEL SENSOR	LEVEL SENSOR
C-4	1"	R/P		ELECTRICAL BOX 1	DOWNSTREAM LEVEL SENSOR	LEVEL SENSOR
C-5	1"	R/P		ELECTRICAL BOX 1	GATE NO. 1	GATE POSITION
C-6	0.75"	R/P		GATE NO. 1	GATE NO. 2	GATE POSITION

ABBREVIATIONS

C	CONDUIT
OIT	OPERATOR INTERFACE TERMINAL
P	POLY VINYL CHLORIDE
PLC	PROGRAMMABLE LOGIC CONTROLLER
PWR	POWER
RTU	REMOTE TERMINAL UNIT
R / RGS	RIGID GALVANIZED STEEL
TB	TERMINAL BLOCK
TSP	TWISTED SHIELDED PAIR

PRELIMINARY
NOT FOR CONSTRUCTION
7/9/13

No.	REVISION	BY	DATE

LOS BANOS CREEK WMP
LBC-DMC CONNECTION
SAN JOAQUIN RIVER EXCHANGE CONTRACTORS WATER AUTHORITY
MERCED COUNTY, CALIFORNIA

PLAN – CONDUITS

PROVOST& PRITCHARD
CONSULTING ENGINEERS
An Employee Owned Company
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LOS BANOS, CALIFORNIA 93635
209/829-1885 FAX 209/829-1675
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0 1
ORIGINAL SCALE SHOWN IS IN INCHES. ADJUST SCALE FOR REDUCED OR ENLARGED PLANS.
SHEET 13 OF __

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Appendix B

CCID's Creek Control Structure Operations

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Los Banos, CA 93635
(209) 829-1685 • FAX (209) 829-1675
www.ppeng.com

MEMORANDUM

To: Chris White, Central California Irrigation District

CC: Elizabeth Partridge, U.S. Bureau of Reclamation
Seth Harris, San Luis & Delta-Mendota Water Authority

From: Rick Iger, Provost & Pritchard Consulting Group

Subject: Summary of Proposed Operations of the Los Banos Creek to Delta-Mendota Canal Connection (REVISED)

Date: April 25, 2013/Revised January 10, 2014

BACKGROUND INFORMATION

The San Joaquin River Exchange Contractors Water Authority (Authority) has been working with several partners including Grassland Water District, San Luis Water District and the City of Los Banos to develop a project to convey a portion of Los Banos Creek (LBC) water into the Delta-Mendota Canal (DMC), owned by the U.S. Bureau of Reclamation and operated by the San Luis & Delta-Mendota Water Authority (SLDMWA). Central California Irrigation District (CCID) will be responsible for construction and operations of the proposed facilities. This document includes a description of the proposed project improvements and a summary of the proposed operations. Also attached is a summary of an operations model run covering a 17-year period, 1995 – 2011.

PROPOSED IMPROVEMENTS

LBC-DMC Connection & Creek Control

The Project will include a creek control structure and a connection structure. The connection structure will be a 250 cfs gravity culvert structure containing two pump bays in conjunction with a 10 feet wide by 6 feet high box culvert. The creek control structure will be a water level control structure with a combination of slide gates and stop logs.

Based on the operating water levels in the DMC and hydraulic modeling of LBC upstream and through the 6-barrel culvert over the DMC, it has been determined that by proper selection of the profile grade at the diversion works and by limiting the head loss in the culvert structure to 1.0 foot, the creek water surface elevation will need to be at elevation 172.3 to make the 250 cfs diversion. To accomplish this during periods of lower flow in the creek, the creek control structure will be constructed across the creek channel immediately upstream of the culverts to raise the creek water surface elevation. The control structure will consist of a reinforced concrete structure with stop log slots that can accept stop logs or flash boards.

The connection structure will consist of a reinforced concrete inlet structure with a galvanized steel trashrack and two aluminum fabricated steel slide gates approximately 6 feet wide by 4 feet high. A 10 feet wide by 6 feet high reinforced concrete box culvert will be utilized to convey water between the turnout structure and the DMC. An acoustic Doppler meter will be used to measure flows in the box culvert. There will be a stop log in the DMC side of the culvert as well as a flap gate as redundant measures to prevent back flow from the DMC when the creek is dry.

Tabulated information on the structures is as follows:

Water Control Structure	
Total Design Capacity	1,000 cfs
Design Capacity of Gates	450 cfs
Top of Structure	177.5
Structure Invert	165.0
Target Upstream Water Level	172.3
Level Measurement	Stilling Well & Logger
Flow Control	Manual Slide Gates
Structure Bottom Width	57 feet
Power Required	No

LBC-DMC Connection Structure	
Design Capacity	250 cfs
Top of Structure (Deck)	174.0
Structure Invert	164.6
Target Upstream Water Level	172.3
DMC Operating Water Level	170.9+/-
Level Measurement	Staff Gauge
Flow Control	Manual Slide Gates
Trash racks	Yes
Inlet Bottom Width	41 feet
Box Culvert Bottom Width	10 feet
Box Culvert Height	6 feet
Flow Measurement	Doppler Meter
Power for Flow Measurements	120 VAC

Refer to design drawings previously submitted for a preliminary general plan layout of the structures along with preliminary structure designs.

Stream Gauging

The Project will also include three stream gauging stations in LBC. Stations will be installed at the water control structure, and at the Central California Irrigation District's (CCID) Outside Canal and Main Canal crossings. These gauging stations will be used to monitor recharge within the creek. Adjustments will be made the creek control structure to maintain creek recharge downstream of the DMC connection similar to historical.

The first stream gauge metering station will be at the water control structure. Flow information will be transferred back to CCCID through SCADA equipment to be installed in the existing control building located adjacent to Check 15.

Two additional water level measuring devices will be .installed at the CCID Outside Canal and the CCID Main Canal. Water level data measured by the transducer will be delivered to a solar powered data logger that will transmit the information to CCID utilizing cellular communication.

PROPOSED OPERATIONS

The Los Banos Creek Weir stop logs will be installed each winter in anticipation of flows to be released from the LBCDR. Communications between LBCDR operators, CCID and the SLDMWA will occur daily during rainfall events. Under existing operation criteria for LBCDR the LBCDR operators (DWR) provide 24 hours notice to SLDMWA and CCID prior to the releases and changes in releases from LBCDR. Upon completion of the rainy season, anticipated to be June of each year, the stop logs will be removed and stored nearby.

The control structure gates will be manually operated to maintain a water surface elevation in the creek in order to provide a constant flow into the DMC. CCID will inspect and adjust gate openings to ensure sufficient flows occur downstream of the weir to match historic recharge. It is anticipated that the target flow rate into the DMC will be limited to 50 cfs less than the release flow from the detention dam at any given time, up to a maximum of 250 cfs at historic DMC operating levels. This will facilitate regulated creek flows past the DMC connection for groundwater recharge. During periods of higher flows, in addition to being operated to maintain a water surface elevation for the DMC diversion, the gates will be operated to minimize flooding upstream of the structure. If creek flows are anticipated to exceed 450 cfs (up to 1,000 cfs), CCID will quickly remove the stop logs by lifting via a crane or similar piece of equipment and slide gates will be fully open. If flash boards are used in lieu of stop logs, the boards would be removed manually. A stilling well with level sensor and data logger will be installed upstream of the connection structure to monitor the water level in the creek. An evaluation of the hydraulic conditions at the site was made and reflected in the water surface profile provided as Figure 1.

As the LBC water level approaches operating level elevation 172.3 feet, the SLDMWA shall determine whether the quality of the water to be diverted into the DMC meets the established quality standards. CCID shall be responsible for sampling and analysis. The initial standards set for acceptable water under normal operating conditions, include the following:

1) the floodflows shall be accepted into the DMC when the quality of water is such that the suspended solids content is less than 200 ppm and maximum particle size is less than 62 microns in diameter and the water contains no deleterious substances, such as oil or floating debris. If water quality is unsatisfactory, releases will not be made into the DMC.

2) An agricultural water suitability analysis shall be conducted within 7 days of initiation of flow to the DMC and monthly thereafter. If water quality exceeds Reclamation criteria for the blend of LBC inflow and DMC flow occurring at the time of inflow, releases into the DMC will be terminated until criteria can be met or SLDMWA and Reclamation decide benefits of reducing LBC flows downstream exceed short term impacts of inflow, taking into consideration blending of inflow water with water in DMC.

The connection structure slide gates will be fully closed during pre and post operations and fully open during operations. The stop log slot in the DMC side of the connection structure will only be used if the flap gate requires maintenance or removal. The flow meter in the connection culvert will be used to collect flow rate and totalized volume readings. The amount of flow into the DMC shall be reported daily to the SLDMWA and monthly to the Bureau of Reclamation.

EMERGENCY OPERATIONS

Although it is anticipated that CCID will receive notice in advance of high flows at the site, the control structure is designed for emergency protection. The control structure is designed to allow 1,000 cfs to pass through the gates and over the stop logs without overtopping the structure, in the case that the stop logs were not removed in time.

When LBC flows are expected to exceed 1,000 cfs, suspended solids and particle size analysis will be re-sampled and analyzed and Project Participant riparian demands will be re-evaluated. If water quality is unsatisfactory releases into DMC will be terminated by closing gates and installing stoplogs in the DMC inlet structure. In anticipation of this type of flow, an analysis was made of flows passing the San Luis Canal at its culvert's maximum flow of 4,300 cfs, if gates were left closed the rise in water surface due to the weir is less than 0.17 feet, as shown on Figure 2.

Environmental Protection Measures

Air Quality and Global Climate Change

Implement a dust control plan and employ dust control measures during construction activities to reduce fugitive dust. Specific measures include, but are not limited to, the following:

- All construction equipment shall be maintained according to manufacturer's specifications. The use of diesel construction equipment that meets California Air Resources Board (CARB) 1996 or newer certification standards for off-road heavy-duty diesel engines shall be maximized. All machinery will meet the emission and registration requirements of CARB's In-Use Off-Road Diesel Vehicle Regulation. In addition, the required state and Federal emission quality control technologies would be implemented and all equipment will have properly operating mufflers and exhaust systems.
- A water truck shall be on-site at all times. Water shall be applied to disturbed areas a minimum of two times per day or more as necessary. Water may be applied by means of truck(s), hoses and/or sprinklers as needed, prior to any land clearing or earth movement, to minimize dust emissions. All visibly dry and disturbed soil surface areas of operation shall be watered to minimize dust emissions. Unpaved roads may be graveled in lieu of watering to reduce dust emissions.
- Haul roads shall be sprayed down with water at the end of the work shift to form a thin crust. This application shall be in addition to the minimum rate of application.
- Haul vehicles transporting soil into or out of the project area shall be covered.
- On-site vehicles shall be limited to 15 miles per hour.
- A publicly visible sign with the telephone number and person to contact regarding dust complaints shall be posted. This person shall respond and take corrective action within 24 hours.
- Existing roads and streets adjacent to the project shall be cleaned at least once per day unless conditions warrant a greater frequency.
- Construction workers shall park in designated parking areas(s) to reduce dust emissions.
- Soil pile surfaces shall be moistened with water if dust is being emitted from the pile(s). Adequately secured tarps, plastic or other material may be required when watering is insufficient or wind speeds exceed 25 miles per hour to further reduce dust emissions.

Vegetation would be allowed to grow on the soil surface. Soil stabilization would also be required after normal working hours and on weekends and holidays.

Biological Resources

Preconstruction Surveys

Within 30 days prior to the onset of construction activities, surveys would be conducted by qualified wildlife biologists to determine whether or not sensitive terrestrial wildlife or plants occur within the project area. California Department of Fish and Wildlife (DFW) and U.S. Fish and Wildlife Service (Service) would be notified immediately of the discovery of any rare, threatened, or endangered species prior to and/or during project implementation. In addition, as applicable, the following surveys would be completed. For those surveys that overlap, the one that is most protective would be implemented.

San Joaquin Kit Fox

A pre-activity survey for kit fox (Service 2011) will be conducted by a qualified wildlife biologist. All requirements will be followed, and a qualified biological monitor shall be available on-site during all project-related activities that may impact special status and other sensitive wildlife species. If kit fox are found on or adjacent to the project sites, all activity will cease until a qualified biologist confirms that the individual(s) has left of its own volition. The following specific measures (Service 2011) would be implemented during construction activities:

- To prevent inadvertent entrapment of kit foxes or other animals, all excavated, steep-walled holes or trenches more than two feet deep would be covered at the close of each working day by plywood or similar materials, or provided with one or more escape ramps constructed of earth fill or wooden planks with a slope of 2:1. Before such holes or trenches are filled, they would be thoroughly inspected for trapped animals. If at any time a trapped or injured kit fox is discovered, the procedures of the standardized recommendations will be followed.
- All food-related trash items such as wrappers, cans, bottles, and food scraps would be disposed of in closed containers and removed at least once a week from the project site.
- No firearms shall be allowed on the project site.
- To prevent potential harassment, mortality of kit foxes or destruction of dens by dogs or cats, no pets would be permitted on project sites.

Swainson's Hawk

A qualified biologist shall conduct a Swainson's hawk nesting survey prior to construction activities if construction activities shall be completed from March 1 through August 31. Additional pre-project surveys for active nests within a ½ mile radius of the project sites shall be conducted by a qualified biologist no more than 10 days prior to the start of project activities and during the appropriate time of day to maximize detectability. A minimum no disturbance buffer of ½ mile

shall be delineated around active nests until the breeding season has ended or until a qualified biologist has determined, and DFW has confirmed in writing, that the birds have fledged and are no longer reliant upon the nest or parental care for survival.

Burrowing Owl

A pre-activity survey for burrowing owl (DFW 1995) will be conducted by a qualified wildlife biologist within a 500-foot radius of the project sites. Surveys shall be conducted within 30 days prior to project commencement and at appropriate times to maximize detection. If any active burrowing owl burrows are observed, these burrows shall be designated an environmentally-sensitive area, protected, and monitored by a qualified biologist (while occupied) during project-related activities. A minimum 250-foot avoidance buffer shall be established and maintained around each owl burrow during the nesting season (February 1 through August 31). If active burrowing owl burrows are observed outside of the nesting season, a minimum 150-foot no disturbance buffer shall be established around each burrow. Passive relocation with one-way doors is not allowed.

Avian Nest Surveys

A qualified biologist would conduct avian nest surveys within the vicinity of the project area (including access routes and staging areas) during the appropriate time of the breeding season (March 1 through August 31). A survey for nesting activity of raptors within a 500-foot radius of the project sites will be conducted. If any active nests are observed, these nests and nest trees will be designated an environmentally-sensitive area and protected with a minimum 500-foot buffer until young have fledged and are no longer reliant on the nest site or parental care. A survey of riparian areas for nesting activity within a 250-foot radius of the defined work areas will be conducted. If any nesting activity is found, these nests and nest trees shall be designated an environmentally-sensitive area and protected with a minimum 250-foot buffer until young have fledged and are no longer reliant on the nest site or parental care.

Installation of Buffer Zones

Prior to start of construction, a qualified biologist shall flag all areas where sensitive plants and animals may occur. These areas would be avoided to the greatest extent possible during construction activities.

Preconstruction Education of Personnel

Prior to start of construction, all on-site personnel would be given written and oral instructions to avoid impacts and be made aware of the ecological values of the sites. A fact sheet covering this information would be distributed to all personnel who would work, visit, or deliver materials to the sites. Biologist(s) shall conduct an educational environmental training session (tailgate training session) for all onsite personnel prior to construction. The program shall consist of a brief presentation explaining listed species concerns to include:

- A description and photograph of each of the sensitive species and their habitat needs.
- An explanation of the status of these species.
- A discussion of the protection measures that would be implemented to reduce impacts to the species during project construction and implementation.

Biological Monitoring

A biological monitor would be on-site periodically during project work. The monitor would check the site before work commences for sensitive wildlife or plant species, assist in avoiding impacts to wildlife and habitats, determine the least damaging options for removal or transplantation of vegetation according to established protocols, and provide technical information.

Vegetation Removal Activities

Removal of vegetation within the creek channels would comply with the Merced County permit for vegetation maintenance. Specific measures include, but are not limited to:

- Trimming and removal of vegetation for project activities will be limited to the minimal amount necessary to complete the project.
- The number and species of all riparian woody-stemmed plants in excess of 4 inches diameter at breast height that are cut, trimmed, or otherwise removed or are damaged during project activities will be documented. Riparian trees and shrubs with a diameter at breast height of 4 inches or greater that are damaged or removed will be replaced by replanting appropriate native species at a 3:1 ratio (replaced to lost), except that heritage trees 24-inches or greater will require replanting of like species at a 10:1 ratio.
- Prior to initiation of project activities, all trees to be cut, chemically treated, or otherwise removed will be identified and clearly marked to avoid accidentally removing trees that should not otherwise be affected.

Work Period

Work will be limited to daytime hours.

Earth Moving Activities

Excavating, filling, and other earth moving would be done in a cautious manner to allow wildlife species to escape in advance of machinery and moving materials. Any fill material used would be free of contaminants. Disturbed areas that previously were vegetated with forbs and grasses and are not maintained in a vegetation-free condition would be re-seeded with forbs and grasses following completion of the work.

Streambed Alteration Agreement

Implement required measures pursuant to Streambed Alteration Agreement No. 1600-2013-0017-R4, as applicable.

Cultural Resources

In the event of an inadvertent cultural resource discovery, Reclamation must follow the Post Review Discovery portion of the regulations at 36 CFR §800.13. Although very unlikely, if human remains are identified on Reclamation lands during implementation of this action, the project shall be halted immediately and the Reclamation Mid-Pacific Regional Archaeologist contacted immediately to discuss how to proceed under the Native American Graves Protection and Repatriation Act, if applicable.

Water Resources

Water Quality

Introduction of Los Banos Creek water is required to meet Reclamation's then current water quality standards prior to introduction into the DMC (Reclamation 2014).

Water quality sampling will be collected at the introduction point to the DMC in addition to water sampling data provided by the Westside Water Coalition.

A Storm Water Pollution Prevention Plan will be developed and implemented as part of the Construction General Permit.

