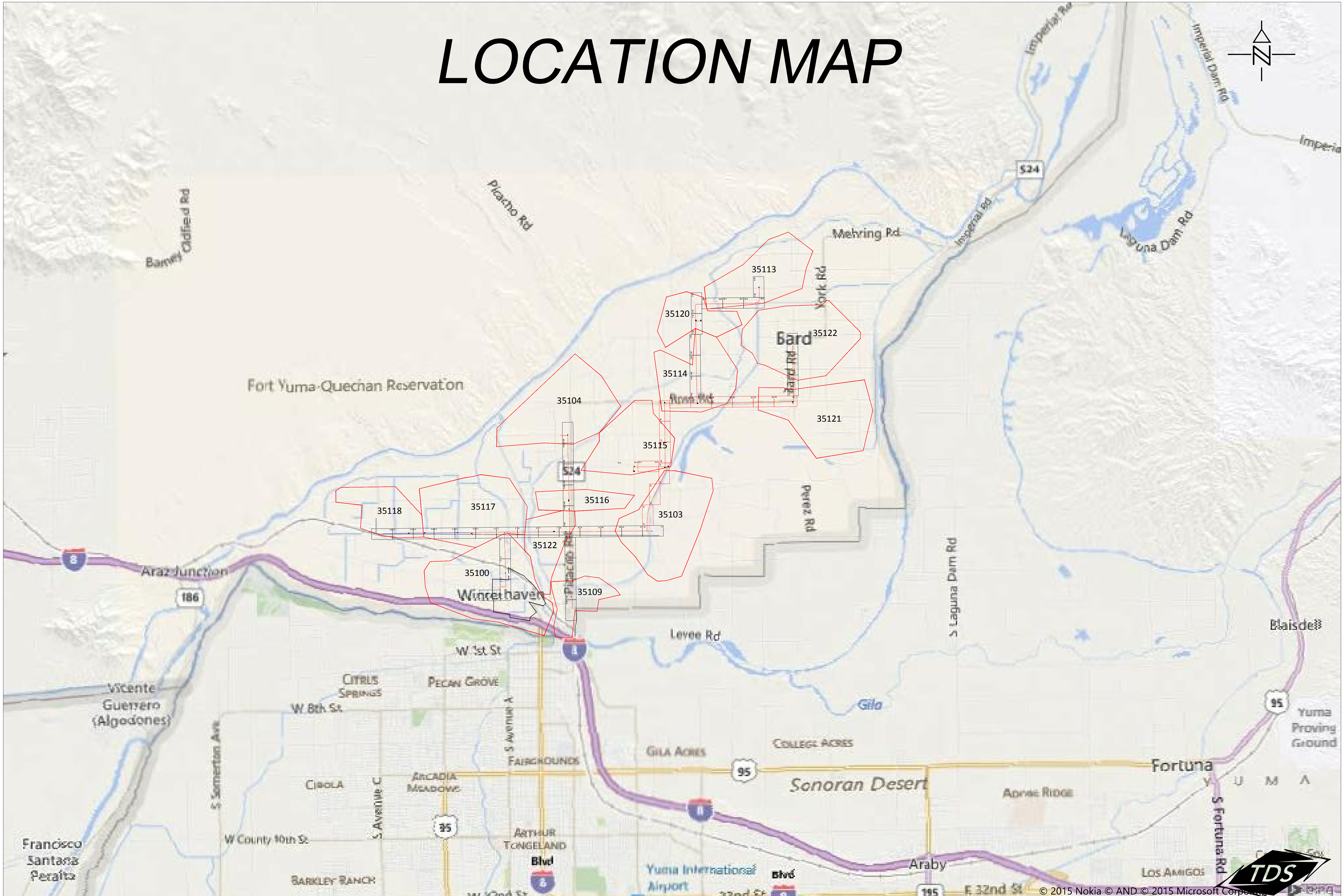
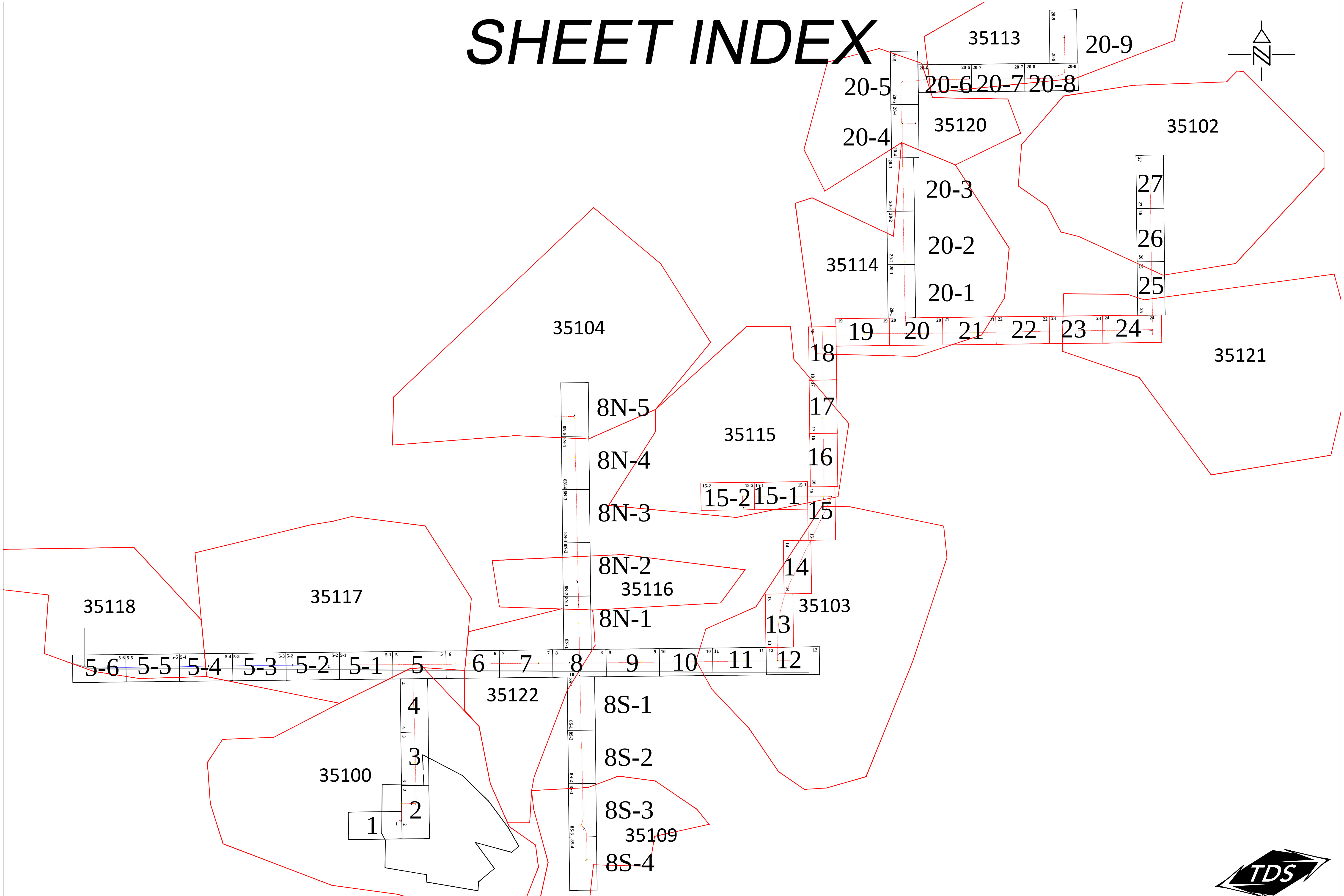
APPENDIX A. PROJECT PLANS

LOCATION MAP



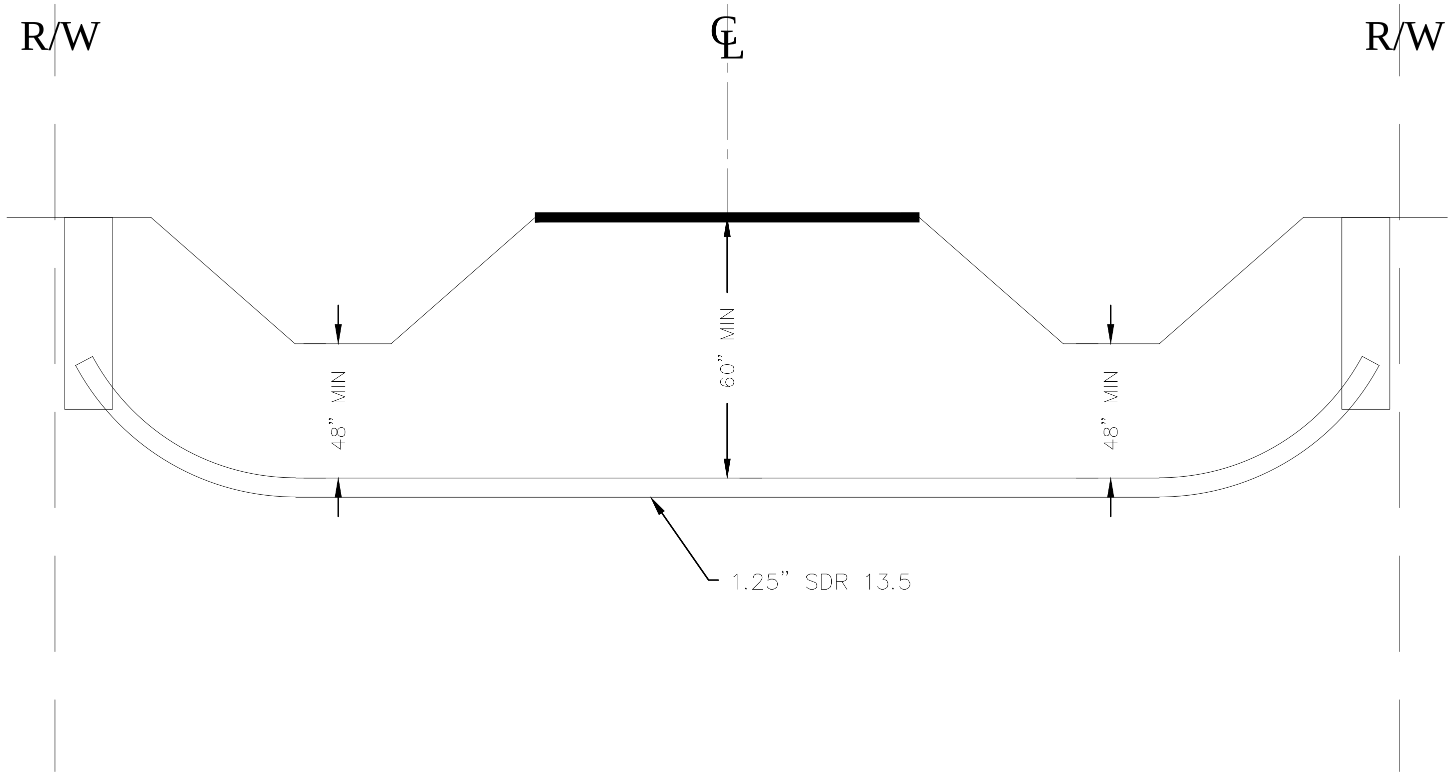
SHEET INDEX



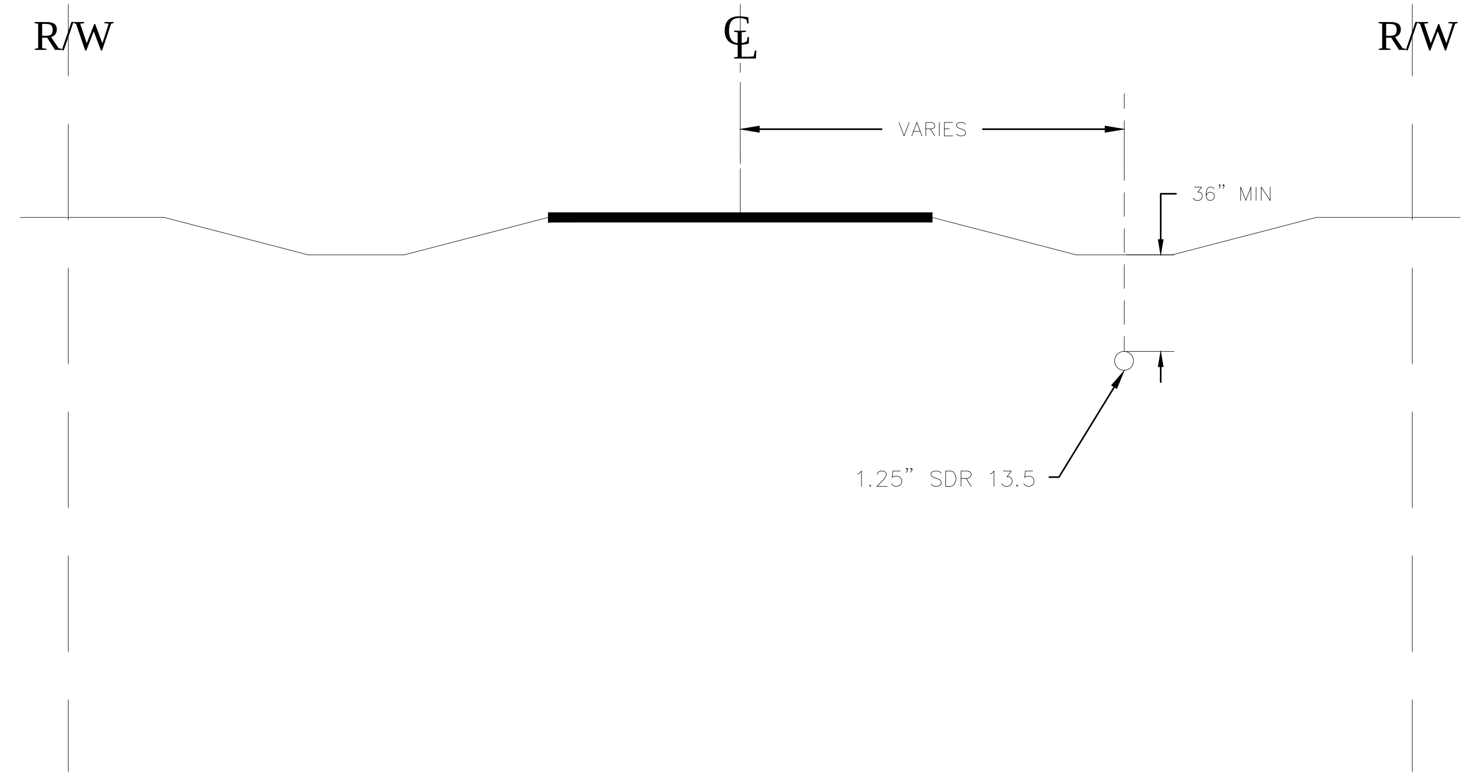
35113
20-9
20-5
20-6
20-7
20-8
35120
20-4
35102
20-3
27
20-2
26
35114
20-1
25
35104
19
20
21
22
23
24
18
35121
8N-5
17
35115
8N-4
16
15-2
15-1
8N-3
15
8N-2
14
35116
35118
35117
8N-1
35103
13
5-6
5-5
5-4
5-3
5-2
5-1
5
6
7
8
9
10
11
12
35122
4
8S-1
3
8S-2
35100
2
1
8S-3
35109
8S-4

PROJECT NO. 23325 | TEL. CO. TDS | EXCHANGE ALL | SERVING AREA ALL | ROUTE ALL

TYPICAL SECTIONS



TYPICAL BORE PROFILE



TYPICAL PARALLEL PROFILE

NOTES:

1. Crossing will be made utilizing directional bore methodology.
2. Depth to top of duct will be a minimum of forty-eight inches (48") below bottom of ditch
3. Depth to top of duct will be a minimum of sixty inches (60") below hard road surface, bottom of waterway or irrigation ditch.
4. Entry and Exit locations on each side of roadway will be dug down to depth of running line as required and care will be taken to return pits to original or better condition.

NOTES:

1. Minimum depth from ground to top of duct will be 36"
2. Placement shall be by directional bore, plow or trench methodology
3. When trenching or plowing, warning tape shall be placed 12" above top of duct
4. Running line shown on sheets subject to change due to location of existing utilities

NOT TO SCALE

PROJECT NO. 23325 | TEL. CO. TDS | EXCHANGE 351

RUNNING LINE = 3'
FROM EDGE PVMT
MIN DEPTH= 36"

ROUTE	DA
SHEET 1 OF 27	
EX. ROUTE	DA
MAP REF.	351002
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	WINTERHAVEN
TWN/RGE	16S / 22E
SEC.	21
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	
REV	
REV	
FILE:	

NOT TO SCALE

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

POLES / PEDS										CABLE					
POLE/ PED NO. TEL CO.	FOR CO.	BD / HA	BG / PG	LEAD ANGLE	POLE LENGTH CLASS	YEAR SET	YEAR REM	JOINT %	JOINT W/	BFO (96)	BFOIE (96)	BFOV (1)(1.25)			
0+00	CO									100					
0+64	MH										64				
TOTAL										100	64				

POLE/ PED NO. TEL CO.	POLE LINE & PED HARDWARE										CUST NO.		HBFO (96)		HO1			W UM
	BM2 (5/8)(8)	BM 21	BM 53	BM 61D														
0+00		1											1		96			1
0+64																		
TOTAL		1											1		96			1

PROJECT NO. 23325 TEL. CO. TDS EXCHANGE 351

ROUTE	DA
SHEET	2 OF 27
EX. ROUTE	DA
MAP REF.	351002
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	WINTERHAVEN
TWN/RGE	16S / 22E
SEC.	21
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	
REV	
REV	
FILE:	

RUNNING LINE = 3'- 6'
FROM EDGE PVMT
MIN DEPTH= 36"

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

NOT TO SCALE

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

TDS

POLES / PEDS										CABLE			POLE LINE & PED HARDWARE			
POLE/ PED NO. TEL CO.	FOR CO.	BD / HA	BG / PG	LEAD ANGLE	POLE LENGTH CLASS	YEAR SET	REM	JOINT %	W/	BFO (24)	BFOI (96)	BFOV (1)(1.25)	BM2 (5/8)(8)	BM 53	BM 61D	CUST NO.
0+64	SHT 1															
6+34	HH1	BH2									610	610		1	610	
11+12	HH2	BH2									512	512		1	512	
15+74	Lateral										496	496			496	
TOTAL		2									1618	1618		2	1618	

PROJECT NO. 23325 TEL. CO. TDS EXCHANGE 351

ROUTE HA

SHEET 3 OF 27

EX. ROUTE HA

MAP REF. 351011/351009

COUNTY: IMPERIAL

TOWNSHIP:

TAX DISTRICT:

MUNICIPALITY: WINTERHAVEN

TWN/RGE 16S / 22E

SEC. 21

STAKED BY FARR

DATE 01/14

DRAFTED BY FARR

DATE 10/14

W.O. TC-CA351ENG-001

REV

REV

REV

FILE:

ROAD 28+98

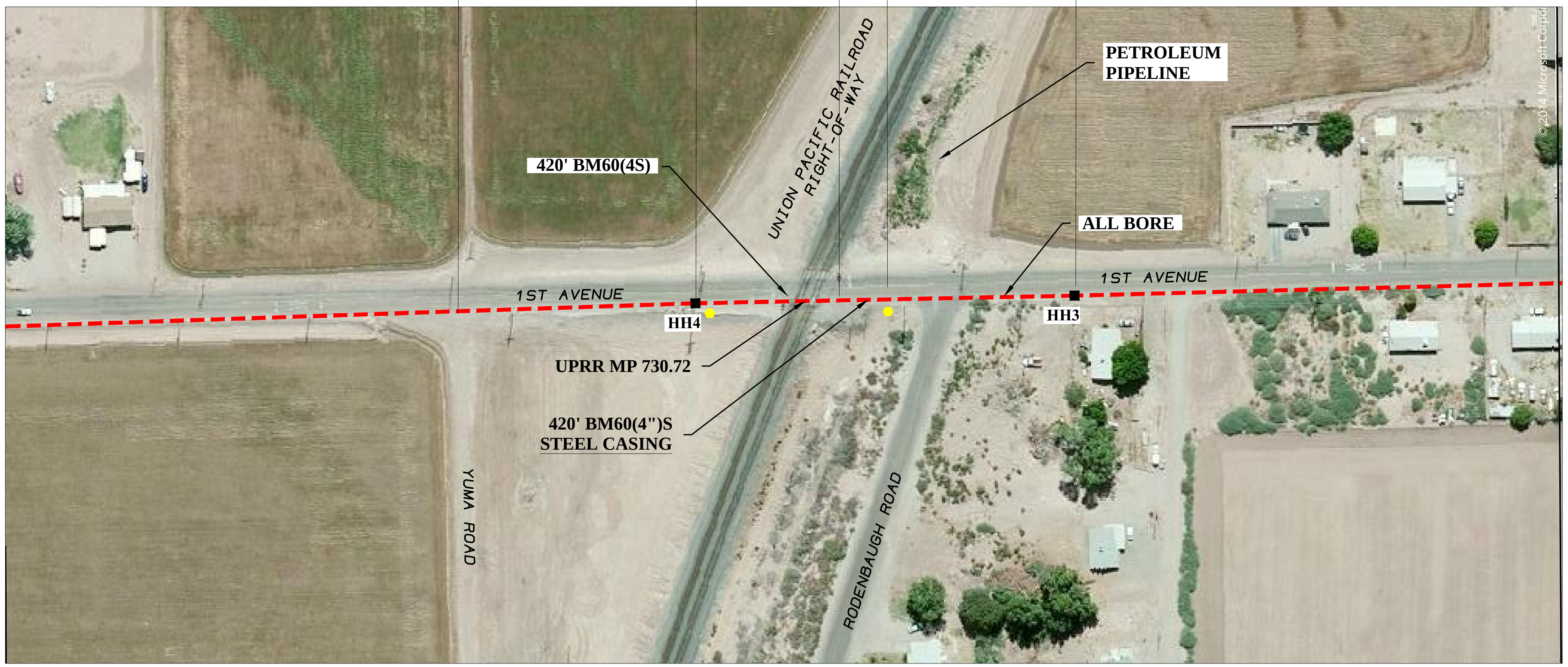
HH 26+34

MP 730.22 25+06

RR ROW 24+46

HH 22+14

KINDER-MORGAN
PETROLEUM PIPELINE
714-560-4411



SHEET 4

SHEET 2

RUNNING LINE = 6'
FROM EDGE PVMT
MIN DEPTH= 36"

