TECHNICAL STUDIES

1. **Air Quality**
2. **Biological Resources**
3. **Cultural Resources**
4. **Noise**
5. **Traffic**

1. AIR QUALITY
CALEEMOD EMISSION OUTPUT SHEETS FOR THE OTAY RIVER RESTORATION PROJECT

Otay River Restoration

San Diego County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Recreational	100.00	User Defined Unit	100.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2016
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Per PD

Construction Phase - Per Tanya Jones (personal communication)

Off-road Equipment - Per Tanya Jones

Off-road Equipment - Per Tanya Jones

Grading - Per Tanya Jones

Trips and VMT - Per Tanya Jones

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	100.00	21.00
tblConstructionPhase	NumDays	155.00	40.00
tblConstructionPhase	PhaseStartDate	1/30/2016	2/1/2016
tblGrading	AcresOfGrading	0.00	100.00

tblGrading	MaterialExported	0.00	50,000.00
tblLandUse	LotAcreage	0.00	100.00
tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblProjectCharacteristics	OperationalYear	2014	2016
tblTripsAndVMT	HaulingTripNumber	6,250.00	0.00
tblTripsAndVMT	WorkerTripNumber	3.00	20.00
tblTripsAndVMT	WorkerTripNumber	13.00	12.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

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	lb/day										lb/day					
2016	3.7464	40.5004	25.1421	0.0413	8.9476	1.8328	10.7803	3.6493	1.7132	5.3625	0.0000	4,203.8269	4,203.8269	1.1109	0.0000	4,227.1555

Total	**3.7464**	**40.5004**	**25.1421**	**0.0413**	**8.9476**	**1.8328**	**10.7803**	**3.6493**	**1.7132**	**5.3625**	**0.0000**	**4,203.8269**	**4,203.8269**	**1.1109**	**0.0000**	**4,227.1555**

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	lb/day										lb/day					
2016	3.7464	40.5004	25.1421	0.0413	8.9476	1.8328	10.7803	3.6493	1.7132	5.3625	0.0000	4,203.8269	4,203.8269	1.1109	0.0000	4,227.1555
Total	**3.7464**	**40.5004**	**25.1421**	**0.0413**	**8.9476**	**1.8328**	**10.7803**	**3.6493**	**1.7132**	**5.3625**	**0.0000**	**4,203.8269**	**4,203.8269**	**1.1109**	**0.0000**	**4,227.1555**

	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	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

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	lb/day										lb/day					
Area	1.0200e-003	1.0000e-004	0.0105	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0219	0.0219	6.0000e-005		0.0232
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
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
Total	**1.0200e-003**	**1.0000e-004**	**0.0105**	**0.0000**	**0.0000**	**4.0000e-005**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**4.0000e-005**		**0.0219**	**0.0219**	**6.0000e-005**	**0.0000**	**0.0232**

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	lb/day										lb/day					
Area	1.0200e-003	1.0000e-004	0.0105	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0219	0.0219	6.0000e-005		0.0232
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
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
Total	**1.0200e-003**	**1.0000e-004**	**0.0105**	**0.0000**	**0.0000**	**4.0000e-005**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**4.0000e-005**		**0.0219**	**0.0219**	**6.0000e-005**	**0.0000**	**0.0232**

	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	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2016	1/29/2016	5	21	
2	Grading	Grading	2/1/2016	3/25/2016	5	40	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 100

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	0	0.00	81	0.73
Demolition	Excavators	0	0.00	162	0.38
Demolition	Rubber Tired Dozers	0	0.00	255	0.40
Demolition	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Excavators	1	8.00	162	0.38
Grading	Graders	0	0.00	174	0.41
Grading	Off-Highway Trucks	1	8.00	400	0.38
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Grading	Rubber Tired Loaders	1	8.00	199	0.36
Grading	Scrapers	0	0.00	361	0.48
Grading	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Grading	Generator Sets	1	8.00	84	0.74

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
Demolition	1	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	5	12.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2016

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	lb/day										lb/day					
Off-Road	0.3406	3.2551	2.4126	3.1100e-003		0.2506	0.2506		0.2306	0.2306		323.6773	323.6773	0.0976		325.7276

Total	**0.3406**	**3.2551**	**2.4126**	**3.1100e-003**		**0.2506**	**0.2506**		**0.2306**	**0.2306**		**323.6773**	**323.6773**	**0.0976**		**325.7276**

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	lb/day										lb/day					
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
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
Worker	0.0699	0.0820	0.8948	2.0800e-003	0.1643	1.2300e-003	0.1655	0.0436	1.1300e-003	0.0447		173.7064	173.7064	8.7000e-003		173.8892
Total	**0.0699**	**0.0820**	**0.8948**	**2.0800e-003**	**0.1643**	**1.2300e-003**	**0.1655**	**0.0436**	**1.1300e-003**	**0.0447**		**173.7064**	**173.7064**	**8.7000e-003**		**173.8892**

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	lb/day										lb/day					
Off-Road	0.3406	3.2551	2.4126	3.1100e-003		0.2506	0.2506		0.2306	0.2306	0.0000	323.6773	323.6773	0.0976		325.7276
Total	**0.3406**	**3.2551**	**2.4126**	**3.1100e-003**		**0.2506**	**0.2506**		**0.2306**	**0.2306**	**0.0000**	**323.6773**	**323.6773**	**0.0976**		**325.7276**

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	lb/day										lb/day					
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
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
Worker	0.0699	0.0820	0.8948	2.0800e-003	0.1643	1.2300e-003	0.1655	0.0436	1.1300e-003	0.0447		173.7064	173.7064	8.7000e-003		173.8892
Total	**0.0699**	**0.0820**	**0.8948**	**2.0800e-003**	**0.1643**	**1.2300e-003**	**0.1655**	**0.0436**	**1.1300e-003**	**0.0447**		**173.7064**	**173.7064**	**8.7000e-003**		**173.8892**

3.3 Grading - 2016

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	lb/day										lb/day					
Fugitive Dust					8.8490	0.0000	8.8490	3.6231	0.0000	3.6231			0.0000			0.0000
Off-Road	3.7044	40.4512	24.6052	0.0400		1.8320	1.8320		1.7126	1.7126		4,099.6031	4,099.6031	1.1057		4,122.8220
Total	**3.7044**	**40.4512**	**24.6052**	**0.0400**	**8.8490**	**1.8320**	**10.6810**	**3.6231**	**1.7126**	**5.3357**		**4,099.6031**	**4,099.6031**	**1.1057**		**4,122.8220**

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	lb/day										lb/day					
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

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
Worker	0.0420	0.0492	0.5369	1.2500e-003	0.0986	7.4000e-004	0.0993	0.0262	6.8000e-004	0.0268		104.2238	104.2238	5.2200e-003		104.3335
Total	**0.0420**	**0.0492**	**0.5369**	**1.2500e-003**	**0.0986**	**7.4000e-004**	**0.0993**	**0.0262**	**6.8000e-004**	**0.0268**		**104.2238**	**104.2238**	**5.2200e-003**		**104.3335**

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	lb/day										lb/day					
Fugitive Dust					8.8490	0.0000	8.8490	3.6231	0.0000	3.6231			0.0000			0.0000
Off-Road	3.7044	40.4512	24.6052	0.0400		1.8320	1.8320		1.7126	1.7126	0.0000	4,099.6031	4,099.6031	1.1057		4,122.8220
Total	**3.7044**	**40.4512**	**24.6052**	**0.0400**	**8.8490**	**1.8320**	**10.6810**	**3.6231**	**1.7126**	**5.3357**	**0.0000**	**4,099.6031**	**4,099.6031**	**1.1057**		**4,122.8220**

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	lb/day										lb/day					
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
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
Worker	0.0420	0.0492	0.5369	1.2500e-003	0.0986	7.4000e-004	0.0993	0.0262	6.8000e-004	0.0268		104.2238	104.2238	5.2200e-003		104.3335
Total	**0.0420**	**0.0492**	**0.5369**	**1.2500e-003**	**0.0986**	**7.4000e-004**	**0.0993**	**0.0262**	**6.8000e-004**	**0.0268**		**104.2238**	**104.2238**	**5.2200e-003**		**104.3335**

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	lb/day										lb/day					
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
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

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Recreational	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-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Recreational	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.510118	0.073510	0.192396	0.133166	0.036737	0.005265	0.012605	0.021642	0.001847	0.002083	0.006548	0.000610	0.003471

5.0 Energy Detail

4.4 Fleet Mix

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	lb/day										lb/day					
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
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

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	lb/day										lb/day					
User Defined Recreational	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
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**

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	lb/day										lb/day					
User Defined Recreational	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

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**

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	lb/day										lb/day					
Mitigated	1.0200e-003	1.0000e-004	0.0105	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0219	0.0219	6.0000e-005		0.0232
Unmitigated	1.0200e-003	1.0000e-004	0.0105	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0219	0.0219	6.0000e-005		0.0232

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	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0200e-003	1.0000e-004	0.0105	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0219	0.0219	6.0000e-005		0.0232
Total	**1.0200e-003**	**1.0000e-004**	**0.0105**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**		**0.0219**	**0.0219**	**6.0000e-005**		**0.0232**

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	lb/day										lb/day					
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0200e-003	1.0000e-004	0.0105	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0219	0.0219	6.0000e-005		0.0232
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0200e-003**	**1.0000e-004**	**0.0105**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**		**0.0219**	**0.0219**	**6.0000e-005**		**0.0232**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Vegetation

Total Phase 1 Emissions (lbs/day)

ROG	NOx	CO	SOx	PM10	PM2.5	CO2	CH4	N2O	CO2e			
0.4105	3.3371	3.3074	0.00519	0.4161	0.2753	497.3837	0.1063	0	500.3601			
									1 lb =	0.000454	MT	1 week = 4 days
						0.225609	4.82E-05	0	0.226959	MT/day		
						3.609748	0.000771	0	3.631349	MT for 4 weeks (16 days)		

Total Phase 2 Emissions (lbs/day)

ROG	NOx	CO	SOx	PM10	PM2.5	CO2	CH4	N2O	CO2e			
3.7464	40.5004	25.1421	0.04125	10.7803	5.3625	4203.827	1.11092	0	4234.933			
									1 lb =	0.000454	MT	1 week = 4 days
						1.906822	0.000504	0	1.920932	MT/day		
						45.76373	0.012094	0	46.10236	MT for 6 weeks (24 days)		

Phase 1 + Phase 2 Emissions (lbs/day)

ROG	NOx	CO	SOx	PM10	PM2.5	CO2	CH4	N2O	CO2e			
4.1569	43.8375	28.4495	0.04644	11.1964	5.6378	4701.211	1.21722	0	4735.293			
									1 lb =	0.000454	MT	1 week = 4 days
						2.132432	0.000552	0	2.147891	MT/day		
						85.29726	0.022085	0	85.91564	MT for 10 weeks (40 days)		

Total Phase 3 Emissions (lbs/day)

ROG	NOx	CO	SOx	PM10	PM2.5	CO2	CH4	N2O	CO2e			
3.7464	40.5004	25.1421	0.04125	10.7803	5.3625	4203.827	1.11092	0	4234.933			
									1 lb =	0.000454	MT	1 week = 4 days
						1.906822	0.000504	0	1.920932	MT/day		
						61.01831	0.016125	0	61.46981	MT for 8 weeks (32 days)		
						146.3156	**0.03821**	**0**	**147.3854**	**Total Project Emissions (MT)**		
						4.877186	**0.001274**	**0**	**4.912848**	**Total Amortized Emissions (MT/yr) Over 30 Year Period**		

2. BIOLOGICAL RESOURCES

BIOLOGICAL RESOURCES REPORT, OTAY RIVER RESTORATION PROJECT; CITY OF CHULA VISTA MITIGATION PARCEL, SAN DIEGO COUNTY, CALIFORNIA

OTAY RIVER RESTORATION PROJECT BIOLOGICAL RESOURCES REPORT

PREPARED FOR:

Otay Land Company, LLC
1903 Wright Place, Suite 220
Carlsbad, CA 92008

PREPARED BY:

ICF International
525 B Street, Suite 1700
San Diego, CA 92101
Contact: Michelle Mattson
michelle.mattson@icfi.com
(858) 444-3928

March 2016

ICF International. 2016. Otay River Restoration Project. Biological resources Report. March. (ICF 00296.14 and ICF 526.15) San Diego, CA. Prepared for Otay Land Company, LLC, Carlsbad, CA.

Contents

Appendices

Tables

Table **Page**

Acronyms and Abbreviations

BMO	Biological Mitigation Ordinance
BMPs	Best Management Practices
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
City	City of Chula Vista
CNDDB	California Natural Diversity Data Base
CNPS	California Native Plant Society's
CRPR	California Rare Plant Ranking
FESA	Federal Endangered Species Act
FR	*Federal Register*
G	zoning designation for a Sensitive Resource
GDP	General Development Plan
GIS	geographic information systems
GPS	global positioning system
HCP	Habitat Conservation Plan
HLIT	Habitat Loss and Incidental Take Ordinance
HMMP	Habitat Mitigation and Monitoring Plan
HMP	Habitat Management Plan
MBTA	Migratory Bird Treaty Act
MSCP	Multiple Species Conservation Program
NCCP	Natural Communities Conservation Planning
OHWM	ordinary high water mark
ORWMP	Otay River Watershed Management Plan
OVRP	Otay Valley Regional Park
OWD	Otay Water District
PCEs	Primary Constituent Elements
POM	Preserve Owner/Manager
R	zoning designation for Coastal Resource Protection Area
RCA	Resource Conservation Areas
RMP	Resource Management Plant
RWQCB	Regional Water Quality Control Board
SAMP	Special Area Management Plan
SDG&E	San Diego Gas and Electric
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

V	Vernal Pool Area
V3	Village 3
V8W	Village 8 West

Summary

The proposed Otay River Restoration Project is a multi-phased project that will satisfy the mitigation requirements for the Otay Villages Projects, the University Project, and the Otay Valley Regional Park. The ultimate goal of this project is to restore the Otay River and surrounding communities into an ecologically functional, self-sustaining wetland that is resilient to a range of natural disturbances (drought, flood, etc.). The project area includes approximately 317 acres of land spanning nine separate parcels owned by the City of Chula Vista, City of San Diego, County of San Diego, and the United States of America.

Impacts associated with this restoration project are focused on two restoration activities: habitat restoration (enhancement and rehabilitation) and grading (establishment and reestablishment). All impacts are considered to be temporary because the project is a restoration activity, and any impacts will be restored with native vegetation and will ultimately lead to a net gain in viable habitat, native plant communities, and overall improved river conditions. Habitat restoration will involve invasive vegetation removal followed by re-establishment of native vegetation communities. Enhancement and rehabilitation activities will generate little to no ground disturbance, and invasive plant species removal will target select species of plants in order to minimize potential impacts on native and sensitive species. Grading activities will involve considerable ground disturbance, with the ultimate goal of redefining the channel and other hydrologic features along the Otay River. Prior to grading activities, biologists will conduct preconstruction surveys to identify sensitive species and environmentally sensitive areas within the limits of grading. Sensitive plant and wildlife species identified within the limits of grading and habitat restoration areas will be avoided when possible. Additionally, seeds from sensitive plant species found within each area will be collected to further minimize potential negative impacts on the sensitive plant community. All work for this restoration project will be performed outside of the migratory bird nesting season (February 15–September 15) in order to prevent impacts on nesting birds.

Suitable habitat for special-status plant species occurs within the project area. Special-status plant species have been observed or have a high potential to occur within the project area. Appendix D provides a list of those species. Potentially significant impacts on these species could result from the temporary impacts on habitat through grading activities. These temporary impacts would be adequately avoided through project design discussed herein. Suitable habitat for special-status wildlife species occurs within the project area. Special-status wildlife species have been observed or have a high potential to occur within the project area. Appendix E provides a list of those species. Potentially significant impacts on these species could result from the temporary impacts on habitat through grading activities. These temporary impacts would be adequately avoided through project design discussed herein.

The project will temporarily impact potentially jurisdictional features including U.S. Army Corps of Engineers (USACE) jurisdictional non-wetland waters of the U.S., Regional Water Quality Control Board (RWQCB) waters of the State, and California Department of Fish and Wildlife (CDFW) jurisdictional state streambed and riparian habitat. Temporary impacts on 0.01 acre of waters of the U.S. and state streambed will be restored on site. Temporary impacts on 0.25 acre of jurisdictional riparian habitat will be restored on site with the revegetation of 0.37 acre of oak riparian woodland/southern willow scrub habitat.

The project is a restoration project that will ultimately increase and enhance suitable sensitive habitats and habitat for special-status plant and wildlife species. Project design will avoid potentially significant impacts on biological resources under the California Environmental Quality Act.

Chapter 1
Introduction

1.1 Purpose of the Project

The Otay River Restoration Project is a component of the Habitat Mitigation and Monitoring Plan (HMMP) (ICF 2016) and is intended for use as compensatory mitigation for unavoidable impacts on jurisdictional waters of the U.S., waters of the State, and associated habitats due to the implementation of the Otay Ranch University Villages. This biological resources report describes the biological resources present or potentially present in the proposed Otay River Restoration project area (Appendix A, Figure 1); identifies biological resource impacts resulting from the proposed project; and recommends measures to avoid, minimize, and mitigate significant impacts consistent with federal, state, and local regulations. This report provides the Otay Land Company, City of Chula Vista, resource agencies, and the public with current biological data to satisfy review of the project under California Environmental Quality Act (CEQA) and other federal, state, and local regulations. This report also includes a review of literature sources and the results of general surveys conducted on site.

1.2 Project Location and Description

The proposed Otay River Restoration Project is primarily located in the City of Chula Vista (City) and within the Otay River Watershed, and is located on the U.S. Geological Survey (USGS) 7.5' series Otay Mesa Quadrangle (Appendix A, Figure 2). The project area consists of nine parcels owned by four entities: the City of Chula Vista, County of San Diego, the United States of America Public Domain, and the City of San Diego (Appendix A, Figure 3). The project study area is divided into two discrete work areas, the mitigation parcel (City of Chula Vista) and the upstream enhancement area. The primary restoration project will be occurring in the mitigation parcel while a singular treatment season of invasive plant species will occur in the upstream enhancement area. The project is also divided into three distinct components: Phase 1, Phase 2, and future phases. Phase 1 includes the singular treatment of the upstream enhancement area as well as the initial treatment of the Phase 2 work area within the mitigation parcel. Phase 2 takes place solely in the mitigation parcel and focuses on the compensatory mitigation for Village 8 and Village 3. Future phases will address the needs of additional Otay Villages as well as other projects requiring compensatory mitigation. These components and the objectives of each are described further below.

Table 1. Project Area Ownership Parcels

Parcel Number	Owner	Project Components
64409004	City of Chula Vista (Mitigation Parcel)	Phase 1 (Habitat Enhancement), Phase 2 (River Restoration), Future Phases
64713003	City of Chula Vista	Phase 1 Upstream Enhancement
644100019	County of San Diego	Phase 1 Upstream Enhancement
64713001	City of San Diego	Phase 1 Upstream Enhancement

Parcel Number	Owner	Project Components
64713002	City of San Diego	Phase 1 Upstream Enhancement
64713010	City of San Diego	Phase 1 Upstream Enhancement
64713012	United States of America Public Domain	Phase 1 Upstream Enhancement
64713008	County of San Diego	Phase 1 Upstream Enhancement
64713007	City of San Diego	Phase 1 Upstream Enhancement

The mainstem and floodplain within the City parcel were highly disturbed by a record flood event in 1916, which resulted in the failure of the original Savage Dam (an earthen and steel structure) and left a substantial amount of sediment and debris in the broad floodplain. The dam was reconstructed in 1918 and has remained intact since. The deposited flood material was subsequently mined for sand and gravel over several decades, continuing until approximately the mid-1980s. The flood of 1916, deposition and intensive harvesting of alluvium material, as well as the presence of the dam itself have substantially altered the natural topography and hydrologic and sediment transport functions of the Otay River within the project area. In particular, the mainstem was filled and manipulated to the point of being nonexistent, with surface flows dissipating and water flowing down-gradient from east to west as shallow groundwater through much of the project area. Similarly the floodplain has been manipulated, with much of the area characterized by artificial mounding from mine tailings. The disturbed hydrology and topography of the site are further exacerbated by the presence of dense stands of an invasive nonnative tree, tamarisk or salt cedar (*Tamarix* spp.) and other invasive species such as arundo (*Arundo donax*) and Peruvian pepper tree (*Schinus molle*). These species provide a significant nonnative seed source to downstream habitats.

The restoration project is proposed within the nearby Otay River Valley, specifically within the Otay River mainstem approximately 1 mile below Savage Dam (Appendix A, Figure 4). The project covers the uppermost reach of the Lower Otay River Watershed and provides an ideal opportunity for restoration. The proposed project includes the design for approximately 100 acres of channel, floodplain, and buffer reestablishment within the approximately 300-acre City of Chula Vista parcel (Assessor's Parcel Number 6440900400), as well as enhancement (removal of invasive species). This project is in line with the restoration recommendations described in the Otay River Watershed Management Plan (ORWMP) (Aspen 2007), which was completed in partnership with the County of San Diego, City of Chula Vista, City of San Diego, U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), California Department of Fish and Wildlife (CDFW), and community stakeholders. The ORWMP provides an evaluation of the baseline conditions of the Upper and Lower Otay River Watershed and recommendations for Best Management Practices (BMPs) and restoration opportunities based on five key goals identified by the ORWMP stakeholders.

The Otay River Restoration Project goal is to restore native habitats and the hydrological and geomorphological conditions in the Otay River Valley on the City of Chula Vista parcel. To protect the restoration project, there will also be a singular treatment of invasive species immediately upstream of the mitigation parcel, which will occur on City of San Diego, County of San Diego, and potentially one federal parcel. The project area includes the mitigation parcel and the upstream enhancement area northeast of the mitigation parcel (Appendix A, Figure 4). This project will be implemented as a multi-phase restoration project that will fulfill the mitigation requirements for the Village 8 West (V8W) and Village 3 (V3) and provide advance permittee responsible mitigation for the Otay Village Projects, the University Project, and the Otay Valley Regional Park. The consecutive

phases are described below and shown in Appendix A, Figure 5. The conceptual plan for the restoration project site is presented in Appendix A, Figure 6. In addition to the phases, a series of "optional" upland enhancement areas have been identified outside of the proposed restoration project boundary within the City of Chula Vista parcel. These areas are not considered part of the proposed restoration project, rather they show future opportunities within the preserve.

As mentioned above, the approximately 100-acre restoration site and the larger 300-acre mitigation parcel are owned by the City of Chula Vista. A portion of the parcel is within the City of Chula Vista Greenbelt Master Plan boundaries and entirely within the Otay Valley Regional Park (OVRP) Concept Plan boundaries. Both of these plans identify future multi-use trails where the existing dirt roads and unofficial trails are currently located. These existing dirt roads are used for a variety of purposes by the U.S. Border Patrol, San Diego Gas and Electric (SDG&E), City of San Diego, and the Otay Water District (OWD), as well as by hikers, cyclists, and equestrians. To prevent the restoration site from being disturbed by existing and future users, wood split-rail fencing would be installed at key locations. The fencing, along with signage indicating the general sensitivity of the restoration site and providing wayfinding, would help to minimize trespassing from trail users who would otherwise be unaware of the sensitivity of the habitat restoration area. The existing roads and trails may be moved slightly to accommodate the 14-foot-wide pathway and installation of the fencing and signage while also avoiding road ponds that support the San Diego fairy shrimp. Only disturbed areas would be used to designate the narrow trail corridor or pathway. In addition, educational kiosks would be installed at key viewing locations within the disturbed areas to help inform the readers of the importance of the restoration site. Additional improvements that are not part of the proposed project and that may occur at a future date under the OVRP Concept Plan and Greenbelt Master Plan could be developed with subsequent environmental review, if necessary, and would not be precluded as a result of implementation of the proposed restoration project.

Phase 1 Objectives (Invasive Species Removal/Enhancement):

City of San Diego and County of San Diego Parcels – Upstream Enhancement Area

- Enhance 6,000 feet of existing channel upstream of the main mitigation parcel, by treating approximately 2.74 acres of riparian habitat in the upstream Otay River mainstem immediately below the Savage Dam (Appendix A, Figure 5). The proposed enhancement areas are disturbed riparian areas whose natural habitat functions and services have been compromised and degraded due to the abundance of invasive trees and plants and the presence of Savage Dam. The proposed enhancement areas generally contain areas heavily infested and/or disturbed by tamarisk, giant reed (*Arundo donax*), pepper trees (*Schinus* spp.), eucalyptus (*Eucalyptus* spp.), and Canary Island date palms (*Phoenix canariensis*), as well as several other nonnative species. This is a one-time effort to protect the restoration project downstream and will occur over the course of a single season. No subsequent work or maintenance is proposed in the upstream enhancement area.

City of Chula Vista Parcel – Mitigation Parcel

- Complete initial removal of invasive species within the Phase 2 boundary (approximately 14 acres) and a 100-foot buffer within the mitigation parcel with a focus on dense stands of tamarisk covering.
- Complete treatment of all large woody trees within the mitigation parcel including eucalyptus and Brazilian pepper trees (*Schinus terebinthifolia*), as well as date and fan palms. Leave on site to degrade and be incorporated as organic material and structure in future grading.

Phase 2 Objectives (Restoration/Re-Establishment of Otay River Mainstem For V3 and V8W):

City of Chula Vista Parcel – Mitigation Parcel

- Re-establish approximately 2,300 linear feet of the intermittent Otay River mainstem at the upstream portion of the mitigation parcel that was not returned to natural conditions following the departure of sand-mining operations. The grading will remove flow obstructions, including berms, rows of cobble piles, and sediment and spoil piles, and will recreate the contours of the Otay River mainstem and the east tributary connection, connect existing low-lying pooling areas, and create floodplains. These actions will improve flow conditions during rain events and hydrological conditions for native plants and will include an upland Diegan Coastal Sage Scrub buffer of approximately 100 feet.
- Re-establish approximately 13.5 acres of floodplain habitat including the mainstem by removing structures such as berms, and rows of cobble piles and sediment and spoil piles that impede flow, and by removing and managing invasive species. This area within the plan boundary currently supports a large, nearly monotypic stand of tamarisk. The tamarisk and other nonnative vegetation will be removed, the natural floodplain contours that were corrupted by mining activities will be recreated, and native plants will be installed following invasive plant removal and regrading.
- Re-establish a river and floodplain cross-section at the two identified crossings to allow for adequate vehicular and foot traffic for U.S. Border Patrol, SDG&E, OWD, and future trail users that minimizes artificial deepening and maintenance and avoids the creation of berms that impound water upstream.
- Establish the easternmost seasonal pond in the north high floodplain totaling approximately 0.5 acre. The remaining ponds will be created in future phases. These ponds will create a unique niche habitat and increase the overall complexity of the site and the ecological services available.
- Protect existing and proposed native riparian habitat by focusing users (i.e., Border Patrol) to key access roads and closing others permanently. One permanent at-grade channel crossing will be created using rock and other natural hard material at the upstream end of the project.
- Rehabilitate approximately 4 acres of upland transitional habitat in the northern portion of the site through recontouring, revegetation, and removal of nonnative species. This habitat serves as a buffer to the restored riverine system and provides foraging and breeding habitat for many species and refugia for riparian species during high flood events.
- Establish OVRP Concept Plan and City of Chula Vista Greenbelt Master Plan trail corridors to minimize the potential impacts on the restoration area from existing and potential future uses. These trail corridors will be identified and approximate road/trail alignments established within the existing disturbed roads or other adjacent disturbed habitat to avoid impacts on all road ponds that support San Diego fairy shrimp. Split-rail fencing, trail signage, and educational kiosks will be installed to keep users on the trails and outside of the restoration area.

Future Phase(s) Objectives:

City of Chula Vista Parcel – Mitigation Parcel

- Re-establish approximately 3,000 linear feet of the intermittent Otay River mainstem connecting the upstream portion of the mitigation parcel and the existing channel downstream. The grading will remove flow obstructions including berms, rows of cobble piles, and sediment and spoil

piles, and will recreate the contours of the Otay River mainstem, connect existing low-lying pooling areas, and create floodplains. These actions will improve flow conditions during rain events and hydrological conditions for native plants and will include an upland Diegan Coastal Sage Scrub buffer of approximately 100 feet.

- Enhance and establish the remaining seasonal ponds in the north high floodplain totaling approximately 1.4 acres. Three existing ponds would be recontoured and up to five new ponds created to form a wetland resource that is available well into the dry season, as it is dependent on groundwater elevations. These ponds create a unique niche habitat and increase the overall complexity of the site and the ecological services available.
- Re-establish a small 1,500 linear feet (1.4 acres) of secondary ephemeral channel along the northern high floodplain. This will improve flow conditions during rain events and create hydrologic flow complexity, as well as habitat complexity.
- Re-establish approximately 2,900 linear feet (2.6 acres) of an ephemeral secondary channel within the southern portion of the floodplain. This will improve flow conditions during rain events and create hydrologic flow complexity, as well as habitat complexity.
- Re-establish approximately 800 linear feet of the west tributary to connect with the re-established floodplain and secondary channels. This tributary currently is cut off by access roads and filled.
- Re-establish approximately 970 linear feet of the east tributary with the re-established floodplain and secondary channels. This tributary currently is cut off by access roads and filled.
- Re-establish approximately 28 acres of outer floodplain in the northern and southern portion of the site that, under current hydrologic conditions, function as alluvial fan habitat. The plan will remove berms, spoil piles, and numerous nonnative trees including pepper trees, eucalyptus, and tamarisk. The recontoured outer floodplain will improve hydrological flow and hydrological conditions. This rehabilitation will also include regrading the outer floodplain that was not returned to natural conditions following the departure of sand-mining operations. Rehabilitation of this area will include installation of native riparian plants following invasive plant removal and regrading.
- Rehabilitate approximately 31 acres of upland transitional habitat in the northern and southern portion of the site through recontouring, revegetation, and removal of nonnative species. This habitat serves as a buffer to the restored riverine system and provides foraging and breeding habitat for many species and refugia for riparian species during high flood events.
- The mitigation parcel is within a portion of the City of Chula Vista Greenbelt Master Plan boundaries and entirely within the OVRP Concept Plan boundaries. Both of these plans identify future multi-use trails where existing dirt roads are currently located within the mitigation parcel (Appendix A, Figures 7 and 8). There are approximately 6,500 linear feet of the future Greenbelt Master Plan trail and approximately 10,200 linear feet of OVRP trails that occur within the mitigation parcel. The proposed project would improve approximately 13,500 linear feet of existing dirt roadways with fencing, signs, and kiosks; improve approximately 1,600 linear feet of road crossings in the active floodplain; and close approximately 4,500 linear feet of existing dirt roads. Additional improvements that are not part of this proposed project and that may occur at a future date under the OVRP Concept Plan could be developed with additional environmental documentation and would not be precluded as a result of implementation of the

proposed project. All proposed improvements would be implemented in compliance with the City of Chula Vista Greenbelt Master Plan and the OVRP Concept Plan.

1.2.1 Project Design Avoidance and Minimization Features

The proposed project is a habitat restoration project that will ultimately restore and enhance habitat for special-status plant and wildlife species. The following measures will be incorporated into the project design.

BIO-1. Biological Awareness Training

Prior to initiation of grading activities, biological resource awareness training will be provided by a qualified biologist to all construction personnel. The training will include information regarding sensitive species with the potential to occur at the site as well as minimization and avoidance measures to reduce potential indirect effects on the habitat. A log of personnel who have completed the training and a copy of the training report/outline (including sensitive species photos, targeted invasive plant species, and descriptions of the measures discussed in the training session) will be maintained at the construction office.

BIO-2. Temporary Fence and Access

Prior to the initiation of grading activities, the limits of grading will be clearly marked by well-installed temporary fencing that is prominently colored. The fence will be installed by the construction contractor. The fence will remain in place during all grading activities. During grading and restoration activities, access for agency needs (U.S. Border Patrol, SDG&E, OWD, City of Chula Vista, etc.) will be maintained by installing detours and signage directing traffic to passable roads within the project site.

BIO-3. Biological Monitor

A qualified biological monitor will be on site during vegetation clearing activities to ensure that grading activities occur within designated areas. The monitor will also ensure that any special-status species that becomes entrapped within the grading limits is moved away from construction equipment. The biological monitor will also periodically inspect the limits of disturbance fence to ensure that it is in good condition. Any parts of the fence that need to attention will be brought to the contractor's attention to be fixed immediately.

BIO-4. Best Management Practices

BMPs will be implemented during all grading activities to reduce potential indirect effects on sensitive species and habitat. BMPs will include the following.

- All trash will be properly stored.
- Vehicles and equipment will be stored only on pre-designated staging areas in disturbed or developed areas.
- All maintenance of vehicles and equipment will be conducted in a manner so that oils and other hazardous materials will not discharge into the Otay River, or into riparian habitat areas (including Freshwater and Freshwater Marsh).
- Dust control measures will be implemented to minimize the settling of dust on vegetation.

- Appropriate firefighting equipment (e.g., extinguishers, shovels, water tankers) will be available on the site during all phases of project construction, and appropriate fire prevention measures will be taken to help minimize the chance of human-caused wildfires.
- All construction will be performed between dawn and dusk to the degree feasible to minimize potential indirect effects (e.g., increased depredation) on the species beyond the limits of disturbance.

BIO-5. Special-Status and Succulent Plant Salvage Plan

During grading and restoration activities, special-status and succulent plant species should be avoided where feasible. Salvage and relocation of target species to adjacent areas will be implemented for unavoidable impacts. Target species include the special-status plant species detected within the restoration project boundary: singlewhorl burrobush (*Ambrosia monogyra*), San Diego sunflower (*Bahiopsis laciniata*), San Diego barrel cactus (*Ferocactus viridescens*), Palmer's grapplinghook (*Harpagonella palmeri*), Tecate cypress (*Hesperocyparis forbesii*), decumbent goldenbush (*Isocoma menziesii* var. *decumbens*), San Diego marsh-elder (*Iva hayesiana*), southwestern spiny rush (*Juncus acutus* ssp*. leopoldii*), small-flowered microseris (*Microseris douglasii* ssp*. platycarpha*), blue streamwort (*Stemodia durantifolia*), and San Diego needlegrass (*Stipa diegoensis*).

A special-status plant and succulent salvage plan will be prepared for the areas of grading and habitat restoration. The plan will be prepared and implemented prior to grading and restoration activities. The plan will include a special-status and succulent plant target species list, seed collection, succulent plant salvage, and transplanting methods.

BIO-6. Nesting Birds

To avoid any direct impacts on nesting coastal California gnatcatchers (*Polioptila californica californica*), least Bell's vireo (*Vireo bellii pusillus*), western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), raptors, or other birds protected under the Migratory Bird Treaty Act (MBTA), removal of habitat, including the removal of any riparian woodland, upland vegetation, and eucalyptus trees that may support active nests on the proposed area of disturbance will occur outside of the breeding season when feasible. The breeding season is defined as February 15–September 15. If work must be conducted during the breeding season, including trail improvement work, nesting bird surveys would need to be completed in order to clear the area or locate active nests for avoidance. Adequate avoidance buffers would be established around any active nests and coordinated with the wildlife agencies.

BIO-7. Vernal Pool–Dependent Species

The San Diego Mesa vernal pool complex located in the northeastern corner of the property is outside of the restoration boundary and will be completely avoided. To avoid all other potential fairy shrimp habitat areas and potential impacts on San Diego fairy shrimp (*Branchinecta sandiegonensis*), other ponding features such as road ruts will be fenced and avoided by all restoration activities including truck traffic and storage. Construction access routes will be rerouted to avoid these ponding features. These new routes will replace existing roads/trails to avoid future impacts associated with vehicular and recreational use. The uplands surrounding the ponds will be restored with native species. Wood split-rail fencing, boulders, and signage

will be used to inform the public of the sensitivity of the area and deter them from trespassing into the ponded areas and river restoration project.

BIO-8. Public Access, Trails, and Recreation

To deter trespassing into the restoration site, wood split-rail fencing will be installed along existing trails and roads that border the restoration site including select OVRP and City of Chula Vista Green Belt trails. Other barriers (boulders, brush piles, logs, and plantings) will be placed at strategic locations when protection of sensitive resources is required where fencing is not present. Additionally, signage and informational kiosks will be installed for educational purposes and to inform the public of the sensitivity of the restoration site and adjacent habitats. All installation activities (signage, fencing, kiosks) will occur outside of the breeding season.

1.3 Survey Methodology

Data regarding biological resources present or potentially present within the project area were obtained through a review of pertinent literature, field reconnaissance, and mapping. Methods are described below.

1.3.1 Literature and Records Search

A literature and records search was conducted to establish the existence or potential occurrence of sensitive, biological resources (i.e., plant or animal species) on or within the vicinity of the project study area. The following sources were reviewed.

- California Natural Diversity Data Base (CNDDB), which is administered by the CDFW Biogeographic Data Division. This database covers sensitive animal and plant species, as well as sensitive natural communities that occur within California (CDFW 2015). A search of the database was conducted within a 1-mile radius of the project area centered on the Otay Mesa USGS 7.5' Quadrangle.
- The California Native Plant Society's (CNPS) Online Inventory of Rare and Endangered Plants, 8th Edition (CNPS 2015), which identifies four specific designations (California Rare Plant Ranking [CRPR]) of sensitive plant species and summarizes regulations that provide for the conservation of sensitive plants. A search of the inventory was conducted within a 1-mile radius of the project area centered on the Otay Mesa USGS 7.5' Quadrangle.
- RECON Environmental, Inc. biological survey data and monitoring reports for the Otay Ranch Preserve (RECON 2011, 2012, 2013, 2014).
- *Biological Technical Report for the Otay Ranch University Village Project* (Dudek 2014).

1.3.2 Field Surveys and Wetland Delineation

Field surveys were conducted annually by RECON Environmental, Inc. biologists from 2009 to 2013, to determine the general biological resources within the mitigation parcel. Surveys by RECON did not include the upstream enhancement area.

ICF International biologists conducted vegetation mapping of the entire project study area in October 2014 and performed a wetland delineation within the mitigation parcel on November 12–

13, 2014. Wetland delineation follows methods described in the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987) and the *Arid West Regional Supplement* (USACE 2008a).

These surveys were conducted on foot and included a general flora and fauna inventory of the project site. Aerial photographs, topographic maps of the project site, global positioning system (GPS) hardware, and geographic information systems (GIS) software were used for orientation and mapping. Photographs were taken to document the site status at the time of the field surveys.

Wetlands are potentially subject to the jurisdiction of the USACE and the CDFW pursuant to Section 1600 et seq. of the California Fish and Game Code, and the RWQCB pursuant to Section 404 of the Clean Water Act.

1.4 Environmental Setting (Existing Conditions)

1.4.1 Regional Context

The proposed project lies within the 100% Conservation area of the City of Chula Vista Multiple Species Conservation Program (MSCP) Subarea Plan, the City of Chula Vista General Plan, the Otay Ranch General Development and Resource Management Plan, the County of San Diego MSCP, Otay River Watershed Management Plan, the Draft Otay River Watershed Special Area Management Plan, City of Chula Vista Greenbelt Master Plan, and the OVRP Concept Plan and Trails Guidelines. The project area is located approximately 1 mile downstream from Lower Otay Lake on the Otay Ranch Preserve.

Soils present within the study area include Olivenhain cobbly loam, Huerhuero loam, Visalia gravely sandy loam, Riverwash, San Miguel-Exchequer rocky silt loams, and Terrace escarpments (Bowman 1973; NRCS 2015).

1.4.2 Vegetation Communities and Land Cover Types

In October 2014, ICF biologists conducted vegetation mapping of the entire project area including the mitigation parcel and the upstream enhancement area to Savage Dam. Vegetation mapping included a 100-foot buffer pursuant to County of San Diego guidelines (County of San Diego 2010). Vegetation communities were classified according to the *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986), as modified for San Diego County (Oberbauer et al. 2008). A total of 22 vegetation communities and land cover types were mapped within the mitigation area and upstream enhancement area: arundo-dominated riparian, chamise chaparral, Diegan coastal sage scrub, Diegan coastal sage scrub-disturbed, disturbed habitat, eucalyptus woodland, open water, freshwater marsh, mule fat scrub, nonnative grassland, San Diego mesa vernal pool complex, southern cottonwood-willow riparian forest, southern cottonwood-willow riparian forest–*disturbed*, southern interior cypress forest, southern mixed chaparral, southern riparian scrub, southern willow scrub, southern willow scrub–*disturbed*, tamarisk scrub, and valley and foothill grassland (Table 2; Appendix A, Figures 9a and 9b).

1.4.3 Sensitive Vegetation Communities

Under the MSCP Subarea Plan, upland vegetation communities defined according to the Holland classification system (Holland 1986) are grouped into habitat tiers, Tier I through Tier IV, based on species composition and rarity within the region. Tier I (rare uplands), Tier II, and Tier III (common uplands) are considered to be sensitive habitats. Tier IV habitats (other uplands) consist of disturbed and developed habitats and are not considered sensitive. Additionally, all wetland areas are considered sensitive under the Wetlands Protection Program of the MSCP Subarea Plan. Sensitive vegetation communities within the project area include wetlands communities, arundo-dominated riparian, water, freshwater marsh, mule fat scrub, San Diego mesa vernal pool complex, southern cottonwood-willow riparian forest, southern cottonwood-willow riparian forest–*disturbed*, southern riparian scrub, southern willow scrub, southern willow scrub–*disturbed*, and tamarisk scrub, and uplands communities chamise chaparral, Diegan coastal sage scrub, Diegan coastal sage scrub-disturbed, nonnative grassland, southern interior cypress forest, southern mixed chaparral, and valley and foothill grassland (Table 2).

Table 2. Vegetation Communities and Land Cover Types Occurring within the Project Area

Modified Holland Code	Vegetation Communities and Land Cover Types	MSCP[a]	Mitigation Parcel				Upstream Enhancement Area[b]	Total Project Area
			Restoration Project Limits		Outside Proposed Restoration Project Limits	Total Mitigation Parcel		
			Limits of Grading	Outside Limits of Grading				
Riparian and Wetlands								***75.99***
65100	Arundo-Dominated Riparian	W	0.02	--	--	0.02	--	0.02
64140	Fresh Water (Open Water)	W	0.07	.10	--	0.17	0.04	0.21
52400	Freshwater Marsh	W	0.17	0.08	--	0.26	<0.01	0.26
63310	Mule Fat Scrub	W	--	0.27	0.23	0.50	--	0.50
44320	San Diego Mesa Vernal Pool Complex	W	--	--	13.17	13.17	--	13.17
61330	Southern Cottonwood – Willow Riparian Forest	W	--	1.34	0.54	1.88	--	1.88
	Southern Cottonwood – Willow Riparian Forest – *Disturbed*	W	0.26	1.55	0.01	1.82	--	1.82
63300	Southern Riparian Scrub	W	--	--	--	--	0.79	0.79
63320	Southern Willow Scrub	W	0.01	--	--	0.01	--	0.01
	Southern Willow Scrub *Disturbed*	W	0.96	0.02	--	0.98	--	0.98
63810	Tamarisk Scrub	W	35.21	19.79	0.03	55.03	1.32	56.35
Uplands								***214.34***
37200	Chamise Chaparral	Tier III	--	--	6.15	6.15	--	6.15
32500	Diegan Coastal Sage Scrub	Tier II	1.50	2.31	70.15	73.96	23.30	97.26
	Diegan Coastal Sage Scrub – *Disturbed*	Tier II	0.58	18.89	62.84 ***Optional Upland Enhance-ment Area****	82.31	--	82.31

Modified Holland Code	Vegetation Communities and Land Cover Types	MSCP[a]	Mitigation Parcel				Upstream Enhancement Area[b]	Total Project Area
			Restoration Project Limits		Outside Proposed Restoration Project Limits	Total Mitigation Parcel		
			Limits of Grading	Outside Limits of Grading				
79100	Eucalyptus Woodland	Tier IV	1.77	2.89	1.49	6.15	<0.01	6.15
42200	Nonnative Grassland	Tier III	--	6.94	5.00	11.94	--	11.94
83200	Southern Interior Cypress Forest	Tier II	0.13	0.09	2.06	2.28	--	2.28
37120	Southern Mixed Chaparral	Tier III	--	0.03	1.48	1.51	4.22	5.73
42000	Valley and Foothill Grassland	Tier I	--	2.02	0.13	2.15	0.37	2.52
Land Cover Types								***26.37***
11300	Disturbed Habitat	Tier IV	0.52	6.54	17.59	24.65	1.31	25.96
12000	Urban/Developed	Tier IV	--	--	0.01	0.01	0.40	0.41
Total*	--	--	**41.35**	**62.71**	**180.88**	**284.95**	**31.77**	**316.71**

All measurements are in acres.

* = rounded acreages do not exactly sum to the total areas.

** The Optional Upland Enhancement Area is not included in the current proposed restoration project but is identified for future planning purposes within the preserve system.

[a] City of Chula Vista's MSCP Subarea Plan Habitat Categories:

- W – Wetlands community considered sensitive under the Wetlands Protection Program
- Tier I – Rare Uplands
- Tier II – Uncommon Uplands
- Tier III – Common Uplands
- Tier IV – Other Uplands

[b] Upstream enhancement acreage totals account for habitat below the Savage Dam and upstream of the mitigation parcel where invasive vegetation removal will be performed.

1.4.3.1 Vegetation Communities and Land Cover Types

Riparian and Wetlands

Arundo-Dominated Riparian: 65100 (0.02 acre). These areas are densely vegetated riparian thickets dominated almost exclusively by giant reed. This designation should only be used where arundo accounts for greater than 50% of the total vegetative cover within a mapping unit. This species is a problem throughout southern California and is extensive along most of the major rivers. In San Diego County, this vegetation community is common in major river channels such as Otay River, Sweetwater River, San Diego River, San Dieguito River, and San Luis Rey River. The arundo-dominated riparian community is located in the eastern portion of the Otay River channel within the limits of grading.

Fresh Water (Open Water): 64140 (0.21 acre). Fresh water areas are composed of year-round bodies of fresh water (extremely low salinity) in the form of lakes, streams, ponds, or rivers. This includes those portions of water bodies that are usually covered by water and contain less than 10% vegetative cover. Fresh water areas are found within the limits of grading and the upstream enhancement area. Within the mitigation parcel these areas are predominantly located in the seasonal ponds, which are deep enough to hit groundwater on the northern side of the floodplain as well as upstream of the eastern channel crossing where water ponds. In this dry intermittent/ephemeral setting, these year-round fresh water sources are a unique habitat.

Freshwater Marsh: 52400 (0.26 acre). This community occurs in areas where water tends to accumulate and supports emergent plant species such as cattail (*Typha* sp.) and bulrush (*Schoenoplectus* sp.). Freshwater marsh occurs in scattered locations within the Otay River channel and the floodplain in the limits of grading and habitat restoration areas in the restoration project boundary and in the upstream enhancement area. This community provides nesting habitat for the red-winged blackbird (*Agelaius phoeniceus*) and marsh wren (*Cistothorus palustris*), and provides foraging habitat for numerous avian species.

Mule Fat Scrub: 63310 (0.50 acre). This is a depauperate, tall, herbaceous riparian scrub strongly dominated by mule fat (*Baccharis salicifolia*) and commonly found in intermittent stream channels with fairly coarse substrate. This community is found within the limits of grading and habitat restoration areas in the restoration project boundary and outside of the proposed restoration project within the mitigation parcel. This early seral community is maintained by frequent flooding. Absent the frequent disturbance, most stands would succeed to cottonwood (*Populus fremontii*) or western sycamore (*Platanus racemosa*) dominated riparian forests or woodlands. This habitat is heavily used for both nesting and foraging by birds including coastal California gnatcatcher and least Bell's vireo.

San Diego Mesa Vernal Pool Complex: 44320 (13.17 acres). This community is characterized by small depressions in flat-topped marine terraces where ferrosilicon cemented hardpan prevents downward drainage of rainwater. Soils often are stonier than northern hardpan vernal pools, and are always coarser and redder than San Diego Mesa claypan vernal pools. San Diego Mesa vernal pool is very similar in aspect to northern hardpan vernal pools, but with different species composition. This is a low, amphibious, herbaceous community dominated by annual herbs and grasses. Germination and growth begin with winter rains, often continuing even when inundated. Rising spring temperatures evaporate the pools, leaving concentric banks of vegetation that colorfully encircle the drying pool. Surrounding high ground is often mantled with chamise

chaparral. In addition to often supporting a suite of unique wildlife including fairy shrimp and various amphibians, these pools also host a variety of unique flora. This potentially includes San Diego button-celery (*Eryngium aristulatum* var. *parishii*), little mousetail (*Myosurus minimus*), spreading navarretia (*Navarretia fossalis*), and Otay Mesa mint (*Pogogyne nudiuscula*). The San Diego Mesa vernal pool complex is located outside of the proposed restoration project within the mitigation parcel.

Southern Cottonwood – Willow Riparian Forest: 61330 (1.88 acres; 1.82 acres *disturbed*). This habitat is composed primarily of tall tree species such as willows, cottonwood, and sycamore that are adapted to wet conditions, and are found in streambeds and other wet areas. This habitat supports high avian diversity and abundance, and provides nesting habitat for species such as yellow warbler (*Setophaga petechia*), Cooper's hawk (*Accipiter cooperii*), and willow flycatcher (*Empidonax traillii*). Southern cottonwood – willow riparian forest occurs within the habitat restoration areas in the restoration project boundary and outside of the proposed restoration project within the mitigation parcel.

Southern Riparian Scrub: 63300 (0.79 acre). Southern riparian scrub occurs throughout San Diego County and is characterized by riparian zones dominated by small trees or shrubs, lacking taller riparian trees. At times it can be found encroaching into some coastal saltmarsh habitats. It is often associated with river systems where scour events occur, minimizing the opportunity for large trees to form. This habitat is characterized by arroyo willow (*Salix lasiolepis*) and other willow species (*Salix* spp.). As with other riparian habitats, it often supports a diverse assemblage of birds, including the federally listed least Bell's vireo. Southern riparian scrub occurs within the upstream enhancement area.

Southern Willow Scrub: 63320 (0.01 acre; 0.98 acre *disturbed*). Southern willow scrub communities are riparian thickets dominated by several willow species, mule fat, and occasionally western cottonwood (*Populus fremontii*). Many stands are too dense to allow much understory development. Within the mitigation area this community included Goodding's black willow (*Salix gooddingii*), cattail, Mexican fan palm (*Washingtonia robusta*), giant reed, Canary Island date palm (*Phoenix canariensis*), and Peruvian pepper tree. Southern willow scrub occurs within the limits of grading and outside of the proposed restoration project within the mitigation parcel. Within the mitigation parcel, this community supports the federally and state-listed as endangered least Bell's vireo and provides suitable nesting habitat for a variety of bird species protected by the federal MBTA.

Tamarisk Scrub: 63810 (56.35 acres). This community comprises a weedy, virtual monoculture of tamarisk species. These stands often occur as a result of major disturbance. Tamarisk outcompetes native species due to its extensive lateral root system that can draw down the water table, and it develops very deep roots. Its leaves secrete salt crystals that when introduced into the soil can prevent native plants from establishing. Tamarisk is also prolific seeder, and has replaced riparian habitat within the Otay River floodplain that was disturbed as a result of sand-mining activities. Tamarisk scrub occurs within the limits of grading and habitat restoration areas in the restoration project boundary, outside of the proposed restoration project within the mitigation parcel, and in the upstream enhancement area.

Uplands

Chamise Chaparral: 37200 (6.15 acres). This community is dominated by chamise (*Adenostoma fasciculatum*) and exists in the southeastern portion of the mitigation parcel outside of any proposed

restoration areas. This habitat is an important community for a variety of small native animals such as rodents, rabbits, and lizards as well as their predators such as the California species of special concern red diamond rattlesnake (*Crotalus ruber*).

Diegan Coastal Sage Scrub: 32500 (97.26 acres; 82.31 acres *disturbed*). Diegan coastal sage scrub is considered to be a sensitive habitat by the U.S. Fish and Wildlife Service (USFWS) and CDFW. This community is characterized by low-growing, woody, drought-deciduous aromatic shrubs and typically occurs on hotter, south-facing slopes. Diegan coastal sage scrub was the dominant habitat type on the coastal plains of San Diego County; its occurrence has been greatly reduced by development. Because of prior significant disturbance within the mitigation parcel, Diegan coastal sage scrub exists in tracts of varying quality and species composition. This habitat occurs within the limits of grading and habitat restoration areas in the restoration project boundary, as well as outside of the proposed restoration project within the City parcel, and in the upstream enhancement area. This community occurs along roadsides and hillsides and is often dominated by California buckwheat (*Eriogonum fasciculatum*), deerweed (*Acmispon glaber*), and white sage (*Salvia apiana*) with scattered individuals of lemonade berry (*Rhus integrifolia*) and California sagebrush that are suffering severely from current drought conditions. Other areas along roads and streambeds are heavily dominated by broom baccharis. The Diegan coastal sage scrub community within the floodplain is dominated by California buckwheat, laurel sumac, toyon, and lemonade berry, while low-lying areas with more moisture contain abundant San Diego marsh-elder (California Rare Plant Rank 2B.2). A few drought-affected individuals of San Diego barrel cactus occur within the mitigation parcel. This community provides nesting habitat for a variety of avian species including those protected by the MBTA, and it has the potential to support state- and/or federally listed species protected by the Endangered Species Act, including federally listed as threatened and California species of special concern coastal California gnatcatcher (*Polioptila californica californica*) and the federally listed as endangered Quino checkerspot butterfly (*Euphydryas editha quino*).

Eucalyptus Woodland: 79100 (6.15 acres). This habitat often consists of monotypic stands of introduced eucalyptus trees. The understory is typically depauperate or sparse due to allelopathic properties of the eucalyptus leaf litter. Eucalyptus woodland is an MSCP Tier IV (other uplands) habitat type. This community is widespread throughout San Diego County, often occupying large tracts of land and displacing native plant communities. Eucalyptus trees are found as individuals or in small populations throughout both the Otay River channel and the Otay River floodplain within the limits of grading and habitat restoration areas in the restoration project boundary, and outside of the proposed restoration project within the City parcel, and in the upstream enhancement area. Eucalyptus woodlands provide habitat and foraging value for many native animals, and are utilized by raptors for nesting and roosting sites and may therefore be considered a resource for those species.

Nonnative Grassland: 42200 (11.94 acres). Nonnative grassland is a dense to sparse cover of annual grasses with flowering culms less than 1 meter high. Nonnative grassland is an MSCP Tier III (common uplands) habitat type. The vegetation community often occurs where native habitats such as native grassland and coastal sage scrub habitat have been disturbed or removed. It is often associated with numerous species of native wildflowers, especially in years of favorable rainfall. In San Diego County the presence of black mustard (*Brassica nigra*), slender wild oats (*Avena barbata*), a variety of brome grasses (*Bromus* sp.), and red-stem filaree (*Erodium cicutarium*) are common indicators. In some areas, depending on past disturbance and annual rainfall, annual forbs may be the dominant species; however, it is presumed that grasses will soon dominate. Germination occurs

with the onset of the late fall rains; growth, flowering, and seed-set occur from winter through spring. With a few exceptions, the plants are dead through the summer–fall dry season, persisting as seeds. Remnant native species are variable.

Nonnative grasslands are considered sensitive habitat by CDFW and some local jurisdictions because they may serve as habitat linkages and may support raptor foraging and sensitive plant species. Nonnative grassland occurs in scattered locations within the habitat restoration areas in the restoration project boundary and outside of the proposed restoration project within the mitigation parcel. This community is found along roadsides and upon hillsides containing species such as black mustard, slender wild oats, a variety of brome grasses, horehound (*Marrubium vulgare*), prickly lettuce (*Lactuca serriola*), and tocalote (*Centaurea melitensis*). Some isolated individual native shrub species persist in some of these areas. This habitat supports a variety of small native mammals, such as Botta's pocket-gophers (*Thomomys bottae*) and native reptiles such as the Southern Pacific rattlesnake (*Crotalus oreganus helleri*), and is often of value to raptors as foraging areas.

Southern Interior Cypress Forest: 83200 (2.28 acres). This community is typically a dense, fire-maintained, low forest of even-aged stands of Tecate cypress, often surrounded by chaparral. Southern interior cypress forest occurs within the limits of grading and habitat restoration areas in the restoration project boundary, and outside of the proposed restoration project within the mitigation parcel. Tecate cypress is found in isolated groves in Orange County, San Diego County, and in Baja California, Mexico. In San Diego County, groves occur on Guatay Mountain, Otay Mountain, and Tecate Peak. The majority of the Otay Mountain population burned during the Otay Fire in 2003, and most of the Tecate Peak population burned during the Harris Fire of 2007. The rare Thorne's hairstreak butterfly (*Callophrys* [*Mitoura*] *gryneus thornei*) is completely dependent upon this species for its survival; this butterfly lays eggs only upon this species of cypress.

Southern Mixed Chaparral: 37120 (5.73 acres). Southern mixed chaparral occurs in the coastal foothills of San Diego County and northern Baja California, usually below 3,000 feet (910 meters). This community is composed of broad-leaved sclerophyll shrubs ranging in height from 1.5 to 3 meters (5 to 10 feet) tall. It is a dense habitat but occasionally occurs with patches of bare soil or with Venturan Coastal Sage Scrub (32300) or Riversidean Sage Scrub (32700) forming a mosaic. In San Diego County, it is dominated by blue-colored lilacs, especially Ramona lilac (*Ceanothus tomentosus* var. *olivaceus*) as well as *C. leucodermis* and *C. oliganthus*; other *Ceanothus* spp. generally indicate other chaparral types. Southern mixed chaparral occurs within the habitat restoration areas in the restoration project boundary, outside of the proposed restoration project within the mitigation parcel, and in the upstream enhancement area.

Valley and Foothill Grassland: 4200 (2.52 acres). Valley and foothill grassland is a low-growing (less than 2 feet) grassland habitat dominated by perennial, tussock-forming purple needlegrass (*Stipa* [previously *Nasella*] *pulchra*). Native and introduced annuals occur between the perennials, often actually exceeding the bunchgrasses in cover. In San Diego County, native perennial herbs such as sanicles (*Sanicula* spp.), checkerbloom (*Sidalcea* spp.), blue-eyed grass (*Sisirynchium bellum*), California poppy (*Eschscholzia californica*), or goldfields (*Lasthenia* spp.) are present. Nonnative grasses occurring include those described in the nonnative grassland vegetation community above. The percentage cover of native species at any one time may be quite low, but is considered native grassland if 20% aerial cover of native species is present. Valley and foothill grassland occurs within the habitat restoration areas in the restoration project boundary, outside of the proposed restoration project within the mitigation parcel, and in the upstream enhancement area.

Land Cover Types

Disturbed Habitat: 11300 (25.96 acres). Disturbed habitat consists of areas heavily dominated by several nonnative plant species that cannot be classified into one of the other nonnative vegetation categories (e.g., Arundo-Dominated Riparian, Eucalyptus Woodland, Nonnative Grassland, or Tamarisk Scrub) or areas that have experienced persistent mechanical disturbance that has resulted in areas devoid of vegetation. Disturbed habitat is an MSCP Tier IV (other uplands) habitat type. Disturbed habitat occurs throughout the mitigation parcel and in the northwestern corner of upstream enhancement area as dirt roads and as areas that experience heavy use by off-road vehicles.

Urban/Developed: 12000 (0.41 acre). Urban/developed land cover is characterized by areas that have been constructed upon or otherwise physically altered to an extent that native vegetation is no longer supported. Developed land is characterized by permanent or semi-permanent structures, pavement or hardscape, and landscaped areas that often require irrigation. Areas where no natural land is evident due to a large amount of debris or other materials being placed upon it may also be considered urban/developed (e.g., car recycling plant, quarry). Little to no vegetation occurs in these areas other than ruderal, disturbance-loving species and a variety of ornamental (usually nonnative) plants. Urban/developed areas occur outside of the proposed restoration project within the mitigation parcel and in the upstream enhancement area.

1.4.4 Flora

Based on previous reports (RECON 2011, 2012, 2013, 2014) approximately 263 plant species have been documented within the project study area; of these species, 75 are nonnative (Appendix B). Large portions of the project area are dominated by nonnative invasive species such as tamarisk, eucalyptus, and giant reed.

1.4.5 Fauna

The project study area provides suitable habitat for many of the common and special-status wildlife species that occur in southwestern San Diego County. A total of 104 wildlife species have been observed in the mitigation parcel during the field surveys conducted by RECON between 2009 and 2013. All invertebrate and vertebrate species observed or detected are listed in Appendix C. Overall, 11 invertebrate, 2 amphibian, 6 reptile, 78 bird, and 7 mammal species were observed or otherwise detected in the study area during the field surveys conducted by RECON.

1.4.5.1 Invertebrates

Eleven species of invertebrates were recorded in the mitigation parcel by RECON. These include two fairy shrimp species that occur in vernal pools in the project area. The project area also provides host plants for several species of moths and butterflies.

1.4.5.2 Amphibians

Two amphibian species was recorded within the mitigation parcel by RECON. Vernal pools that occur on site provide suitable breeding habitat for western spadefoot (*Spea hammondii*), and areas surrounding pools provide suitable upland habitat. The riparian woodland habitats provide leaf litter, tree cavities, and rock crevices that amphibians could utilize during the dry season.

1.4.5.3 Reptiles

Six reptile species were recorded within the mitigation parcel by RECON. Plant communities and associated site characteristics in the project area offer basking, refuge, and foraging habitat for reptiles. Additionally, ground insects (i.e., prey items of most reptiles) were plentiful during the site visit.

1.4.5.4 Birds

Seventy-eight bird species were observed or detected within the mitigation parcel. The woodland habitat in the study area provides suitable habitat for a number of bird species. Characteristic breeding birds in these areas include acorn woodpecker *(Melanerpes formicivorus)*, Nuttall's woodpecker *(Picoides nuttallii),* western wood peewee *(Contopus sordidulus),* and Bullock's oriole *(Icterus bullockii).*

Four diurnal raptor species were observed within the mitigation parcel during the surveys. These include turkey vulture (*Cathartes aura*), white-tailed kite (*Elanus leucurus*), red-tailed hawk (*Buteo jamaicensis*), and Cooper's hawk. The large trees are essential to raptors for roosting and nesting sites. The snags and cavities that characteristically develop in these trees are also used by a wide variety of other avian species. Several large nests were observed within the study area, which may have been created by raptors or corvids.

1.4.5.5 Mammals

Seven mammal species were detected within the mitigation parcel, including woodrat (*Neotoma* sp.), desert cottontail (*Sylvilagus audubonii*), San Diego black-tailed jackrabbit (*Lepus californicus bennettii*), and coyote (*Canis latrans*). A focused bat survey was not conducted. Suitable roosting habitat for foliage-roosting bats occurs on site in the large oak trees, while roosting habitat is lacking for cave-roosting and crevice-roosting bats. Various bat species could be expected to forage throughout the project site.

1.4.6 Special-Status Species

Special-status species are those that meet any of the following criteria.

1.4.6.1 State and Federal Regulations

- Species listed or proposed for listing as threatened or endangered under the Federal Endangered Species Act (FESA) (Code of Federal Regulations [CFR], Title 50, Section 17.12 [listed plants]); 50 CFR 17.11 (listed animals); and various notices in the *Federal Register* (FR) (proposed species).
- Species that are candidates for possible future listing as threatened or endangered under the FESA (79 FR 72450, December 5, 2014).
- Species listed or proposed for listing by the State of California as threatened or endangered under the California Endangered Species Act (CESA) (14 California Code of Regulations [CCR] 670.5).
- Plant species listed as rare under the California Native Plant Protection Act (California Fish and Game Code 1900, et seq.).

- Species that meet the definitions of "rare" or "endangered" under the California Environmental Quality Act (CEQA Guidelines Sections 15380 and 15125).
- Special vascular plants, bryophytes, and lichens listed on the California Rare Plant Ranking.
- Animal species of special concern to the CDFW.
- Bird species of conservation concern as identified by USFWS in *Birds of Conservation Concern 2008.*
- Animals that are fully protected in California (California Fish and Game Code Sections 3511 [birds], 4,700 [mammals], 5050 [amphibians and reptiles], and 5515 [fish]).

1.4.6.2 Regional and Local Plans

- County of San Diego, South County Multiple Species Conservation Program
- County of San Diego Multiple Species Conservation Subarea Plan
- City of Chula Vista Multiple Species Conservation Subarea Plan
- City of San Diego Multiple Species Conservation Subarea Plan
- City of Chula Vista Wetlands Protection Program
- Otay Ranch Resource Management Plan

Annual Reports for the Otay Ranch Preserve (RECON 2011, 2012, 2013, 2014) and the CNDDB (CDFW 2015) were reviewed for information on special-status plant and wildlife species observed or potentially occurring within the project study area. The CNDDB search was conducted within a 1-mile radius centered on the USGS 7.5' minute Otay Mesa Quadrangle Map. No focused plant or wildlife surveys were conducted for the restoration project.

The CNDDB search revealed 43 species of plants and wildlife (26 plants and 17 wildlife) that were recorded within 1 mile of the project area. An additional 66 plant species and 11 wildlife species with no CNDDB records within 1 mile of the project area were also evaluated for potential to occur within the project area based on species range and habitat requirements.

Federally and/or state-listed plant and wildlife species that are known to occur in the project area or within 1 mile of the project area are presented in Table 3. In addition, species covered under the City of Chula Vista Subarea Plan are also included in Table 3 as the primary work area occurs within the City of Chula Vista parcel.