Should unexpected rainfall or discharge events occur during construction activities, best management practices and requirements will be implemented pursuant to the National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges associated with Construction and Land Disturbing Activities.

Water Rights

Water within Los Banos Creek will be maintained at historic levels during diversion periods below the point of diversion in order to protect downstream water rights.

Water would only be delivered to lands riparian to Los Banos Creek in accordance with existing riparian water rights.

Clean Water Act 401 Certification

Implement best management practices and requirements of the Clean Water Act 401 Certification from the Regional Water Quality Control Board.

Clean Water Act 404 Permitting

Implement best management practices and requirements of the Clean Water Act 404 Permit from the U.S. Army Corps of Engineers.

General Resources

Land Use Change

No new lands or lands that have remained fallowed or untilled for 3 years or more shall be brought into production using the water(s) provided from the Proposed Action. The Proposed Action shall not contribute to new or expanded development.

Material Disposal

Vegetation or material removed from the project sites will be disposed of at an appropriate and legal off-site location where the material cannot enter the stream channel. No such material shall be stockpiled in the streambed, banks, or channel, unless that native vegetation removed from the channel is chipped and the chips used as mulch for disturbed soil sites in or near the project areas.

References

Bureau of Reclamation (Reclamation). 2014. Table 5 and Table 6 in *2014 Delta-Mendota Canal Groundwater Pump-in Program Water Quality Monitoring Plan*. South-Central California Area Office. Fresno, CA.

California Department of Fish and Game (DFW). 1995. *Staff Report on Burrowing Owl Mitigation.* California Department of Fish and Game. Sacramento, CA.

U.S. Fish and Wildlife Service (Service). 2011. *Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance.* Sacramento Fish and Wildlife Office, US Fish and Wildlife Service, January 2011.

Appendix D

Hydrology and Operations Study

LBC Inlet to DMC - Simulation A1 - Existing Operations, Historical Outflows

		Without Project	With Project				
Item	Unit	Base Case (Historical)	Annual Average 1995-2011	Wet Year 1996-97	Wet Year 1997-98	Normal Year 2010-11 (1)	Dry Year 2008-09
Input Variables							
Conservation Storage Volume:	ac-ft	20,600	20,600				
Conservation Storage Elevation:	ft	327.8	327.8				
Target Max. Storage Volume:	ac-ft	20,600	20,600				
Max. Flow Target to DMC:	cfs	-	250				
Recharge Capacity LBC:	cfs	50	50				
Annual Volumes:							
Actual Natural Inflow:	ac-ft/yr	13,676	13,670	35,680	64,409	12,241	1,387
Outflow:	ac-ft/yr	11,644	11,628	33,946	61,988	13,896	6
Unaccounted for Inflow/Outflow:	ac-ft/yr	121	121	232	315	2,914	(72)
Evaporation:	ac-ft/yr	2,442	2,444	2,550	2,053	2,466	2,466
Precipitation:	ac-ft/yr	342	342	400	751	431	222
End of Water Year Storage Diff.:	ac-ft	52	61	(183)	1,433	(775)	(935)
Winter/Spring LBC Recharge:	ac-ft/yr	2,792	2,792	7,052	9,138	4,057	6
DMC Release for Recharge (2):	ac-ft/yr	-	342	1,090	1,514	473	-
Summer LBC Recharge:	ac-ft/yr	-	-	-	-	-	-
Total LBC Recharge:	ac-ft/yr	2,792	3,134	8,142	10,651	4,530	6
Winter/Spring Riparian Flow to DMC:	ac-ft/yr	-	6,844	21,808	30,274	9,462	-
LBC Yield Benefit:	ac-ft/yr	-	6,506	20,717	28,760	8,989	-
Non-Beneficial Spill	ac-ft/yr	8,829	1,985	5,087	22,576	376	-
Non-Beneficial Spill (17 yr period):	ac-ft	150,191	33,765				
Max. Storage Volume for Year(s):	ac-ft	31,524	-	26,196	31,697	22,112	19,872
Approx. Max. Storage Elevation for Year:	ft	349	-	339	349	331	327
Approx. Min. Storage Elevation for Year (3):	ft	301	-	326	326	326	323
Approx. Avg. Storage Elevation for Year:	ft	327	328	329	330	328	325

Note: (1) For the 2010-11 Water Year, approximately 2,900 ac-ft of additional inflow was not accounted for in the US Army Corps of Engineers data set.
(2) 5% of Winter/Spring Riparian flow to DMC.
(3) The historical Minimum Storage Elevation of 301 feet (9,700 ac-ft) occurred in January 1991 based on monthly reservoir operation simulations performed by AECOM.

San Joaquin River Exchange Contractors Authority
LBCDR Operation Summary

Exhibit C

LBC Inlet to DMC - Simulation A1 - Existing Operations, Historical Outflows

Water Year	Month	Historical Inflow (ac-ft)	No. of Days of Inflow	Total Outflow (ac–ft)	No. of Days w/ Winter-Spring Outflow	Unaccounted for Inflow/ Outflow (ac-ft)	Evap (ac-ft)	Precip (ac-ft)	Historical Recharge (ac-ft)	Flow to DMC (ac–ft)	DMC Release for Recharge (ac-ft)	No. of Days of DMC Release for Recharge	LBC Yield Benefit (ac-ft)	No. of Days w/ Flow to DMC	Remaining Historical Spill (ac-ft)	Average of Simulated Storage (ac-ft)
1995	Oct	0	0	0	0	-26	187	12	0	0	0	0	0	0	0	18,530
	Nov	18	2	0	0	-66	82	42	0	0	0	0	0	0	0	18,384
	Dec	44	7	0	0	-73	27	20	0	0	0	0	0	0	0	18,339
	Jan	8,017	31	5,784	17	-9	36	165	1,586	4,198	50	1	3,988	13	0	20,104
	Feb	841	28	461	3	11	31	15	263	198	170	3	188	2	0	20,787
	Mar	14,330	31	12,864	19	-46	97	139	1,865	6,635	332	5	6,303	18	4,364	22,296
	Apr	1,055	30	2,178	23	134	167	28	2,178	0	0	0	0	0	0	21,922
	May	480	23	0	0	218	254	9	0	0	0	0	0	0	0	21,744
	Jun	0	0	0	0	51	325	3	0	0	0	0	0	0	0	21,695
	Jul	0	0	2	1	19	372	1	2	0	0	0	0	0	0	21,378
	Aug	0	0	0	0	-6	374	0	0	0	0	0	0	0	0	21,004
	Sep	0	0	0	0	-40	251	0	0	0	0	0	0	0	0	20,677
1995 Total		24,786	152	21,289	63	167	2,201	434	5,894	11,031	552	9	10,479	33	4,364	20,569
1996	Oct	0	0	2	1	-14	185	0	2	0	0	0	0	0	0	20,420
	Nov	0	0	0	0	-14	84	0	0	0	0	0	0	0	0	20,284
	Dec	87	8	0	0	-79	37	76	0	0	0	0	0	0	0	20,262
	Jan	3,791	17	1,701	6	-70	45	96	497	1,204	0	0	1,144	5	0	20,703
	Feb	10,027	29	11,654	23	-75	43	115	2,277	8,015	237	3	7,614	23	1,362	21,667
	Mar	4,522	31	3,202	10	67	116	51	990	2,212	335	4	2,101	10	0	21,490
	Apr	220	10	867	18	388	209	11	867	0	0	0	0	0	0	21,966
	May	26	3	147	4	21	338	30	147	0	0	0	0	0	0	21,341
	Jun	0	0	0	0	41	373	0	0	0	0	0	0	0	0	21,017
	Jul	0	0	0	0	43	419	0	0	0	0	0	0	0	0	20,659
	Aug	0	0	8	1	26	408	0	8	0	0	0	0	0	0	20,260
	Sep	0	0	0	0	-15	275	0	0	0	0	0	0	0	0	19,925
1996 Total		18,673	98	17,580	63	320	2,530	379	4,788	11,431	572	7	10,859	38	1,362	20,829
1997	Oct	42	2	2	1	-59	196	37	2	0	0	0	0	0	0	19,692
	Nov	2,167	15	1,014	6	-36	65	68	594	420	21	1	399	5	0	20,142
	Dec	9,093	30	9,629	26	-72	33	105	2,493	7,136	81	1	6,779	25	0	21,376
	Jan	21,064	31	17,788	29	-145	39	186	2,871	10,720	198	2	10,184	29	4,198	22,405
	Feb	2,422	28	4,536	8	76	75	0	792	2,855	723	8	2,712	8	889	21,640
	Mar	800	31	974	3	143	153	1	297	677	68	1	643	3	0	20,922
	Apr	93	14	0	0	204	255	1	0	0	0	0	0	0	0	21,237
	May	0	0	0	0	115	368	2	0	0	0	0	0	0	0	21,114
	Jun	0	0	2	1	2	377	1	2	0	0	0	0	0	0	20,797
	Jul	0	0	0	0	25	398	0	0	0	0	0	0	0	0	20,421
	Aug	0	0	0	0	-13	319	0	0	0	0	0	0	0	0	20,055
	Sep	0	0	1	1	-7	271	0	1	0	0	0	0	0	0	19,745
1997 Total		35,680	151	33,946	75	232	2,550	400	7,052	21,808	1,090	13	20,717	70	5,087	20,792
1998	Oct	0	0	0	0	-8	188	1	0	0	0	0	0	0	0	19,495
	Nov	99	10	0	0	-54	72	89	0	0	0	0	0	0	0	19,424
	Dec	1,184	26	0	0	-45	38	70	0	0	0	0	0	0	0	20,315
	Jan	10,091	31	10,625	25	-70	39	101	2,441	6,851	11	1	6,508	24	1,333	21,098
	Feb	40,232	28	36,982	28	-219	59	283	2,772	13,430	0	0	12,759	28	20,780	26,359
	Mar	5,710	31	8,425	19	22	91	68	1,855	6,106	1,211	13	5,801	18	463	21,100
	Apr	3,803	29	2,891	11	90	145	28	1,030	1,861	190	4	1,768	9	0	20,981
	May	2,744	31	1,879	7	91	193	101	644	1,236	62	2	1,174	6	0	21,952
	Jun	526	26	1,186	4	242	267	10	396	790	40	1	751	4	0	21,961
	Jul	14	2	0	0	162	368	0	0	0	0	0	0	0	0	21,658
	Aug	0	0	0	0	95	352	0	0	0	0	0	0	0	0	21,399
	Sep	6	1	0	0	9	242	0	0	0	0	0	0	0	0	21,152
1998 Total		64,409	215	61,988	94	315	2,053	751	9,138	30,274	1,514	21	28,760	89	22,576	21,373

San Joaquin River Exchange Contractors Authority
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Exhibit C

LBC Inlet to DMC - Simulation A1 - Existing Operations, Historical Outflows

Water Year	Month	Historical Inflow (ac-ft)	No. of Days of Inflow	Total Outflow (ac–ft)	No. of Days w/ Winter-Spring Outflow	Unaccounted for Inflow/ Outflow (ac-ft)	Evap (ac-ft)	Precip (ac-ft)	Historical Recharge (ac-ft)	Flow to DMC (ac–ft)	DMC Release for Recharge (ac-ft)	No. of Days of DMC Release for Recharge	LBC Yield Benefit (ac-ft)	No. of Days w/ Flow to DMC	Remaining Historical Spill (ac-ft)	Average of Simulated Storage (ac-ft)
1999	Oct	38	4	248	2	50	161	20	198	50	2	1	47	2	0	20,961
	Nov	145	18	129	1	-16	58	44	99	30	0	0	28	1	0	20,781
	Dec	155	18	281	2	-32	36	13	182	99	6	1	94	1	0	20,499
	Jan	1,232	25	1,188	4	-56	29	67	396	792	40	1	752	4	0	20,496
	Feb	4,383	28	4,617	15	10	54	37	1,485	3,132	135	3	2,976	14	0	20,618
	Mar	978	31	214	1	50	111	50	99	115	27	1	109	1	0	20,682
	Apr	583	27	1	1	176	207	10	1	0	0	0	0	0	0	21,457
	May	36	6	0	0	153	320	2	0	0	0	0	0	0	0	21,620
	Jun	0	0	0	0	92	368	0	0	0	0	0	0	0	0	21,389
	Jul	0	0	1	1	1	397	0	1	0	0	0	0	0	0	21,028
	Aug	0	0	0	0	25	347	0	0	0	0	0	0	0	0	20,687
	Sep	0	0	0	0	33	270	0	0	0	0	0	0	0	0	20,401
1999 Total		7,549	157	6,679	27	487	2,358	243	2,461	4,217	211	7	4,007	23	0	20,886
2000	Oct	0	0	0	0	30	205	0	0	0	0	0	0	0	0	20,187
	Nov	8	2	0	0	9	81	9	0	0	0	0	0	0	0	20,084
	Dec	40	7	4	1	21	71	4	4	0	0	0	0	0	0	20,051
	Jan	496	21	0	0	-113	47	102	0	0	0	0	0	0	0	20,166
	Feb	5,579	29	5,807	16	-34	55	84	1,584	4,223	0	0	4,012	16	0	20,832
	Mar	1,811	30	1,030	9	109	142	23	610	420	232	5	399	4	0	20,750
	Apr	117	16	0	0	129	219	20	0	0	0	0	0	0	0	21,080
	May	10	1	0	0	88	316	3	0	0	0	0	0	0	0	20,983
	Jun	0	0	0	0	45	385	3	0	0	0	0	0	0	0	20,702
	Jul	0	0	0	0	14	393	0	0	0	0	0	0	0	0	20,314
	Aug	0	0	0	0	-7	374	0	0	0	0	0	0	0	0	19,943
	Sep	0	0	0	0	8	254	1	0	0	0	0	0	0	0	19,631
2000 Total		8,061	106	6,841	26	298	2,541	250	2,198	4,643	232	5	4,411	20	0	20,392
2001	Oct	62	3	0	0	-120	151	92	0	0	0	0	0	0	0	19,434
	Nov	10	2	0	0	-44	57	5	0	0	0	0	0	0	0	19,345
	Dec	24	4	0	0	-22	38	10	0	0	0	0	0	0	0	19,306
	Jan	87	11	0	0	-48	53	58	0	0	0	0	0	0	0	19,312
	Feb	1,026	22	2	1	-5	65	47	2	0	0	0	0	0	0	19,639
	Mar	1,361	27	933	5	87	141	47	453	479	24	1	455	3	0	20,635
	Apr	54	9	0	0	98	207	18	0	0	0	0	0	0	0	20,732
	May	0	0	4	1	122	406	0	4	0	0	0	0	0	0	20,579
	Jun	0	0	0	0	65	458	0	0	0	0	0	0	0	0	20,211
	Jul	0	0	1	1	18	414	0	1	0	0	0	0	0	0	19,832
	Aug	0	0	0	0	32	380	0	0	0	0	0	0	0	0	19,463
	Sep	0	0	0	0	14	279	6	0	0	0	0	0	0	0	19,147
2001 Total		2,623	78	940	8	195	2,648	282	460	479	24	1	455	3	0	19,804
2002	Oct	0	0	0	0	-14	188	7	0	0	0	0	0	0	0	18,914
	Nov	50	6	2	1	-79	65	52	2	0	0	0	0	0	0	18,804
	Dec	861	13	0	0	-132	37	74	0	0	0	0	0	0	0	18,829
	Jan	1,073	27	0	0	-3	36	27	0	0	0	0	0	0	0	20,441
	Feb	355	28	192	2	37	61	11	164	28	1	1	26	1	0	20,739
	Mar	202	23	0	0	100	154	34	0	0	0	0	0	0	0	20,853
	Apr	4	1	0	0	93	225	5	0	0	0	0	0	0	0	20,901
	May	0	0	0	0	128	355	7	0	0	0	0	0	0	0	20,722
	Jun	0	0	0	0	50	426	0	0	0	0	0	0	0	0	20,412
	Jul	0	0	0	0	32	445	0	0	0	0	0	0	0	0	20,017
	Aug	0	0	0	0	36	381	0	0	0	0	0	0	0	0	19,636
	Sep	0	0	0	0	21	304	0	0	0	0	0	0	0	0	19,326
2002 Total		2,545	98	194	3	269	2,676	217	166	28	1	1	26	1	0	19,961

San Joaquin River Exchange Contractors Authority
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Exhibit C