*SEE RAILROAD PERMIT
EXHIBIT FOR DETAIL
FROM HH3 TO HH4

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

NOT TO SCALE

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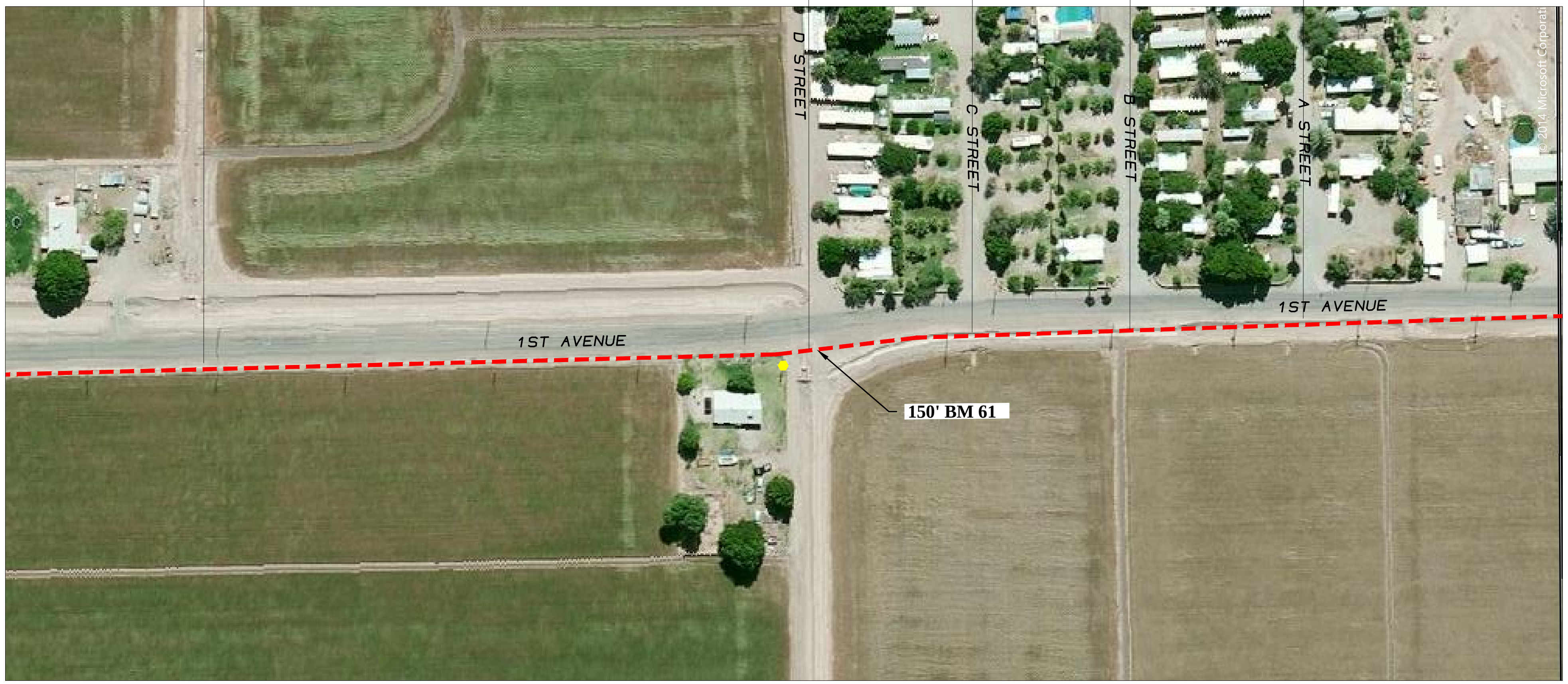
TDS

POLES / PEDS										CABLE					POLE LINE & PED HARDWARE					
POLE/ PED NO.		BD / HA	BG / PG	LEAD	POLE LENGTH CLASS	YEAR		JOINT												CUST NO.
TEL CO.	FOR CO.			ANGLE		SET	REM	%	W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)			BM2 (5/8)(8)	BM 55F	BM 61	BM 60(4")S		
15+74	SHT 2																			
22+14	HH3	BH2 / BD3								100	680	680			1		680			
26+34	HH4	BH2 / BD3								100	454	454			1	2		420		
28+98	ROAD										292	292								
TOTAL		2 / 2								200	1426	1426			2	2	680	420		

PROJECT NO. 23325 | TEL. CO. TDS | EXCHANGE 351

ROUTE HA
SHEET 4 OF 27
EX. ROUTE HA
MAP REF. 351009/351027
COUNTY: IMPERIAL
TOWNSHIP:
TAX DISTRICT:
MUNICIPALITY: WINTERHAVEN
TWN/RGE 16S / 22E
SEC. 21
STAKED BY FARR
DATE 01/14
DRAFTED BY FARR
DATE 10/14
W.O. TC-CA351ENG-001
REV
REV
REV
FILE:



RUNNING LINE = 6'
FROM EDGE PVMT
MIN DEPTH= 36"

NOT TO SCALE

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

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

POLES / PEDS										CABLE			POLE LINE & PED HARDWARE			
POLE/PED NO. TEL CO.	FOR CO.	BD / HA	BG / PG	LEAD ANGLE	POLE LENGTH CLASS	YEAR SET	YEAR REM	JOINT %	JOINT W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)	BM2 (5/8)(8)	BM 53	BM 61D	CUST NO.
28+98	SHT 3															
42+16	IRRIG										1358	1358		1	150	
48+82	IRRIG										706	706				
TOTAL											2064	2064		1	150	

PROJECT NO. 23325	TEL. CO. TDS	EXCHANGE 351	ROUTE HA/HC

SHEET 5 OF 27	
EX. ROUTE	HA/HC
MAP REF.	351027
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	WINTERHAVEN
TWN/RGE	16S / 22E
SEC.	21
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	
REV	
REV	
FILE:	

NOT TO SCALE

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

RUNNING LINE = 6'
FROM EDGE PVMT
MIN DEPTH= 36"

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

TDS

POLES / PEDS										CABLE						POLE LINE & PED HARDWARE																	
POLE/ PED NO. TEL CO.	POLE/ PED NO. FOR CO.	BD / HA	BG / PG	LEAD ANGLE	POLE LENGTH CLASS	YEAR SET	YEAR REM	JOINT %	JOINT W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)				BM2 (5/8)(8)	BM 53	BM 61D								CUST NO.			HBFO (96)	HO1			
48+82	SHT 4																																
55+84	HH6	BH4 / BD3								50	734	734				1	1	180											1	12			
56+52	IRRIG									50	82	82						160															
65+20	PP										894	894					1																
62+36	IRRIG										672	672					1	140															
TOTAL		1 / 1								100	2382	2382				1	3	480											1	12			

PROJECT NO. 23325	TEL. CO. TDS	EXCHANGE 351	ROUTE HA

SHEET	5-1 OF 27
EX. ROUTE	HA
MAP REF.	351023
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	WINTERHAVEN
TWN/RGE	16S / 22E
SEC.	21
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	
REV	
REV	
FILE:	

RUNNING LINE = 6'
FROM EDGE PVMT
MIN DEPTH= 36"

NOT TO SCALE

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

POLES / PEDS										CABLE						POLE LINE & PED HARDWARE			
POLE/ PED NO.		BD / HA	BG / PG	LEAD	POLE LENGTH CLASS	YEAR		JOINT											CUST NO.
TEL CO.	FOR CO.			ANGLE		SET	REM	%	W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)				BM2 (5/8)(8)	BM 53	BM 61D	
62+36	SHT 5																		
75+46	IRRIG																	160	
80+10	MATCH										1830	1830							
TOTAL											1830	1830						160	

PROJECT NO. 23325 TEL. CO. TDS EXCHANGE 351

ROUTE	HA
SHEET	5-2 OF 27
EX. ROUTE	HA
MAP REF.	351023
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	WINTERHAVEN
TWN/RGE	16S / 22E
SEC.	21
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	
REV	
REV	
FILE:	

RUNNING LINE = 6'
FROM EDGE PVMT
MIN DEPTH= 36"

NOT TO SCALE

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

POLES / PEDS — CABLE

POLE/PED NO. TEL CO.	POLE/PED NO. FOR CO.	BD / HA	BG / PG	LEAD ANGLE	POLE LENGTH CLASS	YEAR SET	YEAR REM	JOINT %	JOINT W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)	BFC 100–24		
80+10	MATCH														
82+54	ROAD														
82+54	DSA									50	540	540			
82+58	PH2A3												300		
TOTAL										50	540	540	300		

POLE LINE & PED HARDWARE

POLE/PED NO. TEL CO.	BM2 (5/8)(8)	BM 2C	BM 20	BM 53	BM 61D						CUST NO.			HBFO (96)	HO1	HC1		W BD
80+10																		
82+54				1	100													
82+54			1		230									1	6	100		
82+58		1														100		1
TOTAL		1	1	1	330									1	6	200		1

PROJECT NO. 23325	TEL. CO. TDS	EXCHANGE 351	ROUTE HA

SHEET	5-3 OF 27
EX. ROUTE	HA
MAP REF.	351023
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	WINTERHAVEN
TWN/RGE	16S / 22E
SEC.	21
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	
REV	
REV	
FILE:	

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

N

NOT TO SCALE

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TDS

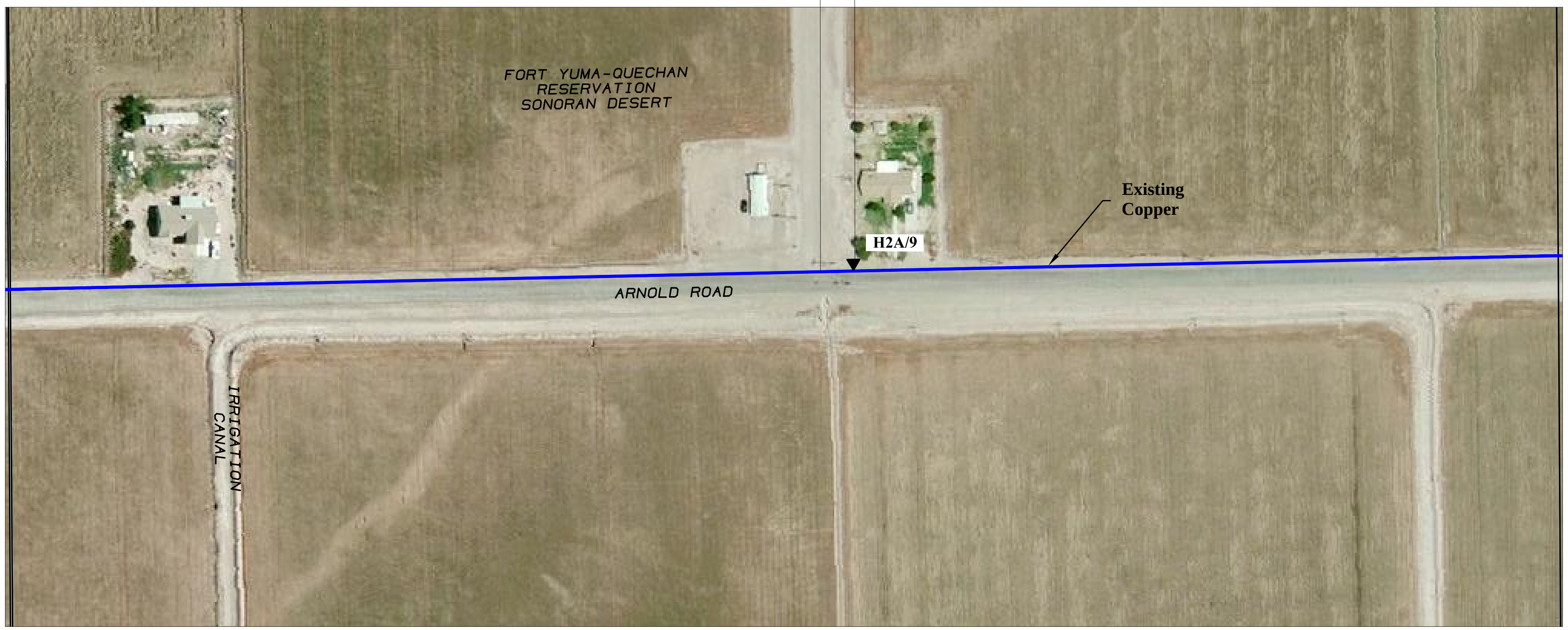
POLES / PEDS										CABLE						POLE LINE & PED HARDWARE																	
POLE/ PED NO. TEL CO.	POLE/ PED NO. FOR CO.	BD / HA	BG / PG	LEAD ANGLE	POLE LENGTH CLASS	YEAR SET	YEAR REM	JOINT %	JOINT W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)				BM2 (5/8)(8)	BM 53	BM 61D								CUST NO.							
TOTAL																																	

PROJECT NO. 23325 TEL. CO. TDS EXCHANGE 351

ROUTE	HA
SHEET	5-4 OF 27
EX. ROUTE	HA
MAP REF.	351023
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	WINTERHAVEN
TWN/RGE	16S / 22E
SEC.	21
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	
REV	
REV	
FILE:	

ROAD 122+02
PED 121+88

SHEET 5-5



SHEET 5-3

NOT TO SCALE

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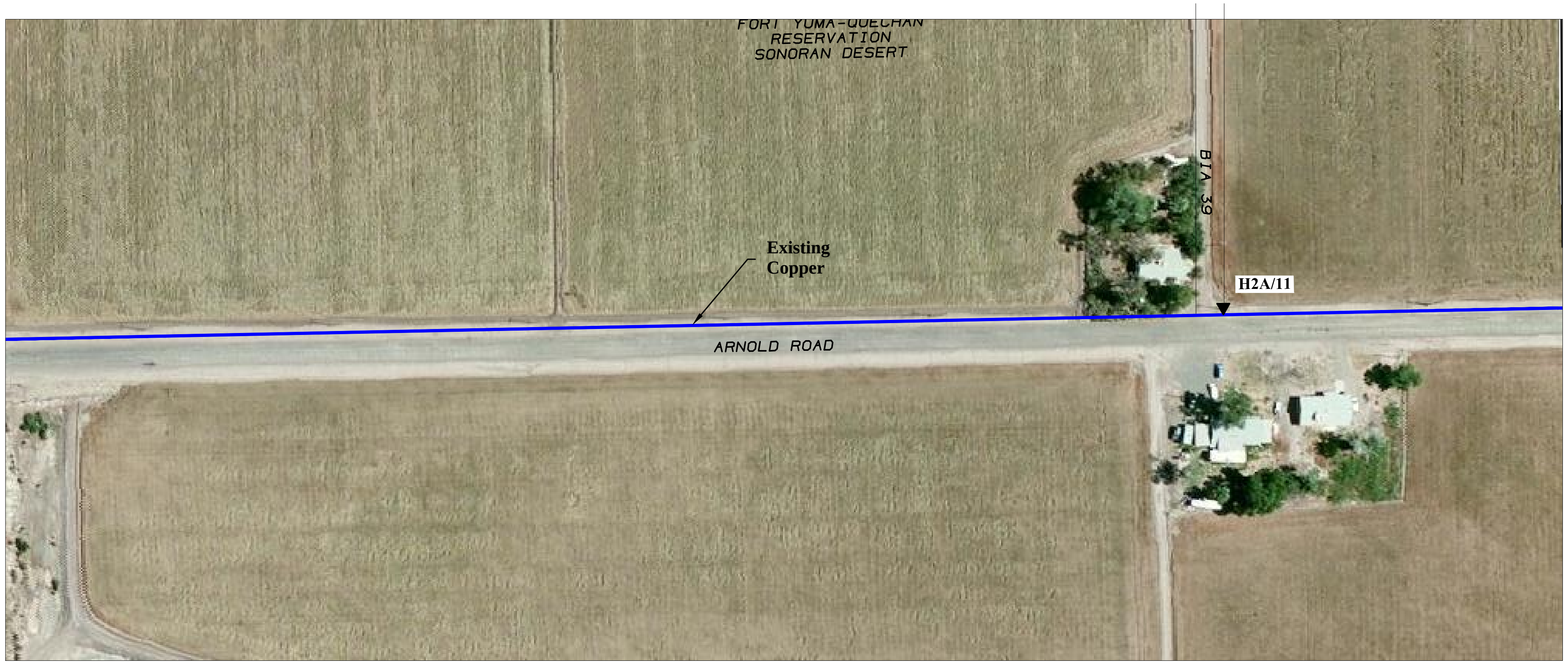
POLES / PEDS										CABLE						POLE LINE & PED HARDWARE																	
POLE/ PED NO.		BD / HA	BG / PG	LEAD	POLE LENGTH CLASS	YEAR		JOINT																		CUST NO.							
TEL CO.	FOR CO.			ANGLE		SET	REM	%	W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)				BM2 (5/8)(8)	BM 53	BM 61D															
TOTAL																																	

PROJECT NO. 23325 TEL. CO. TDS EXCHANGE 351

ROUTE	HA
SHEET 5-5 OF 27	
EX. ROUTE	HA
MAP REF.	351023
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	????
MUNICIPALITY:	WINTERHAVEN
TWN/RGE	16S / 22E
SEC.	21
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	
REV	
REV	
FILE:	

ROAD 134+90
PED 134+70

SHEET 5-6



SHEET 5-4

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

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POLES / PEDS										CABLE						POLE LINE & PED HARDWARE																	
POLE/ PED NO.		BD / HA	BG / PG	LEAD	POLE LENGTH CLASS	YEAR		JOINT																		CUST NO.							
TEL CO.	FOR CO.			ANGLE		SET	REM	%	W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)				BM2 (5/8)(8)	BM 53	BM 61D															
TOTAL																																	

PROJECT NO. 23325 TEL. CO. TDS EXCHANGE 351

ROUTE	HA
SHEET	5-6 OF 27
EX. ROUTE	HA
MAP REF.	351023
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	????
MUNICIPALITY:	WINTERHAVEN
TWN/RGE	16S / 22E
SEC.	21
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	
REV	
REV	
FILE:	

NOT TO SCALE

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

POLES / PEDS										CABLE			POLE LINE & PED HARDWARE				
POLE/ PED NO.		BD / HA	BG / PG	LEAD	POLE LENGTH CLASS	YEAR		JOINT									CUST NO.
TEL CO.	FOR CO.			ANGLE		SET	REM	%	W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)	BM2 (5/8)(8)	BM 53	BM 61D	BM 20	
155+98	DSA															1	
TOTAL																1	

PROJECT NO. 23325 | TEL. CO. TDS | EXCHANGE 351

ROUTE	HC/AL
SHEET	6 OF 27
EX. ROUTE	HC/AL
MAP REF.	351027
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	WINTERHAVEN
TWN/RGE	16S / 22E
SEC.	21
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	
REV	
REV	
FILE:	

RUNNING LINE = 6'
FROM EDGE PVMT
MIN DEPTH= 36"

NOT TO SCALE

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

POLES / PEDS										CABLE			POLE LINE & PED HARDWARE			
POLE/ PED NO. TEL CO.	FOR CO.	BD / HA	BG / PG	LEAD ANGLE	POLE LENGTH CLASS	YEAR SET	YEAR REM	JOINT %	JOINT W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)	BM2 (5/8)(8)	BM 53	BM 61D	CUST NO.
55+84	HH6															
84+00	MATCH										2900	2900		2	1160	
TOTAL											2900	2900		2	1160	

PROJECT NO. 23325 | TEL. CO. TDS | EXCHANGE 351

ROUTE	AL
SHEET 7 OF 27	
EX. ROUTE	AL
MAP REF.	351027
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	WINTERHAVEN
TWN/RGE	16S / 22E
SEC.	21
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	
REV	
REV	
FILE:	