Table 3. Federally Listed, State-Listed, and/or City of Chula Vista MSCP Covered and Narrow Endemic Species Known to Occur within the Project Area or with CNDDB Records within 1-Mile Radius of the Project Area

Scientific Name	Common Name	Status	Nearest Distance (feet)
Plants			
Bloomeria clevelandii	San Diego goldenstar	NE	Observed within the mitigation parcel
Brodiaea orcuttii	Orcutt's brodiaea	NE	1,320
Cylindropuntia californica var. californica	snake cholla	NE	Observed within the mitigation parcel
Deinandra conjugens	Otay tarplant	FT, SE, NE	Observed within the

Scientific Name	Common Name	Status	Nearest Distance (feet)
			mitigation parcel
Dudleya variegata	Variegated dudleya	NE	Observed within the mitigation parcel
Eryngium aristulatum var. *parishii*	San Diego button-celery	FE, SE, NE	180
Ferocactus viridescens	San Diego barrel cactus	NE	Observed within the mitigation parcel and upstream enhancement area
Navarretia fossalis	spreading navarretia	FT, NE	Observed within the mitigation parcel
Pogogyne nudiuscula	Otay Mesa mint	FE, SE, NE	1,982
Wildlife			
Branchinecta sandiegonensis	San Diego fairy shrimp	FE	Observed within the mitigation parcel
Streptocephalus woottoni	Riverside fairy shrimp	FE	423
Euphydryas editha quino	Quino checkerspot butterfly	FE	Observed within the mitigation parcel
Aspidocelis hyperythra hyperythra	Belding's orange throated whiptail	C	Observed within the mitigation parcel
Phrynosoma blainvillii	Blainville's horned lizard	C	Observed within the mitigation parcel
Vireo bellii pusillus	least Bell's vireo	FE, SE	Observed within the mitigation parcel
Polioptila californica californica	coastal California gnatcatcher	FT	Observed within the mitigation parcel
Coccyzus americanus occidentalis	western yellow-billed cuckoo	FT, SE	Observed within the mitigation parcel
Campylorhynchus brunneicapillus sandiegensis	San Diego cactus wren	C	Observed within the mitigation parcel
Aimophila ruficeps canescens	southern California rufous-crowned sparrow	C	Observed within the mitigation parcel
Odocoileus hemionus fulginata	southern mule deer	C	Observed within the mitigation parcel

Federal
FE = listed as endangered under the federal Endangered Species Act.
FT = listed as threatened under the federal Endangered Species Act.
State
SE = listed as endangered under the California Endangered Species Act.
Local
NE = City of Chula Vista Multiple Species Conservation Subarea Plan Narrow Endemic
C = City of Chula Vista Multiple Species Conservation Subarea Plan Covered Species

1.4.6.3 Special-Status Plant Species Detected within the Project Study Area

Based on searches of the CNDDB and CNPS Online Inventory, 92 sensitive plant species are known from the project vicinity. Appendix D provides the probability of occurrence, presence, or absence of each of these species within the project area. Of these 92 sensitive plant species, 22 were detected within the project area and are discussed below and displayed in Appendix A, Figure 10. Eleven

sensitive plant species have a "high" probability of occurring within the project area due to presence of suitable habitat and proximity of extant populations to the project area. These 11 sensitive plant species are discussed in Section 1.4.6.4. The remaining 59 sensitive plant species known from the project vicinity have a probability of "moderate" or "low" or are not reasonably expected to have potential to occur within the project area and are therefore not discussed further in this document.

Special-status plant species observed or with a high potential to occur within the project area include California adolphia (*Adolphia californica*), San Diego bur-sage (*Ambrosia chenopodifolia*), singlewhorl burrobush (*Ambrosia monogyra*), Otay manzanita (*Arctostaphylos otayensis*), south coast saltscale (*Atriplex pacifica*), San Diego sunflower (*Bahiopsis laciniata*), San Diego goldenstar (*Bloomeria clevelandii*), Orcutt's brodiaea (*Brodiaea orcuttii*), round-leaved filaree (*California macrophylla*), Otay Mountain ceanothus (*Ceanothus otayensis*), long-spined spineflower (*Chorizanthe polygonoides* var. *longispina*), snake cholla (*Cylindropuntia californica* var. *californica*), Otay tarplant (*Deinandra conjugens*), variegated dudleya (*Duldleya variegata*), San Diego button-celery (*Eryngium aristulatum* var. *parishii*), San Diego barrel cactus (*Ferocactus viridescens*), Palmer's grapplinghook (*Harpagonella palmeri*), Tecate cypress (*Hesperocyparis forbesii*), graceful Tarplant (*Holocarpha virgata* ssp. *elongata*), decumbent goldenbush (*Isocoma menziesii* var. *decumbens*), San Diego marsh-elder (*Iva hayesiana*), southwestern Spiny Rush (*Juncus acutus* ssp. *leopoldii*), Robinson's pepper-grass (*Lepidium virginicum* var. *robinsonii*), small-flowered microseris (*Microseris douglasii* ssp. *platycarpha*), little mousetail (*Myosurus minimus* ssp. *apus*), spreading navarretia (*Navarretia fossalis*), Nuttall's scrub oak (*Quercus dumosa*), Munz's sage (*Salvia munzii*), ashy spike-moss (*Selaginella cinerascens*), chaparral ragwort (*Senecio aphanactis*), blue streamwort (*Stemodia durantifolia*), and San Diego County needlegrass (*Stipa diegoensis*).

Singlewhorl Burrobrush (*Ambrosia monogyra*) – CRPR List 2B.2

Singlewhorl burrobrush is an evergreen shrub in the sunflower family (Asteraceae) that ranges from southern California to Texas, and south to Sonora, Mexico. This species typically occurs along the edges of intermittent drainages.

This species has been recorded by the CNDDB as being present within the main tributary in the restoration project boundary.

Otay Manzanita (*Arctostaphylos otayensis*) – CRPR 1B.2; San Diego County List A; County MSCP Covered Species; City of San Diego MSCP Covered Species

Otay manzanita is an evergreen shrub and is endemic to southern San Diego County. This species occurs within chaparral on soils derived from metavolcanic rock. This species was detected in one location in the City parcel, outside of the proposed restoration project in the southwestern portion of the parcel by RECON in 2011 and 2012.

South Coast Saltscale (*Atriplex pacifica*) – CRPR 1B.2; San Diego County List A

South coast salt scale is a small, decumbent, herbaceous annual usually occurring in open Diegan coastal sage scrub in areas devoid of larger shrubs. South coast saltscale is considered to have a high potential to occur within the project area due to the presence of suitable habitat and an extant population occurring immediately south of the project area. However, south coast saltscale is not expected to occur within the limits of grading due to a lack of suitable habitat. This species was detected in one location within the City parcel but outside of the restoration project boundary by RECON in 2012.

San Diego Sunflower (*Bahiopsis laciniata*) – CRPR 4.2; San Diego County List D

San Diego sunflower is a small-to medium- sized shrub that typically occurs in clay soils within chaparral and coastal sage scrub on south-facing slopes from Orange County south to Baja California and Sonora, Mexico.

San Diego sunflower was detected in one location within the restoration project boundary and scattered within the City parcel outside of the restoration project footprint by RECON in 2011 through 2013.

San Diego Goldenstar (*Bloomeria clevelandii*) – CRPR 1B.1; San Diego County List A; City of Chula Vista MSCP Narrow Endemic; City of San Diego MSCP Covered Species

San Diego goldenstar is a corm-based herbaceous perennial that ranges from Riverside and San Diego Counties south to Baja California, Mexico. This species prefers needlegrass grasslands, especially near mima mound topography or the vicinity of vernal pools (Reiser 2001).

San Diego goldenstar was detected in the northwestern corner of the mitigation parcel outside of any proposed restoration areas and in the southeastern corner of the City parcel outside of the restoration project footprint by RECON in 2010.

Otay Mountain Ceanothus (*Ceanothus otayensis*) – CRPR 1B.2

Otay Mountain ceanothus is an evergreen shrub that ranges from southern San Diego County to Baja California, Mexico. This species occurs in chaparral on soils derived from metavolcanic or gabbroic rock.

Otay Mountain ceanothus was detected by RECON in 2010 in one location in the southern-central portion of the mitigation parcel outside of any proposed restoration areas.

Snake Cholla (*Cylindropuntia californica* var. *californica*) – CRPR 1B.1; San Diego County List A; County MSCP Covered Species; City of Chula Vista MSCP Narrow Endemic; City of San Diego MSCP Covered Species

Snake cholla is a prostrate to suberect perennial stem succulent that ranges from southern San Diego County to Baja California, Mexico. This species occurs within Diegan coastal sage scrub, usually on xeric hillsides.

Snake cholla was detected scattered in the northeastern corner of the mitigation parcel outside of any proposed restoration areas by RECON in 2010.

Otay Tarplant (*Deinandra conjugens*) – Federally Threatened, State Endangered, CRPR 1B.1; San Diego County List A; County MSCP Covered Species; City of Chula Vista MSCP Narrow Endemic; City of San Diego MSCP Covered Species

Otay tarplant is an annual herb that grows to approximately 20 inches in height and has aromatic deep green or gray-green leaves covered with soft shaggy hairs. The species is endemic to southwestern San Diego County and adjacent Baja California, Mexico. This species prefers heavy clay soils in valley and foothill grasslands or sparsely vegetated Diegan coastal sage scrub.

Otay tarplant was observed in two locations in the southern half of the mitigation parcel within the City parcel outside of the restoration project footprint by RECON in 2012.

Variegated Dudleya (*Dudleya variegata*) – CRPR 1B.2; San Diego County List A; County MSCP Covered Species; City of Chula Vista MSCP Narrow Endemic; City of San Diego MSCP Covered Species

Variegated dudleya is found on clay soils within grassland, chaparral, and coastal scrub. This species is known only from San Diego County and Baja California, Mexico. Variegated dudleya blooms in the late spring with small, yellow, star-shaped flowers.

Variegated dudleya was observed scattered in the City parcel outside of the restoration project footprint in the southeastern corner and the northeastern corner of the parcel (outside of any proposed restoration areas) by RECON in 2009 and 2011 through 2013.

San Diego Barrel Cactus (*Ferocactus viridescens*) – CRPR 2B.1; San Diego County List B; County MSCP Covered Species; City of Chula Vista MSCP Narrow Endemic; City of San Diego MSCP Covered Species

San Diego barrel cactus occurs within grassland, coastal sage scrub, and chaparral. It is a perennial stem succulent that occurs only in coastal and foothill areas of San Diego County and Baja California, Mexico (Reiser 2001).

San Diego barrel cactus was observed in several locations within the enhancement areas in the restoration project boundary and scattered throughout the City parcel outside of the restoration project footprint by RECON in 2011 through 2013. CNDDB records also indicate this species has been recorded from the upstream enhancement area.

Palmer's Grapplinghook (*Harpagonella palmeri*) – CRPR 4.2; San Diego County List D

Palmer's grapplinghook occurs on heavy clay soils within grassland and coastal sage scrub openings. This diminutive annual blooms in early spring and is present in scattered locations throughout Southern California and Baja California, Mexico.

Palmer's grapplinghook was observed in several locations within the restoration areas in the restoration project boundary and scattered throughout the City parcel outside of the restoration project footprint by RECON in 2010 through 2013

Tecate Cypress (*Hesperocyparis forbesii*) – CRPR 1B.1, San Diego County List A; County MSCP Covered Species; City of San Diego MSCP Covered Species

Tecate cypress is an evergreen coniferous tree that ranges from Orange County south to Baja California, Mexico. This species occurs on well-drained, north-facing slopes in closed cone coniferous forest and southern mixed chaparral. Large populations of this species on Otay Mountain are threatened by recurrent fires.

Tecate cypress was observed in two locations within the limits of grading and in several locations within the City parcel outside of the restoration project footprint area by RECON in 2010 through 2013.

Graceful Tarplant (*Holocarpha virgata* ssp. *elongata*) – CRPR 4.2; San Diego County List D

Graceful tarplant occurs in grasslands with clay soils but also may be found in openings in coastal sage scrub, chaparral, and woodlands. This species occurs from Riverside County south to Baja California, Mexico.

Graceful tarplant was observed scattered throughout the City parcel outside of the restoration project footprint by RECON in 2010.

Decumbent Goldenbush (*Isocoma menziesii* var. *decumbens*) – CRPR 1B.2; San Diego County List A

Decumbent goldenbush is a perennial shrub that ranges from Los Angeles County south to Baja California, Mexico. This species typically occurs on clay soils within coastal sage scrub intermixed with grassland. The *Isocoma menziesii* complex is a very confusing plant taxonomic group, and, as a result, the status of decumbent goldenbush in San Diego County is poorly understood.

Decumbent goldenbush was observed within the enhancement areas within the restoration project boundary and scattered throughout the City parcel outside of the restoration project footprint by RECON in 2011 through 2013.

San Diego Marsh-Elder (*Iva hayesiana*) – CRPR 2B.2; San Diego County List B

San Diego marsh-elder is a spring to summer flowering perennial herb. It occurs in marshes and swamps, on playas, and along stream channels in San Diego County and Baja California, Mexico.

San Diego marsh-elder was observed scattered within the limits of grading and enhancement areas within the restoration project boundary, and scattered within the City parcel outside of the restoration project footprint by RECON in 2011 and 2012. CNDDB records also indicate this species has been recorded from the upstream enhancement area.

Southwestern Spiny Rush (*Juncus acutus* ssp. *leopoldii*) – CRPR 4.2; San Diego County List D

Southwestern spiny rush is a large, perennial, rhizomatous, herb, found in coastal salt marsh that is moderately brackish, alkaline meadows, and riparian marshes and in meadows. This species ranges from San Luis Obispo County south into Baja California, Mexico.

Southwestern spiny rush was observed scattered within the limits of grading and enhancement areas within the restoration project boundary, and scattered within the City parcel outside of the restoration project footprint by RECON in 2010 through 2013.

Small-Flowered Microseris (*Microseris douglasii* ssp. *platycarpha*) – CRPR 4.2; San Diego County List D

Small flowered microseris is a diminutive annual that ranges from Los Angeles County south to Baja California, Mexico. This species is typically found on clay lenses in grasslands, on the periphery of vernal pools, or within vernal pools.

Small-flowered microseris was observed in three locations within the enhancement areas in the restoration project boundary and in one location within the City parcel outside of the restoration project footprint by RECON in 2013.

Spreading Navarretia (*Navarretia fossalis*) – Federally Threatened; CRPR 1B.1; San Diego County List A; County MSCP Covered Species; City of Chula Vista MSCP Narrow Endemic; City of San Diego MSCP Covered Species

Spreading navarretia is an annual herb, with a low, mostly spreading growth-form that can reach a height of 6 inches. The species typically blooms in May and June, producing white to lavender flowers in flat-topped, leafy heads. Spreading navarretia is found in vernal pool complexes extending from Los Angeles County, south through coastal San Diego County, and farther south to Baja California, Mexico.

Spreading navarretia was observed in one location within the enhancement areas in the restoration project boundary by RECON in 2011 and 2012.

Munz's Sage (*Salvia munzii*) – CRPR 2B.2; San Diego County List B

Munz's sage is perennial evergreen shrub that occurs in chaparral and coastal scrub in southern San Diego County and Baja California, Mexico. Within San Diego County, this species is mostly confined to the Otay Mesa and Otay Mountain areas.

Munz's sage was observed in two locations within the City parcel outside of the restoration project footprint area by RECON in 2010 through 2013.

Ashy Spike-Moss (*Selaginella cinerascens*) – CRPR 4.1; San Diego County List D

Ashy spike-moss occurs within openings of coastal sage scrub and chaparral. It is found in Orange and San Diego Counties and Baja California, Mexico. This perennial, rhizomatous herb grows as a flat groundcover on the soil surface.

Ashy spike-moss was observed in several locations scattered throughout the western half of the City parcel outside of the restoration project footprint by RECON in 2009 through 2013.

Blue Streamwort (*Stemodia durantifolia*) – CRPR 2B.1; San Diego County List B

Blue streamwort is a small perennial herb that ranges from Riverside County, east to Texas, and south to Sonora, Oxaca, and Baja California Mexico. This species is typically found growing in wet sand along minor creeks and seasonal drainages.

Blue streamwort was observed in two locations within the limits of grading by RECON in 2012.

San Diego County Needlegrass (*Stipa diegoensis*) – CRPR 4.2; San Diego County List D

San Diego County needlegrass is a robust perennial bunch grass that ranges from southwestern San Diego County to Baja California, Mexico. This species occurs in coastal sage scrub in southwestern San Diego County and is closely associated with metavolcanic soils.

San Diego County needlegrass was observed in one location in the enhancement areas in the restoration project boundary by RECON in 2012.

1.4.6.4 Special-Status Plant Species with High Potential to Occur within the Project Study Area

California Adolphia (*Adolphia californica*) – CRPR 2B.1; San Diego County List B

California adolphia is a short spiny shrub, often intermixed with coastal sage scrub, but occasionally occurring on the periphery of coastal sage scrub habitats (Reiser 2001).

California adolphia is considered to have a high potential to occur within the mitigation parcel due to the presence of suitable habitat and an extant population occurring immediately southwest of the project area. However, California adolphia is not expected to occur within the limits of grading due to a lack of suitable habitat and the degraded nature of upland habitat within the limits of grading.

San Diego Bur-Sage (*Ambrosia chenopodifolia*) – CRPR 2B.1; San Diego County List B

San Diego bur-sage is a small shrub typically found within dry exposed areas of open Diegan coastal sage scrub (Reiser 2001).

San Diego bur-sage is considered to have a high potential to occur within the mitigation parcel due to the presence of suitable habitat and an extant population occurring approximately 0.5 mile southwest of the project area. However, San Diego bur-sage is not expected to occur within the limits of grading due to the highly disturbed nature of habitat within the limits of grading.

Orcutt's Brodiaea (*Brodiaea orcuttii*) – CRPR 1B.1; San Diego County List A; City of Chula Vista MSCP Narrow Endemic; City of San Diego MSCP Covered Species

Orcutt's brodiaea is a perennial corm-sprouting herbaceous plant often found growing in vernally moist grasslands and on the periphery of vernal pools. (Reiser 2001).

Orcutt's brodiaea is considered to have a high potential to occur within the mitigation parcel due to the presence of suitable habitat and an extant population occurring approximately 0.25 mile southwest of the project area. However, Orcutt's brodiaea is not expected to occur within the limits of grading due to the highly disturbed nature of habitat within the limits of grading.

Round-Leaved Filaree (*California macrophylla*) – CRPR 1B.1; San Diego County List B

Round-leaved filaree is an annual herbaceous plant that is typically found in grasslands in open areas on friable clay soils (Reiser 2001).

Round-leaved filaree is considered to have a high potential to occur within the mitigation parcel due to the presence of suitable habitat and an extant population occurring approximately 0.5 mile west of the project area. However, round-leaved filaree is not expected to occur within the limits of grading due to the highly disturbed nature of habitat within the limits of grading.

Long-Spined Spineflower (*Chorizanthe polygonoides* var. *longispina*) – CRPR 1B.2; San Diego County List A

Long-spined spineflower is a mostly prostrate annual herb typically occurring on clay lenses that are largely devoid of shrubs and can also be occasionally found on the periphery of vernal pools (Reiser 2001).

Long-spined spineflower is considered to have a high potential to occur within the mitigation parcel due to the presence of suitable habitat and an extant population occurring approximately 1.0 mile north of the project area. However, long-spined spineflower is not expected to occur within the limits of grading due to the highly disturbed nature of habitat within the limits of grading.

San Diego Button-Celery (*Eryngium aristulatum* var. *parishii*) – Federally Endangered; State Endangered; CRPR 1B.1; San Diego County List A; County MSCP Covered Species; City of Chula Vista MSCP Narrow Endemic; City of San Diego MSCP Covered Species

San Diego button-celery is a spreading biennial herb usually restricted to vernal pools or mima mound areas with vernally moist conditions (Reiser 2001).

San Diego button-celery is considered to have a high potential to occur within the mitigation parcel due to the presence of suitable habitat and an extant population occurring immediately south of the project area. However, San Diego button-celery is not expected to occur within the limits of grading due to the highly disturbed nature of habitat within the limits of grading.

Robinson's Pepper-Grass (*Lepidium virginicum* var. *robinsonii*) – CRPR 4.3; San Diego County List A

Robinson's pepper-grass is an annual herb that is typically found within dry exposed locales within openings in chaparral, sage scrub, or grassland communities (Reiser 2001).

Robinson's pepper-grass is considered to have a high potential to occur within the mitigation parcel due to the presence of suitable habitat and an extant population occurring immediately south of the project area. However, Robinson's pepper-grass is not expected to occur within the limits of grading due to the highly disturbed nature of habitat within the limits of grading.

Little Mousetail (*Myosurus minimus* ssp. *apus*) – CRPR 3.1; San Diego County List C

Little mousetail is a cryptic annual herb restricted to vernal pools, usually found in deeper portions of vernal pool basins (Reiser 2001).

Little mousetail is considered to have a high potential to occur within the mitigation parcel due to the presence of suitable habitat and an extant population occurring immediately south of the project area. However, little mousetail is not expected to occur within the limits of grading due to the highly disturbed nature of habitat within the limits of grading.

Otay Mesa Mint (*Pogogyne nudiuscula*) – Federally Endangered; State Endangered; CRPR 1B.1; San Diego County List A; County MSCP Covered Species; City of Chula Vista MSCP Narrow Endemic; City of San Diego MSCP Covered Species

Otay Mesa mint is a small aromatic herb restricted to vernal pools (Reiser 2001).

Otay Mesa mint is considered to have a high potential to occur within the mitigation parcel due to the presence of suitable habitat and an extant population occurring immediately south of the project area. However, Otay Mesa mint is not expected to occur within the limits of grading due to the highly disturbed nature of habitat within the limits of grading.

Nuttall's Scrub Oak (*Quercus dumosa*) – CRPR 1B.1; San Diego County List A

Nuttall's scrub oak is an evergreen shrub in the oak family (Fagaceae) that ranges from Santa Barbra County south to Baja California, Mexico. This species occurs in coastal chaparral with a relatively open canopy in areas of flatter terrain and can form dense monotypic stands on north-facing slopes.

Nuttall's scrub oak is considered to have a high potential to occur within the mitigation parcel due to the presence of suitable habitat and an extant population occurring immediately southwest of the mitigation parcel. However, Nuttall's scrub oak is not expected to occur within the limits of grading due to the highly disturbed nature of habitat within the limits of grading.

Chaparral Ragwort (*Senecio aphanactis*) – CRPR 2B.2; San Diego County List B; City of San Diego MSCP Covered Species

Chaparral ragwort is an annual herb found in areas of open coastal sage scrub and cismontane woodland (Reiser 2001).

Chaparral ragwort is considered to have a high potential to occur within the mitigation parcel due to the presence of suitable habitat and an extant population occurring immediately south of the project area. However, chaparral ragwort is not expected to occur within the limits of grading due to the highly disturbed nature of habitat within the limits of grading.

1.4.6.5 Special-Status Wildlife Species Detected in the Project Study Area

Based on searches of the CNDDB Online Inventory, 74 special-status wildlife species are known from the project vicinity. Special-status species that have been observed within the mitigation parcel by RECON during their field surveys are displayed in Appendix A, Figure 11. Appendix E provides the probability of occurrence, presence, or absence of each of these species within the project area. Special-status wildlife species observed or with a high potential to occur include San Diego fairy shrimp, Quino checkerspot Butterfly, Hermes copper butterfly (*Lycaena hermes*), Thornes hairstreak butterfly (*Mitoura thornei*), western spadefoot, Belding's orange-throated whiptail lizard (*Aspidocelis hyperythra*), coastal whiptail (*Aspidoscelis tigris steinegeri*), Blainville's horned lizard (*Phrynosoma blainvillii*), silvery legless lizard (*Anniella pulchra pulchra*), coast patch-nosed snake (*Salvadora hexalepis vigultea*), Coronado skink (*Plestidon skiltonianus interparietalis*), coastal rosy boa (*Lichanura trivirgata roseofusca*), San Diego ringneck snake (*Diadophis punctatus similis*), red diamond rattlesnake, coastal California gnatcatcher, Bell's sparrow (*Artemisiospiza belli belli*), grasshopper sparrow (*Ammodramus savannarum perpallidus*), southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*), California horned lark (*Eremophila alpestris actia*), San Diego cactus wren (*Campylorhynchus brunneicapillus sandiegensis*), least Bell's vireo, northern harrier (*Circus cyaneus*), white-tailed kite, Coopers hawk, western burrowing owl (*Athene cunicularia*), loggerhead shrike (*Lanius ludovicianus*), yellow-breasted chat (*Icteria virens*), yellow billed cuckoo, yellow warbler (*Dendroica petechia brewsteri*), American badger (*Taxidea taxus*), Dulzura pocket mouse (*Chaetodipus californicus femoralis*), northwestern San Diego pocket mouse (*Chaetodipus fallax fallax*), San Diego woodrat (*Neotoma lepida intermedia*), southern grasshopper mouse (*Onychomys torridus ramona*), San Diego black-tailed jackrabbit, southern mule deer

(*Odocoileus hemionus*), and mountain lion (*Felis concolor*). Potentially significant impacts on these species resulting from the temporary impacts on habitat would be adequately avoided through project design features discussed below.

The following are detailed descriptions of special-status wildlife species that have been observed within the project study area.

San Diego Fairy Shrimp (*Branchinecta sandiegoensis*) – Federally Listed as Endangered; San Diego County Narrow Endemic; City of Chula Vista Subarea Plan MSCP Covered Species; City of San Diego MSCP Covered Species

San Diego fairy shrimp are small freshwater crustaceans that are found in shallow vernal pools and other ephemeral basin (USFWS 2002). San Diego fairy shrimp is found in southwestern coastal California and extreme northwestern Baja California, Mexico, with all known localities below 2,300 feet and within 40 miles of the Pacific Ocean, from Santa Barbara County south to northwestern Baja California (USFWS 2002). These species can also occur in road ruts and ditches that provide suitable conditions for the species. Water temperature is an important factor for this fairy shrimp. The water must not get too hot (above 86°F) or too cold (below 41°F) for this species to occur (USFWS 2002). San Diego fairy shrimp were historically prevalent in vernal pool complexes across Otay Mesa (USFWS 2008).

This species has been observed within the mitigation parcel (Appendix A, Figure 12). Vernal pools occur within the mitigation parcel, predominately in the northeast and southeast portions of the parcel. Within the restoration project boundary, fairy shrimp are confined to road ruts, which are shallow artificial depressions created by persistent use of the dirt roads. The primary vernal pool complex within the mitigation parcel is located in the northeast portion of the parcel; however, this area is heavily degraded with a substantial nonnative thatch layer, as such ponding has been limited and fairy shrimp have not been observed during past RECON monitoring efforts. Suitable habitat does not occur within the upstream enhancement portion.

Quino Checkerspot Butterfly (*Euphydryas editha quino*) – Federally Listed as Endangered; San Diego County Narrow Endemic; City of Chula Vista Subarea Plan MSCP Covered Species

The Quino checkerspot butterfly prefers open grassland and sunny openings within chaparral and coastal sage shrublands that contain its larval host plant and adult nectar sources. The principal larval host plant is dot-seed plantain; however, the larvae may also use desert Indian wheat (*Plantago ovata*), woolly plantain (*Plantago patagonica*), Coulter's snapdragon (*Antirrhinum coulterianum*), purple owl's clover (*Castilleja exserta*), thread-leaved bird's-beak (*Cordylanthus rigidus*), and Chinese houses (*Collinsia* sp.) (USFWS 2002, 2009. These plants grow in or near grasslands and may extend into upland shrub communities of sparse chaparral and coastal sage scrub. In the chaparral and coastal sage scrub habitats where this species survives, it is most likely to be found at sites where high densities of the host plants occur. Within such areas, the Quino checkerspot butterfly may preferentially select sites where exposure to winter sun is the greatest. The elevational distribution of this butterfly has historically ranged from near sea level to about 3,000 feet.

Historically, the geographic range of the Quino checkerspot butterfly extended from Point Dume in Los Angeles County to northern Baja California. At the time of listing, there were only seven or eight

known extant populations in the U.S. The surviving U.S. populations occur in southwestern Riverside County and San Diego County.

The life cycle of the Quino checkerspot butterfly includes the following key stages. The adult flight season occurs from mid-January to late April and peaks between March and April. The eggs hatch in about 10 days, and the larvae begin to feed immediately. They feed until summer, when their primary host plant, dot-seed plantain (*Plantago erecta*), dies. The larvae undergo diapause during the dry season and the winter. The larvae develop through four instars, then pupate, and emerge as adults in early spring of the following year. The adults live from 4 to 8 weeks.

This species has been observed by RECON biologists within the mitigation parcel (Appendix A, Figure 11). Suitable habitat occurs primarily on the southern end of the mitigation parcel outside of the grading limits. The upstream enhancement area is within designated critical habitat; however, the invasive plant species removal effort is focused on the riparian corridor, which does contain suitable habitat for Quino checkerspot butterfly.

Western Spadefoot (*Spea hammondii*) – California Species of Special Concern; San Diego County Group II

Western spadefoot can be found in dry grassland habitat with friable but usually not sandy soils close to seasonal wetlands such as vernal pool complexes, which it requires for reproduction and metamorphosis (Stebbins 2003). Adult western spadefoots spend most of the year in self-excavated underground retreats and possibly in mammal burrows. They emerge from underground retreats during heavy rains in autumn and winter and spawn in seasonal wetlands, such as vernal pools, in late winter or early spring. Eggs hatch in less than a week and larvae metamorphose in 30–80 days, apparently depending on the duration of pool depth sufficient to support larvae and possibly on pool temperature (Jennings and Hayes 1994).

This species has been observed by Recon biologists within the mitigation parcel (Appendix A, Figure 11). Vernal pools occur within the mitigation parcel, predominately in the northeast and southeast portions of the parcel. Suitable habitat does not occur within the upstream enhancement portion.

Belding's Orange-throated Whiptail (*Aspidocelis hyperythra hyperythra*) – California Species of Special Concern; San Diego County Group II; City of Chula Vista Subarea Plan MSCP Covered Species; City of San Diego MSCP Covered Species

Orange-throated whiptail occurs in low-elevation coastal scrub, chamise–redshank chaparral, mixed chaparral, and valley–foothill hardwood habitats (Zeiner et al. 1988). Orange-throated whiptail occurs in Orange, Riverside, and San Diego Counties west of the crest of the Peninsular Ranges and in southwestern San Bernardino County near Colton. It extends up to 3,410 feet above mean sea level (Zeiner et al. 1988). Orange-throated whiptails forage on the ground and scratch through surface debris for food. Their diet consists of a variety of small arthropods, especially termites. Orange-throated whiptails likely lay eggs in loose, well-aerated soil under or near surface objects or at the base of dense shrubs (Zeiner et al. 1988).

This species has been observed by RECON biologists within the mitigation parcel (Appendix A, Figure 11). Suitable habitat occurs throughout the mitigation parcel.

Blainville's Horned Lizard (*Phrynosoma blainvillii*) – California Species of Special Concern; San Diego County Group II; City of Chula Vista Subarea Plan MSCP Covered Species Covered Species; City of San Diego MSCP Covered Species

The range of the Blainville's horned lizard extends from the Sacramento Valley south to San Diego County, including the Coast Range Transverse and Peninsular Ranges below 4,000 feet.

Blainville's horned lizards are found in a wide variety of vegetation communities, from grasslands and shrublands to woodlands, including open coniferous forests. Critical factors are the presence of loose soils with a high sand fraction, an abundance of native ants or other insects, especially harvester ants (*Pogonomyrmex* spp.), and the availability of both sunny basking spots and dense cover for refuge. The species apparently does not eat the introduced Argentine ant (*Linepithema humile*) (Jennings and Hayes 1994).

This species has been observed by RECON biologists within the mitigation parcel (Appendix A, Figure 11). Suitable habitat occurs throughout the mitigation parcel.

Coastal Rosy Boa (*Lichanura trivirgata rosefusca*) – California Species of Special Concern; San Diego County Group II

Coastal rosy boas are heavy-bodied snakes that inhabit arid scrublands, semi-arid and rocky shrublands, rocky deserts, canyons, and other rocky areas. This species eats rodents, small birds, lizards, small snakes, and amphibians and kills its prey by constriction. Coastal Rosy Boas occur in southwestern California from the coastal slopes of the San Gabriel and San Bernardino mountains, and across the peninsular ranges into the desert in San Diego County (Stebbins 2003).

This species has been observed by RECON biologists on the mitigation parcel (Appendix A, Figure 11). Suitable habitat occurs throughout the mitigation parcel and in the upstream enhancement area.

Two-Striped Gartersnake (*Thamnophis hammondii*) – California Species of Special Concern; San Diego County Group I

The two-striped garter snake is a highly aquatic snake that is rarely found far from water. Two-striped garter snakes inhabit perennial and intermittent streams with rocky beds bordered by willow thickets and other dense vegetation. They may also inhabit stock ponds or other artificially created aquatic habitats. Two-striped garter snakes occur throughout the South Coast and Peninsular Ranges west of the San Joaquin Valley from near Salinas south to La Presa, Baja California, Mexico. The species' elevation range extends from sea level to around 8,000 feet above mean sea level. Two-striped garter snakes forage primarily on fish, fish eggs, and tadpoles. They mate in the spring and bear live young in the fall (Jennings and Hayes 1994).

This species has been observed by RECON biologists in a drainage at the north side of the mitigation parcel (Appendix A, Figure 11). Suitable habitat occurs in drainage within the mitigation parcel and in the upstream enhancement area.

Red Diamond Rattlesnake (*Crotalus ruber*) – California Species of Special Concern; San Diego County Group II

The red diamond rattlesnake is a heavy-bodied rattlesnake with a tan, link, brick red, or reddish dorsal color with a tail that is marked with broad evenly spaced distinct black rings. Its range

extends from near Morongo Valley (San Bernardino County) south along the coast and desert sides of the Peninsular Range to Loreto, Baja California, Mexico. It is found in a variety of habitats, though generally is associated with habitats containing thick brush with large rocks or boulders. Typical habitats include chamise and red-shank as well as coastal sage scrub and desert slope scrub. Its elevation range extends from sea level to around 5,000 feet above mean sea level. Mating occurs in the early spring, and they bear live young between late July and September (Jennings and Hayes 1994).

This species has been observed by RECON within the mitigation parcel (Appendix A, Figure 11). ICF also observed the species during a site visit in November 2015. Suitable habitat occurs throughout the mitigation parcel.

Least Bell's Vireo (*Vireo bellii pusillus*) – Federally Listed as Endangered, State-Listed as Endangered; San Diego County Narrow Endemic; City of Chula Vista Subarea Plan MSCP Covered Species; City of San Diego MSCP Covered Species

The least Bell's vireo is a small, grayish songbird whose breeding distribution extends northwest to from San Diego County north to Santa Barbara County (rarely to Monterey County and formerly to the northern Sacramento Valley), northeast to Inyo County, south into northern Baja California, Mexico, and east into the edges of the deserts at a few points such as at the Mohave River (USFWS 1998a). Nesting elevation ranges from below sea level to at least 4,100 feet. The subspecies winters in southern Baja California (Howell and Webb 1995). Least Bell's vireo numbers are currently increasing, with a 400 to 500% increase estimated between 1986 and 1996. However, they remain imperiled in the long term, primarily by brown-headed cowbird (*Molothrus ater*) nest parasitism and threats to the quantity and quality of remaining potential habitat (USFWS 1998b).

Least Bell's vireos select dense vegetation, low in riparian zones, for nesting. As discussed in Franzreb (1989), among 126 locations of California nests recorded in the literature and in museum records, 71 (56%) were in willows and 14 (11%) were in wild rose (*Rosa* spp.). The remaining nests were distributed among 20 other species of vines, shrubs, herbs, and trees. At least locally, least Bell's vireos will also fairly commonly use non-riparian habitats such as chaparral for foraging and even nest location when more typical habitat is adjacent (Kus and Miner 1989).

Willows often dominate the canopy layer in the species' territories, with a mean canopy height of about 26 feet (Salata 1983). Salata believed that a dense, shrubby layer near the ground was a critical component in the breeding habitat. Goldwasser (1981) found that the most critical structural component is a dense shrub layer from 2 to 10 feet from the ground, which agrees with findings of both Salata (1983) and Gray and Greaves (1984). Vegetation preferences are well-summarized in the study by Goldwasser: "Willows are chosen most frequently as nest sites, although nearly all other common riparian shrub species are used. The frequency with which a given plant is chosen seems to be consistent with the relative abundance of shrubs growing in riparian woodlands. There is no obvious preference for any of the uncommon shrubs as nest sites and no apparent avoidance of the abundant species such as willows."

As determined from field data for Southern California (RECON 1989) vireo nest sites are most frequently located in riparian stands between 5 and 10 years old. Even though mature trees are present at many of the sites, the average age of willow vegetation in the immediate vicinity of most nests was between 4 and 7 years. When mature riparian woodland is selected, vireos nest in areas with a substantial robust understory of willows as well as other plant species (Goldwasser 1981).

Based on rigorous statistical analysis of vireo habitat structure and composition (RECON 1989), vireos appear to select sites with large amounts of both shrub and tree cover, a large degree of vertical stratification, and small amounts of aquatic and herbaceous cover.

This species was observed nesting within the riparian woodland during field surveys conducted by RECON between 2009 and 2013 (Appendix A, Figures 11 and 13). The riparian habitats located within the mitigation parcel and upstream enhancement area provide suitable nesting and foraging habitat.

Coastal California Gnatcatcher (*Polioptila californica californica*) – Federally Listed as Threatened, California Species of Special Concern, San Diego County Group I; City of Chula Vista Subarea Plan MSCP Covered Species Covered Species; City of San Diego MSCP Covered Species

The coastal California gnatcatcher is a small, gray, insect-gleaning bird. It is the only subspecies of the California gnatcatcher occurring in the United States. It is a year-round resident of sage scrub of several subtypes and is currently listed by USFWS as a threatened species (USFWS 1993, 1995). Within California it is found from the Mexican border north to extreme eastern and southern Los Angeles County with several small, disjunct populations known north to the Moorpark area of Ventura County. It extends east into western San Bernardino County and well across cismontane Riverside County. Habitat losses, degradation, and fragmentation due to land alteration and development are considered the major threats (Atwood 1990, 1993).

This species was observed within the coastal sage scrub in the project site during protocol surveys conducted by RECON between 2009 and 2013 (Appendix A, Figure 11). Suitable nesting and foraging habitat occurs in sage scrub habitat located within the mitigation parcel. Suitable habitat does not occur within the upstream enhancement area.

Western Yellow-Billed Cuckoo (*Coccyzus americanus occidentalis*) – Federally Listed as Threatened; State-Listed as Endangered; San Diego County Group Narrow Endemic

This neotropical migrant is a relative of the roadrunner and an inhabitant of extensive riparian forests. It formerly occurred from southwestern British Columbia south to the highlands of northern Mexico and the Yucatan Peninsula, wintering in South America. It has declined from a fairly common, local breeder in much of California 60 years ago, to virtual extirpation, with only a handful of tiny populations remaining in all of California today. Losses are tied to obvious loss of nearly all suitable habitat, but other factors may also be involved. Relatively broad, well-shaded riparian forests are utilized, although it tolerates some disturbance. A specialist to some degree on tent caterpillars, young develop remarkably quickly, covering only 18–21 days from incubation to fledging.

This species was observed in the riparian woodland in 2012 during field surveys conducted by RECON (Appendix A, Figure 11). The species was not observed during field surveys conducted in 2009, 2010, 2011, and 2013. Suitable nesting and foraging habitat occurs in riparian habitat located within the mitigation parcel and the upstream enhancement area.

White-Tailed Kite (*Elanus caeruleus*) – California Fully Protected Species (Nesting)

White-tailed kites were threatened with extinction in North America during the early twentieth century. Populations recovered throughout their range in the U.S. from small populations that survived in California, Texas, and Florida. However, since the 1980s, many white-tailed kite populations have been declining, apparently because of loss of habitat and increased disturbance of nests (Dunk 1995).

The breeding season generally extends from early February through early August. White-tailed kites usually nest in large native trees, although nonnative trees also are occasionally used. Nest trees are generally at the edge of wooded habitat next to open fields. Large trees in areas that have been developed may also be used, although the trees need to be close to open fields for foraging (Dunk 1995). White-tailed kites feed primarily on small mammals including voles (*Microtus* sp.), pocket mice (*Perognathus* sp.), and harvest mice (*Reithrodontomys* sp.) (Dunk 1995).

The white-tailed kite population is on the decline mostly due to urban sprawl; however, this species is still considered fairly widespread throughout the foothills of San Diego County (Unitt 2004).

This species has been observed by RECON biologists within the mitigation parcel. Suitable nesting habitat occurs in the riparian habitats located within the mitigation parcel and upstream enhancement area and foraging habitat occurs throughout the mitigation parcel.

San Diego Cactus Wren (*Campylorhynchus brunneicapillus sandiegensis*) – California Species of Special Concern, San Diego County Group II; City of Chula Vista Subarea Plan MSCP Covered Species; City of San Diego MSCP Covered Species

Cactus wrens are a locally common resident in the Mojave and Colorado Deserts, from Mexico to Inyo and Kern Counties. The San Diego subspecies is found in arid parts of Southern California's westward-draining slopes. The San Diego cactus wren occurs in desert succulent shrub, Joshua tree, and desert wash habitats. It forages for insects, spiders, other small invertebrates, cactus fruits, other fruits, nectar, and seeds. The coastal cactus wren breeds from March to June, commonly with two broods per season and four to five eggs per clutch (Zeiner et al. 1990).

This species has been observed by RECON biologists within the mitigation parcel. Suitable nesting habitat occurs in the upland portions of the mitigation parcel, and foraging habitat occurs throughout the mitigation parcel.

Southern California Rufous-Crowned Sparrow (*Aimophila ruficeps canescens*) – CDFW Watch List; San Diego County Group I; City of Chula Vista Subarea Plan MSCP Covered Species; City of San Diego MSCP Covered Species

Southern California rufous-crowned sparrow inhabits mixed chaparral and coastal sage scrub. In California, its range extends southward from Mendocino and Tehama Counties; this species is most numerous in the western part of this range (Zeiner et al. 1990). Southern California rufous-crowned sparrows breed and forage on dry grass and/or forbs on hillsides with scattered shrubs and rock outcrops. Nests are usually made on the ground, at the base of grass tussock or shrubs. It is a year-round resident and diurnally active, eating mostly insects and spiders during the breeding season and seeds, grass, and forb shoots throughout the year. It breeds from mid-March to mid-June with a peak in May. In Southern California coastal sage scrub, the average sized territory is about 2 acres (Zeiner et al. 1990).

This species was observed within the coastal sage scrub in the mitigation parcel during protocol surveys conducted by RECON between 2009 and 2013 (Appendix A, Figure 11). Suitable nesting and foraging habitat occurs in sage scrub habitat located within the mitigation parcel. Suitable habitat does not occur within the upstream enhancement area.

Yellow Warbler (*Dendroica petechia brewsteri*) – California Species of Special Concern, San Diego County Group II

The yellow warbler is a summer breeding bird in San Diego County strongly associated with mature riparian woodland. This species is also common as a migrant but rare in winter.

This species has been observed by RECON biologists within the mitigation parcel (Appendix A, Figure 11). The riparian habitats located within the mitigation parcel and upstream enhancement area provide suitable nesting and foraging habitat.

Yellow-Breasted Chat (*Icteria virens*) – California Species of Special Concern; San Diego County Group I

The yellow-breasted chat is a summer breeding bird in San Diego County strongly associated with mature, dense riparian woodland. This species is also common as a migrant but rare in winter. The riparian woodland within the project site provides suitable habitat.

This species has been observed by RECON biologists within the mitigation parcel (Appendix A, Figure 11). The riparian habitats located within the mitigation parcel and upstream enhancement area provide suitable nesting and foraging habitat.

San Diego Black-Tailed Jackrabbit (*Lepus californicus bennettii*) – California Species of Special Concern; San Diego County Group II

Black-tailed jackrabbits are habitat generalists (Howard 1995). They prefer open areas with sparse vegetation with scattered cacti and shrubs (Best 1996). Black-tailed jackrabbits require shrubs for hiding, nesting, and thermal cover (Howard 1995). They are common in deserts, grasslands, and agricultural areas (Jameson and Peeters 2004) and can also occur in oak woodlands, pinyon-juniper woodlands, and low- to mid-elevation conifer forests (Howard 1995). In areas with high density of chamise chaparral, jackrabbits prefer open areas interspersed with grasses and tend not to occupy closed canopy chaparral (Howard 1995).

Black-tailed jackrabbits breed year-round. Reproduction is generally dependent of the availability of food (Jameson and Peeters 2004). They can have up to four litters of one to eight young in a year and are strictly vegetarian and opportunistic foragers. Black-tailed jackrabbits prefer grasses and forbs, but will eat any kind of vegetation. Diet will change during the seasons as forage availability changes, shifting from foraging on grasses and forbs to woody perennials during dry periods (Lightfoot et al. 2010). They will also forage on agricultural plants when available (Best 1996).

This species has been observed by RECON biologists within the mitigation parcel (Appendix A, Figure 11). Suitable habitat occurs throughout the mitigation parcel.

San Diego Woodrat (*Neotoma lepida intermedia*) – California Species of Special Concern, San Diego County Group II

The desert woodrat as a whole is distributed from central California southward well into Baja California, Mexico, and across much of the Great Basin as far north as eastern Oregon and southwestern Idaho. The San Diego subspecies is found along the coast of California from San Luis Obispo (San Luis Obispo County) southward and inland to San Fernando (Los Angeles County), the western foothills of the San Bernardino Mountains (San Bernardino County), and Julian (San Diego County). Its distribution continues southward in Baja California, Mexico, at least to a point 20 miles east of Ensenada.

It is a medium-sized native rat locally common in a variety of sunny shrub habitats, frequently in rocky and/or steep terrain and upper drainages. This mainly nocturnal vegetarian often builds its dens low in cactus or rock crevices, but will use other sites as needed. Habitats for this subspecies are dry and/or sunny shrublands, especially (but not necessarily) areas with cactus and abundant rocks and crevices. Desert woodrats do not require a source of drinking water. Sage scrub communities are frequently occupied, but other communities are also used as suitable microhabitats when available.

This species has been observed by RECON biologists within the mitigation parcel (Appendix A, Figure 11). Suitable habitat occurs throughout the mitigation parcel.

Southern Mule Deer (*Odocoileus hemionus fulginata*) – San Diego County Group II; City of Chula Vista Subarea Plan MSCP Covered Species; City of San Diego MSCP Covered Species

Southern mule deer are common across the western U.S. in a variety of habitats from forest edges to mountains and foothills (Whitaker 1996). Mule Deer prefer edge habitats, rarely travel or forage far from water, and are most active around dawn and dusk.

This species has been observed by RECON biologists in the mitigation parcel (Appendix A, Figure11). Suitable habitat occurs throughout the mitigation parcel and in the upstream enhancement area.

1.4.7 Wetland/Jurisdictional Waters

A jurisdictional delineation was performed by ICF biologists within the City of Chula Vista parcel on November 12 and 13, 2014. A jurisdictional delineation was not performed within the upstream enhancement area because no impacts would occur on potential jurisdictional areas as a result of enhancement activities. Prior to beginning the field delineation aerial photography, USGS topographic maps, and National Wetland Inventory maps were analyzed to determine the locations of potential areas of USACE, RWQCB, and CDFW jurisdiction. Based on the pre-field analysis it was determined that both wetland and non-wetland features had the potential to occur within the project area.

Potential jurisdictional features were evaluated for the presence of a definable channel and/or wetland vegetation, soils, and hydrology. The project area was analyzed for potential wetlands using the methodology set forth in the 1987 *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987) and the 2008 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008a). Lateral limits of non-wetland waters

were identified using field indicators (e.g., ordinary high water mark [OHWM]) (USACE 2008b). While in the field, potential jurisdictional features were recorded onto a 100-foot-scale color aerial photograph using visible landmarks and mapped using a Trimble hand-held GPS unit with sub-meter accuracy. Vascular plants were identified using *The Jepson Manual: Vascular Plants of California* (Baldwin et al. 2012) and *The National Wetland Plant List* (Lichvar *et al.* 2014).

A total of 13 features were delineated within the City parcel, including the Otay River, 9 ephemeral/intermittent tributaries, and 3 depressional wetlands/open water areas located farther in the floodplain. Table 4 presents the acreage and linear feet for each feature delineated. Appendix A, Figure 14 shows the location and extent of USACE/RWQCB and CDFW jurisdiction. Below is a brief description of each feature delineated.

Feature 1 is the Otay River, which enters the site from the east (flowing west) and supports wetland habitat within its defined OHWM for approximately 1,306 feet until it sheetflows within a broad floodplain across the remainder of the property.

Feature 2 is an ephemeral drainage, flowing in a northern direction for approximately 1,093 linear feet before entering the Otay River.

Feature 3 is an ephemeral drainage, flowing west along a hillside. Indicators of OHWM and a defined bed and bank end at an access road, and the feature appears to sheetflow toward the bottom of the valley.

Feature 4 supports OHWM and wetland habitat and flows in a northern direction within the survey area. The upstream portion of Feature 4 supports wetland habitat, supporting both shallow groundwater and a dominance of San Diego marsh-elder, a facultative wetland species. However, the downstream portion of the feature does not support wetland habitat or shallow groundwater contributions and is more characteristic of an ephemeral drainage, dominated by upland coastal sage scrub species. Indicators of OHWM and a defined bed and bank end at an access road, and the feature appears to sheetflow toward the bottom of the valley.

Feature 5, also known as O'Neal Canyon Creek, is an intermittent drainage that flows in a northwestern direction within the survey area. This feature supports OHWM and is characteristic of a desert wash; until it hits the valley floor a defined channel no longer exists, and the channel sheetflows west along with the Otay River.

Feature 6 is an ephemeral drainage that flows in a southwestern direction. OHWM was observed throughout the length of the feature. The feature flows outside of the mitigation site survey area, eventually flowing along the valley bottom.

Feature 7 is an ephemeral drainage, flowing in a southern direction before flowing directly within the Otay River.

Feature 8 is an ephemeral drainage that flows in a northwest direction for approximately 321 linear feet before dissipating. Indicators of OHWM and a defined bed and bank end once the feature reaches a flat and broad open space, and appears to only sheetflow toward the bottom of the valley.

Feature 9 is an ephemeral drainage, flowing south along a hillside before turning west, paralleling an access road. The feature eventually peters out and sheetflows along the road, no longer supporting a defined OHWM or bed and bank.

Feature 10 is also known as Salt Creek. Only a short segment (307 linear feet) occurs within the mitigation site. This feature supports both OHWM and wetland habitat, dominated by mule fat and southern cattail (*Typha domingensis*).

Features 11 and 12 are human-made depressional wetlands that are primarily unvegetated open water habitat with a freshwater marsh fringe. These features support both a defined OHWM and wetland habitat.

Feature 13 is a human-made depressional wetland supporting freshwater marsh habitat. This feature supports both a defined OHWM and wetland habitat.

Table 4. Jurisdictional Features Occurring within the City of Chula Vista Parcel

	Stream Length	USACE/RWQCB		CDFW	
Feature	**Linear Feet**	**Non-Wetland (acres)[a]**	**Wetland (acres)[a]**	**Streambed (acres)[a]**	**Riparian (acres)[a]**
Feature 1 (Otay River)	1,306	--	0.98	--	1.94
Feature 2	1,093	0.17	--	0.30	--
Feature 3	678	0.05	--	0.07	--
Feature 4	704	0.08	0.32	0.15	0.32
Feature 5 (O'Neal Canyon Creek)	2,096	0.91	--	1.51	--
Feature 6	891	0.07	--	0.13	--
Feature 7	206	0.01	--	0.02	--
Feature 8	321	0.02	--	0.04	--
Feature 9	588	0.03	--	0.06	--
Feature 10 (Salt Creek)	307	--	0.12	--	0.28
Feature 11	N/A	--	0.05	--	--
Feature 12	N/A	--	0.02	--	--
Feature 13	N/A	--	0.12	--	--
TOTAL	**8,191**	**1.34**	**1.62**	**2.28**	**2.54**

[a] Total acreage may not add up to the total shown; total is reflective of rounding GIS raw data in each category.
USACE: U.S. Army Corps of Engineers
RWQCB: Regional Water Quality Control Board
CDFW: California Department of Fish and Wildlife

1.4.8 Habitat Connectivity and Wildlife Corridors

The project site is connected to open space and provides wildlife habitat, and acts as a wildlife corridor. The study area occurs in the Otay River Valley within the floodplain of the Otay River on the City of Chula Vista parcel. The Otay River Restoration Project site is currently undeveloped and

does not inhibit wildlife movement or disrupt habitat connectivity. The project site is connected to the large areas of undeveloped land and open space as part of the Otay Ranch Preserve.

1.4.9 Trails

As mentioned previously, the mitigation parcel owned by the City of Chula Vista is within a portion of the City of Chula Vista Greenbelt Master Plan boundaries and entirely within the OVRP Concept Plan boundaries. Both of these plans identify future multi-use trails where existing dirt roads are currently located within the mitigation parcel (Appendix A, Figures 7 and 8). These existing dirt roads are used for a variety of purposes by the U.S. Border Patrol, SDG&E, City of San Diego, and OWD, as well as hikers, cyclists, and equestrians. Many of these roads are identified as future multi-use trails as part of the OVRP Concept Plan and the City Greenbelt Master Plan (Appendix A, Figures 7 and 8). Altogether there are approximately 6,500 linear feet of the future Greenbelt Master Plan trail and approximately 10,200 linear feet of OVRP trails that occur on the project site.

As road and trail uses are expected to persist and potentially increase with the future construction of the Otay Villages, it is critical to protect the restoration site while simultaneously educating the public and maintaining utility access. To prevent the restoration site from being disturbed by future users, wood split-rail fencing would be installed at key locations along these existing road and trail corridors (Appendix A, Figure 7 and 8). The fencing, along with signage indicating the general sensitivity of the restoration site and providing wayfinding, would help to minimize trespassing from trail users who would otherwise be unaware of the sensitivity of the habitat restoration area. In addition, educational kiosks would be installed at key viewing locations within the disturbed areas near the existing dirt roadways to help inform the readers of the importance of the restoration site.

Figures 7 and 8 identify the designated Greenbelt Master Plan trail and the OVRP trails, and indicate where these corridors are located within the project site. The figures also indicate which trails (i.e., existing roads) would receive trail improvements such as split-rail fencing, signage, and educational kiosks and which trails would be closed. Improvements associated with the portion of the trail identified within the City of Chula Vista's Greenbelt Master Plan would be consistent with the guidelines of that plan and would be installed on existing roads or disturbed habitat that cross and meander in and out of and along the restoration site's northern boundary. Per the Master Plan, the restoration project would identify a 14-foot-wide trail location for the Greenbelt Trail to accommodate multiple uses. Improvements associated with trails identified under the OVRP Concept Plan would be consistent with the guidelines of that plan and would be installed on existing roads that cut through the restoration site and also meander south and east across the property. The restoration project would allow for trail corridors consistent with Type A, B, and C that range between 4 and 8 feet in width. All road and trail improvements would avoid existing road ponds that support San Diego fairy shrimp by moving the alignment as needed, and the adjacent upland area would be restored with native species.

The proposed restoration project would armor two at-grade road crossings through the active floodplain to provide access to the user community while protecting the restored hydrology on site and would close one redundant crossing at the upstream end. Each crossing would be over-excavated, underlain by native large rock, and reformed to match the stream profile as much as possible for safe crossing. The armoring would be provided to prevent the washing away of the crossings during flood events and eliminate the current berming resulting from consistent vehicle use during wet conditions. These artificial berms currently impound water upstream and force the

limited surface hydrology subsurface. In addition, the restoration project proposes four road closures that would be revegetated per the HMMP, as these are either redundant or relocated as discussed with the U.S. Border Patrol, SDG&E, and OWD. ICF and the City of Chula Vista have been in communication with these entities on these road closures, and all are in agreement that they would not limit their ability to achieve their missions. The Border Patrol has asked to install reflectors along trail fencing at road intersections, trail closures, and at the river crossings at specific locations. The exact location of these reflectors will be coordinated with the Border Patrol to ensure safe passage.

During the 5 years of maintenance and monitoring for the restoration project, the Maintenance Contractor would conduct minor repairs on all fencing, signs, and educational kiosks installed as part of the project improvements. This includes reposting loose signs and fence posts, removing graffiti, and conducting road repair to avoid new ruts or ponds from being artificially created. The maintenance contractor will replace up to two signs per year and one educational kiosk over a 5-year period. If excessive vandalism occurs, Homefed would coordinate with the City of Chula Vista and the County of San Diego to support upkeep through the existing Preserve Owner/Manager (POM) funded by the existing Community Facilities District. After the project has completed the 5 years of maintenance and monitoring and the regulatory agencies have signed off on the mitigation site, San Diego County would maintain OVRP trails and trail improvements per the OVRP Joint Exercise of Powers Agreement. The long-term operation and maintenance of the Chula Vista Greenbelt trail would be performed and managed by the City of Chula Vista per the guidelines in the City of Chula Vista Greenbelt Master Plan. The long-term operation and maintenance of the OVRP trails would be shared by the three responsible jurisdictions (County of San Diego, City of Chula Vista, and City of San Diego) per the guidelines in the OVRP Concept Plan and Trail Guidelines.

1.5 Applicable Regulations

1.5.1 Federal Environmental Regulations

1.5.1.1 Federal Endangered Species Act

The FESA was enacted in 1973 to provide protection to threatened and endangered species and their associated ecosystems. “Take” of a listed species is prohibited except when authorization has been granted through a permit under Section 4(d), 7 or 10(a) of the FESA. “Take” is defined as to harass, harm, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any of these activities without a permit. No species listed as threatened or endangered were detected during surveys, but habitat assessments for listed species were conducted.

1.5.1.2 Migratory Bird Treaty Act

The MBTA was enacted in 1918. Its purpose is to prohibit the kill or transport of native migratory birds, or any part, nest, or egg of any such bird unless allowed by another regulation adopted in accordance with the MBTA. The nests of birds protected by the MBTA occur on the project site.

1.5.1.3 Clean Water Act

In 1948, Congress first passed the federal Water Pollution Control Act, which was amended in 1972 and became known as the Clean Water Act. The Clean Water Act regulates the discharge of

pollutants into the waters of the U.S. Under Section 404, permits need to be obtained from the USACE for discharge of dredge or fill material into waters of the U.S. Under Section 401, Water Quality Certification from the RWQCB needs to be obtained if there would be any impacts on waters of the U.S. There are several areas within the project site that may be regulated as waters of the U.S.

1.5.2 State Environmental Regulations

1.5.2.1 California Environmental Quality Act

CEQA requires that biological resources be considered when assessing the environmental impacts resulting from proposed actions. CEQA does not specifically define what constitutes an "adverse effect" on a biological resource. Instead, lead agencies are charged with determining what specifically should be considered an impact.

1.5.2.2 California Fish and Game Code

California Endangered Species Act

CESA prohibits the take of any species that the California Fish and Game Commission determines to be a threatened or endangered species and is administered by the CDFW. Incidental take of these listed species can be approved by the CDFW. Under the act, "take" is defined as to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill. Habitat assessments for potential sensitive species were conducted for this project.

Lake and Streambed Alteration Program

The Lake and Streambed Alteration Program is administered by the CDFW and is found in Section 1600 et seq. of the California Fish and Game Code. The CDFW is to be notified if the project will affect lake or streambed resources. The project has been designed to avoid streams and other waterways.

1.5.2.3 Porter-Cologne Water Quality Control Act

This act is the California equivalent of the federal Clean Water Act. It provides for statewide coordination of water quality regulations through the establishment of the California State Water Resources Control Board and nine separate Regional Water Quality Control Boards that oversee water quality on a day-to-day basis at the regional/local level. The project has been designed to avoid streams and other waterways.

1.5.2.4 Natural Community Conservation Planning Act of 1991

The Natural Community Conservation Planning (NCCP) Act is designed to conserve natural communities at the ecosystem scale while accommodating compatible land use. The CDFW is the principal state agency implementing the NCCP Program. NCCP plans developed in accordance with the act provide for comprehensive management and conservation of multiple wildlife species and identify and provide for the regional or area-wide protection and perpetuation of natural wildlife diversity while allowing compatible and appropriate development and growth. The project site is located within the San Diego MSCP Subregional Plan for the southwestern portion of San Diego County; specifically, the project crosses within the City of Chula Vista MSCP subarea planning area as well as the County of San Diego and the City of San Diego. The proposed restoration project is

contained within the City of Chula Vista parcel boundary and as such is within the City's MSCP Subarea Plan. The upstream enhancement area crosses the City of San Diego and County of San Diego Subarea Plans.

1.5.3 Local Environmental Regulations

1.5.3.1 San Diego County General Plan – Open Space Element (Part I), Conservation Element (Part X), and Community and Subregional Plans

The Open Space Element and the Conservation Element of the County General Plan provide guiding principles for the conservation of biological resources. The Open Space Element outlines the goals and policies pertaining to each type of open space, not all of which are for the preservation of biological resources. The Conservation Element, specifically Chapters 3 and 4, addresses County policies relating to water, vegetation, and wildlife habitat. Appendix K of the Conservation Element outlines the County's Resource Conservation Areas (RCA), which are further described and delineated in each of the Community and Subregional Plans. Each RCA has been designated as such for a purpose specific to that area. When a site is located within a mapped RCA, the project must comply with the relevant policies for that RCA (i.e., avoidance of oaks, etc.). The project site is not known to occur within a RCA.

1.5.3.2 County of San Diego Zoning Ordinance

Land may also have a zoning designation or Special Area Regulation with certain restrictions pursuant to the Zoning Ordinance. For instance, lands may have a zoning designation of S81 Ecological Resource Area Regulations. The few uses allowed on lands with this designation are subject to strict provisions and limitations. The Zoning Ordinance also applies other Special Area Regulations with specific restrictions and provisions, including designator G (Sensitive Resource), R (Coastal Resource Protection Area), and/or V (zoning designation for Vernal Pool Area). The project site is not known to occur within a zoning designation with specific restrictions pertaining to biological resources.

1.5.3.3 Chula Vista MSCP Subarea Plan

The MSCP Subregional Plan is implemented through individual Subarea Plans adopted by each jurisdiction receiving take authorization for covered species. The Chula Vista MSCP Subarea Plan was approved by the City in May 2003 and received take authorization in January 2005. The Subarea Plan provides for conservation of upland habitats and species through Preserve design, regulation of impacts and uses, and management of the Preserve. The proposed project is considered a "Covered Project" under the Chula Vista MSCP Subarea Plan. The 100% Conservation Areas are either already in public ownership or will be dedicated to the Preserve as part of the development approval process for Covered Projects. Any portions of Covered Projects that are located within 100% Conservation Areas must be consistent with conditions allowing specific land uses within the Preserve, as outlined in Chapter 6.0 of the Subarea Plan, and are subject to the narrow endemic species policy (avoidance and minimization), as outlined in Section 5.2.3, and the Wetlands Protection Program, as outlined in Section 5.2.4 of the Subarea Plan.

In compliance with the MSCP Subregional Plan and the Subarea Plan and as a condition of issuance of Take Authorization by the wildlife agencies, the City established a development standard and an implementing ordinance, the Habitat Loss and Incidental Take (HLIT) Ordinance. The HLIT is

consistent with the conservation and mitigation goals of the MSCP Subregional Plan and the City Subarea Plan, which require impacts on sensitive vegetation communities to be avoided and minimized to the maximum extent practicable. Furthermore, the HLIT identifies specific impact and mitigation requirements for impacts on native and some nonnative communities (e.g., nonnative grassland). The HLIT evaluates impacts on three primary resource types as described below based on the location of the project within the MSCP subarea. This project is located within the 100% Conservation Areas of Covered Projects (i.e., within the Preserve). Projects located in 100% Conservation Areas of Covered Projects are limited to the compatible uses described in Section 6.2 of the Subarea Plan. Habitat restoration and enhancement activities are considered compatible uses as described under Section 6.2.2.

Under Section 6.2.2, habitat restoration and enhancement activities are subject to approval by the City and/or Appropriate Managing Entity, as applicable, and the underlying landowner, including obtaining any necessary permits. All activities must be consistent with the Subarea Plan. This includes any conditions associated with 401 certifications, USACE 404 permits, 1600 permits, or other resource conservation permits. In addition, reasonable access will be provided to the Wildlife Agencies (CDFW and USWFS) for the purposes of monitoring species and habitat and evaluating compliance with the permit. Any take resulting from management and/or scientific activities undertaken pursuant to Section 7.0 of the Subarea Plan, including Section 7.5 - City Planning Component Framework Management Plan - and the Otay Ranch RMP (Appendices D, E, and/or F), and/or pursuant to area-specific management directives prepared pursuant to the Subarea Plan, will be authorized by the Take Authorizations. All of the above activities would be carried out under a regional program implemented by the Wildlife Agencies, City of Chula Vista, or Preserve Owner/Manager.

Natural Vegetation Protection

Natural vegetation is vegetation identified as Tier I, II, or III on Table 5-3 of the Chula Vista MSCP Subarea Plan. Impacts on Tier I, II, and III habitats will be mitigated pursuant to HLIT mitigation standards contained in Table 5-3 of the Subarea Plan. To ensure complete assembly of the Preserve as planned by this Subarea Plan, the City will encourage all mitigation to be conducted within the Preserve.

Narrow Endemic Species Protection

Impacts on covered Narrow Endemic Species from Planned and Future Facilities located within the 100% Conservation Areas of Covered Projects will be avoided to the maximum extent practicable. Where impacts are demonstrated to be unavoidable, impacts will be limited to 5% of the total Narrow Endemic Species population within the project area. Unavoidable impacts on narrow endemics are subject to the equivalency findings, limitations, and provisions of Section 5.2.3.6, Equivalency Findings, of the Subarea Plan.

If impacts exceed 5% of the covered Narrow Endemic Species population within the project area after comprehensive consideration of avoidance and minimization measures, the City must make a determination of biologically superior preservation consistent with Section 5.2.3.7 of the Subarea Plan. Regardless of the percent of impact on Narrow Endemic Species, the findings of equivalency and wildlife agency concurrence are required.

Wetlands Protection Program

As part of the CEQA review, development projects that contain wetlands will be required to demonstrate that impacts on wetlands have been avoided to the greatest extent practicable and, where impacts are nonetheless proposed, that such impacts have been minimized. For unavoidable impacts on wetlands within the Development Area, the mitigation ratio will be in accordance with the wetlands mitigation ratios identified in the Subarea Plan. The wetlands mitigation ratios provide a standard for each habitat type but may be adjusted depending on both the functions and values of the impacted wetlands and the wetlands mitigation proposed by the project. The City may also consider the wetland habitat type(s) being impacted and utilized for mitigation in establishing whether these standards have been met.