LBC Inlet to DMC - Simulation A1 - Existing Operations, Historical Outflows

Water Year	Month	Historical Inflow (ac-ft)	No. of Days of Inflow	Total Outflow (ac–ft)	No. of Days w/ Winter-Spring Outflow	Unaccounted for Inflow/ Outflow (ac-ft)	Evap (ac-ft)	Precip (ac-ft)	Historical Recharge (ac-ft)	Flow to DMC (ac–ft)	DMC Release for Recharge (ac-ft)	No. of Days of DMC Release for Recharge	LBC Yield Benefit (ac-ft)	No. of Days w/ Flow to DMC	Remaining Historical Spill (ac-ft)	Average of Simulated Storage (ac-ft)
2003	Oct	0	0	1	1	-15	190	0	1	0	0	0	0	0	0	19,077
	Nov	40	2	0	0	-76	72	46	0	0	0	0	0	0	0	18,962
	Dec	5,462	18	3,580	11	-100	43	107	998	2,582	108	2	2,453	10	0	19,915
	Jan	1,833	31	2,103	10	-16	23	24	899	1,204	82	2	1,144	8	0	20,408
	Feb	304	28	0	0	9	55	37	0	0	0	0	0	0	0	20,631
	Mar	204	23	133	1	91	142	30	99	34	2	1	32	1	0	20,822
	Apr	52	7	0	0	47	158	26	0	0	0	0	0	0	0	20,825
	May	38	4	1	1	108	288	17	1	0	0	0	0	0	0	20,769
	Jun	0	0	2	1	7	372	0	2	0	0	0	0	0	0	20,491
	Jul	278	6	0	0	-91	458	0	0	0	0	0	0	0	0	20,200
	Aug	220	14	0	0	-10	343	13	0	0	0	0	0	0	0	19,972
	Sep	111	9	0	0	21	287	0	0	0	0	0	0	0	0	19,834
2003 Total		8,541	142	5,819	25	-25	2,431	301	2,000	3,819	191	5	3,628	19	0	20,156
2004	Oct	0	0	0	0	-353	213	2	0	0	0	0	0	0	0	19,424
	Nov	26	3	0	0	-90	59	52	0	0	0	0	0	0	0	19,169
	Dec	97	11	0	0	-113	45	96	0	0	0	0	0	0	0	19,125
	Jan	310	14	0	0	-23	27	33	0	0	0	0	0	0	0	19,417
	Feb	3,974	27	1,715	4	-820	53	86	396	1,319	0	0	1,253	4	0	20,015
	Mar	702	25	733	3	108	153	12	271	461	89	1	438	2	0	20,767
	Apr	0	0	0	0	93	249	1	0	0	0	0	0	0	0	20,791
	May	0	0	0	0	58	356	4	0	0	0	0	0	0	0	20,552
	Jun	0	0	0	0	14	406	0	0	0	0	0	0	0	0	20,214
	Jul	0	0	0	0	34	403	0	0	0	0	0	0	0	0	19,843
	Aug	0	0	0	0	11	368	0	0	0	0	0	0	0	0	19,461
	Sep	0	0	0	0	-8	299	3	0	0	0	0	0	0	0	19,130
2004 Total		5,109	80	2,447	7	-1,088	2,632	289	667	1,780	89	1	1,691	6	0	19,825
2005	Oct	32	3	0	0	-68	142	75	0	0	0	0	0	0	0	18,926
	Nov	20	2	0	0	-68	51	33	0	0	0	0	0	0	0	18,866
	Dec	930	6	0	0	-95	30	84	0	0	0	0	0	0	0	18,848
	Jan	6,698	30	5,346	14	-528	23	51	1,386	3,960	198	2	3,762	14	0	20,912
	Feb	5,027	27	5,130	14	-63	44	100	1,352	3,778	0	0	3,589	13	0	21,172
	Mar	4,333	30	2,968	10	-228	112	82	956	2,012	289	4	1,911	9	0	20,936
	Apr	877	29	0	0	146	168	24	0	0	0	0	0	0	0	22,144
	May	99	12	808	3	129	272	33	297	511	26	1	485	3	0	21,964
	Jun	0	0	0	0	14	329	1	0	0	0	0	0	0	0	21,444
	Jul	0	0	0	0	36	428	0	0	0	0	0	0	0	0	21,100
	Aug	0	0	0	0	-13	372	2	0	0	0	0	0	0	0	20,703
	Sep	0	0	0	0	-34	260	3	0	0	0	0	0	0	0	20,362
2005 Total		18,017	139	14,252	41	-774	2,232	488	3,992	10,260	513	7	9,747	39	0	20,609
2006	Oct	0	0	0	0	-33	181	2	0	0	0	0	0	0	0	20,113
	Nov	28	5	0	0	-46	87	9	0	0	0	0	0	0	0	19,972
	Dec	341	12	0	0	-83	31	67	0	0	0	0	0	0	0	19,939
	Jan	3,688	30	3,530	10	8	44	10	990	2,540	127	2	2,413	10	0	20,690
	Feb	276	26	0	0	16	57	21	0	0	0	0	0	0	0	20,504
	Mar	2,938	30	2,303	11	-110	100	90	1,002	1,301	46	3	1,236	9	0	21,152
	Apr	2,415	30	1,550	6	67	123	53	594	956	67	2	909	4	0	21,528
	May	67	6	0	0	132	318	37	0	0	0	0	0	0	0	21,972
	Jun	0	0	0	0	38	373	0	0	0	0	0	0	0	0	21,744
	Jul	0	0	0	0	22	435	0	0	0	0	0	0	0	0	21,367
	Aug	0	0	0	0	-23	344	0	0	0	0	0	0	0	0	20,954
	Sep	0	0	0	0	-42	270	0	0	0	0	0	0	0	0	20,623
2006 Total		9,753	139	7,383	27	-55	2,363	289	2,586	4,798	240	7	4,558	23	0	20,882

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Exhibit C

LBC Inlet to DMC - Simulation A1 - Existing Operations, Historical Outflows

Water Year	Month	Historical Inflow (ac-ft)	No. of Days of Inflow	Total Outflow (ac–ft)	No. of Days w/ Winter-Spring Outflow	Unaccounted for Inflow/ Outflow (ac-ft)	Evap (ac-ft)	Precip (ac-ft)	Historical Recharge (ac-ft)	Flow to DMC (ac–ft)	DMC Release for Recharge (ac-ft)	No. of Days of DMC Release for Recharge	LBC Yield Benefit (ac-ft)	No. of Days w/ Flow to DMC	Remaining Historical Spill (ac-ft)	Average of Simulated Storage (ac-ft)
2007	Oct	0	0	0	0	-23	174	8	0	0	0	0	0	0	0	20,393
	Nov	18	3	0	0	-39	75	13	0	0	0	0	0	0	0	20,252
	Dec	44	4	0	0	-65	42	27	0	0	0	0	0	0	0	20,191
	Jan	36	4	0	0	-49	36	21	0	0	0	0	0	0	0	20,144
	Feb	332	8	0	0	-29	57	45	0	0	0	0	0	0	0	20,163
	Mar	262	13	0	0	-5	126	4	0	0	0	0	0	0	0	20,589
	Apr	6	1	0	0	37	210	18	0	0	0	0	0	0	0	20,488
	May	4	1	0	0	3	331	1	0	0	0	0	0	0	0	20,263
	Jun	0	0	0	0	2	372	0	0	0	0	0	0	0	0	19,921
	Jul	0	0	0	0	39	414	0	0	0	0	0	0	0	0	19,541
	Aug	0	0	0	0	23	363	0	0	0	0	0	0	0	0	19,159
	Sep	0	0	0	0	-33	266	30	0	0	0	0	0	0	0	18,849
2007 Total		702	34	0	0	-140	2,466	166	0	0	0	0	0	0	0	19,996
2008	Oct	6	1	0	0	-18	174	19	0	0	0	0	0	0	0	18,645
	Nov	28	4	0	0	-70	75	11	0	0	0	0	0	0	0	18,527
	Dec	8	1	0	0	-86	42	50	0	0	0	0	0	0	0	18,434
	Jan	1,847	18	0	0	-1,038	36	114	0	0	0	0	0	0	0	18,775
	Feb	2,670	28	1,325	8	91	59	39	784	541	22	2	514	6	0	20,630
	Mar	181	17	4	2	90	126	0	4	0	5	1	0	0	0	20,828
	Apr	10	2	0	0	40	210	0	0	0	0	0	0	0	0	20,778
	May	0	0	0	0	48	331	4	0	0	0	0	0	0	0	20,553
	Jun	0	0	0	0	31	372	0	0	0	0	0	0	0	0	20,232
	Jul	0	0	0	0	30	414	0	0	0	0	0	0	0	0	19,878
	Aug	0	0	0	0	-16	363	0	0	0	0	0	0	0	0	19,491
	Sep	0	0	0	0	-6	266	0	0	0	0	0	0	0	0	19,147
2008 Total		4,750	71	1,329	10	-903	2,468	237	788	541	27	3	514	6	0	19,654
2009	Oct	0	0	0	0	-45	174	1	0	0	0	0	0	0	0	18,898
	Nov	22	2	0	0	-55	75	21	0	0	0	0	0	0	0	18,752
	Dec	14	3	0	0	-48	42	45	0	0	0	0	0	0	0	18,707
	Jan	58	4	0	0	-70	36	62	0	0	0	0	0	0	0	18,689
	Feb	466	14	0	0	-24	57	67	0	0	0	0	0	0	0	18,863
	Mar	792	23	0	0	22	126	12	0	0	0	0	0	0	0	19,733
	Apr	36	4	4	1	26	210	2	4	0	0	0	0	0	0	19,793
	May	0	0	2	1	59	331	10	2	0	0	0	0	0	0	19,597
	Jun	0	0	0	0	49	372	0	0	0	0	0	0	0	0	19,279
	Jul	0	0	0	0	19	414	0	0	0	0	0	0	0	0	18,917
	Aug	0	0	0	0	25	363	0	0	0	0	0	0	0	0	18,544
	Sep	0	0	0	0	-29	266	0	0	0	0	0	0	0	0	18,241
2009 Total		1,387	50	6	2	-72	2,466	222	6	0	0	0	0	0	0	19,002
2010	Oct	69	3	0	0	-106	174	50	0	0	0	0	0	0	0	18,010
	Nov	0	0	0	0	-50	75	13	0	0	0	0	0	0	0	17,876
	Dec	103	8	0	0	-126	42	65	0	0	0	0	0	0	0	17,819
	Jan	2,127	17	0	0	-28	36	101	0	0	0	0	0	0	0	18,510
	Feb	2,236	28	721	3	-21	57	72	259	461	0	0	438	2	0	20,426
	Mar	1,787	29	2,372	10	78	126	24	978	1,394	93	1	1,324	9	0	20,808
	Apr	1,202	27	0	0	163	210	97	0	0	0	0	0	0	0	21,685
	May	40	6	0	0	211	331	7	0	0	0	0	0	0	0	22,123
	Jun	0	0	0	0	25	372	1	0	0	0	0	0	0	0	21,904
	Jul	0	0	0	0	23	414	0	0	0	0	0	0	0	0	21,526
	Aug	0	0	0	0	-263	363	0	0	0	0	0	0	0	0	20,947
	Sep	0	0	0	0	13	266	0	0	0	0	0	0	0	0	20,572
2010 Total		7,564	118	3,093	13	-80	2,466	430	1,238	1,855	93	1	1,762	11	0	20,178

San Joaquin River Exchange Contractors Authority
LBCDR Operation Summary

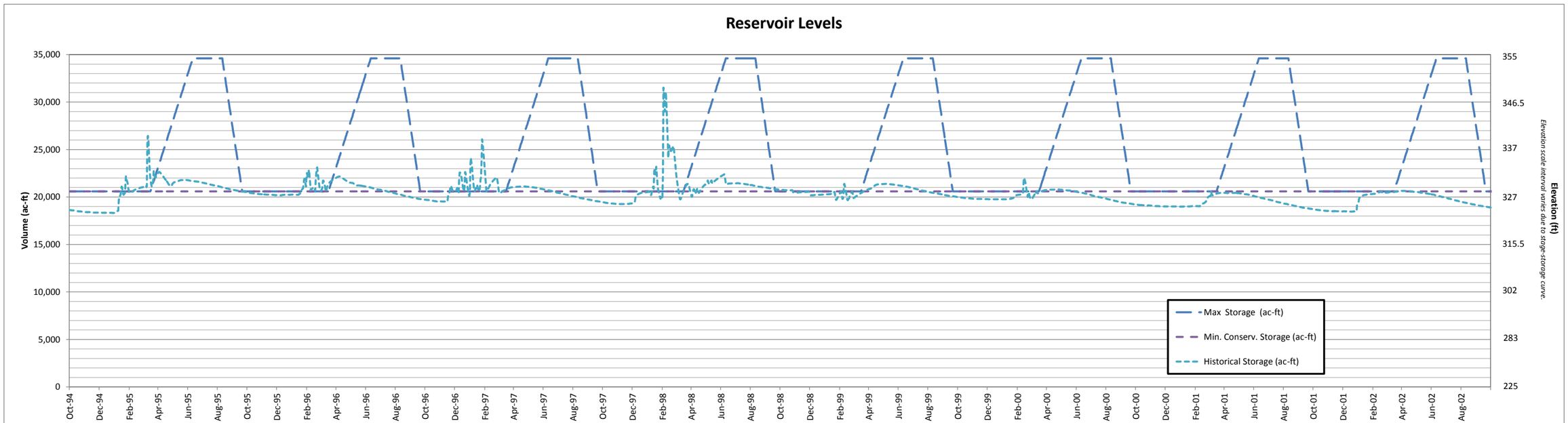
Exhibit C

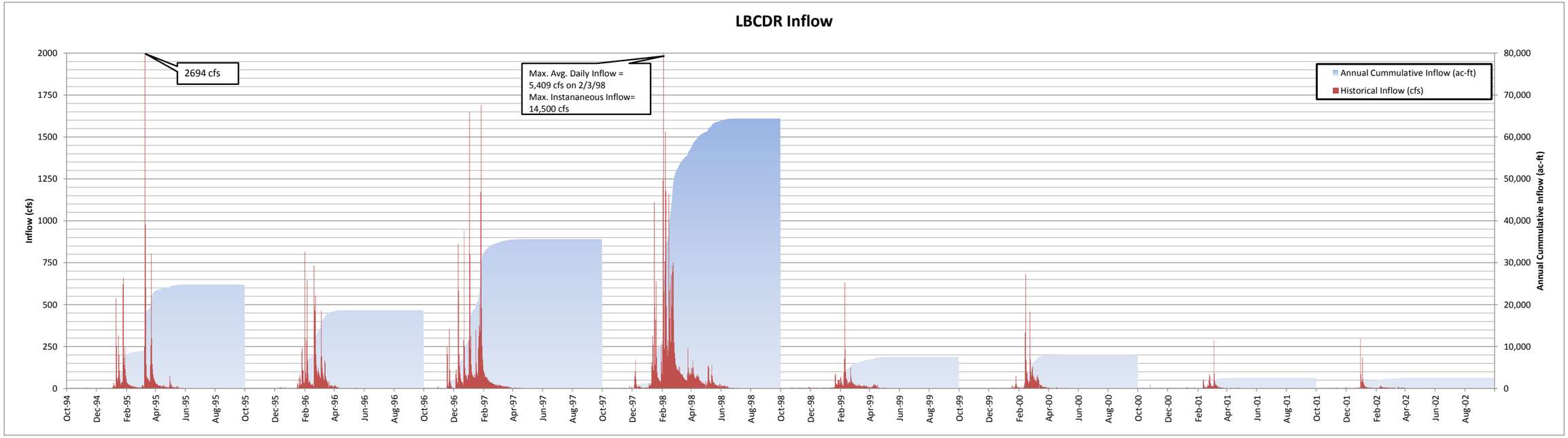
LBC Inlet to DMC - Simulation A1 - Existing Operations, Historical Outflows

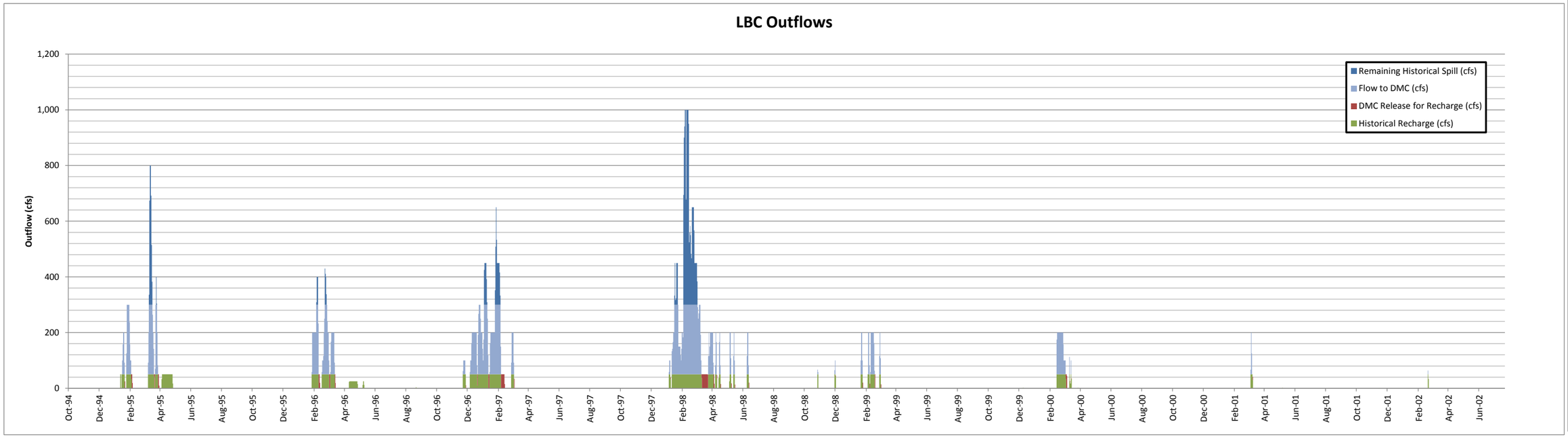
Water Year	Month	Historical Inflow (ac-ft)	No. of Days of Inflow	Total Outflow (ac–ft)	No. of Days w/ Winter-Spring Outflow	Unaccounted for Inflow/ Outflow (ac-ft)	Evap (ac-ft)	Precip (ac-ft)	Historical Recharge (ac-ft)	Flow to DMC (ac–ft)	DMC Release for Recharge (ac-ft)	No. of Days of DMC Release for Recharge	LBC Yield Benefit (ac-ft)	No. of Days w/ Flow to DMC	Remaining Historical Spill (ac-ft)	Average of Simulated Storage (ac-ft)
2011	Oct	0	0	0	0	-47	174	21	0	0	0	0	0	0	0	20,348
	Nov	73	1	0	0	-70	75	58	0	0	0	0	0	0	0	20,222
	Dec	700	13	776	3	421	42	152	281	495	0	0	470	2	0	20,327
	Jan	2,173	26	2,835	12	436	36	15	1,103	1,733	111	2	1,646	10	0	20,512
	Feb	3,392	24	3,744	10	550	57	53	990	2,754	99	1	2,616	10	0	20,833
	Mar	5,217	30	5,847	15	1,216	126	90	1,485	3,986	55	1	3,786	15	376	20,954
	Apr	680	24	693	2	183	210	3	198	495	208	3	470	2	0	21,020
	May	0	0	0	0	142	331	14	0	0	0	0	0	0	0	21,075
	Jun	6	1	0	0	95	372	26	0	0	0	0	0	0	0	20,885
	Jul	0	0	0	0	17	414	0	0	0	0	0	0	0	0	20,523
	Aug	0	0	0	0	-7	363	0	0	0	0	0	0	0	0	20,143
	Sep	0	0	0	0	-23	266	0	0	0	0	0	0	0	0	19,816
2011 Total		12,241	119	13,896	42	2,914	2,466	431	4,057	9,462	473	7	8,989	39	376	20,553
Grand Total		*232,391*	*1,947*	*197,681*	*526*	*2,060*	*41,548*	*5,811*	*47,490*	*116,426*	*5,821*	*95*	*110,605*	*420*	*33,765*	*20,321*
Average		**13,670**	**115**	**11,628**	**31**	**121**	**2,444**	**342**	**2,794**	**6,849**	**342**	**6**	**6,506**	**25**	**1,986**	