IRRIG 90+02

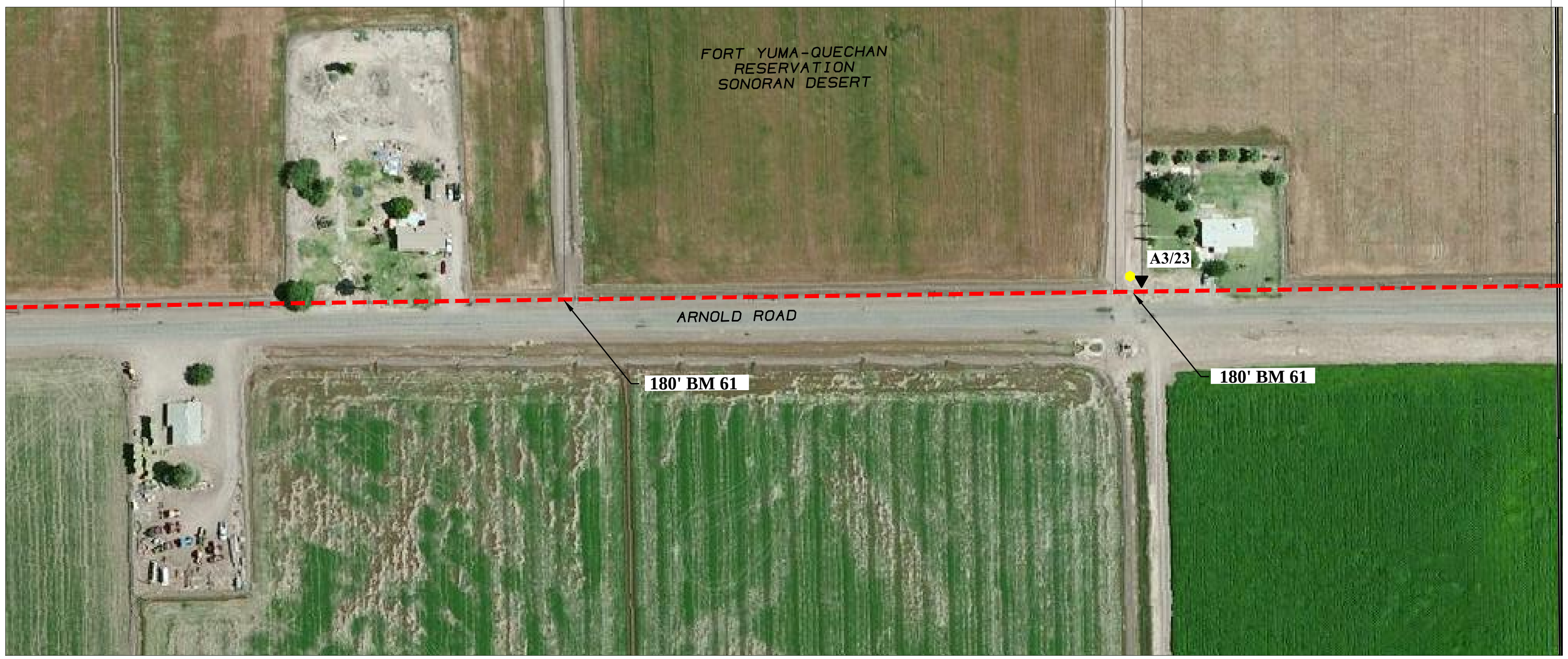
IRRIG 95+94

PED 96+12

MATCH 100+55

SHEET 6

SHEET 8



RUNNING LINE = 6'
FROM EDGE PVMT
MIN DEPTH= 36"

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

NOT TO SCALE

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TDS

POLES / PEDS											CABLE						POLE LINE & PED HARDWARE				
POLE/ PED NO.		BD / HA	BG / PG	LEAD	POLE LENGTH CLASS	YEAR		JOINT												CUST NO.	
TEL CO.	FOR CO.			ANGLE		SET	REM	%	W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)				BM2 (5/8)(8)	BM 53	BM 61D			
84+00	MATCH																				
90+02	IRRIG																	180			
95+94	IRRIG																1	180			
100+55	MATCH										1704	1704									
TOTAL											1704	1704					1	360			

PROJECT NO. 23325 | TEL. CO. TDS | EXCHANGE 351

ROUTE AL

SHEET 8 OF 27

EX. ROUTE AL

MAP REF. 351027

COUNTY: IMPERIAL

TOWNSHIP:

TAX DISTRICT:

MUNICIPALITY: WINTERHAVEN

TWN/RGE 16S / 22E

SEC. 21

STAKED BY FARR

DATE 01/14

DRAFTED BY FARR

DATE 10/14

W.O. TC-CA351ENG-001

REV

REV

REV

FILE:

NOT TO SCALE

RUNNING LINE = 6' FROM EDGE PVMT
MIN DEPTH= 36"

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

POLES / PEDS										CABLE					
POLE/ PED NO. TEL CO.	FOR CO.	BD / HA	BG / PG	LEAD ANGLE	POLE LENGTH CLASS	YEAR SET	REM	JOINT %	W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)	BFOV (3)(1.25)	BFC 400–24	
100+55	MATCH														
109+42	HH	BH4 / BD3								100 / 50	914	914			
111+26	DSA									50/50/50	190		190		
											190				
											190				
114+96	PA3J1													250	
109+68	ROAD														
117+76	MATCH										860	860			
TOTAL		1 / 1								300	2344	1774	190	250	

POLE/ PED NO. TEL CO.	POLE LINE & PED HARDWARE BM2 (5/8)(8)	BM 2C	BM 20	BM 53	BM 61D						CUST NO.			HBFO (96)	HO1	HC1		W BD
100+55					170													
109+42	1			1														
111+26			1											1	72	400		
114+96		1														400		1
109+68					80													
117+76					200													
TOTAL	1	1	1	1	630									1	72	800		1

PROJECT NO. 23325 TEL. CO. TDS EXCHANGE 351

ROUTE AJ

SHEET 8N-1 OF 27

EX. ROUTE AJ

MAP REF. 351027

COUNTY: IMPERIAL

TOWNSHIP:

TAX DISTRICT:

MUNICIPALITY: WINTERHAVEN

TWN/RGE 16S / 22E

SEC. 21

STAKED BY FARR

DATE 01/14

DRAFTED BY FARR

DATE 10/14

W.O. TC-CA351ENG-001

REV

REV

REV

FILE:

RUNNING LINE = 6'
FROM EDGE PVMT
MIN DEPTH= 36"

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

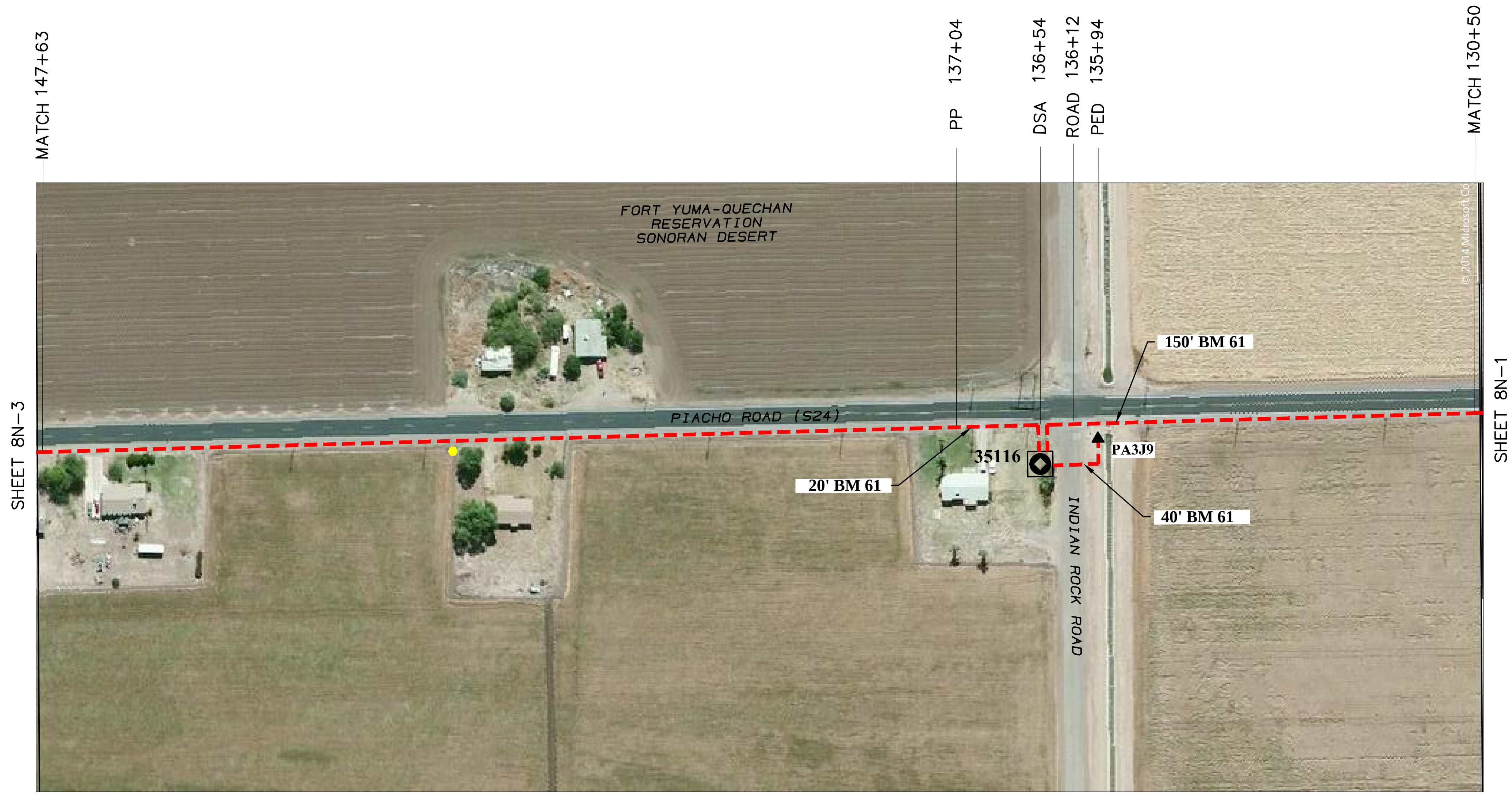
NOT TO SCALE

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

POLES / PEDS										CABLE						POLE LINE & PED HARDWARE				CUST NO.
POLE/ PED NO. TEL CO.	FOR CO.	BD / HA	BG / PG	LEAD ANGLE	POLE LENGTH CLASS	YEAR SET	REM	JOINT %	W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)				BM2 (5/8)(8)	BM 53	BM 61D	BM 73	
109+42	(HH)																			
130+50	MATCH										2172	2172					1			
TOTAL											2172	2172					1			

PROJECT NO. 23325 | TEL. CO. TDS | EXCHANGE 351

ROUTE	AJ
SHEET	8N-2 OF 27
EX. ROUTE	AJ
MAP REF.	351027
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	WINTERHAVEN
TWN/RGE	16S / 22E
SEC.	21
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	
REV	
REV	
FILE:	



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

RUNNING LINE = 6'
FROM EDGE PVMT
MIN DEPTH= 36"

NOT TO SCALE

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

POLES / PEDS										CABLE					
POLE/ PED NO.		BD / HA	BG / PG	LEAD	POLE LENGTH CLASS	YEAR		JOINT							
TEL CO.	FOR CO.			ANGLE		SET	REM	%	W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)	BFOV (2)(1.25)	BFC 100-24	
130+50	MATCH														
136+54	DSA									50 / 50	660	660			
135+94	PED													120	
137+04	PP										120		120		
147+63	MATCH										1090	1090			
TOTAL										100	1870	1750	120	120	

POLE/ PED NO.		POLE LINE & PED HARDWARE																	
TEL CO.	FOR CO.	BM2 (5/8)(8)	BM 2C	BM 20	BM 53	BM 61D						CUST NO.			HBFO (96)	HO1	HC1		W BD
130+50	MATCH					150													
136+54	DSA			1											1	6	100		
135+94	PED		1			40											100		1
137+04	PP					20													
147+63	MATCH				1														
TOTAL			1	1	1	210									1	6	200		1

PROJECT NO. 23325	TEL. CO. TDS	EXCHANGE 351	ROUTE AJ

SHEET	8N-3 OF 27
EX. ROUTE	AJ
MAP REF.	351026
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	WINTERHAVEN
TWN/RGE	16S / 22E
SEC.	21
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	
REV	
REV	
FILE:	

RUNNING LINE = 6'
FROM EDGE PVMT
MIN DEPTH= 36"

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

NOT TO SCALE

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

TDS

POLES / PEDS										CABLE			POLE LINE & PED HARDWARE			
POLE/ PED NO.		BD / HA	BG / PG	LEAD	POLE LENGTH CLASS	YEAR		JOINT								CUST NO.
TEL CO.	FOR CO.			ANGLE		SET	REM	%	W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)	BM2 (5/8)(8)	BM 53	BM 61D	
147+63	MATCH															
164+46	MATCH										1734	1734			150	
TOTAL											1734	1734			150	

PROJECT NO. 23325 | TEL. CO. TDS | EXCHANGE 351

ROUTE	AJ
SHEET	8N-4 OF 27
EX. ROUTE	AJ
MAP REF.	351026
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	WINTERHAVEN
TWN/RGE	16S / 22E
SEC.	21
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	
REV	
REV	
FILE:	

RUNNING LINE = 6'
FROM EDGE PVMT
MIN DEPTH= 36"

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

NOT TO SCALE

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

POLES / PEDS										CABLE			POLE LINE & PED HARDWARE			
POLE/ PED NO. TEL CO.	FOR CO.	BD / HA	BG / PG	LEAD ANGLE	POLE LENGTH CLASS	YEAR SET	REM	JOINT %	W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)	BM2 (5/8)(8)	BM 53	BM 61D	CUST NO.
164+46	MATCH															
														1	420	
181+72	MATCH										1780	1780				
TOTAL											1780	1780		1	420	

PROJECT NO. 23325 TEL. CO. TDS EXCHANGE 351

ROUTE	AJ/AK
SHEET	8N-5 OF 27
EX. ROUTE	AJ/AK
MAP REF.	351026
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	WINTERHAVEN
TWN/RGE	16S / 22E
SEC.	21
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	
REV	
REV	
FILE:	

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

NOT TO SCALE

RUNNING LINE = 6'
FROM EDGE PVMT
MIN DEPTH= 36"

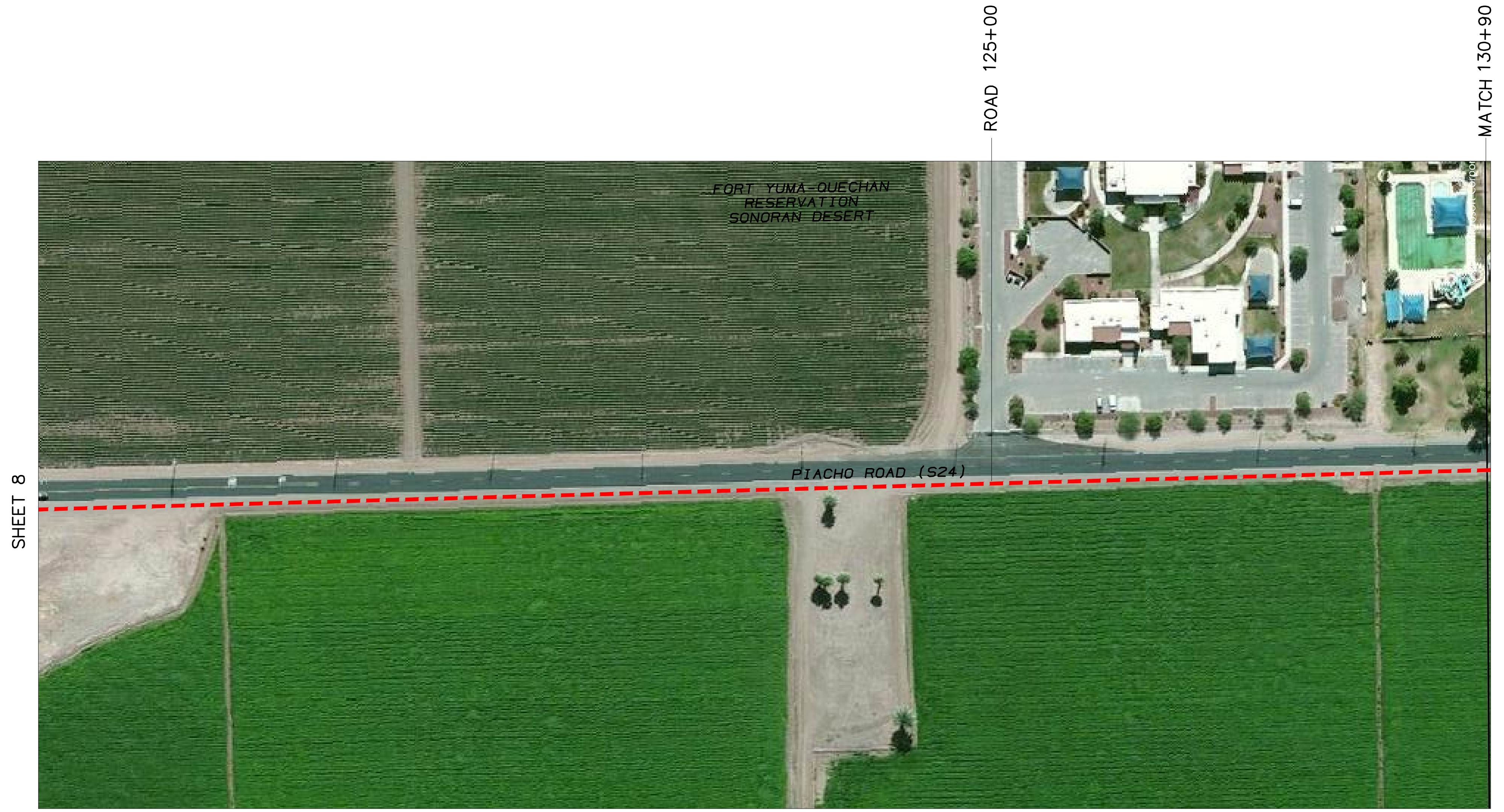
UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

TDS

POLES / PEDS										CABLE					
POLE/ PED NO. TEL CO.	FOR CO.	BD / HA	BG / PG	LEAD ANGLE	POLE LENGTH CLASS	YEAR SET	REM	JOINT %	W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)	BFC 100-24		
181+72	MATCH														
188+75	ROAD										724	724			
189+00	PED														
196+50	DSA									50	800	800	840		
TOTAL										50	1524	1524	840		

POLE/ PED NO. TEL CO.	BM2 (5/8)(8)	BM 2C	BM 20	BM 53F	BM 61D						CUST NO.			HBFO (96)	HO1	HC1		W BD
181+72																		
188+75				1	190													
																100		1
189+00		1																
196+50			1											1	6	100		
TOTAL		1	1	1	190									1	6	200		1

PROJECT NO. 23325	TEL. CO. TDS	EXCHANGE 351



RUNNING LINE = 6'
FROM EDGE PVMT
MIN DEPTH= 36"

ROUTE	AA
SHEET	8S-1 OF 27
EX. ROUTE	AA
MAP REF.	351010
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	WINTERHAVEN
TWN/RGE	16S / 22E
SEC.	21
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	
REV	
REV	
FILE:	

NOT TO SCALE

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

POLES / PEDS										CABLE			POLE LINE & PED HARDWARE			
POLE/ PED NO. TEL CO.	POLE/ PED NO. FOR CO.	BD / HA	BG / PG	LEAD ANGLE	POLE LENGTH CLASS	YEAR SET	YEAR REM	JOINT %	JOINT W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)	BM2 (5/8)(8)	BM 53	BM 61D	CUST NO.
111+26	(DSA)															
130+90	MATCH										2022	2022				
TOTAL											2022	2022				

PROJECT NO. 23325 | TEL. CO. TDS | EXCHANGE 351

ROUTE	AA/09-1000
SHEET	8S-2 OF 27
EX. ROUTE	AA/09-1000
MAP REF.	351012
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	WINTERHAVEN
TWN/RGE	16S / 22E
SEC.	21
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	
REV	
REV	
FILE:	

RUNNING LINE = 6'
FROM EDGE PVMT
MIN DEPTH= 36"

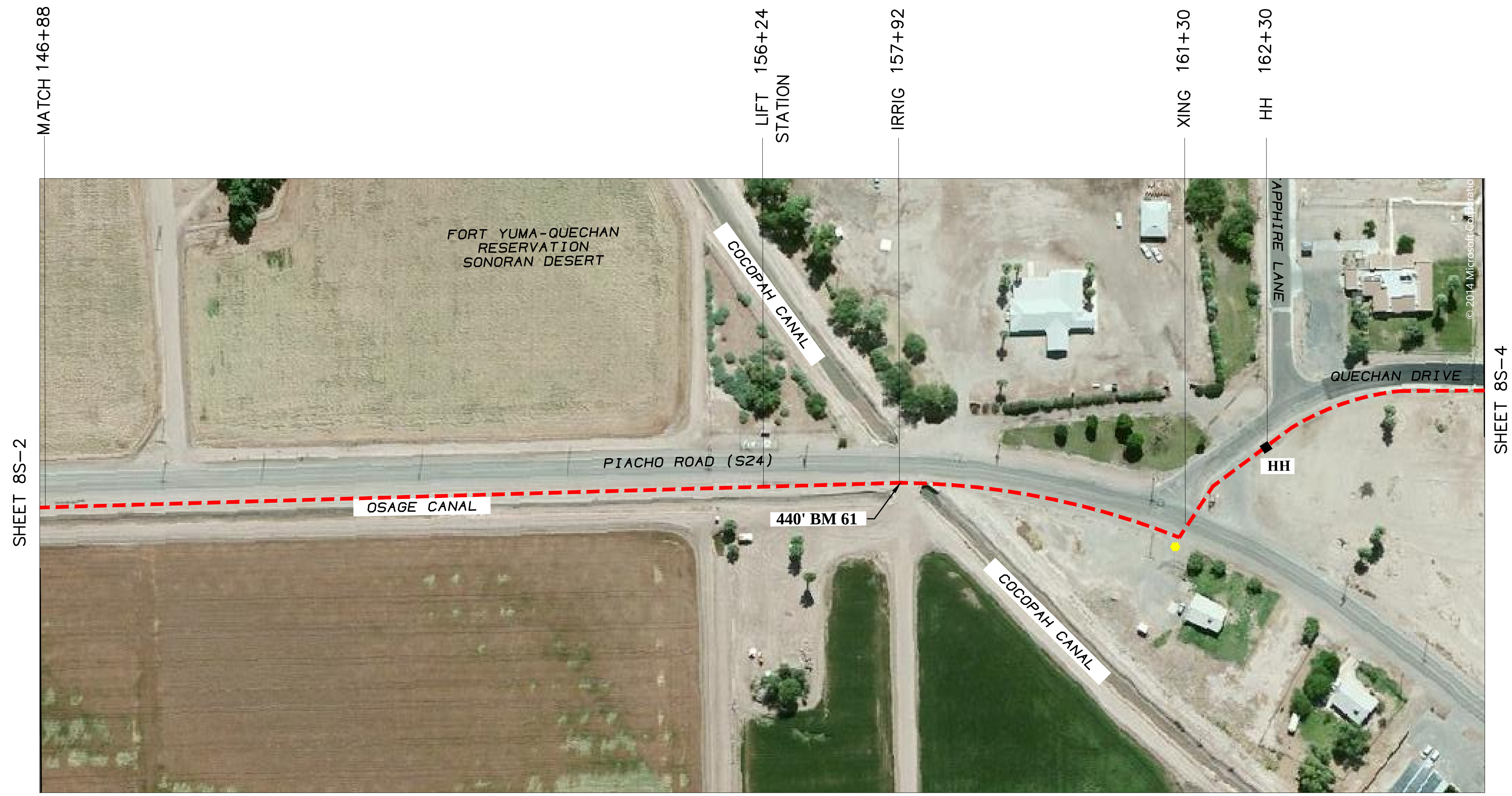
NOT TO SCALE

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

POLES / PEDS										CABLE						POLE LINE & PED HARDWARE											
POLE/ PED NO.		BD / HA	BG / PG	LEAD	POLE LENGTH CLASS	YEAR		JOINT																			CUST NO.
TEL CO.	FOR CO.			ANGLE		SET	REM	%	W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)				BM2 (5/8)(8)	BM 53	BM 61D									
130+90	MATCH																										
146+88	MATCH										1646	1646					1										
TOTAL											1646	1646					1										