1.5.3.4 Otay Ranch Resource Management Plan

The Otay Ranch Resource Management Plan (RMP) was approved by the City in October of 1993 (City of Chula Vista and County of San Diego 1993. 2002). The RMP is composed of two separate documents: the Phase 1 RMP and the Phase 2 RMP. The Phase 1 RMP identifies Preserve areas within Otay Ranch and contains policies regarding species and habitat conservation and long-term management of the Preserve. The Phase 2 RMP was approved by the City in 1996 and incorporated into the Chula Vista MSCP Subarea Plan when the Subarea Plan was approved in 2003 (City of Chula Vista 2003). This Phase 2 RMP includes ranch-wide studies that were conducted pursuant to the Phase 1 RMP and provides additional detail on conveyance, management, and funding. The General Development Plan (GDP) identifies conceptual development, circulation, and open space plans. In addition to the GDP and RMP for Otay Ranch, the municipalities of southern San Diego County collaborated in producing the MSCP Subregional Plan.

In a regional context, the Otay Ranch RMP Preserve provides CEQA mitigation for development of less sensitive areas within the areas proposed for development on Otay Ranch. Therefore, the project design must demonstrate conformance with the conservation goals and Preserve boundaries of the GDP, RMP, and Chula Vista MSCP Subarea Plan.

1.5.3.5 Otay River Watershed Management Plan

The ORWMP provides 17 strategies that are intended to protect, enhance, restore, and/or manage watershed resources in consideration of expected natural and anthropogenic stressors. Each strategy is focused on achieving one or more of the stakeholder-identified ORWMP goals. Specifically, the project addresses one of the key strategies identified in the ORWMP: “Restore the Lower Otay River Floodplain to Enhance the Quality of Water Entering San Diego Bay.” The strategy is ranked as a HIGH priority along with 8 other strategies based on their expected large benefits to the watershed and their capacity to build upon other efforts being planned or underway (Aspen 2007).

1.5.3.6 Otay Valley Regional Park Concept Plan

In 1997 the OVRP Concept Plan was released. The OVRP Concept Plan was the result of a multi-jurisdictional planning effort in the Otay River Valley by the County of San Diego and the cities of Chula Vista and San Diego. The Concept Plan proposed a boundary for the OVRP that includes this restoration plan boundary. The OVRP Concept Plan also included recommendations for open space/core preserve areas, recreation areas, trail corridors, staging areas, viewpoint and overlook

areas, and interpretive centers. Although this restoration project was not designed to specifically include components of the OVRP Concept Plan, it does not preclude any of these elements. The restoration project has identified trail corridors in compliance with the OVRP Concept Plan and would implement trail improvements to a portion of the existing dirt roads and existing unofficial trails within the City parcel both through and adjacent to the restoration project area. These improvements include installing wood split-rail fencing, trail signage, and educational kiosks, which all serve to designate the roads and trails and to protect the restoration site from existing uses. Two existing road crossings through the restoration project area running north-to-south have been identified as necessary for property access by the U.S. Border Patrol, SDG&E, OWD, and the City of Chula Vista. These crossings also overlap with OVRP trail corridors. These road and trail crossings have been designed as part of the restoration project to be at-grade and will be protected using native rock to minimize erosion and maintenance while allowing for unobstructed hydrology and sediment transport. Any other improvements to the roads and trails or other OVRP recreational facilities planned in the river valley would be evaluated under separate regulatory processes including subsequent environmental review and resource permitting if necessary.

The proposed project would be consistent with OVRP goals and policies to site and develop park features and facilities consistent with the requirements and guidelines of the MSCP and all federal, state, and local policies; encourage recreational uses as buffers between the Open Space/Core Preserve Area and new private development; and encourage development standards for roads across the Otay River to minimize impacts on habitat and wildlife movement as well as trail connectivity. The proposed project would also comply with the OVRP Trail Guidelines for education, design and layout, erosion control, signage, fencing, and educational kiosks. The intent of the restoration project is to ensure the OVRP Concept Plan is accommodated, including additional recreational facilities outside of the restoration project area, but on the city of Chula Vista property. This restoration project is not intended to restrict trail development or use as long as it is done to minimize (to the extent practicable) impacts on aquatic resources and other protected habitats.

1.5.3.7 City of Chula Vista Greenbelt Master Plan

The City of Chula Vista Greenbelt Master Plan provides guidance and continuity for planning open space and constructing and maintaining trails that encircle the City of Chula Vista. The plan's primary purpose is to provide goals and policies, trail design standards, and implementation tools that guide the creation of the Greenbelt system. The Greenbelt system is composed of a series of open space segments connected by a multi-use trail extending through each segment; from the channelized Sweetwater River, along golf courses and banks of the Otay Lakes, following the Otay River valley to the Chula Vista Bayfront. The restoration project would implement minor improvements to a portion of the existing dirt road/trail identified within the Otay Valley Regional Park East/Otay Ranch Village Greenway Segments. The proposed project would be consistent with goals and policies to provide connected open space areas around the City of Chula Vista to enhance and protect native biological and sensitive habitats as well as establish a greenbelt system that ensures public access utilizing existing fire roads, access roads, and/or utility easements for the trail system when possible and limit the use of multi-use trails to non-motorized uses except for motorized wheelchairs, and utility, maintenance, and emergency vehicles. The restoration project would also comply with greenbelt design standards for trail signage, educational kiosks, and wood split-rail fencing. The intent of the restoration project is to ensure the Greenbelt trail is accommodated by identification of a realistic corridor, installation of trail signage, split-rail fencing, and educational kiosks while avoiding any sensitive resources. The existing roads and trails will be

moved or modified as needed to avoid road ponds, protect the San Diego fairy shrimp, and the restoration area. The restoration project does not preclude the future implementation of new or upgraded trail facilities identified in the City of Chula Vista Greenbelt Master Plan on the property. Additional trail amenities, if needed, would be evaluated and approved through a subsequent environmental review, if necessary, and associated permitting process if needed.

Chapter 2
Project Effects

2.1 Impact Definitions

Biological resource impacts can be considered direct, indirect, or cumulative. They will also be either permanent or temporary in nature.

Direct: Occur when biological resources are altered, disturbed, or destroyed during project implementation. Examples include clearing vegetation, encroaching into wetland buffers, diverting surface water flows, and the loss of individual species and/or their habitats.

Indirect: Occur when project-related activities affect biological resources in a manner that is not direct. Examples include elevated noise and dust levels, increased human activity, decreased water quality, and the introduction of invasive wildlife (domestic cats and dogs) and plants.

Cumulative: Occur when biological resources are either directly or indirectly impacted to a minor extent as a result of a specific project, but the project-related impacts are part of a larger pattern of similar minor impacts. The overall result of these multiple minor impacts from separate projects is considered a cumulative impact on biological resources.

Temporary: Temporary impacts can be direct or indirect and are considered reversible. Examples include the removal of vegetation from areas that will be revegetated, elevated noise levels, and increased levels of dust.

Permanent: Permanent impacts can be direct or indirect and are not considered reversible. Examples include the removal of vegetation from areas that will have permanent structures placed on them or landscaping an area with nonnative plant species.

2.2 Project Effects on Biological Resources

Impacts on each sensitive biological resource are summarized below. The total project footprint includes impacts associated with equipment staging, soil removal, and soil stockpiling. All impacts associated with this project are considered temporary, as no permanent structures will be constructed, and all resources and habitats will be restored on site to functions and values equal to or greater than the existing conditions.

2.2.1 Habitats

Table 2 presents the vegetation communities that have been mapped within the project area and the acreage of impacts on those vegetation communities from grading and habitat restoration. The Otay River Restoration Project will have an impact on habitat and vegetation communities. Although the project includes the removal of nonnative vegetation communities, the impact of this activity is considered temporary because those areas will be replanted with native vegetation, and there will be a net-gain in native vegetation communities replacing nonnative communities.

2.2.2 Sensitive Plants

The project area contains suitable habitat for a number of sensitive plant species (identified in Appendix D) as depicted in Appendix A, Figure 10. Grading activities will result in the temporary loss of vegetation that could result in impacts on sensitive plant species, including the loss of individuals. No narrow endemic plant species occur within the limits of grading, and no impacts on narrow endemic plant species are anticipated to occur. Potential impacts on other sensitive plant species occurring within the limits of grading may include singlewhorl burrobush, Tecate cypress, San Diego marsh-elder, southwestern spiny rush, and blue streamwort.

Narrow endemic plant species occurring within restoration areas that may be impacted by the project include Otay tarplant, variegated dudleya, San Diego barrel cactus, and spreading navarretia. Other sensitive plant species occurring within enhancement areas that may be impacted by the project include Otay Manzanita, south coast saltscale San Diego sunflower, Palmer's grappling hook, graceful tarplant, decumbent goldenbush, small-flowered microseris, Munz's sage, ashy spike-moss, and San Diego County needlegrass.

2.2.2.1 Critical Habitat

Otay Tarplant

Grading activities related to the proposed project will temporarily impact approximately 2.76 acres of designated Otay tarplant critical habitat, and habitat restoration activities will impact approximately 6.89 acres of Otay tarplant critical habitat within the City of Chula Vista parcel (Table 5 and Appendix A, Figures 10 and 15). Although the grading activities will affect Otay tarplant critical habitat, the Primary Constituent Elements (PCEs) of clay soils are not present within the grading area; the grading area has been disturbed and Otay tarplant is not expected within the grading area. Impacts are not expected to occur in the outer floodplain and upland restoration areas outside of the grading footprint as this area is heavily degraded, dominated by nonnative species, and lacks suitable soil structure.

Spreading Navarretia

Designated spreading navarretia critical habitat occurs at the southeast corner of the City of Chula Vista parcel (Appendix A, Figures 10 and 15). The critical habitat is located well outside of the grading limits and restoration boundary. No activities associated with any phase of the restoration project will impact designated spreading navarretia critical habitat.

Table 5. Otay Tarplant Critical Habitat Temporary Impacts within the Mitigation Parcel

Modified Holland Code	Habitat/Vegetation Community	Otay Tarplant Critical Habitat within Mitigation Parcel[a]	
		Grading Limits	Outside Grading Limits*
65100	Arundo-Dominated Riparian	0.01	--
37200	Chamise Chaparral	--	--
32500	Diegan Coastal Sage Scrub	0.19	0.71
	Diegan Coastal Sage Scrub - *Disturbed*	--	0.79
11300	Disturbed Habitat	0.06	0.41
79100	Eucalyptus Woodland	0.04	0.59
64140	Fresh Water (Open Water)	0.07	--
52400	Freshwater Marsh	--	--
63310	Mule Fat Scrub	--	0.06
42200	Nonnative Grassland	--	2.14
44320	San Diego Mesa Vernal Pool Complex	--	--
61330	Southern Cottonwood - Willow Riparian Forest	--	0.35
	Southern Cottonwood - Willow Riparian Forest - *Disturbed*	0.41	0.62
83200	Southern Interior Cypress Forest	0.02	--
37120	Southern Mixed Chaparral	--	0.02
63300	Southern Riparian Scrub	--	--
63320	Southern Willow Scrub	--	0.08
	Southern Willow Scrub *Disturbed*	--	0.22
63810	Tamarisk Scrub	1.96	0.8
12000	Urban/Developed	--	--
42000	Valley and Foothill Grassland	--	0.1
	Total Acreage	**2.76**	**6.89**

[a] Otay Tarplant Critical Habitat does not overlap with the upstream enhancement area.

* Acreage within the restoration site where habitat type will be temporarily impacted, but the result will be a net gain in habitat type and quality. Work in this area is not associated with grading and will have a minimal ground disturbance beyond vegetation removal, reseeding, and replanting.

2.2.3 Sensitive Wildlife

The project area contains suitable habitat for a number of special-status wildlife species (Appendix A, Figure 11). Grading activities will result in the temporary loss of vegetation that could result in

impacts on special-status wildlife species, including the loss of individuals. If conducted during the nesting season, the grading of vegetation could result in the loss of active nests.

2.2.3.1 Critical Habitat

Coastal California Gnatcatcher

Coastal California gnatcatcher critical habitat is designated over the entire City of Chula Vista parcel. Grading activities related to the proposed restoration project will temporarily impact approximately 43.38 acres of designated coastal California gnatcatcher critical habitat, and habitat restoration activities will impact approximately 60.51 acres of designated coastal California gnatcatcher critical habitat within the City of Chula Vista parcel (Table 6 and Appendix A, Figures 11 and 15). Gnatcatcher PCE habitats within the restoration project boundary include disturbed Diegan coastal sage scrub, as well as inclusions of alluvial fan scrub. The proposed grading limits include tamarisk scrub on previously gravel-mined riverwash alluvium; although tamarisk scrub riparian areas may be utilized for California gnatcatcher foraging, particularly in the summer months, they are not known to be nesting habitat and are not a PCE habitat. The disturbed Diegan coastal sage scrub in the remainder of the restoration area is sparely vegetated Diegan coastal sage scrub on alluvium, includes species such as California sagebrush and California buckwheat, and has the appropriate PCE habitat for nesting coastal California gnatcatcher. The habitat restoration activities outside of the grading limits will not affect coastal California gnatcatcher breeding because they will be conducted outside the breeding season and will improve the quality of habitat for coastal California gnatcatcher.

Quino Checkerspot Butterfly

The restoration activities occurring on the City of Chula Vista parcel are located outside of designated Quino checkerspot butterfly critical habitat. Designated Quino checkerspot butterfly critical habitat is located to the east of the City of Chula Vista parcel within the City of San Diego and County of San Diego parcels in the upstream enhancement area (Appendix A, Figures 11 and 15). Activities in the upstream enhancement area will impact approximately 2.74 acres of mapped Quino checkerspot butterfly critical habitat; however, the impacts occur in riparian habitat, which doesn't provide suitable habitat for the butterfly (Table 6 and Appendix A, Figures 11 and 15). The presence of riparian habitat within the mapped critical habitat was determined via low resolution mapping. Enhancement activities will occur within the stream channel and will not result in any removal of suitable Quino checkerspot butterfly habitat or any of the PCEs of clay soils and host plants.

San Diego Fairy Shrimp

Designated San Diego Fairy Shrimp critical habitat occurs at the southeast corner of the City of Chula Vista parcel (Appendix A, Figure 15). The critical habitat is outside of the restoration project boundary and the upstream enhancement areas. No activities associated with the current or potential future phases of the restoration project will impact designated San Diego fairy shrimp critical habitat.

Table 6. Coastal California Gnatcatcher and Quino Checkerspot Butterfly Critical Habitat Temporary Impacts within the Project Study Area

Modified Holland Code	Habitat/Vegetation Community	Restoration Project Temporary Impacts (acreage)		
		Coastal California Gnatcatcher Critical Habitat[a]		Quino Checkerspot Butterfly Critical Habitat[b]
		Mitigation Parcel Boundary		
		Grading Limits	Outside Grading Limits*	Upstream Enhancement Area*
65100	Arundo-Dominated Riparian	0.02	--	--
37200	Chamise Chaparral	--	--	--
32500	Diegan Coastal Sage Scrub	1.5	2.29	--
	Diegan Coastal Sage Scrub – *Disturbed*	0.58	18.89	--
11300	Disturbed Habitat	0.52	6.54	--
79100	Eucalyptus Woodland	1.77	2.89	--
64140	Fresh Water (Open Water)	0.07	0.10	--
52400	Freshwater Marsh	0.17	0.08	--
63310	Mule Fat Scrub	--	0.27	--
42200	Nonnative Grassland	--	6.94	1.41
44320	San Diego Mesa Vernal Pool Complex	--	--	--
61330	Southern Cottonwood – Willow Riparian Forest	--	1.34	--
	Southern Cottonwood – Willow Riparian Forest – *Disturbed*	0.43	1.40	--
83200	Southern Interior Cypress Forest	0.13	0.09	--
37120	Southern Mixed Chaparral	--	0.02	--
63300	Southern Riparian Scrub	--	--	--
63320	Southern Willow Scrub	0.01	--	--
	Southern Willow Scrub *Disturbed*	0.96	0.02	--
63810	Tamarisk Scrub	35.09	19.79	1.33
12000	Urban/Developed	--	--	--
42000	Valley and Foothill Grassland	--	2.02	--
	Total Acreage	**41.25**	**62.68**	**2.74**

[a] Coastal California Gnatcatcher critical habitat does not overlap with the upstream enhancement area.

[b] Quino Checkerspot critical habitat does not overlap with the City of Chula Vista mitigation parcel.

* Acreage within the restoration site where habitat type will be temporarily impacted, but the result will be a net gain in habitat type and quality. Work in this area is not associated with grading and will have a minimal ground disturbance beyond vegetation removal, reseeding, and replanting.

2.2.4 Wetlands and Jurisdictional Waters

The proposed project design would result in temporary impacts on wetlands and jurisdictional areas within the City of Chula Vista parcel. Table 7 details the acreage and the jurisdiction for temporary impacts associated with the Otay River Restoration Project.

Table 7. Wetlands and Jurisdictional Waters Temporary Impacts

	Stream Length	USACE/RWQCB		CDFW	
Otay River Restoration Site	**Linear Feet**	**Non-Wetland (acres)[a]**	**Wetland (acres)[a]**	**Streambed (acres)[a]**	**Riparian (acres)[a]**
Pre-Restoration Site Totals	8,191	1.34	1.62	2.28	2.54
Temporary Impacts from Grading	2,211	0.116	1.01	0.225	0.19
Temporary Impacts from Enhancement within City Parcel	3,534	0.039	0.169	0.10	1.76

[a] Total acreage may not add up to the total shown because of rounding error.
USACE: U.S. Army Corps of Engineers
RWQCB: Regional Water Quality Control Board
CDFW: California Department of Fish and Wildlife

2.2.5 Core Wildlife Area/Wildlife Corridors

Temporary impacts in the project area will be minimal with regard to wildlife habitat. The proposed project is not expected to significantly change the overall use and foraging areas for wildlife in the area. Short-term construction activity is expected to take place primarily within existing disturbed areas during daylight hours, with minimal impacts on local wildlife movement during construction. The proposed project will not affect a wildlife corridor or core wildlife area.

Chapter 3
Special-Status Species

3.1 Guidelines for the Determination of Significance

A project would have a potentially significant effect on biological resources if the project would have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS.

Specifically, any of the following conditions would be considered significant.

3A. The project would impact one or more individuals of a species listed as federally or state endangered or threatened.

3B. The project would impact the regional long-term survival of a County Group A or B plant species, or a County Group I animal species, or a species listed as a state Species of Special Concern, or a narrow endemic plant species under the Chula Vista MSCP Subarea Plan.

3C. The project would impact the regional long-term survival of a County Group C or D plant species or a County Group II animal species, or a covered animal species under the Chula Vista MSCP Subarea Plan.

3D. The project would impact arroyo toad aestivation, foraging, or breeding habitat.

3E. The project would impact golden eagle habitat.

3F. The project would result in a loss of functional foraging habitat for raptors.

3G. The project would impact the viability of a core wildlife area, defined as a large block of habitat (typically 500 acres or more not limited to project boundaries, though smaller areas with particularly valuable resources may also be considered a core wildlife area) that supports a viable population of a sensitive wildlife species or an area that supports multiple wildlife species.

3H. The project would cause indirect impacts, particularly at the edge of open space or other natural habitat areas.

3I. The project would impact occupied burrowing owl habitat.

3J. The project would impact occupied cactus wren habitat or formerly occupied coastal cactus wren habitat that has been burned by wildfire.

3K. The project would impact occupied Hermes copper butterfly habitat.

3L. The project would impact the nesting success of sensitive animals through grading, clearing, fire fuel modification, and/or noise-generating activities such as construction.

Each of these significance criteria is discussed in Section 3.2, *Analysis of Project Effects*, with respect to the proposed project.

3.2 Analysis of Project Effects

Each of the significance criteria listed above is discussed herein with respect to the project's anticipated effects. Those criteria for which impacts are not anticipated are discussed briefly at the end of the section.

3A. The project has the potential to impact one or more individuals of a species listed as federally or state endangered or threatened.

Otay tarplant occurs outside of the restoration project boundary and will not be impacted as a result of the project (Appendix A, Figure 11). As the species occurs along an access route, flagging will be placed to ensure avoidance during egress and ingress to the project site. Spreading navarretia occurs in a localized area within the southern portion of the restoration project boundary within the upland restoration area and will be flagged and avoided during project activities (weeding and planting) (Appendix A, Figure 11). The project will comply with the allowable threshold for narrow endemic species per the City of Chula Vista Subarea Plan and will result in 100% avoidance of both species. The project will not significantly affect the regional long-term survival of these species. In addition implementation of Project Design Measures BIO-5, *Special-Status and Succulent Plant Salvage Plan*, and BIO-8, *Public Access, Trails, and Recreation* (Section 1.2.1, *Project Design Avoidance and Minimization Features*) will ensure persistence of viable populations of these species within the project area and limit trespassing into the restoration project and special-status plant populations. The project is a restoration project and will ultimately improve and enhance habitat and populations of these species within the project area.

The 13.18 acres San Diego Mesa vernal pool complex, located outside of the restoration project boundary, in the northeastern corner of the property provides suitable although degraded habitat for federally listed San Diego fairy shrimp. This area is heavily degraded with a substantial nonnative thatch layer, as such ponding has been limited and fairy shrimp have not been observed during recent RECON monitoring efforts. A small restoration effort is underway in this area but is targeting Quino checkerspot and not specifically vernal pool fairy shrimp. The vernal pool complex is outside of the restoration boundary and will be completely avoided. In addition, San Diego fairy shrimp and the common Versatile fairy shrimp (*Branchinecta lindahli*) have been observed in discrete locations throughout the project site, many in road ruts. Project Design Measure BIO-7, *Vernal Pool-Dependent Species*, will ensure avoidance of known locations of fairy shrimp and road ruts. All potential fairy shrimp habitat features such as road ruts and other seasonal ponded areas will be temporarily fenced and avoided during construction activities such as truck movement and storage during the wet season. All road and trail improvements (fencing, signage, and educational kiosks) will avoid existing road ponds that support San Diego fairy shrimp by moving the alignment as needed. Access routes will be rerouted to avoid these ponding features, and new routes will replace existing roads/trails to avoid future impacts associated with vehicular and recreational use. For portions of the existing roads/trails with ponds, the official location and width of the road/trail will avoid the ponded areas. In addition, where appropriate the adjacent upland areas surrounding road ruts will be restored with native species. Wood split-rail fencing, boulders, and signage will be used to inform the public of the sensitivity of the area and deter them from trespassing into the ponded areas and into the river restoration project. Though the majority of grading will occur within the Otay River floodplain, some grading and staging of equipment will occur in upland areas outside of the floodplain. All potentially suitable habitat for San Diego fairy shrimp will be avoided during the wet season.

Quino checkerspot butterfly were detected within the project area during surveys conducted by RECON in 2013 (Appendix A, Figure 15). During those same surveys RECON mapped suitable quino checkerspot habitat within the project area and ranked it into three levels of quality based on the presence and density of host plants (Appendix A, Figure 14). All of the detections and mapped suitable habitat are outside of the grading limits and upstream enhancement area for the project and, therefore, will not be impacted by restoration activities. The suitable habitat for Quino checkerspot butterfly within the restoration project boundary will ultimately increase in quality as a result of restoration activities as those areas will be managed for nonnative plant species, and host plants will be further seeded.

A total of 5.48 acres of riparian habitat and 0.50 acre of mulefat scrub occurs in the in the project area, and 56.35 acres of tamarisk scrub habitat occurs in the Otay River channel in the project area. The project includes grading 0.99 acre and enhancing 0.77 acre of riparian habitat, enhancement of 0.27 acre of mulefat habitat, and grading 35.21 acres and enhancing 21.11 acres of tamarisk scrub habitat. These habitats provide nesting habitat for a number of bird species, including federally or state-listed least Bell's vireo and western yellow-billed cuckoo. The project will avoid most significant stands of riparian habitat in the project site (Appendix A, Figure 13), and the enhancement will be conducted through the use of hand tools to drill and poison nonnative trees that will be left in place. Much of the existing tamarisk will be removed and replanted with native riparian woodland species. Grading and enhancement activities will be conducted outside of the nesting season for least Bell's vireo and yellow-billed cuckoo. Therefore, there will be no impacts on nesting birds. Though the project will result in the removal of individual trees the project has been designed to avoid grading in riparian habitats. The restoration project will ultimately benefit least Bell's vireo and yellow-billed cuckoo by enhancing suitable nesting and forging habitat in the Otay River channel.

A total of 241.69 acres of upland habitats, including coastal sage scrub, chaparral, grasslands, cypress forest, eucalyptus woodland, grassland, and nonnative vegetation provide habitat for a number of special-status wildlife species. The project includes grading 3.01 acre of coastal sage scrub and enhancing 21.20 acres of coastal sage scrub habitats. This habitat is suitable for federally listed coastal California gnatcatchers, which have been observed in the project area. Grading activities in coastal sage scrub could significantly impact coastal California gnatcatchers by temporarily removing suitable habitat. The project has been designed to avoid the nesting season. Therefore, no coastal California gnatcatcher nests will be impacted. Gnatcatchers that are within the grading area will be able to move to adjacent coastal sage scrub within the project site or off site that will not be impacted. Additionally, the project is a restoration project that will ultimately improve habitat for coastal California gnatcatchers by enhancing coastal sage scrub habitat.

3B. The project has the potential to impact the regional long-term survival of a species listed as a state Species of Special Concern; a CRPR 1B or 2B plant species; a County Group A or B plant species, or a County Group I animal species; or a narrow endemic species under the Chula Vista MSCP Subarea Plan.

Variegated dudleya, San Diego barrel cactus, Tecate cypress, decumbent goldenbush, San Diego marsh-elder, and blue streamwort occur within the restoration project areas, including the limits of grading as well as the upstream enhancement areas. Otay tarplant and spreading navarretia are both listed species and were discussed under the 3A analysis above. Potential impacts on these

species as a result of grading and restoration activities will either be avoided through project design or will not significantly affect the regional long-term survival of these species. Implementation of Project Design Measures BIO-5, *Special-Status and Succulent Plant Salvage Plan*, and BIO-8, *Public Access, Trails, and Recreation*, will ensure persistence of viable populations of these species within the project area and limit trespassing into the restoration project and special-status plant populations. The project is a restoration project and will ultimately improve and enhance habitat and populations of these species within the project area.

Impacts on County Group I animal species or Species of Special Concern as a result of upstream enhancement activities are not expected and will not significantly affect the regional long-term survival of these species. The project is a restoration project that will ultimately improve and enhance habitat function of suitable habitats within the project area.

3C. The project has the potential to impact the regional long-term survival of a County Group C or D plant species or a County Group II animal species, or a covered species under the Chula Vista MSCP Subarea Plan.

San Diego sunflower, Palmer's grapplinghook, southwestern spiny rush, small-flowered microseris, and San Diego County needlegrass occur within the restoration project areas, including the limits of grading as well as the upstream enhancement areas. Potential impacts on these species as a result of grading and restoration activities will either be avoided through project design or will not significantly affect the regional long-term survival of these species. Implementation of Project Design Measures BIO-5, *Special-Status and Succulent Plant Salvage Plan*, and BIO-8, *Public Access, Trails, and Recreation*, will ensure persistence of viable populations of these species within the project area and limit trespassing into the restoration project and special-status plant populations. The project is a restoration project and will ultimately improve and enhance habitat within the project area.

Impacts on County Group II animal species or a covered animal species under the Chula Vista MSCP Subarea Plan that would result from grading and restoration activities will be either avoided through project design or will not significantly affect the regional long-term survival of these species. The project is a restoration project that will ultimately improve and enhance habitat function of suitable habitats within the project area.

3D. The project will not impact arroyo toad aestivation, foraging, or breeding habitat.

3E. The project will not impact any suitable golden eagle nesting habitat. No golden eagle nests are on site or within 4,000 feet of the project site.

3F. The project may have short-term impacts on potential raptor foraging habitat during grading. However, the project is a restoration project that will not result in the loss of functional foraging habitat for raptors.

3G. The project will not result in the loss of a core wildlife area. The project is a restoration project that will improve and enhance habitat for wildlife species.

3H. The project will not cause direct or indirect impacts on natural areas. The project is a restoration project that will improve and enhance the quality of the habitat for adjacent natural areas. During project activities the following Project Design Measures will be implemented: all personnel will go through a comprehensive environmental training (BIO-1, *Biological Awareness Training*), fencing will be installed during construction to focus work

areas and illustrate avoidance areas (BIO-2, *Temporary Fence and Access*), BMPs will be implemented throughout the project work area to minimize impacts on adjacent resources (BIO-4, *Best Management Practices*), and signage and wood split-rail fencing will be installed to limit trespassing and protect sensitive biological resources (BIO-8, *Public Access, Trails, and Recreation*).

3I. The project will not impact known occupied burrowing owl habitat. In addition grading and vegetation removal will be conducted outside of the nesting season. Burrowing owl surveys will be conducted in any suitable habitat that will be impacted by grading activities. If any active burrows are discovered, they will be avoided (BIO-6, *Nesting Birds*).

3J. Coastal cactus wrens are known to occur within the project area. The project is a restoration project that will ultimately improve habitat for coastal cactus wrens. Grading activities will be conducted outside of the nesting season, so nesting coastal cactus wrens will be avoided (BIO-6, *Nesting Birds*).

3K. Hermes copper butterflies are not known to occur within the project area. The project is a restoration project that will ultimately improve habitat for Hermes copper butterflies.

3L. Grading activities will remove vegetation that could provide suitable nesting habitat for nesting birds. Approximately 4.66 acres of eucalyptus trees will be removed as a result of the project. Many of the trees will be drilled and poisoned and left in place. The dead trees will then be cut down and removed from the site. The eucalyptus trees provide suitable nesting habitat for many raptor species, including red-tailed hawk and red-shouldered hawk. To avoid the impacts on raptor nests, the removal of the eucalyptus trees will be conducted outside of the nesting season (BIO-6, *Nesting Birds*). Any eucalyptus trees that have existing raptor nests will be left in place. Additionally, many acres of eucalyptus trees will remain in proximity to the project area and will continue to provide suitable nesting habitat for raptors. The project is a restoration project that will ultimately improve nesting habitat for birds. Grading activities will be conducted outside of the nesting season, so there will be no impacts on nesting birds.

3.3 Cumulative Impact Analysis

The proposed project is limited to the grading, revegetation, and restoration of the project area. The proposed project would only result in temporary impacts on sensitive species use of the area; no permanent impacts would occur. The project vicinity is surrounded by extant undeveloped land whose existing resources would not significantly change during the time that the restoration project is active. The proposed project and mitigation would result in a site with permanent gains to sensitive species habitat, so temporary impacts would not be cumulatively significant.

3.4 Project Design Features

Though the project will include temporary impacts on suitable habitats for special-status plant and wildlife species, ultimately the project will result in increased habitat for these wildlife species and increase the populations of the sensitive plant species. Project features BIO-1 through BIO-8

(Section 1.2.1, *Project Design Avoidance and Minimization Features*) will be implemented during restoration activities to avoid or minimize impacts on special status plant or wildlife species.

3.5 Conclusions

Though the project will include temporary impacts on suitable habitats for special-status species, ultimately the project will result in increased habitat for wildlife species and increased populations of and habitat for special-status plant species. The project has been designed to reduce the temporary project impacts on any special-status plant or wildlife species to a level less than significant.

Chapter 4

Riparian Habitat or Sensitive Natural Communities

4.1 Guidelines for the Determination of Significance

A project would have a potentially significant effect on biological resources if the project would have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the CDFW or USFWS.

Specifically, any of the following conditions would be considered significant.

4A. Project-related construction, grading, clearing, or other activities would temporarily or permanently remove sensitive native or naturalized habitat on or off the project site.

4B. Any of the following would occur to or within jurisdictional wetlands and/or riparian habitats as defined by USACE, CDFW, City of Chula Vista Wetlands Protection Program, and the County of San Diego: removal of vegetation; grading; obstruction or diversion of water flow; adverse change in velocity, siltation, volume of flow, or runoff rate; placement of fill; placement of structures; construction of a road crossing; placement of culverts or other underground piping; any disturbance of the substratum; and/or any activity that may cause an adverse change in native species composition, diversity, and abundance.

4C. The project would draw down the groundwater table to the detriment of groundwater-dependent habitat, typically a drop of 3 feet or more from historical low groundwater levels.

4D. The project would cause indirect impacts to levels that would likely harm sensitive habitats over the long term.

4E. The project does not include a wetland buffer adequate to protect the functions and values of existing wetlands.

Each of these significance criteria is discussed in Section 4.2, *Analysis of Project Effects*, with respect to the proposed project.

4.2 Analysis of Project Effects

Each of the significance criteria listed above is discussed herein with respect to the project's anticipated effects. Those criteria for which impacts are not anticipated are discussed briefly at the end of the section.

4A. Project-related construction, grading, clearing, or other activities would temporarily or permanently remove sensitive native or naturalized habitat on or off the project site.

Temporary impacts on sensitive habitat associated with the proposed project would consist of 32.49 acres of Tier I, II, or III habitat and 59.85 acres of riparian habitat. Temporary impacts on critical habitat would include approximately 104 acres of coastal California gnatcatcher critical habitat, 0.01 acre of Quino checkerspot butterfly critical habitat, and 9.7 acres of Otay tarplant critical habitat.

4B. Grading would occur within jurisdictional wetlands and/or riparian habitats as defined by USACE, CDFW, City of Chula Vista's Subarea Plan Wetlands Protection Program, and the County of San Diego. The proposed project would result in temporary impacts on or within jurisdictional wetlands and/or riparian habitats as defined by USACE, CDFW, City of Chula Vista Wetlands Protection Program, and the County of San Diego. These temporary impacts will be mitigated on site as part of the restoration project, including rehabilitation and reestablishment of the river channel and its floodplain. In addition to restoring existing wetlands and riparian habitat, the project will expand and reestablish both federal wetlands as well as waterways including over 30 acres of waters of the U.S. and almost 10,000 feet of restored channel length. In addition, hydrology will be restored and invasive vegetation removed, further improving conditions for native species composition, diversity, and abundance throughout the site.

4C. The project does not propose to use groundwater.

4D. The proposed project will not alter long-term indirect impacts on the site. The proposed project would be active for a short period and will not introduce human access or domestic animals.

4E. The project does include a wetland buffer adequate to protect the functions and values of existing wetlands.

One of the primary goals of this project is to enhance the functions and values of the wetlands on-site. Any work performed will only have temporary impacts on site, and the result of the work will include an overall net gain in functions and values of the existing wetlands.

4.3 Cumulative Impact Analysis

The proposed project is limited to the restoration and revegetation of the project area. The proposed project would only result in temporary impacts on riparian habitat and sensitive communities; no permanent impacts would occur. The proposed project would remove environmental contaminants from the area, and the project mitigation would return the site to equal or greater functions and values than those currently on site. The proposed project would result in a site with permanent gains to sensitive habitat, so temporary impacts would not be cumulatively significant.

4.4 Project Design Features

4A. The proposed project has been designed to avoid impacts on sensitive natural communities to the maximum extent practicable, and restoration of impacted habitat will occur. All equipment staging and soil stockpile will occur within disturbed habitat that does not support listed species. Wood split-rail fencing and signage (educational kiosks and general trail signage) will be installed to limit trespassing into the restoration project and adjacent habitats (BIO-8, *Public Access, Trails, and Recreation*).

4.5 Conclusions

Onsite restoration of sensitive vegetation communities, including riparian habitat, will reduce any project-related impacts to a level less than significant.

This page intentionally left blank.

Chapter 5
Federal Wetlands and Waterways

5.1 Guidelines for the Determination of Significance

A project would have a potentially significant effect on biological resources if the project would have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act through direct removal, filling, hydrological interruption, or other means.

Specifically, any of the following conditions would be considered significant.

5A. Any of the following would occur to or within jurisdictional wetlands and/or riparian habitats as defined by the USACE: removal of vegetation; grading; obstruction, or diversion of water flow; adverse change in velocity, siltation, volume of flow, or runoff rate; placement of fill; placement of structures; construction of a road crossing; placement of culverts or other underground piping; any disturbance of the substratum; and/or any activity that may cause an adverse change in native species composition, diversity, and abundance.

5B. The project would draw down the groundwater table to the detriment of groundwater-dependent habitat, typically a drop of 3 feet or more from historical low groundwater levels.

5C. The project does not include a wetland buffer adequate to protect the functions and values of existing wetlands.

Each of these significance criteria is discussed in Section 5.2, *Analysis of Project Effects*, with respect to the proposed project.

5.2 Analysis of Project Effects

Each of the significance criteria listed above is discussed herein with respect to the project's anticipated effects. Those criteria for which impacts are not anticipated are discussed briefly at the end of the section.

5A. The proposed project design would result in temporary impacts on or within jurisdictional wetlands and/or waterways as defined by USACE within the City of Chula Vista parcel. These temporary impacts on jurisdictional habitat will be mitigated on site as part of the restoration project including rehabilitation and reestablishment of the river channel and its floodplain. In addition to restoring those areas already delineated as jurisdictional, the project will expand and reestablish both federal wetlands as well as waterways, including over 30 acres of waters of the U.S. and almost 10,000 feet of restored channel length. In addition, hydrology will be restored and invasive vegetation removed, further improving conditions for native species composition, diversity, and abundance throughout the site.

5B. The project does not propose to use groundwater and will create increased opportunity for groundwater infiltration as a result of floodplain restoration.

5C. One of the primary goals of this project is to enhance the functions and values of the wetlands on-site which includes the buffer habitat. The project has been designed to include both the rehabilitation and enhancement of riparian and upland habitat buffers.

5.3 Cumulative Impact Analysis

The proposed project is limited to the restoration and revegetation of the project area. The proposed project would only result in temporary impacts on jurisdictional drainages; no permanent impacts would occur. The proposed project would restore the Otay River channel. The proposed project would result in a site with permanent gains in the functions and values of federal waterways on site, so temporary impacts would not be cumulatively significant.

5.4 Project Design Features

The proposed project would result in a site with permanent gains in the functions and values of federal waterways on site, so temporary impacts would not be cumulatively significant.

5.5 Conclusions

Onsite restoration of jurisdictional waterways will reduce project-related impacts to a level less than significant.

Chapter 6
Wildlife Movement and Nursery Sites

6.1 Guidelines for the Determination of Significance

A project would have a potentially significant effect on biological resources if the project would interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Any of the following conditions would be considered significant.

6A. The project would prevent wildlife access to foraging habitat, breeding habitat, water sources, or other areas necessary for their reproduction.

6B. The project would substantially interfere with connectivity between blocks of habitat, or would potentially block or substantially interfere with a local or regional wildlife corridor or linkage.

6C. The project would create artificial wildlife corridors that do not follow natural movement patterns.

6D. The project would increase noise and/or nighttime lighting in a wildlife corridor or linkage to levels proven to affect the behavior of the animals identified in a site-specific analysis of wildlife movement.

6E. The project does not maintain an adequate width for an existing wildlife corridor or linkage and/or would further constrain an already narrow corridor through activities such as (but not limited to) reduction of corridor width, removal of available vegetative cover, placement of incompatible uses adjacent to it, and placement of barriers in the movement path.

6F. The project does not maintain adequate visual continuity (i.e., long lines-of-site) within wildlife corridors or linkage.

Each of these significance criteria is discussed in Section 6.2, *Analysis of Project Effects*, with respect to the proposed project.

6.2 Analysis of Project Effects

The proposed project will not result in significant impacts under the above-listed guidelines for the following reasons.

6A. The project would not prevent wildlife access to foraging habitat, breeding habitat, water sources, or other areas necessary for their reproduction. The grading activities will be conducted outside of the nesting season. Restoration of the Otay River channel will improve function of the channel and ultimately restore flow in the river.

6B. The project would not prevent wildlife access to habitat nor would it create a barrier to wildlife movement. Restoration of the project site will improve habitat connectivity in the region.

6C. The project would not create artificial wildlife corridors. Restoration of the project site will improve habitat connectivity in the region.

6D. The project does not propose to increase noise or nighttime lighting within a wildlife corridor.

6E. The project would not constrain a wildlife corridor nor would it create a barrier to wildlife movement.

6F. The project would not impact visual continuity within a wildlife movement corridor.

6.3 Cumulative Impact Analysis

The proposed project would not affect a wildlife corridor and therefore would not be cumulatively significant.

6.4 Project Design Features

The proposed project is a restoration project that will improve habitat function within the project site and will improve function to wildlife corridors and linkages. Wood split-rail fencing and signage (educational kiosks and general trail signage) will be installed to limit trespassing into the restoration project and adjacent habitats (BIO-8, *Public Access, Trails, and Recreation*). No additional project design features are necessary.

6.5 Conclusions

The proposed project would not result in impacts on wildlife corridors and linkages and will ultimately improve habitat corridors within the project area.

Chapter 7
Local Policies, Ordinances, Adopted Plans

7.1 Guidelines for the Determination of Significance

A project would have a potentially significant effect on biological resources if the project would conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation Plan.

Any of the following conditions would be considered significant.

7A. For lands outside of the MSCP, the project would impact coastal sage scrub vegetation in excess of the County's 5% habitat loss threshold as defined by the Southern California Coastal Sage Scrub Natural Communities Conservation Planning Process Guidelines.

7B. The project would preclude or prevent the preparation of the subregional Natural Communities Conservation Planning Process. For example, if the project proposes development within areas that have been identified by the County or resource agencies as critical to future habitat preserves.

7C. The project would impact any amount of sensitive habitat lands as outlined in the Resource Protection Ordinance.

7D. The project would not minimize and/or mitigate coastal sage scrub habitat loss in accordance with Section 4.3 of the Natural Communities Conservation Planning Process Guidelines.

7E. The project does not conform to the goals and requirements as outlined in any applicable Habitat Conservation Plan (HCP), Habitat Management Plan (HMP), Special Area Management Plan (SAMP), Watershed Plan, or similar regional planning effort.

7F. For lands within the MSCP, the project would not minimize impacts on sensitive resources as defined by the HLIT Ordinance.

7G. The project would preclude connectivity between areas of high habitat values, as defined by the Southern California Coastal Sage Scrub Natural Communities Conservation Planning Process Guidelines.

7H. The project does not maintain existing movement corridors and/or habitat linkages as defined by the Biological Mitigation Ordinance (BMO).

7I. The project does not avoid impacts on MSCP narrow endemic species and would impact core populations of narrow endemics.

7J. The project would reduce the likelihood of survival and recovery of listed species in the wild.

7K. The project would result in the killing of migratory birds or destruction of active migratory bird nests and/or eggs (MBTA).

7L. The project would result in the take of eagles, eagle eggs, or any part of an eagle (Bald and Golden Eagle Protection Act).

Each of these significance criteria is discussed in Section 7.2, *Analysis of Project Effects*, with respect to the proposed project.

7.2 Analysis of Project Effects

The proposed project will not result in significant impacts under the above-listed guidelines for the following reasons.

7A. & 7D. The project will include temporary impacts on 0.19 acre of coastal sage scrub through grading activities. This habitat will be restored on site.

7B. The project is consistent with the City of Chula Vista MSCP Subarea Plan, and, because an NCCP is in effect, this project does not preclude or prevent the preparation of a NCCP.

7C. The project is primarily on City of Chula Vista land and is not subject to the Resource Protection Ordinance.

7E. The project will directly benefit the primary goal of the Subarea Plan, which is to conserve covered species and their habitat through the conservation of interconnected significant habitat cores and linkages. The project will restore over 1 mile of lost river channel and its floodplain and will further enhance existing preserved upland all while minimizing impacts on sensitive resources per the City HLIT Ordinance. Ultimately the project will improve habitat functions and directly benefit many of the MSCP covered flora and fauna.

7F. The project will restore and enhance existing preserve land and minimize impacts on sensitive resources per the City HLIT Ordinance. This includes avoidance of impacts on narrow endemic species, restoration of protected wetlands, and the enhancement and rehabilitation of Tier I, Tier II, and Tier III upland habitats (BIO-5, *Special-Status and Succulent Plant Salvage Plan*).

7G. & 7H. The proposed project does not preclude connectivity between areas of high habitat value or disrupt habitat linkages.

7I. The proposed project does not impact MSCP narrow endemics.

7J. The project has been designed to avoid impacts on listed species, including San Diego fairy shrimp, least Bell's vireo, yellow-billed cuckoo, and coastal California gnatcatcher (BIO-6, *Nesting Birds*).

7K. The project has been designed to avoid the killing of migratory birds or destruction of active migratory bird nests and/or eggs protected under the MBTA. Grading activities will be conducted outside of the nesting season, and onsite monitors will ensure that any birds occurring on site will be avoided (BIO-6, *Nesting Birds*).

7L. The project will not result in the take of bald eagles or golden eagles. These species are not known to nest within the project area, and any bald eagles or golden eagles that could forage on site will be avoided.

7.3 Cumulative Impact Analysis

The proposed project would only result in temporary impacts on sensitive resources on site; no permanent impacts would occur. The proposed project would restore the Otay River channel as well as riparian and upland habitats, and would return the site to greater functions and values than are currently extant within the project area. The proposed project would not be cumulatively significant.

7.4 Project Design Features

The proposed project is a restoration project that will improve habitat function within the project area. The project will not result in conflicts with local policies or ordinances protecting biological resources or with the provisions of the MSCP. Therefore, no additional project design features are necessary.

7.5 Conclusions

The project design will not conflict with any local policies or ordinances protecting biological resources or conflict with the provisions of an adopted HCP, NCCP, or other approved local, regional, or state HCP.

This page intentionally left blank.

Chapter 8
Summary of Project Impacts and Mitigation

The proposed project is a restoration project that will ultimately improve and increase habitat for special-status plant and wildlife species as well as jurisdictional waters and riparian habitat. However, potentially significant impacts could occur on special-status plant and wildlife species during grading through the temporary loss of habitat, direct impacts on individuals, and the loss of active nests for birds protected under the MBTA. Certain features have been incorporated into the project design that would avoid and minimize the potentially significant impacts on these species. These include developing and implementing a salvage plan for special-status plants that would be directly impacted by grading activities (BIO-5, *Special-Status and Succulent Plant Salvage Plan*), restricting vegetation clearing or grading during the breeding season for migratory birds (approximately February 15–September 15) (BIO-6, *Nesting Birds*), fencing grading limits to ensure that the grading activities are contained to those areas (BIO-2, *Temporary Fence and Access*), having a biological monitor present during grading activities (BIO-3, *Biological Monitor*), and implementing BMPs to protect jurisdictional waters and other sensitive natural communities (BIO-4, *Best Management Practices*).

Potentially significant impacts on jurisdictional waterways will be mitigated through onsite replacement in-kind. Potentially significant impacts on jurisdictional features will be mitigated through onsite restoration as described in Section 5.2, *Analysis of Project Effects*.

Because the project is a restoration project and will ultimately improve and increase habitat for special-status plant and wildlife species as well as jurisdictional waters and riparian habitat, no additional mitigation measures will be necessary.

This page intentionally left blank.

Chapter 9
References

Aspen Environmental Group (Aspen). 2007. *Otay River Watershed Management Plan*. Prepared for the County of San Diego and the City of Chula Vista. Available: http://www.sandiegocounty.gov/dplu/docs/05-06FinalDraft_OtayRiverWMP.pdf.

Atwood, J. L. 1990. *Status Review of the California Gnatcatcher (*Polioptila californica*)*. Unpublished Technical Report. Manomet Bird Observatory, Manomet, MA. 79 pp.

———. 1993. California Gnatcatchers and Coastal Sage Scrub: The Biological Basis for Endangered Species Listing. Pages 149–169 in J. E. Keeley, ed. *Interface Between Ecology and Land Development in California.* Southern Calif. Acad. Sci., Los Angeles.

Baldwin, B. G., D. H. Goldman, D. J. Keil, R. Patterson, T. J. Rosatti, and D. H. Wilken (eds.). 2012. *The Jepson Manual: Vascular Plants of California*. Second Edition. Berkeley: University of California Press.

Best, T. L. 1996. *Lepus californicus*. Pages 1–10 in *Mammalian Species* No. 530. American Society of Mammalogists.

Bowman, R. 1973. *Soil Survey of the San Diego Area*. USDA in cooperation with the USDI, UC Agricultural Experiment Station, Bureau of Indian Affairs, Department of the Navy, and the U.S. Marine Corps.

California Department of Fish and Wildlife (CDFW). 2015. California Natural Diversity Database, RareFind 4. Available: https://www.dfg.ca.gov/biogeodata/cnddb/. Accessed: May 2015.

California Native Plant Society (CNPS), Rare Plant Program. 2015. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society, Sacramento, CA. Available: http://www.rareplants.cnps.org. Accessed: May 2015.

City of Chula Vista. 1993. *Otay Ranch Management Plan*. Available: http://www.sdcounty.ca.gov/pds/mscp/or.html. Accessed: 2015.

———. 1996. Otay *Ranch Phase 2 Resource Management Plan*. Available: http://www.sdcounty.ca.gov/pds/docs/OtayRanchRMP2.pdf. Accessed: Maybe 2015.

———. 1997. *City of Chula Vista Multiple Species Conservation Plan (MSCP)*. Available: http://www.chulavistaca.gov/city_services/development_services/planning_building/Planning/Environmental/Habitat.asp. Accessed 2015.

———. 2003. *City of Chula Greenbelt Master Plan*. Available: http://www.chulavistaca.gov/departments/development-services/planning/chula-vista-greenbelt-master-plan. Accessed: May 2015.

County of San Diego (County). 1997a. *Multiple Species Conservation Program: County of San Diego Subarea Plan*. Available at http://www.sdcounty.ca.gov/pds/mscp/sc.html. Accessed: May 2015.

———. 1997b. *Otay Valley Regional Park Concept Plan*. Available at http://www.sandiegocounty.gov/content/dam/sdc/parks/OVRP/Documents/ovrpconceptplan.pdf. Accessed: May 2015.

———. 2010. *Report Format and Content Requirements Biological Resources*. Land Use and Environment Group. Fourth Revision. September 15.

Dudek. 2014. *Biological Technical Report for the Otay Ranch University Villages Project*. Prepared for: SSBT LCRE V LLC. Chula Vista, California.

Dunk, J. R. 1995. White-tailed kite (*Elanus leucurus*). In A. Poole (ed.), *The Birds of North America Online*. Ithaca: Cornell Lab of Ornithology. Available: http://bna.birds.cornell.edu/bna/species/178.

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*. Technical Report Y-87-1. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. 100 pp. with Appendices.

Franzreb, K. E. 1989. *Ecology and Conservation of the Endangered Least Bell's Vireo*. U.S. Fish & Wildlife Service Biol. Rep. 89.

Goldwasser, S. 1981. *Habitat Requirements of the Least Bell's Vireo*. California Department of Fish and Game Final Report., Job IV-38.1.

Gray, M. V., and J. M. Greaves. 1984. Riparian Forest as Habitat for the Least Bell's Vireo. Pages 605–611 in R. E. Warner and K. M. Hendrix, (eds.), *California Riparian Systems: Ecology, Conservation, and Productive Management*. Berkeley: University of California Press.

Holland, R. F. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California*. Nongame-Heritage Program, California Department of Fish and Game.

Howard, Janet L. 1995. *Lepus californicus*. In *Fire Effects Information System* (Online). U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us.databases/feis/.

Howell, S. N. G., and S. Webb. 1995. *A Guide to the Birds of Mexico and Northern Central America*. Oxford University Press.

ICF International. 2016. *Otay River Restoration Project Habitat Mitigation and Monitoring Plan (HMMP).* Prepared for Otay Land Company, LLC. March.

Jameson Jr., E. W., and H. J. Peeters. 2004. *Mammals of California*. Revised Edition. Berkeley: University of California Press.

Jennings, M. R., and M. P. Hayes. 1994. *Amphibian and Reptile Species of Special Concern in California*. California Department of Fish and Game, Inland Fisheries Department. Rancho Cordova, California.

Kus, B. E., and K. L. Miner. 1989. *Use of Non-Riparian Habitats by Least Bell's Vireos*. USDA Forest Service Gn. Tech. Rep. PSW-10. Available: http://www.fs.fed.us/psw/publications/documents/psw_gtr110/psw_gtr110_f_kus.pdf. Accessed: March 7, 2016.

Lichvar, R. W., M. Butterwick, N. C. Melvin, and W. N. Kirchner. 2014. The National Wetland Plant List: 2014 Update of Wetland Ratings. *Phytoneuron* 2014(41):1–42.

Lightfoot, D. C., A. D. Davidson, C. M. McGlone, and D. G. Parker. 2010. Rabbit Abundance Relative to Rainfall and Plant Production in Northern Chihuahuan Desert Grassland and Shrubland Habitats. *Western North American Naturalist* 70:490–499.

Natural Resource Conservation Service (NRCS). 2015. Agency website. Available: http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx. Accessed: May 2015.

Oberbauer, T., M. Kelly, and J. Buegge. March 2008. *Draft Vegetation Communities of San Diego County*. Based on Robert F. Holland, Ph.D., *Preliminary Descriptions of the Terrestrial Natural Communities of California.* October 1986.

RECON (Regional Environmental Consultants). 1989. *Comprehensive Species Management Plan for the Least Bell's Vireo (*Vireo bellii pusillus*)*. Prepared for San Diego Association of Governments, San Diego, California.

———. 2011. *2009–2010 Annual Report for Otay Ranch Preserve – Salt Creek and San Ysidro Parcels*. Prepared for the City of Chula Vista. Chula Vista, California.

———. 2012. *2011 Annual Report for the Otay Ranch Preserve*. Prepared for the City of Chula Vista. Chula Vista, California.

———. 2013. *Annual Report for the Otay Ranch Preserve January 1–December 31, 2012*. Prepared for the City of Chula Vista. Chula Vista, California.

———. 2014. *Annual Report for the Otay Ranch Preserve January 1–December 31, 2013*. Prepared for the City of Chula Vista. Chula Vista, California.

Reiser, C. H. 2001. *Rare Plants of San Diego County*. Aquafir Press. 2001 edition.

Salata, L. 1983. *Status of the Least Bell's Vireo on Camp Pendleton, California: Report on Research Done in 1983*. Unpublished Report, U.S. Fish and Wildlife Service, Laguna Niguel, CA.

Stebbins, R. C. 2003. *A Field Guide to Western Reptiles and Amphibians*. Third Edition. Houghton Mifflin Company. Boston and New York.

Unitt, P. 2004. *San Diego County Bird Atlas*. San Diego Natural History Museum.

U.S. Army Corps of Engineers (USACE). 2008a. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region*. Version 2.0. Vicksburg, MS: U.S. Army Engineer Research and Development Center. Report dated September 2008.

———. 2008b. *A Field Guide to the Identification of the Ordinary High Water Mark in the Arid West Region of the Western United States: A Determination Manual*. August. Available: http://www.crrel.usace.army.mil/library/technicalreports/ERDC-CRREL-TR-08-12.pdf.

U.S. Fish and Wildlife Service (USFWS). 1993. Threatened Coastal California Gnatcatcher; Final Rule and Proposed Special Rule. *Federal Register* 58, number 59.

———. 1995. Endangered and Threatened Wildlife and Plants; Notice of Determination to Retain the Threatened Status for the Coastal California Gnatcatcher under the Endangered Species Act. March 27, 1995. Notice of determination. *Federal Register* 60: 15693–15699.

———. 1998a. *Draft Recovery Plan for the Least Bell's Vireo*. Portland, Oregon. Available: http://www.fws.gov/carlsbad/SpeciesStatusList/RP/19980506_Draft%20RP_LBV.pdf.

———. 1998b. *Recovery Plan for Vernal Pools of Southern California.* Portland, Oregon. 113+ pp. Available: http://www.fws.gov/sacramento/es/Recovery-Planning/Vernal-Pool/es_recovery_vernal-pool-recovery.htm.

———. 2002. *Life History of the Vernal Pool Tadpole Shrimp*. Updated February 4, 2002. http://ecos.fws.gov/docs/life_histories/K048.html.

———. 2008. *San Diego Fairy Shrimp Five-year Review*. September 30. Available: http://ecos.fws.gov/docs/five_year_review/doc1999.pdf.

———. 2009. *Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for the Quino Checkerspot butterfly (Euphydryas editha quino)*. Final Rule. June 2009.

Vickery, P. D. 1996. Grasshopper Sparrow (*Ammodramus savannarum*). In A. Poole (ed.), *The Birds of North America Online.* Ithaca: Cornell Lab of Ornithology. Available: http://bna.birds.cornell.edu/bna/species/239.

Whitaker, J. O. 1996. *The Audubon Society Field Guide to North American Mammals*. Revised and expanded. New York: A.A. Knopf.

Zeiner, D. C., W. F. Laudenslayer Jr., and K. E. Mayer (eds.). 1988. *California's Wildlife, Volume 1: Amphibians and Reptiles*. Sacramento, California: California Department of Fish and Game.

Zeiner, D. C., W. F. Laudenslayer Jr., K. E. Mayer, and M. White (eds.). 1990. *California's Wildlife, Volume 2: Birds*. Sacramento, California: California Department of Fish and Game.