San Joaquin River Exchange Contractors Authority
LBCDR Operation Summary
LBC Inlet to DMC - Simulation A1 - Existing Operations, Historical Outflows

Water Year	Historical Inflow (ac-ft)	No. of Days of Inflow	Total Outflow (ac-ft)	No. of Days w/ Outflow	Flow to DMC (ac-ft)	No. of Days w/ Flow to DMC	DMC Release for Recharge (ac-ft)	No. of Days of DMC Release for Recharge
1995	24,786	152	21,289	63	11,031	33	552	9
1996	18,673	98	17,580	63	11,431	38	572	7
1997	35,680	151	33,946	75	21,808	70	1,090	13
1998	64,409	215	61,988	94	30,274	89	1,514	21
1999	7,549	157	6,679	27	4,217	23	211	7
2000	8,061	106	6,841	26	4,643	20	232	5
2001	2,623	78	940	8	479	3	24	1
2002	2,545	98	194	3	28	1	1	1
2003	8,541	142	5,819	25	3,819	19	191	5
2004	5,109	80	2,447	7	1,780	6	89	1
2005	18,017	139	14,252	41	10,260	39	513	7
2006	9,753	139	7,383	27	4,798	23	240	7
2007	702	34	-	-	-	-	-	-
2008	4,750	71	1,329	10	541	6	27	3
2009	1,387	50	6	2	-	-	-	-
2010	7,564	118	3,093	13	1,855	11	93	1
2011	12,241	119	13,896	42	9,462	39	473	7
Grand Total	232,391	1,947	197,681	526	116,426	420	5,821	95
Average	**13,670**	**115**	**11,628**	**31**	**6,849**	**25**	**342**	**6**


Reservoir Levels
Volume (ac-ft)
Elevation (ft)
Elevation scale interval varies due to stage-storage curve.
Max Storage (ac-ft)
Min. Conserv. Storage (ac-ft)
Historical Storage (ac-ft)


LBCDR Inflow
Inflow (cfs)
Annual Cummulative Inflow (ac-ft)
2694 cfs
Max. Avg. Daily Inflow = 5,409 cfs on 2/3/98
Max. Instananeous Inflow= 14,500 cfs
Annual Cummulative Inflow (ac-ft)
Historical Inflow (cfs)


LBC Outflows
Outflow (cfs)
1,200
1,000
800
600
400
200
0
Remaining Historical Spill (cfs)
Flow to DMC (cfs)
DMC Release for Recharge (cfs)
Historical Recharge (cfs)
Oct-94
Dec-94
Feb-95
Apr-95
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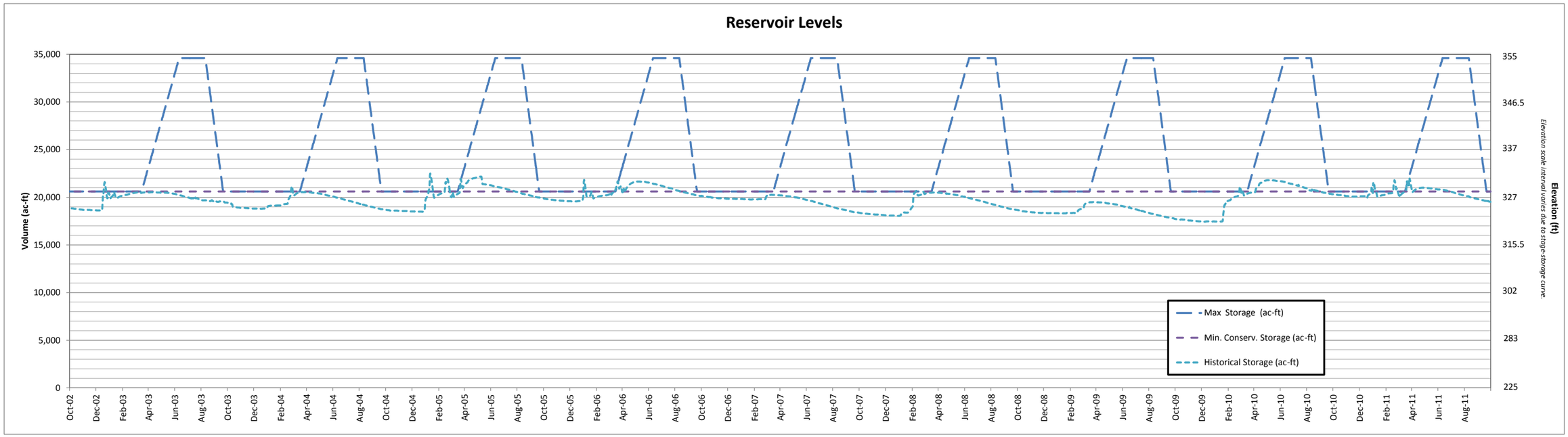
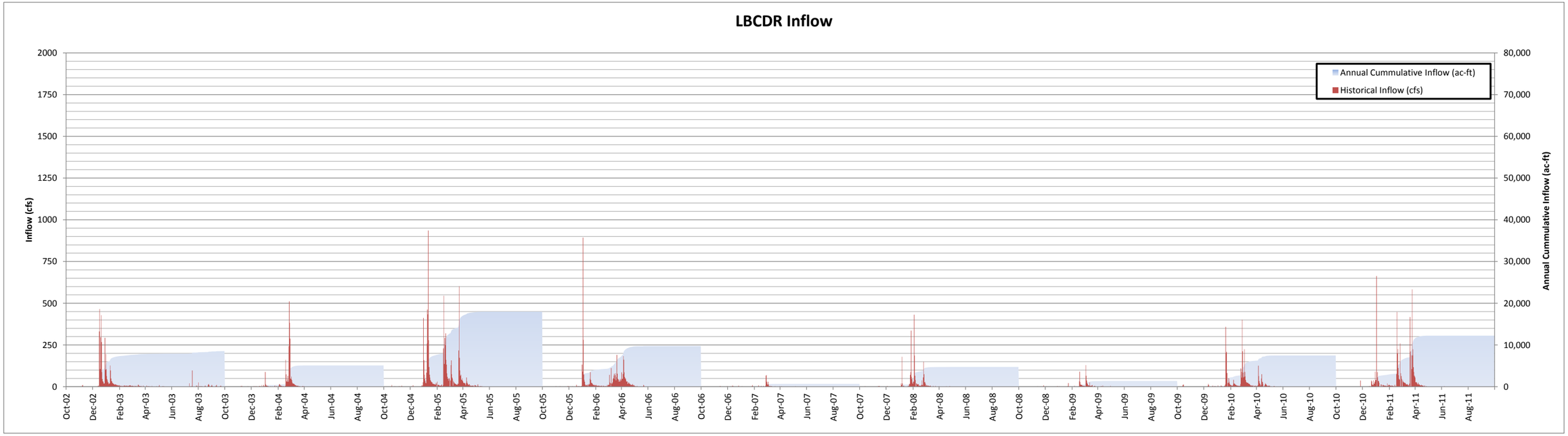
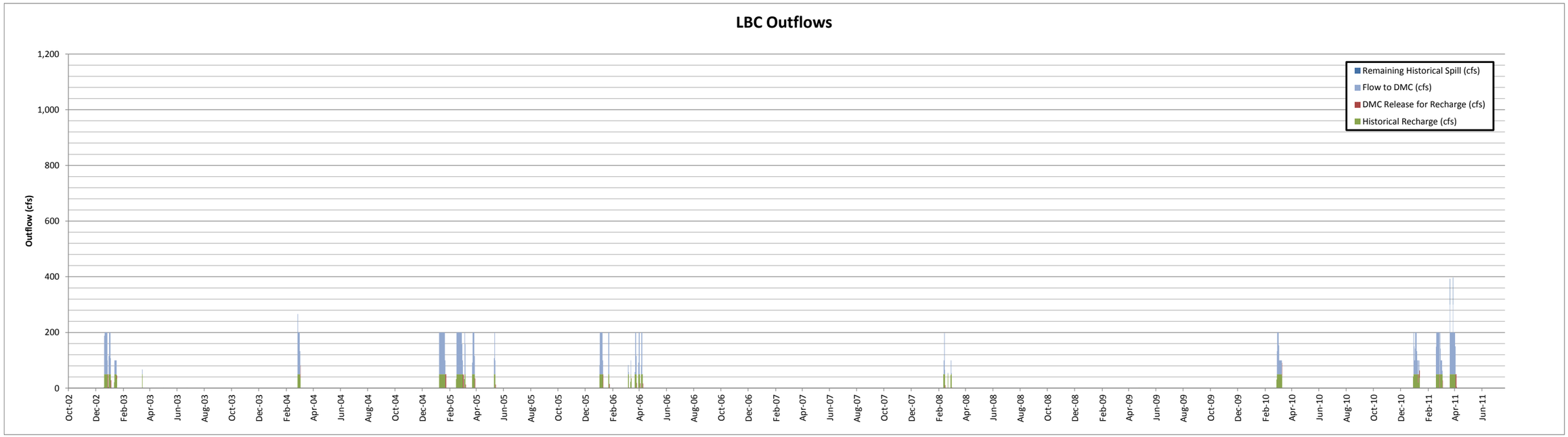
Jun-02


Reservoir Levels
Volume (ac-ft)
Elevation (ft)
Elevation scale interval varies due to stage-storage curve.
Max Storage (ac-ft)
Min. Conserv. Storage (ac-ft)
Historical Storage (ac-ft)


LBCDR Inflow
Inflow (cfs)
Annual Cummulative Inflow (ac-ft)
Annual Cummulative Inflow (ac-ft)
Historical Inflow (cfs)


LBC Outflows
Outflow (cfs)
1,200
1,000
800
600
400
200
0
Remaining Historical Spill (cfs)
Flow to DMC (cfs)
DMC Release for Recharge (cfs)
Historical Recharge (cfs)
Oct-02
Dec-02
Feb-03
Apr-03
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Apr-10
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Apr-11
Jun-11

Appendix E

Reclamation's Indian Trust Assets Determination

Emerson, Rain <remerson@usbr.gov>

Re: 12-060 For Review

RIVERA, PATRICIA <privera@usbr.gov> Fri, Sep 5, 2014 at 2:44 PM
To: "Emerson, Rain" <remerson@usbr.gov>
Cc: Kristi Seabrook <kseabrook@usbr.gov>, "Williams, Mary D (Diane)" <marywilliams@usbr.gov>

Rain,

I reviewed the proposed action to issue a series of Warren Act contracts to Central California Irrigation District (CCID), Grasslands Water District, and/or San Luis Water District for introduction of Los Banos Creek water into the Delta-Mendota Canal (DMC). Reclamation also proposes to issue a 50-year land use authorization to CCID for installation, operation, and maintenance of a connection structure and creek control structure within Reclamation right-of-way near Check 15 of the DMC. In addition, CCID proposes to install three stream gauging stations in Los Banos Creek.

The proposed action does not have a potential to impact Indiana Trust Assets.

Patricia Rivera
Native American Affairs Program Manager
US Bureau of Reclamation
Mid-Pacific Region
2800 Sacramento, California 95825
(916) 978-5194

Kristi this is admin. thanks

Appendix F

Reclamation's Cultural Resources Determination

CULTURAL RESOURCE COMPLIANCE
Mid-Pacific Region
Division of Environmental Affairs
Cultural Resources Branch

MP-153 Tracking Number: 13-SCAO-241

Project Name: Los Banos Creek Diversion Project, Merced County, California

NEPA Document: EA-12-060

Project Manager/NEPA Contact: Rain Emerson

MP 153 Cultural Resources Reviewer: Mark Carper

Determination: No Adverse Effects to Historic Properties

Date: 10/14/2014

This proposed undertaking by Reclamation is authorize San Joaquin River Exchange Contractors Water Authority access to Reclamation's right-of-way to install connection and creek control structures at the Delta Mendota Canal (DMC) at its intersection with Los Banos Creek. Reclamation's issuance of the land use authorization and use of Federal funding constitute an undertaking as defined in Section 301(7) of the NHPA (16 U.S.C. 470), as amended, and requires compliance with Section 106 of the NHPA.

The proposed project involves construction of connection and creek controls at the DMC to draw water from Los Banos Creek into the DMC during high creek flow and flood control operations of the Los Banos Creek Detention Dam. Stilling wells to monitor stream flow will be placed at two locations along Los Banos Creek: CCID's Main Canal and Outside.

In an effort to identify potential historic properties within the APE, Reclamation conducted a record search at the Southern San Joaquin Information Center and an intensive pedestrian survey of the APE. One historic property, the Delta-Mendota Canal (DMC), was identified within the APE. In addition two canals the Main Canal and the Outside Canal, which are the locations for the stilling wells within the APE, for the purposes of this project, are assumed to be eligible for the National Register of Historic Places as well.

All proposed activities will be conducted entirely within the constraints of the three (i.e., DMC, Main, and Outside) canals' built environments. Therefore, the potential for the presence of subsurface cultural

resources is negligible. Nor will there be visual impacts on the surrounding area. There is little potential to encounter sites of religious and cultural significance pursuant to the regulations at 36 CFR § 800.3(f)(2) and 36 CFR § 800.4(a)(4). Reclamation did not consult with federally recognized Indian tribes for this project.

Reclamation has determined that the proposed project will not adversely affect any of the characteristics of the three canals that would make them eligible for National Register inclusion.

Reclamation initiated consultation with the California State Preservation Office (SHPO) by letter on August 27, 2014. SHPO responded by letter on September 12, 2014 concurring with Reclamation's determination of no adverse effects to historic properties by the undertaking.

This memorandum is intended to convey the completion of the NHPA Section 106 process for this undertaking. Please retain a copy in the administrative record for this action. Should changes be made to this project, additional NHPA Section 106 review, possibly including consultation with the State Historic Preservation Officer, may be necessary. Thank you for providing the opportunity to comment.

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
1725 23rd Street, Suite 100
SACRAMENTO, CA 95816-7100
(916) 445-7000 Fax: (916) 445-7053
calshpo@parks.ca.gov
www.ohp.parks.ca.gov

October 9, 2014 Reply in Reference To: BUR_2014_0910_001

Anastasia T. Leigh
Regional Environmental Officer
Bureau of Reclamation, Mid-Pacific Regional Office
2800 Cottage Way
Sacramento, CA 95825-1898

RE: Los Banos Creek Diversion Project, Merced County, California; (13-SCAO-241)

Dear Ms. Leigh:

Thank you for seeking my consultation regarding the above noted undertaking. Pursuant to 36 CFR Part 800 (as amended 8-05-04) regulations implementing Section 106 of the National Historic Preservation Act (NHPA), the Bureau of Reclamation (Reclamation) is seeking my comments regarding the effects that the above named project will have on historic properties and my concurrence with a *Finding of No Adverse Effect to Historic Properties*.

Reclamation proposes to authorize San Joaquin River Exchange Contractors Water Authority to access Reclamation's right-of-way to install connection and creek control structures near Check 15 the Delta Mendota Canal (DMC) and stream gauges at the Central California Irrigation District (CCID) Main and Outside Canals at their intersection with Los Banos Creek. This involves:

- DMC: Construction of a concrete inlet structure with fabricated steel slide gates containing two pump bays.
- DMC: Construction of a ten-foot wide, six-foot high concrete box culvert.
- DMC: Installation of a concrete check structure, turnout structure and lining on the channel floor and sides within Los Banos Creek.
- DMC: Installation of a stilling well and data logger.
- Outside Canal: Installation of a stilling well in a concrete foundation and a concrete stand-pipe.
- Main Canal: Installation of a stilling well in a concrete foundation, stand-pipe with a pressure transducer.

The Area of Potential Effects (APE) is located in three discontiguous areas located in Sections 9, 29 and 32 of Township 10S, Range 10E, Mount Diablo Base Meridian. The vertical APE will vary to a maximum depth of sixteen feet at the stilling well locations. The entire APE is contained within the built environment of the canals and the constructed earthen-covered riprapped banks of the channelized Los Banos Creek.

In addition to your letter received September 8, 2014, you have submitted the *Cultural Resources Compliance Report (14-SCAO-241)* (Carper, August 8, 2014) as evidence of your efforts to identify and evaluate historic properties in the project APE.

Archival research included a records search at the Southern San Joaquin Valley Information Center. The Delta Mendota Canal (DMC) (P-50-001904), part of the Central Valley Project (CVP), was the only previously recorded cultural resource identified within the APE. A pedestrian surface survey was conducted on May 16, 2014. No new cultural resources were identified during field survey.

The DMC has been determined eligible to the National Register of Historic Places (NRHP) and contributes to the CVP. The Main Canal and Outside Canal are likely eligible to the NRHP. Reclamation has determined the project will not adversely affect the characteristics that contribute to the eligibility of the DMC, CVP, Main Canal and Outside Canal. Pursuant to 36 CFR §800.5(b) Reclamation has determined a *Finding of No Adverse Effect to Historic Properties* by the proposed project.

Based on the information provided, I concur identification efforts are sufficient and I also have no objections to the delineation of the APE, as depicted in the supporting documentation. I concur with a *Finding of No Adverse Effects* to historic properties for the project.

Thank you for considering effects to historic properties in your project planning. Be advised that under certain circumstances, such as unanticipated discovery or a change in project description, Reclamation may have additional future responsibilities for this undertaking under 36 CFR Part 800. Thank you for seeking my comments and considering historic properties as part of your project planning. If you have any questions or concerns regarding archaeological resources, please contact Associate State Archaeologist, Kim Tanksley at (916) 445-7035 or by email at kim.tanksley@parks.ca.gov. Any questions concerning the built environment should be directed to State Historian, Kathleen Forrest at (916)445-7022 or by email at kathleen.forest@parks.ca.gov.