PROJECT NO. 23325 | TEL. CO. TDS | EXCHANGE 351

ROUTE	09-1000
SHEET	8S-3 OF 27
EX. ROUTE	09-1000
MAP REF.	351006
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	WINTERHAVEN
TWN/RGE	16S / 22E
SEC.	21
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	
REV	
REV	
FILE:	



RUNNING LINE = 6'
FROM EDGE PVMT
MIN DEPTH= 36"

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

NOT TO SCALE

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

TDS

POLES / PEDS										CABLE			POLE LINE & PED HARDWARE			
POLE/ PED NO.		BD / HA	BG / PG	LEAD	POLE LENGTH CLASS	YEAR		JOINT								CUST NO.
TEL CO.	FOR CO.			ANGLE		SET	REM	%	W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)	BM2 (5/8)(8)	BM 53	BM 61D	
146+88	MATCH															
162+30	HH	BH2 / BD3								100	1590	1590	1	1	440	
TOTAL		1 / 1								100	1590	1590	1	1	440	

PROJECT NO. 23325	TEL. CO. TDS	EXCHANGE 351	ROUTE 09-1000

SHEET	8S-4 OF 27
EX. ROUTE	09-1000
MAP REF.	351006
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	WINTERHAVEN
TWN/RGE	16S / 22E
SEC.	21
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	
REV	
REV	
FILE:	

RUNNING LINE = 2'
FROM BACK OF WALK
MIN DEPTH= 36"

NOT TO SCALE

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

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

TDS

POLES / PEDS — CABLE

POLE/PED NO. TEL CO.	POLE/PED NO. FOR CO.	BD / HA	BG / PG	LEAD ANGLE	POLE LENGTH CLASS	YEAR SET	YEAR REM	JOINT %	JOINT W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)	BFOV (2)(2)		
162+30	(HH)														
162+30	HH	BH4								50	1188	1188			
DSA										50	60	60	60		
TOTAL		1								100	1248	1248	60		

POLE LINE & PED HARDWARE

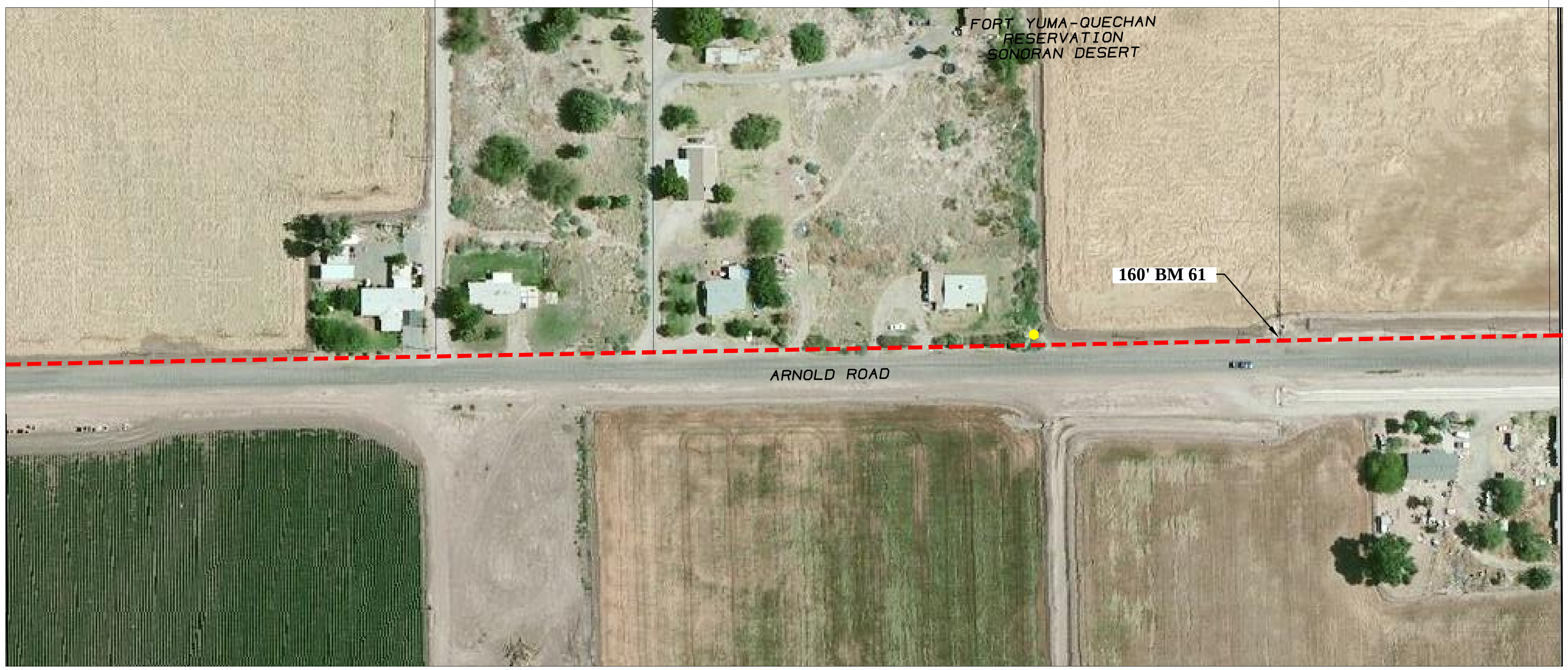
POLE/PED NO. TEL CO.	BM2 (5/8)(8)	BM 20	BM 53	BM 61D							CUST NO.			HBFO (96)	HO1			
162+30																		
162+30																		
			1	100														
DSA		1		60										1	6			
TOTAL		1	1	160										1	6			

PROJECT NO. 23325 TEL. CO. TDS EXCHANGE 351

ROUTE	AA
SHEET 9 OF 27	
EX. ROUTE	AA
MAP REF.	351027
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	WINTERHAVEN
TWN/RGE	16S / 22E
SEC.	21
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	
REV	
REV	
FILE:	

ROAD 122+80
ROAD 125+02
IRRIG 131+88
MATCH 135+06

SHEET 8



SHEET 10

RUNNING LINE = 6'
FROM EDGE PVMT
MIN DEPTH= 36"

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

NOT TO SCALE

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

POLES / PEDS										CABLE						POLE LINE & PED HARDWARE			
POLE/ PED NO. TEL CO.	FOR CO.	BD / HA	BG / PG	LEAD ANGLE	POLE LENGTH CLASS	YEAR SET	YEAR REM	JOINT %	JOINT W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)				BM2 (5/8)(8)	BM 53	BM 61D	CUST NO.
109+42	(HH)																		
135+06	MATCH										2640	2640					1	160	
TOTAL											2640	2640					1	160	

PROJECT NO. 23325 | TEL. CO. TDS | EXCHANGE 351

ROUTE	AA
SHEET	10 OF 27
EX. ROUTE	AA
MAP REF.	351031
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	WINTERHAVEN
TWN/RGE	16S / 22E
SEC.	21
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	
REV	
REV	
FILE:	

NOT TO SCALE

RUNNING LINE = 6'
FROM EDGE PVMT
MIN DEPTH= 36"

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

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

POLES / PEDS

POLE/PED NO. TEL CO.	POLE/PED NO. FOR CO.	BD / HA	BG / PG	LEAD ANGLE	POLE LENGTH CLASS	YEAR SET	YEAR REM	JOINT %	JOINT W/
135+06	MATCH								
152+04	MATCH								
TOTAL									

CABLE

	BFO (96)	BFOI (96)	BFOV (1)(1.25)			
135+06						
152+04		1748	1748			
TOTAL		1748	1748			

POLE LINE & PED HARDWARE

	BM2 (5/8)(8)	BM 53	BM 61D	CUST NO.
135+06				
152+04			160	
TOTAL			160	

PROJECT NO. 23325 | TEL. CO. TDS | EXCHANGE 351

ROUTE	AA
SHEET	11 OF 27
EX. ROUTE	AA
MAP REF.	351031
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	WINTERHAVEN
TWN/RGE	16S / 22E & 23E
SEC.	24/19
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	02/15
REV	
REV	
FILE:	

MATCH 152+04

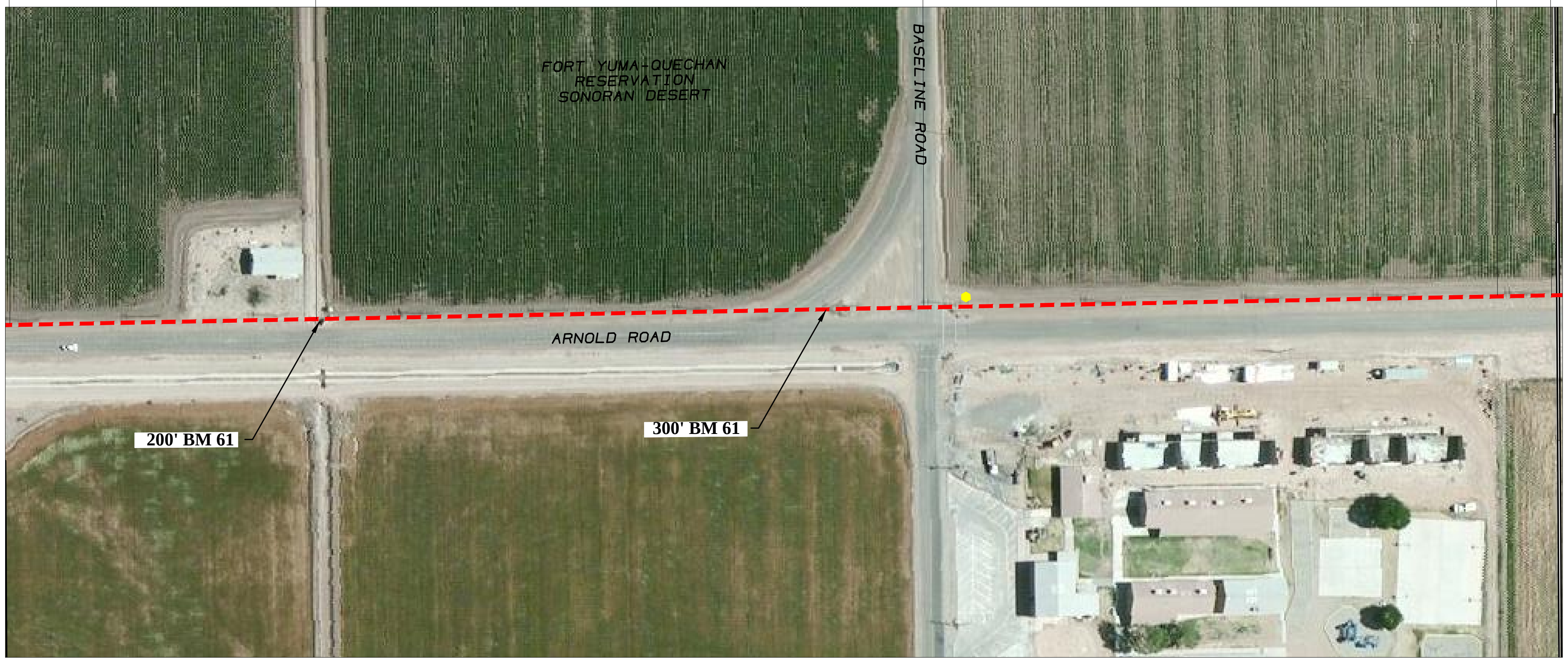
IRRIG 155+64

ROAD 162+38

162+66

MATCH 169+04

SHEET 10



SHEET 12

RUNNING LINE = 6'
FROM EDGE PVMT
MIN DEPTH= 36"

NOT TO SCALE

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

POLES / PEDS										CABLE			POLE LINE & PED HARDWARE						
POLE/ PED NO. TEL CO.	FOR CO.	BD / HA	BG / PG	LEAD ANGLE	POLE LENGTH CLASS	YEAR SET	YEAR REM	JOINT %	JOINT W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)	BM2 (5/8)(8)	BM 53	BM 61D	CUST NO.	HBFO (96)	HO1	
152+04	MATCH																		
															200				
169+04	MATCH										1752	1752		1	300				
TOTAL											1752	1752		1	500				

PROJECT NO. 23325 | TEL. CO. TDS | EXCHANGE 351

ROUTE	AA
SHEET	12 OF 27
EX. ROUTE	AA
MAP REF.	351048
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	WINTERHAVEN
TWN/RGE	16S / 23E
SEC.	19
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	02/15
REV	
REV	
FILE:	

RUNNING LINE:
Arnold Road = 6' FROM EDGE PVMT
Cocopah Road = 3' East of Power Poles
MIN DEPTH= 36"

NOT TO SCALE

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

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

POLES / PEDS: POLE/PED NO. TEL CO.	FOR CO.	BD / HA	BG / PG	LEAD ANGLE	POLE LENGTH CLASS	YEAR SET	YEAR REM	JOINT %	JOINT W/	CABLE: BFO (96)	BFOI (96)	BFOV (1)(1.25)	POLE LINE & PED HARDWARE: BM2 (5/8)(8)	BM 20	BM 53	BM 61D	CUST NO.	HBFO (96)	HO1
169+04	MATCH																		
																160		1	6
172+80	HH 8	BH4 / BD3								50/50/50	390	390	1		1				
177+24	DSA									50	520	520		1		50		1	6
177+34	EX. DSA											12							
177+19	MATCH										452	152							
TOTAL		1 / 1								200	1362	1362	1	1	1	210		2	8

PROJECT NO. 23325 | TEL. CO. TDS | EXCHANGE 351

ROUTE AA

SHEET 13 OF 27

EX. ROUTE AA

MAP REF. 351031

COUNTY: IMPERIAL

TOWNSHIP:

TAX DISTRICT:

MUNICIPALITY: WINTERHAVEN

TWN/RGE 16S / 23E

SEC. 19

STAKED BY FARR

DATE 01/14

DRAFTED BY FARR

DATE 10/14

W.O. TC-CA351ENG-001

REV 02/15

REV

REV

FILE:

MATCH 194+60

MATCH 177+19

SHEET 14

SHEET 12

NOT TO SCALE

RUNNING LINE = 3' EAST OF POWER POLES
MIN DEPTH= 36"

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

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

POLES / PEDS										CABLE						POLE LINE & PED HARDWARE																	
POLE/PED NO. TEL CO.	POLE/PED NO. FOR CO.	BD / HA	BG / PG	LEAD ANGLE	POLE LENGTH CLASS	YEAR SET	YEAR REM	JOINT %	JOINT W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)				BM2 (5/8)(8)	BM 53	BM 61D								CUST NO.							
177+19	MATCH																																
194+60	MATCH										1796	1796					1																
TOTAL											1796	1796					1																

PROJECT NO. 23325 TEL. CO. TDS EXCHANGE 351

ROUTE	AA
SHEET	14 OF 27
EX. ROUTE	AA
MAP REF.	351031
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	WINTERHAVEN
TWN/RGE	16S / 23E
SEC.	19
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	02/15
REV	
REV	
FILE:	

MATCH 213+69

MATCH 194+60

SHEET 15

SHEET 13

NOT TO SCALE

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

RUNNING LINE = 3' EAST OF POWER POLES
MIN DEPTH= 36"

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

POLES / PEDS										CABLE						POLE LINE & PED HARDWARE			
POLE/ PED NO.		BD / HA	BG / PG	LEAD	POLE LENGTH CLASS	YEAR		JOINT											CUST NO.
TEL CO.	FOR CO.			ANGLE		SET	REM	%	W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)				BM2 (5/8)(8)	BM 53	BM 61D	
194+60	MATCH																		
213+69	MATCH										1970	1970					1		
TOTAL											1970	1970					1		

PROJECT NO. 23325 | TEL. CO. TDS | EXCHANGE 351 | ROUTE AA

SHEET 15 OF 27
EX. ROUTE AA
MAP REF. 351030
COUNTY: IMPERIAL
TOWNSHIP:
TAX DISTRICT:
MUNICIPALITY: WINTERHAVEN
TWN/RGE 16S / 23E
SEC. 18
STAKED BY FARR
DATE 01/14
DRAFTED BY FARR
DATE 10/14
W.O. TC-CA351ENG-001
REV 02/15
REV
REV
FILE:

MATCH 235+08

HH9 229+21

BORE 228+87

BORE 215+96

MATCH 213+69

SHEET 16

231+92 HH10

SHEET 14

236+94 MATCH

SHEET 15-1

NOT TO SCALE

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

RUNNING LINE:
COCOPAH ROAD = 3' EAST OF POWER POLES
HAUGHTELIN ROAD = 3' SOUTH OF POWER POLES
PEREZ ROAD = 3' EAST OF POWER POLES
MIN DEPTH= 36"

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

TDS

POLES / PEDS										CABLE			POLE LINE & PED HARDWARE					
POLE/ PED NO. TEL CO.	FOR CO.	BD / HA	BG / PG	LEAD ANGLE	POLE LENGTH CLASS	YEAR SET	YEAR REM	JOINT %	JOINT W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)	BM2 (5/8)(8)	BM 53	BM 61D	CUST NO.	HBFO (96)	HO1
231+69	MATCH																	
															80			
229+21	HH9	BH4 / BD3								100	1600	1600	1	1	80			
231+92	HH10	BH4 / BD3								100/50	280	280	1	1			1	6
235+08	MATCH										330	330						
236+94	MATCH										520	520						
TOTAL		2 / 2								250	2730	2730	2	2	160		1	6

PROJECT NO. 23325 TEL. CO. TDS EXCHANGE 351

ROUTE	AF
SHEET	15-1 OF 27
EX. ROUTE	AF
MAP REF.	351030
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	WINTERHAVEN
TWN/RGE	16S / 23E
SEC.	18
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	02/15
REV	
REV	
FILE:	

MATCH 236+94

BORE IRR 245+00

MATCH 236+94

SHEET 15-2

SHEET 15

RUNNING LINE:
3' SOUTH OF POWER POLES TO YARD,
THEN TRANSITION TO 3' NORTH OF IRRIGATION BERM
MIN DEPTH= 36"

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

NOT TO SCALE

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

TDS

POLES / PEDS										CABLE						POLE LINE & PED HARDWARE																	
POLE/ PED NO. TEL CO.	FOR CO.	BD / HA	BG / PG	LEAD ANGLE	POLE LENGTH CLASS	YEAR SET	YEAR REM	JOINT %	JOINT W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)				BM2 (5/8)(8)	BM 53	BM 61D								CUST NO.			HBFO (96)	H01			
236+94	MATCH																																
254+07	MATCH										1800	1800						80															
TOTAL											1800	1800						80															

PROJECT NO. 23325 | TEL. CO. TDS | EXCHANGE 351

ROUTE AA
SHEET 15-2 OF 27
EX. ROUTE AA
MAP REF. 351030
COUNTY: IMPERIAL
TOWNSHIP:
TAX DISTRICT:
MUNICIPALITY: WINTERHAVEN
TWN/RGE 16S / 23E
SEC. 18
STAKED BY FARR
DATE 01/14
DRAFTED BY FARR
DATE 10/14
W.O. TC-CA351ENG-001
REV 02/15
REV
REV
FILE:

HH10-1 257+89

MATCH 254+07

SHEET 15-1

DSA 260+86

NOT TO SCALE

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

RUNNING LINE:
HAUGHTELIN ROAD: 3' NORTH OF IRRIGATION BERM
BASELINE ROAD: 3' WEST OF POWER POLES
MIN DEPTH= 36"

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

POLES / PEDS										CABLE						POLE LINE & PED HARDWARE																	
POLE/ PED NO. TEL CO.	POLE/ PED NO. FOR CO.	BD / HA	BG / PG	LEAD ANGLE	POLE LENGTH CLASS	YEAR SET	YEAR REM	JOINT %	JOINT W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)	BFC 150-24			BM2 (5/8)(8)	BM 20	BM 53	BM 61D							CUST NO.			HBFO (96)	HO1	HC1		WBD
254+07	MATCH																																
257+89	HH10-1	BH4 / BD3								100	440	440				1		1															
260+86	DSA									50	380	380					1		100										1	6	150		
	A5F7												30																		150		1
TOTAL		1 / 1								150	820	820	30			1	1	1	100										1	6	300		1

PROJECT NO. 23325	TEL. CO. TDS	EXCHANGE 351	ROUTE N/A

SHEET 16 OF 27	
EX. ROUTE	N/A
MAP REF.	351030
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	WINTERHAVEN
TWN/RGE	16S / 23E
SEC.	18
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	02/15
REV	
REV	
FILE:	