Appendix A
Figures

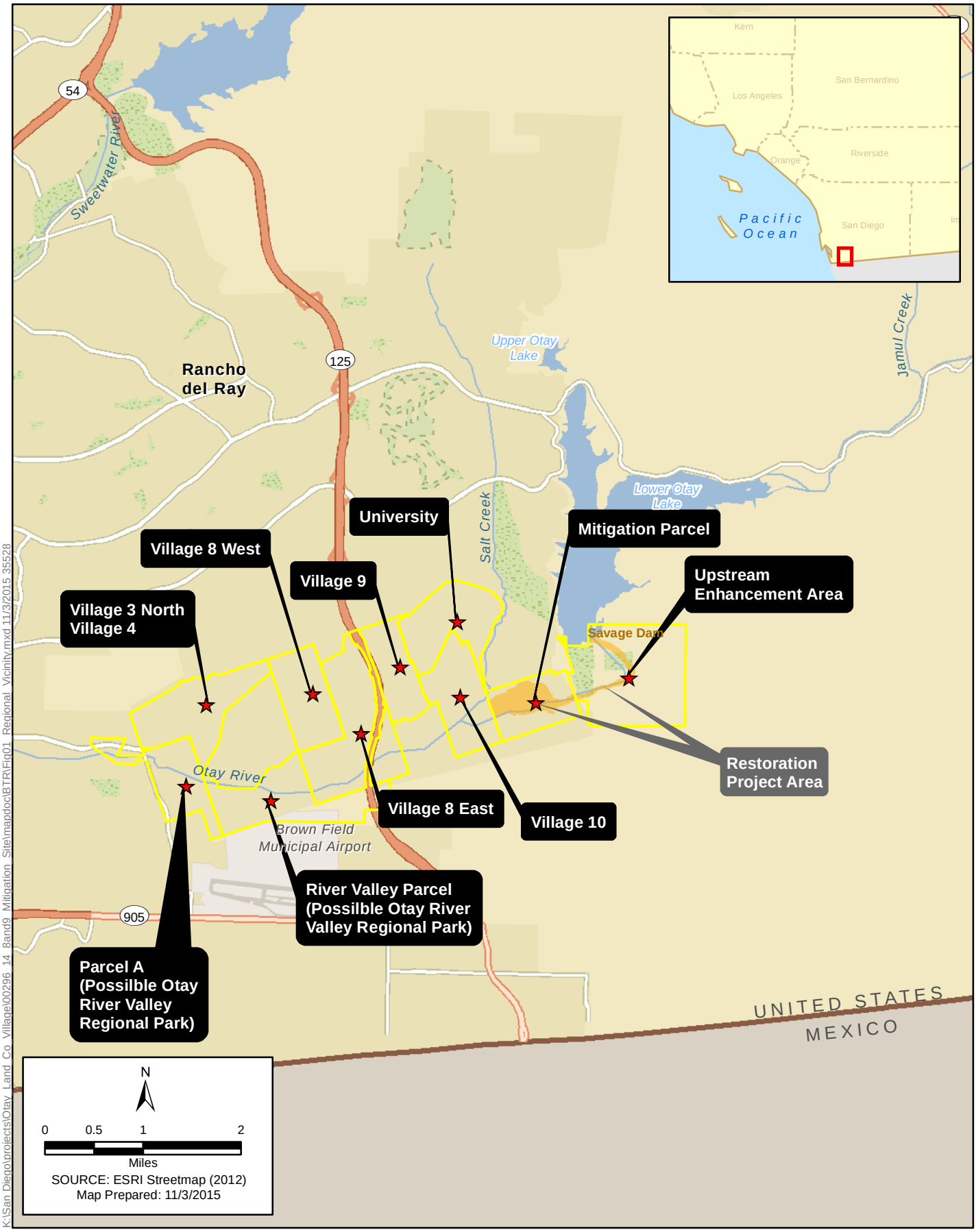
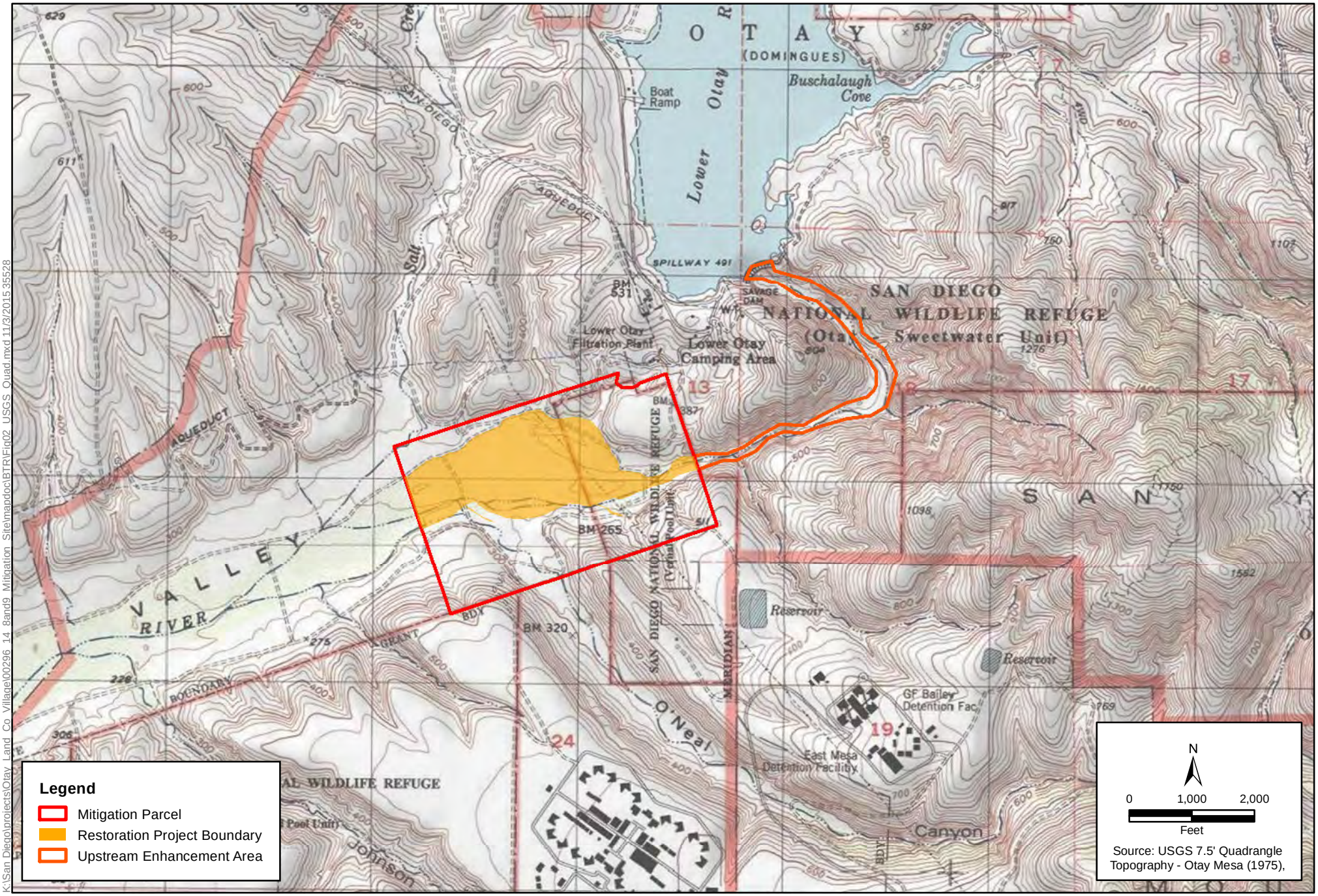
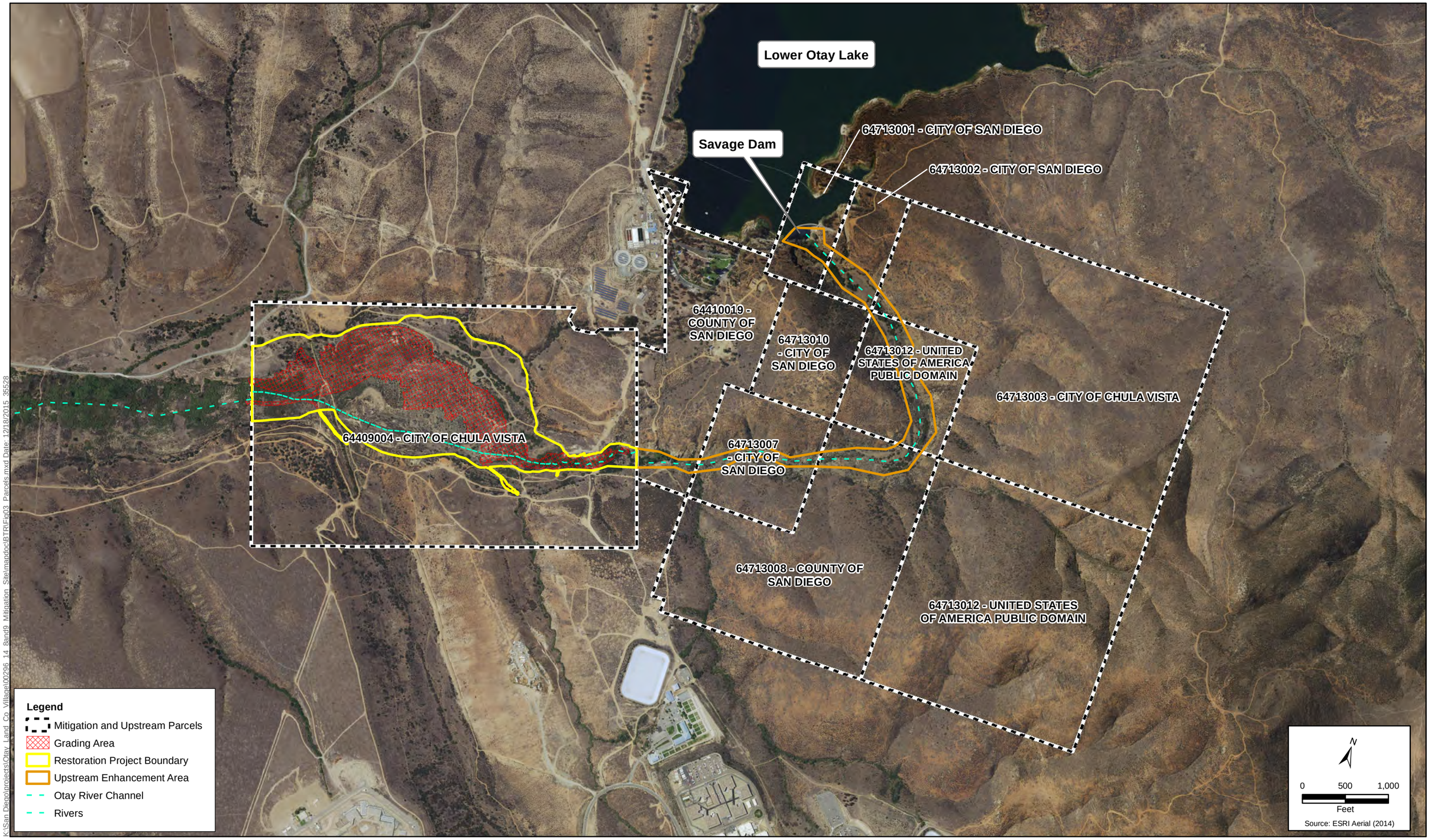


Figure 1
Regional Vicinity
Otay River Restoration Project



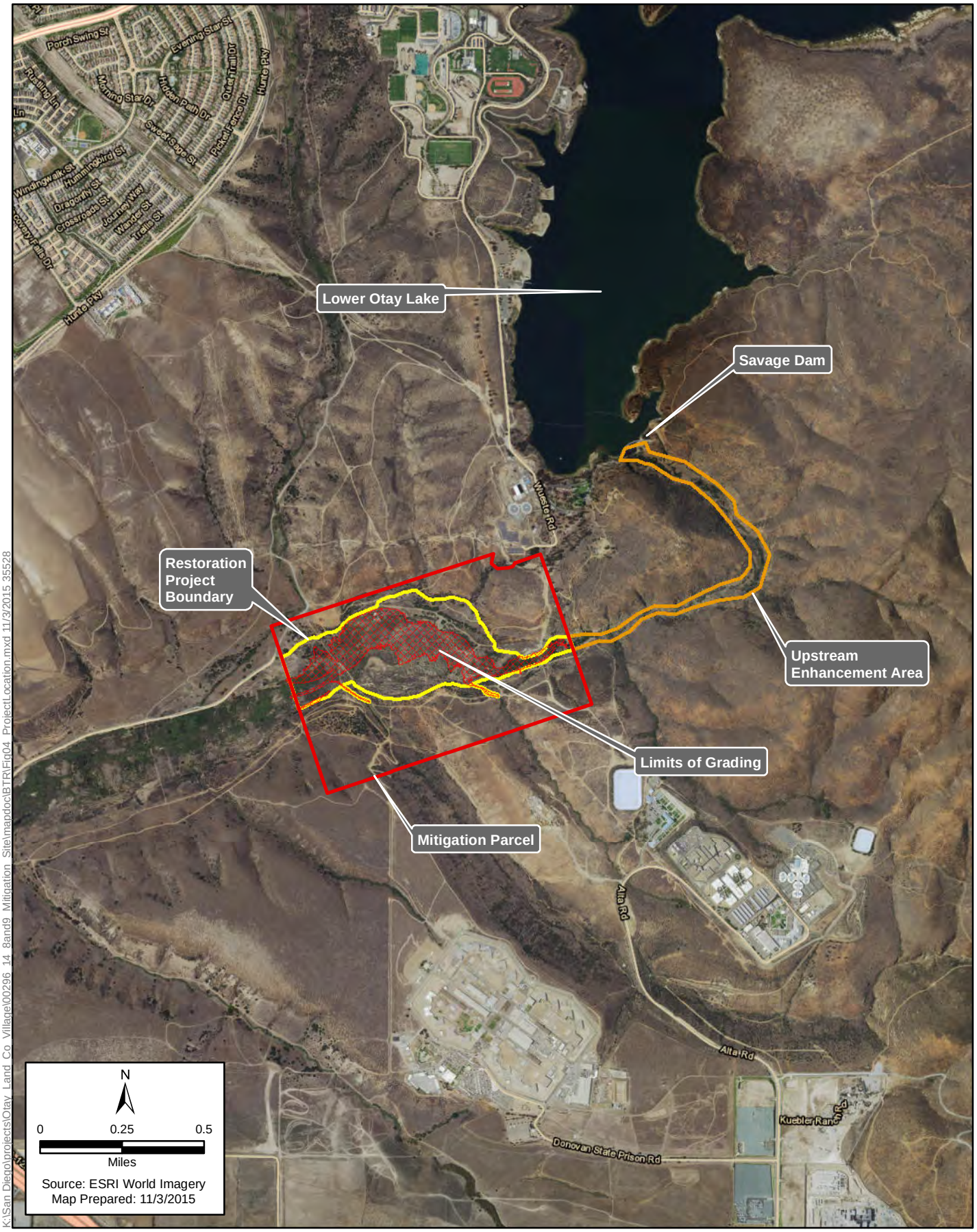
K:\San Diego\projects\Otay Land Co Village\00296.14 8and9 Mitigation Site\mapdoc\BTR\Fig02 USGS Quad.mxd 11/3/2015 35528

Figure 2
USGS Otay Mesa Quad Map
Otay River Restoration Project



K:\San Diego\projects\Otay Land Co Village\00296.14 8and9 Mitigation Site\mapdoc\BTR\Fig03 Parcels.mxd Date: 12/18/2015 35528

Figure 3
Parcel Map
Otay River Restoration Project



K:\San Diego\projects\Otay Land Co Village\00296.14 8and9 Mitigation Site\mapdoc\BTR\Fig04 ProjectLocation.mxd 11/3/2015 35528

Figure 4
Restoration Project Area
Otay River Restoration Project

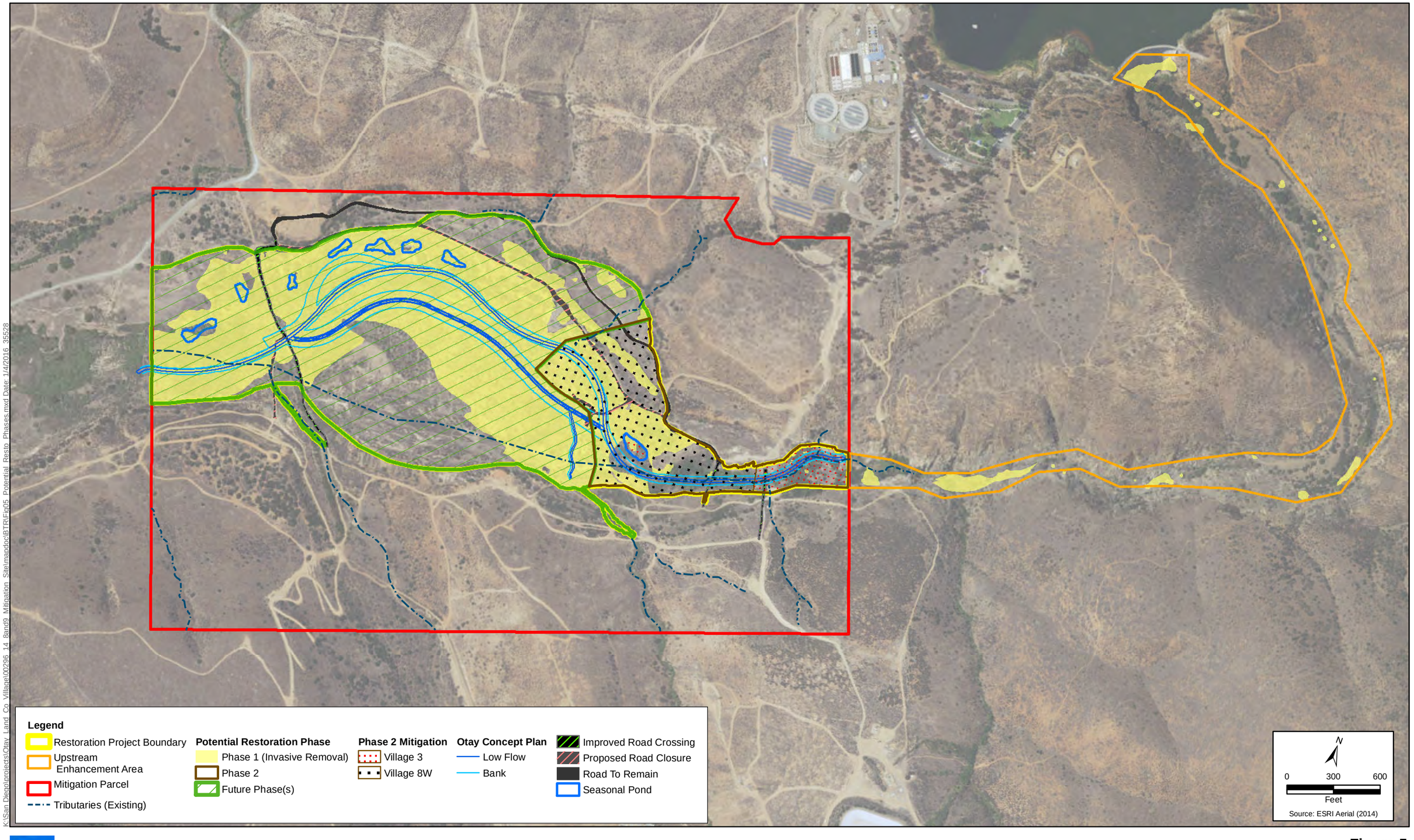
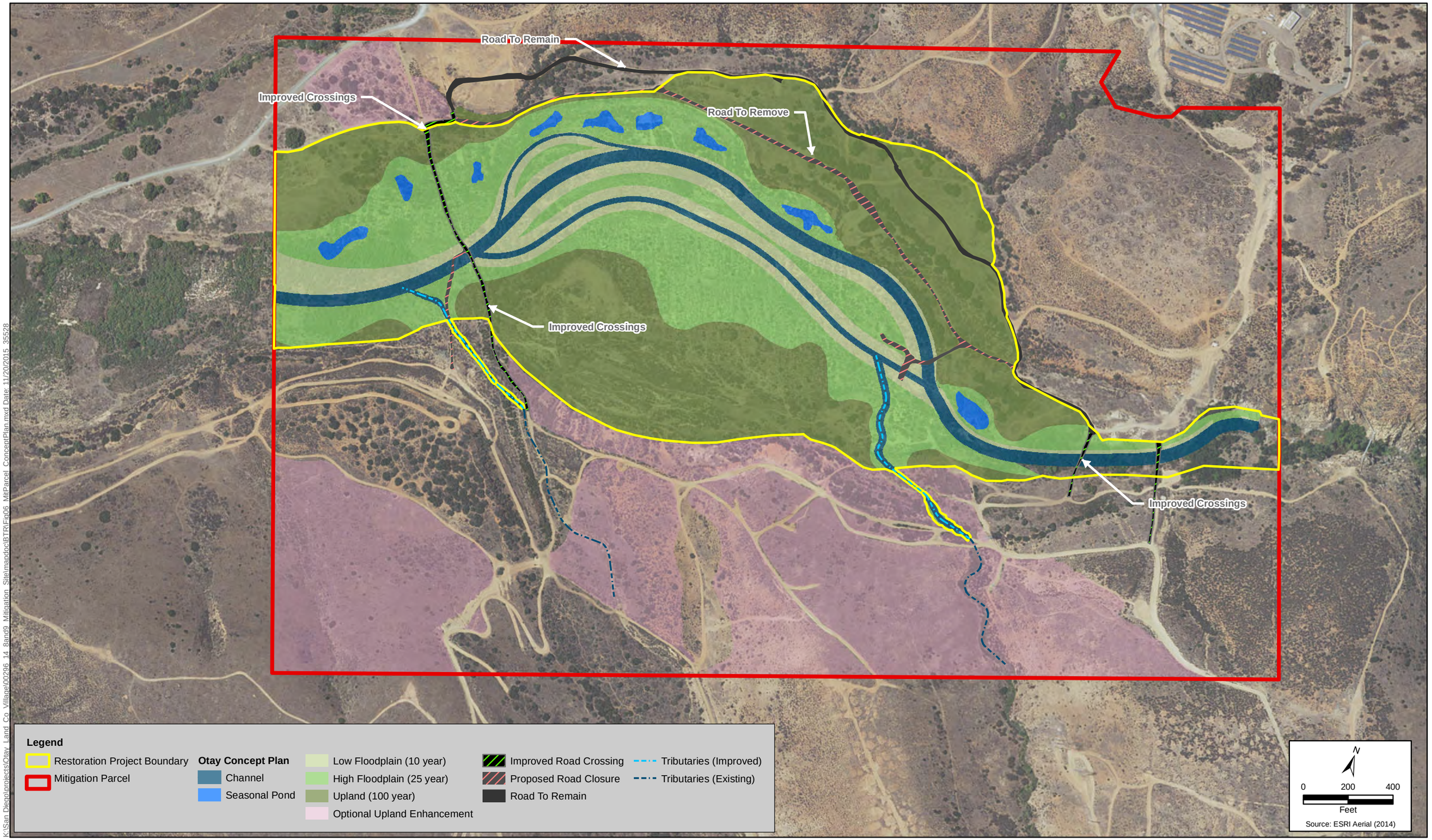
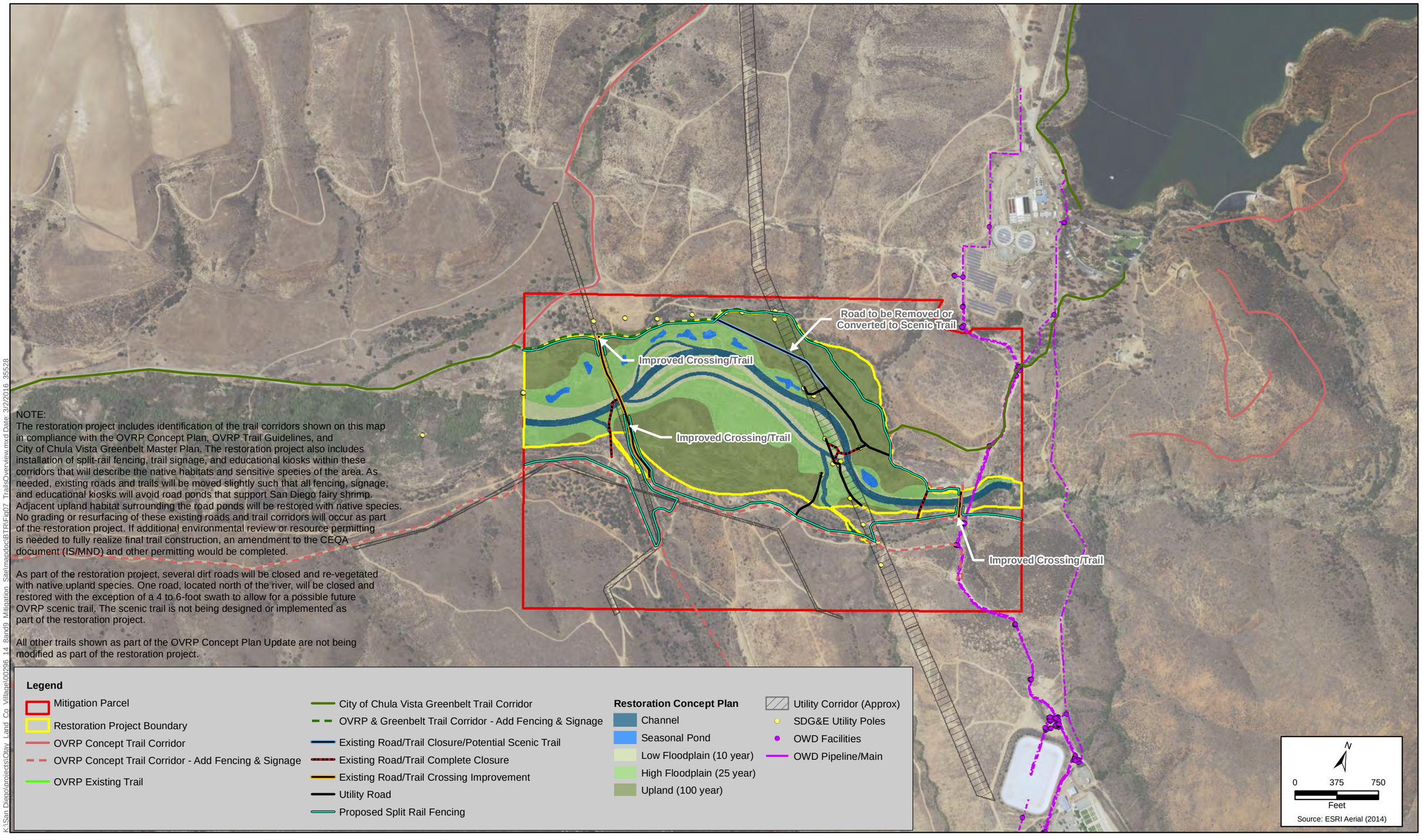


Figure 5
Potential Restoration Phases
Otay River Restoration Project



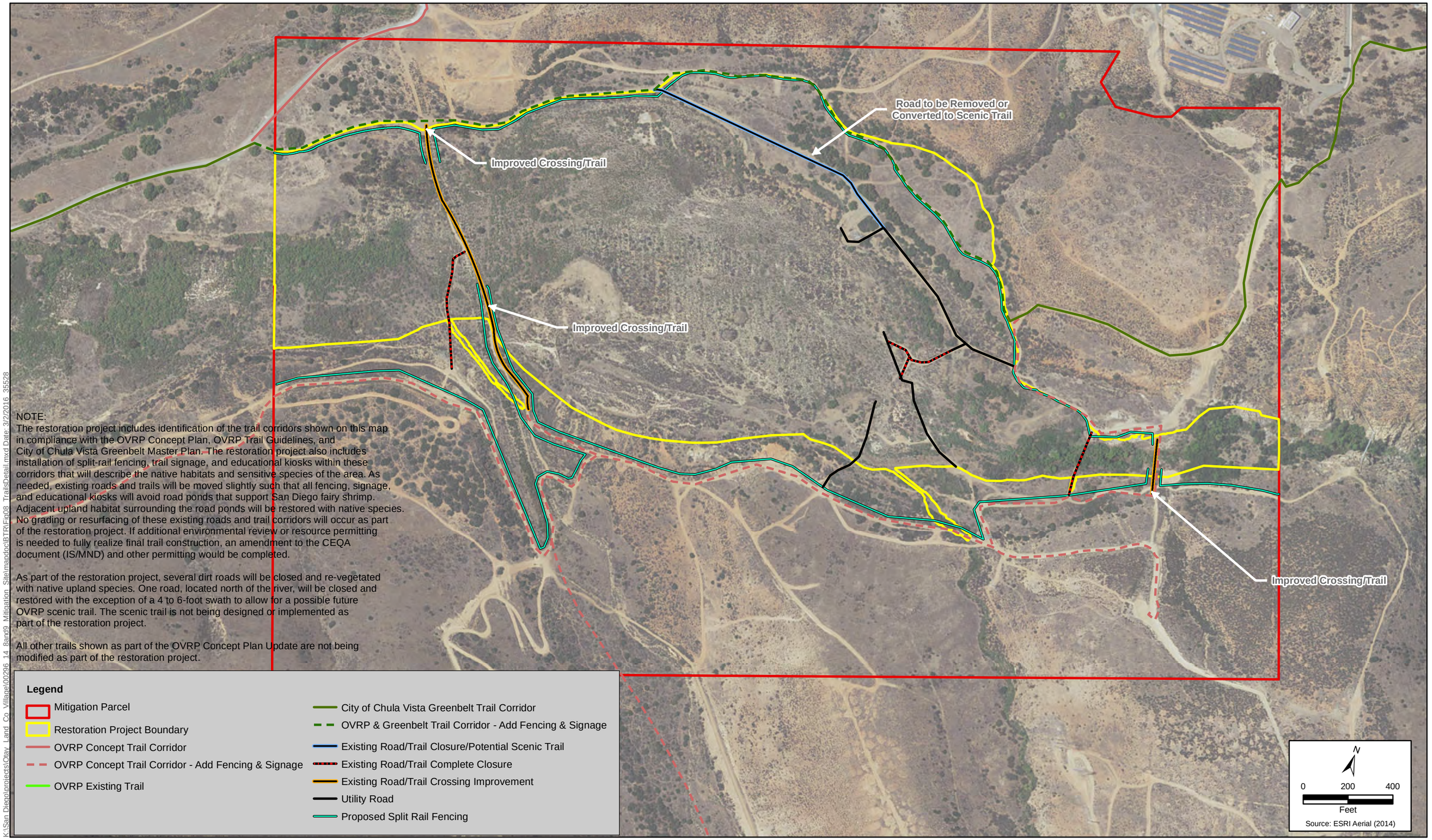
K:\San Diego\projects\Otay Land Co Village\00296.14 Band9 Mitigation Sitemap\doc\ETR\Fig06_MitParcel_ConceptPlan.mxd Date: 11/20/2015 35528

Figure 6
Mitigation Parcel Concept Plan Map
Otay River Restoration Project



K:\San Diego\projects\Otay Land Co Village\00296.14 8and9 Mitigation Site\mapdoc\BTR\Fig07_TrailsOverview.mxd Date: 3/2/2016 35528

Figure 7
Existing Infrastructure, OVRP Concept Plan Trails, and Other Constraints
Otay River Restoration Project



K:\San Diego\projects\Otay_Land_Co_Village\00226.14_8ard9_Mitigation_Site\mapdoc\BTR\Fig08_TrailsDetail.mxd Date: 3/2/2016 35528

Figure 8
Mitigation Parcel Trails
Otay River Restoration Project

K:\San Diego\projects\Otay_Land_Co_Village\00296.14_8and9_Mitigation_Site\mapdoc\BTR\Fig09a_MitParcel_V2.mxd Date: 2/17/2016 :35528

Legend

- Restoration Project Boundary
- Mitigation Parcel

Vegetation

- Arundo donax Dominant/Southern Willow Scrub
- Chamise Chaparral
- Diegan Coastal Sage Scrub
- Diegan Coastal Sage Scrub - Disturbed
- Disturbed Habitat
- Eucalyptus Woodland
- Freshwater Marsh
- Mule Fat Scrub
- Non-Native Grassland
- Open Water
- San Diego Mesa Vernal Pool Complex
- Southern Cottonwood - Willow Riparian Forest
- Southern Cottonwood - Willow Riparian Forest - Disturbed
- Southern Interior Cypress Forest
- Southern Mixed Chaparral
- Southern Willow Scrub
- Southern Willow Scrub Disturbed
- Tamarisk Scrub
- Urban/Developed
- Valley and Foothill Grassland

N

0 200 400

Feet

Source: ESRI Aerial (2014)

ICF INTERNATIONAL

Figure 9a
Vegetation Map
Otay River Restoration Project

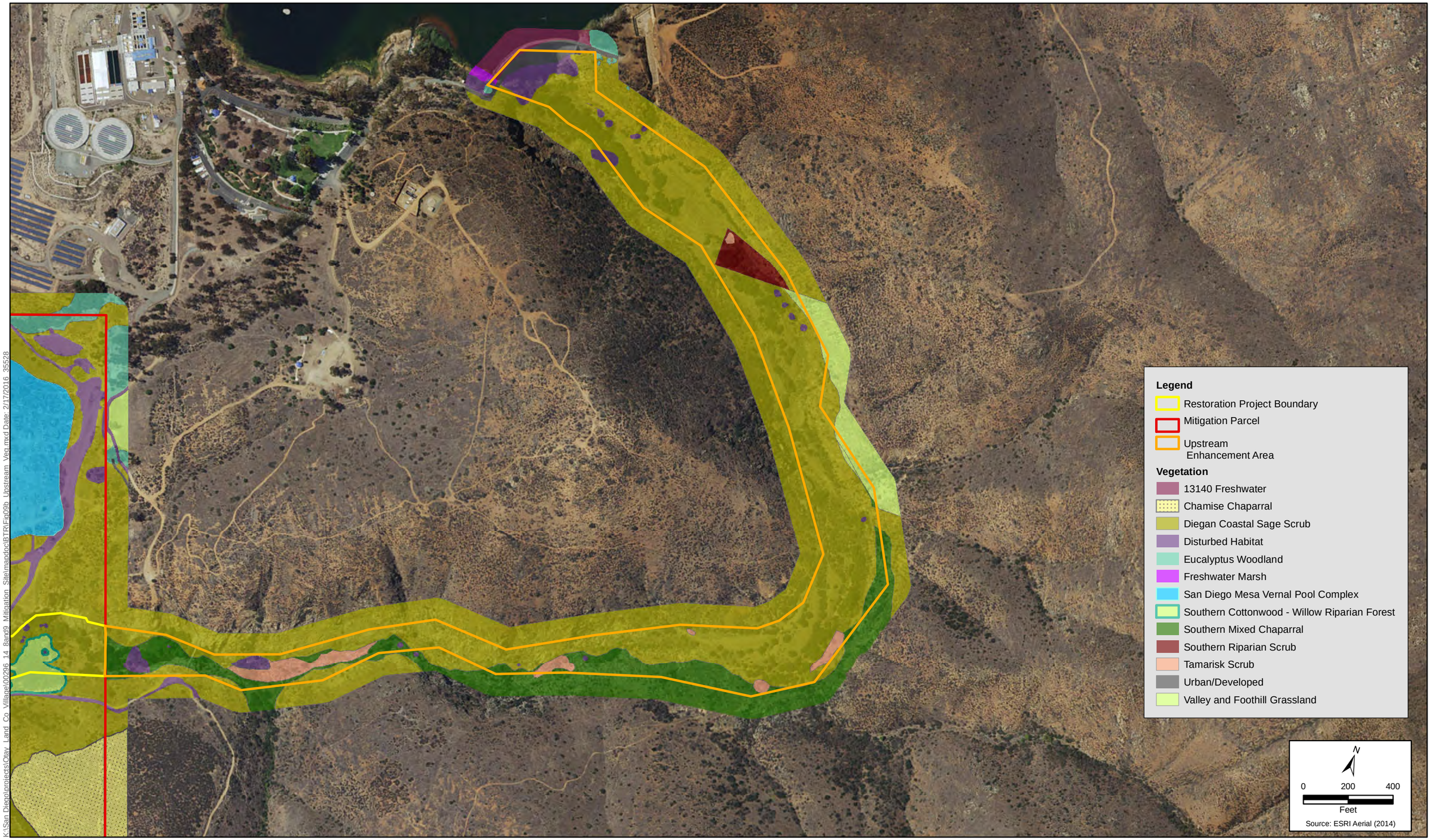
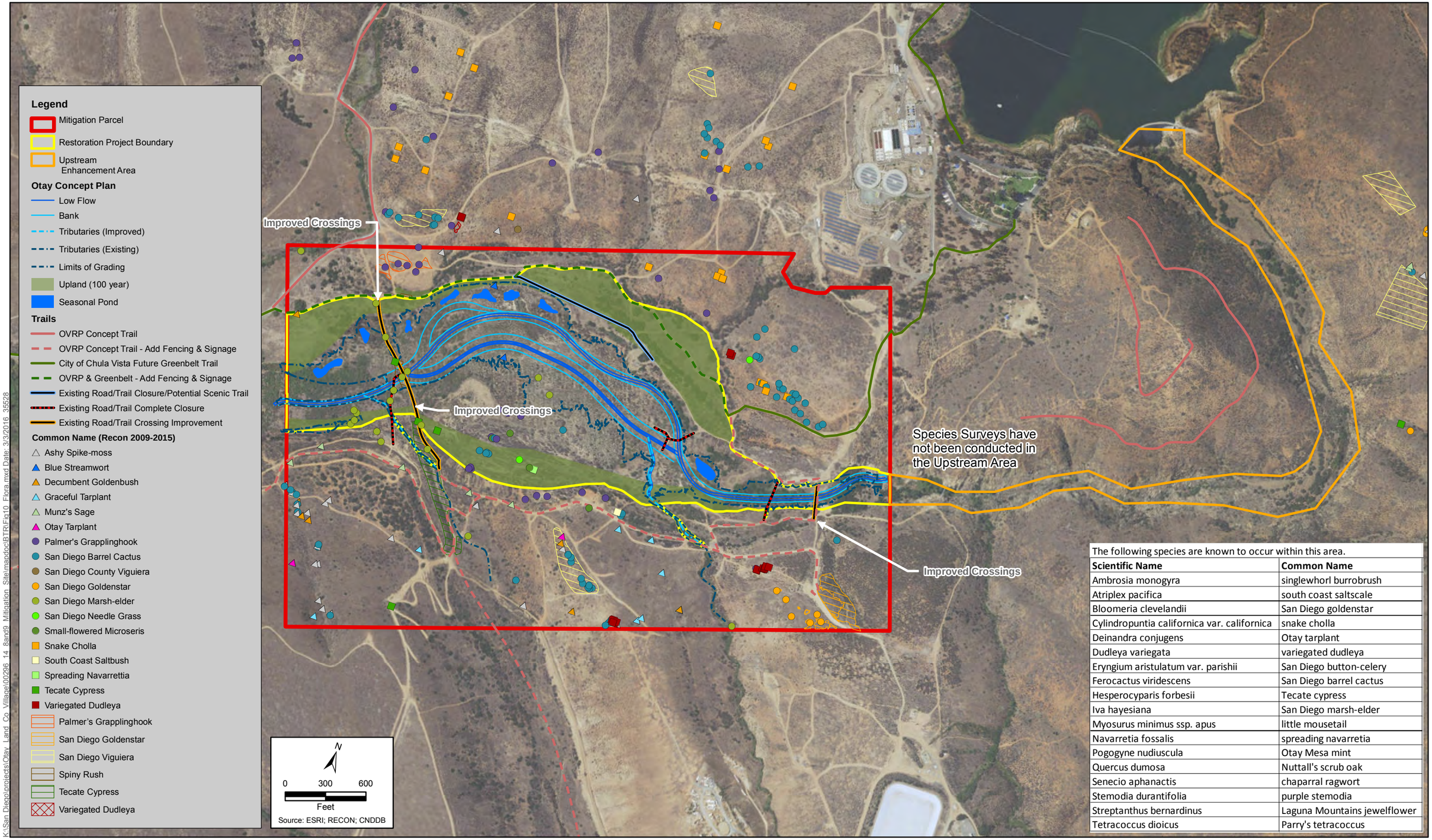


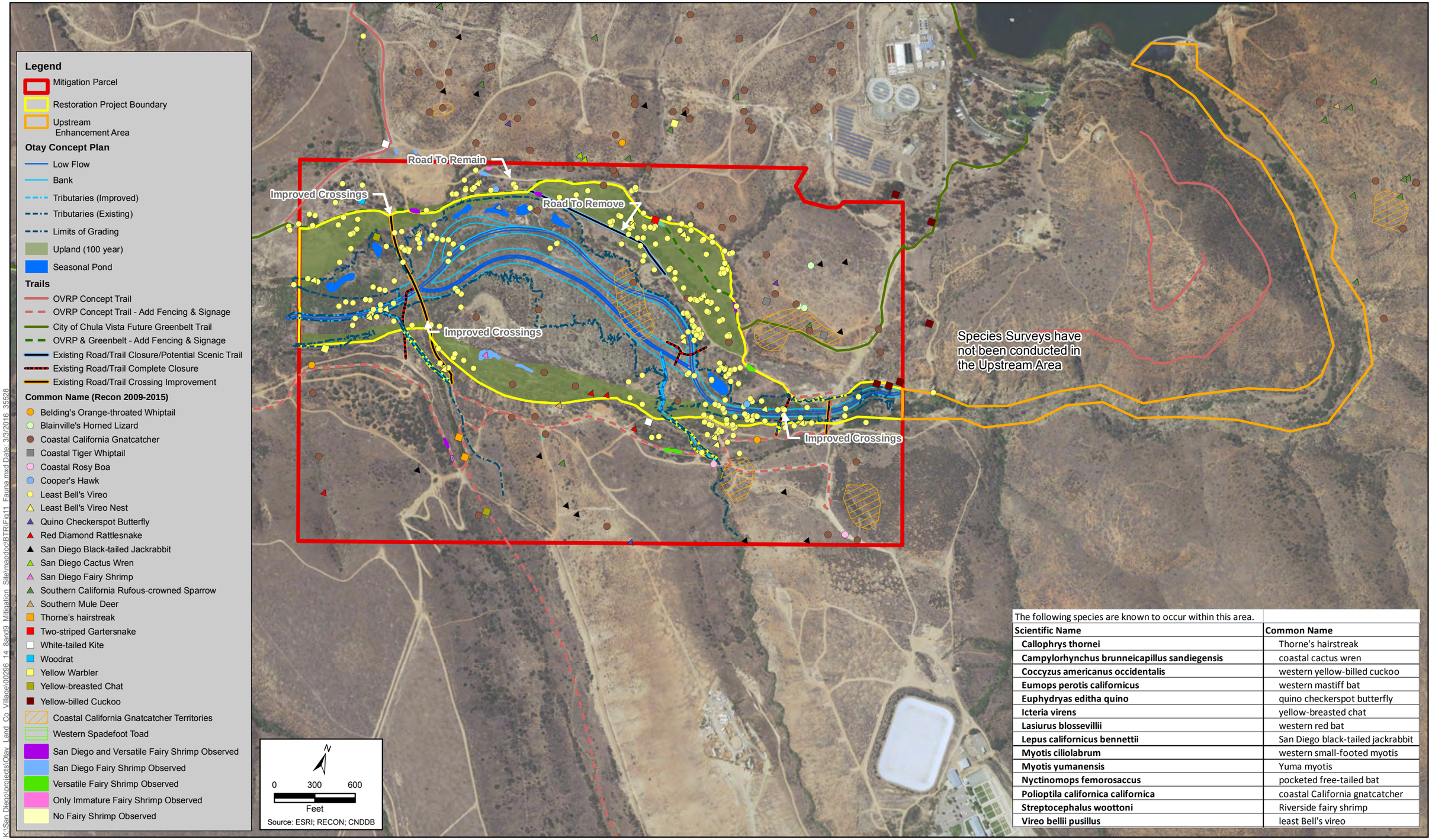
Figure 9b
Vegetation Map
Otay River Restoration Project



The following species are known to occur within this area.

Scientific Name	Common Name
Ambrosia monogyra	singlewhorl burrobrush
Atriplex pacifica	south coast saltscale
Bloomeria clevelandii	San Diego goldenstar
Cylindropuntia californica var. californica	snake cholla
Deinandra conjugens	Otay tarplant
Dudleya variegata	variegated dudleya
Eryngium aristulatum var. parishii	San Diego button-celery
Ferocactus viridescens	San Diego barrel cactus
Hesperocyparis forbesii	Tecate cypress
Iva hayesiana	San Diego marsh-elder
Myosurus minimus ssp. apus	little mousetail
Navarretia fossalis	spreading navarretia
Pogogyne nudiuscula	Otay Mesa mint
Quercus dumosa	Nuttall's scrub oak
Senecio aphanactis	chaparral ragwort
Stemodia durantifolia	purple stemodia
Streptanthus bernardinus	Laguna Mountains jewelflower
Tetracoccus dioicus	Parry's tetracoccus

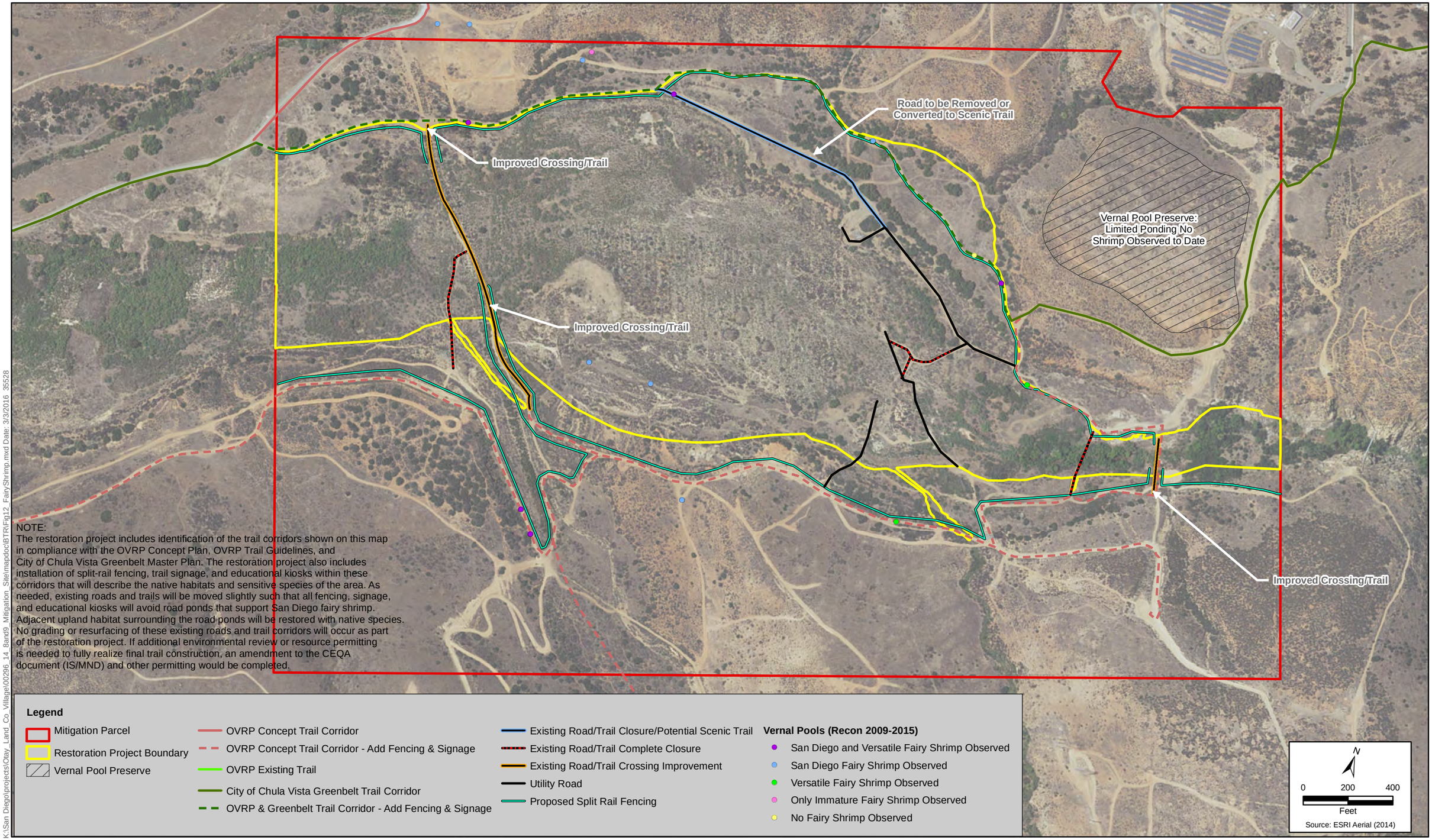
Figure 10
Special-Status Plant Species Occurring within Project Area
Otay River Restoration Project



The following species are known to occur within this area.	
Scientific Name	**Common Name**
Callophrys thornei	Thorne's hairstreak
Campylorhynchus brunneicapillus sandiegensis	coastal cactus wren
Coccyzus americanus occidentalis	western yellow-billed cuckoo
Eumops perotis californicus	western mastiff bat
Euphydryas editha quino	quino checkerspot butterfly
Icteria virens	yellow-breasted chat
Lasiurus blossevillii	western red bat
Lepus californicus bennettii	San Diego black-tailed jackrabbit
Myotis ciliolabrum	western small-footed myotis
Myotis yumanensis	Yuma myotis
Nyctinomops femorosaccus	pocketed free-tailed bat
Polioptila californica californica	coastal California gnatcatcher
Streptocephalus woottoni	Riverside fairy shrimp
Vireo bellii pusillus	least Bell's vireo

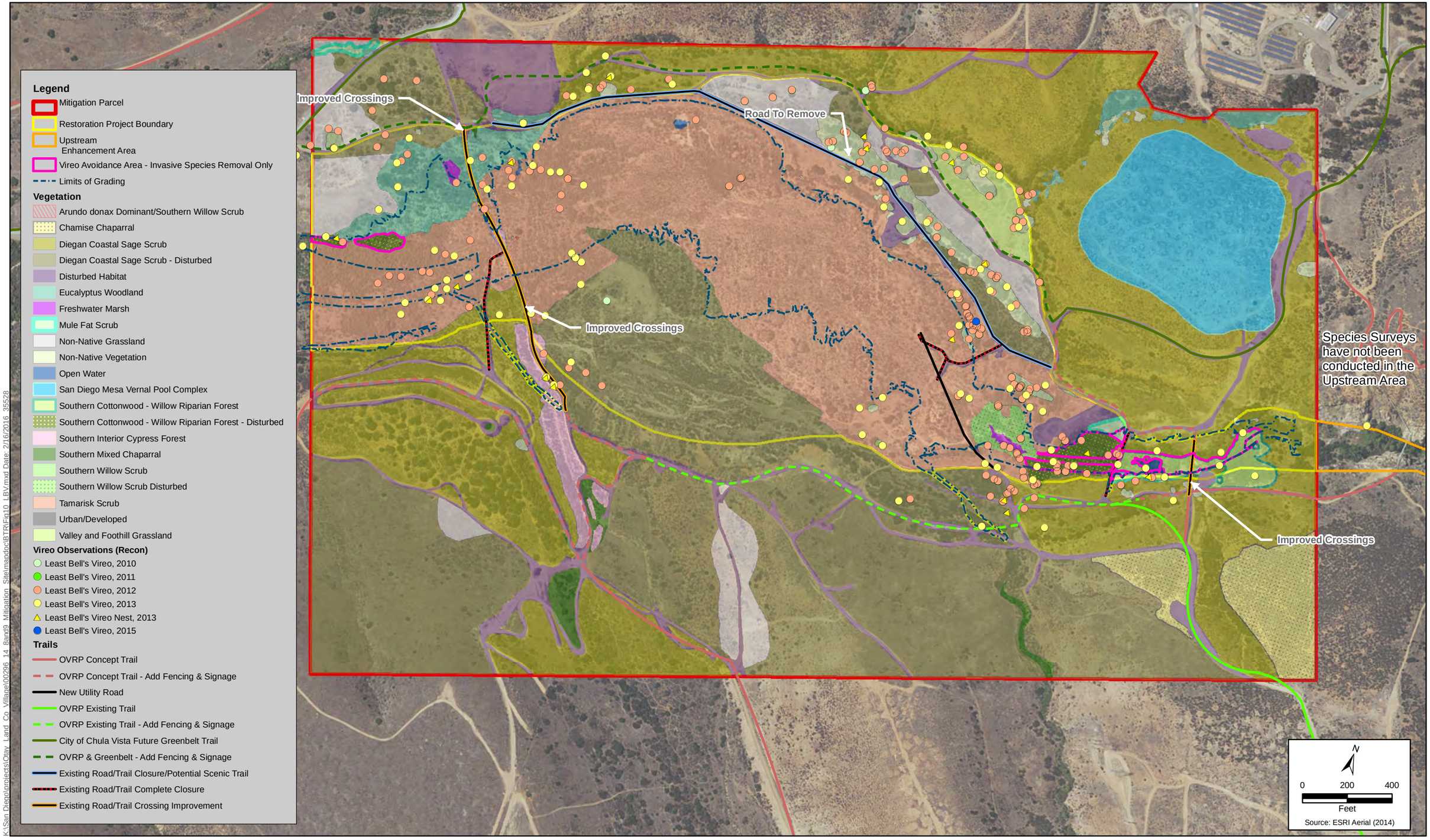
K:\San Diego\projects\Otay Land Co Village\00296.14 8and9 Mitigation Site\mapdoc\BTR\Fig11_Fauna.mxd Date: 3/3/2016 35528

Figure 11
Special-Status Wildlife Species Occurring within Project Area
Otay River Restoration Project



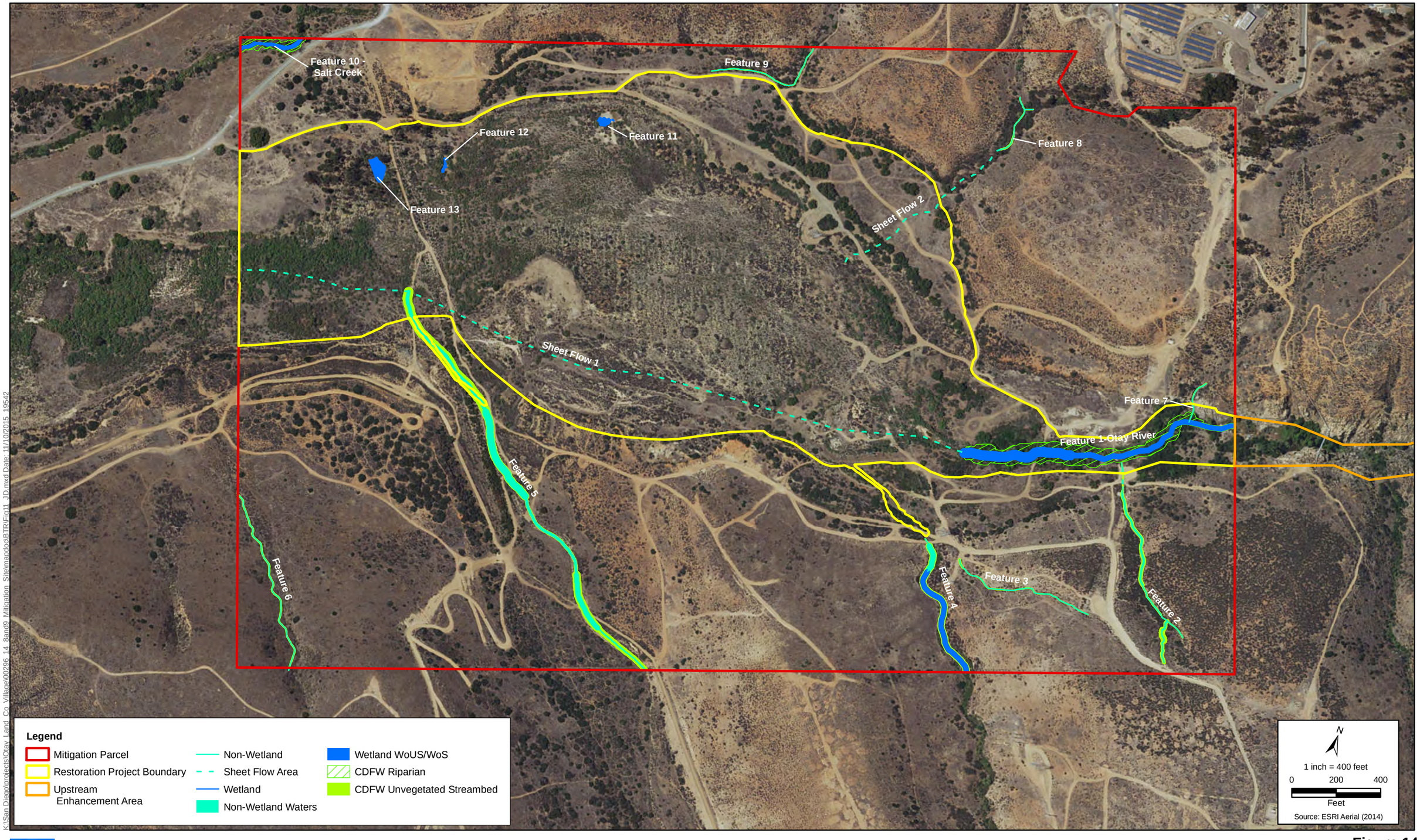
K:\San Diego\projects\Otay_Land_Co_Village\00296_14_8and9_Mitigation_Site\mapdoc\BTR\Fig12_FairyShrimp.mxd Date: 3/3/2016 35528

Figure 12
Fairy Shrimp
Otay River Restoration Project



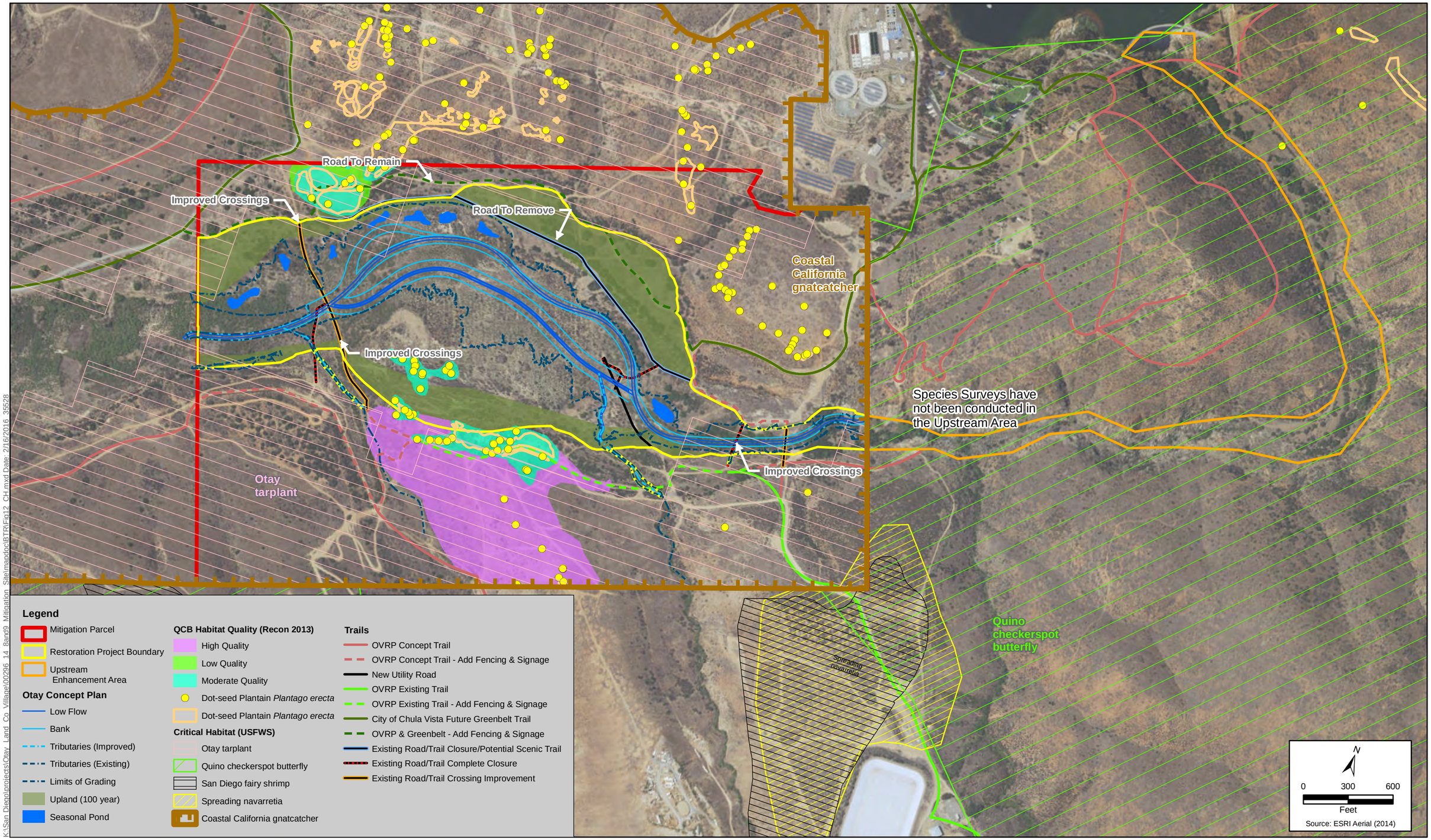
K:\San Diego\projects\Otay Land Co Village\00296.14 Band9 Mitigation Site\mapdoc\BTR\Fig10_LBV.mxd Date: 2/16/2016 35528

Figure 13
Least Bell's Vireo Occurrences within the Project Area
Otay River Restoration Project



K:\San Diego\projects\Otay Land Co Village\00296.14 8and9 Mitigation Site\mapdoc\BTRIFig11_1D.mxd Date: 11/10/2015 19542

Figure 14
Potential Jurisdictional Waters and Wetlands Occurring within the Project Area
Otay River Restoration Project



K:\San Diego\projects\Otay Land Co Village\00296.14 8and9 Mitigation Site\mapdoc\BTR\Fig12_CH.mxd Date: 2/16/2016 35528

Figure 15
Critical Habitat
Otay River Restoration Project

Appendix B

Observed Species List – Flora

Appendix B. Observed Species List - Flora

	Scientific Name	Common Name	Special Status
	LYCOPHYTES		
	Selaginellaceae - Spike-moss family		
	Selaginella bigelovii	bushy spike-moss	
	Selaginella cinerascens	ashy spike-moss	CRPR 4.1
	FERNS		
	Marsileaceae - Marsilea family		
	Marsilea vestita ssp. vestita	hairy clover fern	
	Pilularia americana	American pillwort	
	Pteridaceae - Brake family		
	Pellaea mucronata	bird's-foot cliff-break	
	Pentagramma triangularis	goldback fern	
	GYMNOSPERMS		
	Cupressaceae - Cypress family		
	Hesperocyparis forbesii	Tecate cypress	CRPR 1B.1
	EUDICOTS		
	Adoxaceae - Muskroot family		
	Sambucus nigra ssp. caerulea	blue elderberry	
	Aizoaceae - Fig-marigold family		
*	*Aptenia cordifolia*	baby sun-rose	
*	*Mesembryanthemum crystallinum*	crystalline iceplant	
	Sesuvium verrucosum	western sea-purslane	
	Anacardiaceae - Sumac Or Cashew family		
	Malosma laurina	laurel sumac	
	Rhus integrifolia	lemonade berry	
*	*Schinus molle*	Peruvian pepper tree	
*	*Schinus terebinthifolius*	Brazilian pepper tree	
	Apiaceae - Carrot family		
	Apiastrum angustifolium	mock parsley	
*	*Apium graveolens*	celery	
*	*Conium maculatum*	poison hemlock	
	Daucus pusillus	rattlesnake weed	
*	*Foeniculum vulgare*	fennel	

	Scientific Name	Common Name	Special Status
	Apocynaceae - Dogbane family		
	Funastrum cynanchoides var. hartwegii	Hartweg's climbing milkweed	
	Asteraceae - Sunflower family		
	Achillea millefolium	common yarrow	
	Ambrosia acanthicarpa	annual bur-sage	
	Ambrosia monogyra	singlewhorl burrobrush	CRPR 2B.2
*	*Anthemis cotula*	mayweed	
	Artemisia californica	California sagebrush	
	Artemisia douglasiana	Douglass' sagebrush	
	Baccharis pilularis ssp. pilularis	coyote brush	
	Baccharis salicifolia ssp. salicifolia	mule fat	
	Baccharis sarothroides	broom baccharis	
	Bahiopsis laciniata	San Diego sunflower	CRPR 4.2
	Brickellia californica	California brickellbush	
*	*Carduus pycnocephalus ssp. pycnocephalus*	Italian thistle	
*	*Centaurea melitensis*	tocalote	
*	*Cirsium vulgare*	bull thistle	
	Corethrogyne filaginifolia	common sand aster	
*	*Cotula australis*	Australian cotula	
*	*Cotula coronopifolia*	brass-buttons	
*	*Cynara cardunculus*	cardoon	
	Deinandra conjugens	Otay tarplant	FT, SE, CRPR 1B.1
	Deinandra fasciculata	fascicled tarplant	
*	*Dittrichia graveolens*	stinkwort	
	Encelia californica	California encelia	
	Encelia farinosa	brittlebush	
	Erigeron canadensis	horseweed	
	Eriophyllum confertiflorum	golden woolly sunflower	
	Eriophyllum confertiflorum var. confertiflorum	golden woolly sunflower	
*	*Glebionis coronaria*	crown daisy	
	Grindelia camporum	field gumplant	
	Gutierrezia sarothrae	matchweed	
	Hazardia squarrosa	saw toothed goldenbush	
*	*Hedypnois cretica*	crete weed	

	Scientific Name	Common Name	Special Status
*	*Helminthotheca echioides*	bristly ox-tongue	
	Heterotheca grandiflora	telegraph weed	
	Holocarpha virgata ssp. elongata	graceful tarplant	CRPR 4.2
*	*Hypochaeris glabra*	smooth cat's-ear	
	Isocoma menziesii	coastal goldenbush	
	Isocoma menziesii var. decumbens	decumbent goldenbush	CRPR 1B.2
	Iva hayesiana	San Diego marsh-elder	CRPR 2B.2
*	*Lactuca serriola*	prickly lettuce	
	Lasthenia gracilis	common goldfields	
	Logfia filaginoides	California cottonrose	
*	*Logfia gallica*	French cottonrose	
*	*Matricaria discoidea*	pineapple weed	
	Microseris douglasii ssp. platycarpha	small-flowered microseris	CRPR 4.2
	Osmadenia tenella	osmadenia	
	Pluchea odorata var. odorata	saltmarsh-fleabane	
	Pseudognaphalium beneolens	fragrant Everlansting	
	Pseudognaphalium californicum	California everlasting	
*	*Pseudognaphalium luteoalbum*	white lamb everlasting	
	Psilocarphus brevissimus var. brevissimus	dwarf woolly-marbles	
	Psilocarphus tenellus	slender woolly-marbles	
*	*Silybum marianum*	blessed milkthistle	
	Stephanomeria sp.	wire-lettuce	
*	*Symphyotrichum subulatum var. elongatum*	elongated annual saltmarsh aster	
*	*Taraxacum officinale*	common dandelion	
	Xanthium strumarium	cocklebur	
	Boraginaceae - Borage family		
	Amsinckia menziesii	Menzies's fiddleneck	
	Cryptantha intermedia	clearwater cryptantha	
	Eriodictyon trichocalyx	hairy yerba santa	
	Harpagonella palmeri	Palmer's grapplinghook	CRPR 4.2
	Heliotropium curassavicum var. oculatum	alkali heliotrope	
	Pectocarya linearis ssp. ferocula	narrow-toothed pectocarya	
	Phacelia cicutaria	caterpillar phacelia	
	Plagiobothrys acanthocarpus	adobe popcornflower	

	Scientific Name	Common Name	Special Status
	Brassicaceae - Mustard family		
*	*Brassica nigra*	black mustard	
*	*Capsella bursa-pastoris*	shepherd's purse	
*	*Hirschfeldia incana*	shortpod mustard	
*	*Lepidium draba*	heart podded pepper-grass	
*	*Lepidium latifolium*	perennial pepper-grass	
	Lepidium nitidum	shining pepper-grass	
	Nasturtium officinale	medicinal water cress	
	Cactaceae - Cactus family		
	Cylindropuntia californica var. californica	snake cholla	CRPR 1B.1
	Cylindropuntia prolifera	coast cholla	
	Ferocactus viridescens	San Diego barrel cactus	CRPR 2B.1
	Mammillaria dioica	White fishhook cactus	
	Opuntia basilaris var. basilaris	beavertail cactus	
	Opuntia littoralis	coastal prickly pear	
	Caryophyllaceae - Pink family		
*	*Cerastium glomeratum*	sticky mouse-ear chickweed	
*	*Silene gallica*	windmill catchfly	
*	*Spergularia villosa*	hairy sand-spurrey	
	Chenopodiaceae - Goosefoot family		
	Atriplex pacifica	south coast saltscale	CRPR 1B.2
*	*Atriplex semibaccata*	Australian saltbush	
*	*Chenopodium album*	lamb's quarters	
*	*Chenopodium murale*	nettleleaf goosefoot	
*	*Salsola tragus*	prickly Russian thistle	
	Cistaceae - Rock-rose family		
	Crocanthemum scoparium var. vulgare	common peak rush-rose	
	Cleomaceae - Spiderflower family		
	Peritoma arborea	bladderpod	
	Convolvulaceae - Morning-glory family		
	Calystegia macrostegia	coast morning-glory	
*	*Convolvulus arvensis*	bindweed, orchard morning-glory	
	Cuscuta sp.	dodder	

	Scientific Name	Common Name	Special Status
	Crassulaceae - Stonecrop family		
	Crassula aquatica	Water pygmyweed	
	Crassula connata	pygmyweed	
	Dudleya edulis	ladies fingers	
	Dudleya lanceolata	lance-leaved dudleya	
	Dudleya pulverulenta	chalk dudleya	
	Dudleya variegata	variegated dudleya	CRPR 1B.2
	Cucurbitaceae - Gourd family		
	Cucurbita foetidissima	calabazilla	
	Marah macrocarpa	large fruit wild cucumber	
	Elatinaceae - Waterwort family		
	Elatine brachysperma	shortseed waterwort	
	Ericaceae - Heath family		
	Arctostaphylos otayensis	Otay manzanita	CRPR 1B.2
	Euphorbiaceae - Spurge family		
	Croton setigerus	doveweed	
	Euphorbia albomarginata	white margin spurge	
	Euphorbia polycarpa	many seed spurge	
	Fabaceae - Legume family		
	Acmispon americanus var. americanus	Spanish-clover	
	Acmispon glaber	deerweed	
	Astragalus trichopodus var. lonchus	hairy fruit spear milkvetch	
	Lupinus succulentus	arroyo lupine	
*	*Medicago lupulina*	black burclover	
*	*Melilotus indicus*	Indian sweetclover	
*	*Trifolium hirtum*	rose clover	
	Fagaceae - Oak family		
	Quercus agrifolia	coast live oak	
	Quercus berberidifolia	scrub oak	
	Gentianaceae - Gentian family		
	Zeltnera exaltata	tall centaury	
	Zeltnera venusta	California centaury	
	Geraniaceae - Geranium family		
*	*Erodium botrys*	longbeak filaree	

	Scientific Name	Common Name	Special Status
*	*Erodium cicutarium*	redstem filaree	
*	*Erodium moschatum*	whitestem filaree	
	Geranium sp.	geranium	
	Grossulariaceae - Gooseberry family		
	Ribes speciosum	fuchsia-flowered gooseberry	
	Lamiaceae - Mint family		
*	*Marrubium vulgare*	horehound	
	Salvia apiana	white sage	
	Salvia columbariae	chia	
	Salvia mellifera	black sage	
	Salvia munzii	Munz's sage	CRPR 2B.2
	Trichostema lanceolatum	vinegar weed	
	Lythraceae - Loosestrife family		
	Ammannia robusta	grand redstem	
*	*Lythrum hyssopifolia*	grass Poly	
	Malvaceae - Mallow family		
	Malacothamnus fasciculatus	chaparral bush-mallow	
*	*Malva parviflora*	cheeseweed	
	Sidalcea malviflora	mallow leaf checkerbloom	
	Sidalcea sparsifolia	southern checkerbloom	
	Montiaceae - Purslane family		
	Claytonia perfoliata ssp. perfoliata	round leaf miner's lettuce	
	Myrsinaceae - Myrsine family		
*	*Anagallis arvensis*	scarlet pimpernel	
	Myrtaceae - Myrtle family		
*	*Eucalyptus globulus*	blue gum	
	Eucalyptus sp.	gum	
	Nyctaginaceae - Four O'clock family		
	Mirabilis laevis var. crassifolia	coastal wishbone plant	
	Onagraceae - Evening Primrose family		
	Camissoniopsis bistorta	California sun cup	
	Camissoniopsis hirtella	hairy suncup	
	Epilobium canum	California fuchsia	

	Scientific Name	Common Name	Special Status
	Orobanchaceae - Broom-rape family		
	Castilleja affinis ssp. affinis	coast indian paintbrush	
	Oxalidaceae - Oxalis family		
	Oxalis californica	California wood-sorrel	
	Papaveraceae - Poppy family		
	Eschscholzia californica	California poppy	
	Phrymaceae - Lopseed family		
	Mimulus brevipes	widethroat yellow monkeyflower	
	Plantaginaceae - Plantain family		
	Antirrhinum coulterianum	Coulter's snapdragon	
	Antirrhinum nuttallianum	Nuttall's snapdragon	
	Callitriche marginata	winged water-starwort	
	Plantago elongata	prairie plantain	
	Plantago erecta	dot seed plantain	
*	*Plantago lanceolata*	English plantain	
	Stemodia durantifolia	purple stemodia	CRPR 2B.1
	Veronica peregrina ssp. xalapensis	purslane speedwell	
	Platanaceae - Plane Tree, Sycamore family		
	Platanus racemosa	western sycamore	
	Polemoniaceae - Phlox family		
	Gilia sp.	gilia	
	Linanthus dianthiflorus	fringed linanthus	
	Navarretia fossalis	spreading navarretia	FT, CRPR 1B.1
	Navarretia hamata	hooked navarretia	
	Polygonaceae - Buckwheat family		
	Chorizanthe fimbriata	fringed spineflower	
	Eriogonum fasciculatum	California buckwheat	
	Persicaria lapathifolia	willow smartweed	
*	*Polygonum aviculare ssp. depressum*	dented oval leaf knotweed	
*	*Rumex crispus*	curly dock	
	Primulaceae - Primrose family		
	Primula clevelandii	padre's shooting star	
	Ranunculaceae - Buttercup family		
	Clematis pauciflora	few flowered virgin's bower	