Sincerely,

Carol Roland-Nawi, PhD
State Historic Preservation Officer

Appendix G

CalEEMod Air Quality Calculations

Los Banos Creek-Delta Mendota Canal Connection

San Joaquin Valley Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	83.60	1000sqft	1.92	83,600.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	45
Climate Zone	3			**Operational Year**	2014
Utility Company					
CO2 Intensity (lb/MWhr)	0	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Project is installation of a creek control structure, a connection structure, and stream flow measuring weirs in the Los Banos Creek.

Land Use - total area of disturbed lands is 1.9 acres

Construction Phase - it is assumed that site prep will last one month while the construction of structures will last five months.

Off-road Equipment - using default site prep equipment

Off-road Equipment - construction equipment provided by construction manager

Grading - 1.9 total acres disturbed

Trips and VMT - it's assumed that there will be 60 construction workers

Energy Use -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	1.00

tblConstructionPhase	NumDays	200.00	1.00
tblConstructionPhase	NumDays	2.00	23.00
tblConstructionPhase	NumDays	200.00	112.00
tblConstructionPhase	NumDays	10.00	1.00
tblConstructionPhase	NumDays	200.00	1.00
tblConstructionPhase	PhaseEndDate	7/10/2014	7/9/2014
tblConstructionPhase	PhaseEndDate	1/31/2014	2/2/2014
tblConstructionPhase	PhaseEndDate	7/10/2014	7/9/2014
tblConstructionPhase	PhaseEndDate	7/10/2014	7/9/2014
tblConstructionPhase	PhaseStartDate	7/10/2014	7/9/2014
tblConstructionPhase	PhaseStartDate	7/10/2014	7/9/2014
tblConstructionPhase	PhaseStartDate	7/10/2014	7/9/2014
tblGrading	AcresOfGrading	11.50	1.90
tblOffRoadEquipment	HorsePower	97.00	287.00
tblOffRoadEquipment	HorsePower	162.00	321.00
tblOffRoadEquipment	HorsePower	174.00	185.00
tblOffRoadEquipment	HorsePower	8.00	240.00
tblOffRoadEquipment	HorsePower	78.00	60.00
tblOffRoadEquipment	HorsePower	80.00	32.00
tblOffRoadEquipment	HorsePower	64.00	189.00
tblOffRoadEquipment	HorsePower	62.00	78.00
tblOffRoadEquipment	HorsePower	16.00	425.00
tblOffRoadEquipment	HorsePower	9.00	425.00
tblOffRoadEquipment	HorsePower	84.00	445.00
tblOffRoadEquipment	LoadFactor	0.37	0.29
tblOffRoadEquipment	LoadFactor	0.38	0.20
tblOffRoadEquipment	LoadFactor	0.41	0.74
tblOffRoadEquipment	LoadFactor	0.43	0.40

tblOffRoadEquipment	LoadFactor	0.48	0.37
tblOffRoadEquipment	LoadFactor	0.38	0.41
tblOffRoadEquipment	LoadFactor	0.46	0.45
tblOffRoadEquipment	LoadFactor	0.31	0.48
tblOffRoadEquipment	OffRoadEquipmentType	Forklifts	Excavators
tblOffRoadEquipment	OffRoadEquipmentType	Generator Sets	Graders
tblOffRoadEquipment	OffRoadEquipmentType	Rubber Tired Dozers	Plate Compactors
tblOffRoadEquipment	OffRoadEquipmentType	Tractors/Loaders/Backhoes	Air Compressors
tblOffRoadEquipment	OffRoadEquipmentType	Graders	Rollers
tblOffRoadEquipment	OffRoadEquipmentType	Welders	Sweepers/Scrubbers
tblOffRoadEquipment	OffRoadEquipmentType		Aerial Lifts
tblOffRoadEquipment	OffRoadEquipmentType		Dumpers/Tenders
tblOffRoadEquipment	OffRoadEquipmentType		Cement and Mortar Mixers
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblTripsAndVMT	VendorTripNumber	14.00	0.00
tblTripsAndVMT	WorkerTripNumber	35.00	0.00
tblTripsAndVMT	WorkerTripNumber	35.00	0.00
tblTripsAndVMT	WorkerTripNumber	35.00	100.00
tblTripsAndVMT	WorkerTripNumber	35.00	0.00
tblTripsAndVMT	WorkerTripNumber	13.00	0.00
tblTripsAndVMT	WorkerTripNumber	7.00	0.00
tblTripsAndVMT	WorkerTripNumber	8.00	100.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2014	1.6118	9.7551	4.2592	0.0105	0.1158	0.3981	0.5139	0.0478	0.3779	0.4257	0.0000	1,006.8689	1,006.8689	0.1924	0.0000	1,010.9088
Total	**1.6118**	**9.7551**	**4.2592**	**0.0105**	**0.1158**	**0.3981**	**0.5139**	**0.0478**	**0.3779**	**0.4257**	**0.0000**	**1,006.8689**	**1,006.8689**	**0.1924**	**0.0000**	**1,010.9088**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2014	1.6108	9.7436	4.2546	0.0105	0.1158	0.3976	0.5134	0.0478	0.3775	0.4253	0.0000	1,005.7336	1,005.7336	0.1922	0.0000	1,009.7688
Total	**1.6108**	**9.7436**	**4.2546**	**0.0105**	**0.1158**	**0.3976**	**0.5134**	**0.0478**	**0.3775**	**0.4253**	**0.0000**	**1,005.7336**	**1,005.7336**	**0.1922**	**0.0000**	**1,009.7688**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.0658**	**0.1184**	**0.1073**	**0.0951**	**0.0000**	**0.1181**	**0.0934**	**0.0000**	**0.1191**	**0.1057**	**0.0000**	**0.1128**	**0.1128**	**0.1144**	**0.0000**	**0.1128**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.3847	1.0000e-005	8.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.4900e-003	1.4900e-003	0.0000	0.0000	1.5900e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.3847**	**1.0000e-005**	**8.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.4900e-003**	**1.4900e-003**	**0.0000**	**0.0000**	**1.5900e-003**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.3847	1.0000e-005	8.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.4900e-003	1.4900e-003	0.0000	0.0000	1.5900e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.3847**	**1.0000e-005**	**8.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.4900e-003**	**1.4900e-003**	**0.0000**	**0.0000**	**1.5900e-003**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/1/2014	2/2/2014	5	23	
2	Structure Construction	Building Construction	2/3/2014	7/8/2014	5	112	
3	Building Construction	Building Construction	7/9/2014	7/9/2014	5	1	
4	Structure Constuction	Building Construction	7/9/2014	7/9/2014	5	1	
5	Paving	Paving	7/9/2014	7/9/2014	5	1	
6	Architectural Coating	Architectural Coating	7/9/2014	7/9/2014	5	1	

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Structure Construction	Tractors/Loaders/Backhoes	4	8.00	287	0.29
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Cranes	1	6.00	226	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Structure Construction	Excavators	1	8.00	321	0.20
Paving	Pavers	1	6.00	125	0.42
Paving	Rollers	1	7.00	80	0.38
Structure Construction	Graders	2	8.00	185	0.74
Structure Construction	Plate Compactors	2	8.00	240	0.40
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Structure Constuction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Structure Construction	Air Compressors	2	8.00	60	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Structure Constuction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Structure Construction	Rollers	2	8.00	32	0.41

Paving	Paving Equipment	1	8.00	130	0.36
Structure Construction	Sweepers/Scrubbers	4	8.00	189	0.45
Building Construction	Welders	3	8.00	46	0.45
Structure Constuction	Cranes	1	6.00	226	0.29
Structure Constuction	Forklifts	1	6.00	89	0.20
Structure Constuction	Generator Sets	1	8.00	84	0.74
Site Preparation	Graders	1	8.00	174	0.41
Site Preparation	Rubber Tired Dozers	1	7.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Structure Constuction	Welders	3	8.00	46	0.45
Site Preparation	Aerial Lifts	0		78	0.48
Structure Construction	Dumpers/Tenders	24	8.00	425	0.38
Structure Construction	Cement and Mortar Mixers	8	8.00	425	0.56
Structure Construction	Pumps	2	8.00	445	0.74
Structure Construction	Cranes	1	6.00	226	0.29
Structure Construction	Forklifts	1	6.00	89	0.20
Structure Construction	Generator Sets	1	8.00	84	0.74
Structure Construction	Welders	3	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Structure Constuction	8	0.00	14.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Structure Constuction	8	0.00	14.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Structure Construction	57	100.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	0.00	14.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	100.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2014

Unmitigated Construction On-Site

Acres of Grading: 1.9

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0616	0.0000	0.0616	0.0334	0.0000	0.0334	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0293	0.3124	0.1966	2.0000e-004		0.0171	0.0171		0.0157	0.0157	0.0000	18.9987	18.9987	5.6100e-003	0.0000	19.1166
Total	**0.0293**	**0.3124**	**0.1966**	**2.0000e-004**	**0.0616**	**0.0171**	**0.0787**	**0.0334**	**0.0157**	**0.0491**	**0.0000**	**18.9987**	**18.9987**	**5.6100e-003**	**0.0000**	**19.1166**

3.2 Site Preparation - 2014

Unmitigated Construction Off-Site

Acres of Grading: 1.9

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0230	7.1100e-003	0.0708	1.1000e-004	9.1900e-003	8.0000e-005	9.2800e-003	2.4400e-003	8.0000e-005	2.5200e-003	0.0000	8.8661	8.8661	5.5000e-004	0.0000	8.8777
Total	**0.0230**	**7.1100e-003**	**0.0708**	**1.1000e-004**	**9.1900e-003**	**8.0000e-005**	**9.2800e-003**	**2.4400e-003**	**8.0000e-005**	**2.5200e-003**	**0.0000**	**8.8661**	**8.8661**	**5.5000e-004**	**0.0000**	**8.8777**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0616	0.0000	0.0616	0.0334	0.0000	0.0334	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0293	0.3120	0.1964	2.0000e-004		0.0170	0.0170		0.0157	0.0157	0.0000	18.9761	18.9761	5.6100e-003	0.0000	19.0939
Total	**0.0293**	**0.3120**	**0.1964**	**2.0000e-004**	**0.0616**	**0.0170**	**0.0786**	**0.0334**	**0.0157**	**0.0491**	**0.0000**	**18.9761**	**18.9761**	**5.6100e-003**	**0.0000**	**19.0939**

3.2 Site Preparation - 2014

Mitigated Construction Off-Site

Acres of Grading: 1.9

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0230	7.1100e-003	0.0708	1.1000e-004	9.1900e-003	8.0000e-005	9.2800e-003	2.4400e-003	8.0000e-005	2.5200e-003	0.0000	8.8661	8.8661	5.5000e-004	0.0000	8.8777
Total	**0.0230**	**7.1100e-003**	**0.0708**	**1.1000e-004**	**9.1900e-003**	**8.0000e-005**	**9.2800e-003**	**2.4400e-003**	**8.0000e-005**	**2.5200e-003**	**0.0000**	**8.8661**	**8.8661**	**5.5000e-004**	**0.0000**	**8.8777**

3.3 Structure Construction - 2014

Unmitigated Construction On-Site

Acres of Grading: 0

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.8604	9.3653	3.6211	9.6300e-003		0.3782	0.3782		0.3595	0.3595	0.0000	932.6193	932.6193	0.1828	0.0000	936.4585
Total	**0.8604**	**9.3653**	**3.6211**	**9.6300e-003**		**0.3782**	**0.3782**		**0.3595**	**0.3595**	**0.0000**	**932.6193**	**932.6193**	**0.1828**	**0.0000**	**936.4585**

3.3 Structure Construction - 2014

Unmitigated Construction Off-Site

Acres of Grading: 0

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1121	0.0347	0.3447	5.4000e-004	0.0448	4.0000e-004	0.0452	0.0119	3.7000e-004	0.0123	0.0000	43.1738	43.1738	2.6900e-003	0.0000	43.2304
Total	**0.1121**	**0.0347**	**0.3447**	**5.4000e-004**	**0.0448**	**4.0000e-004**	**0.0452**	**0.0119**	**3.7000e-004**	**0.0123**	**0.0000**	**43.1738**	**43.1738**	**2.6900e-003**	**0.0000**	**43.2304**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.8594	9.3542	3.6168	9.6200e-003		0.3778	0.3778		0.3591	0.3591	0.0000	931.5099	931.5099	0.1826	0.0000	935.3445
Total	**0.8594**	**9.3542**	**3.6168**	**9.6200e-003**		**0.3778**	**0.3778**		**0.3591**	**0.3591**	**0.0000**	**931.5099**	**931.5099**	**0.1826**	**0.0000**	**935.3445**

3.3 Structure Construction - 2014

Mitigated Construction Off-Site

Acres of Grading: 0

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1121	0.0347	0.3447	5.4000e-004	0.0448	4.0000e-004	0.0452	0.0119	3.7000e-004	0.0123	0.0000	43.1738	43.1738	2.6900e-003	0.0000	43.2304
Total	**0.1121**	**0.0347**	**0.3447**	**5.4000e-004**	**0.0448**	**4.0000e-004**	**0.0452**	**0.0119**	**3.7000e-004**	**0.0123**	**0.0000**	**43.1738**	**43.1738**	**2.6900e-003**	**0.0000**	**43.2304**

3.4 Building Construction - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.9500e-003	0.0113	7.6500e-003	1.0000e-005		8.0000e-004	8.0000e-004		7.7000e-004	7.7000e-004	0.0000	0.9363	0.9363	2.3000e-004	0.0000	0.9410
Total	**1.9500e-003**	**0.0113**	**7.6500e-003**	**1.0000e-005**		**8.0000e-004**	**8.0000e-004**		**7.7000e-004**	**7.7000e-004**	**0.0000**	**0.9363**	**0.9363**	**2.3000e-004**	**0.0000**	**0.9410**

3.4 Building Construction - 2014

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7000e-004	9.5000e-004	1.4000e-003	0.0000	5.0000e-005	2.0000e-005	7.0000e-005	1.0000e-005	2.0000e-005	3.0000e-005	0.0000	0.1550	0.1550	0.0000	0.0000	0.1550
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.7000e-004**	**9.5000e-004**	**1.4000e-003**	**0.0000**	**5.0000e-005**	**2.0000e-005**	**7.0000e-005**	**1.0000e-005**	**2.0000e-005**	**3.0000e-005**	**0.0000**	**0.1550**	**0.1550**	**0.0000**	**0.0000**	**0.1550**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.9500e-003	0.0113	7.6500e-003	1.0000e-005		8.0000e-004	8.0000e-004		7.7000e-004	7.7000e-004	0.0000	0.9351	0.9351	2.3000e-004	0.0000	0.9399
Total	**1.9500e-003**	**0.0113**	**7.6500e-003**	**1.0000e-005**		**8.0000e-004**	**8.0000e-004**		**7.7000e-004**	**7.7000e-004**	**0.0000**	**0.9351**	**0.9351**	**2.3000e-004**	**0.0000**	**0.9399**

3.4 Building Construction - 2014

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7000e-004	9.5000e-004	1.4000e-003	0.0000	5.0000e-005	2.0000e-005	7.0000e-005	1.0000e-005	2.0000e-005	3.0000e-005	0.0000	0.1550	0.1550	0.0000	0.0000	0.1550
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.7000e-004**	**9.5000e-004**	**1.4000e-003**	**0.0000**	**5.0000e-005**	**2.0000e-005**	**7.0000e-005**	**1.0000e-005**	**2.0000e-005**	**3.0000e-005**	**0.0000**	**0.1550**	**0.1550**	**0.0000**	**0.0000**	**0.1550**

3.5 Structure Constuction - 2014

Unmitigated Construction On-Site

Acres of Paving: 0

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.0900e-003	0.0126	8.5600e-003	1.0000e-005		9.0000e-004	9.0000e-004		8.7000e-004	8.7000e-004	0.0000	1.0489	1.0489	2.6000e-004	0.0000	1.0543
Total	**2.0900e-003**	**0.0126**	**8.5600e-003**	**1.0000e-005**		**9.0000e-004**	**9.0000e-004**		**8.7000e-004**	**8.7000e-004**	**0.0000**	**1.0489**	**1.0489**	**2.6000e-004**	**0.0000**	**1.0543**

3.5 Structure Constuction - 2014

Unmitigated Construction Off-Site

Acres of Paving: 0

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.5000e-004	1.8900e-003	2.8000e-003	0.0000	1.6000e-004	4.0000e-005	2.0000e-004	4.0000e-005	4.0000e-005	8.0000e-005	0.0000	0.3099	0.3099	0.0000	0.0000	0.3100
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.5000e-004**	**1.8900e-003**	**2.8000e-003**	**0.0000**	**1.6000e-004**	**4.0000e-005**	**2.0000e-004**	**4.0000e-005**	**4.0000e-005**	**8.0000e-005**	**0.0000**	**0.3099**	**0.3099**	**0.0000**	**0.0000**	**0.3100**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.0900e-003	0.0126	8.5500e-003	1.0000e-005		9.0000e-004	9.0000e-004		8.7000e-004	8.7000e-004	0.0000	1.0476	1.0476	2.6000e-004	0.0000	1.0531
Total	**2.0900e-003**	**0.0126**	**8.5500e-003**	**1.0000e-005**		**9.0000e-004**	**9.0000e-004**		**8.7000e-004**	**8.7000e-004**	**0.0000**	**1.0476**	**1.0476**	**2.6000e-004**	**0.0000**	**1.0531**

3.5 Structure Constuction - 2014

Mitigated Construction Off-Site

Acres of Paving: 0

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.5000e-004	1.8900e-003	2.8000e-003	0.0000	1.6000e-004	4.0000e-005	2.0000e-004	4.0000e-005	4.0000e-005	8.0000e-005	0.0000	0.3099	0.3099	0.0000	0.0000	0.3100
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.5000e-004**	**1.8900e-003**	**2.8000e-003**	**0.0000**	**1.6000e-004**	**4.0000e-005**	**2.0000e-004**	**4.0000e-005**	**4.0000e-005**	**8.0000e-005**	**0.0000**	**0.3099**	**0.3099**	**0.0000**	**0.0000**	**0.3100**