MATCCH 252+21

MATCCH 235+08

SHEET 17

SHEET 15

NOT TO SCALE

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

RUNNING LINE = 3' EAST OF POWER POLES
MIN DEPTH= 36"

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

TDS

POLES / PEDS										CABLE						POLE LINE & PED HARDWARE			
POLE/ PED NO. TEL CO.	FOR CO.	BD / HA	BG / PG	LEAD ANGLE	POLE LENGTH CLASS	YEAR SET	YEAR REM	JOINT %	JOINT W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)				BM2 (5/8)(8)	BM 53	BM 61D	CUST NO.
235+08	MATCH																		
252+21	MATCH										1764	1764					1		
TOTAL											1764	1764					1		

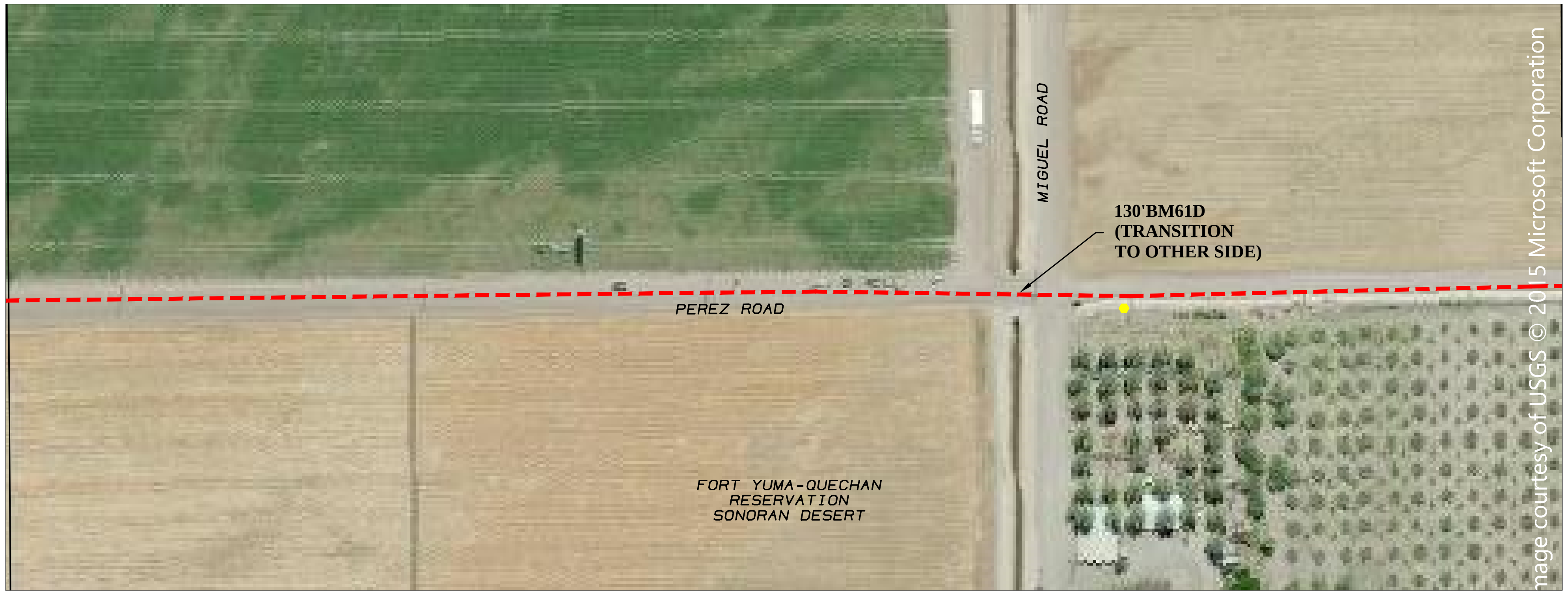
PROJECT NO. 23325 | TEL. CO. TDS | EXCHANGE 351

ROUTE	N/A
SHEET	17 OF 27
EX. ROUTE	N/A
MAP REF.	351030/35129
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	WINTERHAVEN
TWN/RGE	16S / 23E
SEC.	18
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	02/15
REV	
REV	
FILE:	

MATCH 269+33

MATCH 252+21

SHEET 18



SHEET 16

NOT TO SCALE

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

RUNNING LINE:
SOUTH OF MIGUEL ROAD = 3' EAST OF POWER POLES
NORTH OF MIGUEL ROAD = 3' NORTH OF POWER POLES
MIN DEPTH= 36"

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

TDS

POLES / PEDS										CABLE						POLE LINE & PED HARDWARE			
POLE/ PED NO.		BD / HA	BG / PG	LEAD	POLE LENGTH CLASS	YEAR		JOINT											CUST NO.
TEL CO.	FOR CO.			ANGLE		SET	REM	%	W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)				BM2 (5/8)(8)	BM 53	BM 61D	
252+21	MATCH																		
269+33	MATCH										1780	1780					1	130	
TOTAL											1780	1780					1	130	

PROJECT NO. 23325 | TEL. CO. TDS | EXCHANGE 351

ROUTE	AB
SHEET	18 OF 27
EX. ROUTE	AB
MAP REF.	351029
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	WINTERHAVEN
TWN/RGE	16S / 23E
SEC.	7
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	02/15
REV	
REV	
FILE:	

HH 284+13

288+44 MATCH

SHEET 19

SHEET 17

NOT TO SCALE

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

RUNNING LINE:
PEREZ ROAD = 3' WEST OF POWER POLES
ROSS ROAD = 6' FROM EDGE PVMT
MIN DEPTH= 36"

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

TDS

POLES / PEDS										CABLE			POLE LINE & PED HARDWARE			
POLE/ PED NO. TEL CO.	FOR CO.	BD / HA	BG / PG	LEAD ANGLE	POLE LENGTH CLASS	YEAR SET	YEAR REM	JOINT %	JOINT W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)	BM2 (5/8)(8)	BM 53	BM 61D	CUST NO.
269+33	MATCH															
284+13	HH11	BH4 / BD3								100	1524	1542	1	1		
288+44	MATCH										444	444				
TOTAL										100	1968	1968	1	1		

PROJECT NO. 23325 | TEL. CO. TDS | EXCHANGE 351

ROUTE	BA
SHEET	19 OF 27
EX. ROUTE	BA
MAP REF.	351029
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	BARD
TWN/RGE	16S / 23E
SEC.	7
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	02/15
REV	
REV	
FILE:	

MATCH 288+44

MATCH 305+56

SHEET 18

SHEET 20

RUNNING LINE = 6' FROM EDGE PVMT
MIN DEPTH= 36"

NOT TO SCALE

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

POLES / PEDS										CABLE						POLE LINE & PED HARDWARE			
POLE/ PED NO.		BD / HA	BG / PG	LEAD	POLE LENGTH CLASS	YEAR		JOINT											CUST NO.
TEL CO.	FOR CO.			ANGLE		SET	REM	%	W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)				BM2 (5/8)(8)	BM 53	BM 61D	
288+44	MATCH																		
305+56	MATCH										1766	1766					1		
TOTAL											1766	1766					1		

PROJECT NO. 23325 | TEL. CO. TDS | EXCHANGE 351

ROUTE	BA
SHEET	20 OF 27
EX. ROUTE	BA
MAP REF.	351035
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	BARD
TWN/RGE	16S / 22E
SEC.	7
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	02/05
REV	
REV	
FILE:	

305+56 MATCH

310+59 DSA

311+10 PP

SHEET 20–1

END BORE 320+39

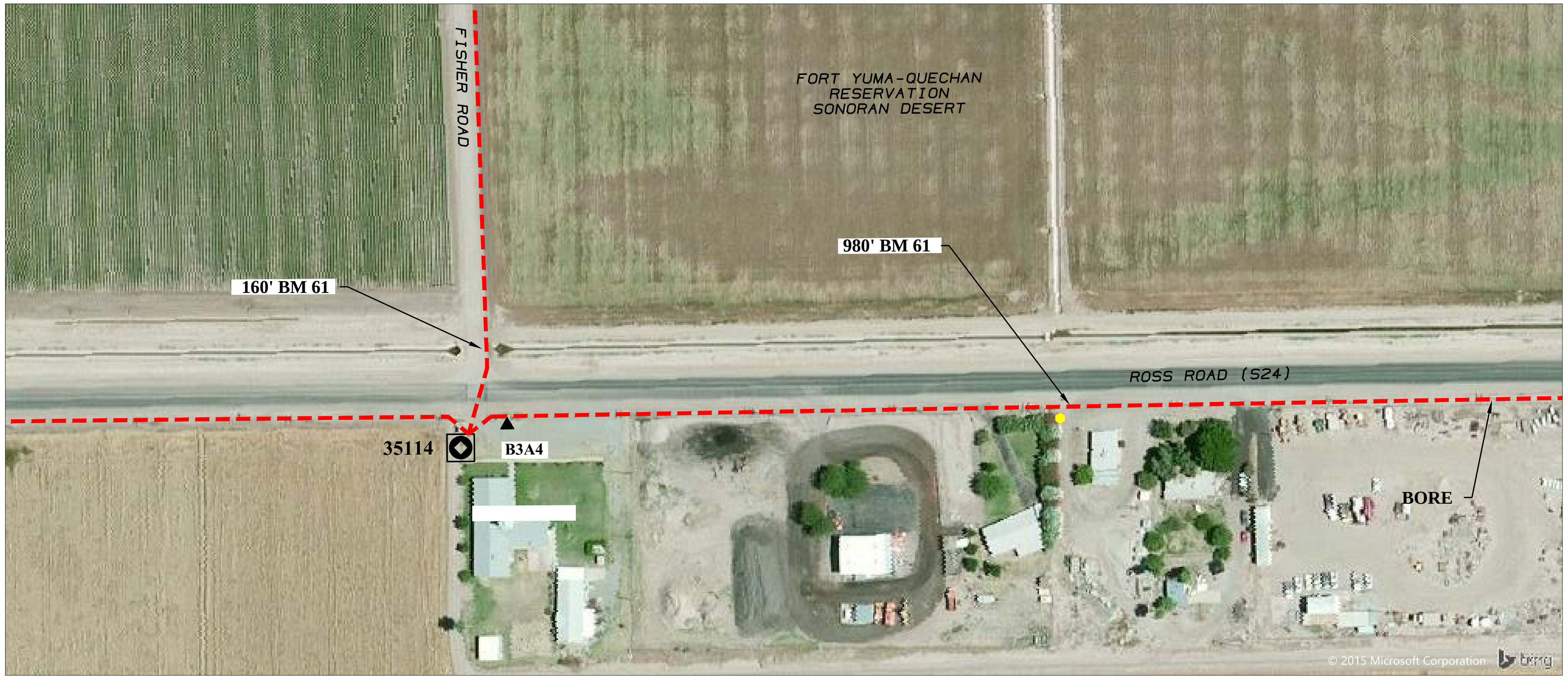
322+68 MATCH

315+47 MATCH

311+71 IRRIG.

SHEET 19

SHEET 21



NOT TO SCALE

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

RUNNING LINE = 6'
FROM EDGE PVMT
MIN DEPTH= 36"

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

TDS

POLES / PEDS: POLE/PED NO. TEL CO.	FOR CO.	BD / HA	BG / PG	LEAD ANGLE	POLE LENGTH CLASS	YEAR SET	YEAR REM	JOINT %	JOINT W/	CABLE: BFO (96)	BFOI (96)	BFOV (1)(1.25)	BFC 100–24			POLE LINE & PED HARDWARE: BM2 (5/8)(8)	BM 2C	BM 20	BM 53	BM 61D						CUST NO.			HBFO (96)	HO1	HC1		W BD
305+56	MATCH																																
310+59	DSA									100	560	560						1											1	24	100		
	B3A4												110				1														100		1
322+68	MATCH										1290	1290								980													
315+37	MATCH									50	550	550								160													
TOTAL										150	2400	2400	110				1	1		1140									1	24	200		1

PROJECT NO. 23325 TEL. CO. TDS EXCHANGE 351

ROUTE	BD
SHEET	20-1 OF 27
EX. ROUTE	BD
MAP REF.	351035
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	BARD
TWN/RGE	16S / 23E
SEC.	8
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	02/15
REV	
REV	
FILE:	

MATCH 332+64

ROAD 324+15

MATCH 315+37

SHEET 20-2

SHEET 20

RUNNING LINE = 6'
FROM EDGE PVMT
MIN DEPTH= 36"

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

NOT TO SCALE

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

TDS

POLES / PEDS										CABLE			POLE LINE & PED HARDWARE			
POLE/ PED NO. TEL CO.	FOR CO.	BD / HA	BG / PG	LEAD ANGLE	POLE LENGTH CLASS	YEAR SET	YEAR REM	JOINT %	JOINT W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)	BM2 (5/8)(8)	BM 53	BM 61D	CUST NO.
315+37	MATCH															
332+64	MATCH										1784	1784				
TOTAL											1784	1784				

PROJECT NO. 23325	TEL. CO. TDS	EXCHANGE 351	ROUTE BD

SHEET	20-2 OF 27
EX. ROUTE	BD
MAP REF.	351035
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	BARD
TWN/RGE	16S / 23E
SEC.	8/5
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	02/15
REV	
REV	
FILE:	

NOT TO SCALE

RUNNING LINE = 2'
WEST OF POWER POLES
MIN DEPTH= 36"

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

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

POLES / PEDS										CABLE						POLE LINE & PED HARDWARE																	
POLE/PED NO. TEL CO.	POLE/PED NO. FOR CO.	BD / HA	BG / PG	LEAD ANGLE	POLE LENGTH CLASS	YEAR SET	YEAR REM	JOINT %	JOINT W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)				BM2 (5/8)(8)	BM 53	BM 61D								CUST NO.							
332+64	MATCH																																
350+06	MATCH										1794	1794					1	200															
TOTAL											1794	1794					1	200															

PROJECT NO. 23325 | TEL. CO. TDS | EXCHANGE 351

ROUTE	BD
SHEET	20-3 OF 27
EX. ROUTE	BD
MAP REF.	351034
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	BARD
TWN/RGE	16S / 23E
SEC.	5
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	02/15
REV	
REV	
FILE:	

NOT TO SCALE

RUNNING LINE = 6'
FROM EDGE PVMT
MIN DEPTH= 36"

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

POLES / PEDS										CABLE						POLE LINE & PED HARDWARE							
POLE/ PED NO.		BD / HA	BG / PG	LEAD	POLE LENGTH CLASS	YEAR		JOINT															CUST NO.
TEL CO.	FOR CO.			ANGLE		SET	REM	%	W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)				BM2 (5/8)(8)	BM 53	BM 61D					
350+06	MATCH																						
																		250					
																		140					
365+48	ROAD										1588	1588					1						
TOTAL											1588	1588					1	390					

PROJECT NO. 23325 | TEL. CO. TDS | EXCHANGE 351

ROUTE BD
SHEET 20-4 OF 27
EX. ROUTE BD
MAP REF. 351034
COUNTY: IMPERIAL
TOWNSHIP:
TAX DISTRICT:
MUNICIPALITY: BARD
TWN/RGE 16S / 23E
SEC. 5
STAKED BY FARR
DATE 01/14
DRAFTED BY FARR
DATE 10/14
W.O. TC-CA351ENG-001
REV 02/15
REV
REV
FILE:

NOT TO SCALE

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

RUNNING LINE = 6' FROM EDGE PVMT
MIN DEPTH= 36"

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

POLES / PEDS										CABLE						POLE LINE & PED HARDWARE																	
POLE/ PED NO. TEL CO.	FOR CO.	BD / HA	BG / PG	LEAD ANGLE	POLE LENGTH CLASS	YEAR SET	REM	%	JOINT W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)	BFOV (2)(1.25)	BFC 25–24		BM2 (5/8)(8)	BM 2C	BM 20	BM 53	BM 61D						CUST NO.			HBFO (96)	HO1	HC1		W BD
365+48	MATCH																																
																				150													
																				150													
377+90	PB3R5										1280	1280																					
382+65	DSA										490		490					1											1	6	25		
											490																						
382+95	PB3R3													50			1														25		1
383+90	MATCH										618	618																					
TOTAL											2878	1898	490	50			1	1		300									1	6	50		1

PROJECT NO. 23325 | TEL. CO. TDS | EXCHANGE 351

ROUTE	BP
SHEET	20-5 OF 27
EX. ROUTE	BP
MAP REF.	351034
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	BARD
TWN/RGE	16S / 23E
SEC.	5
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	10/14
REV	
REV	
FILE:	

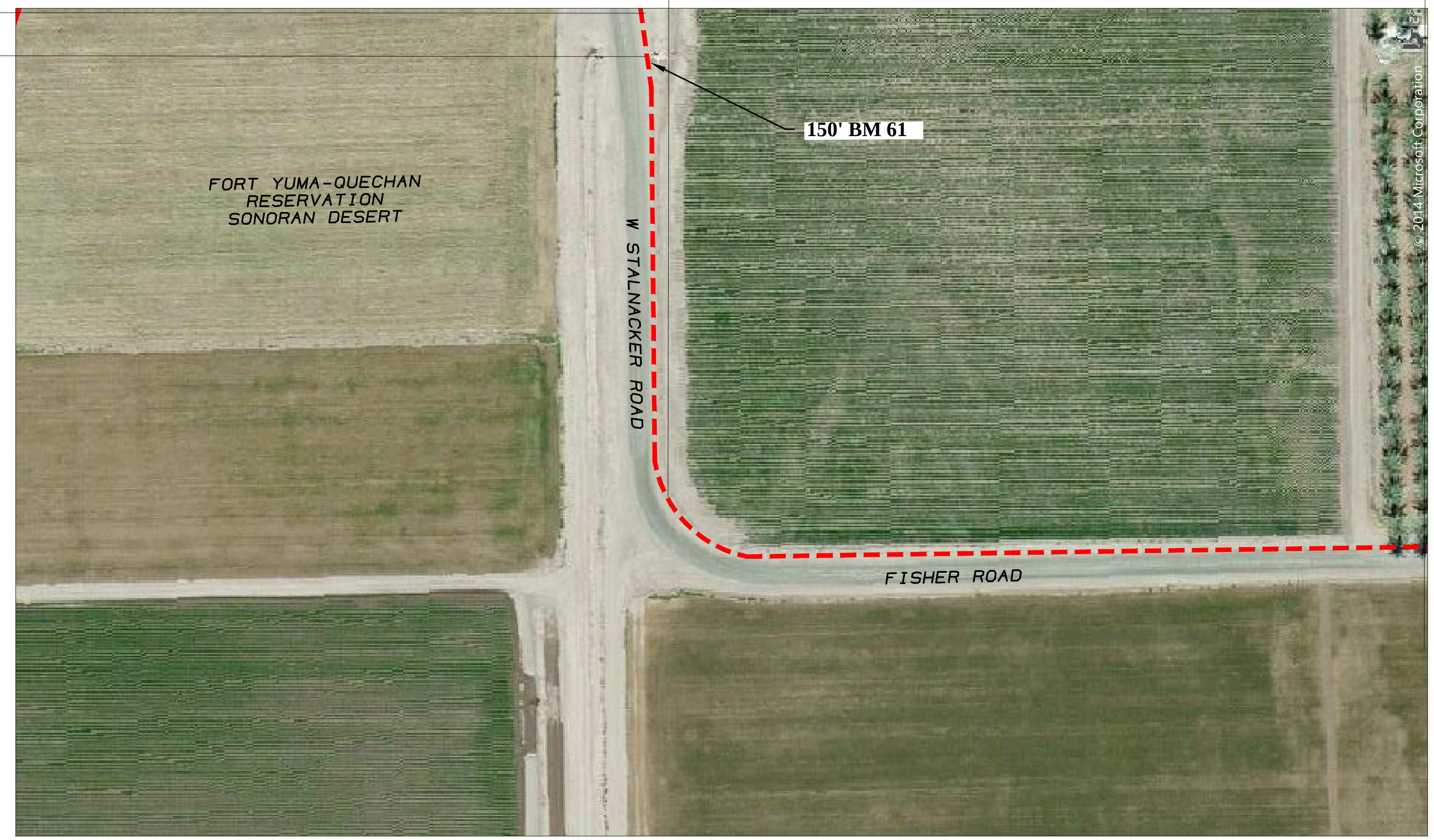
TURN 391+94

SHEET 20-6

MATCH 383+80

396+94 MATCH

396+02 IRRIG



SHEET 20-4

NOT TO SCALE

RUNNING LINE = 6'
FROM EDGE PVMT
MIN DEPTH= 36"

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

TDS

POLES / PEDS										CABLE						POLE LINE & PED HARDWARE																
POLE/ PED NO. TEL CO.	FOR CO.	BD / HA	BG / PG	LEAD ANGLE	POLE LENGTH CLASS	YEAR SET	YEAR REM	JOINT %	JOINT W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)				BM2 (5/8)(8)	BM 53	BM 61D								CUST NO.						
383+80	MATCH																															
396+94	MATCH										1360	1360						150														
TOTAL											1360	1360						150														

PROJECT NO. 23325 TEL. CO. TDS EXCHANGE 351

ROUTE	BP
SHEET	20-6 OF 27
EX. ROUTE	BP
MAP REF.	351034
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	BARD
TWN/RGE	16S / 23E
SEC.	5
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	02/15
REV	
REV	
FILE:	