	Scientific Name	Common Name	Special Status
	Delphinium parryi ssp. parryi	Parry's larkspur	
	Rhamnaceae - Buckthorn family		
	Ceanothus otayensis	Otay Mountain ceanothus	CRPR 1B.2
	Ceanothus tomentosus	woollyleaf ceanothus	
	Rhamnus crocea	spiny redberry	
	Rosaceae - Rose family		
	Adenostoma fasciculatum var. fasciculatum	chamise	
	Cercocarpus minutiflorus	San Diego mountain mahogany	
	Heteromeles arbutifolia	toyon	
	Prunus ilicifolia	holly-leaf cherry	
	Rosa californica	California rose	
	Rubiaceae - Madder family		
	Galium angustifolium ssp. angustifolium	narrow leaved bedstraw	
	Galium aparine	common bedstraw	
	Galium nuttallii ssp. nuttallii	Nuttall's bedstraw	
	Salicaceae - Willow family		
	Populus fremontii ssp. fremontii	Fremont cottonwood	
	Salix exigua	sand bar willow	
	Salix gooddingii	Goodding's black willow	
	Salix lasiolepis	arroyo willow	
	Saxifragaceae - Saxifrage family		
	Jepsonia parryi	Parry's jepsonia	
	Scrophulariaceae - Figwort family		
*	*Myoporum laetum*	ngaio tree	
	Simmondsiaceae - Jojoba family		
	Simmondsia chinensis	jojoba	
	Solanaceae - Nightshade family		
	Datura wrightii	wright's jimsonweed	
	Lycium andersonii	Anderson's box-thorn	
*	*Nicotiana glauca*	tree tobacco	
	Solanum douglasii	Douglas' nightshade	
	Tamaricaceae - Tamarisk family		
	Tamarix sp.	tamarisk	

	Scientific Name	Common Name	Special Status
	Urticaceae - Nettle family		
	Urtica dioica	stinging nettle	
	Verbenaceae - Vervain family		
	Phyla nodiflora	turkey tangle fogfruit	
	Verbena menthifolia	mint leaf vervain	
	Violaceae - Violet family		
	Viola pedunculata	johnny-jump-up	
	MONOCOTS		
	Agavaceae - Century Plant family		
	Chlorogalum parviflorum	smallflower soap plant	
	Hesperoyucca whipplei	chaparral yucca	
	Alismataceae - Water-plantain family		
	Echinodorus berteroi	upright burhead	
	Arecaceae - Palm family		
*	*Phoenix canariensis*	Canary Island palm	
*	*Washingtonia robusta*	mexican fan palm	
	Cyperaceae - Sedge family		
	Bolboschoenus maritimus ssp. paludosus	saltmarsh bulrush	
	Eleocharis macrostachya	pale spikerush	
	Iridaceae - Iris family		
	Sisyrinchium bellum	lovely blue-eyed-grass	
	Juncaceae - Rush family		
	Juncus acutus ssp. leopoldii	southwestern spiny rush	CRPR 4.2
	Juncus bufonius	toad rush	
	Juncus dubius	mariposa rush	
	Liliaceae - Lily family		
	Calochortus splendens	splendid mariposa lily	
	Poaceae - Grass family		
	Aristida adscensionis	sixweeks three-awn	
	Aristida purpurea var. nealleyi	Nealley three-awn	
*	*Arundo donax*	giant reed	
*	*Avena barbata*	slender wild oat	
	Bothriochloa barbinodis	cane bluestem	
*	*Brachypodium distachyon*	purple false brome	

	Scientific Name	Common Name	Special Status
*	*Bromus diandrus*	ripgut brome	
*	*Bromus hordeaceus*	soft brome	
*	*Bromus madritensis ssp. rubens*	red brome	
*	*Cortaderia jubata*	purple pampas grass	
*	*Cynodon dactylon*	Bermuda grass	
	Deschampsia danthonioides	annual hairgrass	
	Distichlis spicata	salt grass	
*	*Festuca myuros*	rattail fescue	
*	*Festuca perennis*	rye grass	
*	*Gastridium phleoides*	nit grass	
*	*Hordeum murinum ssp. glaucum*	smooth barley	
*	*Lamarckia aurea*	goldentop grass	
	Melica imperfecta	coast range onion grass	
*	*Melinis repens ssp. repens*	natal grass	
	Muhlenbergia microsperma	littleseed muhly	
	Phalaris sp.	canary grass	
*	*Poa annua*	annual blue grass	
*	*Polypogon monspeliensis*	rabbit foot beard grass	
*	*Schismus barbatus*	Mediterranean schismus	
	Sporobolus airoides	alkali sacaton	
	Stipa coronata	crested needle grass	
	Stipa diegoensis	San Diego County needle grass	CRPR 4.2
	Stipa lepida	foothill needle grass	
*	*Stipa miliacea var. miliacea*	smilo grass	
	Stipa pulchra	purple needle grass	
	Themidaceae - Brodiaea family		
	Bloomeria clevelandii	San Diego goldenstar	CRPR 1B.1
	Bloomeria crocea	common goldenstar	
	Brodiaea terrestris ssp. kernensis	Kern brodiaea	
	Dichelostemma capitatum	blue dicks	
	Typhaceae - Cattail family		
	Typha sp.	cattail	

Scientific Name	Common Name	Special Status

Legend

*= Non-native or invasive species

Special Status:

CRPR – California Rare Plant Rank
1A. Presumed extinct in California and elsewhere
1B. Rare or Endangered in California and elsewhere
2A. Presumed extinct in California, more common elsewhere
2B. Rare or Endangered in California, more common elsewhere
3. Plants for which we need more information - Review list
4. Plants of limited distribution - Watch list

Threat Ranks
.1 - Seriously endangered in California
.2 – Fairly endangered in California

Appendix C

Observed Species List – Fauna

Appendix C. Observed Species List - Fauna

Scientific Name	Common Name	Special Status	
INVERTEBRATES			
Branchiopods			
Branchinecta lindahli	Versatile Fairy Shrimp		
Branchinecta sandiegonensis	San Diego Fairy Shrimp	FE	SDC Group I, MSCP
Moths, Skippers and Butterflies			
Pontia protodice	Checkered White		
**Pieris rapae*	Cabbage White		
Anthocharis sara	Pacific Orangetip		
Zerene eurydice	California Dogface		
Icaricia acmon	Acmon Blue		
Apodemia virgulti	Behr's Metalmark		
Phyciodes mylitta	Mylitta Crescent		
Vanessa cardui	Painted Lady		
Junonia coenia	Common Buckeye		
VERTEBRATES			
Amphibians			
**Lithobates catesbeianus*	American Bullfrog		
Spea hammondii	Western Spadefoot	CSC	SDC Group II
Reptiles			
Aspidoscelis hyperythra hyperythra	Belding's Orange-throated Whiptail	CSC	SDC Group II, MSCP
Phrynosoma blainvillii	Blainville's Horned Lizard	CSC	SDC Group II, MSCP
Sceloporus occidentalis	Western Fence Lizard		
Uta stansburiana elegans	Western Side-blotched Lizard		
Lichanura trivirgata	Rosy Boa		SDC Group II
Pituophis catenifer annectens	San Diego Gophersnake		
Birds			
Anas platyrhynchos	Mallard		
Callipepla californica	California Quail		
Ardea herodias	Great Blue Heron		SDC Group II
Butorides virescens	Green Heron		SDC Group II
Cathartes aura	Turkey Vulture		SDC Group I
Elanus leucurus	White-tailed Kite	CFP	SDC Group I
Circus cyaneus	Northern Harrier	CSC	SDC Group I, MSCP

Scientific Name	Common Name	Special Status	
Accipiter cooperii	Cooper's Hawk		SDC Group I, MSCP
Buteo jamaicensis	Red-tailed Hawk		
Rallus limicola	Virginia Rail		
Fulica americana	American Coot		
Charadrius vociferus	Killdeer		
Zenaida macroura	Mourning Dove		
Coccyzus americanus	Yellow-billed Cuckoo		
Geococcyx californianus	Greater Roadrunner		
Tyto alba	Barn Owl		SDC Group II
Bubo virginianus	Great Horned Owl		
Chordeiles acutipennis	Lesser Nighthawk		
Aeronautes saxatalis	White-throated Swift		
Archilochus alexandri	Black-chinned Hummingbird		
Calypte anna	Anna's Hummingbird		
Calypte costae	Costa's Hummingbird		
Picoides nuttallii	Nuttall's Woodpecker		
Picoides pubescens	Downy Woodpecker		
Falco sparverius	American Kestrel		
Empidonax traillii	Willow Flycatcher	SE	
Empidonax difficilis	Pacific-slope Flycatcher		
Sayornis nigricans	Black Phoebe		
Sayornis saya	Say's Phoebe		
Myiarchus cinerascens	Ash-throated Flycatcher		
Tyrannus vociferans	Cassin's Kingbird		
Tyrannus verticalis	Western Kingbird		
Vireo bellii pusillus	Least Bell's Vireo	FE, SE	SDC Group I, MSCP
Vireo gilvus	Warbling Vireo		
Aphelocoma californica	Western Scrub-Jay		
Corvus brachyrhynchos	American Crow		
Corvus corax	Common Raven		
Eremophila alpestris	Horned Lark		
Tachycineta thalassina	Violet-green Swallow		
Stelgidopteryx serripennis	Northern Rough-winged Swallow		

Scientific Name	Common Name	Special Status	
Petrochelidon pyrrhonota	Cliff Swallow		
Psaltriparus minimus	Bushtit		
Troglodytes aedon	House Wren		
Cistothorus palustris	Marsh Wren		
Thryomanes bewickii	Bewick's Wren		
Campylorhynchus brunneicapillus	Cactus Wren		
Campylorhynchus brunneicapillus sandiegensis	San Diego Cactus Wren	CSC	SDC Group I, MSCP
Polioptila caerulea	Blue-gray Gnatcatcher		
Polioptila californica	California Gnatcatcher	FT, CSC	SDC Group I, MSCP
Chamaea fasciata	Wrentit		
Sialia mexicana	Western Bluebird		SDC Group II, MSCP
Catharus guttatus	Hermit Thrush		
Toxostoma redivivum	California Thrasher		
Mimus polyglottos	Northern Mockingbird		
**Sturnus vulgaris*	European Starling		
Phainopepla nitens	Phainopepla		
Oreothypis celata	Orange-crowned Warbler		
Geothlypis trichas	Common Yellowthroat		
Setophaga petechia	Yellow Warbler	CSC	SDC Group II
Cardellina pusilla	Wilson's Warbler		
Icteria virens	Yellow-breasted Chat	CSC	SDC Group I
Pipilo maculatus	Spotted Towhee		
Aimophila ruficeps canescens	Southern California Rufous-crowned Sparrow		SDC Group I, MSCP
Melozone crissalis	California Towhee		
Artemisiospiza belli belli	Bell's Sage Sparrow		SDC Group I
Ammodramus savannarum	Grasshopper Sparrow	CSC	SDC Group I
Melospiza melodia	Song Sparrow		
Zonotrichia leucophrys	White-crowned Sparrow		
Piranga ludoviciana	Western Tanager		
Pheucticus melanocephalus	Black-headed Grosbeak		
Passerina amoena	Lazuli Bunting		
Agelaius phoeniceus	Red-winged Blackbird		
Sturnella neglecta	Western Meadowlark		

Scientific Name	Common Name	Special Status	
**Molothrus ater*	Brown-headed Cowbird		
Icterus cucullatus	Hooded Oriole		
Icterus bullockii	Bullock's Oriole		
Haemorhous mexicanus	House Finch		
Carduelis psaltria	Lesser Goldfinch		
Carduelis tristis	American Goldfinch		
Mammals			
Sylvilagus audubonii	Desert Cottontail		
Lepus californicus	Black-tailed Jackrabbit		
Ostospermophilus beecheyi	California Ground Squirrel		
Neotoma lepida intermedia	San Diego Desert Woodrat	CSC	SDC Group II
Canis latrans	Coyote		
**Equus caballus*	Domestic Horse		
**Bos taurus*	Domestic Cattle		

Legend

*= Non-native or invasive species

Special Status:

Federal:
FE = Endangered
FT = Threatened

State:
SE = Endangered
ST =Threatened
CSC = California Species of Special Concern
CFP = California Fully Protected Species

County:
SDC Group I = includes animal species that have a very high level of sensitivity, either because they are listed as threatened or endangered or because they have very specific natural history requirements that must be met.
SDC Group II - includes animal species that are becoming less common, but are not yet so rare that extirpation or extinction is imminent without immediate action. These species tend to be prolific within their suitable habitat types.

MSCP = Multiple Species Conservation Program Covered Species

Appendix D

Potential to Occur – Sensitive Species Table: Flora

Common Name (*Scientific Name*)	Status	Habitat Preference/Requirements	Potential to Occur	Rationale
San Diego thorn-mint (*Acanthomintha ilicifolia*)	FT/CE CRPR 1B.1 SD County List A County MSCP City of Chula Vista MSCP NE	Annual herb. Prefers friable or broken clay soils in grassy openings in chaparral and coastal sage scrub, valley and foothill grassland, and vernal pools; 10-960 m (33-3150 ft). Blooming period: April - June	Low	Potentially suitable friable clay soils for this species occur in a very limited area within the project area.
Nuttall's lotus (*Acmispon prostratus*)	CRPR 1B.1 SD County List A County MSCP	Annual herb. Coastal dunes and sandy coastal scrub; 0-10 m (0-32 ft). Blooming period: March - July	Not Expected	Suitable coastal dune habitat is not present within the project area.
California adolphia (*Adolphia californica*)	CRPR 2B.1 SD County List B	Deciduous shrub. Clay soils in chaparral, coastal scrub, and valley and foothill grassland; 45-740 m (147-2428 ft). Blooming period: December - May	High	Suitable soils and habitat are present within the project area. This species has been documented immediately southwest of the project area.
Shaw's agave (*Agave shawii* var. *shawii*)	CRPR 2B.1 SD County List B County MSCP	Perennial leaf succulent. Coastal bluff scrub, coastal scrub; 10-120 m (32-393 ft). Blooming period: September - May	Not Expected	Appropriate coastal bluff habitat does not occur within the project area.
San Diego bur-sage (*Ambrosia chenopodiifolia*)	CRPR 2B.1 SD COUNTY List B	Perennial shrub. Coastal scrub; 55-155 m (178-508 ft). Blooming period: April - June	High	Suitable soils and habitat are present within the project area. This species has been documented approximately 0.5 mile south of the project area.

Common Name (*Scientific Name*)	Status	Habitat Preference/Requirements	Potential to Occur	Rationale
singlewhorl burrobrush (*Ambrosia monogyra*)	CRPR 2B.2	Perennial shrub. Sandy soils in chaparral, coastal sage scrub, Sonoran desert scrub, and washes; 10-500 m (328-1640 ft). Blooming period: August - November	Present	This species was observed within the project area during surveys.
San Diego ambrosia (*Ambrosia pumila*)	FE CRPR 1B.1 SD County List A County MSCP City of Chula Vista MSCP NE	Rhizomatous herb. Sandy loam or clay soils in chaparral, coastal sage scrub, valley and foothill grassland, vernal pools; often in disturbed areas or sometimes alkaline areas. Can occur in creek beds, seasonally dry drainages, and floodplains; 20-415 m (66-1362 ft). Blooming period: April - October	Moderate	Suitable soils and habitat are present within the project area. However, the nearest known occurrence of this species is approximately 4 miles west of the project area.
aphanisma (*Aphanisma blitoides*)	CRPR 1B.2 SD County List A County MSCP	Annual herb. Sandy soils in coastal bluff scrub, coastal dunes, and coastal scrub; 1-305 m (3-1000 ft). Blooming period: March - June	Not Expected	Appropriate coastal bluff habitat does not occur within the project area.
Otay manzanita (*Arctostaphylos otayensis*)	CRPR 1B.2 SD County List A County MSCP	Evergreen shrub. Chaparral or cismontane woodlands on volcanic rock outcrops; 275-1700 m (902-5576 ft). Blooming period: January - April	Present	This species was observed within the project area during surveys.
San Diego sagewort (*Artemisia palmeri*)	CRPR 4.2 SD County List D	Deciduous shrub. Sandy soils in mesic areas in chaparral, coastal scrub, riparian forest, riparian scrub, riparian woodland; 15-915 m (49-3002 ft). Blooming period: February - September	Moderate	Suitable soils and habitat are present within the project area. However, the nearest known occurrence of this species is approximately 8 miles west of the project area.

Common Name (*Scientific Name*)	Status	Habitat Preference/Requirements	Potential to Occur	Rationale
Dean's milk-vetch (*Astragalus deanei*)	CRPR 1B.1 SD County List A	Perennial herb. Open shrubby slopes, coastal sage scrub, chaparral, cismontane woodland, riparian forest, and sandy washes; 75-695 m (246-2279 ft). Blooming period: February - May	Low	Suitable soils and habitat are present within the project area. However, this species has not been detected south of State Route 94.
San Diego milk-vetch (*Astragalus oocarpus*)	CRPR 1B.2 SD County List A	Perennial herb. Openings in chaparral and cismontane woodland, at the periphery of meadows; 305-1524m (1000-4999 ft). Blooming period: May - August	Low	This species tends to occur farther east and at higher elevations than those found within the project area.
Coulter's saltbush (*Atriplex coulteri*)	CRPR 1B.2 SD County List A	Perennial herb. Alkaline or clay soils in coastal bluff scrub, coastal dunes, coastal scrub, and valley and foothill grassland; 3-460 m (9-1509 ft). Blooming period: March - October	Moderate	Suitable soils and habitat are present within the project area. However, the nearest known occurrence of this species is approximately 5 miles southwest of the project area.
south coast saltscale (*Atriplex pacifica*)	CRPR 1B.2 SD County List A	Annual herb. Coastal bluff scrub, coastal dunes, coastal scrub, playas; 0-140 m (0-459 ft). Blooming period: March - October	Present	This species was observed within the project area during surveys.
Encinitas baccharis (*Baccharis vanessae*)	FT/CE CRPR 1B.1 SD County List A MSCP	Deciduous shrub. Sandstone in maritime chaparral and cismontane woodland; 60-720 m (196-2362 ft). Blooming period: August - November	Not Expected	Suitable maritime chaparral habitat for this species does not occur within the project area.
San Diego Sunflower (*Bahiopsis laciniata*)	CRPR 4.2 SD County List D	Perennial shrub. Chaparral and coastal scrub; 10-750 m (33-2461 ft). Blooming period: February - August	Present	This species was observed within the project area during surveys.

Common Name (*Scientific Name*)	Status	Habitat Preference/Requirements	Potential to Occur	Rationale
Golden-spined cereus (*Bergerocactus emoryi*)	CRPR 2B.2 SD County List B	Perennial stem succulent. Sandy soils in costal scrub, chaparral, and closed-cone coniferous forest, moist ocean breezes may be a key to its habitat requirements; 3-395 m (9-1295 ft). Blooming period: May - June	Not Expected	Appropriate maritime succulent scrub habitat for this species does not occur within the project area.
San Diego goldenstar *(Bloomeria clevelandii*)	CRPR 1B.1 SD County List A MSCP	Perennial bulbiferous herb. Clay soils in chaparral, coastal sage scrub, valley grasslands, particularly near mima mound topography or the vicinity of vernal pools; 50 - 465 m (164-1526 ft). Blooming period : April - May	Present	This species was observed within the project area during surveys.
Orcutt's brodiaea (*Brodiaea orcuttii*)	CRPR 1B.1 SD County List A County MSCP City of Chula Vista MSCP NE	Bulbiferous herb. Found on mesic, clay, sometimes serpentinite soils in closed-cone coniferous forest, chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland, and vernal pools ; 30-1692 m (98-5550 ft). Blooming period: May - July	High	Appropriate habitat for this species occurs within the vernal pool complex within the project area. This species has been documented approximately 0.25 mile southwest of the project area.
Round-leaved filaree (*California macrophylla*)	CRPR 1B.1 SD County List B	Annual herb. Clay soils in cismontane woodland and valley and foothill grassland; 15-1200 m (50-3936 ft). Blooming period: March - May	High	Suitable soils and habitat for this are present within the project area. This species has been documented approximately 0.5 mile west of the project area.
Dunn's mariposa-lily (*Calochortus dunnii*)	SR CRPR 1B.2 SD County List A County MSCP	Perennial bulbiferous herb. Gabbroic or metavolcanic soils, or rocky openings in chaparral or grassland/chaparral ecotone, also in closed-cone coniferous forest; 185-1830 m (606-6002 ft). Blooming period: February - June	Not Expected	Appropriate ultramafic soils for this species do not occur within the project area.

Common Name (*Scientific Name*)	Status	Habitat Preference/Requirements	Potential to Occur	Rationale
Lakeside ceanothus (*Ceanothus cyaneus*)	CRPR 1B.2 SD County List A County MSCP	Evergreen shrub. Closed-cone coniferous forest, dense chaparral; 235-755 m (771-2543 ft). Blooming period: April - June	Not Expected	The project area is outside the known range of this species.
Otay Mountain ceanothus (*Ceanothus otayensis*)	CRPR 1B.2	Perennial evergreen shrub. Metavolcanic or gabbroic chaparral; 600-1100 m (1968-3608 ft). Blooming period: January - April	Present	This species was observed within the project area during surveys.
wart-stemmed ceanothus (*Ceanothus verrucosus*)	CRPR 2B.2 SD County List B County MSCP	Evergreen shrub. Chaparral; 1-380 m (3-1247 ft). Blooming period: December - May	Not Expected	Appropriate coastal chaparral habitat for this species does not occur within the project area.
salt marsh bird's-beak (*Chloropyron maritimum* ssp. *maritimum*)	FE/CE CRPR 1B.2 SD County List A County MSCP City of Chula Vista NE	Hemiparasitic annual herb. Coastal dunes and coastal salt marshes and swamps; 0-30 m (0-98 ft). Blooming period: May - October	Not Expected	Appropriate salt marsh habitat for this species does not occur within the project area.
Orcutt's spineflower (*Chorizanthe orcuttiana*)	FE/CE CRPR 1B.1 SD County List A	Annual herb. Sandy openings in closed-cone coniferous forest, maritime chaparral, and coastal scrub; 3-125 m (9-410 ft). Blooming period: March - May	Not Expected	Appropriate habitat for this species does not occur within the project area. This species is not known to occur south of Point Loma.
long-spined spineflower (*Chorizanthe polygonoides* var. *longispina*)	CRPR 1B.2 SD County List A	Annual herb. Clay lenses, largely devoid of shrubs in chaparral, coastal scrub, meadows and seeps, valley and foothill grassland, and vernal pools; 30-1530 m (98-	High	Suitable soils and habitat for this species are present within the project area. This species has been documented approximately 1.0 mile north of the project area.

Common Name (*Scientific Name*)	Status	Habitat Preference/Requirements	Potential to Occur	Rationale
		5018 ft). Blooming period: April - July		
delicate clarkia (*Clarkia delicata*)	CRPR 1B.2 SD County List A	Annual herb. Oak woodlands and chaparral, often on gabbroic soils; 235-1000 m (770-3280 ft). Blooming period: April - June	Not Expected	Suitable oak woodland and mesic areas within chaparral habitat for this species do not occur within the project area.
San Miguel savory (*Clinopodium chandleri*)	CRPR 1B.2 SD County List A	Perennial shrub. Rocky , gabbroic, or metavolcanic areas in chaparral, cismontane woodland, coastal scrub, riparian scrub, and valley and foothill grassland; 120-1075 (393-3526 ft). Blooming period: March - July	Not Expected	Suitable ultramafic soils for this species do not occur within the project area.
summer holly (*Comarostaphylis diversifolia* ssp. *diversifolia*)	CRPR 1B.2 SD County List A County MSCP	Evergreen shrub. Chaparral and cismontane woodland; 30-790 m (98-2591 ft). Blooming period: April - June	Not Expected	Suitable mature, tall southern mixed chaparral habitat for this species does not occur within the project area.
small-flowered morning glory (*Convolvulus simulans*)	CRPR 4.2 SD County List D	Annual herb. Friable clay soils or serpentine seeps in chaparral openings, coastal scrub, and valley and foothill grassland; 30-700 m (98-2297 ft). Blooming period: March - July	Moderate	Suitable soils and habitat for this species are present within the project area. However, the nearest known occurrence of this species is several miles from the project area.

Common Name (*Scientific Name*)	Status	Habitat Preference/Requirements	Potential to Occur	Rationale
San Diego sand aster (*Corethrogyne filaginifolia* var. *incana*)	CRPR 1B.1	Perennial herb. Coastal bluff scrub, chaparral, and coastal scrub; 3-115 m (9-377 ft). Blooming period: June - September	Not Expected	Suitable coastal bluff scrub habitat for this species does not occur within the project area.
snake cholla (*Cylindropuntia californica* var. *californica*)	CRPR 1B.1 SD County List A County MSCP City of Chula Vista MSCP NE	Stem succulent. Chaparral and coastal scrub, typically on xeric hillsides; 30-150 m (98-492 ft). Blooming period: April - May	Present	This species was observed within the project area during surveys.
Otay tarplant (*Deinandra conjugens*)	FT/CE CRPR 1B.1 SD County List A MSCP	Annual herb. Clay soils in coastal sage scrub and valley and foothill grassland; 25-300 m (82-984 ft). Blooming period: May - June	Present	This species was observed within the project area during surveys.
Orcutt's bird's-beak (*Dicranostegia orcuttiana*)	CRPR 2B.1 SD County List B County MSCP City of Chula Vista MSCP NE	Hemiparasitic annual herb. Coastal scrub, seasonally dry drainages, uplands adjacent to riparian habitat; 10-350 m (32-1148 ft). Blooming period: March - September	Low	Suitable habitat for this species is highly disturbed within the project area.
Orcutt's dudleya (*Dudleya attenuata* ssp. *attenuata*)	CRPR 2B.1 SD County List B	Perennial herb. Rocky or gravelly coastal bluff scrub, chaparral, coastal scrub; 3-50 m (9-160 ft). Blooming period: May -July	Low	Suitable habitat for this species is present within the project area, however, this species tends to occur in areas with a greater coastal influence.
Blochman's dudleya (Dudleya blochmaniae ssp. *blochmaniae*)	CRPR 1B.1 SD County List A	Perennial herb. Rocky, often clay or serpentine soils in coastal bluff scrub, chaparral, coastal scrub, and valley and foothill grassland; 5-450 m (16-1476 ft). Blooming period: April - June	Low	Suitable habitat for this species is present within the project area, however, this species tends to occur in areas with a greater coastal influence.

Common Name (*Scientific Name*)	Status	Habitat Preference/Requirements	Potential to Occur	Rationale
variegated dudleya (*Dudleya variegata*)	CRPR 1B.2 SD County List A County MSCP City of Chula Vista MSCP NE	Perennial herb. Clay soils in chaparral, cismontane woodland, coastal scrub, valley and foothill grassland, and vernal pools; 3-580 m (9-1903 ft). Blooming period: April - June	Present	This species was observed within the project area during surveys.
Palmer's goldenbush (*Ericameria palmeri* var. *palmeri*)	CRPR 1B.1 SD County List B County MSCP City of Chula Vista MSCP NE	Evergreen shrub. Coastal drainages, in mesic chaparral sites, or rarely in coastal sage scrub; below 600 m (1969 ft). Blooming period: August - October (uncommon in July)	Low	Suitable riparian habitat for this species occurs within the project area, however, the project area is south of the known range of this species.
San Diego button-celery (*Eryngium aristulatum* var. *parishii*)	FE/CE CRPR 1B.1 SD County List A County MSCP City of Chula Vista MSCP NE	Annual/perennial herb. Mesic soils in coastal scrub, valley and foothill grassland, and vernal pools; 20-620 m (65-2034 ft). Blooming period: April - June	High	Appropriate habitat for this species occurs within the vernal pool complex within the project area. This species has been documented immediately south of the project area.
cliff spurge (*Euphorbia misera*)	CRPR 2B.2 SD County List B	Perennial shrub. Rocky areas in coastal bluff scrub, coastal scrub, and Mojavean desert scrub; 10-500 m (32-1640 ft). Blooming period: December - October	Not Expected	Suitable coastal bluff habitat for this species does not occur within the project area.
San Diego barrel cactus (*Ferocactus viridescens*)	CRPR 2B.1 SD County List B County MSCP City of Chula Vista MSCP NE	Stem succulent. Sandy to rocky areas; chaparral, coastal scrub, valley and foothill grassland, vernal pools; 3-450 m (9-1476 ft). Blooming period: May - June	Present	This species was observed within the project area during surveys.
Palmer's frankenia (*Frankenia palmeri*)	CRPR 2B.1 SD County List B	Perennial herb. Coastal dunes, coastal salt marshes and swamps, playas; 0-10 m (0-32 ft). Blooming period: May - July	Not Expected	Suitable salt marsh habitat for this species does not occur within the project area.

Common Name (*Scientific Name*)	Status	Habitat Preference/Requirements	Potential to Occur	Rationale
chaparral ash (*Fraxinus parryi*)	CRPR 2B.2	Perennial shrub. Chaparral; 213-620 m (698-2033 ft). Blooming period March - May	Not Expected	Suitable dense, southern mixed chaparral habitat for this species does not occur within the project area.
Mexican flannelbush (*Fremontodendron mexicanum*)	FE/SR CRPR 1B.1 SD County List A	Evergreen shrub. Gabbroic, metavolcanic, or serpentine soils in closed-cone coniferous forest, chaparral, and cismontane woodland; 10-716 m (32-2349 ft). Blooming period: March - June	Not Expected	Suitable ultramafic soils for this species do not occur within the project area.
Borrego bedstraw (*Galium angustifolium* ssp. *borregoense*)	SR CRPR 1B.3 SD County List A	Perennial herb. Rocky Sonoran desert scrub; 350-1250 m (1148-4100 ft). Blooming period: March	Not Expected	Suitable habitat for this species does not occur within the project area.
San Diego gumplant (*Grindelia hallii*)	CRPR 1B.2 SD County List A	Perennial herb. Meadows, chaparral, lower montane coniferous forest, and valley and foothill grassland; 185-1745 m (606-5723 ft). Blooming period: May - October	Low	Suitable mesic montane meadow habitat for this species does not occur within the project area.
Palmer's grapplinghook (*Harpagonella palmeri*)	CRPR 4.2 SD County List D	Annual herb. Clay soils in chaparral, grasslands, coastal sage scrub; 20-955 m (65 to 3132 ft). Blooming period: March - May	Present	This species was observed within the project area during surveys.
Tecate cypress (*Hesperocyparis forbesii*)	CRPR 1B.1 SD County List A County MSCP	Perennial evergreen tree. Clay, gabbroic, or metavolcanic soils within closed-cone coniferous forest and chaparral; 80-1500 m (262-4921 ft).	Present	This species was observed within the project area during surveys.

Common Name (*Scientific Name*)	Status	Habitat Preference/Requirements	Potential to Occur	Rationale
beach goldenaster (*Heterotheca sessiliflora* ssp. *sessiliflora*)	CRPR 1B.1	Perennial herb. Coastal chaparral, coastal dunes, and coastal scrub; 0-1225 m (0-4018 ft). Blooming period: March - December	Not Expected	Suitable coastal dune habitat for this species does not occur within the project area.
graceful Tarplant (*Holocarpha virgata* ssp. *elongata*)	CRPR 4.2 SD County List D	Annual herb. Chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland; 60-1100 m (196-3600 ft). Blooming period: May - November	Present	This species was observed within the project area during surveys.
Ramona horkelia (*Horkelia truncata*)	CRPR 1B.3 SD County List A	Perennial herb. Metavolcanic and gabbroic soils in chaparral and cismontane woodland; 400-1300 m (1312-4265 ft). Blooming period: May - June	Not Expected	Suitable ultramafic soils for this species do not occur within the project area.
Otay Mountain lotus (*Hosackia crassifolia* var. *otayensis*)	CRPR 1B.1 SD County List A	Perennial herb. Metavolcanic chaparral, often in disturbed areas; 380-1005 m (1246-3296 ft). Blooming period: May - August	Not Expected	Suitable ultramafic soils for this species do not occur within the project area.
decumbent goldenbush (*Isocoma menziesii* var. *decumbens*)	CRPR 1B.2 SD County List A	Perennial shrub. Chaparral and in sandy coastal scrub, often in sandy disturbed areas; 10-135 m (33-443 ft). Blooming period: April - November	Present	This species was observed within the project area during surveys.
San Diego marsh-elder (*Iva hayesiana*)	CRPR 2B.2 SD County List B	Perennial herb. Marshes and swamps, wetland areas, and playas; 10-500 m (32-1640 ft). Blooming period: April - October	Present	This species was observed during surveys.

Common Name (*Scientific Name*)	Status	Habitat Preference/Requirements	Potential to Occur	Rationale
southwestern Spiny Rush (*Juncus acutus* ssp. *leopoldii*)	CRPR 4.2 SD County List D	Perennial rhizomatous herb. Mesic soils in coastal dunes, alkaline seeps in meadows and seeps, and coastal salt marshes and swamps; 3-900 m (9-2953 ft). Blooming period: May - June	Present	This species was observed within the project area during surveys.
Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*)	CRPR 1B.1, SD County List A	Annual herb. Coastal salt marsh, coastal salt swamps, playas, vernal pools; 1-1220 m (3-4001 ft). Blooming period: February - June	Not Expected	Suitable salt marsh habitat for this species does not occur within the project area.
Gander's pitcher sage (*Lepechinia ganderi*)	CRPR 1B.3 SD County List A MSCP	Perennial shrub. Gabbroic or metavolcanic soils in closed-cone coniferous forest, chaparral, coastal scrub, and valley and foothill grassland; 305-1005 m (1000-3296 ft). Blooming period: June - July	Not Expected	Suitable soils for this species are present within the project area.
Robinson's pepper-grass (*Lepidium virginicum* var. *robinsonii*)	CRPR 4.3 SD County List A	Annual herb. Openings in chaparral and sage scrub; below 885 m (2900 ft). Blooming Period: January - July	High	Suitable soils and habitat for this species are present within the project area. This species has been documented immediately south of the project area.
sea dahlia (*Leptosyne maritima*)	CRPR 2B.2 SD County List B	Perennial herb. Coastal bluff scrub and coastal scrub; 5-150 m (16-492 ft). Blooming period: March - May	Not Expected	Suitable coastal bluff habitat for this species does not occur within the project area.
small-flowered microseris (*Microseris douglasii* ssp. *platycarpha*)	CRPR 4.2 SD County List D	Annual herb. Clay soils in cismontane woodland, coastal scrub, valley and foothill grassland, and vernal pools; 15-1070 m (49-3510 ft). Blooming period: March - May	Present	This species was observed within the project area during surveys.

Common Name (*Scientific Name*)	Status	Habitat Preference/Requirements	Potential to Occur	Rationale
felt-leaved monardella (*Monardella hypoleuca* ssp. *lanata*)	CRPR 1B.2 SD County List A County MSCP	Rhizomatous herb. Chaparral and cismontane woodland; 300-1575 m (984-5040 ft). Blooming Period: June - August	Not Expected	Suitable metavolcanic and/or gabbroic soil types for this species do not occur within the project area.
Jennifer's monardella (*Monardella stoneana*)	CRPR 1B.2 SD County List A	Perennial herb. Usually in rocky, intermittent streambeds in closed-cone coniferous forest, chaparral, coastal scrub, riparian scrub; 10-790 m (32-2591 ft). Blooming period: June - September	Low	Suitable habitat for this species within the project area is highly disturbed.
willowy monardella (*Monardella viminea*)	FE/CE CRPR 1B.1 SD County List A County MSCP	Perennial herb. Alluvial ephemeral washes in chaparral, coastal scrub, riparian forest, riparian scrub, and riparian woodland; 50-225 m (164-738 ft). Blooming period: June - August	Not Expected	The project area is outside the known range of this species. This species is not known to occur south of Interstate 8.
little mousetail (*Myosurus minimus* ssp. *apus*)	CRPR 3.1 SD County List C	Annual herb. Valley and foothill grassland, and alkaline vernal pools; 20-640 m (65-2100 ft). Blooming period: March - June	High	Appropriate habitat for this species occurs within the vernal pool complex within the project area. This species has been documented immediately south of the project area.
mud nama (*Nama stenocarpum*)	CRPR 2B.2 SD County List B	Annual/perennial herb. Marshes and swamps, also riverbanks and lake margins; 5-500 m (16-1640 ft). Blooming period: January - July	Not Expected	Suitable wetland habitat for this species does not occur within the project area.

Common Name (*Scientific Name*)	Status	Habitat Preference/Requirements	Potential to Occur	Rationale
spreading navarretia (*Navarretia fossalis*)	FT CRPR 1B.1 SD County List A County MSCP City of Chula Vista MSCP NE	Annual herb. Chenopod scrub, assorted freshwater marshes and swamps, playas, and vernal pools; 30-655 m (98-2149 ft). Blooming period: April - June	Present	This species was observed within the project area during surveys.
prostrate vernal pool navarretia (*Navarretia prostrata*)	CRPR 1B.1 SD County List A	Annual herb. Mesic coastal scrub, meadows and seeps, alkaline valley and foothill grassland, and vernal pools; 15-1210 m (49-3968 ft). Blooming period: April - July	Low	Suitable habitat for this species occurs in the vernal pool complex within the project area. However, this species is only known from vernal pools on Kearny and Miramar Mesas in San Diego County.
coast woolly-heads (*Nemacaulis denudata* var. *denudata*)	CRPR 1B.2 SD County List A	Annual herb. Coastal dunes; 0-100 m (0-328 ft). Blooming period: April - September	Not Expected	Suitable coastal dune habitat for this species does not occur within the project area.
slender cottonheads (*Nemacaulis denudata* var. *gracilis*)	CRPR 2B.2 SD County List B	Annual herb. Coastal dunes, desert dunes, and Sonoran desert scrub; -50 – 400 m (-164 – 1312 ft). Blooming period: March - May	Not Expected	Suitable dune habitat for this species does not occur within the project area.
Dehesa nolina (*Nolina interrata*)	SE CRPR 1B.1 SD County List A County MSCP	Perennial herb. Gabbroic, metavolcanic, or serpentinite soils in open southern mixed chaparral and chamise chaparral; 185-855 m (606-2804 ft). Blooming period: June - July	Not Expected	Suitable ultramafic soils for this species do not occur within the project area.
California Orcutt grass (*Orcuttia californica*)	FE/CE CRPR 1B.1 SD County List A County MSCP City of Chula Vista MSCP NE	Annual herb. Vernal pools; 15-660 m (49-2165 ft). Blooming period: April - August	Moderate	Appropriate habitat for this species occurs within the vernal pool complex within the project area. However, the nearest known occurrence of this species is within a restoration area approximately 2 miles southwest of the project area.

Common Name (*Scientific Name*)	Status	Habitat Preference/Requirements	Potential to Occur	Rationale
Baja California birdbush (*Ornithostaphylos oppositifolia*)	CE CRPR 2B.1 SD County List B	Perennial evergreen shrub. Chaparral; 55-800 m (180-2624 ft). Blooming period: January - April	Low	Suitable habitat for this species occurs within the project area. However, this species is only known from 5 locations within Border Field State Park.
short-lobed broomrape (*Orobanche parishii* ssp. *brachyloba*)	CRPR 4.2 SD County List D	Parasitic perennial herb. Sandy coastal bluff scrub, coastal dunes, and coastal scrub; 3-305 m (9-1000 ft). Blooming period: April - October	Not Expected	Suitable coastal bluff habitat for this species does not occur within the project area.
Gander's ragwort (*Packera ganderi*)	CR CRPR 1B.2 SD County List A	Perennial herb. Chaparral often in burned areas and gabbroic outcrops; 400-1200 m (1312-3937 ft). Blooming period April - June	Not Expected	Suitable ultramafic soils for this species do not occur within the project area.
Brand's star phacelia (*Phacelia stellaris*)	CRPR 1B.1 SD County List A	Annual herb. Coastal dunes, coastal scrub; 1-400 m (3-1312 ft). Blooming period: March - June	Not Expected	Suitable coastal dune habitat for this species does not occur within the project area.
Otay Mesa mint (*Pogogyne nudiuscula*)	FE/CE CRPR 1B.1 SD County List A County MSCP City of Chula Vista MSCP NE	Annual herb. Vernal pools; 90-250 (295-820 ft). Blooming period: May - July	High	Appropriate habitat for this species occurs within the vernal pool complex within the project area. This species has been documented immediately south of the project area.
Cedros Island oak (*Quercus cedrosensis*)	CRPR 2B.2 SD County List B	Evergreen tree. Closed-cone coniferous forest, chaparral, coastal scrub; 255-960 m (836-3148). Blooming period: April - May	Not Expected	Suitable habitat for this species does not occur within the project area. This species is only known from a few locations on Otay Mountain within San Diego County.

Common Name (*Scientific Name*)	Status	Habitat Preference/Requirements	Potential to Occur	Rationale
Nuttall's scrub oak (*Quercus dumosa*)	CRPR 1B.1 SD County List A County MSCP	Perennial evergreen shrub. Sandy or clay loam in closed-cone coniferous forest, chaparral, and coastal scrub; 15-400 m (49-1312 ft.). Blooming period: February - August	High	Appropriate habitat for this species occurs within the project area. This species has been documented immediately south of the project area.
Moreno currant (*Ribes canthariforme*)	CRPR 1B.3 SD County List A	Deciduous shrub. Chaparral and riparian scrub; 340-1200 m (1115-3937 ft). Blooming period: February - April	Not Expected	Suitable habitat for this species does not occur within the project area. This species tends to occur in areas with large rock exposures.
Santa Catalina Island currant (*Ribes viburnifolium*)	CRPR 1B.2 SD County List A	Evergreen shrub. Chaparral and cismontane woodland; 30-305 m (98-1000 ft). Blooming period: February - April	Not Expected	This species is only known from a few locations in Border Field State Park within San Diego County.
small-leaved rose (*Rosa minutifolia*)	CE CRPR 2B.1 SD County List B	Deciduous shrub. Chaparral and coastal scrub; 150-160 m (492-524 ft). Blooming period: January - June	Low	Suitable habitat for this species is present within the project area. However, this species is only known from two locations near State Route 905 in San Diego County.
Munz's sage (*Salvia munzii*)	CRPR 2B.2 SD County List B	Evergreen shrub. Chaparral and coastal sage scrub; 120-1065 m (393-3493 ft). Blooming period: February - April	Present	This species was observed within the project area during surveys.
ashy spike-moss (*Selaginella cinerascens*)	CRPR 4.1 SD County List D	Perennial rhizomatous herb. Chaparral and coastal sage scrub; 20-640 m (65-2099 ft).	Present	This species was observed within the project area during surveys.

Common Name (*Scientific Name*)	Status	Habitat Preference/Requirements	Potential to Occur	Rationale
chaparral ragwort (*Senecio aphanactis*)	CRPR 2B.2 SD County List B	Annual herb. Chaparral, cismontane woodland, coastal scrub, and alkaline flats; 15-800 m (49-2624 ft.). Blooming period: January - April	High	Suitable soils and habitat for this species are present within the project area. This species has been documented immediately south of the project area.
purple stemodia (*Stemodia durantifolia*)	CRPR 2B.1 SD County List B	Perennial herb. Population wide, along minor creeks and seasonal drainages, often in mesic, sandy soils in Sonoran desert scrub. Within the coastal zone in streams and creeks, typically slow moving rocky streams; 180-300 m (590-984 ft). Blooming period: January - December	Present	This species was observed within the project area during surveys.
San Diego County needle grass (*Stipa diegoensis*)	CRPR 4.2 SD County List D	Perennial herb. Rocky, often mesic soils within chaparral and coastal scrub; 10-800 m (32-2624 ft). Blooming period: February - June	Present	This species was observed within the project area during surveys.
Laguna Mountains jewel-flower (*Streptanthus bernardinus*)	CRPR 4.3 SD County List D	Perennial herb. Chaparral and lower montane coniferous forest; 670-2500 m (2198-8202 ft). Blooming period: May - August	Not expected	This species tends to occur farther east and at higher elevations than those found within the project area.
oil neststraw (*Stylocline citroleum*)	CRPR 1B.1 SD County List A	Annual herb. Clay soils in chenopod scrub, coastal scrub, and valley and foothill grassland, associated with oilfields; 50-400 m (164-1312 ft). Blooming period: March - April	Not Expected	Appropriate habitat for this species does not occur within the project area.

Common Name (*Scientific Name*)	Status	Habitat Preference/Requirements	Potential to Occur	Rationale
estuary seablite (*Suaeda esteroa*)	CRPR 1B.2 SD County List A	Perennial herb. Coastal salt marshes and swamps; 0-5 m (0-16 ft). Blooming period: May - January	Not Expected	Suitable wetland habitat for this species does not occur within the project area.
Parry's tetracoccus (*Tetracoccus dioicus*)	CRPR 1B.2 SD County List A CountyMSCP	Deciduous shrub. Chaparral and coastal sage scrub; 165-1000 m (541-3280 ft). Blooming period: April - May	Not Expected	Suitable ultramafic soils for this species do not occur within the project area.
California screw moss (*Tortula californica*)	CRPR 1B.2	Sandy soil in chenopod scrub and valley and foothill grassland;10-1460 m (32-4,790 ft).	Moderate	Suitable soils and habitat for this species are present within the project area. However the nearest known occurrence of this species is approximately 11 miles southwest of the project area.

LEGEND:

Status:

Federal

FE - Listed as endangered under the federal Endangered Species Act.

FT - Listed as threatened under the federal Endangered Species Act.

FC – Candidate for listing under the federal Endangered Species Act.

State

CE - Listed as endangered under the California Endangered Species Act.

CT – Listed as threatened under California Endangered Species Act.

CR – Listed as rare under California Endangered Species Act.

CA Rare Plant Rank (CRPR) – Formerly known as CNPS List

1A. Presumed extirpated in California, and either rare or extinct elsewhere

Common Name (*Scientific Name*)	Status	Habitat Preference/Requirements	Potential to Occur	Rationale
1B. Rare, Threatened, or Endangered in California and elsewhere 2A. Presumed extripated in California, more common elsewhere 2B. Rare, Threatened,or Endangered in California, more common elsewhere 3. Plants for which we more information is needed - Review list 4. Plants of limited distribution - Watch list *Threat Ranks* .1 - Seriously endangered in California .2 – Fairly endangered in California .3 – Not very endangered in California **San Diego County List** A – Rare, threatened or endangered in California and elsewhere B – Rare, threatened or endangered in California but more common elsewhere C – Maybe quite rare, but more information is needed to determine their status D – Limited distribution and are uncommon but not presently rare or endangered County MSCP – Covered Species under the MSCP South County Subarea Plan City of Chula Vista MSCP - MSCP Subarea Plan species with known occurrences or suitable habitat within the Chula Vista Subarea. NE = Narrow Endemic **References:** Special Status plant information from CDFW 2013. Nomenclature and plant descriptions from: CNPS Online Inventory, Calflora.org, Baldwin 2012, Lightner 2011, Reiser 2001, Roberts 1989. Range information from CNDDB 2013, CNPS 2013, and SDNHM Plant Atlas Project 2013.				

Appendix E

Potential to Occur – Sensitive Species Table: Fauna

Appendix E. Special-Status Wildlife Species with Potential to Occur

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Potential to Occur	Rationale
INVERTEBRATES				
Globuse Dune Beetle (*Coelus globosus)*	SDC Group I	Leaf litter under shrubs and perennial vegetation in coastal dunes	None	Suitable habitat not present within the mitigation parcel
Hermes Copper Butterfly (*Lycaena hermes)*	CT	Mesa habitats; chaparral, mixed woodlands. Larval host plant is spiny redberry.	Moderate	Suitable habitat occurs within the project area
Monarch Butterfly (*Danaus plexippus)*	SDC Group II	Migratory. Populations overwinter in California. Primarily overwinters in large trees, including *Eucalyptus*, within the immediate vicinity of the coast.	Low	Eucalyptus groves onsite, but site is 10 miles from coast and know occurrences are within 1 mile of coast.
Quino Checkerspot butterfly (*Euphydryas editha quino)*	FE SDC NE MSCP	Inhabits openings on clay soils within or in the vicinity of shrublands, grasslands, meadows, vernal pools, and lake margins. Closely tied to its larval host plant, dwarf plantain *(Plantago erecta)* or owl's clover (*Castilleja exserta* ssp*. exserta).*	Present	Observed within the mitigation parcel by Recon, suitable habitat occurs within the mitigation parcel
Riverside Fairy Shrimp (*Streptocephalus woottoni*)	FE SDC NE MSCP	Vernal swales, detention basins and deeper vernal pools. It occurs from Los Angeles County to Baja California.	Low	Vernal pools occur within the mitigation parcel, but may not be deep enough for species.
San Diego Fairy Shrimp (*Branchinecta sandiegoensis*)	FE SDC NE MSCP	Vernal pools. All known localities are below 701m (2,300 ft) and are within 64km (40 miles) of the Pacific Ocean.	Present	Observed within the mitigation parcel by Recon, vernal pools occur within the project area
Sandy Beach Tiger Beetle (*Cicindela hirticollis gravidai*)	SDC Group II	Coastal dunes.	None	Suitable habitat not present within the mitigation parcel
Senile Tiger Beetle (*Cicindela senilis frosti*)	SDC Group II	Estuaries, tidal mud flats.	None	Suitable habitat not present within the mitigation parcel
Thorne's Hairstreak (*Callophrys thornei)*	SDC NE	Larval host plant is the Tecate cypress.	Present	Hostplant Tecate cypress is present within the mitigation parcel
Wandering Skipper (*Panoquina errans*)	SDC Group I MSCP	Salt marshes. The host plant is *Distichlis spicata*; individuals overwinter as larvae in California. There are multiple flights each year	None	Suitable habitat not present within the mitigation parcel
Western Beach Tiger Beetle (*Cicindela latesignata latesignata*	SDC Group II	Estuaries, tidal mud flats.	None	Suitable habitat not present within the mitigation parcel
Western Tidal-flat Tiger Beetle (*Cicindela gabbii*)	SSC SDC Group II	Estuaries, tidal mud flats, salt marshes and sea beaches.	None	Suitable habitat not present within the mitigation parcel

Appendix E. Special-Status Wildlife Species with Potential to Occur

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Potential to Occur	Rationale
California Brackish Water Snail (Tryonia imitator)		Brackish marshes	None	Suitable habitat not present within the mitigation parcel
AMPHIBIANS				
Arroyo Toad (*Bufo californicus)*	FE SDC NE MSCP	Exposed shallow pools with a sand or gravel base are used for breeding. Breeding pools must occur in the vicinity (ca. 10-100 m) of a braided sandy channel with shorelines or central bars made of stable, sandy terraces.	Low	No known occurrences within the Otay River watershed, known occurrences within the Sweetwater River watershed to the north and the Tijuana River watershed to the east
Western Spadefoot (*Spea (=Scaphiopus) hammondii*)	SSC SDC Group II	Temporary pools with water temperatures between 9°C and < 30°C that last at least 3 weeks within areas of open vegetation.	Present	Observed within the mitigation parcel by Recon, suitable breeding and upland occurs in the mitigation parcel.
REPTILES				
Belding's Orange-throated Whiptail (*Aspidoscelis hyperythra beldingi*)	SSC SDC Group II MSCP	The habitat characteristics are poorly understood, however historically it was found in floodplains or terraces along streams. Closely tied to coastal sage scrub plants and some chaparral plants.	Present	Observed within the mitigation parcel by Recon, suitable habitat occurs within the mitigation parcel
Blainville's Horned Lizard (*Phrynosoma blainvillii*)	SSC SDC Group II MSCP	Grasslands, brushlands, woodlands, and open coniferous forest with sandy or loose soil; requires abundant ant colonies for foraging.	Present	Observed within the mitigation parcel by Recon, suitable habitat occurs within the mitigation parcel
Coast Patched-Nosed Snake (*Salvadora hexalepis virgultea)*	SSC SDC Group II	Inhabits semi-arid brushy areas and chaparral in canyons, rocky hillsides, and plains.	High	Suitable habitat occurs in the mitigation parcel
Coastal Tiger Whiptail (*Aspidoscelis tigris stejnegeri*)	SDC Group II	Found in open brushland in semiarid habitats.	Present	Observed within the mitigation parcel by Recon, suitable habitat occurs within the mitigation parcel
Coronado Skink (*Plestiodon skiltonianus interparietalis*)	SSC SDC Group II	Forest, open woodland and grassy areas. Usually found under leaf litter, logs or rocks.	High	Suitable habitat occurs in the mitigation parcel
Green Turtle (*Chelonia mydas*)	FT	Marine bay. Sea turtles have been reported in San Diego Bay since the 1850's	None	Suitable habitat not present in the mitigation parcel
Coastal Rosy Boa (*Lichanura trivirgata roseofusca)*	SSC SDC Group II	Inhabits chaparral and desert scrub	Present	Observed within the mitigation parcel by Recon, suitable habitat occurs within the mitigation parcel
Red Diamond Rattlesnake (*Crotalus ruber*)	SSC SDC Group II	Occurs from sea level to 914m (3,000 ft) in chaparral, woodland, and arid desert habitats with rocky areas and dense vegetation.	Present	Observed within the mitigation parcel by Recon, suitable habitat occurs within the mitigation parcel

Common Name (*Scientific Name*)	**Sensitivity Code & Status**	**Habitat Preference/Requirements**	**Potential to Occur**	**Rationale**
San Diego Ringneck Snake (*Diadophis punctatus similis)*	SDC Group II	Prefers moist habitats, including wet meadows, rocky hillsides, gardens, farmland, grassland, chaparral, mixed coniferous forests and woodlands.	High	Suitable habitat occurs in the mitigation parcel
Silvery Legless Lizard (*Anniella pulchra pulchra*)	SSC SDC Group II	Occurs in sparsely vegetated areas of beach dunes, chaparral, pine-oak woodlands, desert scrub, sandy washes, and stream terraces with sycamores, cottonwoods, or oaks. Leaf litter under trees and bushes in sunny areas often indicate suitable habitat.	Moderate	May occur in riparian woodland
Southwestern Pond Turtle (*Actinemys marmorata pallid*)	SSC SDC NE MSCP	Requires slack- or slow-water aquatic habitat as well as aerial and aquatic basking sites. Also requires an upland oviposition site on an unshaded slope with clay soils, in the vicinity of the aquatic site.	Low	Suitable habitat not present currently within the mitigation parcel
Two-striped Garter Snake (*Thamnophis hammondii*)	SSC SDC Group I	Inhabits perennial and intermittent streams with rocky beds and bordered by willow thickets or other dense vegetation.	Present	Observed within the mitigation parcel by Recon, suitable habitat occurs within the mitigation parcel
BIRDS				
American Peregrine Falcon (*Falco peregrinus anatum*)	F Delisted S Delisted FP SDC NE MSCP	Nests on cliff ledges or on tall building or bridges. Will foage over s wide variety of habitats..	Nesting: None Foraging: Moderate	No suitable nesting habitat in the mitigation parcel, may forage or perch in the mitigation parcel
Belding's Savannah Sparrow (*Passerunculus sandwichensis beldingi*)	SE SDC NE MSCP	Resident species that is restricted to coastal marshes dominated by pickleweed. It is known to occur within 5 general areas of coastal San Diego County (Unitt 2004).	Nesting: None Foraging: None	Suitable habitat not present within the mitigation parcel
Bell's Sage Sparrow (*Artemisiospiza belli belli)*	SDC Group I	Open chaparral and sage scrubs.	Nesting: High Foraging: High	Suitable nesting and foraging habitat within the mitigation parcel
California Black Rail *(Laterallus Jamaicensis cotumicullus*)	ST FP SDC NE	Brackish freshwater marsh	Nesting: None Foraging: None	Suitable habitat not present within the mitigation parcel
California Horned Lark (*Eremophila alpestris actia*)	SDC Group II	Grasslands, recently disturbed habitat where seeds and insects are easy to find.	Nesting: High Foraging: High	Suitable nesting and foraging habitat within the mitigation parcel

Appendix E. Special-Status Wildlife Species with Potential to Occur

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Potential to Occur	Rationale
California Least Tern (*Stemula antillarum browni*)	FE SE CDFW FP SDC NE MSCP	Bays, estuaries, lagoons, shoreline. Resident. Migratory breeder in San Diego County that nests on beaches and dunes and forages over water (Unitt 2004). NAB is known to support a breeding population that is regularly studied.	Nesting: None Foraging: None	Suitable nesting habitat not present within the mitigation parcel
Coastal Cactus Wren (*Campylorhynchus brunneicapillus sandiegensis*)	SSC SDC NE MSCP	Cactus thickets of *Opuntia* or *Cylindropuntia* species, preferably over 1m tall.	Nesting: Present Foraging: Present	Observed within the mitigation parcel by Recon, suitable nesting and foraging habitat occurs within the mitigation parcel
Coastal California Gnatcatcher (*Polioptila californica californica*)	FT SSC SDC Group I MSCP	Prefer open scrubby habitats such as coastal sage scrub and some forms of chaparral.	Nesting: Present Foraging: Present	Observed within the mitigation parcel by Recon, suitable nesting and foraging habitat occurs within the mitigation parcel
Cooper's Hawk (*Accipiter cooperii*)	CDFW WL SDC Group I MSCP	Oak groves and mature stands of riparian woodland. This species has adapted well to development and is abundant in urban canyons with eucalyptus trees.	Nesting: Present Foraging: Present	Observed within the mitigation parcel by Recon, suitable nesting and foraging habitat occurs within the mitigation parcel
Double-crested Cormorant (*Phalacrocorax auritus Albociliatus*)	SSC SDC Group II	Bays, lagoons, estuaries. Non-breeding year-round visitor.	Nesting: None Foraging: None	Suitable habitat not present within the mitigation parcel
Golden Eagle (*Aquila chrysaetos)*	FP SDC Group I MSCP	Nest on cliff ledges or trees on steep slopes. Forage in grasslands, sage scrub or broken chaparral.	Nesting: None Foraging: High	No suitable nesting habitat within the mitigation parcel may forage or perch in the mitigation parcel
Grasshopper sparrow (*Ammodramus savannarum perpallidus*)	SSC	Occurs in dry, dense grasslands, especially those with a variety of grasses and tall forbs and scattered shrubs for singing perches. Nests in slight depressions in dense grasslands.	Nesting: High Foraging: High	Suitable nesting habitat occurs in grasslands within the mitigation parcel
Least Bell's Vireo (*Vireo bellii pusillus*)	FE SE SDC NE MSCP	Riparian thickets either near water or in dry portions of river bottoms; nests along margins of bushes and forages low to the ground; may also be found using mesquite and arrow weed in desert canyons.	Nesting: Present Foraging: Present	Observed within the mitigation parcel by Recon, suitable nesting and foraging habitat occurs within the mitigation parcel
Light-footed Ridgway Rail {Light-footed Clapper Rail} (*Rallus longirostris levipes*)	FE SE CDFW FP SDC Group I MSCP	Occurs in coastal salt marshes, especially where cordgrass dominates.	Nesting: None Foraging: None	Suitable habitat not present within the mitigation parcel

Appendix E. Special-Status Wildlife Species with Potential to Occur

Common Name (*Scientific Name*)	**Sensitivity Code & Status**	**Habitat Preference/Requirements**	**Potential to Occur**	**Rationale**
Loggerhead shrike (*Lanius ludovicianus*)	CSC	Found near grassland, open sage scrub and chaparral, and desert scrub. They nest in dense vegetation adjacent to their open foraging habitats.	Nesting: High Foraging: High	Suitable nesting and foraging habitat present within the mitigation parcel
Northern Harrier (*Circus cyaneus*)	SSC (nesting) SDC Group I MSCP	Grasslands and marshes. Nests are on the ground and typically concealed within a marsh or other dense, low-growing vegetation. The northern harrier is considered a breeding resident and a migrant species. Nesting harriers are now considered rare and the known breeding population in San Diego County is estimated at 25 to 75 pairs (Unitt 2004).	Nesting: Low Foraging: High	Little suitable nesting habitat within the mitigation parcel, suitable foraging habitat is present
Prairie Falcon (*Falco mexicanus)*	SDC Group I	Nest on cliffs or bluffs and forage in open desert or grasslands. In San Diego County, nest at least 23 miles from the coast (Unitt 2004).	Nesting: None Foraging: Low	No suitable nesting habitat onsite, may forage or perch within the mitigation parcel
Southern California Rufous-crowned Sparrow (*Aimophila ruficeps canescens*)	CDFW WL SDC Group I MSCP	Fairly common, widespread and generally fairly conspicuous resident of rocky grassland and patchy shrub habitats, often including areas with disturbance from fire, trash, soil compaction and non-native vegetation.	Nesting: Present Foraging: Present	Observed within the mitigation parcel by Recon, suitable nesting and foraging habitat occurs within the mitigation parcel
Southwestern Willow Flycatcher (*Empidonax trallii extimus)*	FE SE SDC NE MSCP	Will forage over a variety of habitats; however, species does not breed in California.	Nesting: Low Foraging: Low	Not known to occur within the mitigation parcel; suitable habitat occurs in riparian woodland
Swainson's Hawk (*Buteo Swainsoni)*	ST SDC Group I MSCP	Open country of the western US and Canada for breeding, from low to moderate elevations. Prairies, rangelands, meadows, open areas with scattered trees. Cultivated lands attract this hawk in some areas, where the human disturbance of agriculture causes concentrations of insects ad rodents.	Nesting: None Foraging: Low	Not known to breed in San Diego County, may be present during migration.
Tricolored Blackbird	SSC (nesting colony) SDC Group I MSCP	Breeds near fresh water, preferably in emergent wetland with tall, dense cattails or tules, but also in thickets of willow, blackberry, wild rose, tall herbs. Feeds in grassland and cropland habitats.	Nesting: Low Foraging: Low	Suitable nesting habitat is absent from the mitigation parcel.

Common Name (*Scientific Name*)	**Sensitivity Code & Status**	**Habitat Preference/Requirements**	**Potential to Occur**	**Rationale**
Western Burrowing Owl (*Athene cunicularia*)	SSC SDC NE MSCP	Prairies, grasslands, lowland scrub, agricultural lands, coastal dunes, desert floors, and some artificial, open areas. They require large open expanses of sparsely vegetated areas on gently rolling or level terrain with an abundance of active small mammal burrows. They use rodent or other burrows for roosting and nesting cover and also known to use pipes, culverts, and nest boxes where burrows are scarce.	Nesting: High Foraging: High	Suitable nesting and foraging habitat within the mitigation site
Western Snowy Plover (*Charadrius nivosus nivosus)*	FT SSC SDC Group I MSCP	Sandy beaches, lagoon margins, tidal mud flats. Migrant and winter resident. Migratory breeder in San Diego County; uses beaches, dunes and salt flats for nesting. Silver Strand supports one of the two most concentrated nesting sites in San Diego County (Unitt 2004).	Nesting: None Foraging: None	Suitable nesting habitat not present in the mitigation parcel
Western Yellow-billed Cuckoo (*Coccyzus americanus)*	FT SE SDC NE	Cottonwood-dominated forests with larger rivers running through arid country	Nesting: Present Foraging: Present	Observed within the mitigation parcel by Recon in 2012, suitable nesting and foraging habitat occurs within the mitigation parcel
White-tailed kite (*Elanus leucarus*)	FP SDC Group II	Lowland areas west of Sierra Nevada from the head of the Sacramento Valley south, including coastal valleys and foothills to western San Diego County at the Mexico border	Nesting: Present Foraging: Present	Observed within the mitigation parcel by Recon, suitable nesting and foraging habitat occurs within the mitigation parcel
Yellow Warbler (*Setophaga petechial*)	SSC SDC Group II	Mature riparian woodlands.	Nesting: Present Foraging: Present	Observed within the mitigation parcel by Recon, suitable nesting and foraging habitat occurs within the mitigation parcel
Yellow-breasted Chat (*Icteria virens)*	SSC SDC Group I	Dense riparian woodland.	Nesting: Present Foraging: Present	Observed within the mitigation parcel by Recon, suitable nesting and foraging habitat occurs within the mitigation parcel
MAMMALS				
American Badger (*Taxidea taxus*)	SSC SDC Group II MSCP	Inhabit a diversity of habitats with principal requirements of sufficient food, friable soils, and relatively open, uncultivated ground. Grasslands, savannas, mountain meadows, and desert scrub.	High	Suitable habitat occurs in the mitigation parcel

Common Name (*Scientific Name*)	**Sensitivity Code & Status**	**Habitat Preference/Requirements**	**Potential to Occur**	**Rationale**
Big free-tailed Bat (*Nyctinomops macrotis*)	SSC SDC Group II	Inhabits arid, rocky areas; roosts in crevices in cliffs. Has been recorded in urban locations in San Diego County (CDFG 2005. Species is rare in California (CDFG 2005).	Roosting: None	Detected in 2003 along Otay River at mouth of Dam Canyo, suitable roosting habitat is lacking in the mitigation parcel. Could forage throughout the parcel.
California Leaf-nosed Bat (*Macrotus californicus)*	SSC SDC Group II	Day roosts are usually large caves or deep mine tunnels with high ceilings	Roosting: None	Detected in 2003 along Otay River at mouth of Dam Canyo, suitable roosting habitat is lacking in the mitigation parcel. Could forage throughout the parcel.
Dulzura Pocket Mouse (*Chaetodipus californicus femoralis)*	SSC SDC Group II	Coastal and montane regions in grassland, sage scrub, and chaparral slopes.	High	Suitable habitat occurs in the mitigation parcel
Long-eared Myotis (*Myotis evotis)*	SDC Group II	Brush, woodland and forest habitats from sea level to 9000 ft. Lives in coniferous forests in mountain areas, roosts in small colonies in caves, buildings and under tree bark.	Roosting: None	Detected in 2003 along Otay River at mouth of Dam Canyo, suitable roosting habitat is lacking in the mitigation parcel. Could forage throughout the parcel.
Mexican Long-tongued Bat (*Choeronycteris mexicana*)	SSC SDC Group II	Likes desert canyons, arid mountain ranges. Roosts by day in caves, mines or buildings. Records indicate only a summer resident in San Diego County (CDFG 2005). Feeds on nectar and pollen from agaves and cactus blossoms.	Roosting: None	Suitable roosting habitat is lacking within the mitigation parcel. Could forage throughout the parcel.
Mountain Lion (*Felis concolor*)	SDC Group II MSCP	Occurs in a wide range of habitats, including coastal sage scrub, chaparral, and riparian woodlands. Rest in rocky area and on cliffs that provide cover.	High	Suitable habitat occurs in the mitigation parcel
San Diego Pocket Mouse (*Chaetodipus fallax fallax*)	SSC SDC Group II	Coastal sage scrub, sage scrub/grassland ecotones, and chaparral communities.	High	Suitable habitat occurs in the mitigation parcel
Pacific Pocket Mouse (*Perognathus longimembris pacificus*)	FE SSC SDC Group I	Coastal lowland; patchily distributed species	None	Project is outside of species' known range
Pallid Bat (*Antrozous pallidus*)	SSC SDC Group II	Throughout So. Cal. From coast to mixed conifer forest; grasslands, shrublands, woodlands, & forest; most common in open, dry habitats w/ rocky areas for roosting; yearlong resident in most of range. Roosts in rock crevices, caves, mine shafts, under bridges, in buildings and tree hollows.	Roosting: None	Suitable roosting habitat is lacking within the mitigation parcel. Could forage throughout the parcel.