3.6 Paving - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.2000e-004	7.5500e-003	4.5800e-003	1.0000e-005		4.6000e-004	4.6000e-004		4.2000e-004	4.2000e-004	0.0000	0.6334	0.6334	1.8000e-004	0.0000	0.6372
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**7.2000e-004**	**7.5500e-003**	**4.5800e-003**	**1.0000e-005**		**4.6000e-004**	**4.6000e-004**		**4.2000e-004**	**4.2000e-004**	**0.0000**	**0.6334**	**0.6334**	**1.8000e-004**	**0.0000**	**0.6372**

3.6 Paving - 2014

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.1000e-004	7.5400e-003	4.5700e-003	1.0000e-005		4.6000e-004	4.6000e-004		4.2000e-004	4.2000e-004	0.0000	0.6326	0.6326	1.8000e-004	0.0000	0.6365
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**7.1000e-004**	**7.5400e-003**	**4.5700e-003**	**1.0000e-005**		**4.6000e-004**	**4.6000e-004**		**4.2000e-004**	**4.2000e-004**	**0.0000**	**0.6326**	**0.6326**	**1.8000e-004**	**0.0000**	**0.6365**

3.6 Paving - 2014

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.7 Architectural Coating - 2014

Unmitigated Construction On-Site

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 125,400; Non-Residential Outdoor: 41,800

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.5812					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.2000e-004	1.3900e-003	9.6000e-004	0.0000		1.2000e-004	1.2000e-004		1.2000e-004	1.2000e-004	0.0000	0.1277	0.1277	2.0000e-005	0.0000	0.1280
Total	**0.5815**	**1.3900e-003**	**9.6000e-004**	**0.0000**		**1.2000e-004**	**1.2000e-004**		**1.2000e-004**	**1.2000e-004**	**0.0000**	**0.1277**	**0.1277**	**2.0000e-005**	**0.0000**	**0.1280**

3.7 Architectural Coating - 2014

Unmitigated Construction Off-Site

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 125,400; Non-Residential Outdoor: 41,800

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.5812					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.2000e-004	1.3900e-003	9.6000e-004	0.0000		1.2000e-004	1.2000e-004		1.2000e-004	1.2000e-004	0.0000	0.1275	0.1275	2.0000e-005	0.0000	0.1279
Total	**0.5815**	**1.3900e-003**	**9.6000e-004**	**0.0000**		**1.2000e-004**	**1.2000e-004**		**1.2000e-004**	**1.2000e-004**	**0.0000**	**0.1275**	**0.1275**	**2.0000e-005**	**0.0000**	**0.1279**

3.7 Architectural Coating - 2014

Mitigated Construction Off-Site

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 125,400; Non-Residential Outdoor: 41,800

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.414654	0.062558	0.156261	0.179339	0.052131	0.008047	0.017854	0.095889	0.001821	0.001637	0.006500	0.000975	0.002335

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.3847	1.0000e-005	8.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.4900e-003	1.4900e-003	0.0000	0.0000	1.5900e-003
Unmitigated	0.3847	1.0000e-005	8.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.4900e-003	1.4900e-003	0.0000	0.0000	1.5900e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0581					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3265					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	8.0000e-005	1.0000e-005	8.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.4900e-003	1.4900e-003	0.0000	0.0000	1.5900e-003
Total	**0.3847**	**1.0000e-005**	**8.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.4900e-003**	**1.4900e-003**	**0.0000**	**0.0000**	**1.5900e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0581					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3265					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	8.0000e-005	1.0000e-005	8.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.4900e-003	1.4900e-003	0.0000	0.0000	1.5900e-003
Total	**0.3847**	**1.0000e-005**	**8.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.4900e-003**	**1.4900e-003**	**0.0000**	**0.0000**	**1.5900e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

Appendix H

U.S. Fish and Wildlife Coordination Act Report

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Suite W-2605
Sacramento, California 95825-1846

In Reply Refer to:
FF08ESMF00-
2014-CPA-0019-2

SEP 11 2014

Memorandum

To: Duane D. Stroup, Deputy Area Manager, U.S. Bureau of Reclamation, Fresno, California

From: Acting Field Supervisor, Sacramento Fish and Wildlife Office, Sacramento, California

Subject: Draft Fish and Wildlife Coordination Act Report for the Los Banos Creek Diversion Project, Merced County, California

This memorandum transmits the U.S. Fish and Wildlife Service's (Service) Draft Fish and Wildlife Coordination Act (FWCA) report, as provided for in Section 2(b) of the FWCA (48 stat. 401, as amended), for the Los Banos Creek Diversion Project.

The FWCA report assesses potential project effects on fish and wildlife resources and provides the Service's preliminary recommendations to avoid, minimize, rectify, or compensate for potential adverse effects. This report is primarily based on the Service's review of: 1) the September 2013 *Administrative Draft Environmental Assessment for the Los Banos Creek to Delta-Mendota Canal Connection and Associated Los Banos Creek Measuring Weirs*; 2) the March 2014 *Project Description for Administrative Draft Environmental Assessment for the Los Banos Creek Diversion Project*; 3) the July 16, 2014, site visit; and 4) other information available to the Service. This report has also been submitted to the California Department of Fish and Wildlife and the National Marine Fisheries Service for review and comment. Details of the project's effects on federally-listed species, pursuant to section 7 of the Endangered Species Act of 1973, as amended, are being addressed separately.

Any questions or comments regarding this report should be directed to Mark Littlefield, Watershed Planning Branch or Amber Aguilera, Fish and Wildlife Biologist at (916) 414-6600.

Attachment

cc:
Shauna McDonald, U.S. Bureau of Reclamation, Fresno, California
California Department of Fish and Wildlife, Stockton, California
National Oceanic Atmospheric Administration, National Marine Fisheries Service, Sacramento, California

DRAFT FISH AND WILDLIFE COORDINATION ACT REPORT
Los Banos Creek Diversion Project
September 2014

INTRODUCTION

This is the U.S. Fish and Wildlife Service's (Service) Draft Fish and Wildlife Coordination Act (FWCA) report for the U.S. Bureau of Reclamation's (Reclamation) Los Banos Creek Diversion Project (Project) in Merced County, California. Findings presented in this report are based on the September 2013 *Administrative Draft Environmental Assessment for the Los Banos Creek to Delta-Mendota Canal Connection and Associated Los Banos Creek Measuring Weirs*, the March 2014 *Project Description for Administrative Draft Environmental Assessment for the Los Banos Creek Diversion Project*, a July 2014 site visit, available data, field investigations, and other information available to the Service. This report has been prepared under the authority of, and in accordance with, the provisions of section 2(b) of the FWCA (48 stat. 401, as amended; 16 U.S.C. 661 *et seq.*).

BACKGROUND

Los Banos Creek is an intermittent creek that begins in the Diablo Range in San Benito County, flows north, and then flows eastward into western Merced County where it is dammed at the Los Banos Creek Detention Dam. The dam was built by Reclamation in 1966 to detain floodwater in order to protect the San Luis Canal, the City of Los Banos, and adjacent areas from damaging floods. The dam was constructed as a flood control facility and is subject to operation criteria of the U.S. Army Corps of Engineers (Corps). Otherwise, Los Banos Creek Detention Dam is operated in accordance with License 12134 from the State Water Resources Control Board. The license is held by Reclamation and subject to agreements with multiple agencies. The license allows for storage from November 1 to April 30 of up to 14,000 acre-feet (AF) annually for recreation, incidental domestic use, fish culture, and fish/wildlife maintenance within the vicinity of the reservoir. The license is subject to downstream appropriative right under License 5271, the memorandum of agreement with the California Department of Fish and Wildlife (CDFW) to deliver up to 4,000 AF annually to wetlands in Merced County, and a protest dismissal agreement with the Grasslands Water District (GWD). The reservoir, with a capacity of 34,000 AF, is a joint-use facility owned by Reclamation and operated and maintained by the California Department of Water Resources (DWR). As part of operations, flood control releases from the reservoir are made according to flood control criteria specified by the Corps between September 20th and March 15th.

Central California Irrigation District (CCID), GWD, and the San Luis Water District (SLWD) historically have delivered surface water from the Central Valley Project (CVP) and Los Banos Creek to lands that are riparian to Los Banos Creek (see Figure 1). Water delivered is used for crop production as well as maintenance of wetlands, waterfowl habitat, and vegetation growth. The delivery of surface water to these riparian lands benefits wildlife and reduces groundwater extraction by riparian landowners. A substantial portion of these lands are not fully able to use the intermittent high flows released into Los Banos Creek during flood control operations of Los Banos Creek Detention Dam because there are no pumps or diversion facilities sized for proper management of these "flashy short duration flows," which may only last several days. To increase pumping or diversion capacity during these events would require installation of dozens of separate pumps and the extension and maintenance of miles of electric service lines to meet new electric generation demands. Additionally, in the 1960s, weir structures located in CCID's Main and Outside Canals that had previously intercepted flows from

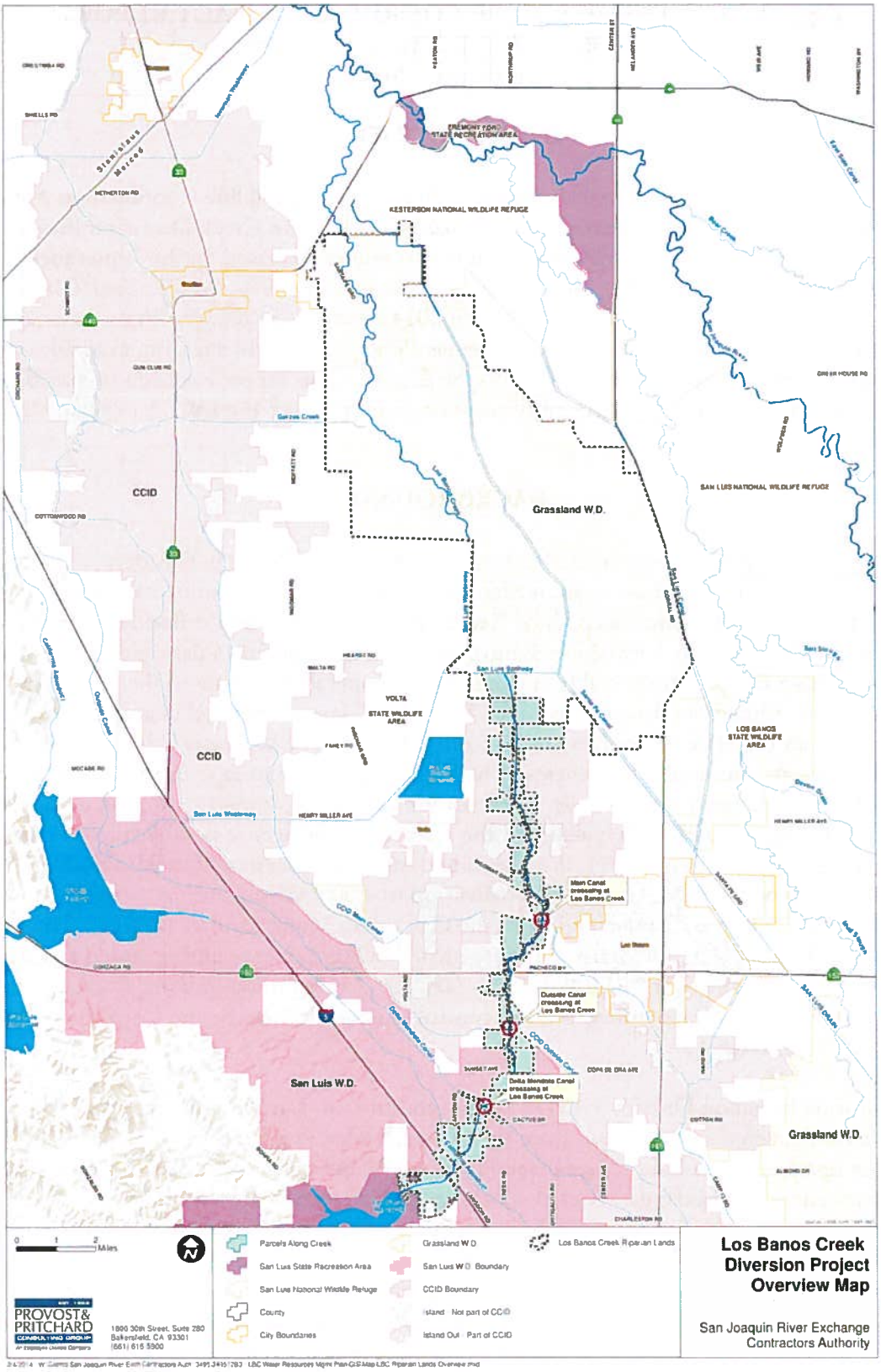

Figure 1. Central California Irrigation District, Grasslands Water District, and San Luis Water District lands in relation to Los Banos Creek

Los Banos Creek for conveyance to the riparian lands in CCID and GWD were replaced with siphons that pass under the creek. These siphons are unable to capture precipitation flows in Los Banos Creek.

DESCRIPTION OF ALTERNATIVES

There are two alternatives for the Project: the No Action Alternative and the Proposed Action. The No Action Alternative reflects the future conditions without the Project and serves as a basis of comparison for determining any potential effects.

PROJECT DESCRIPTION

Reclamation proposes to issue a series of Warren Act contracts to CCID, GWD, and/or SLWD for the introduction of Los Banos Creek water into the DMC. Reclamation also proposes to issue a 50 year land use authorization to CCID for the installation, operation, and maintenance of a connection structure and creek control structure within Reclamation right-of-way near Check 15 of the DMC (see Figure 2). In addition, CCID proposes to install three stream gauging stations in Los Banos Creek. Locations of the Project's infrastructure occur within Merced County at the following locations (see Figure 1): CCID Main Canal Crossing Weir, CCID Outside Canal Crossing Weir, and the DMC Crossing Inlet and Los Banos Creek Control Weir.

Warren Act Contract(s)

Dependent on available capacity and Reclamation approval, CCID, GWD, and/or SLWD would cumulatively introduce annually up to 31,000 AF of Los Banos Creek water into the DMC near Check 15. Warren Act contracts would be for varying lengths of time between March 1, 2014, and February 29, 2064 (contract years 2013-2063). All introduced water would be subject to 5 percent conveyance losses and may only be used on the riparian lands associated with Los Banos Creek in CCID, North GWD, and SLWD. Delivery to the riparian lands must occur within 30 days of introduction. Any Los Banos Creek water not delivered within the 30 days would be placed back into Los Banos Creek near Check 15 or from existing CCID or GWD facilities. This would allow for additional groundwater recharge as it is conveyed into the GWD through Los Banos Creek.

Los Banos Creek – Delta Mendota Canal Connection

The following would be installed by CCID in Los Banos Creek and the DMC.

Connection Structure

The connection structure would consist of a 250 cubic feet per second (cfs) gravity reinforced concrete inlet structure containing two pump bays in conjunction with a 10 foot wide by 6 foot high reinforced concrete box culvert (see Figure 2). The inlet structure would include a galvanized steel trashrack and two aluminum fabricated steel slide gates that are 6 feet wide and 5.6 feet high. The culvert would be utilized to convey water between the inlet structure in Los Banos Creek and the DMC. An acoustic Doppler meter would be used to measure flows in the box culvert. The connection structure slide gates would always be fully open or fully closed and a stop log in the DMC side of the connection structure would only be used if the flap gate requires maintenance or removal to prevent back flow from the DMC when the creek is dry. Specific details on the structure are shown in Table 1.