MATCH 396+94

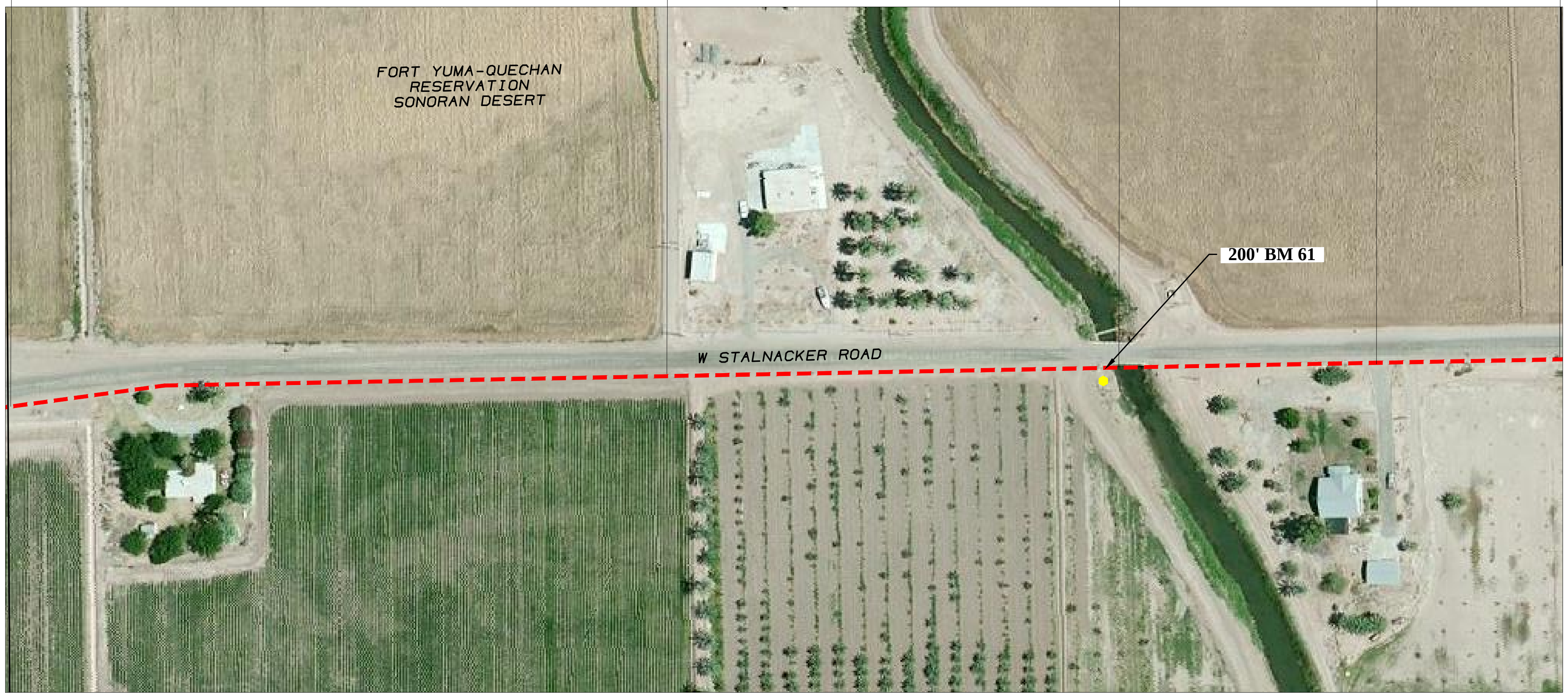
DVWY 404+90

CANAL 409+06

DVWY 411+86

MATCH 413+44

SHEET 20-5



SHEET 20-7

NOT TO SCALE

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

RUNNING LINE = 6'
FROM EDGE PVMT
MIN DEPTH= 36"

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

POLES / PEDS										CABLE						POLE LINE & PED HARDWARE			
POLE/ PED NO.		BD / HA	BG / PG	LEAD	POLE LENGTH CLASS	YEAR		JOINT											CUST NO.
TEL CO.	FOR CO.			ANGLE		SET	REM	%	W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)				BM2 (5/8)(8)	BM 53	BM 61D	
396+94	MATCH																		
413+44	MATCH										1700	1700					1	200	
TOTAL											1700	1700					1	200	

PROJECT NO. 23325 | TEL. CO. TDS | EXCHANGE 351

ROUTE BP

SHEET 20-7 OF 27

EX. ROUTE BP

MAP REF. 351034

COUNTY: IMPERIAL

TOWNSHIP:

TAX DISTRICT:

MUNICIPALITY: BARD

TWN/RGE 16S / 23E

SEC. 5

STAKED BY FARR

DATE 01/14

DRAFTED BY FARR

DATE 10/14

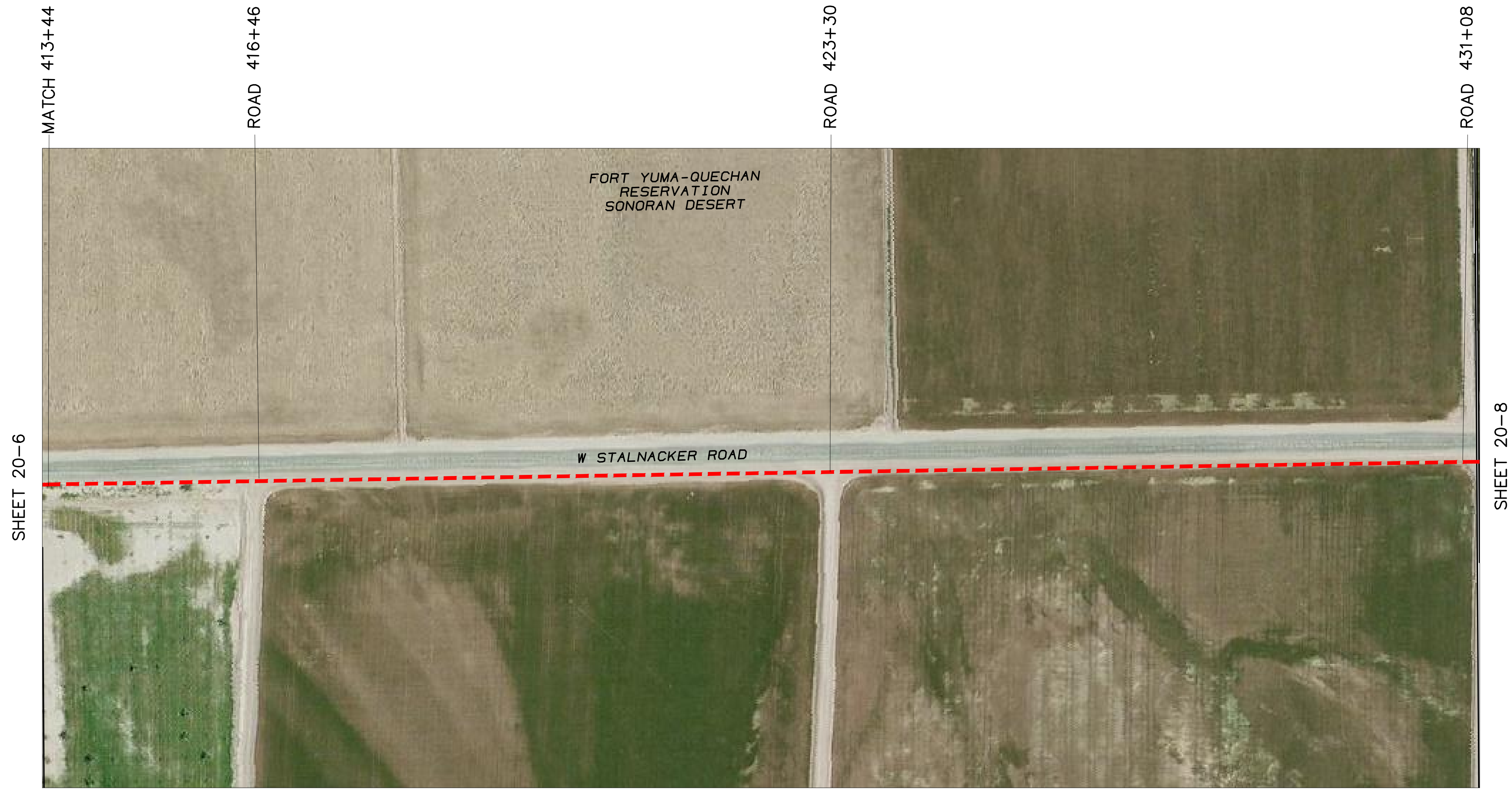
W.O. TC-CA351ENG-001

REV 02/15

REV

REV

FILE:



NOT TO SCALE

RUNNING LINE = 6'
FROM EDGE PVMT
MIN DEPTH= 36"

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

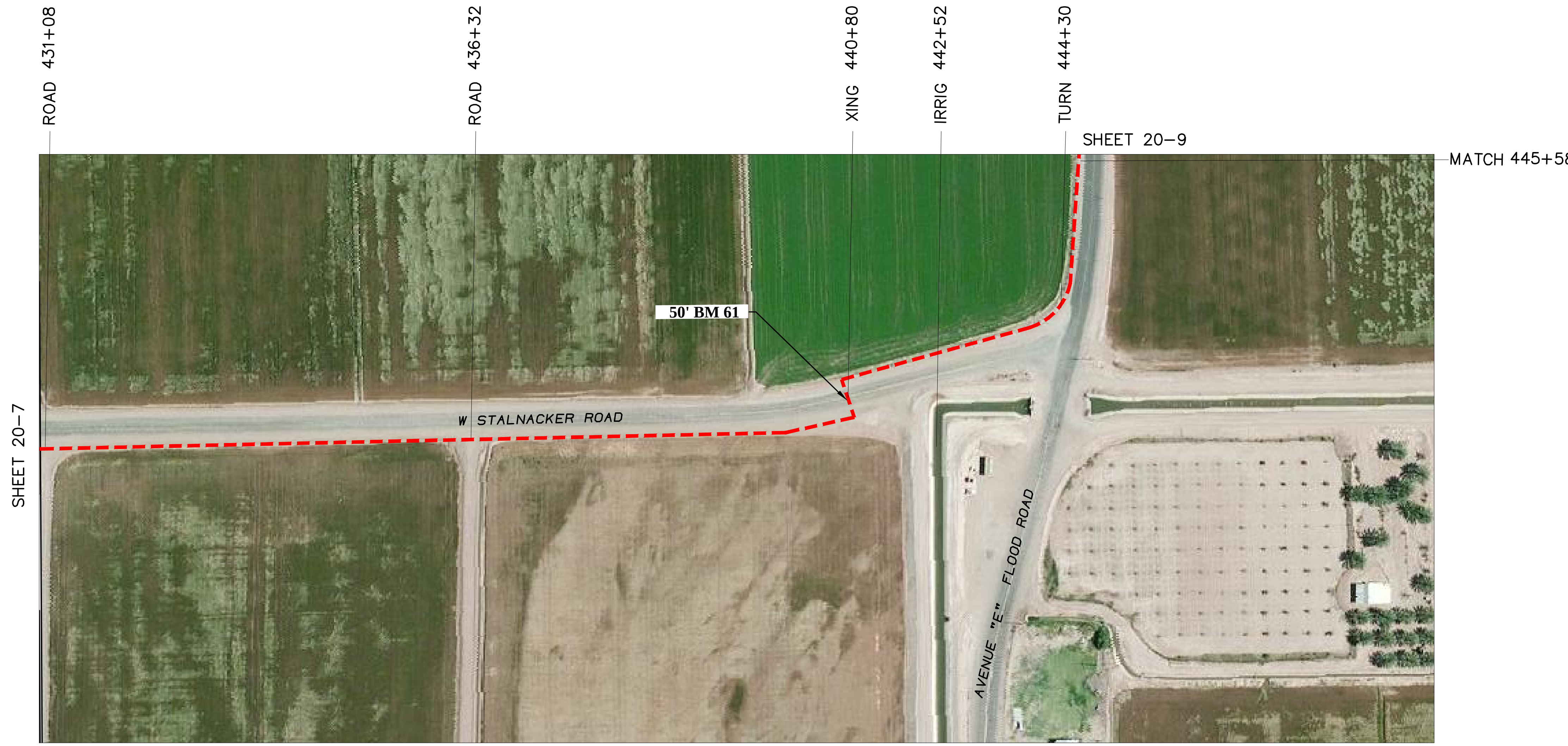
UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

TDS

POLES / PEDS										CABLE						POLE LINE & PED HARDWARE			
POLE/ PED NO. TEL CO.	FOR CO.	BD / HA	BG / PG	LEAD ANGLE	POLE LENGTH CLASS	YEAR SET	YEAR REM	JOINT %	JOINT W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)				BM2 (5/8)(8)	BM 53	BM 61D	CUST NO.
413+44	MATCH																		
431+08	ROAD										1820	1820							
TOTAL											1820	1820							

PROJECT NO. 23325 | TEL. CO. TDS | EXCHANGE 351

ROUTE	BP
SHEET	20-8 OF 27
EX. ROUTE	BP
MAP REF.	351034
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	BARD
TWN/RGE	16S / 23E
SEC.	5/32
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	02/15
REV	
REV	
FILE:	



RUNNING LINE = 6'
FROM EDGE PVMT
MIN DEPTH= 36"

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

NOT TO SCALE

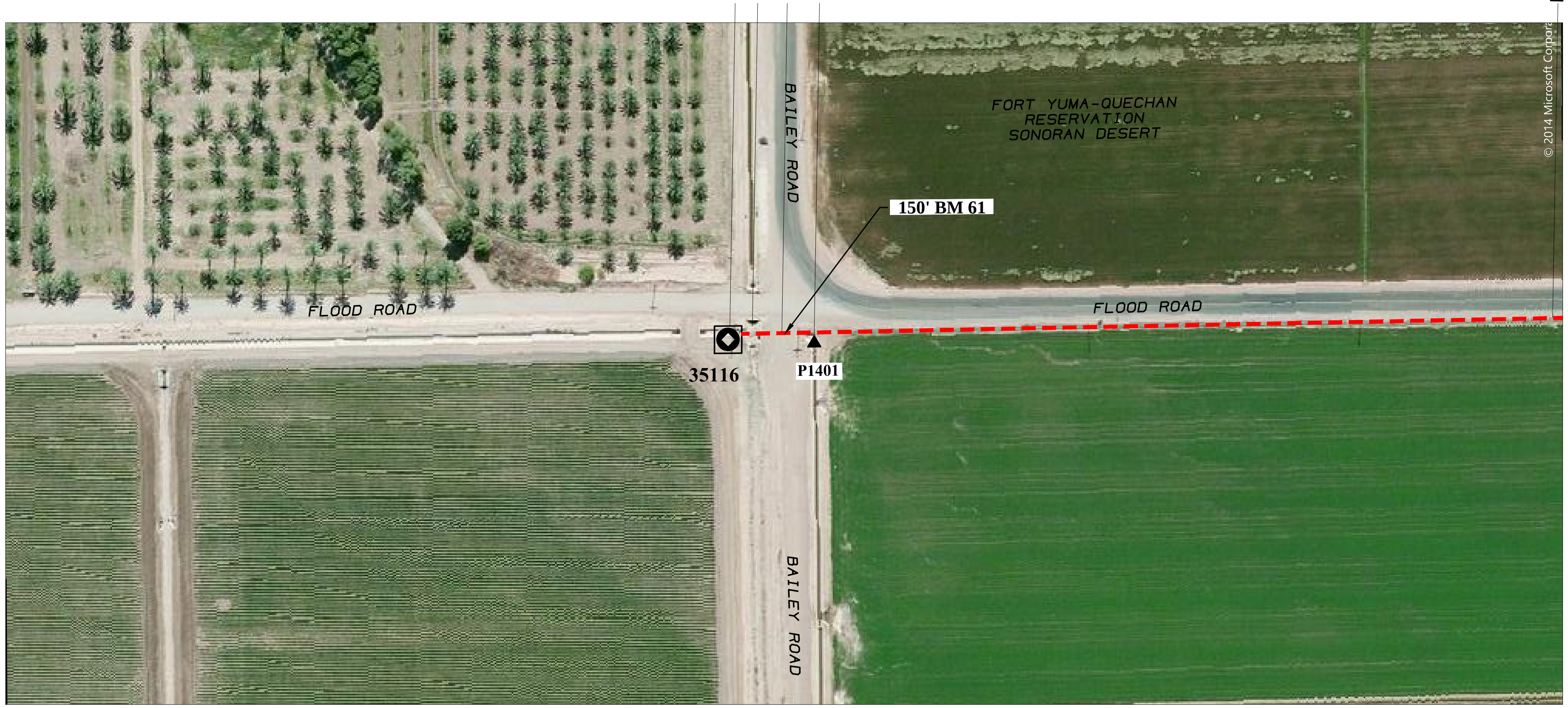
UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

POLES / PEDS										CABLE						POLE LINE & PED HARDWARE			
POLE/ PED NO.		BD / HA	BG / PG	LEAD	POLE LENGTH CLASS	YEAR		JOINT											CUST NO.
TEL CO.	FOR CO.			ANGLE		SET	REM	%	W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)				BM2 (5/8)(8)	BM 53	BM 61D	
431+08	MATCH																		
449+80	XING																	50	
445+58	MATCH										1550	1550							
TOTAL											1550	1550						50	

PROJECT NO. 23325 | TEL. CO. TDS | EXCHANGE 351

ROUTE	BP
SHEET	20-9 OF 27
EX. ROUTE	BP
MAP REF.	351033
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	BARD
TWN/RGE	15S / 23E
SEC.	32
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	02/15
REV	
REV	
FILE:	

DSA 457+00
IRRIG 456+90
ROAD 456+30
PED 456+20
MATCH 445+58



SHEET 20-8

RUNNING LINE = 6'
FROM EDGE PVMT
MIN DEPTH= 36"

NOT TO SCALE

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

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

TDS

POLES / PEDS

POLE/ PED NO. TEL CO.	FOR CO.	BD / HA	BG / PG	LEAD ANGLE	POLE LENGTH CLASS	YEAR SET	REM	JOINT %	W/
445+58	MATCH								
456+20	P1401								
457+00	DSA								
TOTAL									

CABLE

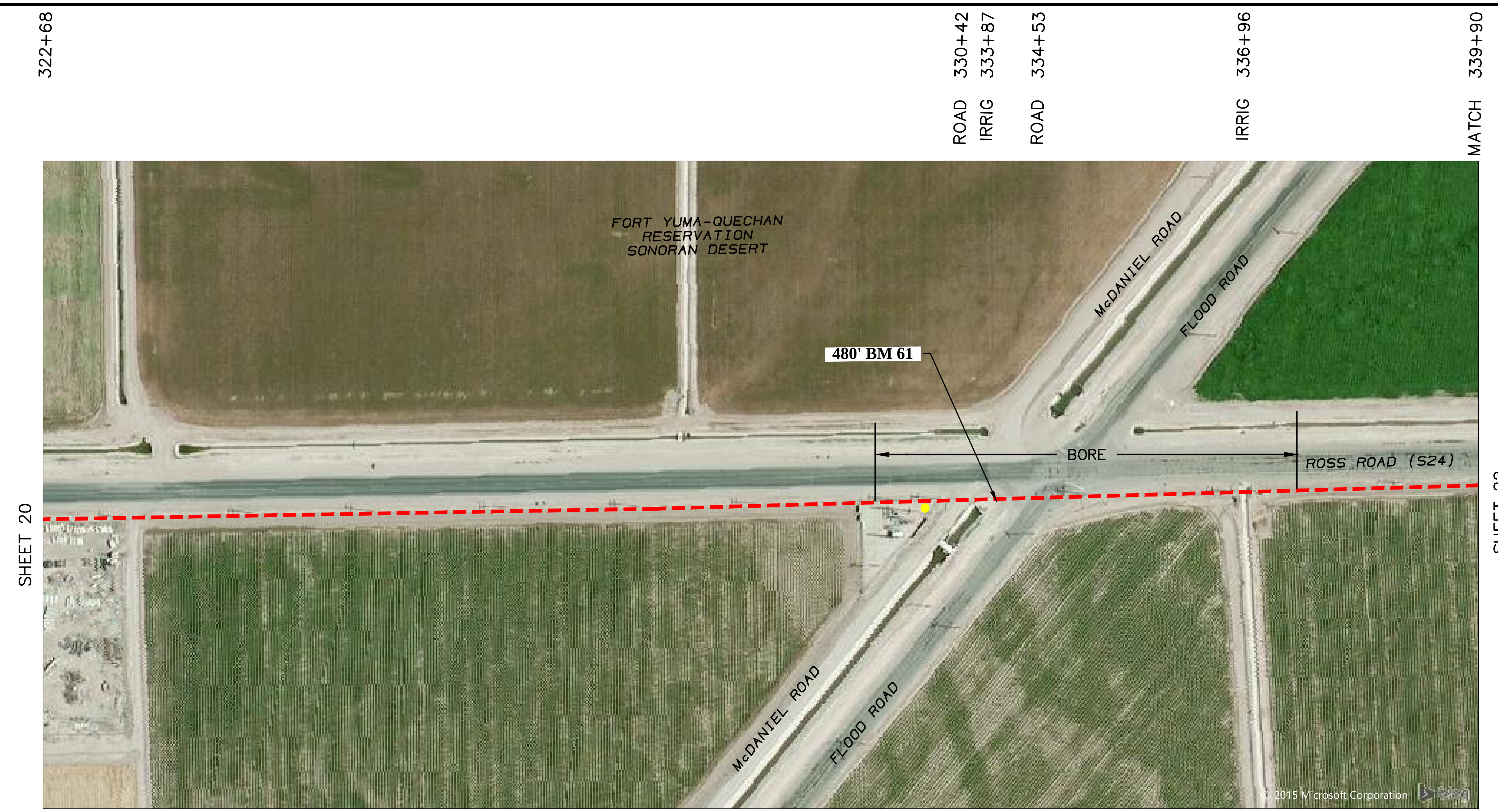
POLE/ PED NO. TEL CO.	BFO (96)	BFOI (96)	BFOV (1)(1.25)	BFC 50–24		
445+58						
456+20		1094	1094			
457+00	50	150	150	150		
TOTAL	50	1244	1244	150		