Appendix E. Special-Status Wildlife Species with Potential to Occur

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Potential to Occur	Rationale
Pocketed Free-tailed Bat (*Nyctinomops femorosaccus*)	SSC SDC Group II	Lives in deserts and sage scrub, roosts in rocky crevices.	Roosting: None	Detected in 2003 along Otay River at mouth of Dam Canyo, suitable roosting habitat is lacking in the mitigation parcel. Could forage throughout the parcel.
San Diego Black-tailed Jackrabbit (*Lepus californicus bennettii*)	SSC SDC Group II	Mostly found on the coastal side of our local mountains in open habitats, usually avoiding dense stands of chaparral or woodlands.	Present	Observed onsite by Recon, suitable habitat occurs in the mitigation parcel.
San Diego Desert Woodrat (*Neotoma lepida intermedia*)	SSC SDC Group II	Variety of shrub and desert habitats primarily associated with rock outcroppings, boulders, cacti, or areas of dense undergrowth.	Present	Observed onsite by Recon, suitable habitat occurs in the mitigation parcel.
Southern grasshopper mouse (*Onychomys torridus ramona*)	SSC	Grasslands, sparse coastal sage scrub, and chaparral habitats.	High	Suitable habitat occurs in the mitigation parcel
Southern Mule Deer (*Odocoileus hemionus)*	SDC Group II MSCP	Occurs in wide-range of habitats, including conifer and mixed forests, chaparral, brushlands, and grasslands	Present	Observed onsite by Recon, suitable habitat occurs in the mitigation parcel.
Townsend's Big-eared Bat (*Corynorhinus townsendii)*	CT SDC Group II	Species can be found in a variety of habitats throughout the state where appropriate roosting habitat exists. Primarily roosts in caves and cavern-like spaces; also include in abandoned buildings, mines, culverts, box-like spaces in bridges and other structures, and large hollows in trees. Very sensitive to human disturbances.	Roosting: None	Suitable roosting habitat is lacking within the mitigation parcel. Could forage throughout the parcel.
Western Mastiff Bat (*Eumops perotis californicus*)	SSC SDC Group II	Primarily a cliff-dwelling species for breeding. Found foraging in a variety of habitats, from dry desert washes, flood plains, chaparral, oak woodland, open ponderosa pine forest, grassland, montane meadows, and agricultural areas.	Roosting: None	Detected in 2003 along Otay River at mouth of Dam Canyo, suitable roosting habitat is lacking in the mitigation parcel. Could forage throughout the parcel.
Western Red Bat (*Lasiurus blossevillii*)	SSC SDC Group II	Usually among dense foliage, in forests and wooded areas, making long migrations from the northern latitudes to warmer climes for winter, sometimes hibernates in tree hollows or woodpecker holes.	Roosting: Low	Detected in 2003 along Otay River at mouth of Dam Canyo, suitable roosting habitat could occur in riparian forest in the mitigation parcel. Could forage throughout the parcel.
Western Small-footed Myotis (*Myotis cililabrum)*	SDC Group II	Not much information available, but has been spotted under rock slabs and in crevices, mine tunnels, under loose tree bark, and in buildings.	Roosting: None	Detected in 2003 along Otay River at mouth of Dam Canyo, suitable roosting habitat is lacking in the mitigation parcel. Could forage throughout the parcel.

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Potential to Occur	Rationale
Yuma Myotis (*Myotis yumanensis*)	SDC Group II	Found near lakes, creeks or ponds. Roosts by day under building sidings or shingles. Nursery colonies choose caves, mines, buildings or under bridges.	Roosting: None	Detected in 2003 along Otay River at mouth of Dam Canyo, suitable roosting habitat is lacking in the mitigation parcel. Could forage throughout the parcel.

LEGEND:

STATUS:
Federal
FE - listed as endangered under the federal Endangered Species Act.
FT - listed as threatened under the federal Endangered Species Act.
FP – listed as fully protected
F Delisted = Delisted
State
SE - listed as endangered under the California Endangered Species Act.
ST- listed as threatened under the California Endangered Species Act.
CT- candidate threatened
S Delisted - Delisted
CDFW FP – fully protected species in California.
SSC – species of special concern in California.
WL – Watch List

San Diego County Group (SDC Group)

I = includes animal species that have a very high level of sensitivity, either because they are listed as threatened or endangered or because they have very specific natural history requirements that must be met.

II = includes animal species that are becoming less common, but are not yet so rare that extirpation or extinction is imminent without immediate action. These species tend to be prolific within their suitable habitat types.

NE = Narrow Endemic Species

MSCP= Covered species under the City of Chula Vista Multiple Species Conservation Program (MSCP) Subarea Plan

‡ – Taxa listed with ‡ fall into one or more of the following categories:

- Taxa considered endangered or rare under Section 15380(d) of CEQA guidelines
- Taxa that are biologically rare, very restricted in distribution, or declining throughout their range
- Population(s) in California that may be peripheral to the major portion of a taxon's range, but which are threatened with extirpation within California
- Taxa closely associated with a habitat that is declining in California at an alarming rate (e.g., wetlands, riparian, old growth forests, desert aquatic systems, native grasslands)

References

Special Status information from CDFW 2015. Nomenclature and invertebrate descriptions from Hogan 2005 and USFWS 1997. Nomenclature and vertebrate descriptions from AOU 1998 and supplements, CDFW 2015, Collins and Taggart 2015, Baker *et al.* 2003, and Unitt 2004.

3. CULTURAL RESOURCES

CEQA CULTURAL RESOURCES TECHNICAL REPORT, OTAY RIVER RESTORATION PROJECT; CITY OF CHULA VISTA MITIGATION PARCEL, SAN DIEGO COUNTY, CALIFORNIA

CEQA Cultural Resources Technical Report Otay River Restoration Project; City of Chula Vista Mitigation Parcel, San Diego County, California

Prepared for:

Otay Land Company, LLC.
1903 Wright Place, Suite 220
Carlsbad, CA, 92006
Contact: Jeff O'Connor
760.918.8200

Prepared by:

ICF International
525 B Street, Suite 1700
San Diego, CA 92101
Contact: Michelle Mattson
858.444.3928

October 2015

ICF International. 2015. CEQA Cultural Resources Technical Report, Otay River Restoration Project; City of Chula Vista Mitigation Parcel, San Diego County, California. October. (ICF 00296.14.) San Diego, CA. Prepared for Otay Land Company, LLC., Carlsbad, CA.

Author(s):	J. Tait Elder, MA, RPA
Consulting Firm:	ICF International 525 B Street, Suite 1700 San Diego, CA 92101 858.444.3928
Client:	Otay Land Company, LLC. A subsidiary of HomeFed Corporation
Report Date:	October 2015
Report Title:	CEQA Cultural Resources Technical Report, Otay River Restoration Project; City of Chula Vista Mitigation Parcel, San Diego County, California
Type of Study:	Phase I Field Survey and Impacts Assessment
New Sites:	None
Updated Sites:	CA-SDI-10875
USGS Quadrangle:	Otay Mesa, California: 7.5' series (1:24,000)
Acreage:	PAL 110 acres; fully surveyed
Keywords:	Phase I Survey and Inventory; CEQA Impact Assessment; Otay Mesa, Otay Valley, lithic scatter, lithic isolate

This page intentionally left blank.

Executive Summary

The Otay Land Company, LLC (OLC) is proposing multiple residential and commercial development projects as part of the Otay University Villages. The projects would result in direct impacts on small first-order ephemeral drainages, and would therefore require compensatory mitigation to offset unavoidable loss of stream acreage and function under Section 404 of the Clean Water Act. Compensatory mitigation is proposed within the nearby Otay River Valley on the Otay River mainstem immediately below the Savage Dam. The mitigation project would require permits from the U.S. Army Corps of Engineers (Corps) and would need to be conducted in compliance with Section 106 of the National Historic Preservation Act of 1966 (NHPA) and the California Environmental Quality Act of 1970 (CEQA). ICF International (ICF) was retained to perform a cultural resources survey to support the project's NHPA and CEQA obligations.

The contents of this technical report are adapted from the technical report titled *Cultural Resources Survey for the Otay River Restoration Project; City of Chula Vista Mitigation Parcel, San Diego County, California* (Elder 2015). The purpose of this technical report is to describe the findings of the cultural resources survey for the project and provide technical recommendations accordance with the project's CEQA obligations.

A records review revealed that three archaeological sites and isolates have been documented within the project area limits (PAL): Site CA-SDI-10875 and Isolates 37-015385 and 37-015386. A review of the Sacred Lands File performed by the Native American Heritage Commission (NAHC) revealed no documented Native American cultural resources within the PAL.

ICF archaeologist J. Tait Elder performed a pedestrian survey of the PAL between June 2 and June 3, 2015. No historic properties were identified during the cultural resources survey of the PAL. The pedestrian survey resulted in the identification of two lithic artifacts within the previously defined boundary for CA-SDI-10875. Considering that only two non-diagnostic lithic artifacts were documented within a 17-acre portion of the site that occurs within the PAL, that previous recent studies could not relocate any artifacts within the site boundary (AECOM 2013), and that no features or chronologically diagnostic artifacts have been documented within the PAL, ICF recommends this portion not eligible for listing in the CRHR. In addition, no artifacts were identified in the location of the previously documented isolates (Isolates 37-015385 and 37-015386) within the PAL. The artifacts associated with these isolates were collected during their initial documentation (Kyle et al. 1993a, 1993b).

Historic documentation review and a pedestrian survey revealed that the central portion of the PAL has been subject to deep and widespread ground disturbance associated with a sand and gravel mining operation that occurred on site during the late twentieth century. This area is considered to have limited potential to contain archaeological and historic built resources.

Although the project is not expected to affect any CRHR-eligible resources and ICF recommends a finding of no significant impacts on historic resources, ICF also recommends that an unanticipated discovery plan be developed for use during project implementation to account for the widespread presence of archaeological sites in the PAL vicinity, potential for encountering redeposited artifacts in the sediment stockpiles on-site, and variable ground surface visibility within the PAL; ICF also recommends that an unanticipated discovery plan be developed for use during project

implementation. The plan should establish the procedures to follow in the event of an unanticipated discovery of archaeological deposits or human remains occurs, describe the anticipated range of archaeological resource types, list the character-defining elements that would render archaeological resources eligible for listing in the CRHR and/or NRHP, and the documentation procedures to follow in the event that an archaeological discovery does not retain the necessary character-defining elements to be considered eligible for listing in the CRHR or NRHP.

Contents

Tables and Figures

Acronyms and Abbreviations

BP	years before present
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
Corps	U.S. Army Corps of Engineers
CRHR	California Register of Historical Resources
HMMP	habitat mitigation and monitoring plan
ICF	ICF International
NAHC	Native American Heritage Commission
NHPA	Section 106 of the National Historic Preservation Act
NRHP	National Register of Historic Places
PAL	Project Area Limits
SCIC	South Coastal Information Center
Section 404	Section 404 of the Clean Water Act
the project	Otay Ranch Villages 8 and 9 and the City of Chula Vista Mitigation Parcel project

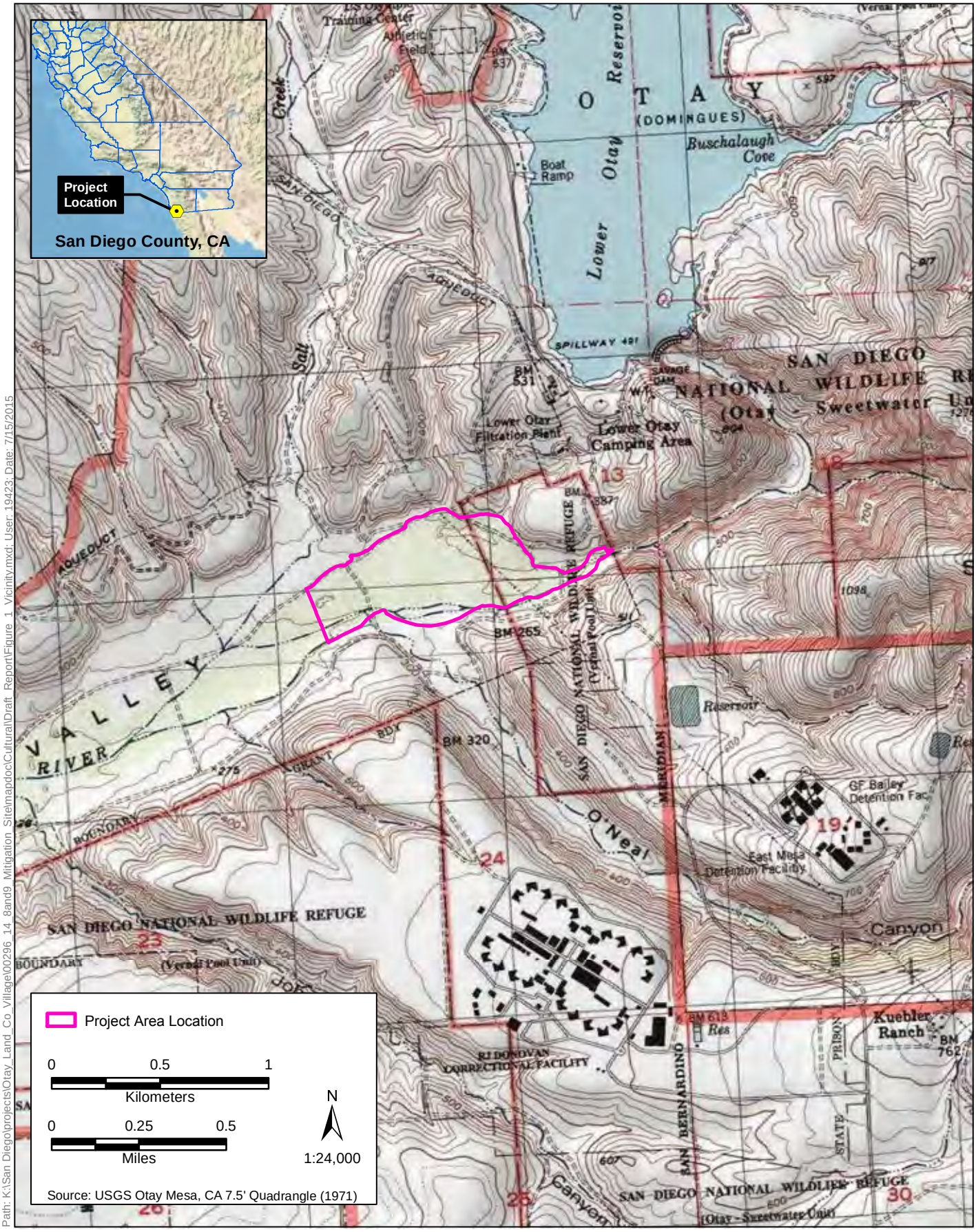
Chapter 1
Introduction

The Otay Land Company, LLC. (OLC) and City of Chula Vista are proposing multiple residential and commercial development projects as part of the Otay University Villages (the projects). The projects would result in direct impacts to small first-order ephemeral drainages, and would therefore require compensatory mitigation to offset unavoidable loss of stream acreage and function under Section 404 of the Clean Water Act (Section 404). Compensatory mitigation is proposed within the nearby Otay River Valley on the Otay River mainstem immediately below the Savage Dam. To guide the mitigation project, a habitat mitigation and monitoring plan (HMMP) was developed. The HMMP proposes channel and floodplain re-establishment within a 200+ acre parcel owned by the City of Chula Vista and enhancement (removal of invasive species) within the mainstem channel just upstream of the City of Chula Vista parcel. Project elements associated with these activities would include grading, vegetation removal, recontouring, plantings, establishment of main access roads and permanent at-grade channel crossings, and decommissioning of other less frequently used roads.

The project is a federal undertaking and would require compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. A technical report describing the project's cultural resources findings in accordance with Section 106 of the NHPA has already been completed (i.e., Elder 2015). The project would also be funded by the City of Chula Vista and is therefore subject to review under the California Environmental Quality Act (CEQA) of 1970 and it's implementing regulations in the CEQA guidelines. CEQA requires state and local agencies to evaluate their proposed projects for their potential to cause significant impacts to archaeological resources, as well as other environmental resources. This technical report describes the findings of the cultural resources survey and provides technical recommendations in accordance with the projects CEQA obligations.

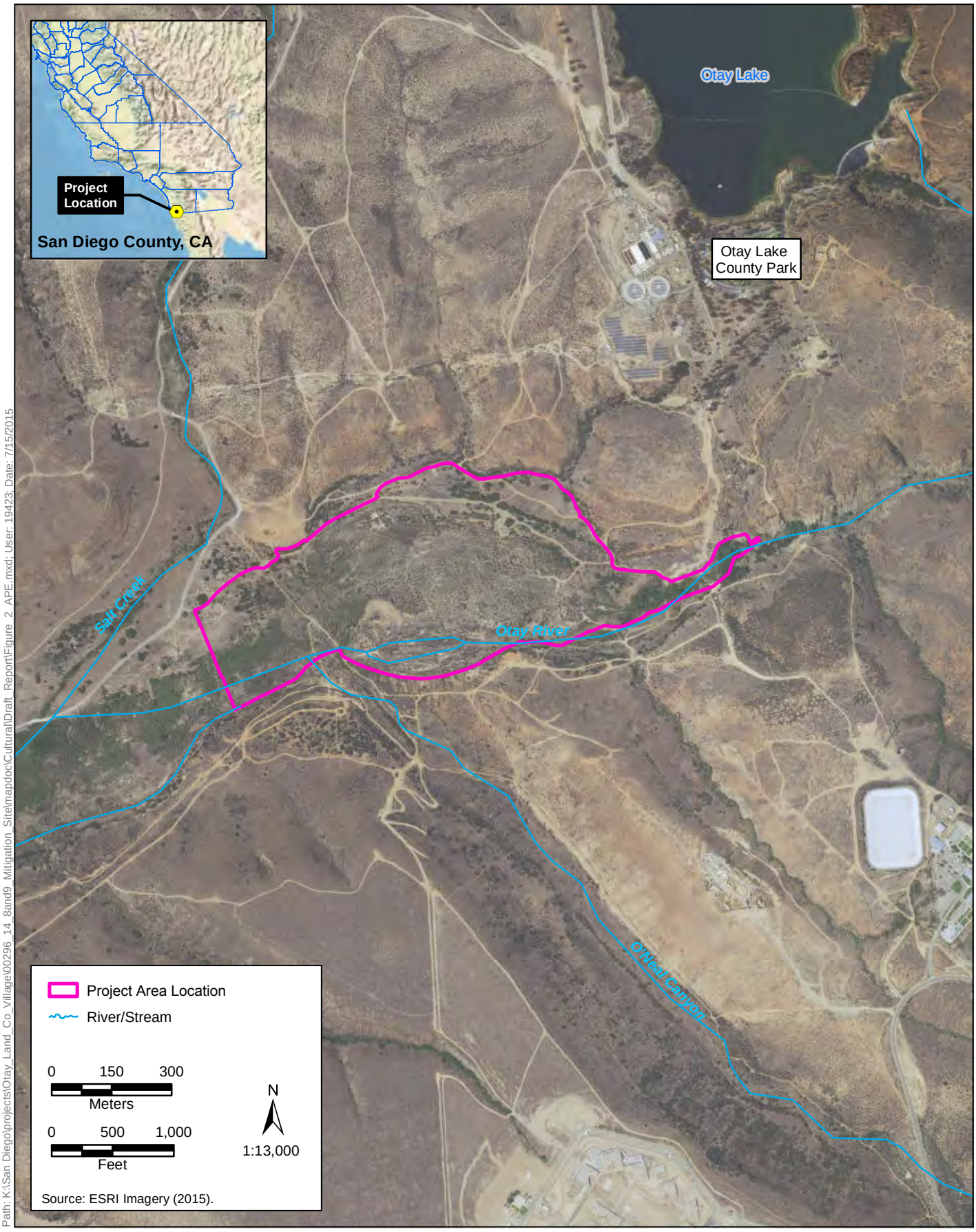
Project Area Limits

The project is located at the base of the Otay Valley, approximately 8 miles southeast of the city of Chula Vista, California, and would primarily occur within Assessor's Parcel Number 6440900400 (Figure 1-1 and 1-2). It is anticipated that the project would result in minimal and temporary construction-related effects (e.g., dust, noise, and light) to areas that fall outside of the project's construction footprint. As a result, the horizontal extent of the project's archaeological and historic built environment project area limits (PAL) encompasses the project's construction footprint and associated access roads – which is just over 110 acres in size. The PAL would be accessed via existing paved and gravel roads. The vertical extent of the PAL would be defined as the depth of ground-disturbing activities, which would vary by activity across the PAL. For example, the depth of excavation associated with grading and channel excavation may extend as deep as 15 feet below the ground surface, while road decommissioning is anticipated to only result in minimal disturbance of the ground surface.



Path: K:\San Diego\projects\Otay_Land_Co_Village\00296_14_8and9_Mitigation_Sitemapdoc\Cultural\Draft_Report\Figure_1_Vicinity.mxd; User: 19423; Date: 7/15/2015

Figure 1-1
Project Location
Otay Land Company Restoration Project



Path: K:\San Diego\projects\Otay_Land_Co_Village\00296_14_8and9_Mitigation_Site\mapdoc\Cultural\Draft_Report\Figure_2_APE.mxd; User: 19423; Date: 7/15/2015

Figure 1-2
Project Area Location
Otay Land Company Restoration Project

Regulatory Context

Federal and state regulations recognize the public's interest in cultural resources and the benefit in preserving them. These laws and regulations require analysts to consider how a project might affect cultural resources and to take steps to avoid or reduce potential damages to them. A cultural resource can be considered any property valued (e.g., monetarily, aesthetically, or religiously) by a group of people. Valued properties can be historical in character or date to the precontact past (i.e., the time prior to contact with European Americans). The project's Federal cultural resources regulatory obligations were previously considered in the technical report *Cultural Resources Survey for the Otay River Restoration Project; City of Chula Vista Mitigation Parcel, San Diego County, California* (Elder 2015) and the purpose of this technical report is to address the project's state and local cultural resources obligations. Therefore, the following is a summary of the state and local cultural resources regulations that apply to the project.

State Regulations

California Environmental Quality Act

CEQA is the primary regulation that guides the need for environmental review in California. The purpose of CEQA is to consider whether a project would result in adverse effects to the environment and whether any effects could be reduced or mitigated. Any projects undertaken by a public agency or any discretionary projects (i.e., projects that require the exercise of judgement or deliberation by a public agency) performed by private parties are subject to the CEQA process. Under CEQA, "historical resources" are considered part of the environment, and are therefore protected. "Historical resources" (§15064.5a) are defined as:

- A resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources (CRHR) (Pub. Res. Code SS5024.1, Title 14 CCR. Section 4850 et seq.).
- A resource included in a local register of historical resources, as defined in section 5020.1(k) of the Public Resources Code or identified as significant in an historical resource survey meeting the requirements of section 5024.1(g) of the Public Resources Code,
- Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource shall be considered by the lead agency to be "historically significant" if the resource meets the criteria for listing on the California Register of Historical Resources (Pub. Res. Code SS5024.1, Title 14, Section 4852), which parallel the NRHP criteria but consider state and local significance.

Even in instances where a resource is not listed in, nor determined eligible for, listing in the CRHR; not included in a local register of historical resources; or not identified in an historical resources survey, a lead agency may still determine that a resource as a historical resource as defined in Public Resources Code section 5020.1(j) or 5024.1.If it is determined that a project would result in a substantial adverse change to the significance of a historical resource, then that project would have a "significant effect" on the environment .

CEQA also contains provisions regarding the protection of Native American remains (§15064.5 (d) & (e). In the event that a study identifies the existence of, or likelihood of, Native American remains, the lead agency shall work with the appropriate Native Americans as identified by the Native American Heritage Commission as provided in Public Resources Code SS5097.98. The applicant may develop an agreement for treating or disposing of, with appropriate dignity, the human remains and any items associated with Native American burials with the appropriate Native Americans as identified by the Native American Heritage Commission.

Local Regulations

San Diego County Local Register of Historical Resources

San Diego County requires that resource importance be assessed not only at the State level as required by CEQA, but at the local level. If a resource meets any of the local register criteria, which parallel the NRHP criteria but consider resource significance at the county and local level.

Chapter 2
Setting

The following is a summary of the key characteristics of the PAL's natural and cultural setting. Discussion of the natural setting includes geology, flora, and fauna; while discussion of the cultural setting summarizes the precontact, ethnographic, and historical cultural setting of the PAL vicinity.

Environmental Setting

Geology

The PAL is located at the interface between the coastal plain and inland mountains within the Peninsular Ranges physiographic province. The province is characterized by a series of north-to-south trending mountain ranges that gradually slope west to the coastal plain and sharply slope east to the Salton trough (Norris and Webb 1990). The coastal plain is characterized by a series of terraces with localized vertical stream incision. The terraces are comprised of uplifted bedrock derived from marine and non-marine sediments deposited along the coastal margin during the Tertiary (65 million years ago to 1.8 million years ago) and Quaternary (1.8 million years ago to the present) periods (Jahns, 1954; Roffers and Bedrossian 2010). The PAL is situated on the floor of the Otay Valley, which was created when the ancestral Otay River and its tributary streams incised the Otay Mesa – one of the many terraces located along the coastal plain. The central portion of the PAL is situated on a floodplain and alluvial terraces formed during the Holocene epoch, while the northern and southern margins are situated on high alluvial terraces formed during the Pleistocene epoch. Outcrops of metavolcanic rock are located along - but outside of - the eastern, southern, and northwestern margins of the PAL (Tan and Kennedy 2002).

Flora

Based on a previous floristic survey performed by ICF in 2013, A total of 11 vegetation communities and land cover types were documented within the PAL, including Diegan coastal sage scrub, southern willow scrub, southern cottonwood-willow riparian forest, freshwater marsh, disturbed habitat, urban/developed, chamise chaparral, southern interior cypress forest, non-native grassland, eucalyptus woodland, and non-native vegetation (ICF international 2015). The most frequently observed vegetation on-site included buckwheat (*Eriogonum fasciculatum*), laurel sumac (*Malosma, laurina*), California sagebrush (*Artemisia californica*), toyon (*Heteromeles arbutifolia*), broom baccharis (*Baccharis sarothroides*), Californian pepper tree (*Schinus molle*) and tamarisk (*Tamarix* sp.).

Fauna

Prior to the historic period, terrestrial faunal resources in the region included, but were not limited to, grizzly bear (*Ursus horribilis*) and black bear (*Ursus americanus*), mountain lion (*Felis concolor*), bobcat (*Lynx rufus*), mule deer (*Odocoileus hemionus*), coyote (*Canis latrans*), gray fox (*Urocyon cinereoargenteus*), badger (*Taxidea taxus*), ringtail (*Bassariscus asutus*), raccoon (*Procyon lotor*),

jackrabbit (*Lepus californicus*), brush rabbit (*Sylvilagus bachmani*), cottontail rabbit (*Sylvilagus audubonii*), ground squirrel (*Spermophilus beecheyi*), and the pocket gopher (*Thomomys bottae*)(Burt and Grossenheider 1976).

Cultural Setting

Precontact Setting

The PAL is located within the south coastal cultural region of California. Several cultural chronologies have been developed for the region (including, but not limited to, Morrato 1984; Bull 1987; Gallegos 1992; Warren 1987). The setting provided below synthesizes some of these chronologies into a brief discussion of regional cultural trends over time. This setting divides the precontact cultural sequence into three periods. These periods are analytical constructs and do not necessarily reflect Native American views.

Paleoindian Period

Traditionally, it was thought that the earliest human inhabitants of North America were highly mobile terrestrial hunters. Commonly referred-to as the Clovis, these people used intricate bone and stone technology. On the west coast of North America, Clovis assemblages are characterized by a wide but sparse distribution of isolated tools and caches dated to between 12,800 and 12,500 years before present (BP) (Meltzer 2004). However, over the last few decades along the western coasts of North and South America, several archaeological sites and sets of human remains have been documented in island and mainland coastal contexts that date to the same period as the Clovis (i.e., Erlandson et al. 2007). These discoveries have forced researchers to reconsider how early humans migrated to the Americas and their land-use strategies – with a greater emphasis placed on coastal environments.

In the south coastal region of California, the earliest evidence of human occupation has been found on the Channel Islands (Rick et al. 2005). For example, in addition to the set of human remains dated to around 13,000 years ago on Santa Rosa Island, an archaeological site dating to around 11,600 BP has been documented on San Miguel Island. The site contains numerous fish and shellfish remains, indicating an emphasis on marine resources (Rick et al. 2001). At least two archaeological sites along the mainland coast have been dated to prior to 10,000 BP, as well (i.e., Glassow et al. 2007). Although no coastal assemblages dated to earlier than 10,000 BP have been documented along the San Diego shoreline, it is inferred that the absence of sites is largely a function of a long term trend in sea level rise and shoreline erosion in the region. These trends are likely to have obscured and/or destroyed early coastal sites.

Archaic Period

Evidence of human occupation of the San Diego region begins to appear at around 10,000 BP in the form of lithic assemblages comprised of scrapers, scraper planes, cobble choppers, large blades, large projectile points, and crescentic stones of unknown function (Davis et al. 1969; Warren 1967). These items are attributed to a cultural complex locally referred-to as the San Dieguito. Based on the range of artifact types, artifact frequency, and distribution of archaeological sites, the San Dieguito are thought to have used a generalized terrestrial hunting and gathering land-use strategy (Davis et

al. 1969). At about the same time, shell middens with millstone assemblages began to appear along sloughs and lagoons. Although this complex was originally considered to be a separate cultural tradition - the La Jolla – several researchers have subsequently argued that the San Dieguito, La Jolla, and Pauma (an inland lithic tradition indicative of inland resource collection and processing) complexes were created by the same group. The differences between the various complexes are thought to be a function of localized differences in the types of resources that were being collected and processed, rather than a difference in cultural affiliation (Gallegos 1987) Interestingly, since the archaeological contents of early to middle Holocene-aged coastal sites in the San Diego vicinity sites tend to differ from coastal sites located further north, and include items typically associated with early Great Basin cultures (Morrato 1984), researchers have argued that the San Dieguito are descendants of groups that migrated out of the Great Basin region after the great Pleistocene lakes receded (i.e., Gallegos 1991).

It appears that after around 4,000 BP the frequency of coastal archaeological sites in the San Diego region began to decline. Several mechanisms for this apparent decline have been postulated, including, but not limited to, the in-filling of shallow lagoons during this period (Gallegos 1992; Masters and Gallegos 1997) and poor visibility/preservation of ca. 4,000 BP related to local geomorphic factors (Waters et al. 1999).

Late Prehistoric Period

Starting at around 1,300 BP, the archaeological record reflects the emergence of two cultural traditions in the San Diego region. The range and spatial distribution of site types, as well as site constituents for both traditions is thought to reflect the ethnographically observed lifeways of the Kumeyaay and Luiseño peoples (Morrato 1984). Although these two groups have clear linguistic and cultural distinctions, both appear to have designed their land-use around the intensive exploitation of a range local resources and established permanent to semi-permanent villages from the coast to the mountains and foothills. Both groups also adopted the use of small projectile points, pottery, and intensified use of acorns (True 1970).

Based on ethnographic data, the boundary between the lands of the Kumeyaay (to the south) and Luiseño (to the north) peoples occurred in the vicinity of Agua Hedionda and Batiquitos Lagoon (Kroeber 1925). It is unknown, however, whether this boundary reflects a persistent spatial division between the two groups or the most recently recorded position of a boundary that fluctuated over time. Regardless, the PAL is located within an area inhabited by the Kumeyaay. Archaeological sites attributed to the Kumeyaay are characterized by a range of artifact types referred-to as the *Cuyamaca complex*. The complex includes small triangular pressure flaked projectile points, mortars and pestles, drilled stone ornaments, olivella beads, a steatite industry, ceramics, and urn cremations. Archaeological sites attributes to the Luiseño (termed *the San Luis Rey complex*) contain a similar range of artifact types, but tend to have lesser frequencies of side-notched projectile points, ceramics and ceramic forms, milling stones; and cremations tended to be ungathered (True 1970).

Ethnographic Setting

The PAL was traditionally inhabited by the Kumeyaay people (previously referred-to as the *Diegueño*), who spoke the *Tipai* dialect of the Yuman language. The Kumeyaay inhabited a region that contained the southern San Diego County, west and central Imperial County, and the Northern Baja peninsula (Spier 1923; Almstedt 1982). Speakers of the Tipai dialect traditionally lived south of

the San Diego River, while speakers of the Ipai tended traditionally lived north of the San Diego River (Langdon 1975; Hedges 1975).

The Kumeyaay used a wide range of environments for habitation and resource collection, including the coast, foothills, mountains, and desert (Almstedt 1982). In response to the wide-ranging conditions from these environments, the Kumeyaay used a range of settlement strategies. For example, residential mobility was commonly practiced in desert environments where resources were sparse and widely distributed (Hicks 1963); whereas large seasonal residential bases were established in the mountains and foothills (Almstedt 1982). In keeping with the wide range of environments that they inhabited, the Kumeyaay exploited a range of resources, including (but not limited to) terrestrial mammals, birds, fish, and marine invertebrates, grasses, manzanita, sage, sunflowers, lemonade berry, chia, mesquite, agave, and acorns. The latter was particularly important because they could be processed and stored for long periods (Hicks 1963l; Shackley 1984).

The documentary record for ethnographically named places attributed to the Kumeyaay is sparse, consisting of fewer than 60 named places (Luomala 1978). Review of the publically available literature reveals no documented ethnographically named places within the PAL. However, consultation with the affected tribes may result in the identification of previous undocumented ethnographically named places.

Historical Setting

The historical period began in the San Diego region between late sixteenth century and the middle eighteenth century, which corresponds with the arrival of Spanish explorers. A brief history of the interaction between Native Americans, Europeans, and European Americans that followed initial contact is provided below.

Native American History

The Kumeyaay first encountered Spanish explorers in any great number in 1796, when the Spanish established the Mission San Diego de Alcalá and, later, the Mission San Luis Rey de Francia in 1798. The missions used the local Native American inhabitants as laborers and attempted to convert them to Catholicism (Castillo 1978). At contact, it is thought that the Kumeyaay population numbered between 16,000 and 19,000 individuals (Shipek 1986). Following the establishment of the missions and the introduction of European diseases, the Kumeyaay population decreased dramatically. By the early 1820s, California came under Mexico's rule. Despite the transition, the Kumeyaay continued to be forced from their traditional lands and to work as laborers (Castillo 1978). As a result of this continued hardship and a period of political instability, many Native Americans participated in an uprising against the Mexican rancheros and left the missions and rancheros to live in their traditional villages (Shipek 1970). When California became a state in 1849, the Kumeyaay continued to receive harsh treatment (Castillo 1978).

As conflicts with encroaching European Americans increased, the United States government entered into treaty negotiations with the Kumeyaay (referred to as the *Dieguiño* at the time) in 1852 to obtain exclusive rights to land and cessation of hostilities in exchange for allotted reservation land, payment, and European American farming and industrial equipment (Kappler 1929; Shipek 1978). The treaty, referred to as the *1852 Treaty of Santa Ysabel*, was completed and sent to congress for ratification. Under pressure from settlers and a California Senate delegation, the treaty—as well as 17 other treaties—was rejected (Castillo 1978). After several years of additional encroachment by

European Americans, the United States congress passed the *1891 Act for the Relief of Mission Indians*. This act set aside reservation lands and trust lands—often small in size and lacking adequate water—for the Kumeyaay people. Today, many descendants of the Kumeyaay live within or near the 13 reservations of the Kumeyaay Bands or in surrounding communities (Shipek 1978).

European/European American History

Spanish Period

The historic period in California began with the early explorations of Juan Cabrillo in 1542. Cabrillo came ashore on what is now Point Loma to claim the land for Spain and gave it the name San Miguel. Sixty years passed before another European, Sebastían Vizcaíno, entered the bay on November 10, 1602, and gave it the name San Diego. Although both expeditions encountered native inhabitants, there appears to have been little or no interaction. The first Spanish settlement in San Diego was established in 1769 on Presidio Hill and consisted of a presidio (fort) and a chapel that also served as Alta California's first mission. In that same year, an expedition headed by Gaspar de Portolá traveled north from the Presidio de San Diego to extend the Spanish Empire from Baja California into Alta California by seeking out locations for a chain of presidios and missions in the area. This expedition led to the establishment of the San Diego, San Luis Rey, and San Juan Capistrano missions between 1769 and 1821 (Pourade 1960).

During the Spanish period, colonists introduced horses, cattle, sheep, pigs, corn, wheat, olives and other agricultural goods and implements, as well as new architecture and methods of building construction (Englehardt 1920). Despite the economic prosperity of the missions, Spain maintained a tenuous grip on the region—a grip that was ultimately overcome by Spanish colonists in Alta California in 1822 (Pourade 1961; Rawls and Bean 2003).

Mexican Period

Following Mexico's independence from Spain in 1821, the Mexican period began in San Diego County and lasted until 1848, ending with the conclusion of the Mexican-American War. During this period, most Spanish laws and practices continued until shortly before secularization of Mission San Luis Rey, Mission San Juan Capistrano, and Mission San Diego de Alcalá. During the Mexican Period, former Presidio soldiers became civilian residents, the Pueblo of San Diego was established, and transportation routes were expanded. During the 1820s, the region's economic activity centered on agriculture and livestock-raising for subsistence and localized markets, and hide and tallow production for the international market (Pourade 1961; Sherman 2001).

After years of political instability and several failed efforts to secularize the missions, in 1834 Governor José Figueroa issued a proclamation defining the terms of the secularization redistribution of mission lands that would occur over the following 2 years. This redistribution resulted in the distribution of approximately 500 private rancho land grants, mainly to officials and retired soldiers (Rawls and Bean 2003).

American Period

Mexico's defeat in the Mexican-American War in 1848 initiated the American period, when Mexico ceded California to the United States under the Treaty of Guadalupe Hidalgo. Subsequently, land ownership by the Mexicans living in California became a matter of considerable legal wrangling. In

principle, the Treaty of Guadalupe Hidalgo protected Californios' (residents of California prior to its acquisition by the United States) property. In practice, however, the legal process for vetting land claims that was set into motion by the Land Commission established in 1851, combined with the mounting debts of many rancho owners, allowed Americans and other newcomers to take possession of nearly all of the rancho lands originally granted to Californios. Much of the land that once constituted rancho holdings became public land, available for settlement by emigrants to California. The discovery of gold in the state, the conclusion of the Civil War, and the subsequent availability of free land through passage of the Homestead Act all resulted in an influx of people to California and the San Diego region after 1848. California's importance to the country as an agricultural area began in the latter half of the nineteenth century and was subsequently supported by the construction of connecting railways for the transportation of people and goods.

The completion of a transcontinental railroad connection to San Diego in the mid-1880s inaugurated the first land boom and saw the City of San Diego's population soar to over 35,000 in a few short years. The boom was felt throughout the region in the form of many newly formed towns and communities. Thousands of people came to the County to take advantage of the possibilities of the region. Paramount to the quest to develop the area was water acquisition, and late nineteenth century San Diego became a major focal point of dam construction in the world (Pryde 1984).

By the end of the 1880s, however, the "boom" had become a "bust" as banks failed, land prices plummeted, and speculation could not be sustained by true and beneficial economic growth. Thousands of people left the region, abandoning their significantly devalued properties to the tax assessors. However, not all of them left; many remained to form the foundations of many small pioneering communities across the county. These families practiced dry farming, planted orchards, raised livestock, built schools and post offices, and created a life for themselves in the valleys and mesas of San Diego County (Griffin and Weeks 2004).

Historic Land Use in the PAL

Review of historical maps, aerial images, and documents reveals that the PAL was subject to limited development between the nineteenth and middle twentieth centuries. After a short period of mining in the late twentieth century, no additional development has occurred in the PAL.

During the late nineteenth century, a rockfill dam was designed by E.S. Babcock and built to create the Lower Otay Lake just upstream of the PAL. Upon completion in 1897, the dam was 150 feet tall and was the tallest rockfill dam in the world. In 1916 after heavy rains, the dam breached and a 20-foot-high wall of water made its way over the PAL and down the valley (Hill 2002). The flooding left many of the inhabitants of the Otay Valley homeless and at least 20 people dead (United States Navy 1916). In some areas, it was reported that the flooding removed fine sediments on the valley floor, leaving only gravel (Pourade 1695). The dam was replaced by a concrete arch gravity dam in 1918 (Hill 2002).

Starting in the early twentieth century, commercial sand and gravel mining companies began to operate in the Otay Valley. The sand and gravel obtained from the valley was used for paving, laying foundations, and mixing asphalt and concrete. By the middle twentieth century, several companies were operating extensive mining operations in the Otay Valley (Schoenherr 2009). Between 1971 and 1981, mining operations occurred within the PAL (NETR Online 2015a. 2015b). Following the completion of the mining operations, no substantive development appears to have occurred within the PAL.

Chapter 3
Literature Review

Archaeological Studies and Records

In June and October of 2014, Dr. Anna Noah, PhD, of Noah Archaeological Services performed a literature review at the South Coastal Information Center (SCIC) to identify previously documented archaeological and historic built resources within a 0.5-mile radius of the PAL. The SCIC contains all cultural resources records from Imperial and San Diego Counties.

The literature review revealed that 54 archaeological sites and isolates have been documented within 0.5 mile of the PAL (Table 3-1). Forty-five of the archaeological sites and isolates are precontact in age, and all but one consist exclusively of lithic artifacts. The other nine sites are historical in age and primarily consist of refuse scatters. Three of the archaeological sites and isolates have been documented within the PAL. Site CA-SDI-10875 and Isolates 37-015385 and 37-015386. Brief summaries of these resources are provided below.

CA-SDI-10875: First documented in 1987 as a large but sparse lithic scatter on a terrace overlooking the Otay River, this site was originally documented as containing lithic flakes, debitage, and a biface fragment (Kyle 1987). The site was also described as being subject to disturbance from several dirt roads that cross the site. The site was subsequently revisited in 1996, and the site boundary was expanded (Smith 1996). The site was revisited again in 2010, and several additional lithic artifacts—including scrapers, choppers, utilized flakes, retouched flakes, hammer stones, and debitage—were documented within the revised site boundary (Blotner 2010). In 2013, AECOM performed a pedestrian survey and conducted archaeological monitoring within the site boundary but identified no archaeological deposits (AECOM 2013).

Isolate 37-015385: This isolate, a metavolcanic flake, was located on a river bottom. It was documented and collected in 1993 (Kyle et al. 1993a).

Isolate 37-015386: This isolate, two metavolcanic flakes, was located on a river bottom. It was documented and collected in 1993 (Kyle et al. 1993b).

Table 3-1. Cultural Resources Located within 0.5 Mile of the PAL

Designation	Resource Type	Description	Recorder(s)
CA-SDI-4732	Isolate	Two metavolcanic flakes.	Waters 1973; Smith 1996; Blotner 2010
CA-SDI-4733	Site	Lithic tools and flakes.	Waters 1973; Smith 1996
CA-SDI-4734	Site	Lithic flakes.	Waters 1973; Smith 1996
CA-SDI-4735	Site	Lithic flakes.	Waters 1973; Smith 1996
CA-SDI-4736	Site	San Dieguito #II Site – no description of contents.	Waters 1973

Designation	Resource Type	Description	Recorder(s)
CA-SDI-4736	Site	Lithic flakes, flake tools, and tools; historic glass fragments and milled wood.	Waters 1973; Kyle et al. 1993c
CA-SDI-4989	Site	Tools, cores, and flakes	Waters 1973; Smith 1996
CA-SDI-7212	Site	Disturbed lithic artifact scatter.	Ray and Hunter 1979; RECON 1989; Gallegos and Associates 1993; HDR 2010
CA-SDI-8649	Site	Lithic scatter.	Ainsworth 1981; Blotner and Clowery 2010
CA-SDI-9970	Site	A small concentration of lithic artifacts surrounded by a broad area of isolated lithic artifacts.	Thesken 1982
CA-SDI-10667	Site	Hammerstone fragments, expended core fragment, flake, glass shards.	Huey and Campbell 1991
CA-SDI-10668	Site	Prehistoric quarry site with light lithic scatters.	Thesken 1979; Kyle 1986; Blotner 2010; AECOM 2013
CA-SDI-10862/H	Site	Historic building pads, structures, trash scatter and dumps.	Hector et al. 1987
CA-SDI-10874	Site	Precontact quarry with associated lithic scatter.	Kyle 1986
*CA-SDI-10875	Site	Lithic scatter.	WESTEC Services Inc. 1987; Smith 1996; Blotner 2010; AECOM 2013
CA-SDI-11335/H	Site	Lower Otay Lakes filtration plant and associated infrastructure	Schaefert 1989
CA-SDI-11360/H	Site	Possible homestead remnants.	Ritz et al. 1989
CA-SDI-11370/H	Site	Historic trash scatter.	Collett et al. 1989
CA-SDI-11371/H	Site	Historic metal scatter.	Collett et al. 1989
CA-SDI-11380	Site	Lithic scatter.	Ritz et al. 1989
CA-SDI-11381	Site	Lithic scatter.	Collett 1989
CA-SDI-11382/H	Site	Historic trash scatter.	Ritz et al. 1989
CA-SDI-11385/H	Site	Historic Brown Field bombing range.	Collett 1989; Blotner 2010
CA-SDI-12876	Site	One flake and several possible waste fragments.	Huey and Campbell 1991
CA-SDI-12930	Site	Lithic scatter.	Hector 1992

Designation	Resource Type	Description	Recorder(s)
CA-SDI-13456	Site	Lithic scatter.	Kyle et al. 1993c
CA-SDI-13457	Site	Lithic scatter.	Kyle et al. 1993c
CA-SDI-13458	Site	Lithic scatter.	Kyle et al. 1993c; Stropes 2010
CA-SDI-13459/H	Site	Historic trash dump	Kyle et al. 1993c
CA-SDI-13460/H	Site	Historic trash scatter.	Kyle et al. 1993c
CA-SDI-13461	Site	Two flaked tools and one flake.	Kyle et al. 1993c
P-37-14535	Isolate	Lithic artifact – scraper.	Smith 1996
P-37-14538	Isolate	Lithic artifact – scraper.	Smith 1996
CA-SDI-14199	Site	Lithic scatter.	Smith 1996
CA-SDI-14579	Site	Lithic scatter.	Smith 1996
CA-SDI-14580	Site	Lithic scatter.	Smith 1996
CA-SDI-14581	Site	Lithic scatter.	Smith 1996
CA-SDI-14583	Site	Lithic scatter.	Smith 1996
CA-SDI-14584	Site	Ceramic and lithic scatter.	Smith 1996; Blotner and Clowery 2010
CA-SDI-14585	Site	Lithic scatter.	Smith 1996; Blotner and Clowery 2010
CA-SDI-15200	Isolate	One flake tool and one core	Huey 1991
CA-SDI-15381	Isolate	One lithic flake.	Kyle and Tift 1993
P-37-15382	Isolate	Two lithic flakes.	Kyle and Tift 1993c
P-37-15384	Isolate	Two lithic flakes.	Kyle et al. 1993d
*P-37-15385	Isolate	One lithic flake.	Kyle et al. 1993a
*P-37-15386	Isolate	Two lithic flakes.	Kyle et al. 1993b
P-37-15387	Isolate	One lithic flake.	Kyle et al. 1993e
P-37-15388	Isolate	One lithic flake.	Kyle et al. 1993f
P-37-15391	Isolate	One lithic flake.	Kyle et al. 1993g
P-37-19182	Isolate	One lithic biface fragment and one piece of debitage.	Kyle 2000
P-37-31365	Isolate	One lithic flake.	Blotner 2010
P-37-31366	Isolate	One lithic flake.	Blotner 2010
P-37-31367	Isolate	Two lithic flakes.	Blotner 2010
P-37-31368	Isolate	One lithic flake.	Blotner 2010

Designation	Resource Type	Description	Recorder(s)
*Located within or directly adjacent to the PAL			

Native American Resources

In July 2015, ICF requested a record search for Native American cultural resources documented in the Sacred Lands File. The Sacred Lands File is maintained by the Native American Heritage Commission (NAHC). On August 26, 2015, the Native American Heritage Commission (NAHC) replied and indicated that no Native American cultural resources are documented in the project's APE (PAL), but noted that this does not preclude the possibility that undocumented Native American cultural resource are present. The NAHC recommended contacting representatives from the following Native American groups: Barona Group of the Capitan Grande, Ewiiaapaaya Tribal Office, La Posta Band Mission Indians, Manzanita Band of the Kumeyaay Nation, San Pasqual Band of Mission Indians, Sycuan Band of the Kumeyaay Nation, Viejas Band of Kumeyaay Indians, Kumeyaay Cultural Historic Committee, Campo Band of Mission Indians, Jamul Indian Village, Mesa Grande Band of Mission Indians, Kwaaymil Laguna Band of Mission Indians, Inaja Band of Mission Indians, Kumeyaay Cultural Repatriation Committee, La Posta Band of Mission Indians, Baron Group of the Captain Grande, Viejas Band of Kumeyaay Indians, San Pasqual Band of Indians, Manzanita Band of Mission Indians, Iipay Nation of San Ysabel, and the Inter-Tribal Cultural Resource Protection Council.

In compliance with the project's obligations under Section 106 of the NHPA, the U.S. Army Corps of Engineers initiated consultation with Native American tribes on September 1, 2015.

- On September 1, 2015, Clint Linton of the Iipay Nation of Santa Ysabel requested that a Kumeyaay Native monitor be on-site for all ground disturbing activities related to the project and the avoidance of impacts to Kumeyaay sites.
- On September 2, 2015, the Viejas Band of Kumeyaay Indians requested additional information on archaeological data and information on the project site in order to provide an informed decision and recommendation on the proposed project.

Neither response provided information relating to Native American cultural resources. At the time of the submittal of this technical report, no Native American tribe has requested that the City of Chula Vista notify them of projects in accordance with AB-52. Appendix A contains all correspondence received from the NAHP and Native American tribes.

Chapter 4
Research Design

Objectives

The objective of this study is to identify previously undocumented archaeological and historic built resource, to evaluate previously documented resources for their eligibility for listing in the NRHP based on surface-exposed artifacts and features where conditions are appropriate, and to more precisely delineate the boundaries of previously documented resources when needed.

Expectations

Analysis of the background information provided in Chapters 2 and 3 resulted in the development of the following expectations:

- Review of the geology of the PAL reveals that it contains both Holocene-aged and Pleistocene-aged alluvium. Therefore, the PAL has the potential to contain both surface-exposed and buried archaeological resources. However, considering the nature of the ground disturbance that occurred in the PAL during the historic period, the potential for encountering intact archaeological resources within the area where excavations associated with mining activities occurred is considered to be small.
- Review of the precontact and ethnographic literature, as well as the record search, revealed that the PAL vicinity has a history of precontact use. The presence of numerous lithic artifact scatters in the PAL vicinity, but paucity of other classes of precontact artifacts and features, suggests that the PAL vicinity served as a resource collection area. Given the documented presence of lithic artifact scatters within, and in the vicinity of, the PAL, it is considered highly likely that additional lithic artifacts associated with documented and previously undocumented precontact archaeological sites are located within the PAL.
- With the exception of extensive sand and gravel mining operations that occurred in the PAL during the late twentieth century, limited development has occurred within the PAL during the historic period. Therefore, it is anticipated that the PAL will have limited potential to contain historic built resources or historical archaeological sites.

Based on an examination of the existing data, the likelihood for encountering archaeological sites in the PAL is considered to be high. However, the locations where there is a high likelihood of encountering such sites are anticipated to only include those areas that were not excavated during mining activities.

Field Methods

ICF archaeologists performed a pedestrian survey in the project's PAL. During the survey, ICF archaeologists carefully inspected the ground surface and road- and stream-cuts to identify artifacts, features, and infrastructure and assess the local geomorphic context. In areas where no resources

have been previously documented, pedestrian survey transects were spaced at 15-meter intervals when vegetation and topography permitted it. When revisiting documented resources or recording previously undocumented resources, pedestrian survey transects were spaced at 5-meter intervals when vegetation and topography permitted it. Field observations were recorded on standard field survey forms, and any resources or important landscape features were documented via photography and handheld global positioning system units.

Chapter 5
Results

ICF archaeologist J. Tait Elder performed a pedestrian survey of the PAL between June 2 and June 3, 2015. The pedestrian survey relocated CA-SDI-10875, but neither Isolate 37-015385 nor Isolate 37-015386 was relocated. No previously undocumented archaeological or historic built resources were identified.

Landform Summary

The PAL is at the base of the Otay Valley where it widens just downstream of a confined bedrock canyon. Much of the PAL is on a series of flat to gently sloping alluvial terraces. The surface-exposed sediments on the higher elevation terraces appear to have undergone both pedogenesis (i.e., rubified soil) and some level of deflation (i.e., a high frequency of coarse sands and small gravels). The lower elevation terraces tended to show no visible indicators of pedogenesis at the ground surface—although observation of previous cuts on these terraces reveals a rubified subsoil—and had a higher frequency of fine-grained sediment than the higher elevation terraces. The central portion of the PAL has been extensively excavated (see below for additional detail) and has an undulating and irregular topography. The southern portion of the PAL contains a dry channel and associated floodplains. It is questionable as to whether the channel predates the ground disturbance that has occurred in the PAL because it appears to have been redirected around the excavated area and inhabits a location that is at a higher elevation than the excavated area.

As indicated previously in Chapter 2, "Setting," the PAL has been subject to at least two major anthropogenic landscape-altering events during the historic period. The first event, the breach of the Otay Dam, occurred just upstream of the PAL in 1916. The second event, a sand and gravel mining operation, occurred within the PAL between 1971 and 1981. The Otay Dam breach resulted in extensive flooding throughout the Otay Valley and resulted in the removal of fine sediments in some portions of the valley. No obvious landscape features associated with the dam breach were identified during the survey.

The mining operation resulted in widespread excavation and material sorting within the PAL. Based on observations and measurements of cut-wall exposures obtained during the pedestrian survey, excavations associated with the mining operation occurred in the central portion of the PAL and ranged in depth from 6 to 10 feet below the pre-mining ground surface (Appendix B: Photographs 1 and 2). Large cobbles and boulders were then stored in hedge rows within the excavated area (Appendix B; Photograph 3), while silts, sands, and gravels were piled along the edges of the excavated area (Appendix B; Photograph 4). The extent of the mining operations can be clearly observed using bare earth light detection and ranging imagery (LiDAR) (Figure 5-1).

Ground Surface Visibility

Across the northern third of the PAL, the relative lack of vegetation provided for good to excellent ground surface visibility (70% to 100%). However, occasional thick patches of Californian pepper

tree and buckwheat in this area resulted in poor (0% to 30%) ground surface visibility. Ground surface visibility was highly variable in the central third of the PAL, but tended range from poor to fair (20% to 40%).

Across much of the portion of CA-SDI-10875 that is located within the PAL, ground surface visibility was poor to good (20% to 50%). Despite patches of poor ground surface visibility, a sufficient amount of the ground surface was exposed to visually identify surface exposed artifacts if they were present in any great number. Ground surface visibility was fair (30% to 40%) in the vicinity of both of the isolates that were previously documented within the PAL (Isolates 37-015385 and 37-015386).

Resource Summaries

Three resources have been previously documented within the PAL. The pedestrian survey did not relocate two of the resources (Isolates 37-015385 and 37-015386) and identified two previously undocumented artifacts associated with CA-SDI-10875. Figure 5-2 shows the locations of the three resources, as well as the locations of the newly documented artifacts associated with CA-SDI-10875. Appendix C includes an archaeological resource update form for CA-SDI-10875.

CA-SDI-10875

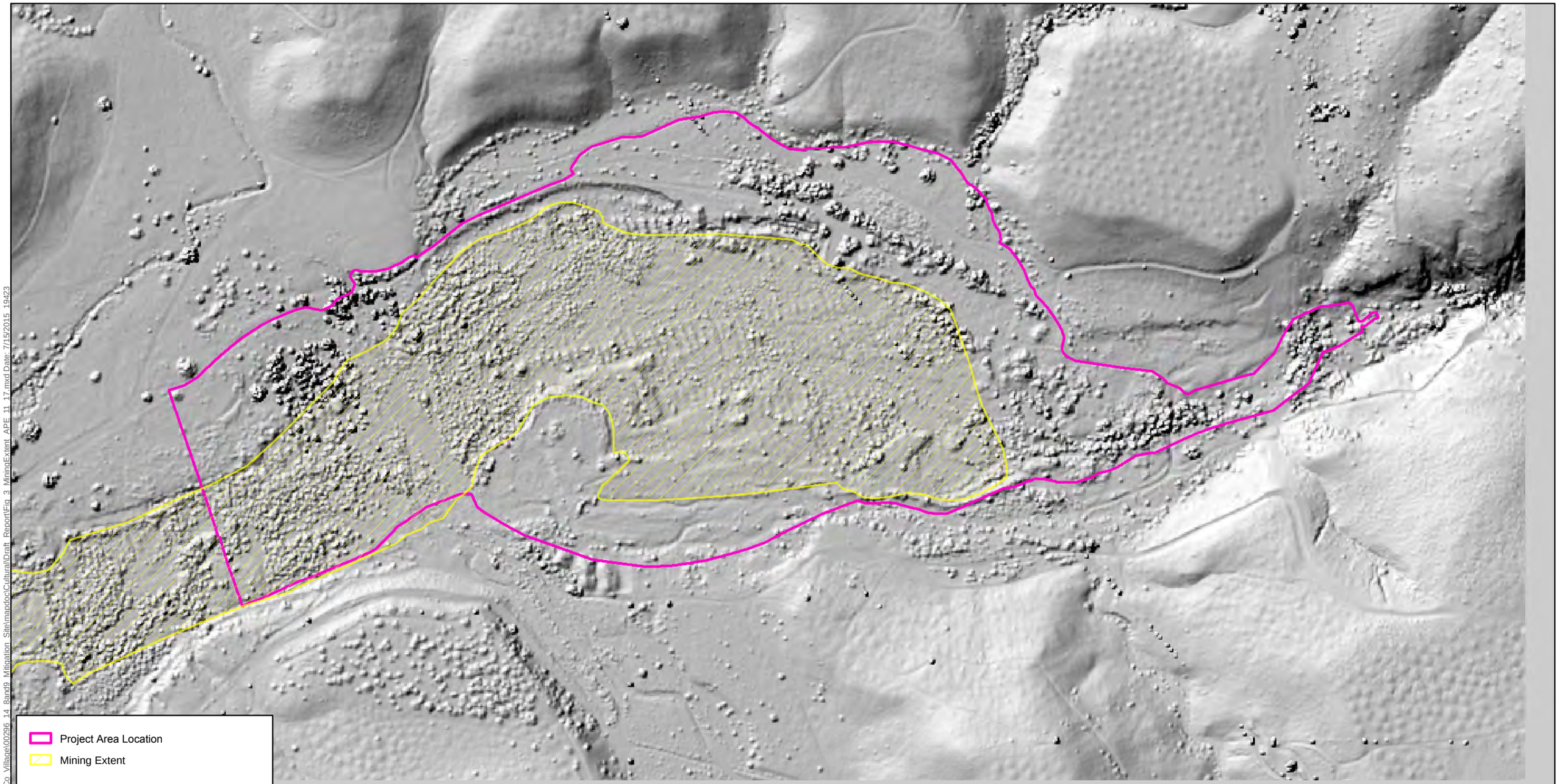
A 17-acre portion of the site is located within the PAL on a series of alluvial terraces and along a dry channel. In this area, the pedestrian survey identified two artifacts—a yellowish white metasedimentary cobble with three flake scars and a greenish gray cryptocrystalline silicate core reduction flake. This paucity of artifacts is consistent with the results of a previous recent pedestrian survey and archaeological monitoring project performed by AECOM (2013), during which no artifacts were identified. The site has not been formally evaluated for its eligibility for listing in the NRHP or CRHR, and it would be inappropriate to evaluate the entire site based on the contents of a small and spatially limited portion of the site. Therefore, ICF's recommendations are only applicable to the portion of the site located within the APE and this portion is recommended not eligible for listing in the CRHR because of a paucity artifacts within the PAL. This portion of the site was previously recommended not eligible for listing in the NRHP (Elder 2015).

Isolate 37-015385

This isolate was collected during field investigations performed by Kyle et al. (1993a). No additional artifacts were identified during the pedestrian survey.

Isolate 37-015386

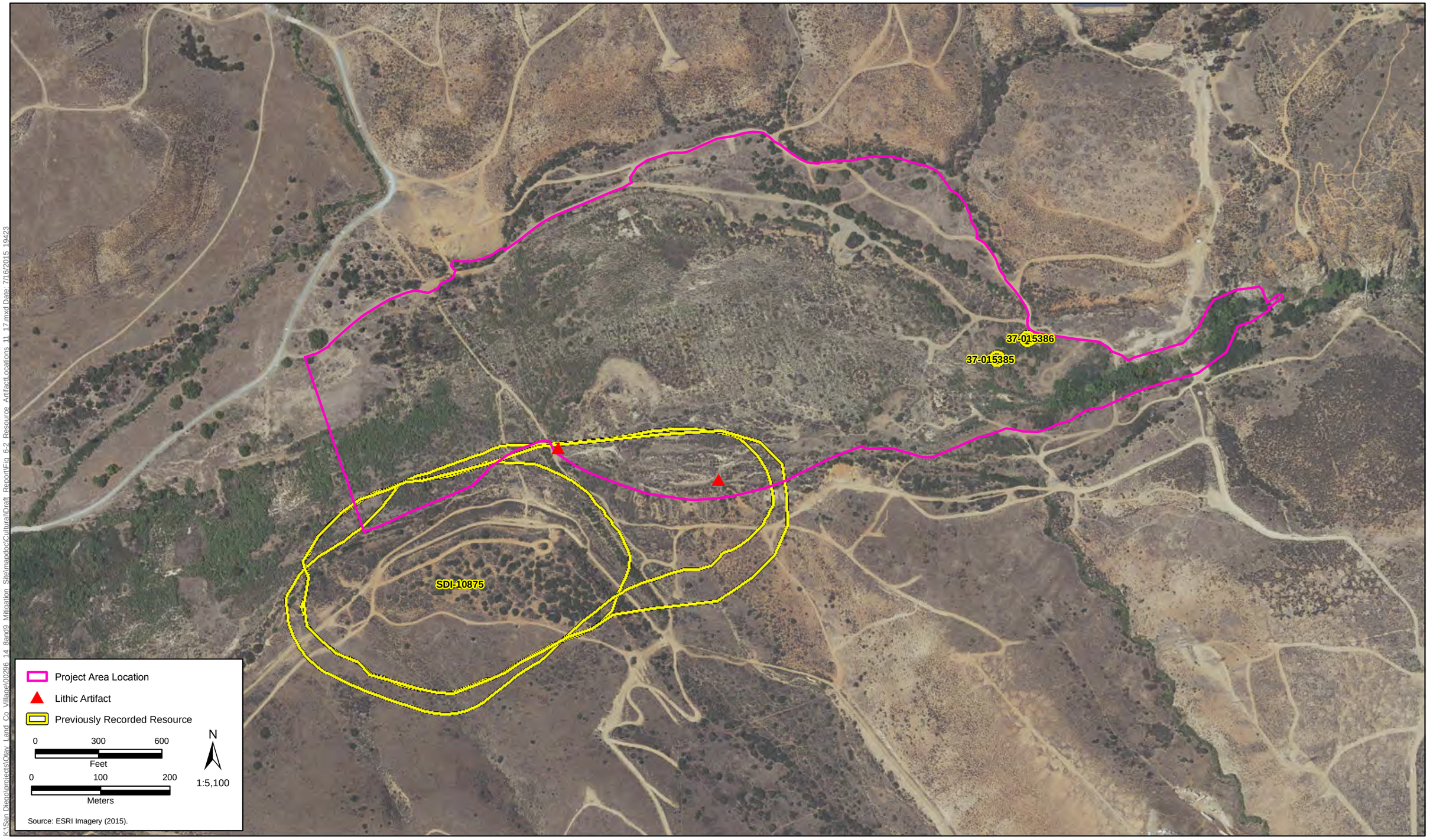
This isolate was collected during field investigations performed by Kyle et al. (1993b). No additional artifacts were identified during the pedestrian survey.



K:\San Diego\projects\Otay Land Co Village\00296.14 Rand9 Mitigation Sitemap\doc\Cultural\Draft Report\Fig 3 MiningExtent APE 11 17.mxd Date: 7/15/2015 19423

Figure 5-1
Extent of Mining in the PAL
Otay Land Company Restoration Project

This page intentionally left blank.



K:\San Diego\projects\Otay Land Co Village\00296.14 Band9 Mitigation Site\mapdoc\Cultural\Draft Report\Fig 6-2 Resource Artifact Locations 11 17.mxd Date: 7/16/2015 19423

Figure 5-2
Resource and Artifact Locations
Otay Land Company Restoration Project

This page intentionally left blank.

Chapter 6
Conclusions and Recommendations

Conclusions

No historic resources were identified during the cultural resources survey of the PAL. The pedestrian survey resulted in the identification of two lithic artifacts within the previously defined boundary for CA-SDI-10875. Considering that only two non-diagnostic lithic artifacts were documented within a 17-acre portion of the site that occurs within the PAL, that previous recent studies could not relocate any artifacts within the site boundary (AECOM 2013), and that no features or chronologically diagnostic artifacts have been documented within the PAL, ICF recommends this portion not eligible for listing in the CRHR. This portion of the site was previously recommended not eligible for listing in the NRHP (Elder 2015).

No artifacts were identified in the location of the previously documented isolates (Isolates 37-015385, and 37-015386) within the PAL. The artifacts associated with these isolates were collected during their initial documentation (Kyle et al. 1993a, 1993b). Since there are no extant artifacts at these locations, no CRHR eligibility recommendation is provided.

Historic documentation review and a pedestrian survey revealed that the central portion of the PAL has been subject to deep and widespread ground disturbance associated with a sand and gravel mining operation that occurred on site during the late twentieth century. This area is considered to have limited potential to contain archaeological and historic built resources.