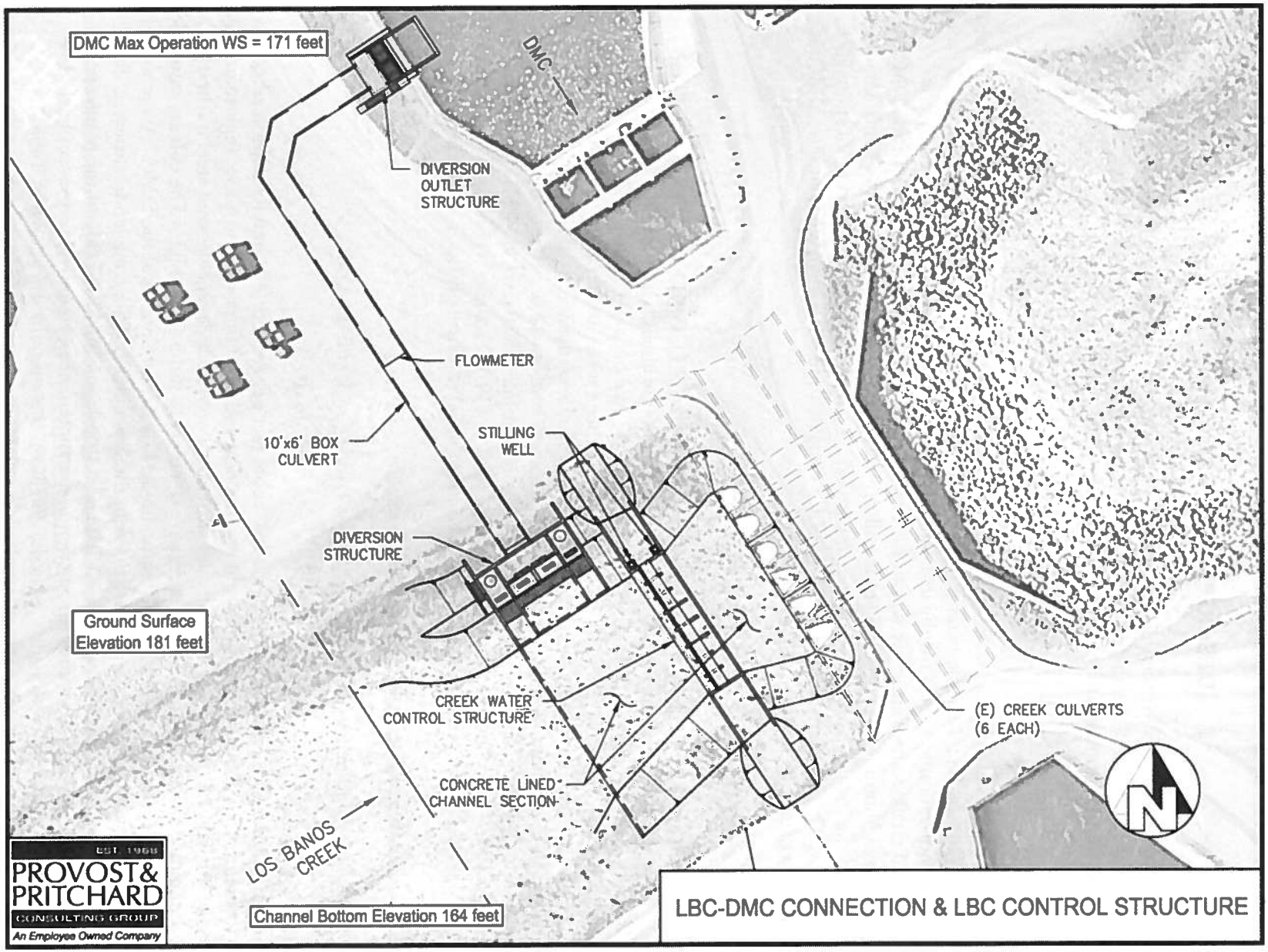

Figure 2. Los Banos Creek to Delta Mendota Canal Connection Structure and Los Banos Creek Control Structure

Table 1. Specifications of the Los Banos Creek – Delta Mendota Canal Connection Structure

Design Capacity	250 cfs
Top of Structure (Deck)	174.0 feet
Structure Invert	164.6 feet
Target Upstream Water Level	172.3 feet
DMC Operating Water Level	170.9 +/-
Level Measurement	Staff gauge
Flow Control	Manual Slide Gates
Trash Racks	Yes
Inlet Bottom Width	41 feet
Box Culvert Bottom Width	10 feet
Box Culvert Height	6 feet
Flow Measurement	Doppler Meter
Power for Flow Measurement	Electrical at DMC Check 15

Creek Control Structure

Construction within the Los Banos Creek streambed would consist of a check structure perpendicular to the stream, a turnout structure along the creek bank to deliver water to the DMC, and lining along the channel floor and side slopes (see Figure 2). Construction would be directly upstream of the DMC crossing. The check and turnout structures would be made of reinforced concrete and would require steel rebar and temporary formwork. The check structure would require 130 cubic yards (cy) of concrete, the turnout to the DMC would require 170 cy of concrete, and the lining along the channel floor would require 45 cy of concrete. The concrete would be placed from trucks located on the bank of the creek. The bank of the creek would be excavated and then backfilled and compacted for installation of the box culvert. Another 38 cy of reinforced concrete would be placed over 2,000 square feet at a depth of 6 inches. A total of 0.20 acre of channel disturbance would occur.

A stilling well with level sensor and data logger would be installed upstream of the connection structure to monitor the water level in the creek. The creek control structure would consist of a combination of slide gates and stop logs or flash boards to create a pond in Los Banos Creek upstream of the DMC crossing. The creek control structure would raise the creek water surface elevation to around 172 feet. Immediately downstream of the Project's creek control structure is an extensive road crossing maintained by San Luis Delta – Mendota Water Authority (SLDMWA). The creek control structure may be attached to the road crossing structure for stability purposes. The location, design, and dimensions are shown in Figure 2, and specific details on the structure are shown in Table 2.

Proposed Operations

The following is a general description of CCID's operation of the creek control structure. Weir stop logs would be installed in Los Banos Creek each winter in anticipation of storm flow releases from the Los Banos Creek Detention Reservoir and then removed each year after the end of the rainy season. Communications between reservoir operators, CCID, and the SLDMWA would occur daily during rainfall events. In general, DWR provides 24 hour notice to SLDMWA and CCID prior to initiating a release or making operational changes. Up to 250 cfs would be diverted into the DMC via the connection structure when flood waters are being released. The amounts actually diverted would be dependent on demand and available capacity in the DMC. In order to match historic groundwater

Table 2. Specifications of the Los Banos Creek Control Structure

Total Design Capacity	1,000 cfs
Gate Design Capacity	450 cfs
Top of Structure	177.5 feet
Structure Invert	165.0 feet
Target Upstream Water Level	172.3 feet
Level Measurement	Stilling Well and Logger
Flow Control	Manual Slide Gates
Structure Bottom Width	57 feet
Power Required	No

recharge in the area between the Los Banos Creek Detention Dam and CCID's Main Canal crossing, a minimum of 50 cfs would be maintained in this portion of Los Banos Creek during diversion events.

The creek control structure gates would be manually operated to maintain a water surface elevation of 172 feet in order to provide a constant flow into the DMC. This would provide a regulated head of water so that a series of gates at the diversion could regulate the amount of water to be diverted into the DMC and Los Banos Creek. It would also provide a way to measure the diverted flows entering the DMC and the flow within Los Banos Creek. CCID would inspect and adjust gate openings to ensure sufficient flows occur downstream. During periods of high flows, the gates would be operated to minimize flooding upstream of the structure. If creek flows are anticipated to exceed 450 cfs (up to 1,000 cfs), CCID would remove the stop logs by crane and fully open the slide gates to allow flood flows to continue down Los Banos Creek. If flash boards are used in lieu of stop logs, the boards would be removed manually. Although it is anticipated that CCID would receive notice in advance of high flows at the site, the control structure is designed to allow 1,000 cfs to pass through the gates and over the stop logs without overtopping the structure.

The majority of sediment in Los Banos Creek is captured behind the Los Banos Creek Detention Dam; however, in order to determine sediment in the creek, CCID would operate a station to measure turbidity downstream of the dam. The creek control structure would be designed to collect sediment in and through the weir, and sediment would be periodically removed by sluicing through the gates. Flows for sluicing would be controlled in order to maintain sediment flow in the creek in as close to a natural condition as possible. In addition, the creek control structure would be installed so it does not substantially raise water levels upstream where quarrying activities could be impacted.

Stream Gauging

In order to monitor stream flow and groundwater recharge in Los Banos Creek, CCID would install stream gauging stations in its Outside and Main Canals.

Outside Canal

A stilling well for stream flow monitoring would be constructed 25 feet downstream of the centerline of the Outside Canal crossing of Los Banos Creek. Work would consist of constructing a concrete stilling well in the Los Banos Creek bank set back 2 feet from the top hinge point of the creek. The stilling well would be set in a reinforced concrete foundation 2 feet below the creek invert elevation of 136 feet, along with a 24 inch Class III reinforced concrete stand pipe that is 18.5 feet tall. A pressure transducer would be installed in the stand pipe and connected to a solar powered data logger with

cellular modem to collect and transmit water level measurements. A 6 inch SDR-35 polyvinyl chloride (PVC) pipe would extend from the stand pipe into the creek with the invert of the 6 inch pipe matching the creek invert. The last 28 feet of pipe would be encased in concrete to protect the pipe. Excavation and fill would be less than 0.5 cy. The stilling well facilities would occupy 78 square feet, including facilities located within and outside of waters of the United States. Time for construction would be 14 calendar days. The overall project footprint, including the staging area, is 0.14 acre with 0.06 acre within waters of the United States.

Main Canal
A stilling well for stream flow monitoring would be constructed 65 feet upstream of the centerline of the Main Canal crossing of Los Banos Creek. Work would consist of constructing a concrete stilling well in the Los Banos Creek bank set back 2 feet from the top hinge point of the creek. The stilling well would be set in a reinforced concrete foundation 2 feet below the creek invert elevation of 119.0 feet, along with a 24 inch Class III reinforced concrete stand pipe that is 13 feet tall. A pressure transducer would be installed in the stand pipe and connected to a solar powered data logger with cellular modem to collect and transmit water level measurements. A 6 inch SDR-35 PVC pipe would extend from the stand pipe into the creek with the invert of the 6 inch pipe matching the creek invert. The last 6 feet of pipe would be encased in concrete to protect the pipe. The concrete encasement would be 2 feet wide and extend 1 foot above and 1 foot below the pipe. Total excavation and fill would be less than 1.5 cy within waters of the United States. The stilling well facilities would occupy 32 square feet including facilities located within and outside of waters of the United States. Time for construction would be 14 calendar days. The overall project footprint, including the staging area, is 0.11 acre with 0.05 acre within waters of the United States.

Staging Areas, Quarry Areas, and Access Routes

Existing service roads for the DMC, Outside Canal, and Main Canal would be used to access the Project sites during construction. A temporary road may be graded to provide access to the creek channel during construction. Existing berms along the edges of the Los Banos Creek channel would be removed to allow equipment access into the creek and the embankment graded for a temporary access road. Removed material would be stored outside of the channel and replaced once access to the channel is no longer needed.

Timing of Construction

Construction activities would take 150 working days to complete and the majority of the work would most likely be done concurrently. Work in Los Banos Creek would largely be done when the creek is dry; however, should rainfall occur during construction, CCID would implement measures required by a Clean Water Act 401 Permit and a Stormwater Pollution Prevention Plan. Normal working hours would be 0630-1700, Monday through Friday, excluding legal holidays. Construction would begin once environmental compliance and permitting are completed.

BIOLOGICAL RESOURCES

Water Resources

Los Banos Creek is an intermittent creek that begins in San Benito County and drains about 160 square miles of the Diablo Range. It than flows into western Merced County, where the water is held within

the Los Banos Creek Detention Reservoir behind the Los Banos Creek Detention Dam. The creek then flows into the San Joaquin Valley, but has been hydrologically disconnected from the San Joaquin River by the San Luis Spillway, which in flood events flows into managed wetlands within various refuges and duck clubs. When Los Banos Creek flood flows are able to reach the managed wetlands, the refuge and duck club managers have to release their previously delivered water in order to absorb the extra flow. The released water then drains into Mud Slough which eventually flows into the San Joaquin River.

San Joaquin River Exchange Contractors
The exchange contractors consist of CCID, Columbia Canal Company, Firebaugh Canal Water District, and San Luis Canal Company. The Exchange Contractors hold historic water rights to the San Joaquin River with their service area located on the west side of the San Joaquin Valley. In exchange for the regulation and diversion of the San Joaquin River at Millerton Lake, Reclamation agreed to supply water to the Exchange Contractors from the CVP's Delta Division via the DMC. The Exchange Contractors provide water delivery to over 240,000 acres of irrigable land on the west side of the San Joaquin Valley, spanning a distance roughly from the town of Mendota in the south, to the town of Crows Landing in the north. The Exchange Contractors in-district conveyance and delivery systems generally divert water from the DMC and Mendota Pool to convey water to their delivery turnouts. Deliveries include conveyance of water to wildlife areas (i.e. wetlands).

San Luis Water District
San Luis Water District is a CVP Contractor with a contract supply of 125,090 AF of CVP water. Their service area is located on the west side of the San Joaquin Valley.

Grassland Water District
The GWD conveys Central Valley Project Improvement Act (CVPIA) water supplies to privately and publicly owned wetlands (i.e. refuges) identified in CVPIA under a cooperative agreement between Reclamation and GWD. The GWD water conveyance system consists of natural channels, main canals, and irrigation laterals which operate by gravity flow. In the North Grasslands area of the Grassland Resource Conservation District (GRCD), the main channels include Los Banos Creek, Garzas Creek, Mud Slough North, the Santa Fe Canal, and the Eagle Ditch. The natural channels provide drainage for the North Grasslands when conveying storm runoff, operational spills, and tail water which exit GWD. The GWD has two sources of surface water supply, CVP water delivered under CVPIA and seasonal runoff from local creeks. The CVPIA commitments total 180,000 acre feet; 125,000 acre feet of Level 2 and 55,000 acre feet of Incremental Level 4. The Level 2 water includes granted water rights from Los Banos and Garzas Creeks and substitute Los Banos Creek water as a result of the construction of Los Banos and San Luis Reservoirs.

Vegetation

The habitats associated with the project area are highly disturbed and are dominated by agriculture. The agriculture includes pasture, orchard, vineyard, and row crops that are intensively managed through disking, grazing, crop rotation, and the use of chemicals. In addition, there is active gravel mining adjacent to the project area.

The Project footprints at all three sites would occur within the DMC and CCID maintenance roads and associated rights-of-way, which are bordered by canals, orchards, grassland, and active gravel mining. The grassland adjacent to the project area contains very little shrub cover.

Wildlife

The project area, including the Los Banos Creek corridor, provides grasslands, agriculture and patches of riparian woodland habitat. These diverse habitats support a corresponding diversity of wildlife.

The lands near the project area provide feeding, resting, and/or nesting habitat for many bird species, many of which require the aquatic areas of the creek, or the riparian vegetation of the ecosystem. Riparian areas are known to support a species-rich songbird community (Gaines 1977), and Los Banos Creek and the surrounding grasslands provides habitat for many raptors, including Swainson's hawks, red-shouldered hawks, northern harriers and golden eagles, all of which require or are closely associated with riparian and grassland vegetation. Waterfowl, including many species of duck and geese, use the managed wetland systems within the area extensively.

There are many species of mammals within and adjacent to the project area. Common species include beaver, jackrabbit, striped skunk, Virginia opossum, raccoon, coyote, ground squirrel, and many small rodents and insectivores including voles, moles, shrews, mice, and gophers. Uncommon species include several carnivores, such as river otter, gray fox, bobcat, and mink.

Reptile species along Los Banos Creek and within the project area include California kingsnake, western rattlesnake, Gilbert's skink, western fence lizard, gopher snake, common gartersnake, and western pond turtle. Common amphibians include the Pacific chorus frog, western toad, western spadefoot toad, and the introduced bullfrog.

Endangered Species

Based on a search of the Volta USGS quadrangle map there are several listed species which could occur within or near the project area. The species under the jurisdiction of the Service which may be affected by the project includes the giant garter snake and the San Joaquin kit fox. The other species (anadromous fish) are under the jurisdiction of National Marine Fisheries Service (NOAA Fisheries). The complete list is included in Enclosure 1 as well as a summary of Federal agencies responsibilities under the Endangered Species Act of 1973, as amended.

FUTURE CONDITIONS WITHOUT THE PROJECT (NO ACTION ALTERNATIVE)

Under the No Action Alternative, Reclamation would not issue Warren Act contracts for introduction of Los Banos Creek water into the DMC, nor would Reclamation issue land use authorization to CCID for construction activities within its rights-of-way. Riparian landowners would continue to use whatever water is available from Los Banos Creek, but it is unlikely they would be able to beneficially use all the water available to them. Additional water would continue to be provided by groundwater pumping and/or supplemental CVP water supplies delivered by CCID, GWD, and/or SLWD. CCID may decide to install the Los Banos Creek stream gauging stations located outside of Reclamation rights-of-way under the No Action Alternative. In addition, SLDMWA and CCID would continue to access the Project site for monitoring, operations, and for road and channel maintenance. Routine activities on privately owned farmland adjacent to Los Banos Creek and on Reclamation owned rights-of-way would also continue.

FUTURE CONDITIONS WITH THE PROJECT

The Project would not require any additional water to be released from the Los Banos Creek Detention Dam and the flood control releases that would supply the Project would be made regardless of if the Project was constructed. Overall, the Project would benefit water resources because flood flows in Los Banos Creek would be used in a more effective and efficient manner then what is currently taking place. In addition, landowners along Los Banos Creek have riparian water rights to pump and use water released from Los Banos Creek Detention Dam on their land. Construction of the Project, which controls the access of these flood flows by diverting and "holding" them for up to 30 days, would reduce the amount of groundwater pumping when riparian landowners need additional water. In addition, the Project would not result in a change of flow within the San Joaquin River because water released from Los Banos Creek Detention Dam does not normally flow to the San Joaquin River and any water diverted later in time that is eventually released into a San Joaquin tributary would happen regardless of the Project, but utilizing a different water source (i.e. groundwater pumping, additional CVP supplies).

As explained previously, Los Banos Creek has been hydrologically disconnected from the San Joaquin River by the San Luis Spillway. The California Regional Water Quality Control Board's (CRWQCB) *Survey of Tributaries to Mud Slough (North) Merced County, California* (CRWQCB 1989), found there are few discharges to Los Banos Creek between the Los Banos Creek Detention Dam and the San Luis Spillway Ditch, resulting in little or no flow within that section of Los Banos Creek. The report also describes a check structure at the San Luis Spillway that "essentially ends Los Banos Creek except during periods of flooding." Since flows from Los Banos Creek do not directly drain into the San Joaquin River but displace previously delivered CVP water held within duck clubs and refuges that eventually flow into the San Joaquin River via Mud Slough, the Project would have a negligible effect on San Joaquin River flows, especially during flood season.

The diversion of water from Los Banos Creek into the DMC would have a negligible effect on water quality within the DMC. Water quality data and a description of the discharges into Los Banos Creek from the Los Banos Creek Detention Dam to Mud Slough (North) is described in CRWQCB's *Survey of Tributaries to Mud Slough (North) Merced County, California* (CRWQCB 1989). For the survey, water quality was monitored at a number of sites along Los Banos Creek and other tributaries to Mud Slough (North). Electrical conductivity, boron, selenium, and molybdenum (collectively, referred to as the constituents) were measured at the monitoring sites because they best represent subsurface agricultural drainage into the creek. The data revealed that the constituents are relatively low over the course of the year, even at monitoring stations downstream of the San Luis Spillway where there are numerous discharges into the creek. The portion of creek between the Los Banos Creek Detention Dam and the DMC has no known discharges; therefore, any water introduced into the DMC should be comparable to the water released from the dam. In addition, any water introduced into the DMC from Los Banos Creek would have to meet Reclamation's current water quality standards.