POLE LINE & PED HARDWARE

POLE/ PED NO. TEL CO.	BM2 (5/8)(8)	BM 2C	BM 20	BM 53	BM 61D					CUST NO.			HBFO (96)	HO1	HC1		W BD
445+58																	
456+20		1													50		1
457+00			1		150								1	6	50		
TOTAL		1	1		150								1	6	100		1

PROJECT NO. 23325 | TEL. CO. TDS | EXCHANGE 351

ROUTE	BA
SHEET	21 OF 27
EX. ROUTE	BA
MAP REF.	351035
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	BARD
TWN/RGE	16S / 23E
SEC.	8
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	02/15
REV	
REV	
FILE:	



NOT TO SCALE

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

RUNNING LINE = 6'
FROM EDGE PVMT
MIN DEPTH= 36"

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

POLES / PEDS										CABLE			POLE LINE & PED HARDWARE			
POLE/PED NO. TEL CO.	POLE/PED NO. FOR CO.	BD / HA	BG / PG	LEAD ANGLE	POLE LENGTH CLASS	YEAR SET	YEAR REM	JOINT %	JOINT W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)	BM2 (5/8)(8)	BM 53	BM 61D	CUST NO.
322+68	MATCH															
															480	
339+90	MATCH										1766	1766		1		
TOTAL											1766	1766		1	480	

PROJECT NO. 23325 | TEL. CO. TDS | EXCHANGE 351

ROUTE	BA
SHEET	22 OF 27
EX. ROUTE	BA
MAP REF.	351035
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	BARD
TWN/RGE	16S / 23E
SEC.	8
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	02/15
REV	
REV	
FILE:	

MATCH 339+90

IRRIG 349+18

MATCH 357+02

SHEET 21

SHEET 23

NOT TO SCALE

RUNNING LINE = 6'
FROM EDGE PVMT
MIN DEPTH= 36"

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

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

TDS

POLES / PEDS										CABLE						POLE LINE & PED HARDWARE																
POLE/ PED NO. TEL CO.	POLE/ PED NO. FOR CO.	BD / HA	BG / PG	LEAD ANGLE	POLE LENGTH CLASS	YEAR SET	YEAR REM	JOINT %	JOINT W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)				BM2 (5/8)(8)	BM 53	BM 61D								CUST NO.						
339+90	MATCH																															
																		480														
357+02	MATCH										1770	1770																				
TOTAL											1770	1770						480														

PROJECT NO. 23325 | TEL. CO. TDS | EXCHANGE 351

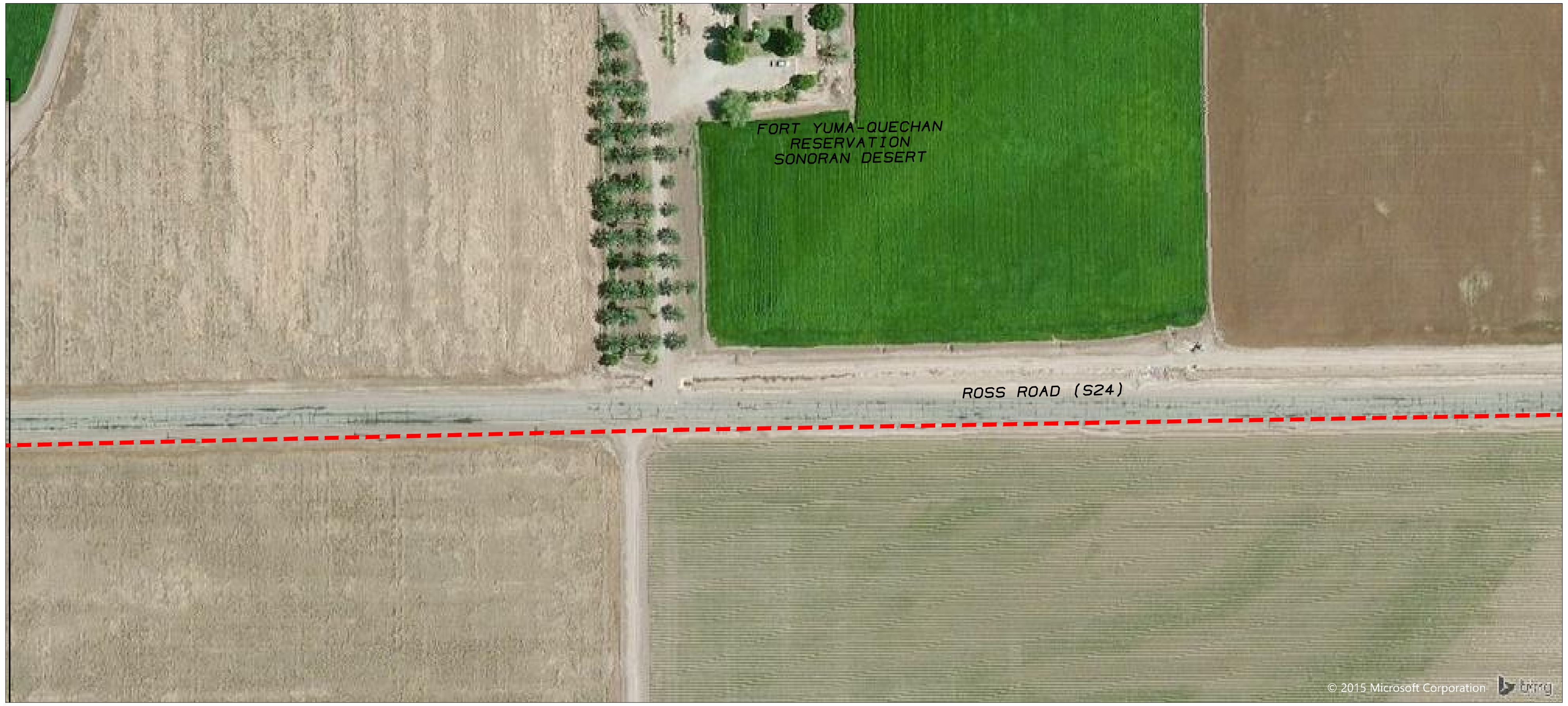
ROUTE	BB
SHEET	23 OF 27
EX. ROUTE	BB
MAP REF.	351035
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	BARD
TWN/RGE	16S / 23E
SEC.	8
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	02/15
REV	
REV	
FILE:	

MATCH 357+02

ROAD 364+18

MATCH 374+16

SHEET 22



SHEET 24

RUNNING LINE = 6'
FROM EDGE PVMT
MIN DEPTH= 36"

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

NOT TO SCALE

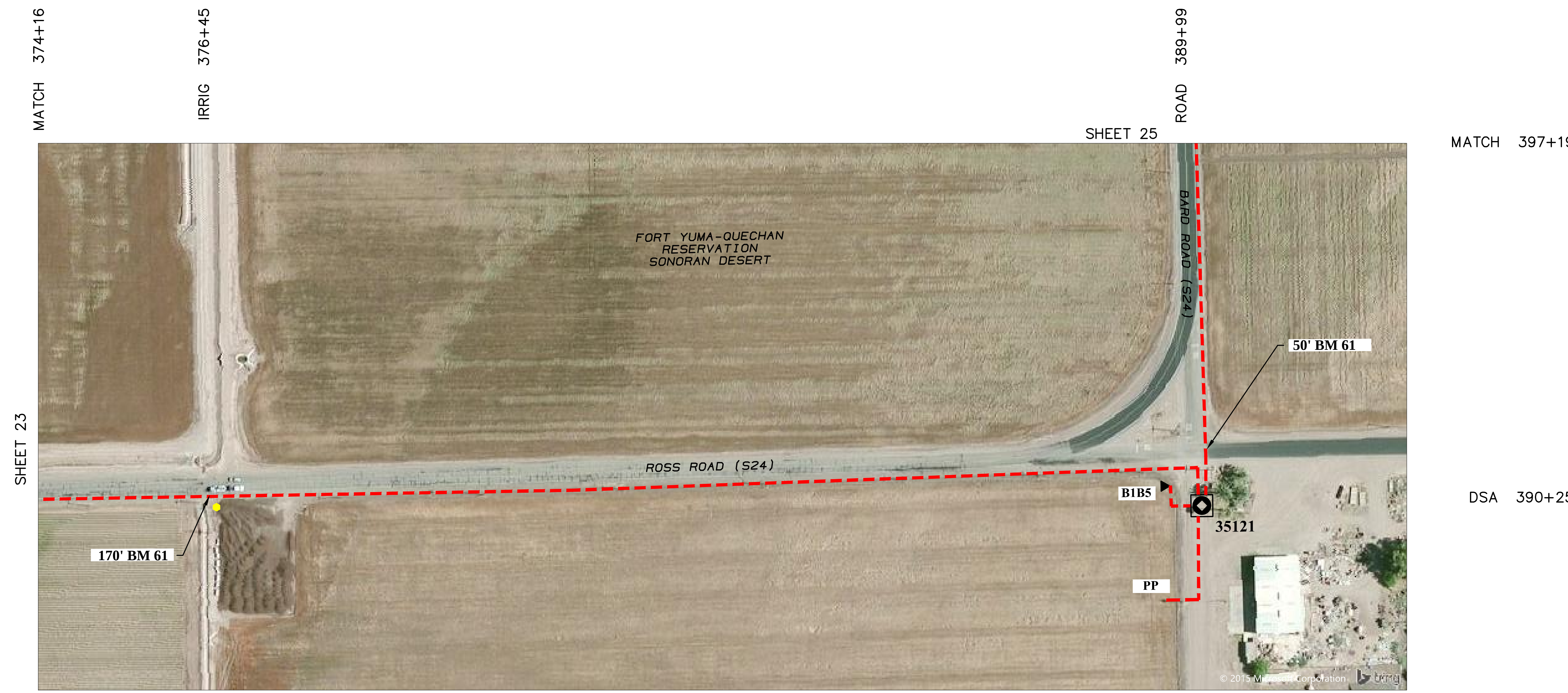
UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

TDS

POLES / PEDS										CABLE			POLE LINE & PED HARDWARE			
POLE/PED NO. TEL CO.	FOR CO.	BD / HA	BG / PG	LEAD ANGLE	POLE LENGTH CLASS	YEAR SET	REM	JOINT %	W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)	BM2 (5/8)(8)	BM 53	BM 61D	CUST NO.
357+02	MATCH															
374+16	MATCH										1770	1770				
TOTAL											1770	1770				

PROJECT NO. 23325 | TEL. CO. TDS | EXCHANGE 351

ROUTE	BB
SHEET	24 OF 27
EX. ROUTE	BB
MAP REF.	351035
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	BARD
TWN/RGE	16S / 23E
SEC.	9
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	02/15
REV	
REV	
FILE:	



NOT TO SCALE

RUNNING LINE = 6'
FROM EDGE PVMT
MIN DEPTH= 36"

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

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

TDS

POLES / PEDS										CABLE					
POLE/PED NO. TEL CO.	POLE/PED NO. FOR CO.	BD / HA	BG / PG	LEAD ANGLE	POLE LENGTH CLASS	YEAR SET	YEAR REM	JOINT %	JOINT W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)	BFC 100–24		
374+16	MATCH														
390+25	DSA									100	1700	1700			
	B1B5												110		
	PP											180			
397+19	MATCH										780	780			
TOTAL										100	2480	2660	110		

POLE/PED NO. TEL CO.	POLE LINE & PED HARDWARE BM2 (5/8)(8)	BM 20	BM 53	BM 61D							CUST NO.			HBFO (96)	HO1	HC1		WBD
374+16																		
390+25		1	1	170										1	6	100		
B1B5																100		1
PP																		
397+19																		
TOTAL		1	1	170										1	6	200		1

PROJECT NO. 23325 TEL. CO. TDS EXCHANGE 351

ROUTE BB	
SHEET 25 OF 27	
EX. ROUTE BB	
MAP REF. 351040	
COUNTY: IMPERIAL	
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY: BARD	
TWN/RGE 16S / 23E	
SEC. 9	
STAKED BY FARR	
DATE 01/14	
DRAFTED BY FARR	
DATE 10/14	
W.O. TC-CA351ENG-001	
REV 02/15	
REV	
REV	
FILE:	

MATCH 411+79

ROAD 403+67

MATCH 397+19

SHEET 26

SHEET 24

NOT TO SCALE

RUNNING LINE = 6'
FROM EDGE PVMT
MIN DEPTH= 36"

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

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

TDS

POLES / PEDS										CABLE						POLE LINE & PED HARDWARE																	
POLE/ PED NO. TEL CO.	FOR CO.	BD / HA	BG / PG	LEAD ANGLE	POLE LENGTH CLASS	YEAR SET	YEAR REM	JOINT %	JOINT W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)				BM2 (5/8)(8)	BM 53	BM 61D								CUST NO.							
397+19	MATCH																																
411+79	MATCH										1510	1510																					
TOTAL											1510	1510																					

PROJECT NO. 23325 TEL. CO. TDS EXCHANGE 351

ROUTE	BB
SHEET	26 OF 27
EX. ROUTE	BB
MAP REF.	351040
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	BARD
TWN/RGE	16S / 23E
SEC.	9/4
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	02/15
REV	
REV	
FILE:	

MATCH 428+83

ROAD 417+19

IRRIG 416+23

MATCH 411+79

SHEET 27

SHEET 25

NOT TO SCALE

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

RUNNING LINE = 6'
FROM EDGE PVMT
MIN DEPTH= 36"

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

POLES / PEDS										CABLE			POLE LINE & PED HARDWARE			
POLE/ PED NO.		BD / HA	BG / PG	LEAD	POLE LENGTH CLASS	YEAR		JOINT								CUST NO.
TEL CO.	FOR CO.			ANGLE		SET	REM	%	W/	BFO (96)	BFOI (96)	BFOV (1)(1.25)	BM2 (5/8)(8)	BM 53	BM 61D	
411+79	MATCH															
428+83	MATCH										1760	1760		1	170	
TOTAL											1760	1760		1	170	

PROJECT NO. 23325 | TEL. CO. TDS | EXCHANGE 351

ROUTE	BB
SHEET	28 OF 27
EX. ROUTE	BB
MAP REF.	351040
COUNTY:	IMPERIAL
TOWNSHIP:	
TAX DISTRICT:	
MUNICIPALITY:	WINTERHAVEN
TWN/RGE	16S / 22E
SEC.	4
STAKED BY	FARR
DATE	01/14
DRAFTED BY	FARR
DATE	10/14
W.O.	TC-CA351ENG-001
REV	
REV	
REV	
FILE:	

DSA 439+19
ROAD 436+75

MATCH 428+83

SHEET 26

RUNNING LINE = 6'
FROM EDGE PVMT
MIN DEPTH= 36"

NOT TO SCALE

UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM FIELD OBSERVATIONS BUT ARE NOT NECESSARILY EXACT. IT IS THE CONTRACTORS RESPONSIBILITY TO FIELD LOCATE ALL UNDERGROUND OBSTRUCTIONS AND UTILITIES PRIOR TO CONSTRUCTION. COMPLETE REPAIR OF ANY AND ALL DAMAGES INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR.

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

POLES / PEDS										CABLE						POLE LINE & PED HARDWARE																	
POLE/ PED NO.		BD / HA	BG / PG	LEAD	POLE LENGTH CLASS	YEAR		JOINT																		CUST NO.							
TEL CO.	FOR CO.			ANGLE		SET	REM	%	W/	BFO (96)	BFOI (96)	BFOV 1.25				BM2 (5/8)(8)	BM 20	BM 53	BM 61D										HBFO (96)	HO1			
428+83	MATCH																																
439+19	DSA									50	1070	1070					1	1											1	6			
TOTAL										50	1070	1070					1	1											1	6			

APPENDIX B. CALEEMOD RESULTS

CASF Winterhaven

Imperial County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	0.00	1000sqft	0.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.4	**Precipitation Freq (Days)**	12
Climate Zone	15			**Operational Year**	2016
Utility Company	Imperial Irrigation District				
CO2 Intensity (lb/MWhr)	1270.9	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Buried conduit would be installed by plowing and directional boring and the nodes would be installed by backhoe. Progress rates are 2 miles/day for plowing, 400 feet/day for boring, and two nodes/day would be installed.

Off-road Equipment - Plowed conduit would be installed by a dozer equipped with a plow and cable reel. A second dozer may be used in tandem with the plow dozer in difficult areas. The air compressor will be used for conduit pigging and blowing fiber through the conduit.

Off-road Equipment - Bored conduit would be installed with a horizontal drilling rig with the assistance of a backhoe. The air compressor wil be used for conduit pigging and blowing fiber through the conduit. The mud pump will be used for evacuating drilling fluid and the backhoe will be used for digging bore pits.

Off-road Equipment - Nodes (buried vaults) would be installed using a backhoe.

Trips and VMT - Vendor trips include conduit and cable delivery and water truck visits for dust control. Workers are assumed to be based in Winterhaven and vendors in Yuma. Conduit and fiber reels would be delivered at a rate of 2/day for plowed installations and 1/day for bored installations. Node vaults would be delivered in a daily trip carrying both vaults to be installed. The water truck, included as a vendor trip, would apply water for dust control twice a day for each construction phase

Construction Off-road Equipment Mitigation - Disturbed areas will be watered twice a day and vehicle speed will be limited to 25mph on unpaved roads.

On-road Fugitive Dust - Approximately 10% of the roads in the project area are not paved (Haughtelin, Perez, and Fisher).

Road Dust - Approximately 10% of the roads in the project area are not paved. See previous comment.

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterExposedAreaPM10PercentReduction	55	61
tblConstDustMitigation	WaterExposedAreaPM25PercentReduction	55	61
tblConstructionPhase	PhaseStartDate	3/5/2016	3/7/2016
tblOffRoadEquipment	LoadFactor	0.37	0.37
tblOffRoadEquipment	OffRoadEquipmentType	Concrete/Industrial Saws	Crawler Tractors
tblOffRoadEquipment	OffRoadEquipmentType	Graders	Bore/Drill Rigs
tblOffRoadEquipment	OffRoadEquipmentType		Tractors/Loaders/Backhoes
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Air Compressors
tblOffRoadEquipment	OffRoadEquipmentType		Air Compressors
tblOnRoadDust	VendorPercentPave	50.00	10.00
tblOnRoadDust	VendorPercentPave	50.00	10.00
tblOnRoadDust	VendorPercentPave	50.00	10.00

tblOnRoadDust	WorkerPercentPave	50.00	10.00
tblOnRoadDust	WorkerPercentPave	50.00	10.00
tblOnRoadDust	WorkerPercentPave	50.00	10.00
tblProjectCharacteristics	OperationalYear	2014	2016
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblRoadDust	RoadPercentPave	50	90
tblTripsAndVMT	VendorTripLength	11.90	8.90
tblTripsAndVMT	VendorTripLength	11.90	8.90
tblTripsAndVMT	VendorTripLength	11.90	8.90
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	3.00
tblTripsAndVMT	VendorTripNumber	0.00	3.00
tblTripsAndVMT	WorkerTripLength	10.20	7.30
tblTripsAndVMT	WorkerTripLength	10.20	7.30
tblTripsAndVMT	WorkerTripLength	10.20	7.30
tblTripsAndVMT	WorkerTripNumber	10.00	3.00
tblTripsAndVMT	WorkerTripNumber	20.00	3.00

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	3.2609	30.3137	19.8301	0.0418	76.1793	1.7907	77.1859	7.6047	1.7254	8.5518	0.0000	4,173.7067	4,173.7067	0.9095	0.0000	4,192.8066
Total	**3.2609**	**30.3137**	**19.8301**	**0.0418**	**76.1793**	**1.7907**	**77.1859**	**7.6047**	**1.7254**	**8.5518**	**0.0000**	**4,173.7067**	**4,173.7067**	**0.9095**	**0.0000**	**4,192.8066**

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	3.2609	30.3137	19.8301	0.0418	60.2241	1.7907	61.2307	6.0092	1.7254	6.9563	0.0000	4,173.7067	4,173.7067	0.9095	0.0000	4,192.8066
Total	**3.2609**	**30.3137**	**19.8301**	**0.0418**	**60.2241**	**1.7907**	**61.2307**	**6.0092**	**1.7254**	**6.9563**	**0.0000**	**4,173.7067**	**4,173.7067**	**0.9095**	**0.0000**	**4,192.8066**

	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**	**20.94**	**0.00**	**20.67**	**20.98**	**0.00**	**18.66**	**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	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
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	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated 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	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
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	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	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	Plowed conduit installation	Trenching	1/12/2016	1/20/2016	5	7	
2	Bored conduit installation	Trenching	1/21/2016	3/4/2016	5	32	
3	Node installation	Trenching	3/7/2016	3/11/2016	5	5	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

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
Node installation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Bored conduit installation	Pumps	2	8.00	84	0.74
Plowed conduit installation	Crawler Tractors	2	8.00	208	0.43
Bored conduit installation	Air Compressors	2	4.00	78	0.48
Plowed conduit installation	Air Compressors	2	4.00	78	0.48
Bored conduit installation	Bore/Drill Rigs	2	8.00	205	0.50
Bored conduit installation	Tractors/Loaders/Backhoes	2	8.00	97	0.37

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
Plowed conduit installation	4	3.00	4.00	0.00	7.30	8.90	20.00	LD_Mix	HDT_Mix	HHDT
Bored conduit installation	8	3.00	3.00	0.00	7.30	8.90	20.00	LD_Mix	HDT_Mix	HHDT
Node installation	1	3.00	3.00	0.00	7.30	8.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Plowed conduit installation - 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	1.9070	22.2421	8.2000	0.0194		0.9978	0.9978		0.9390	0.9390		1,975.9201	1,975.9201	0.5271		1,986.9883
Total	**1.9070**	**22.2421**	**8.2000**	**0.0194**		**0.9978**	**0.9978**		**0.9390**	**0.9390**		**1,975.9201**	**1,975.9201**	**0.5271**		**1,986.9883**