Recommendations

Based on the results of the pedestrian survey, the project is not expected to affect any CRHR-eligible resources. Therefore, ICF recommends a finding of no significant impacts on historic resources for this undertaking. However, given the widespread presence of archaeological sites in the PAL vicinity, potential for encountering redeposited artifacts in the sediment stockpiles on site, and variable ground surface visibility within the PAL, ICF also recommends that an unanticipated discovery plan be developed for use during project implementation. The plan should establish the procedures to follow in the event of an unanticipated discovery of archaeological deposits or human remains, describe the anticipated range of archaeological resource types, list the character-defining elements that would render archaeological resources eligible for listing in the NRHP and/or CRHR, and the identify documentation procedures to follow in the event that an archaeological discovery does not retain the necessary character-defining elements to be considered eligible for listing in the NRHP or CRHR.

This page intentionally left blank.

Chapter 7
Bibliography

AECOM
2013 Archaeological Site Survey Record Update, CA-SDI-10875. On file at the South Coastal Information Center.

Almstedt, R. F.
1982 Kumeyaay and `IIpay. In (Ed. C.M. Woods) *APS/SDG&E Interconnection Native American Cultural Resources*. Wirth Associates, Inc., San Diego, CA.

Blotner, N.
2010 Archaeological Site Survey Record Update, CA-SDI-10875. On file at the South Coastal Information Center.

Bull, C.S.
1987 A New Proposal: Some Suggestions for San Diego Prehistory. In (Ed. D. Gallegos) *San Dieguito-La Jolla: Chronology and Controversy*. San Diego County Archaeological Society Research Paper 1

Burt, W. H., and R.P. Grossenheider
1976 *A Field Guide to the Mammals of America North of Mexico*. Houghton Mifflin Company, Boston, MA.

Castillo, E.D.
1978 The Impact of Euro-American Exploration and Settlement. In (Ed. R.F. Heizer) *Handbook of North American Indians, Volume 8*. Smithsonian Institution, Washington D.C.

Davis, E.L. C.W.Brott, and D.L. Weide
1969 *The Western Lithic Co-Tradition.* San Diego Museum Papers 6, San Diego CA.

Elder, J.T.
2015 *Cultural Resources Survey for the Otay River Restoration Project; City of Chula Vista Mitigation Parcel, San Diego County, California.* Prepared for Otay Land Company, LLC.

Englehardt, Z.
1920 *San Diego Mission.* James H. Barry Company, San Francisco, CA.

Erlandson, J.M., T.C. Rick, T.L. Jones, and J.F. Porcasi
2007 One if by Land, Two if by Sea: Who Were the First Californians? In (Ed. T.L Jones and K. A. Klar) *California Prehistory: Colonization, Culture, and Complexity*. Alta Mira Press, Lanham, MD.

Gallegos, D.R.
1987 A Review and Synthesis of Environmental and Cultural Material for the Batiquitos Lagoon Region. *San Dieguito-La Jolla: Chronology and Controversy*. San Diego Archaeological Society, San Diego, CA.

1991 Antiquity and Adaptation at Agua Hedionda, Carlsbad, California. In (ed. J.M. Erlandson and R.H. Colten) *Hunter-Gatherers of Early Holocene Coastal California*. Institute of Archaeology, University of California, Los Angeles, CA.

1992 *Patterns and Implications of Coastal Settlement in San Diego County: 9000 to 1300 Years Ago*. In (Ed. T. Jones) Essays on the Prehistory of Maritime California. Center for Archaeological Research at Davis Publications 10: 205-216, Davis, Ca.

Glassow , M.A., A. Lynn, H. Gamble, J.E. Perry, and G.S. Russell

2007 Prehistory of the Northern California Bight and the Adjacent Transverse Ranges. In (Ed. T.L. Jones and K.A. Klar) *California Prehistory: Colonization, Culture, and Complexity*. Alta Mira Press, Lanham, MD.

Griffin, E.C., and J. R. Weeks

2004 Peopling the Region: San Diego's Population Patterns. In (Ed. P. R. Pryde) *San Diego: An Introduction to the Region*. 3rd ed. Sunbelt Publications, Inc., San Diego, CA.

Hedges, Kenneth

1975 Notes on the Kumeyaay: A Problem of Identification. *The Journal of California Anthropology* 2(1):71-83.

Hicks, F.N.

1963 *Ecological Aspects of Aboriginal Culture in the Western Yuman Area*. Unpublished Ph.D. Dissertation, Department of Anthropology, University of California, Los Angeles, CA

Hill, J.

2002 Dry Rivers, Dammed Rivers, and Floods: An Early History of the Struggle Between Droughts and Floods in San Diego. *The Journal of San Diego History* 48:1.

ICF International

2015 *Otay Land Company Village 8 West and Village 9, Draft Habitat Mitigation and Monitoring Plan.* Prepared for Otay Land Company.

Jahns, R. H.

1954 Investigations and Problems of Southern California Geology, Chapter 1. In R. H. Jahns (ed.), *Geology of Southern California, Bulletin* 170. California Department of Natural Resource, Division of Mines, San Francisco, CA.

Kappler, C.J.

1929 Treaty Made and Concluded at the Village of Santa Ysabel, California, Between O.M. Wozencraft, United States Indian Agent, and the Captains and Head Men of the Nation of Dieguino Indians, January 7, 1852. In *Indian Affairs: Laws and Treaties, Vol IV. Laws*. Government Printing Office, Washington. D.C.

Kroeber, A.L.

1925 *Handbook of the Indians of California*. Bureau of American Ethnology Bulletin 78, Washington D.C.

Kyle, C.

1987 Archaeological Site Survey Record, CA-SDI-10875. On file at the South Coastal Information Center.

Kyle, C., R. Phillips, S. Briggs, and L. Tift

1993a Isolate Record, P-37-105385. On file at the South Coastal Information Center.
1993b Isolate Record, P-37-105386. On file at the South Coastal Information Center.

Langdon, Margaret
1975 Kamia and Kumeyaay: A Linguistic Perspective. *The Journal of California Anthropology* 2(1):64-70.

Luomala, K.
1978 Tipai-Ipai. In (Ed. R.F. Heizer) *Handbook of North American Indians, Volume 8*. Smithsonian Institution, Washington D.C.

Masters, P.M. and D.R. Gallegos
1997 Environmental Change and Coastal Adaptations in San Diego County during the Middle Holocene. In (ed. J.M. Erlandson and M.A. Glassow) *Archaeology of the California Coast during the Middle Holocene*. Institute of Archaeology, University of California, Los Angeles, CA.

Meltzer, D.J.
2004 Peopling of North America. In (Ed. A.R. Gillespie, S.C Porter, and B.F. Atwater) *Developments in Quaternary Science Volume 1: The Quaternary Period in the United States*. Elsiever, Amsterdam, The Netherlands.

Moratto, M.J.
1984 *California Archaeology*. Academic Press, Orlando, FL.

NETR Online
2015a Historic Aerial Photograph, 1971. Electronic document, http://www.historicaerials.com, accessed June 9, 2015.
2015b Historic Aerial Photograph, 1981. Electronic document, http://www.historicaerials.com, accessed June 9, 2015.

Norris, R. M., and R. W. Webb
1990 *Geology of California*. Second Edition. John Wiley & Sons, Inc.

Pourade, Richard F.
1960 *The Explorers: the History of San Diego*. Union-Tribune Publishing, San Diego, CA.
1961 *Time of the Bells: the History of San Diego*. Union-Tribune Publishing, San Diego, CA.
1965 *Gold in the Sun: History of San Diego.* Union-Tribune Publishing, San Diego, CA

Pryde, P. R. (editor)
1984 *San Diego: An Introduction to the Region.* 2nd ed. Kendall/Hunt Publishing Company, Dubuque, IA.

Rawls, J.J. and W. Bean
2003 *California: An Interpretive History*. 8th ed. McGraw-Hill Publishing, San Francisco, CA.

Rick, T.C., J.M. Erlandson, and R.L. Vellanoweth
2001 Paleocoastal Marine Fishing on the Pacific Coast of the Americas: Perspectives from Daisy Cave, California. *American Antiquity* 66:595-613.

Rick, T.C., J.M. Erlandson, R.L. Vellanoweth, and T.J. Braje

2005 From Pliesticoene Mariners to Complex Hunter Gatherers: The Archaeology of the California Channel Islands. *Journal of World Prehistory* 19 169-228.

Roffers, P. D., and T. L. Bedrossian
2010 *Geologic Compilation of Quaternary Surficial Deposits in Southern California Offshore Portion of the San Diego 30' x 60' Quadrangle*, CGS Special Report 217, Plate 14. California Geological Survey, Department of Water Resources.

Schoenherr, S.
2009 *History of the Commercial Mining Activities in the Otay Valley Regional Park*. Online document, http://www.ovrp.org/viewHistory.php. Accessed June 9, 2015.

Shackley, M.S.
1984 *Archaeological Investigations in the Western Colorado Desert: A Socioecological Approach, Vol. 1*. Wirth Environmental Services, A Division of Dames & Moore, San Diego, CA.

Sherman, L.
2001 *A History of North San Diego County: From Mission to Millennium*. Heritage Media Group. Carlsbad, CA.

Shipek, F.C.
1970 *The Autobiography of Delfina Cuero*. Malki Museum Press, Banning, CA.
1978 History of Southern California Mission Indians. In (Ed. R.F. Heizer) *Handbook of North American Indians, Volume 8*. Smithsonian Institution, Washington D.C.
1986 The Impact of Europeans upon Kumeyaay Culture. In (Ed. R. Starr) *The Impact of European Exploration and Settlement on Local Native Americans*. Cabrillo Historical Association, San Diego, CA.

Smith, B.F.
1996 Archaeological Site Survey Record Update, CA-SDI-10875. On file at the South Coastal Information Center.

Spier, L.
1923 *Southern Diegueño Customs*. University of California Publications in American Archaeology and Ethnology 20:292-358.

Tan, S.S. and M.P. Kennedy
2002 *Geologic Map of the Otay Mesa 7.5' Quadrangle San Diego, California: A Digital Database.* Department of Conservation, California Geological Survey.

True, D.L.
1970 *Investigation of a Late Prehistoric Complex in Cuyamaca Rancho State Park, San Diego County, California*. Archaeological Survey Monograph, Department of Anthropology, University of California, Los Angeles, CA.

United States Navy
1916 Otay Flood Relief Expedition Records. Housed at the San Diego History Center Document Collection.

Warren, C.N.
1967 The San Dieguito Complex: A Review and Hypothesis. *American Antiquity* 32 (2):168-185.

1987 The San Dieguito and La Jolla: Some Comments. In (Ed. D. Gallegos) *San Dieguito-La Jolla: Chronology and Controversy*. San Diego County Archaeological Society Research Paper 1

Waters, M.R., B.F. Byrd, and S. N. Reddy

1999 Geoarchaeological Investigations of San Mateo and Las Flores Creeks, California; Implications for Coastal Settlement Models. *Geoarchaeology: An International Journal* 14 (3): 289-306.

This page intentionally left blank.

Appendix A
Correspondence

This page intentionally left blank.

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, U.S. ARMY CORPS OF ENGINEERS
5900 LA PLACE COURT, SUITE 100
CARLSBAD, CALIFORNIA 92008

September 1, 2015

To: Native American Representatives

SUBJECT: Section 106 National Historic Preservation Act Consultation - Otay River Restoration Project

The United States (U.S.) Army Corps of Engineers Los Angeles District (Corps) received a permit application from Otay Land Company (OLC) for the Otay River Restoration Project. The proposed project is located within the City of Chula Vista, San Diego County, California. More specifically, the project area is located on the Otay Mesa California, USGS 7.5-minute topographic quadrangle at latitude 32.601364°N and longitude -116.938372°W. Figures depicting the project area are enclosed. Please note, Otay River Restoration Project is related to the compensatory mitigation for Otay Ranch Village 3 and 8 West development projects (Corps file number SPL-2012-00181-RAG and SPL-2013-00495-RAG, respectively), also proposed by OLC.

The Otay River Restoration Project includes re-establishment of the Otay River channel and floodplain. In addition, the applicant is proposing to enhance, through non-native and invasive vegetation removal, the parcel located directly below Savage Dam and upstream of the project site (see enclosed figures).

We respectfully request any comments you may have regarding this area's role in your tribal history, and we will address any concerns that may arise in this regard. Furthermore, in an effort to address Native American concerns, the Corps is requesting any information that you are willing to share regarding the nature of cultural and Native American resources within the proposed project area, if applicable.

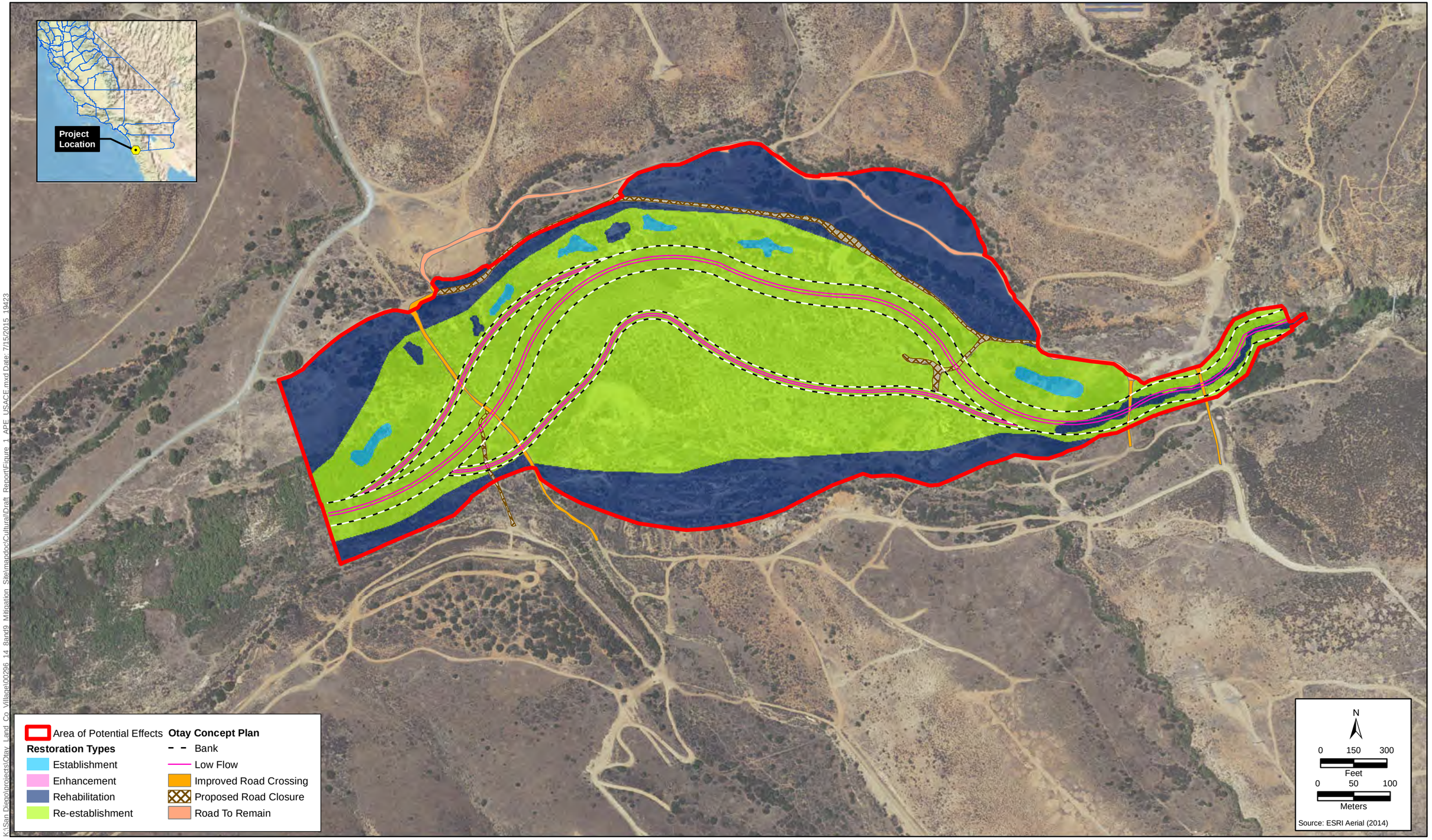
Based on our review of the application materials and a search of National Register sites, the Corps has determined that there are no resources identified within the boundaries of the project site that meet the eligibility criteria for nomination to the National Register of Historic Places (NRHP). In addition, the Native American Heritage Commission's record search of the Sacred Lands File did not indicate the presence of Native American cultural resources in the vicinity of the project area (see enclosures).

Please review the enclosed information and let me know if you are willing to share information or have concerns relevant to the proposed project via phone, e-mail, or letter within 30 days of receipt of this letter. You may contact me to discuss this project further at 760-602-4835 or via e-mail at Rose.A.Galer@usace.army.mil. Please refer to this letter and the Otay River Restoration Project in your reply.

Sincerely,

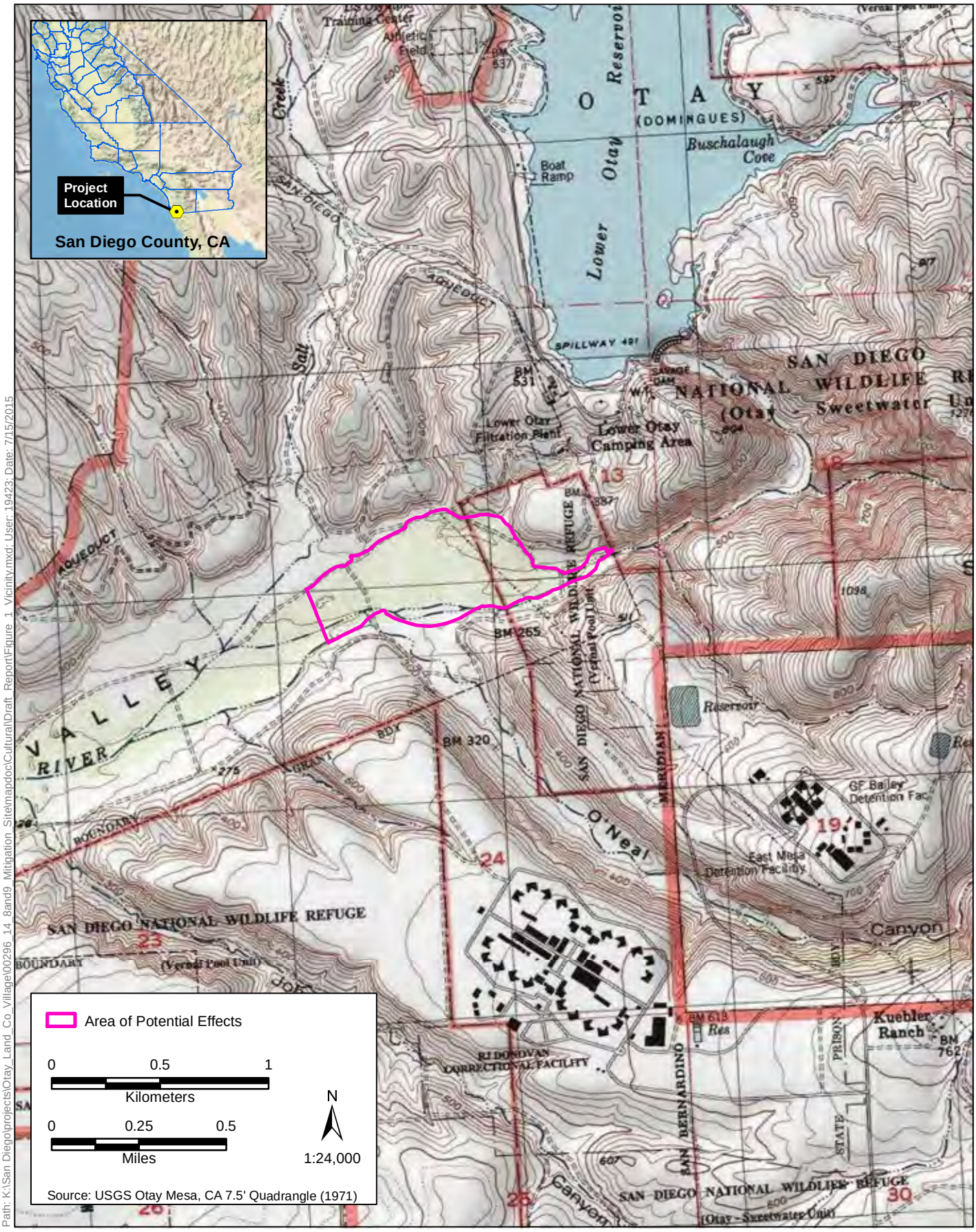
Rose Galer
Project Manager
South Coast Branch

Enclosures



K:\San Diego\projects\Otay Land Co Village\00296.14 8and9 Mitigation Site\mapdoc\Cultural\Draft Report\Figure 1 APE USACE.mxd Date: 7/15/2015 19423

Figure 1
Area of Potential Effects and Proposed Project Activities
Otay River Restoration Project City of Chula Vista
Mitigation Parcel



Path: K:\San Diego\projects\Otay_Land_Co_Village\00296_14_8and9_Mitigation_Site\mapdoc\Cultural\Draft_Report\Figure_1_Vicinity.mxd; User: 19423; Date: 7/15/2015

Figure 2
Project Location
Otay River Restoration Project City of Chula Vista Mitigation Parcel

STATE OF CALIFORNIA Edmund G. Brown, Jr., Governor

NATIVE AMERICAN HERITAGE COMMISSION
1550 Harbor Blvd., ROOM 100
West SACRAMENTO, CA 95691
(916) 373-3710
Fax (916) 373-5471

August 26, 2015

Lanika Cervantes
ICF International
525 B Street, Suite 1700
San Diego, CA 92101

Sent by Email: Lanika.Cervantes@icfi.com
Number of Pages: 4

RE: Otay Ranch Village 8W Mitigation Site (SPL-2013-004950 Otay Mesa USGS Quadrangle, San Diego County

Dear Ms. Cervantes:

A record search of the Native American Heritage Commission (NAHC) *Sacred Lands File* was completed for your project area with negative results, based on the USGS quadrangle information you provided. Please note that the absence of specific site information in the *Sacred Lands File* does not indicate the absence of Native American cultural resources in any APE. Other sources of cultural resources information should be contacted regarding known and recorded sites. A Native American tribe or individual may in fact

Please contact all of the people on the attached list. The list should provide a starting place to locate areas of potential adverse impact within the APE. I suggest you contact all of those listed, if they cannot supply information, they might recommend others with specific knowledge. By contacting all those on the list, your organization will be better able to respond to claims of failure to consult. If a response has not been received within two weeks of notification, the NAHC requests that you follow-up with a telephone call to ensure that the project information has been received

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact me at my email address: rw_nahc@pacbell.net.

Sincerely,

Rob Wood
Associate Governmental Program Analyst

Native American Contact
San Diego County
August 26, 2015

Barona Group of the Capitan Grande
Clifford LaChappa, Chairperson
1095 Barona Road
Lakeside , CA 92040
cloyd@barona-nsn.gov
(619) 443-6612
(6190 443-0681
Diegueno

Ewiiaapaayp Tribal Office
Robert Pinto Sr., Chairperson
4054 Willows Road
Alpine , CA 91901
wmicklin@leaningrock.net
(619) 445-6315

(619) 445-9126 Fax
Diegueno/Kumeyaay

La Posta Band of Mission Indians
Gwendolyn Parada, Chairperson
8 Crestwood Road
Boulevard , CA 91905
LP13boots@aol.com
(619) 478-2113
(619) 478-2125
Diegueno/Kumeyaay

Manzanita Band of Kumeyaay Nation
Angela Elliott Santos, Chairperson
P.O. Box 1302
Boulevard , CA 91905
aelliottsantos7@aol.com
(619) 766-4930

(619) 766-4957 Fax
Diegueno/Kumeyaay

San Pasqual Band of Mission Indians
Allen E. Lawson, Chairperson
P.O. Box 365
Valley Center , CA 92082
allenl@sanpasqualtribe.org
(760) 749-3200

(760) 749-3876 Fax
Diegueno

Sycuan Band of the Kumeyaay Nation
Cody J. Martinez, Chairperson
1 Kwaaypaay Court
El Cajon , CA 92019
ssilva@sycuan-nsn.gov
(619) 445-2613

(619) 445-1927 Fax
Diegueno/Kumeyaay

Viejas Band of Kumeyaay Indians
Anthony R. Pico, Chairperson
P.O. Box 908
Alpine , CA 91903
jhagen@viejas-nsn.gov
(619) 445-3810

(619) 445-5337 Fax
Diegueno/Kumeyaay

Kumeyaay Cultural Historic Committee
Ron Christman
56 Viejas Grade Road
Alpine , CA 91901
(619) 445-0385
Diegueno/Kumeyaay

Campo Band of Mission Indians
Ralph Goff, Chairperson
36190 Church Road, Suite 1
Campo , CA 91906
rgoff@campo-nsn.gov
(619) 478-9046

(619) 478-5818 Fax
Diegueno/Kumeyaay

Jamul Indian Village
Raymond Hunter, Chairperson
P.O. Box 612
Jamul , CA 91935
Rhunter1948@yahoo.com
(619) 669-4785
Diegueno/Kumeyaay

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed Otay Ranch Village 8W Mitigation Site (SPL-2013-00495), Otay Mesa USGS Quadrangle, San Diego County

Native American Contact
San Diego County
August 26, 2015

Mesa Grande Band of Mission Indians
Mark Romero, Chairperson
P.O Box 270 Diegueno
Santa Ysabel , CA 92070
mesagrandeband@msn.com
(760) 782-3818

(760) 782-9092 Fax

Barona Group of the Capitan Grande
ATTN: Sheilla Alvarez
1095 Barona Road Diegueno
Lakeside , CA 92040
salvarez@barona-nsn.gov
(619) 443-6612

Kwaaymii Laguna Band of Mission Indians
Carmen Lucas
P.O. Box 775 Diegueno-Kwaaymii
Pine Valley , CA 91962 Kumeyaay
(619) 709-4207

Viejas Band of Kumeyaay Indians
ATTN: Julie Hagen, Cultural Resources
P.O. Box 908 Diegueno/Kumeyaay
Alpine , CA 91903
jhagen@viejas-nsn.gov
(619) 445-3810
(619) 445-5337

Inaja Band of Mission Indians
Rebecca Osuna, Chairman
2005 S. Escondido Blvd. Diegueno
Escondido , CA 92025
(760) 737-7628

(760) 747-8568 Fax

San Pasqual Band of Indians
Kristie Orosco, Environmental Coordinator
P.O. Box 365 Diegueno
Valley Center , CA 92082
council@sanpasqualtribe.org
(760) 749-3200

(760) 749-3876 Fax

Kumeyaay Cultural Repatriation Committee
Steve Banegas, Spokesperson
1095 Barona Road Diegueno/Kumeyaay
Lakeside , CA 92040
sbanegas50@gmail.com
(619) 742-5587

(619) 443-0681 Fax

Ewiiaapaayp Tribal Office
Will Micklin, Executive Director
4054 Willows Road Diegueno/Kumeyaay
Alpine , CA 91901
wmicklin@leaningrock.net
(619) 445-6315

(619) 445-9126 Fax

La Posta Band of Mission Indians
Javaughn Miller
8 Crestwood Road Diegueno
Boulevard , CA 91905
jmiller@Lapostatribe.net
(619) 478-2113

(619) 478-2125- Fax

Manzanita Band of Mission Indians
ATTN: Keith Adkins, EPA Director
P.O. Box 1302 Kumeyaay
Boulevard , CA 91905
(619) 766-4930

(619) 766-4957 Fax

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed Otay Ranch Village 8W Mitigation Site (SPL-2013-00495), Otay Mesa USGS Quadrangle, San Diego County

Native American Contact
San Diego County
August 26, 2015

Iipay Nation of Santa Ysabel
Clint Linton, Director of Cultural Resources
P.O. Box 507 Diegueno/Kumeyaay
Santa Ysabel , CA 92070
cjlinton73@aol.com
(760) 803-5694

Inter-Tribal Cultural Resource Protection Council
Frank Brown, Coordinator
240 Brown Road Diegueno/Kumeyaay
Alpine , CA 91901
frbrown@viejas-nsn.gov
(619) 884-6437

Iipay Nation of Santa Ysabel
Rodney Kephart, Environmental Coordinator
PO Box 130 Diegueno
Santa Ysabel , CA 92070
syirod@aol.com
(760) 765-0845

Kumeyaay Cultural Repatriation Committee
Bernice Paipa, Vice Spokesperson
P.O. Box 937 Diegueno/Kumeyaay
Boulevard , CA 91905
bernicepaipa@gmail.com

Sycuan Band of the Kumeyaay Nation
Lisa Haws, Cultural Resource Manager
1 Kwaaypaay Court Diegueno/Kumeyaay
El Cajon , CA 92019
(619) 445-4564

Iipay Nation of Santa Ysabel
Virgil Perez, Chairperson
P.O. Box 130 Diegueno/Kumeyaay
Santa Ysabel , CA 92070
(760) 765-0845

(760) 765-0320 Fax

Manzanita Band of the Kumeyaay Nation
Nick Elliott, Cultural Resources Coordinator
P.O. Box 1302 Kumeyaay
Boulevard , CA 91905
nickmepa@yahoo.com
(619) 766-4930
(619) 925-0952 Cell
(919) 766-4957 Fax

Kumeyaay Diegueno Land Conservancy
Mr. Kim Bactad, Executive Director
2 Kwaaypaay Court Diegueno/Kumeyaay
El Cajon , CA 92019
kimbactad@gmail.com
(619) 659-1008 Office

(619) 445-0238 Fax

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed Otay Ranch Village 8W Mitigation Site (SPL-2013-00495), Otay Mesa USGS Quadrangle, San Diego County

From:	Clint Linton
To:	Galer, Rose A SPL
Subject:	[EXTERNAL] Re: Section 106 National Historic Preservation Act Consultation for Otay River Restoration Project (UNCLASSIFIED)
Date:	Tuesday, September 01, 2015 3:08:36 PM

Dear Rose. Thank you for the opportunity to consult. On behalf of the Iipay Nation of Santa Ysabel we would lole to request under section 106; please have a Kumeyaay native monitor on site for all ground disturbing activities related to this project, please avoid impacts to Kumeyaay sites. Thank you, clint

Sent from my iPhone

> On Sep 1, 2015, at 2:17 PM, Galer, Rose A SPL <Rose.A.Galer@usace.army.mil> wrote:
>
> Classification: UNCLASSIFIED
> Caveats: NONE
>
> Dear Native American Representative-
>
> Please see the attached Section 106 National Historic Preservation Act Consultation letter. A hard copy of the letter was sent via mail today.
>
> Let me know if you have any questions.
>
> Best Regards,
> Rose Galer
> Project Manager, Carlsbad Field Office
> U.S. Army Corps of Engineers, Regulatory Branch
> 5900 La Place Court, Suite 100
> Carlsbad, CA 92008
> Rose.A.Galer@usace.army.mil
> (760) 602-4835 (direct)
> (760) 277-5225 (cell)
> (760) 602-4848 (fax)
> (Please note: we do not have out-of-office notifications)
>
>
>
>
> Classification: UNCLASSIFIED
> Caveats: NONE
>
>
> <Otay River Restoration Project Native American Consultation Letter Final w Enclosures 09.01.15.pdf>

From: Julie Hagen
To: Galer, Rose A SPL
Subject: [EXTERNAL] Otay River Restoration Project
Date: Wednesday, September 02, 2015 1:52:06 PM
Attachments: Otay River Restoration Project.pdf

Hello,

Attached is a comment letter from Viejas Band. Thank you

Julie Hagen

Environmental Coordinator

1 Viejas Grade Rd

Alpine, CA 91901

Phone: 619-659-2339

Cell: 619-890-2346

VIEJAS
TRIBAL GOVERNMENT

P.O Box 908
Alpine, CA 91903
#1 Viejas Grade Road
Alpine, CA 91901

Phone: 6194453810
Fax: 6194455337
viejas.com

September 1, 2015

Dept. of the Army
Rose Galer
5900 La Place Court, Suite 100
Carlsbad, CA 92008

RE: Otay River Restoration Project

Dear Ms. Galer,

The Viejas Band of Kumeyaay Indians would like to request additional information on the archeological data and information on the project site on the above referenced project in order to make an informed decision/recommendation on the matter.

Sincerely,

VIEJAS BAND OF KUMEYAAY INDIANS

This page intentionally left blank.

Appendix B
Photographs

This page intentionally left blank.

Photo 1. Example of mining cut depth, view north. Note exposed cut wall in background.

Photo 2. Additional example of mining cut depth, view north-northwest.

Photo 3. Example of large boulders stacked in hedge rows in excavated area. View south-southwest.

Photo 4. Example of a silt, sand, and gravel pile along the margin of the excavated area. View south-southwest.

This page intentionally left blank.

Appendix C

Archaeological Resource Update Forms

This page intentionally left blank.

First documented in 1987 as a large but sparse lithic scatter on a terrace overlooking the Otay River, CA-SDI-10875 was originally documented as containing lithic flakes, debitage, and a biface fragment (Kyle 1987). The site, which measured 304 meters by 150 meters, was also described as being subject to disturbance from several dirt roads that cross the site. The site was subsequently revisited in 1996, and the site boundary was expanded to approximately 650 meters by 260 meters (Smith 1996).The site revisited again in 2010, and several additional lithic artifacts, including scrapers, choppers, utilized flakes, retouched flakes, hammer stones, and debitage were documented within the revised site boundary (Blotner 2010). In 2013, AECOM performed a pedestrian survey and conducted archaeological monitoring within the site boundary, but identified no archaeological deposits (AECOM 2013).

Between June 2 and June 3, 2015, ICF archaeologists performed a pedestrian survey within a 17 acre portion of the site. Ground surface visibility ranged from poor (20%) to good (50%) during the survey and two artifacts – a - a yellowish white metasedimentary cobble with three flake scars and a greenish gray cryptocrystalline silicate core reduction flake – were identified within the site boundary. Photos of each of the artifacts are provided below and the location of the artifacts is provided in the attached sketch map.

Greenish gray cryptocrystalline silicate core reduction flake. View of ventral surface.

Yellowish white metasedimentary cobble. Note flake scars along margin of cobble at top of photo.

4. NOISE

NOISE FIELD SHEETS AND CONSTRUCTION NOISE ANALYSIS FOR THE OTAY RIVER RESTORATION PROJECT

Field Noise Survey Sheets

FIELD NOISE MEASUREMENT DATA

Jones & Stokes

PROJECT: Otay River Restoration PROJ. # 60526.15

SITE IDENTIFICATION: ST1 OBSERVER(S): Eric Moskus

ADDRESS: Otay River County Park

START DATE / TIME: 10/23/15 / 11:39 am END DATE / TIME: 10/23/15 12:05 pm

METEROLOGICAL CONDITIONS:

TEMP: 77 °F HUMIDITY: 56 %R.H. WIND: ~~CALM~~ LIGHT MODERATE VARIABLE

WINDSPEED: 1-4 MPH DIR: N NE E SE S SW W NW STEADY GUSTY

SKY: ~~SUNNY~~ ~~CLEAR~~ OVRCST PRTLY CLOUDY FOG RAIN OTHER:

ACOUSTIC MEASUREMENTS:

INSTRUMENT: LD 831 TYPE: (1) 2 SERIAL #: 0003786

CALIBRATOR: LD CAL 200 SERIAL #: 66645

CALIBRATION CHECK: PRE-TEST 114.0 dBA SPL POST-TEST 114.04 dBA SPL WINDSCREEN

SETTINGS: ~~A-WEIGHTED~~ ~~SLOW~~ FAST FRONTAL ~~RANDOM~~ ~~ANSI~~ OTHER:

REC #	START	END	L_{eq}	L_{max}	L_{min}	L_{90}	L_{50}	L_{10}	~~OTHER:~~ LF.83	~~(TYPE?)~~ C1.67	L25
080	11:39	12:05	40.9	54.9	32.7	34.4	37.2	45.3	45.7	48.7	40.5

COMMENTS:
- very distant hammering (?)
- distant people talking
- paused for maintenance crew near mic
- semi-frequent aircraft passby's
- some local birds nearby

SOURCE INFO AND TRAFFIC COUNTS:

PRIMARY NOISE SOURCE: TRAFFIC AIRCRAFT RAIL INDUSTRIAL ~~AMBIENT~~ OTHER:

ROADWAY TYPE:

TRAFFIC COUNT DURATION: ____-MIN

	SPEED NB / EB	SPEED SB / WB	#2 COUNT NB / EB	#2 COUNT SB / WB	SPEED NB / EB	SPEED SB / WB
AUTOS:						
MED. TRUCKS:						
HVY TRUCKS:						
BUSES:						
MOTORCYCLES:						

SPEED ESTIMATED BY: RADAR / DRIVING / OBSERVER

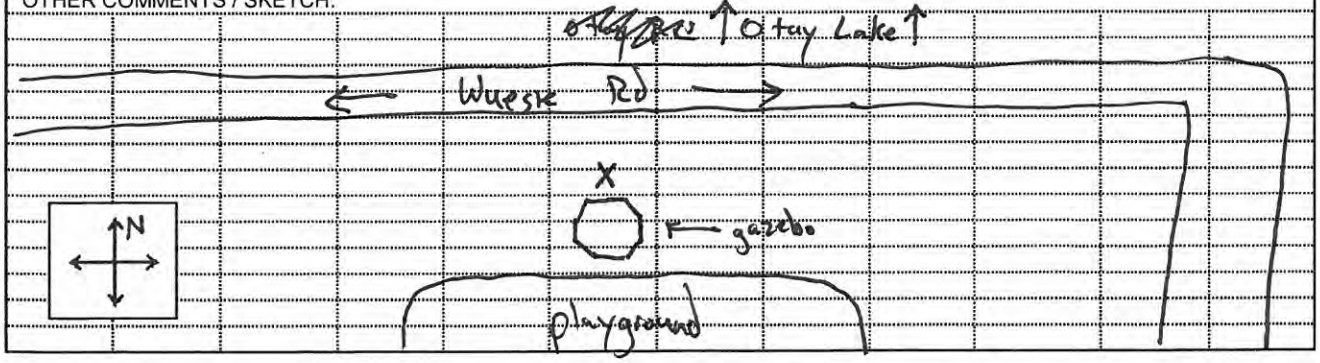
OTHER SOURCES: ~~DIST. AIRCRAFT~~ RUSTLING LEAVES / DIST. BARKING DOGS / ~~BIRDS~~ / DIST. INDUSTRIAL
DIST. CHILDREN PLAYING / DIST. TRAFFIC / DIST. LANDSCAPING ACTIVITIES / OTHER:

DESCRIPTION / SKETCH:

TERRAIN: HARD ~~SOFT~~ MIXED FLAT OTHER:

PHOTOS:

OTHER COMMENTS / SKETCH:



FIELD NOISE MEASUREMENT DATA

Jones & Stokes

PROJECT: Otay River Restoration PROJ. # 00526.15

SITE IDENTIFICATION: ST2 OBSERVER(S): Eric Moskus

ADDRESS: South of Otay Water Treatment Plant

START DATE / TIME: 10/23/15 12:54 END DATE / TIME: 10/23/15 13:20

METEROLOGICAL CONDITIONS:

TEMP: 91 °F HUMIDITY: 59 %R.H. WIND: CALM LIGHT MODERATE VARIABLE

WINDSPEED: 2-9 MPH DIR: N NE E SE S SW W NW STEADY GUSTY

SKY: SUNNY CLEAR OVRCST PRTLY CLOUDY FOG RAIN OTHER:

ACOUSTIC MEASUREMENTS:

INSTRUMENT: CD 831 TYPE: 1 2 SERIAL #: 0003780

CALIBRATOR: CD CAL 200 SERIAL #: 6643

CALIBRATION CHECK: PRE-TEST 114.3 dBA SPL POST-TEST 113.80 dBA SPL WINDSCREEN Y

SETTINGS: A-WEIGHTED SLOW FAST FRONTAL RANDOM ANSI OTHER:

REC #	START	END	L_{eq}	L_{max}	L_{min}	L_{90}	L_{50}	L_{10}	OTHER: 63.93	1667 (TYPE?)	125
081	12:54	13:20	39.3	58.5	26.5	27.9	31.9	43.8	44.5	47.9	38.8

COMMENTS: paused for military jets; wind gust

SOURCE INFO AND TRAFFIC COUNTS:

PRIMARY NOISE SOURCE: TRAFFIC AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER:

ROADWAY TYPE:

TRAFFIC COUNT DURATION: ____-MIN SPEED #2 COUNT SPEED

	NB / EB	SB / WB	NB / EB	SB / WB	NB / EB	SB / WB	NB / EB	SB / WB
AUTOS:								
MED. TRUCKS:								
HVY TRUCKS:								
BUSES:								
MOTORCYCLES:								

SPEED ESTIMATED BY: RADAR / DRIVING / OBSERVER

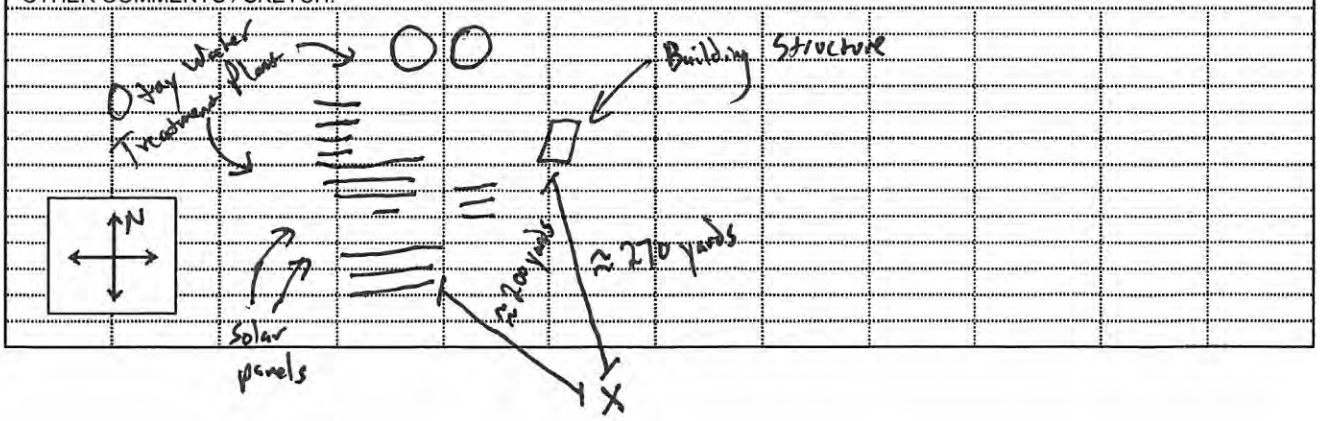
OTHER SOURCES: DIST. AIRCRAFT / RUSTLING LEAVES / DIST. BARKING DOGS / BIRDS / DIST. INDUSTRIAL
DIST. CHILDREN PLAYING / DIST. TRAFFIC / DIST. LANDSCAPING ACTIVITIES / OTHER:

DESCRIPTION / SKETCH:

TERRAIN: HARD SOFT MIXED FLAT OTHER:

PHOTOS:

OTHER COMMENTS / SKETCH:



FIELD NOISE MEASUREMENT DATA

Jones & Stokes

PROJECT: Otay River Restoration PROJ. # 00526.15

SITE IDENTIFICATION: ST3 OBSERVER(S): Eric Moskus

ADDRESS: ~~Kiowa~~ George Bailey Detention Facility

START DATE / TIME: 10/23/15 10:02 am END DATE / TIME: 10/23/15 10:56 am

METEROLOGICAL CONDITIONS:

TEMP: 75 °F HUMIDITY: 51 %R.H. WIND: (CALM) LIGHT MODERATE VARIABLE

WINDSPEED: 2-4 MPH DIR: N NE E SE S SW W NW STEADY GUSTY

SKY: ~~SUNNY~~ (CLEAR) OVRCST PRTLY CLOUDY FOG RAIN OTHER:

ACOUSTIC MEASUREMENTS:

INSTRUMENT: LD831 TYPE: (1) 2 SERIAL #: 0003786

CALIBRATOR: LD CAL 200 SERIAL #: 6645

CALIBRATION CHECK: PRE-TEST 114.0 dBA SPL POST-TEST 113.93 dBA SPL WINDSCREEN

SETTINGS: (A-WEIGHTED) (SLOW) FAST FRONTAL (RANDOM) (ANSI) OTHER:

REC #	START	END	L_{eq}	L_{max}	L_{min}	L_{90}	L_{50}	L_{10}	~~OTHER:~~ L2.33	(~~TYPE?~~) L1.67	L25
.079	10:02	10:56	47.5	63.7	38.2	40.5	44.1	50.4	51.1	56.6	47.2

COMMENTS: - have to pause and noise from nearby construction equipment - roofing construction
- Passing and queuing at nearby gate; idling garbage truck
- Lots of miscellaneous noise from within the prison

SOURCE INFO AND TRAFFIC COUNTS:

PRIMARY NOISE SOURCE: TRAFFIC AIRCRAFT RAIL INDUSTRIAL (AMBIENT) OTHER:

ROADWAY TYPE:

TRAFFIC COUNT DURATION: ____-MIN

	SPEED NB / EB	SPEED SB / WB	#2 COUNT NB / EB	#2 COUNT SB / WB	SPEED NB / EB	SPEED SB / WB
AUTOS:						
MED. TRUCKS:						
HVY TRUCKS:						
BUSES:						
MOTORCYCLES:						

SPEED ESTIMATED BY: RADAR / DRIVING / OBSERVER

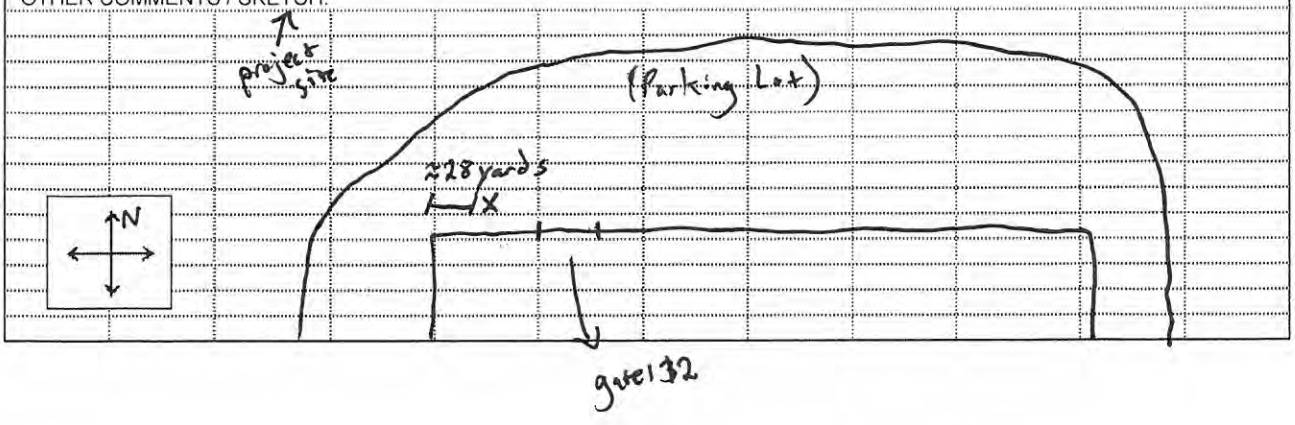
OTHER SOURCES: ~~DIST. AIRCRAFT~~ / RUSTLING LEAVES / DIST. BARKING DOGS / (BIRDS) / DIST. INDUSTRIAL
DIST. CHILDREN PLAYING / (DIST. TRAFFIC) / DIST. LANDSCAPING ACTIVITIES / OTHER:

DESCRIPTION / SKETCH:

TERRAIN: (HARD) SOFT (MIXED) FLAT OTHER:

PHOTOS:

OTHER COMMENTS / SKETCH:



Construction Noise Analysis

Table 1. Otay Lake County Park Phase 1 Construction Noise Analysis

Equipment		Typical Level @ 50', dBA[1]	Usage Factor[1,2]	Number of Units	Correction for 10 Hour Workday, dB	Distance to Receiver (Acoustical Average Distance), ft.	Hard or Soft Site?	Barrier Attenuation, dB	8-Hour Leq, dBA
Item No.	Description								
2	Backhoe	77.6	0.4	1	-0.97	2100	soft	0	34
	Combined Equipment								**34**

Table 2. Otay Lake County Park Phase 2 Construction Noise Analysis

Equipment		Typical Level @ 50', dBA[1]	Usage Factor[1,2]	Number of Units	Correction for 10 Hour Workday, dB	Distance to Receiver (Acoustical Average Distance), ft.	Hard or Soft Site?	Barrier Attenuation, dB	8-Hour Leq, dBA
Item No.	Description								
61	Truck, Dump	76.5	0.4	1	-0.97	2100	soft	0	33
18	Excavator	80.7	0.4	1	-0.97	2100	soft	0	37
51	Scraper	83.6	0.4	1	-0.97	2100	soft	0	40
29	Loader (Front End Loader)	79.1	0.4	1	-0.97	2100	soft	0	36
70	Truck, Water	76.5	0.4	1	-0.97	2100	soft	0	33
13	Dozer	81.7	0.4	1	-0.97	2100	soft	0	38
	Combined Equipment								**45**

Table 3. Otay Lake County Park Phase 3 Construction Noise Analysis

Equipment		Typical Level @ 50', dBA[1]	Usage Factor[1,2]	Number of Units	Correction for 10 Hour Workday, dB	Distance to Receiver (Acoustical Average Distance), ft.	Hard or Soft Site?	Barrier Attenuation, dB	8-Hour Leq, dBA
Item No.	Description								
61	Truck, Dump	76.5	0.4	10	-0.97	2100	soft	0	43
18	Excavator	80.7	0.4	1	-0.97	2100	soft	0	37
51	Scraper	83.6	0.4	6	-0.97	2100	soft	0	48
29	Loader (Front End Loader)	79.1	0.4	2	-0.97	2100	soft	0	39
70	Truck, Water	76.5	0.4	2	-0.97	2100	soft	0	36
13	Dozer	81.7	0.4	4	-0.97	2100	soft	0	44
23	Grader	85	0.4	1	-0.97	2100	soft	0	41
20	Generator	80.6	0.5	1	-0.97	2100	soft	0	38
	Combined Equipment								**52**

1. Obtained or estimated from:
"Transit Noise and Vibration Impact Assessment", FTA, (FTA-VA-90-1003-06), May 2006; and/or
FHWA Roadway Construction Noise Model (RCNM), Version 1.0, February 2, 2006; and/or
"Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances;" BBN/EPA, December 31, 1971

2. Usage Factor = percentage of time equipment is operating in noisiest mode while in use

Table 4. High Tech High Chula Vista Phase 1 Construction Noise Analysis

Equipment		Typical Level @ 50', dBA[1]	Usage Factor[1,2]	Number of Units	Correction for 10 Hour Workday, dB	Distance to Receiver (Acoustical Average Distance), ft.	Hard or Soft Site?	Barrier Attenuation, dB	8-Hour Leq, dBA
Item No.	Description								
2	Backhoe	77.6	0.4	1	-0.97	7000	soft	0	21
	Combined Equipment								**21**

Table 5. High Tech High Chula Vista Phase 2 Construction Noise Analysis

Equipment		Typical Level @ 50', dBA[1]	Usage Factor[1,2]	Number of Units	Correction for 10 Hour Workday, dB	Distance to Receiver (Acoustical Average Distance), ft.	Hard or Soft Site?	Barrier Attenuation, dB	8-Hour Leq, dBA
Item No.	Description								
61	Truck, Dump	76.5	0.4	1	-0.97	7000	soft	0	20
18	Excavator	80.7	0.4	1	-0.97	7000	soft	0	24
51	Scraper	83.6	0.4	1	-0.97	7000	soft	0	27
29	Loader (Front End Loader)	79.1	0.4	1	-0.97	7000	soft	0	22
70	Truck, Water	76.5	0.4	1	-0.97	7000	soft	0	20
13	Dozer	81.7	0.4	1	-0.97	7000	soft	0	25
	Combined Equipment								**32**

Table 6. High Tech High Chula Vista Phase 3 Construction Noise Analysis

Equipment		Typical Level @ 50', dBA[1]	Usage Factor[1,2]	Number of Units	Correction for 10 Hour Workday, dB	Distance to Receiver (Acoustical Average Distance), ft.	Hard or Soft Site?	Barrier Attenuation, dB	8-Hour Leq, dBA
Item No.	Description								
61	Truck, Dump	76.5	0.4	10	-0.97	7000	soft	0	30
18	Excavator	80.7	0.4	1	-0.97	7000	soft	0	24
51	Scraper	83.6	0.4	6	-0.97	7000	soft	0	35
29	Loader (Front End Loader)	79.1	0.4	2	-0.97	7000	soft	0	25
70	Truck, Water	76.5	0.4	2	-0.97	7000	soft	0	23
13	Dozer	81.7	0.4	4	-0.97	7000	soft	0	31
23	Grader	85	0.4	1	-0.97	7000	soft	0	28
20	Generator	80.6	0.5	1	-0.97	7000	soft	0	25
	Combined Equipment								**38**

1. Obtained or estimated from:

"Transit Noise and Vibration Impact Assessment", FTA, (FTA-VA-90-1003-06), May 2006; and/or

FHWA Roadway Construction Noise Model (RCNM), Version 1.0, February 2, 2006; and/or

"Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances;" BBN/EPA, December 31, 1971

2. Usage Factor = percentage of time equipment is operating in noisiest mode while in use

Table 7. George Bailey Detention Facility Phase 1 Construction Noise Analysis

Equipment		Typical Level @ 50', dBA[1]	Usage Factor[1,2]	Number of Units	Correction for 10 Hour Workday, dB	Distance to Receiver (Acoustical Average Distance), ft.	Hard or Soft Site?	Barrier Attenuation, dB	8-Hour Leq, dBA
Item No.	Description								
2	Backhoe	77.6	0.4	1	-0.97	5300	soft	0	24
	Combined Equipment								**24**

Table 8. George Bailey Detention Facility Phase 2 Construction Noise Analysis

Equipment		Typical Level @ 50', dBA[1]	Usage Factor[1,2]	Number of Units	Correction for 10 Hour Workday, dB	Distance to Receiver (Acoustical Average Distance), ft.	Hard or Soft Site?	Barrier Attenuation, dB	8-Hour Leq, dBA
Item No.	Description								
61	Truck, Dump	76.5	0.4	1	-0.97	5300	soft	0	23
18	Excavator	80.7	0.4	1	-0.97	5300	soft	0	27
51	Scraper	83.6	0.4	1	-0.97	5300	soft	0	30
29	Loader (Front End Loader)	79.1	0.4	1	-0.97	5300	soft	0	25
70	Truck, Water	76.5	0.4	1	-0.97	5300	soft	0	23
13	Dozer	81.7	0.4	1	-0.97	5300	soft	0	28
	Combined Equipment								**35**

Table 9. George Bailey Detention Facility Phase 3 Construction Noise Analysis

Equipment		Typical Level @ 50', dBA[1]	Usage Factor[1,2]	Number of Units	Correction for 10 Hour Workday, dB	Distance to Receiver (Acoustical Average Distance), ft.	Hard or Soft Site?	Barrier Attenuation, dB	8-Hour Leq, dBA
Item No.	Description								
61	Truck, Dump	76.5	0.4	10	-0.97	5300	soft	0	33
18	Excavator	80.7	0.4	1	-0.97	5300	soft	0	27
51	Scraper	83.6	0.4	6	-0.97	5300	soft	0	38
29	Loader (Front End Loader)	79.1	0.4	2	-0.97	5300	soft	0	28
70	Truck, Water	76.5	0.4	2	-0.97	5300	soft	0	26
13	Dozer	81.7	0.4	4	-0.97	5300	soft	0	34
23	Grader	85	0.4	1	-0.97	5300	soft	0	31
20	Generator	80.6	0.5	1	-0.97	5300	soft	0	28
	Combined Equipment								**41**

1. Obtained or estimated from:
"Transit Noise and Vibration Impact Assessment", FTA, (FTA-VA-90-1003-06), May 2006; and/or
FHWA Roadway Construction Noise Model (RCNM), Version 1.0, February 2, 2006; and/or
"Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances;" BBN/EPA, December 31, 1971

2. Usage Factor = percentage of time equipment is operating in noisiest mode while in use

5. TRAFFIC

OTAY RIVER RESTORATION PROJECT

HABITAT MITIGATION AND MONITORING PLAN – TRAFFIC ANALYSIS

CHEN RYAN

December 7, 2015

Ms. Michelle Mattson
ICF international
525 B St, Suite 1700
San Diego, CA 92101

Subject: **Otay River Restoration Project Habitat Mitigation and Monitoring Plan – Traffic Analysis**

The purpose of this letter is to document the potential traffic related impacts associated with the Restoration Project Habitat Mitigation and Monitoring Plan (HMMP) of the Otay River (proposed project).

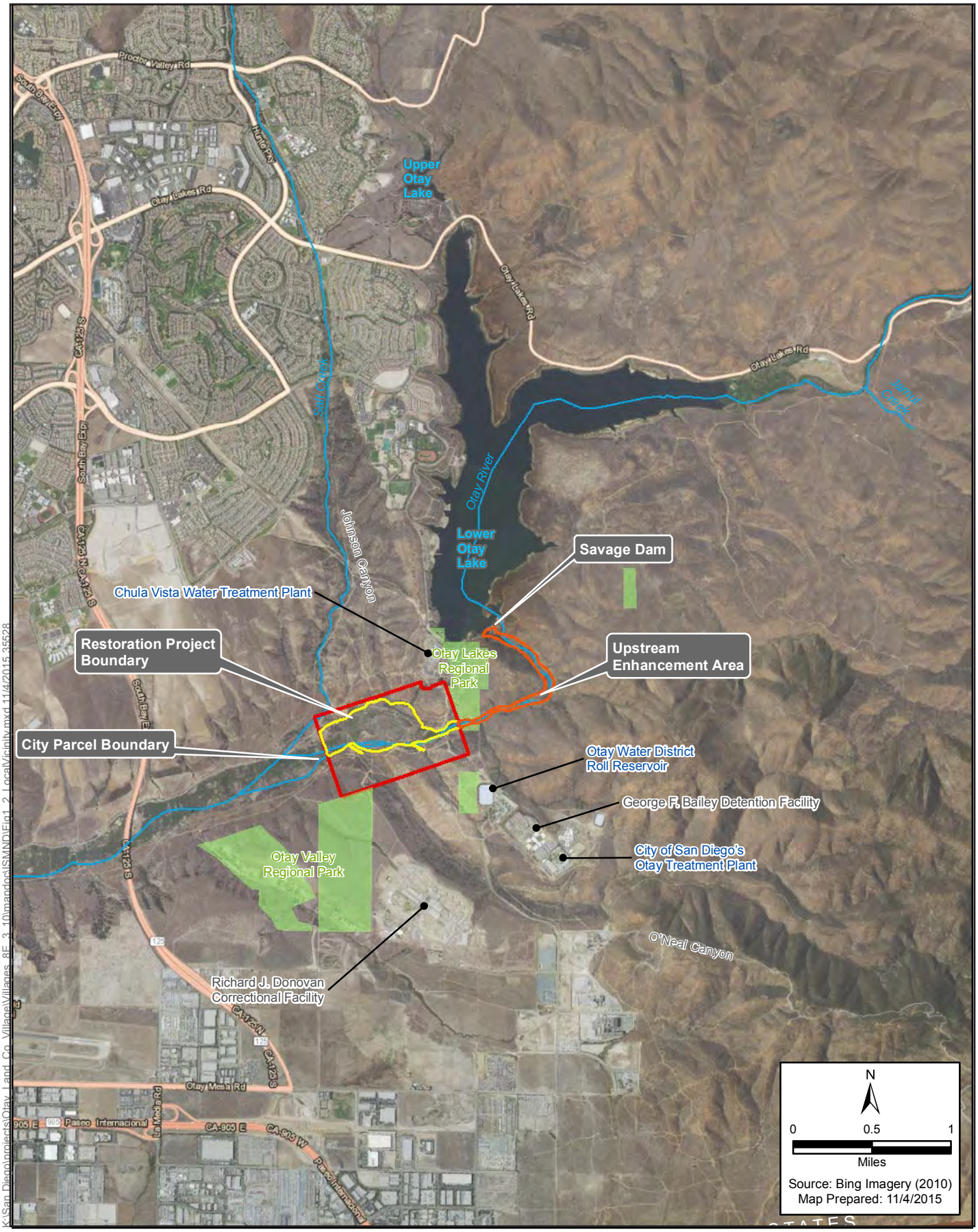
PROJECT BACKGROUND

The proposed project involves implementation of the Otay River Restoration Project HMMP to restore over 100 acres of hydrologic and sediment transport processes and native habitats in the Otay River Valley on an approximately 300-acre parcel owned by the City of Chula Vista (City parcel). The purpose of the HMMP is for use as compensatory mitigation for unavoidable impacts to jurisdictional waters of the U.S., waters of the State, and associated habitats as a result of implementation of the Otay Ranch University Villages. Two mixed-use private development projects associated with the Otay Ranch University Villages (Otay Ranch Village 3 and Otay Ranch Village 8 West) are currently under review by the regulatory agencies.

The proposed project includes establishment, re-establishment, and rehabilitation of approximately 2.74 acres of upstream habitat; approximately 63.31 acres of onsite habitat; approximately 10.88 acres of primary channel habitat; approximately 4.09 of secondary habitat; approximately 53.75 aces of terraces; approximately 2.36 acres of seasonal ponds; and approximately 31.96 acres of upland habitat. There is also an additional 63.89 acres of upland habitat enhancement proposed as an optional project component. It is currently anticipated that the project would begin in the summer/fall 2016. Successful completion of the proposed project would take a little over approximately 5 years including completion of a 5-year maintenance, monitoring, and reporting phase.

PROJECT LOCATION

The project site encompasses over 100 acres on an approximately 300-acre parcel (Assessor's Parcel Number (APN) 6440900400) located in and owned by the City of Chula Vista in southern San Diego County, California. The project site occurs within the upper portion of the Lower Otay River Watershed, approximately 1 mile downstream of Savage Dam. It is generally south and west of the Lower Otay Reservoir, north of the George F. Bailey Detention Facility, and north of the Otay Water District Roll Reservoir. **Figure 1** displays the regional and local project vicinity as well as the location of the Otay Ranch University Villages mentioned above.



K:\San Diego\projects\Otay Land Co. Village\Villages_8F_3_10\mapdoc\SMND\Fig1_2_LocalVicinity.mxd 11/4/2015 35528

Otay River Restoration Project Habitat Mitigation and Monitoring Plan

Figure 1

CHEN RYAN

Project Location

TYPICAL DAILY OPERATIONS

After the completion of the restoration process, the proposed project is not anticipated to generate any addition vehicular traffic. Therefore, no near-term or long-term traffic analysis is required. However, the proposed project is anticipated to generate additional vehicular traffic during project construction which may result in temporary traffic related impacts. Therefore, an analysis of the project construction conditions is provided below.

CONSTRUCTION CONDITIONS

This section analyzes the traffic operations around the project site during project construction. Traffic analyses were performed and compared both with and without project construction in order to identify any significant transportation related impacts that may be associated with the proposed project.

Construction Traffic Trip Generation and Assignment

Based on information provided by the project applicant, the construction related activities associated with the proposed project is anticipated to mostly be contained on-site. However, some materials may need to be hauled to the Otay Landfill (one truck load per day), located at the northern terminus of Maxwell Road. During the 5 year river restoration process it is anticipated that a maximum of 10 workers would be on-site at any given time. To provide a worst-case scenario, all construction workers were assumed to arrive during the AM peak hour and depart during the PM peak hour, and all workers were assumed to drive separate vehicles to and from the project site. **Table 1** displays the assumed project vehicle trip generation during the peak of project construction.

Table 1: Otay River Restoration - Construction Trip Generation

Task	Units	Trip Generation	PVE	Total Daily Vehicle Trips	AM Peak Hour		PM Peak Hour	
					In	Out	In	Out
Workers	10	2 / worker	1	20	10	0	0	10
Trucks	1	2 / Truck	3	6	0	0	0	0
Total				**26**	**10**	**0**	**0**	**10**

Source: ICF, December 2015

As shown, during the peak of project construction, the restoration is anticipated to generate 26 daily passenger vehicle equivalent trips per day, with 10 trips arriving to the plant during the AM peak hour and 10 trips departing from the restoration site during the PM peak hour.

It is anticipated that these trips would exit the project site via Wiley Road, head west on Main Street and then head north on Maxwell Road to access the landfill. Trucks would then return to the project site via the same route.

Additionally, construction worker traffic will be coming to/from the project site each day. It is assumed that all construction worker traffic will access the proposed project from I-805, head east on Main Street and access the project site via Wiley Road.

Figure 2 displays the anticipated trip assignment, associated with the construction of the proposed project.