The Project would have a very small effect on the water surface profile of Los Banos Creek. The project area for the creek control and connection structures is at the crossing of Los Banos Creek with the DMC, where the water ponds in the existing man made channel located inside an active gravel pit. The culverts are 3 feet above the lowest point in the channel bottom which enable sediments to accumulate in the channel bottom before traveling downstream. An evaluation of the channel and culvert hydraulics was conducted for both project alternatives. Profiles of the water surfaces for flow rates of 200 cfs, 450 cfs, and 1,000 cfs were calculated and a plot of the profiles is shown in Figure 3.

In order to provide delivery of Los Banos Creek water into the DMC, the control structure allows the water surface rise to 172.3 feet above mean sea level, causing a change in depth of about 3.0 feet for a flow of 200 cfs and 2.0 feet for 450 cfs. For 1,000 cfs flows, the profile drops about 0.7 feet due to running the weir open and diverting 250 cfs into the DMC. In all cases the water surface is below the top of bank. In addition to evaluating the effects of channel hydraulics at the normal operating flows, an analysis was done at 4,300 cfs, the maximum flow that can pass the San Luis Canal. Therefore, due to the water surface being controlled by the DMC crossing culvert elevations and size, and the dip road crossing elevation, the Project's flow control structure would have a 0.17 foot effect on the water surface profile.

In addition, the Project would provide multiple benefits to the water districts, especially the GWD which operates and maintains a water conveyance system that serves the lands within the Grassland Resource Conservation District (GRCD). The GRCD has a water service contract with Reclamation and Reclamation has the obligation to deliver 125,000 acre-feet AF of Level 2 water and 55,000 AF of Incremental Level 4 water to the GRCD as identified in the CVPIA. The delivery of Level 2 water has been very reliable with 2014 being the only year since enactment of CVPIA that less than 100 percent of Level 2 water would likely be delivered.

Currently, only 65 percent of the District's Level 2 water entitlement has been allocated by Reclamation, which is less than the minimum Level 2 allocation of 75 percent required by CVPIA. In addition, Reclamation has historically only acquired and delivered about 35 percent of the GRCD's Incremental Level 4 contract entitlement of 55,000 AF. Reclamation has been mandated by CVPIA to deliver 100 percent of Incremental Level 4 water quantities to the CVPIA identified refuges, including the GRCD, since 2002. It is because of the inability of Reclamation to meet their water supply obligations to the GRCD that GWD is partnering in the Project to develop additional reliable water supply to enable optimal management of a portion of the last 5 percent of the historical wetlands remaining in California.

The Project would provide the ability to divert a portion of the water released from the dam into the DMC for use on riparian lands within 30 days of diversion. This would allow for improved use and delivery of riparian water to the wetland habitat in the North Grasslands area. Releases from the dam are typically made in the winter or spring when the wetlands in the North Grasslands are full or draining down to promote the growth of plants vital to sustaining, on average, 60 percent of the entire waterfowl population of the Pacific Flyway during their wintering period.

The ability to intensively manage the wetlands is critical to providing the necessary food for wintering waterfowl. The ability to divert a portion of flood releases into the DMC would provide much needed relief from the typical large releases that must be routed through the GWD conveyance system. These large releases can cause damage to GWD facilities and wetlands, as well as delay drawdown of the wetlands that can have detrimental impacts on waterfowl food production. In addition, diversion of riparian flows from Los Banos Creek into the DMC provides GWD the opportunity to efficiently use their CVP refuge water in other areas and to delay the timing of water application so it is beneficial, such as for the irrigation of swamp timothy, a critical food crop for wintering waterfowl. The Project would also provide GWD a more efficient tool that can be used to control and manage its release of wetland drawdown water to the San Joaquin River rather than pumping the creek water, requiring energy and potential greenhouse gas impacts.

Figure 2-3 Los Banos Creek HEC Culvert Model

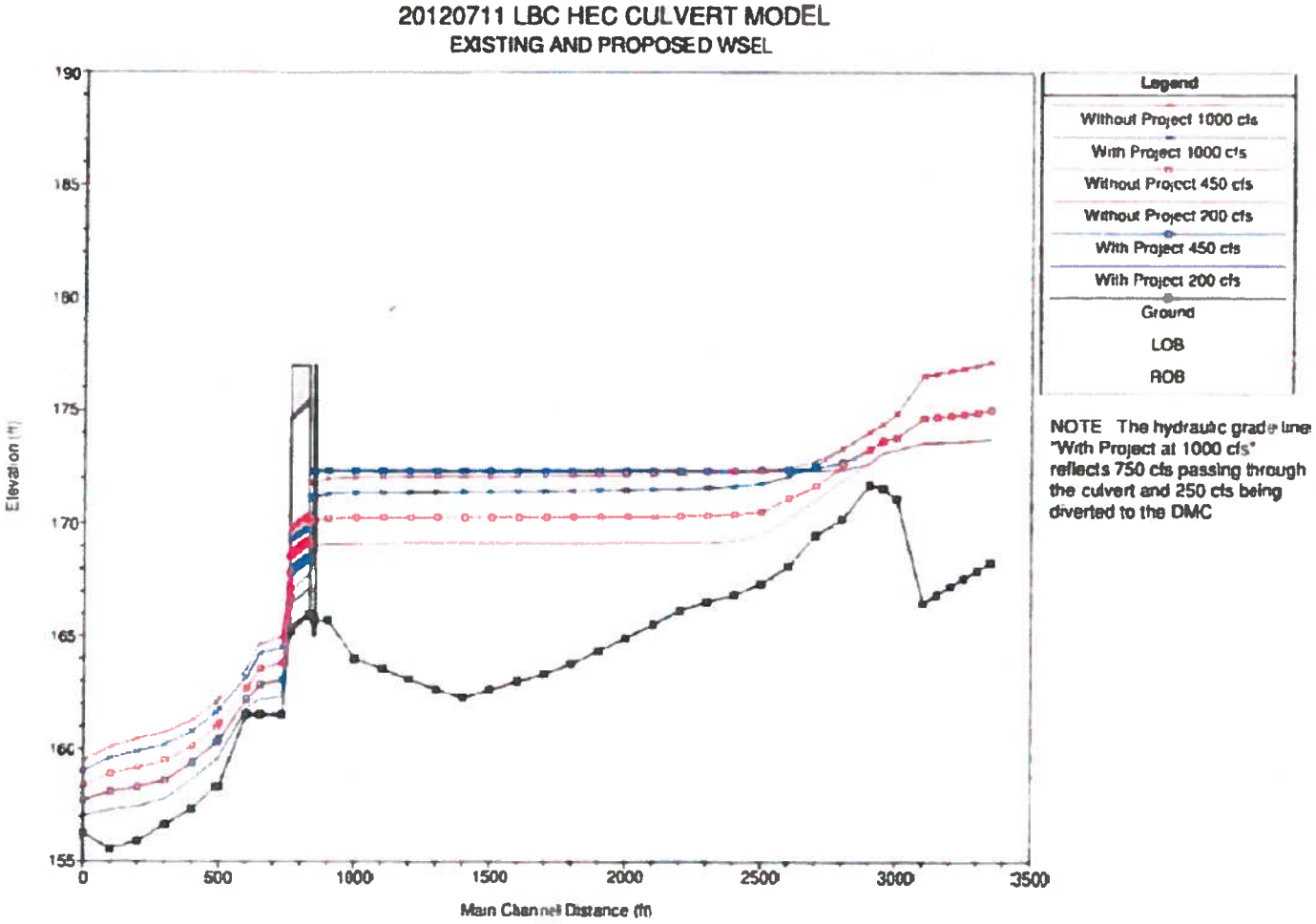

Figure 3. Water surface profile plots at the Los Banos Creek/DMC Connection for 200 cfs, 450 cfs, and 1,000 cfs

DISCUSSION

Service Mitigation Policy

The recommendations provided herein for the protection of fish and wildlife resources are in accordance with the Service's Mitigation Policy as published in the Federal Register (46:15; January 23, 1981).

The Mitigation Policy provides Service personnel with guidance in making recommendations to protect or conserve fish and wildlife resources. The policy helps ensure consistent and effective Service recommendations, while allowing agencies and developers to anticipate Service recommendations and plan early for mitigation needs. The intent of the policy is to ensure protection and conservation of the most important and valuable fish and wildlife resources, while allowing reasonable and balanced use of the Nation's natural resources.

Under the Mitigation Policy, resources are assigned to one of four distinct Resource Categories, each having a mitigation planning goal which is consistent with the fish and wildlife values involved. The Resource Categories cover a range of habitat values from those considered to be unique and irreplaceable to those believed to be much more common and of relatively lesser value to fish and wildlife. However, the Mitigation Policy does not apply to threatened and endangered species, Service recommendations for completed Federal projects or projects permitted or licensed prior to enactment of Service authorities, or Service recommendations related to the enhancement of fish and wildlife resources.

In applying the Mitigation Policy during an impact assessment, the Service first identifies each specific habitat or cover-type that may be impacted by the project. Evaluation species[1] which utilize each habitat or cover-type are then selected for Resource Category analysis. Selection of evaluation species can be based on several criteria, as follows: (1) species known to be sensitive to specific land- and water-use actions; (2) species that play a key role in nutrient cycling or energy flow; (3) species that utilize a common environmental resource; or (4) species that are associated with Important Resource Problems, such as anadromous fish and migratory birds, as designated by the Director or Regional Directors of the Fish and Wildlife Service. Based on the relative importance of each specific habitat to its selected evaluation species, and the habitat's relative abundance, the appropriate Resource Category and associated mitigation planning goal are determined.

Mitigation planning goals range from "no loss of existing habitat value" (i.e., Resource Category 1) to "minimize loss of habitat value" (i.e., Resource Category 4). The planning goal of Resource Category 2 is "no net loss of in-kind habitat value." To achieve this goal, any unavoidable losses would need to be replaced in-kind. "In-kind replacement" means providing or managing substitute resources to replace the habitat value of the resources lost, where such substitute resources are physically and biologically the same or closely approximate those lost. The planning goal of Resource Category 3 is "no net loss of habitat while minimizing loss of in-kind value." To achieve this goal any unavoidable losses will be replaced in-kind or if it is not desirable or possible out-of-kind mitigation would be allowed. The planning goal of Resource Category 4 is "minimize loss of habitat value." To achieve this goal the Service will recommend ways to rectify, reduce, or minimize loss of habitat value.

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1 Note: Evaluation species used for Resource Category determinations may or may not be the same evaluation species used in a HEP application, if one is conducted.

In addition to mitigation planning goals based on habitat values, Region 8 of the Service, which includes California, has a mitigation planning goal of no net loss of acreage and value for wetland habitat. This goal is applied in all impact analyses.

In recommending mitigation for adverse impacts to fish and wildlife habitat, the Service uses the same sequential mitigation steps recommended in the Council on Environmental Quality's regulations. These mitigation steps (in order of preference) are: avoidance, minimization, rectifying, reducing or eliminating impacts over time, and compensation.

Three fish and/or wildlife habitats were identified in the project area which had potential for impacts from the Project: annual grassland, riparian woodland, and stream/waters of the United States. The resource categories, evaluation species, and mitigation planning goal for the habitats impacted by the project are summarized in Table 3.

Table 3. Resource categories, evaluation species, and mitigation planning goal for the habitats possibly impacted by the proposed Los Banos Creek Diversion Project, Merced County, California.

COVER-TYPE	EVALUATION SPECIES	RESOURCE CATEGORY	MITIGATION GOAL
Annual Grassland	Red-tailed hawk	3	No net loss of habitat value while minimizing loss of in-kind habitat value.
Riparian Woodland	Yellow-billed magpie Swainson's hawk Wood duck	2	No net loss of in-kind habitat value or acreage.
Stream/Waters of the U.S.	Pacific chorus frog Sunfish Egret	2	No net loss of in-kind habitat value or acreage.

The evaluation species selected for the annual grassland cover-type is the red-tailed hawk, which utilizes these areas for foraging. This species was selected because of the Service's responsibility for their protection and management under the Migratory Bird Treaty Act, and their overall high non-consumptive values to humans. Annual grassland areas potentially impacted by the project vary in their relative values to the evaluation species, depending on the degree of human disturbance, plant species composition, and juxtaposition to other foraging and nesting areas. Therefore, the Service designates the annual grassland cover-type in the project area as Resource Category 3. Our associated mitigation planning goal for these areas is "no net loss of habitat value while minimizing loss of in-kind habitat value."

The evaluation species selected for the riparian woodland cover-type are the yellow-billed magpie, Swainson's hawk, and wood duck. Woody riparian vegetation provides important cover, roosting, foraging, and nesting habitat for these species. Large diameter trees also provide critical nesting sites for species such as the wood duck and Swainson's hawk. Riparian habitat has high value to evaluation species and overall, is extremely scarce (less than 2 percent remaining in California from pre-development conditions). Therefore, the Service designates the riparian woodland cover-type in the project area as Resource Category 2. Our associated mitigation planning goals for these areas is "no net loss of in-kind habitat value."

The evaluation species selected for the stream/waters of the U.S. cover-type are the Pacific chorus frog, sunfish, and egret. The stream/waters of the U.S. cover-type provides important cover, breeding, and foraging habitat for the Pacific chorus frog and sunfish. In addition, streams are important to a number of regionally important wading birds (e.g., herons and egrets), who use streams and other shallow waters for feeding. Therefore, the Service designates the stream/waters of the U.S. cover-type in the project area as Resource Category 2. Our associated mitigation planning goals for these areas is "no net loss of in-kind habitat value."

Based on our review of the Project, impacts to wildlife would be temporary losses of habitat value for species utilizing annual grasslands during construction of the stilling wells at the Outside and Main Canals. Wildlife species utilizing this area are already highly disturbed due to the ongoing maintenance of canals and the active farming of agriculture in the area. Wildlife species utilizing these areas would be displaced and there would be a temporary loss of habitat values during construction activities. In addition, there would be some minimal impacts to the stream channel and banks for installation of the connection structure and the stream gauging equipment. Since the creek channel and bed are already highly disturbed and all ground disturbed areas would be restored back to pre-project conditions after the completion of construction, these impacts would be insignificant. The timing of project construction would help to avoid impacts to migratory birds which may be nesting in affected vegetation and nearby areas throughout the riparian corridor. The Project would also have beneficial impacts to ground water resources by reducing the amount of ground water pumping and would be beneficial to waterfowl since water within the vast wetland system that is riparian to Los Banos Creek can be better managed.

Table 4. Habitat Impacts due to construction of the Los Banos Creek Diversion Project

Project Structure	Habitat Impacted	Total Impacts (acres)	Impacts to Waters of the U.S. (acres)
Los Banos Creek to DMC connection	Stream channel and bank	0.2	0.2
Outside Canal Stream Gauging	Stream channel and bank	0.14	0.06
Main Canal Stream Gauging	Stream channel and bank	0.11	0.05

RECOMMENDATIONS

The Service recommends:

1. Avoid impacts to native trees, shrubs, and aquatic vegetation. Any native trees or shrubs removed with a diameter at breast height of 2 inches or greater should be replaced on-site, in-kind with container plantings so that the combined diameter of the container plantings is equal

to the combined diameter of the trees removed. These replacement plantings should be monitored for 5 years or until they are determined to be established and self-sustaining. The planting site(s) should be protected in perpetuity.

2. Avoid future impacts to the site by ensuring all fill material is free of contaminants.

3. Avoid impacts to migratory birds nesting in trees along the access route and adjacent to the Project site by conducting pre-construction surveys for active nests along the proposed haul road, staging area, and construction site. Work activity around active nests should be avoided until the young have fledged. The following protocol from the CDFW for Swainson's hawk would suffice for the pre-construction survey for raptors, except the Service recommends an active nesting season of January 1 to August 31 to include all potential nesting migratory bird species.

   A focused survey for Swainson's hawk nests will be conducted by a qualified biologist during the nesting season (February 1 to August 31) to identify active nests within 0.25 mile of the project area. The survey will be conducted no less than 14 days and no more than 30 days prior to the beginning of construction. If nesting Swainson's hawks are found within 0.25 mile of the project area, no construction will occur during the active nesting season of February 1 to August 31, or until the young have fledged (as determined by a qualified biologist), unless otherwise negotiated with the California Department of Fish and Wildlife. If work is begun and completed between September 1 and February 28, a survey is not required.

4. Minimize project impacts by reseeding all disturbed areas at the completion of construction with forbs and grasses.

5. Minimize the impact of removal and trimming of all trees and shrubs by having these activities supervised and/or completed by a certified arborist.

6. Contact the NOAA Fisheries for possible effects of the project on federally-listed species under their jurisdiction.

7. Contact the CDFW regarding possible effects of the project on State listed species.

8. Monitor water quality in Los Banos Creek downstream of the diversion facility to ensure that existing water quality is maintained. Specific elements to monitor should include TDS, selenium, boron, and arsenic.

References

California Regional Water Quality Control Board (CRWQCB). 1989. Survey of Tributaries to Mud Slough (North), Merced County, California. April 1989. Central Valley Region, Sacramento, California

Gaines, D.A. 1977. The valley riparian forests of California: their importance to bird populations. Pages 57-85 *in* Riparian Forests in California: their ecology and conservation. A. Sands, ed. University of California, Davis, Inst of Ecology Publ. no. 15.

ENCLOSURE 1

FEDERAL ENDANGERED AND THREATENED SPECIES LIST

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 VOLTA (403C) U.S.G.S. 7 1/2 Minute Quad

Database last updated: September 18, 2011
Report Date: June 11, 2014

Listed Species

Invertebrates

Branchinecta longiantenna
longhorn fairy shrimp (E)

Branchinecta lynchi
vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus
valley elderberry longhorn beetle (T)

Lepidurus packardi
vernal pool tadpole shrimp (E)

Fish

Hypomesus transpacificus
delta smelt (T)

Oncorhynchus mykiss
Central Valley steelhead (T) (NMFS)

Amphibians

Ambystoma californiense
California tiger salamander, central population (T)

Rana draytonii
California red-legged frog (T)

Reptiles

Gambelia (=Crotaphytus) sila
blunt-nosed leopard lizard (E)

Thamnophis gigas
giant garter snake (T)

Mammals

Dipodomys nitratoides exilis
Fresno kangaroo rat (E)

Vulpes macrotis mutica
San Joaquin kit fox (E)

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.

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 December 09, 2014.