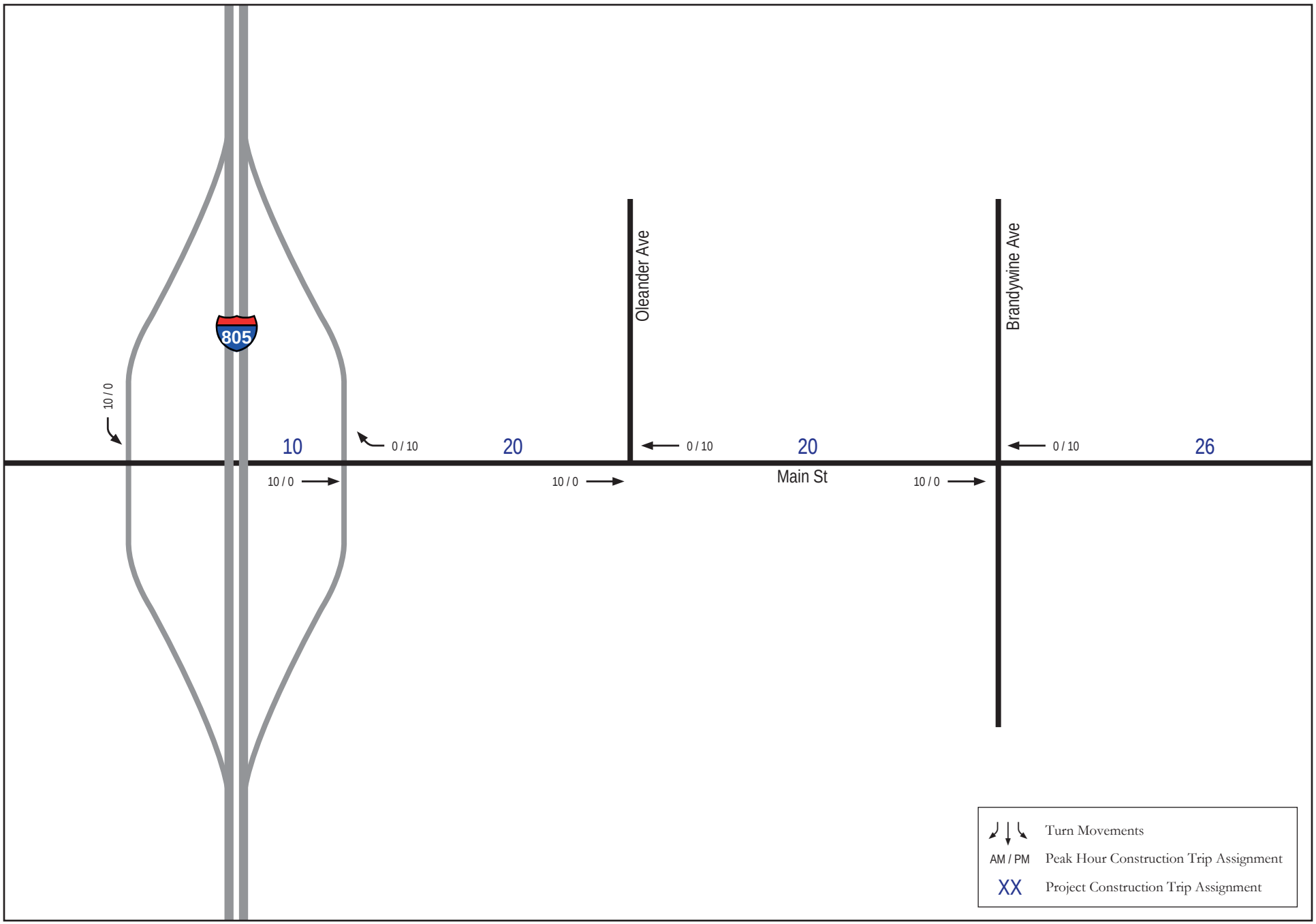


Figure 2
Project Construction Trip Assignment

CHEN RYAN

Construction Base Year

As noted previously, the restoration process is anticipated to begin in summer/fall 2016. Successful completion of the proposed project would take a little over approximately 5 years including completion of a 5-year maintenance, monitoring, and reporting phase. To be conservative, a construction base year was assumed during the latter part of construction, under Year 2020 conditions. Based on recommendations from City Staff, the Construction Base Year traffic volumes were derived from the Year 2020 with project volumes contained in the University Villages Project Draft Environmental Impact Report, November 2014, which takes into account all relevant cumulative projects. Excerpts from the University Villages Project Draft Environmental Impact Report and associated Traffic Impact Study, including roadway geometric and traffic volume figures, are provided in **Attachment 1**. Construction Base Year traffic volumes are displayed in **Figure 3**.

As previously displayed in Figure 2, construction traffic is only anticipated to occur on Main Street between I-805 and Wiley Road. Therefore, only the roadway segments and intersections along Main Street between I-805 and Wiley Road were analyzed under Construction Year Base (Year 2020) conditions. **Tables 2 and 3** display the anticipated peak hour intersection and roadway operations under Construction Year Base (Year 2020), within the project study area, respectively. Intersection LOS calculations were conducted using the methodologies outlined the in Highway Capacity Manual 2010, and calculated using SYNCHRO 8.0 (Build 806) Traffic Analysis software, calculation worksheets for Construction Base Year (Year 2020) conditions are provided in **Attachment 2**.

Table 2: Peak Hour Intersection LOS Results – Construction Base Year (Year 2020) Conditions

Intersection	AM Peak Hour		PM Peak Hour	
	Avg. Delay (sec.)	LOS	Avg. Delay (sec.)	LOS
1. I-805 SB Ramps / Main Street	32.6	C	46.1	D
2. I-805 NB Ramps / Main Street	33.8	C	51.3	D
3. Oleander Avenue / Main Street	11.0	B	9.0	A
4. Brandywine Avenue / Main Street	49.1	D	48.8	D

Source: Chen Ryan Associates; December 2015

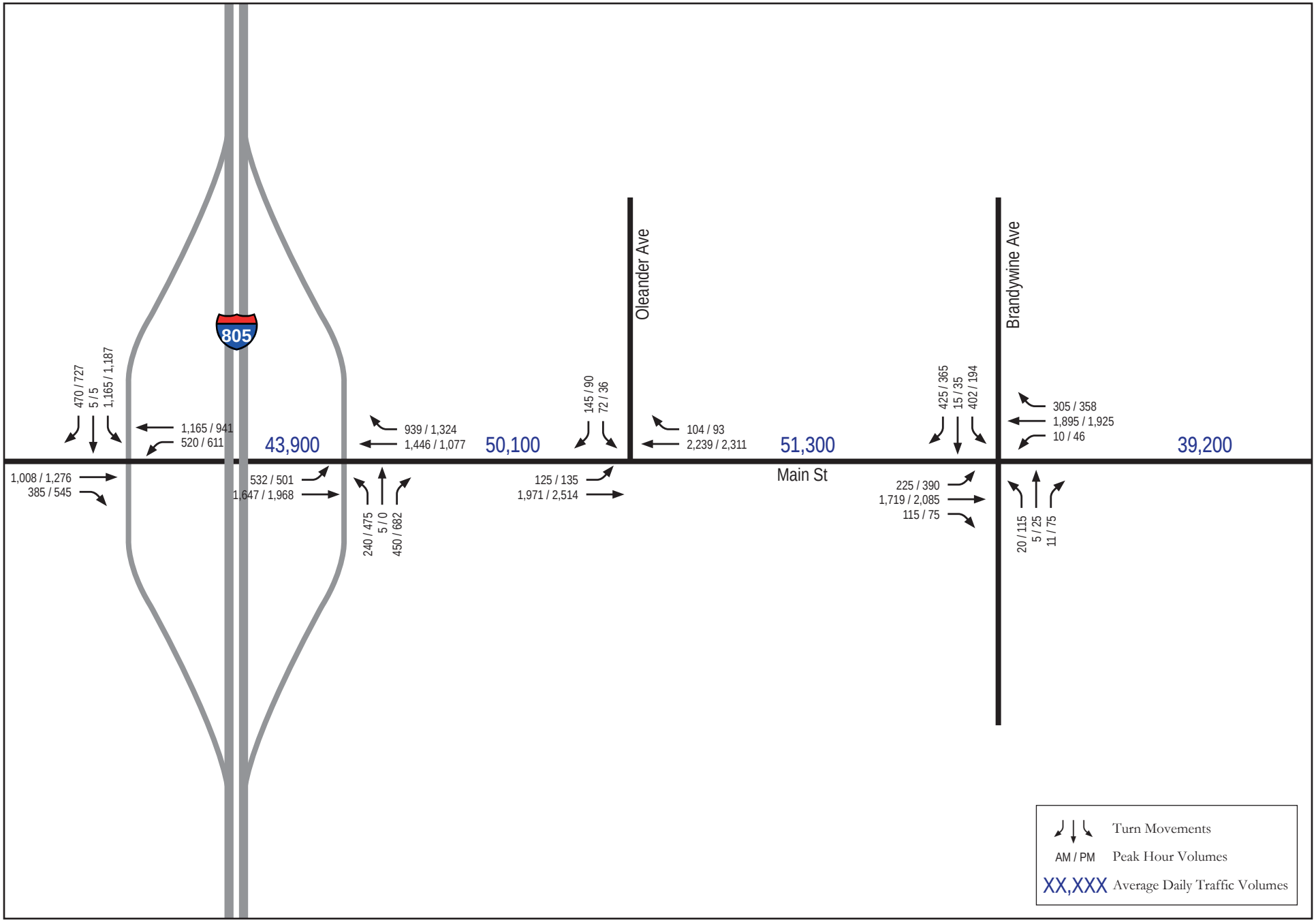
As shown, all intersections within the project study are anticipated to operate at acceptable LOS D or better under Construction Base Year (Year 2020) conditions.

Table 3: Daily Roadway LOS Results – Construction Base Year (Year 2020) Conditions

Roadway	From	To	Cross-Section	ADT	LOS Threshold (LOS C)	LOS
Main Street	I-805 SB Ramps	I-805 NB Ramps	6-Ln	43,900	50,000	C
Main Street	I-805 NB Ramps	Oleander Avenue	6-Ln w/RM	50,100	50,000	**D**
Main Street	Oleander Avenue	Brandywine Avenue	6-Ln w/TWLTL	51,300	50,000	**D**
Main Street	Brandywine Avenue	Wiley Road	6-Ln w/RM	39,200	50,000	B

Source: Chen Ryan Associates; December 2015

Note:
Roadway LOS Threshold based on City of Chula Vista Roadway Design Standards.



Otay River Restoration Project Habitat Mitigation and Monitoring Plan

Figure 3

Construction Year (Year 2020) Base Conditions - Traffic Volumes

CHEN RYAN

As shown in Table 3, the following two roadway segments within the project study are anticipated to operate at substandard LOS under Construction Base Year (Year 2020) conditions:

- Main Street between I-805 NB Ramps and Oleander Avenue (LOS D)
- Main Street between Oleander Avenue and Brandywine Avenue (LOS D)

Construction-Related Operations

Roadway and intersection geometrics, during project construction, were assumed to be identical to those assumed under Construction Base Year Volumes (Year 2020) conditions, as provided in Attachment 1. Traffic volumes during project construction were derived by adding the projected construction traffic trip assignment volumes (displayed in Figure 2) to the Construction Base Year Volumes (Year 2020) displayed in Figure 3. Project Construction traffic volumes are displayed in **Figure 4**.

Tables 4 and 5 display the anticipated peak hour intersection and roadway operations during project construction within the project study area, respectively. Peak hour intersection LOS worksheets during Project Constriction conditions are provided in **Attachment 3**.

Table 4: Peak Hour Intersection LOS Results – During Project Construction

Intersection	AM Peak Hour		PM Peak Hour	
	Avg. Delay (sec.)	LOS	Avg. Delay (sec.)	LOS
1. I-805 SB Ramps / Main Street	35.0	C	49.4	D
2. I-805 NB Ramps / Main Street	33.7	C	52.3	D
3. Oleander Avenue / Main Street	11.0	B	9.0	A
4. Brandywine Avenue / Main Street	49.1	D	49.0	D

Source: Chen Ryan Associates, December 2015

As shown, all intersections within the project study are anticipated to operate at acceptable LOS D or better under Construction Base Year (Year 2020) conditions.

As stated in the City of Chula Vista's traffic impact criteria, project related impact is considered significant at intersections under the following conditions:

(a) Direct impact if both the following criteria are met:
   i. Level of service is LOS E or LOS F.
   ii. Project trips comprise 5% or more of entering volume.

(b) Cumulative impact if only (i) is met.

Since all study area intersections are projected to operate at LOS D or better during project construction, no direct or cumulative impacts would result along any of the study area intersections.

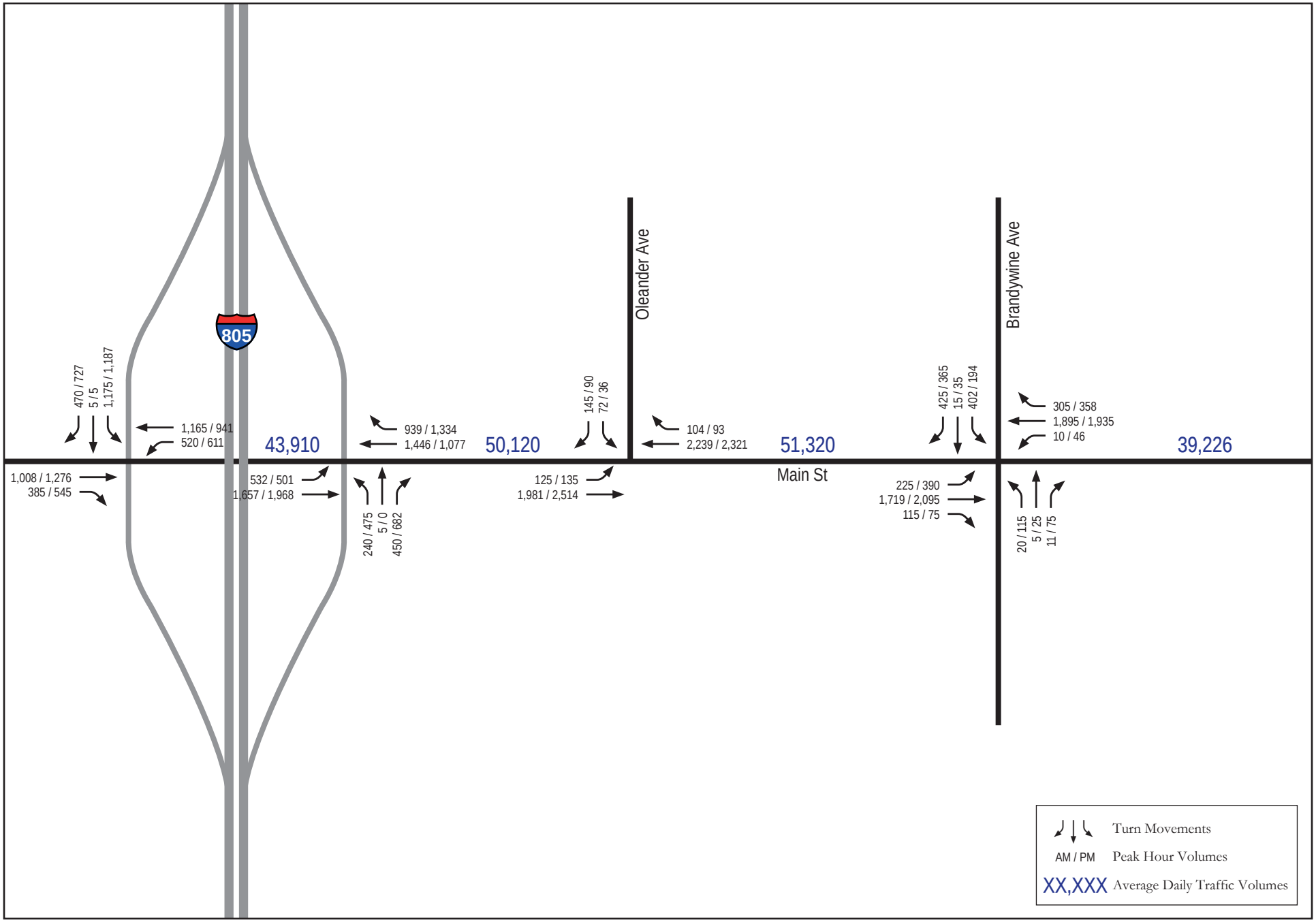


Figure 4
Project Construction Conditions - Traffic Volumes

CHEN RYAN

Table 5: Daily Roadway LOS Results – During Project Construction

Roadway	From	To	Cross-Section	ADT w/ Project	LOS Threshold (LOS C)	LOS w/ Project	Project ADT (> 800)	Project Contribution (≥ 5%)	Intersection along Segments Operating @ LOS D or Better?	Significant Impact?
Main Street	I-805 SB Ramps	I-805 NB Ramps	6-Ln	43,920	50,000	C	20	<1%	Yes	No
Main Street	I-805 NB Ramps	Oleander Avenue	6-Ln w/RM	50,120	50,000	**D**	20	<1%	Yes	No
Main Street	Oleander Avenue	Brandywine Avenue	6-Ln w/TWLTL	51,320	50,000	**D**	20	<1%	Yes	No
Main Street	Brandywine Avenue	Wiley Road	6-Ln w/RM	39,226	50,000	B	26	<1%	Yes	No

Source: Chen Ryan Associates, December 2015

Note:
Roadway LOS Threshold based on City of Chula Vista Roadway Design Standards.

As shown in Table 5, two of the study area roadway segments would continue to operate at substandard LOS under Construction Base Year (Year 2020) plus construction traffic conditions:

- Main Street between I-805 NB Ramps and Oleander Avenue (LOS D)
- Main Street between Oleander Avenue and Brandywine Avenue (LOS D)

As stated in the City of Chula Vista's traffic impact criteria, project related impact is considered significant for a roadway segment under the following conditions:

(a) Direct impact if all of the following criteria are met:
   i. Level of service is LOS D for more than 2 hours or LOS E/F for 1 hour;
   ii. Project trips comprise five percent or more of segment volume; and
   iii. Project adds greater than 800 ADT to segment

(b) Cumulative impact if only (i) above is met. However, if the intersections along a LOS D or LOS E segment all operate at LOS D or better, the segment impact is considered not significant since intersection analysis is more indicative of actual roadway system operations than street segment analysis. If segment Level of Service is LOS F, impact is significant regardless of intersection LOS

(c) Notwithstanding the foregoing, if the impact identified in paragraph a. above occurs at study horizon year 10 or later, and is offsite and not adjacent to the project, the impact is considered cumulative. Study year 10 may be that typical SANDAG model year which is between 8 and 13 years in the future. In this case of a traffic study being performed in the period of 2000 to 2002, because the typical model will only evaluate traffic at years divisible by 5 (i.e. 2005, 2010, 2015 and 2020) study horizon year 10 would correspond to the Sandag model for year 2010 and would be 8 years in the future. If the model year is less than 7 years in the future, study horizon year 10 would be 13 years in the future.

(d) In the event a direct identified project specific impact in paragraph a. above occurs at study horizon year 5 or earlier and the impact is offsite and not adjacent to this project, but the property immediately adjacent to the identified project specific impact is also proposed to be developed in approximately the same time frame, an additional analysis may be required to determine whether or not the identified project specific impact would still occur if the development of the adjacent property does not take place. If the additional analysis concludes that the identified project specific impact is no longer a direct impact, then the impact shall be considered cumulative.

Since the traffic associated with project construction would not comprise more than 5% of the total segment volume, would not add more than 800 ADT to the segment, and all intersections along Main Street, within the project study area are projected to operate at LOS D or better, project construction traffic is not anticipated to have a direct or cumulative impact along any of the roadway segments identified above.

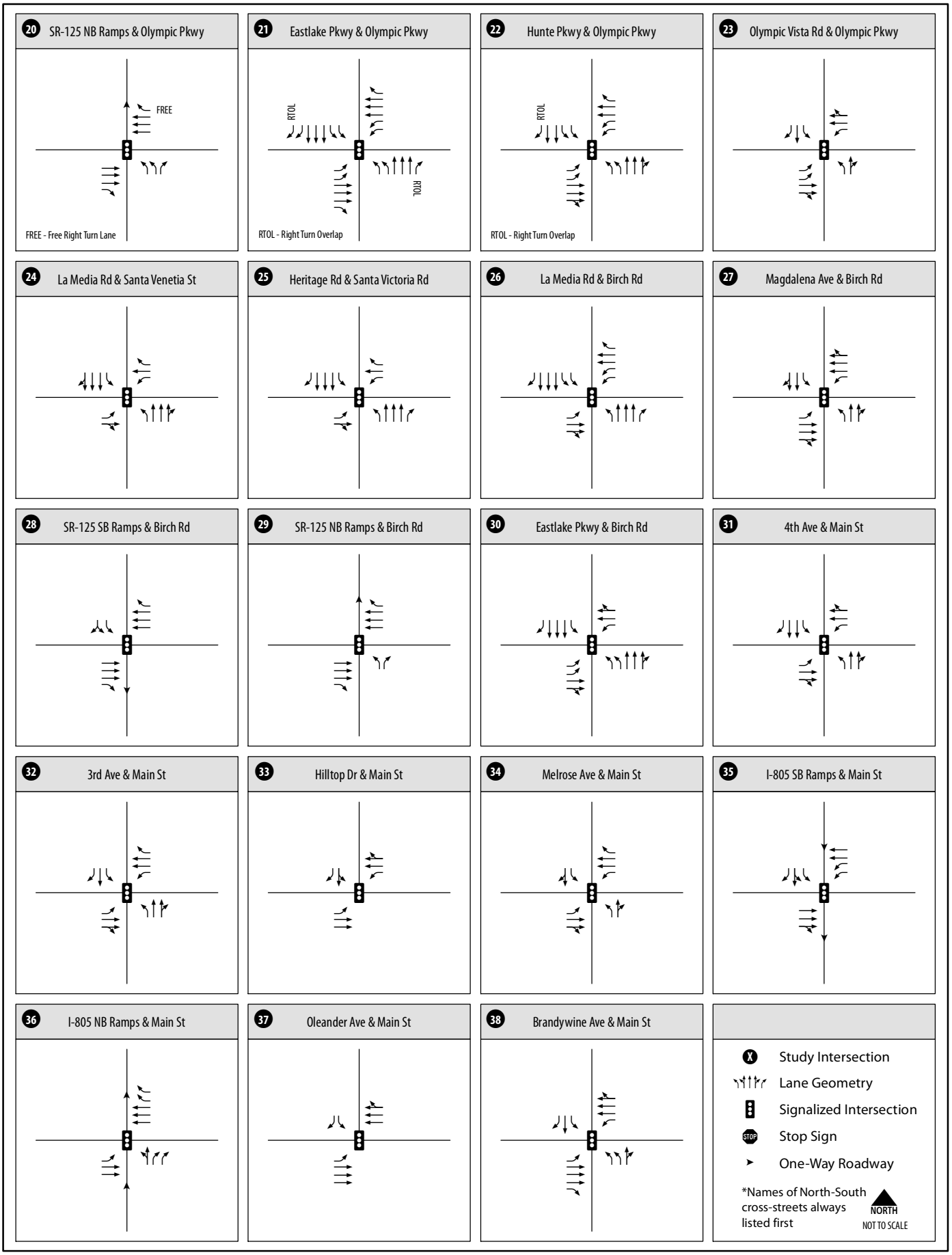
CONCLUSION

As noted in the sections above, the traffic associated with the Otay River Restoration Project Habitat Mitigation and Monitoring Plan is not anticipated to significantly impact any roadway or intersection facilities adjacent to or accessing the proposed project site.

Sincerely

Stephen Cook, PE
Scook@chenryanmobility.com

Attachment 1
Excerpts from the University Villages EIR

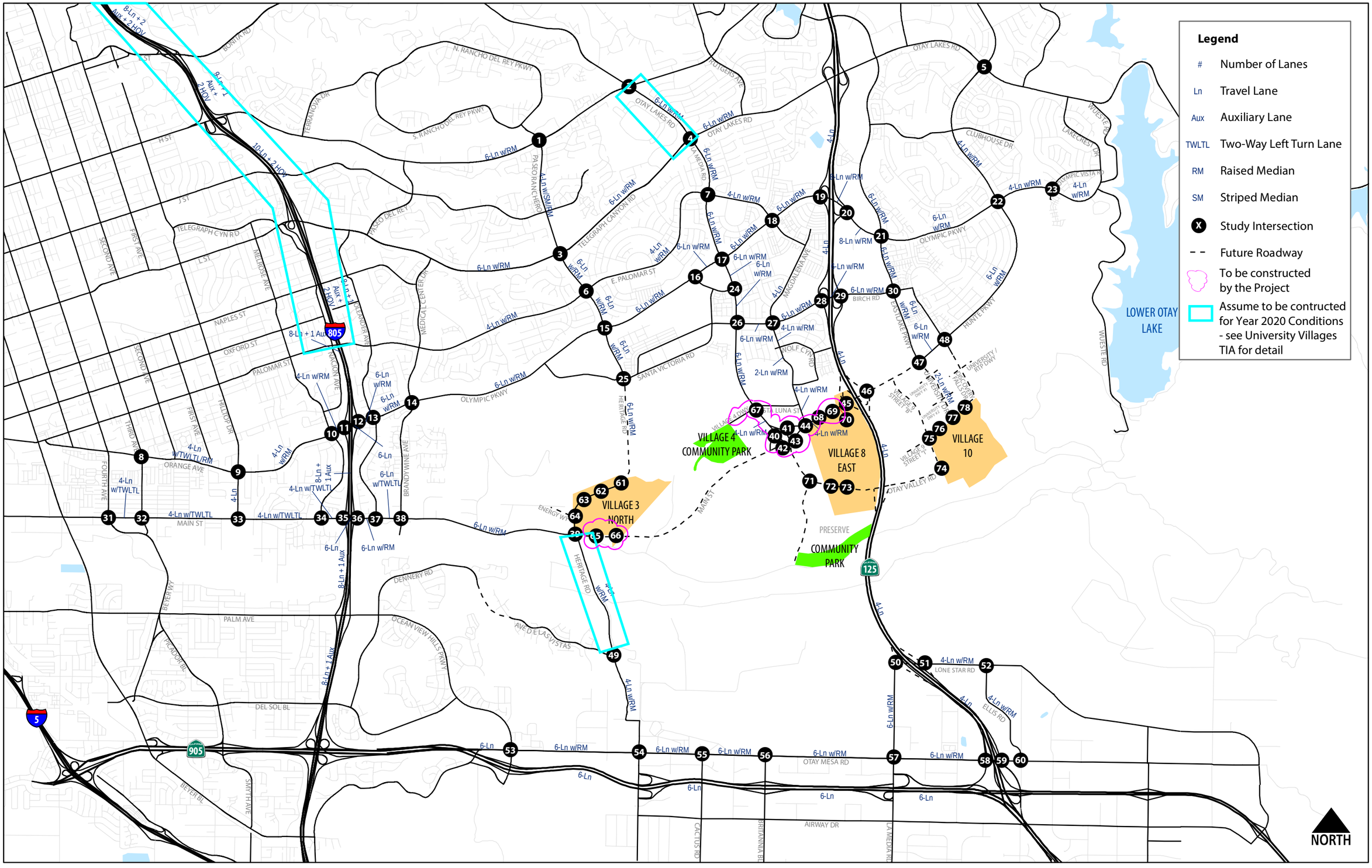


University Villages TIA,
Otay Ranch Villages 3 North, 8 East and 10

CHEN RYAN

Figure 7-1A

Intersection Geometrics - Year 2020 Conditions
(Study Intersections 20-38)

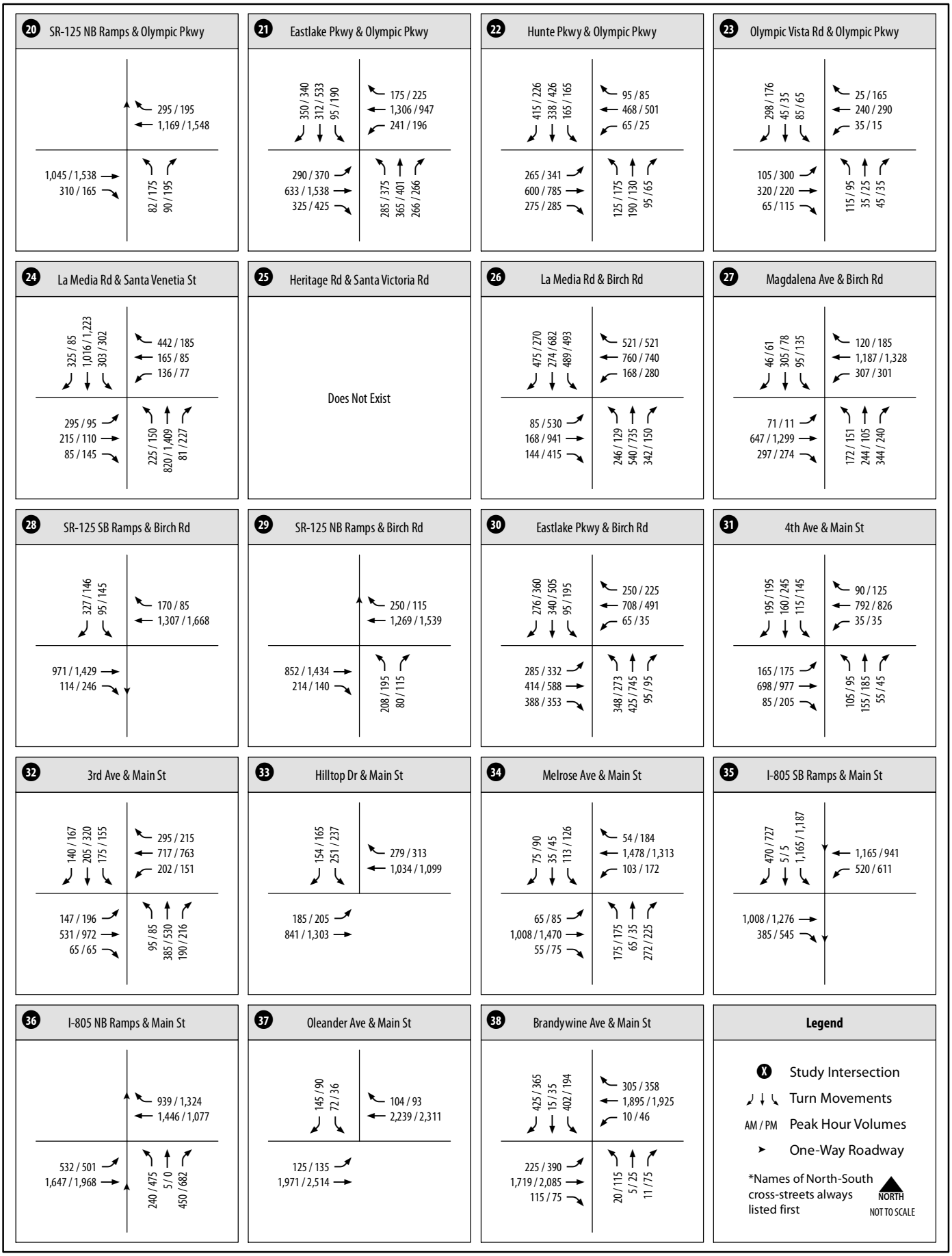


University Villages TIA, Otay Ranch Villages 3 North, 8 East and 10

Figure 7-1B

Roadway Geometrics - Year 2020 Conditions

CHEN RYAN



University Villages TIA,
Otay Ranch Villages 3 North, 8 East and 10

CHEN RYAN

Figure 7-2A

Intersection Peak Hour Traffic Volumes -
Year 2020 Base Plus Project Conditions (Study Intersections 20-38)

Attachment 2
Peak Hour LOS Worksheets –
Construction Base Year (Year 2020) Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1008	385	520	1165	0	0	0	0	1170	0	470
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	1061	300	547	1226	0				1232	0	390
Adj No. of Lanes	0	3	0	2	2	0				2	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1184	335	626	1868	0				1351	0	603
Arrive On Green	0.00	0.30	0.30	0.18	0.53	0.00				0.38	0.00	0.38
Sat Flow, veh/h	0	4110	1114	3442	3632	0				3548	0	1583
Grp Volume(v), veh/h	0	912	449	547	1226	0				1232	0	390
Grp Sat Flow(s),veh/h/ln	0	1695	1666	1721	1770	0				1774	0	1583
Q Serve(g_s), s	0.0	22.6	22.6	13.6	21.9	0.0				28.9	0.0	17.7
Cycle Q Clear(g_c), s	0.0	22.6	22.6	13.6	21.9	0.0				28.9	0.0	17.7
Prop In Lane	0.00		0.67	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1018	501	626	1868	0				1351	0	603
V/C Ratio(X)	0.00	0.90	0.90	0.87	0.66	0.00				0.91	0.00	0.65
Avail Cap(c_a), veh/h	0	1044	513	628	1898	0				1417	0	632
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	29.3	29.3	34.9	14.9	0.0				25.7	0.0	22.3
Incr Delay (d2), s/veh	0.0	10.0	18.0	13.0	0.8	0.0				8.9	0.0	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.0	11.9	12.8	7.6	10.8	0.0				15.7	0.0	8.1
LnGrp Delay(d),s/veh	0.0	39.4	47.3	47.9	15.8	0.0				34.7	0.0	24.4
LnGrp LOS		D	D	D	B					C		C
Approach Vol, veh/h		1361			1773						1622	
Approach Delay, s/veh		42.0			25.7						32.2	
Approach LOS		D			C						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	19.9	30.3		37.4		50.3		
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0		
Max Green Setting (Gmax), s	16.0	27.0		35.0		47.0		
Max Q Clear Time (g_c+I1), s	15.6	24.6		30.9		23.9		
Green Ext Time (p_c), s	0.4	1.7		2.5		11.4		

Intersection Summary	
HCM 2010 Ctrl Delay	32.6
HCM 2010 LOS	C

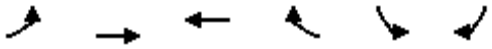
Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	532	1647	0	0	1446	939	240	5	450	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	0	0	1863	1863	1900	1863	1863			
Adj Flow Rate, veh/h	560	1734	0	0	1522	988	253	5	474			
Adj No. of Lanes	1	2	0	0	3	2	0	1	2			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	572	2595	0	0	1865	1022	310	6	495			
Arrive On Green	0.32	0.73	0.00	0.00	0.37	0.37	0.18	0.18	0.18			
Sat Flow, veh/h	1774	3632	0	0	5253	2787	1741	34	2787			
Grp Volume(v), veh/h	560	1734	0	0	1522	988	258	0	474			
Grp Sat Flow(s),veh/h/ln	1774	1770	0	0	1695	1393	1776	0	1393			
Q Serve(g_s), s	28.1	23.1	0.0	0.0	24.3	31.3	12.6	0.0	15.2			
Cycle Q Clear(g_c), s	28.1	23.1	0.0	0.0	24.3	31.3	12.6	0.0	15.2			
Prop In Lane	1.00		0.00	0.00		1.00	0.98		1.00			
Lane Grp Cap(c), veh/h	572	2595	0	0	1865	1022	316	0	495			
V/C Ratio(X)	0.98	0.67	0.00	0.00	0.82	0.97	0.82	0.00	0.96			
Avail Cap(c_a), veh/h	572	2595	0	0	1865	1022	316	0	495			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	30.2	6.3	0.0	0.0	25.8	28.0	35.6	0.0	36.7			
Incr Delay (d2), s/veh	32.4	1.4	0.0	0.0	4.1	21.2	15.3	0.0	29.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(-26165%),veh/ln	18.8	11.6	0.0	0.0	12.0	15.0	7.5	0.0	7.8			
LnGrp Delay(d),s/veh	62.6	7.7	0.0	0.0	29.8	49.2	50.9	0.0	66.3			
LnGrp LOS	E	A			C	D	D		E			
Approach Vol, veh/h		2294			2510			732				
Approach Delay, s/veh		21.1			37.5			60.9				
Approach LOS		C			D			E				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		70.0			33.0	37.0		20.0
Change Period (Y+Rc), s		4.0			4.0	4.0		4.0
Max Green Setting (Gmax), s		66.0			29.0	33.0		16.0
Max Q Clear Time (g_c+I1), s		25.1			30.1	33.3		17.2
Green Ext Time (p_c), s		38.1			0.0	0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	33.8
HCM 2010 LOS	C



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	125	1971	2239	104	72	145
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	132	2075	2357	109	76	153
Adj No. of Lanes	1	3	3	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	167	3837	2998	138	225	201
Arrive On Green	0.09	0.75	0.60	0.60	0.13	0.13
Sat Flow, veh/h	1774	5253	5151	229	1774	1583
Grp Volume(v), veh/h	132	2075	1598	868	76	153
Grp Sat Flow(s),veh/h/ln	1774	1695	1695	1822	1774	1583
Q Serve(g_s), s	4.9	11.4	24.0	24.5	2.6	6.3
Cycle Q Clear(g_c), s	4.9	11.4	24.0	24.5	2.6	6.3
Prop In Lane	1.00			0.13	1.00	1.00
Lane Grp Cap(c), veh/h	167	3837	2039	1096	225	201
V/C Ratio(X)	0.79	0.54	0.78	0.79	0.34	0.76
Avail Cap(c_a), veh/h	184	3837	2039	1096	420	375
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.0	3.4	10.1	10.2	26.9	28.5
Incr Delay (d2), s/veh	19.1	0.6	2.1	4.0	0.9	5.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	3.3	5.4	11.7	13.3	1.3	5.7
LnGrp Delay(d),s/veh	49.1	4.0	12.2	14.3	27.8	34.3
LnGrp LOS	D	A	B	B	C	C
Approach Vol, veh/h		2207	2466		229	
Approach Delay, s/veh		6.7	12.9		32.2	
Approach LOS		A	B		C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		55.0		12.6	10.3	44.7		
Change Period (Y+Rc), s		4.0		4.0	4.0	4.0		
Max Green Setting (Gmax), s		51.0		16.0	7.0	40.0		
Max Q Clear Time (g_c+I1), s		13.4		8.3	6.9	26.5		
Green Ext Time (p_c), s		36.4		0.4	0.0	13.3		

Intersection Summary	
HCM 2010 Ctrl Delay	11.0
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	225	1719	115	10	1895	305	20	5	11	402	15	425
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	237	1809	121	11	1995	216	21	5	12	423	16	163
Adj No. of Lanes	1	3	1	1	3	0	2	1	0	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	246	2296	715	273	2177	234	653	14	34	441	163	139
Arrive On Green	0.14	0.45	0.45	0.15	0.47	0.47	0.19	0.03	0.03	0.25	0.09	0.09
Sat Flow, veh/h	1774	5085	1583	1774	4664	500	3442	487	1169	1774	1863	1583
Grp Volume(v), veh/h	237	1809	121	11	1445	766	21	0	17	423	16	163
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1695	1774	1721	0	1656	1774	1863	1583
Q Serve(g_s), s	18.2	41.4	6.2	0.7	54.2	55.4	0.7	0.0	1.4	32.2	1.1	9.4
Cycle Q Clear(g_c), s	18.2	41.4	6.2	0.7	54.2	55.4	0.7	0.0	1.4	32.2	1.1	9.4
Prop In Lane	1.00		1.00	1.00		0.28	1.00		0.71	1.00		1.00
Lane Grp Cap(c), veh/h	246	2296	715	273	1582	828	653	0	48	441	163	139
V/C Ratio(X)	0.96	0.79	0.17	0.04	0.91	0.92	0.03	0.00	0.35	0.96	0.10	1.17
Avail Cap(c_a), veh/h	246	2973	926	273	1610	843	653	0	194	441	626	532
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.6	31.9	22.3	49.3	33.9	34.2	45.2	0.0	65.2	50.7	57.4	38.3
Incr Delay (d2), s/veh	46.7	1.1	0.1	0.1	8.3	15.7	0.0	0.0	4.4	32.6	0.3	93.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	12.1	19.7	2.7	0.4	27.1	30.6	0.3	0.0	0.7	19.7	0.6	8.4
LnGrp Delay(d),s/veh	105.2	33.1	22.4	49.3	42.2	49.9	45.2	0.0	69.5	83.3	57.7	132.1
LnGrp LOS	F	C	C	D	D	D	D		E	F	E	F
Approach Vol, veh/h		2167			2222			38			602	
Approach Delay, s/veh		40.4			44.9			56.1			95.8	
Approach LOS		D			D			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	25.1	65.8	30.0	16.0	23.0	67.9	38.0	8.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	4.0	80.0	4.0	46.0	19.0	65.0	34.0	16.0
Max Q Clear Time (g_c+I1), s	2.7	43.4	2.7	11.4	20.2	57.4	34.2	3.4
Green Ext Time (p_c), s	1.2	18.3	0.0	0.6	0.0	6.4	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	49.1
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1276	545	611	941	0	0	0	0	1192	0	727
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	1343	195	643	991	0				1255	0	397
Adj No. of Lanes	0	3	0	2	2	0				2	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1403	204	768	2039	0				1217	0	543
Arrive On Green	0.00	0.31	0.31	0.22	0.58	0.00				0.34	0.00	0.34
Sat Flow, veh/h	0	4654	651	3442	3632	0				3548	0	1583
Grp Volume(v), veh/h	0	1015	523	643	991	0				1255	0	397
Grp Sat Flow(s),veh/h/ln	0	1695	1748	1721	1770	0				1774	0	1583
Q Serve(g_s), s	0.0	29.1	29.1	17.7	16.3	0.0				34.0	0.0	21.8
Cycle Q Clear(g_c), s	0.0	29.1	29.1	17.7	16.3	0.0				34.0	0.0	21.8
Prop In Lane	0.00		0.37	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1061	547	768	2039	0				1217	0	543
V/C Ratio(X)	0.00	0.96	0.96	0.84	0.49	0.00				1.03	0.00	0.73
Avail Cap(c_a), veh/h	0	1061	547	799	2071	0				1217	0	543
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	33.4	33.4	36.8	12.4	0.0				32.6	0.0	28.5
Incr Delay (d2), s/veh	0.0	18.1	28.0	7.6	0.2	0.0				34.1	0.0	5.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.0	16.2	18.2	9.2	7.9	0.0				22.3	0.0	10.2
LnGrp Delay(d),s/veh	0.0	51.5	61.4	44.4	12.5	0.0				66.6	0.0	33.5
LnGrp LOS		D	E	D	B					F		C
Approach Vol, veh/h		1538			1634						1652	
Approach Delay, s/veh		54.9			25.1						58.7	
Approach LOS		D			C						E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	26.1	35.0		38.0		61.1		
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0		
Max Green Setting (Gmax), s	23.0	31.0		34.0		58.0		
Max Q Clear Time (g_c+I1), s	19.7	31.1		36.0		18.3		
Green Ext Time (p_c), s	2.4	0.0		0.0		11.6		

Intersection Summary	
HCM 2010 Ctrl Delay	46.1
HCM 2010 LOS	D

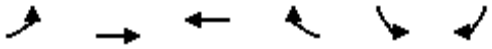
Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	501	1968	0	0	1077	1324	475	0	682	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	0	0	1863	1863	1900	1863	1863			
Adj Flow Rate, veh/h	527	2072	0	0	1134	899	500	0	560			
Adj No. of Lanes	1	2	0	0	3	2	0	1	2			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	520	2171	0	0	1356	743	497	0	780			
Arrive On Green	0.29	0.61	0.00	0.00	0.27	0.27	0.28	0.00	0.28			
Sat Flow, veh/h	1774	3632	0	0	5253	2787	1774	0	2787			
Grp Volume(v), veh/h	527	2072	0	0	1134	899	500	0	560			
Grp Sat Flow(s),veh/h/ln	1774	1770	0	0	1695	1393	1774	0	1393			
Q Serve(g_s), s	22.0	41.0	0.0	0.0	15.8	20.0	21.0	0.0	13.6			
Cycle Q Clear(g_c), s	22.0	41.0	0.0	0.0	15.8	20.0	21.0	0.0	13.6			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	520	2171	0	0	1356	743	497	0	780			
V/C Ratio(X)	1.01	0.95	0.00	0.00	0.84	1.21	1.01	0.00	0.72			
Avail Cap(c_a), veh/h	520	2171	0	0	1356	743	497	0	780			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	26.5	13.5	0.0	0.0	26.0	27.5	27.0	0.0	24.3			
Incr Delay (d2), s/veh	42.7	10.6	0.0	0.0	4.7	106.8	42.0	0.0	3.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(-26165%),veh/ln	16.9	22.8	0.0	0.0	7.9	18.7	16.0	0.0	5.6			
LnGrp Delay(d),s/veh	69.2	24.2	0.0	0.0	30.7	134.3	69.0	0.0	27.5			
LnGrp LOS	F	C			C	F	F		C			
Approach Vol, veh/h		2599			2033			1060				
Approach Delay, s/veh		33.3			76.5			47.1				
Approach LOS		C			E			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		50.0			26.0	24.0		25.0
Change Period (Y+Rc), s		4.0			4.0	4.0		4.0
Max Green Setting (Gmax), s		46.0			22.0	20.0		21.0
Max Q Clear Time (g_c+I1), s		43.0			24.0	22.0		23.0
Green Ext Time (p_c), s		3.0			0.0	0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	51.3
HCM 2010 LOS	D



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	135	2514	2311	93	36	90
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	142	2646	2433	98	38	95
Adj No. of Lanes	1	3	3	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	179	4025	3154	126	150	134
Arrive On Green	0.10	0.79	0.63	0.63	0.08	0.08
Sat Flow, veh/h	1774	5253	5184	201	1774	1583
Grp Volume(v), veh/h	142	2646	1639	892	38	95
Grp Sat Flow(s),veh/h/ln	1774	1695	1695	1827	1774	1583
Q Serve(g_s), s	5.0	14.6	22.4	22.8	1.3	3.8
Cycle Q Clear(g_c), s	5.0	14.6	22.4	22.8	1.3	3.8
Prop In Lane	1.00			0.11	1.00	1.00
Lane Grp Cap(c), veh/h	179	4025	2131	1149	150	134
V/C Ratio(X)	0.80	0.66	0.77	0.78	0.25	0.71
Avail Cap(c_a), veh/h	193	4025	2131	1149	440	393
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.3	2.9	8.6	8.7	27.6	28.7
Incr Delay (d2), s/veh	19.0	0.9	1.8	3.4	0.9	6.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	3.4	6.9	10.8	12.2	0.7	3.5
LnGrp Delay(d),s/veh	47.4	3.8	10.4	12.1	28.5	35.5
LnGrp LOS	D	A	B	B	C	D
Approach Vol, veh/h		2788	2531		133	
Approach Delay, s/veh		6.0	11.0		33.5	
Approach LOS		A	B		C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		55.0		9.4	10.5	44.5		
Change Period (Y+Rc), s		4.0		4.0	4.0	4.0		
Max Green Setting (Gmax), s		51.0		16.0	7.0	40.0		
Max Q Clear Time (g_c+I1), s		16.6		5.8	7.0	24.8		
Green Ext Time (p_c), s		34.1		0.2	0.0	15.1		

Intersection Summary	
HCM 2010 Ctrl Delay	9.0
HCM 2010 LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	390	2085	75	46	1925	358	115	25	75	194	35	365
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	411	2195	16	48	2026	145	121	26	77	204	37	152
Adj No. of Lanes	1	3	1	1	3	0	2	1	0	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	396	3177	989	119	2271	162	437	32	96	198	116	99
Arrive On Green	0.22	0.62	0.62	0.07	0.47	0.47	0.13	0.08	0.08	0.11	0.06	0.06
Sat Flow, veh/h	1774	5085	1583	1774	4847	345	3442	415	1230	1774	1863	1583
Grp Volume(v), veh/h	411	2195	16	48	1414	757	121	0	103	204	37	152
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1695	1802	1721	0	1646	1774	1863	1583
Q Serve(g_s), s	30.0	38.3	0.5	3.5	51.1	51.8	4.3	0.0	8.3	15.0	2.6	5.9
Cycle Q Clear(g_c), s	30.0	38.3	0.5	3.5	51.1	51.8	4.3	0.0	8.3	15.0	2.6	5.9
Prop In Lane	1.00		1.00	1.00		0.19	1.00		0.75	1.00		1.00
Lane Grp Cap(c), veh/h	396	3177	989	119	1588	844	437	0	128	198	116	99
V/C Ratio(X)	1.04	0.69	0.02	0.40	0.89	0.90	0.28	0.00	0.80	1.03	0.32	1.54
Avail Cap(c_a), veh/h	396	3177	989	119	1588	844	437	0	196	198	332	283
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.2	16.7	9.6	60.2	32.6	32.8	53.1	0.0	61.0	59.7	60.3	30.8
Incr Delay (d2), s/veh	55.6	1.3	0.0	2.2	7.9	14.2	0.3	0.0	12.9	72.3	1.6	255.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	20.7	18.3	0.2	1.8	25.5	29.0	2.1	0.0	4.2	11.3	1.4	10.4
LnGrp Delay(d),s/veh	107.8	17.9	9.6	62.4	40.5	47.0	53.5	0.0	73.9	132.2	61.9	286.3
LnGrp LOS	F	B	A	E	D	D	D		E	F	E	F
Approach Vol, veh/h		2622			2219			224			393	
Approach Delay, s/veh		32.0			43.2			62.8			185.1	
Approach LOS		C			D			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	88.0	21.1	12.4	34.0	67.0	19.0	14.5
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	9.0	84.0	7.0	24.0	30.0	63.0	15.0	16.0
Max Q Clear Time (g_c+I1), s	5.5	40.3	6.3	7.9	32.0	53.8	17.0	10.3
Green Ext Time (p_c), s	3.1	25.8	0.1	0.5	0.0	7.6	0.0	0.2

Intersection Summary	
HCM 2010 Ctrl Delay	48.8
HCM 2010 LOS	D

Attachment 3
Peak Hour LOS Worksheets – During Project Construction Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1008	385	520	1165	0	0	0	0	1180	0	470
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	1061	300	547	1226	0				1242	0	390
Adj No. of Lanes	0	3	0	2	2	0				2	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1182	334	624	1864	0				1356	0	605
Arrive On Green	0.00	0.30	0.30	0.18	0.53	0.00				0.38	0.00	0.38
Sat Flow, veh/h	0	4110	1114	3442	3632	0				3548	0	1583
Grp Volume(v), veh/h	0	912	449	547	1226	0				1242	0	390
Grp Sat Flow(s),veh/h/ln	0	1695	1666	1721	1770	0				1774	0	1583
Q Serve(g_s), s	0.0	22.7	22.7	13.6	22.0	0.0				29.2	0.0	17.7
Cycle Q Clear(g_c), s	0.0	22.7	22.7	13.6	22.0	0.0				29.2	0.0	17.7
Prop In Lane	0.00		0.67	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1017	500	624	1864	0				1356	0	605
V/C Ratio(X)	0.00	0.90	0.90	0.88	0.66	0.00				0.92	0.00	0.64
Avail Cap(c_a), veh/h	0	1042	512	627	1893	0				1413	0	631
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	29.5	29.5	35.0	15.1	0.0				25.8	0.0	22.3
Incr Delay (d2), s/veh	0.0	10.2	18.3	13.2	0.8	0.0				9.4	0.0	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.0	12.0	12.9	7.6	10.9	0.0				16.1	0.0	8.1
LnGrp Delay(d),s/veh	0.0	39.7	47.7	48.2	15.9	0.0				35.2	0.0	24.4
LnGrp LOS		D	D	D	B					D		C
Approach Vol, veh/h		1361			1773						1632	
Approach Delay, s/veh		42.3			25.9						32.6	
Approach LOS		D			C						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	19.9	30.4		37.6		50.3		
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0		
Max Green Setting (Gmax), s	16.0	27.0		35.0		47.0		
Max Q Clear Time (g_c+I1), s	15.6	24.7		31.2		24.0		
Green Ext Time (p_c), s	0.3	1.7		2.3		11.3		

Intersection Summary	
HCM 2010 Ctrl Delay	32.9
HCM 2010 LOS	C

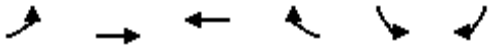
Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	532	1657	0	0	1446	939	240	5	450	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	0	0	1863	1863	1900	1863	1863			
Adj Flow Rate, veh/h	560	1744	0	0	1522	988	253	5	474			
Adj No. of Lanes	1	2	0	0	3	2	0	1	2			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	572	2595	0	0	1865	1022	310	6	495			
Arrive On Green	0.32	0.73	0.00	0.00	0.37	0.37	0.18	0.18	0.18			
Sat Flow, veh/h	1774	3632	0	0	5253	2787	1741	34	2787			
Grp Volume(v), veh/h	560	1744	0	0	1522	988	258	0	474			
Grp Sat Flow(s),veh/h/ln	1774	1770	0	0	1695	1393	1776	0	1393			
Q Serve(g_s), s	28.1	23.3	0.0	0.0	24.3	31.3	12.6	0.0	15.2			
Cycle Q Clear(g_c), s	28.1	23.3	0.0	0.0	24.3	31.3	12.6	0.0	15.2			
Prop In Lane	1.00		0.00	0.00		1.00	0.98		1.00			
Lane Grp Cap(c), veh/h	572	2595	0	0	1865	1022	316	0	495			
V/C Ratio(X)	0.98	0.67	0.00	0.00	0.82	0.97	0.82	0.00	0.96			
Avail Cap(c_a), veh/h	572	2595	0	0	1865	1022	316	0	495			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	30.2	6.3	0.0	0.0	25.8	28.0	35.6	0.0	36.7			
Incr Delay (d2), s/veh	32.4	1.4	0.0	0.0	4.1	21.2	15.3	0.0	29.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(-26165%),veh/ln	18.8	11.6	0.0	0.0	12.0	15.0	7.5	0.0	7.8			
LnGrp Delay(d),s/veh	62.6	7.7	0.0	0.0	29.8	49.2	50.9	0.0	66.3			
LnGrp LOS	E	A			C	D	D		E			
Approach Vol, veh/h		2304			2510			732				
Approach Delay, s/veh		21.0			37.5			60.9				
Approach LOS		C			D			E				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		70.0			33.0	37.0		20.0
Change Period (Y+Rc), s		4.0			4.0	4.0		4.0
Max Green Setting (Gmax), s		66.0			29.0	33.0		16.0
Max Q Clear Time (g_c+I1), s		25.3			30.1	33.3		17.2
Green Ext Time (p_c), s		37.9			0.0	0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	33.7
HCM 2010 LOS	C



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	125	1981	2239	104	72	145
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	132	2085	2357	109	76	153
Adj No. of Lanes	1	3	3	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	167	3837	2998	138	225	201
Arrive On Green	0.09	0.75	0.60	0.60	0.13	0.13
Sat Flow, veh/h	1774	5253	5151	229	1774	1583
Grp Volume(v), veh/h	132	2085	1598	868	76	153
Grp Sat Flow(s),veh/h/ln	1774	1695	1695	1822	1774	1583
Q Serve(g_s), s	4.9	11.5	24.0	24.5	2.6	6.3
Cycle Q Clear(g_c), s	4.9	11.5	24.0	24.5	2.6	6.3
Prop In Lane	1.00			0.13	1.00	1.00
Lane Grp Cap(c), veh/h	167	3837	2039	1096	225	201
V/C Ratio(X)	0.79	0.54	0.78	0.79	0.34	0.76
Avail Cap(c_a), veh/h	184	3837	2039	1096	420	375
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.0	3.4	10.1	10.2	26.9	28.5
Incr Delay (d2), s/veh	19.1	0.6	2.1	4.0	0.9	5.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	3.3	5.4	11.7	13.3	1.3	5.7
LnGrp Delay(d),s/veh	49.1	4.0	12.2	14.3	27.8	34.3
LnGrp LOS	D	A	B	B	C	C
Approach Vol, veh/h		2217	2466		229	
Approach Delay, s/veh		6.7	12.9		32.2	
Approach LOS		A	B		C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		55.0		12.6	10.3	44.7		
Change Period (Y+Rc), s		4.0		4.0	4.0	4.0		
Max Green Setting (Gmax), s		51.0		16.0	7.0	40.0		
Max Q Clear Time (g_c+I1), s		13.5		8.3	6.9	26.5		
Green Ext Time (p_c), s		36.3		0.4	0.0	13.3		

Intersection Summary	
HCM 2010 Ctrl Delay	11.0
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	225	1729	115	10	1895	305	20	5	11	402	15	425
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	237	1820	121	11	1995	216	21	5	12	423	16	163
Adj No. of Lanes	1	3	1	1	3	0	2	1	0	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	246	2308	719	269	2177	234	654	14	34	441	163	139
Arrive On Green	0.14	0.45	0.45	0.15	0.47	0.47	0.19	0.03	0.03	0.25	0.09	0.09
Sat Flow, veh/h	1774	5085	1583	1774	4664	500	3442	487	1169	1774	1863	1583
Grp Volume(v), veh/h	237	1820	121	11	1445	766	21	0	17	423	16	163
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1695	1774	1721	0	1656	1774	1863	1583
Q Serve(g_s), s	18.2	41.7	6.2	0.7	54.2	55.4	0.7	0.0	1.4	32.2	1.1	9.4
Cycle Q Clear(g_c), s	18.2	41.7	6.2	0.7	54.2	55.4	0.7	0.0	1.4	32.2	1.1	9.4
Prop In Lane	1.00		1.00	1.00		0.28	1.00		0.71	1.00		1.00
Lane Grp Cap(c), veh/h	246	2308	719	269	1582	828	654	0	48	441	163	139
V/C Ratio(X)	0.96	0.79	0.17	0.04	0.91	0.92	0.03	0.00	0.35	0.96	0.10	1.18
Avail Cap(c_a), veh/h	246	2973	926	269	1610	843	654	0	194	441	599	509
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.6	31.8	22.1	49.5	33.9	34.2	45.2	0.0	65.2	50.7	57.5	38.3
Incr Delay (d2), s/veh	46.7	1.1	0.1	0.1	8.3	15.7	0.0	0.0	4.4	32.6	0.3	94.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	12.1	19.6	2.7	0.4	27.1	30.6	0.3	0.0	0.7	19.7	0.6	8.4
LnGrp Delay(d),s/veh	105.2	32.9	22.2	49.6	42.2	49.9	45.2	0.0	69.5	83.3	57.7	133.0
LnGrp LOS	F	C	C	D	D	D	D		E	F	E	F
Approach Vol, veh/h		2178			2222			38			602	
Approach Delay, s/veh		40.2			44.9			56.1			96.1	
Approach LOS		D			D			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	24.8	66.1	30.0	16.0	23.0	67.9	38.0	8.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	4.0	80.0	6.0	44.0	19.0	65.0	34.0	16.0
Max Q Clear Time (g_c+I1), s	2.7	43.7	2.7	11.4	20.2	57.4	34.2	3.4
Green Ext Time (p_c), s	1.2	18.5	0.0	0.6	0.0	6.4	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	49.1
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1276	545	611	941	0	0	0	0	1192	0	727
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	1343	195	643	991	0				1255	0	397
Adj No. of Lanes	0	3	0	2	2	0				2	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1403	204	768	2039	0				1217	0	543
Arrive On Green	0.00	0.31	0.31	0.22	0.58	0.00				0.34	0.00	0.34
Sat Flow, veh/h	0	4654	651	3442	3632	0				3548	0	1583
Grp Volume(v), veh/h	0	1015	523	643	991	0				1255	0	397
Grp Sat Flow(s),veh/h/ln	0	1695	1748	1721	1770	0				1774	0	1583
Q Serve(g_s), s	0.0	29.1	29.1	17.7	16.3	0.0				34.0	0.0	21.8
Cycle Q Clear(g_c), s	0.0	29.1	29.1	17.7	16.3	0.0				34.0	0.0	21.8
Prop In Lane	0.00		0.37	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1061	547	768	2039	0				1217	0	543
V/C Ratio(X)	0.00	0.96	0.96	0.84	0.49	0.00				1.03	0.00	0.73
Avail Cap(c_a), veh/h	0	1061	547	799	2071	0				1217	0	543
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	33.4	33.4	36.8	12.4	0.0				32.6	0.0	28.5
Incr Delay (d2), s/veh	0.0	18.1	28.0	7.6	0.2	0.0				34.1	0.0	5.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.0	16.2	18.2	9.2	7.9	0.0				22.3	0.0	10.2
LnGrp Delay(d),s/veh	0.0	51.5	61.4	44.4	12.5	0.0				66.6	0.0	33.5
LnGrp LOS		D	E	D	B					F		C
Approach Vol, veh/h		1538			1634						1652	
Approach Delay, s/veh		54.9			25.1						58.7	
Approach LOS		D			C						E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	26.1	35.0		38.0		61.1		
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0		
Max Green Setting (Gmax), s	23.0	31.0		34.0		58.0		
Max Q Clear Time (g_c+I1), s	19.7	31.1		36.0		18.3		
Green Ext Time (p_c), s	2.4	0.0		0.0		11.6		

Intersection Summary	
HCM 2010 Ctrl Delay	46.1
HCM 2010 LOS	D

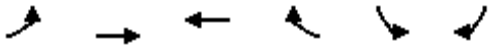
Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	501	1968	0	0	1077	1334	475	0	682	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	0	0	1863	1863	1900	1863	1863			
Adj Flow Rate, veh/h	527	2072	0	0	1134	909	500	0	560			
Adj No. of Lanes	1	2	0	0	3	2	0	1	2			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	520	2171	0	0	1356	743	497	0	780			
Arrive On Green	0.29	0.61	0.00	0.00	0.27	0.27	0.28	0.00	0.28			
Sat Flow, veh/h	1774	3632	0	0	5253	2787	1774	0	2787			
Grp Volume(v), veh/h	527	2072	0	0	1134	909	500	0	560			
Grp Sat Flow(s),veh/h/ln	1774	1770	0	0	1695	1393	1774	0	1393			
Q Serve(g_s), s	22.0	41.0	0.0	0.0	15.8	20.0	21.0	0.0	13.6			
Cycle Q Clear(g_c), s	22.0	41.0	0.0	0.0	15.8	20.0	21.0	0.0	13.6			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	520	2171	0	0	1356	743	497	0	780			
V/C Ratio(X)	1.01	0.95	0.00	0.00	0.84	1.22	1.01	0.00	0.72			
Avail Cap(c_a), veh/h	520	2171	0	0	1356	743	497	0	780			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	26.5	13.5	0.0	0.0	26.0	27.5	27.0	0.0	24.3			
Incr Delay (d2), s/veh	42.7	10.6	0.0	0.0	4.7	112.3	42.0	0.0	3.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(-26165%),veh/ln	16.9	22.8	0.0	0.0	7.9	19.2	16.0	0.0	5.6			
LnGrp Delay(d),s/veh	69.2	24.2	0.0	0.0	30.7	139.8	69.0	0.0	27.5			
LnGrp LOS	F	C			C	F	F		C			
Approach Vol, veh/h		2599			2043			1060				
Approach Delay, s/veh		33.3			79.2			47.1				
Approach LOS		C			E			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		50.0			26.0	24.0		25.0
Change Period (Y+Rc), s		4.0			4.0	4.0		4.0
Max Green Setting (Gmax), s		46.0			22.0	20.0		21.0
Max Q Clear Time (g_c+I1), s		43.0			24.0	22.0		23.0
Green Ext Time (p_c), s		3.0			0.0	0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	52.3
HCM 2010 LOS	D



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	135	2514	2321	93	36	90
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	142	2646	2443	98	38	95
Adj No. of Lanes	1	3	3	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	179	4025	3155	126	150	134
Arrive On Green	0.10	0.79	0.63	0.63	0.08	0.08
Sat Flow, veh/h	1774	5253	5185	200	1774	1583
Grp Volume(v), veh/h	142	2646	1645	896	38	95
Grp Sat Flow(s),veh/h/ln	1774	1695	1695	1827	1774	1583
Q Serve(g_s), s	5.0	14.6	22.6	23.0	1.3	3.8
Cycle Q Clear(g_c), s	5.0	14.6	22.6	23.0	1.3	3.8
Prop In Lane	1.00			0.11	1.00	1.00
Lane Grp Cap(c), veh/h	179	4025	2131	1149	150	134
V/C Ratio(X)	0.80	0.66	0.77	0.78	0.25	0.71
Avail Cap(c_a), veh/h	193	4025	2131	1149	440	393
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.3	2.9	8.6	8.7	27.6	28.7
Incr Delay (d2), s/veh	19.0	0.9	1.8	3.5	0.9	6.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	3.4	6.9	10.8	12.6	0.7	3.5
LnGrp Delay(d),s/veh	47.4	3.8	10.4	12.2	28.5	35.5
LnGrp LOS	D	A	B	B	C	D
Approach Vol, veh/h		2788	2541		133	
Approach Delay, s/veh		6.0	11.1		33.5	
Approach LOS		A	B		C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		55.0		9.4	10.5	44.5		
Change Period (Y+Rc), s		4.0		4.0	4.0	4.0		
Max Green Setting (Gmax), s		51.0		16.0	7.0	40.0		
Max Q Clear Time (g_c+I1), s		16.6		5.8	7.0	25.0		
Green Ext Time (p_c), s		34.1		0.2	0.0	14.9		

Intersection Summary	
HCM 2010 Ctrl Delay	9.0
HCM 2010 LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	390	2085	75	46	1935	358	115	25	75	194	35	365
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	411	2195	16	48	2037	145	121	26	77	204	37	152
Adj No. of Lanes	1	3	1	1	3	0	2	1	0	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	396	3177	989	119	2272	161	437	32	96	198	116	99
Arrive On Green	0.22	0.62	0.62	0.07	0.47	0.47	0.13	0.08	0.08	0.11	0.06	0.06
Sat Flow, veh/h	1774	5085	1583	1774	4849	343	3442	415	1230	1774	1863	1583
Grp Volume(v), veh/h	411	2195	16	48	1421	761	121	0	103	204	37	152
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1695	1802	1721	0	1646	1774	1863	1583
Q Serve(g_s), s	30.0	38.3	0.5	3.5	51.6	52.3	4.3	0.0	8.3	15.0	2.6	5.9
Cycle Q Clear(g_c), s	30.0	38.3	0.5	3.5	51.6	52.3	4.3	0.0	8.3	15.0	2.6	5.9
Prop In Lane	1.00		1.00	1.00		0.19	1.00		0.75	1.00		1.00
Lane Grp Cap(c), veh/h	396	3177	989	119	1588	844	437	0	128	198	116	99
V/C Ratio(X)	1.04	0.69	0.02	0.40	0.89	0.90	0.28	0.00	0.80	1.03	0.32	1.54
Avail Cap(c_a), veh/h	396	3177	989	119	1588	844	437	0	196	198	332	283
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.2	16.7	9.6	60.2	32.7	32.9	53.1	0.0	61.0	59.7	60.3	30.8
Incr Delay (d2), s/veh	55.6	1.3	0.0	2.2	8.2	14.7	0.3	0.0	12.9	72.3	1.6	255.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	20.7	18.3	0.2	1.8	25.9	29.5	2.1	0.0	4.2	11.3	1.4	10.4
LnGrp Delay(d),s/veh	107.8	17.9	9.6	62.4	40.9	47.6	53.5	0.0	73.9	132.2	61.9	286.3
LnGrp LOS	F	B	A	E	D	D	D		E	F	E	F
Approach Vol, veh/h		2622			2230			224			393	
Approach Delay, s/veh		32.0			43.6			62.8			185.1	
Approach LOS		C			D			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	88.0	21.1	12.4	34.0	67.0	19.0	14.5
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	9.0	84.0	7.0	24.0	30.0	63.0	15.0	16.0
Max Q Clear Time (g_c+I1), s	5.5	40.3	6.3	7.9	32.0	54.3	17.0	10.3
Green Ext Time (p_c), s	3.1	25.8	0.1	0.5	0.0	7.3	0.0	0.2

Intersection Summary	
HCM 2010 Ctrl Delay	49.0
HCM 2010 LOS	D