3.2 Plowed conduit installation - 2016

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	0.0525	0.4120	0.6723	1.0100e-003	47.1667	8.7100e-003	47.1754	4.7090	8.0100e-003	4.7170		100.3676	100.3676	6.2000e-004		100.3806
Worker	0.0155	0.0202	0.1677	1.8000e-004	29.0126	1.3000e-004	29.0127	2.8957	1.2000e-004	2.8959		14.2589	14.2589	1.3400e-003		14.2870
Total	**0.0680**	**0.4322**	**0.8400**	**1.1900e-003**	**76.1793**	**8.8400e-003**	**76.1881**	**7.6047**	**8.1300e-003**	**7.6129**		**114.6265**	**114.6265**	**1.9600e-003**		**114.6676**

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	1.9070	22.2421	8.2000	0.0194		0.9978	0.9978		0.9390	0.9390	0.0000	1,975.9201	1,975.9201	0.5271		1,986.9883
Total	**1.9070**	**22.2421**	**8.2000**	**0.0194**		**0.9978**	**0.9978**		**0.9390**	**0.9390**	**0.0000**	**1,975.9201**	**1,975.9201**	**0.5271**		**1,986.9883**

3.2 Plowed conduit installation - 2016

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	0.0525	0.4120	0.6723	1.0100e-003	37.2883	8.7100e-003	37.2971	3.7212	8.0100e-003	3.7292		100.3676	100.3676	6.2000e-004		100.3806
Worker	0.0155	0.0202	0.1677	1.8000e-004	22.9357	1.3000e-004	22.9359	2.2881	1.2000e-004	2.2882		14.2589	14.2589	1.3400e-003		14.2870
Total	**0.0680**	**0.4322**	**0.8400**	**1.1900e-003**	**60.2241**	**8.8400e-003**	**60.2329**	**6.0092**	**8.1300e-003**	**6.0174**		**114.6265**	**114.6265**	**1.9600e-003**		**114.6676**

3.3 Bored conduit installation - 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	3.2061	29.9845	19.1582	0.0408		1.7840	1.7840		1.7193	1.7193		4,084.1721	4,084.1721	0.9077		4,103.2342
Total	**3.2061**	**29.9845**	**19.1582**	**0.0408**		**1.7840**	**1.7840**		**1.7193**	**1.7193**		**4,084.1721**	**4,084.1721**	**0.9077**		**4,103.2342**

3.3 Bored conduit installation - 2016

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	0.0394	0.3090	0.5043	7.5000e-004	35.3750	6.5300e-003	35.3816	3.5318	6.0100e-003	3.5378		75.2757	75.2757	4.6000e-004		75.2855
Worker	0.0155	0.0202	0.1677	1.8000e-004	29.0126	1.3000e-004	29.0127	2.8957	1.2000e-004	2.8959		14.2589	14.2589	1.3400e-003		14.2870
Total	**0.0548**	**0.3292**	**0.6719**	**9.3000e-004**	**64.3876**	**6.6600e-003**	**64.3943**	**6.4275**	**6.1300e-003**	**6.4336**		**89.5346**	**89.5346**	**1.8000e-003**		**89.5724**

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	3.2061	29.9845	19.1582	0.0408		1.7840	1.7840		1.7193	1.7193	0.0000	4,084.1721	4,084.1721	0.9077		4,103.2342
Total	**3.2061**	**29.9845**	**19.1582**	**0.0408**		**1.7840**	**1.7840**		**1.7193**	**1.7193**	**0.0000**	**4,084.1721**	**4,084.1721**	**0.9077**		**4,103.2342**

3.3 Bored conduit installation - 2016

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	0.0394	0.3090	0.5043	7.5000e-004	27.9663	6.5300e-003	27.9728	2.7909	6.0100e-003	2.7969		75.2757	75.2757	4.6000e-004		75.2855
Worker	0.0155	0.0202	0.1677	1.8000e-004	22.9357	1.3000e-004	22.9359	2.2881	1.2000e-004	2.2882		14.2589	14.2589	1.3400e-003		14.2870
Total	**0.0548**	**0.3292**	**0.6719**	**9.3000e-004**	**50.9020**	**6.6600e-003**	**50.9087**	**5.0789**	**6.1300e-003**	**5.0851**		**89.5346**	**89.5346**	**1.8000e-003**		**89.5724**

3.4 Node installation - 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	0.3392	3.2419	2.4028	3.1000e-003		0.2496	0.2496		0.2296	0.2296		322.3651	322.3651	0.0972		324.4071
Total	**0.3392**	**3.2419**	**2.4028**	**3.1000e-003**		**0.2496**	**0.2496**		**0.2296**	**0.2296**		**322.3651**	**322.3651**	**0.0972**		**324.4071**

3.4 Node installation - 2016

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	0.0394	0.3090	0.5043	7.5000e-004	35.3750	6.5300e-003	35.3816	3.5318	6.0100e-003	3.5378		75.2757	75.2757	4.6000e-004		75.2855
Worker	0.0155	0.0202	0.1677	1.8000e-004	29.0126	1.3000e-004	29.0127	2.8957	1.2000e-004	2.8959		14.2589	14.2589	1.3400e-003		14.2870
Total	**0.0548**	**0.3292**	**0.6719**	**9.3000e-004**	**64.3876**	**6.6600e-003**	**64.3943**	**6.4275**	**6.1300e-003**	**6.4336**		**89.5346**	**89.5346**	**1.8000e-003**		**89.5724**

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	0.3392	3.2419	2.4028	3.1000e-003		0.2496	0.2496		0.2296	0.2296	0.0000	322.3651	322.3651	0.0972		324.4071
Total	**0.3392**	**3.2419**	**2.4028**	**3.1000e-003**		**0.2496**	**0.2496**		**0.2296**	**0.2296**	**0.0000**	**322.3651**	**322.3651**	**0.0972**		**324.4071**

3.4 Node installation - 2016

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	0.0394	0.3090	0.5043	7.5000e-004	27.9663	6.5300e-003	27.9728	2.7909	6.0100e-003	2.7969		75.2757	75.2757	4.6000e-004		75.2855
Worker	0.0155	0.0202	0.1677	1.8000e-004	22.9357	1.3000e-004	22.9359	2.2881	1.2000e-004	2.2882		14.2589	14.2589	1.3400e-003		14.2870
Total	**0.0548**	**0.3292**	**0.6719**	**9.3000e-004**	**50.9020**	**6.6600e-003**	**50.9087**	**5.0789**	**6.1300e-003**	**5.0851**		**89.5346**	**89.5346**	**1.8000e-003**		**89.5724**

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
General Light Industry	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	16.40	9.50	11.90	59.00	28.00	13.00	92	5	3

4.4 Fleet Mix

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.452463	0.070907	0.165532	0.163183	0.043777	0.005595	0.012812	0.078576	0.001869	0.000152	0.002393	0.000687	0.002054

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	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					
General Light Industry	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					
General Light Industry	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	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

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	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**

6.2 Area by SubCategory

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					
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	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**

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

APPENDIX C. BIOLOGICAL RESOURCES EVALUATION

TDS Telecom
Winterhaven Last Mile Underserved Broadband Project
Imperial County, California

Biological Resources Evaluation

Prepared by:
Tim Jordan, Senior Biologist

Prepared for:
TDS Telecommunications Corporation
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Submitted by:
Tierra Right of Way Services, Ltd.
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April 17, 2015

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April 17, 2015

ABSTRACT

Winterhaven Telephone Company d.b.a. TDS Telecom proposes to construct the Winterhaven Last Mile Underserved Broadband Project (the project), which will provide high-speed internet services to portions of the Fort Yuma-Quechan Indian Reservation, as well as portions of unincorporated Imperial County, California.

This Biological Resources Evaluation (BRE) has been prepared to provide a summary of existing biological conditions, the potential presence of special status species and resources, an initial evaluation of impacts of the project on biological resources, and feasible avoidance and minimization measures to reduce potential impacts to a level typically considered less than significant under the California Environmental Quality Act (CEQA). This report is useful for the preparation of the proposed project's CEQA Proponent's Environmental Assessment/Mitigated Negative Declaration and is in compliance with the National Environmental Policy Act (NEPA).

As discussed herein, the BRE determines to what extent the proposed project may potentially impact biological resources that are subject to provisions of CEQA and NEPA. Based on existing conditions and characteristics of the study area, Sonoran Desert Toad *(Incilius alvarius)*, Lowland Leopard Frog *(Lithobates yavapaiensis)*, Loggerhead Shrike *(Lanius ludovicianus)*, Vermilion Flycatcher *(Pyrocephalus rubinus)*, Yellow-headed Blackbird *(Xanthocephalus xanthocephalus)*, Townsend's Big-eared Bat *(Corynorhinus townsendii)*, and Yuma Hispid Cotton Rat *(Sigmodon hispidus eremicus)* are known to occur or have the potential to occur in the study area; therefore these species are evaluated for potential impacts.

It was determined that the proposed project would have no effect on species or critical habitats listed under the Endangered Species Act and that the project would have no impact on habitats meeting the criteria of sensitive natural communities as defined by the California Department of Fish and Wildlife (CDFW). In addition, it was determined that irrigation canals in the study area that may be Waters of the U.S. subject to U.S. Army Corps of Engineers, Regional Water Quality Control Board, and/or CDFW jurisdiction would not be impacted by the proposed project.

The BRE concludes that the proposed project would potentially impact special status species listed by CDFW and it may result in the spread of invasive plant species; however, implementation of the recommended avoidance and minimization measures will reduce these potential impacts to a less than significant level.

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1.0 INTRODUCTION

Winterhaven Telephone Company d.b.a. TDS Telecom (TDS) proposes to construct the Winterhaven Last Mile Underserved Broadband Project (the Project) which will provide high-speed internet services to portions of the Fort Yuma-Quechan Indian Reservation, as well as portions of unincorporated Imperial County, California.

This Biological Resource Evaluation (BRE) presents the results of a database search and a reconnaissance level biological survey of regionally-occurring special-status species and sensitive biological resources within the project area. The purpose of this report is to document the dominant plant and animal species observed at the time of the survey, to discuss the general habitat types present, and to evaluate the potential for the project site and vicinity to contain, or provide habitat for, Federal or State listed special status plant and animal species and sensitive natural communities. Additionally, this report provides standard recommended avoidance and minimization measures to reduce potential impacts to sensitive biological resources.

1.1 Project Location

The project area is located in southeastern Imperial County, California, just north of Yuma, Arizona, and the Colorado River. Baseline Road, which runs north-south, marks the boundary between the Fort Yuma-Quechan Reservation and private land; the Reservation is west of Baseline, and private land is to the east. The southern edge of the project area is roughly bounded by the Union Pacific Railroad (UPRR) tracks, the community of Winterhaven, and the Paradise Casino on Picacho Road. The Cocopah Canal runs along the eastern boundary of the project area, and the community of Bard is located at the northeastern limits of the project area. Stalnacker and Ross Roads along with the community of Ross Corner make up the approximate northern limits of the project area, and the western edge of the project area is near Arnold Road where the road approaches the UPRR. Specifically, the project area is located in portions of Section 2, Township 15 South, Range 24 East; Sections 11, 14, and 21–27, Township 16 South, Range 22 East; and Sections 4, 5, 7–9, 18, and 19 Township 16 South Range 23 East; San Bernardino Baseline and Meridian (SBB&M), as depicted on the Araz, Bard, Yuma East, and Yuma West, AZ/CA, 7.5-minute U.S. Geological Survey (USGS) topographic quadrangle maps (Figures 1 and 2).

1.2 Project Description

The proposed project involves the construction of a second-generation, very-high-bit-rate digital subscriber line (VDSL2) fiber-optic network capable of 25 Mbps/5 Mbps (download/upload) speeds. In total, approximately 24.65 km (15.31 miles) of new fiber-optic cable will be buried within protective conduit along existing roads in the project area and approximately 2.25 km (1.40 miles) of existing buried copper line will be used to connect a proposed DLC site on Arnold Road to the new system. A summary of the associated lengths to be installed on and off the Fort Yuma–Quechan Reservation can be found in Table 1. The buried line installation, which consists of the telecommunications cable and its protective conduit, will be performed using plowing construction techniques, and a directional boring machine will be used to install the line at canal and road crossings. Ancillary equipment to be installed includes 10 new equipment cabinets that will serve as connecting “nodes” for customers, splice boxes, and line markers. The equipment cabinets will be approximately 0.6 by 1.0 by 1.2 m (2.0 by 3.0 by 4.0 feet) in size and will be installed on top of buried concrete vaults within an approximately 6-m-square (20-foot-square) area. Splice boxes are small rectangular metal enclosures that will be installed between lengths of cable.

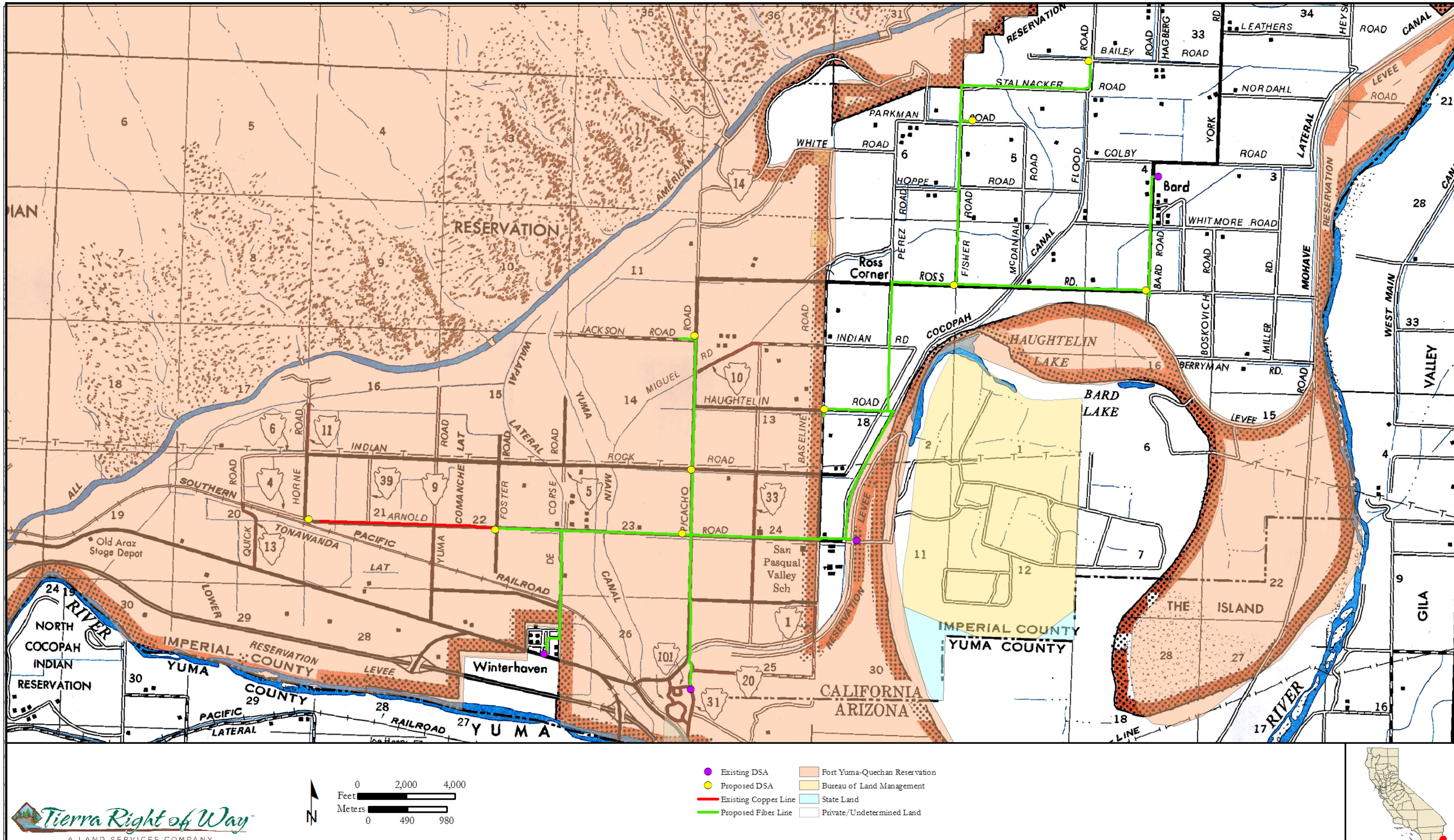

Figure 1. Project location.

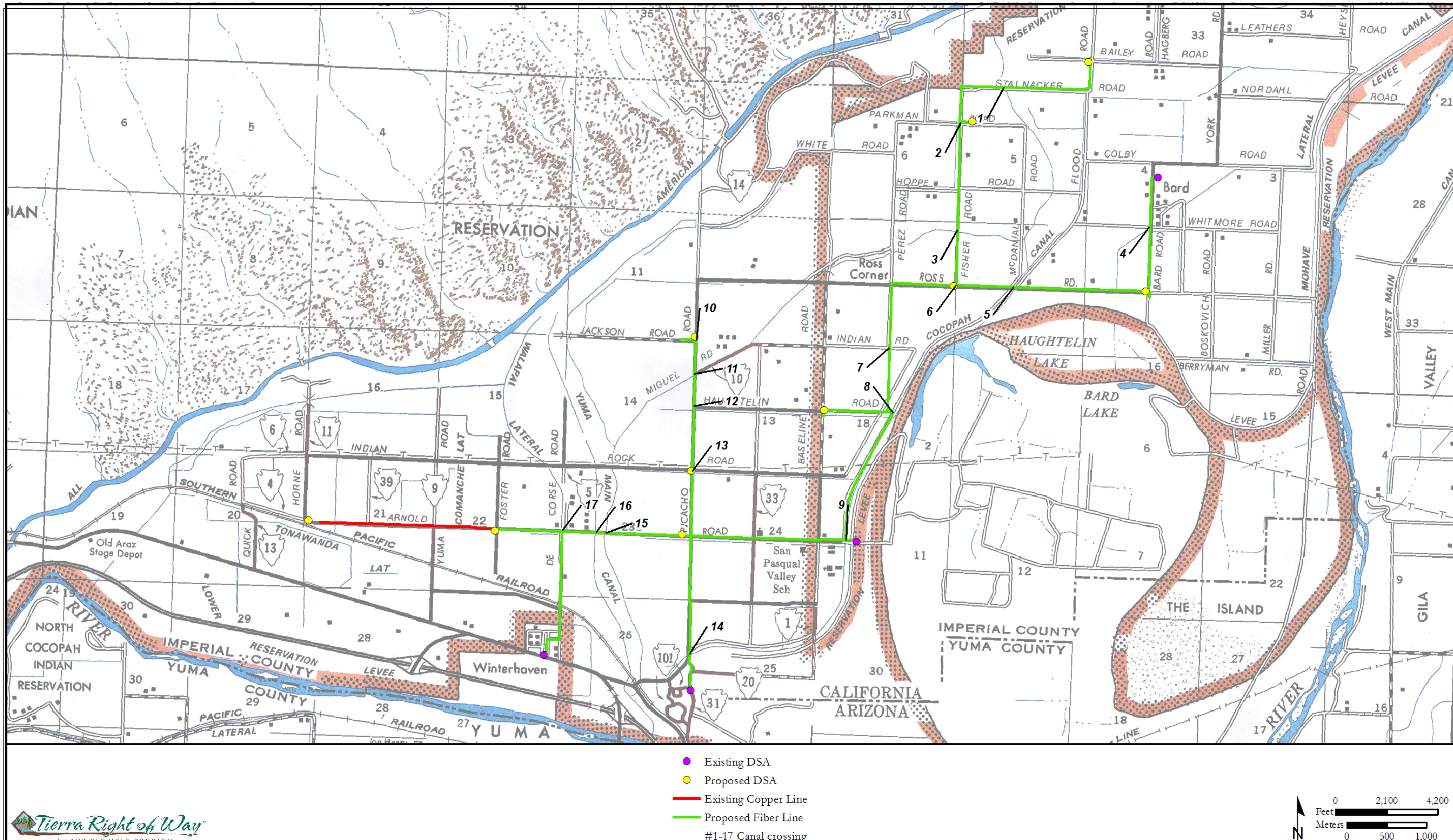

Figure 2. Project area.

Table 1. Cable Installation Lengths

Installation	Length (m)	Length (km)	Length (feet)	Length (miles)
On-Reservation	10,139	10.14	33,264	6.30
Off-Reservation	14,507	14.51	47,595	9.01
Total	**24,646**	**24.65**	**80,859**	**15.31**

Line markers, which will be installed at intervals of approximately 305 m (1,000 feet), are approximately 1.2 m (4.0 feet) tall and made of flexible fiberglass.

The line installation will be performed in two steps. First, a protective conduit for the fiber-optic cable will be installed by either plowing or directional boring construction methods. Second, the fiber-optic cable will be "blown" through the conduit using compressed air. The total combined ground disturbance associated with the project, including both the plowed and bored installations, would not exceed an area approximately 5.1 ha (12.5 acres) in size.

1.2.1 Plowed Conduit Installation

Plowed conduit is installed using a machine equipped with a specialized single ripper that loosens the soil along the installation path. Conduit is fed either from the plow machine or from a separate truck-mounted reel through a plow chute attached to the ripper and laid directly at a nominal depth of 1 m (3 feet). A compaction machine follows directly behind the plow machine, restoring the ground surface to its original contour. The installation path may be "pre-ripped" if necessary to loosen the soil in areas where subsurface rock or other buried obstructions may be present. Ground disturbance associated with the plowed installation will be limited to an approximately 2.4-m-wide (8.0-foot-wide) corridor.

1.2.2 Bored Conduit Installation

Directional boring is a method used to install underground utilities without the need for trenching. Typically it is used to install utility lines under waterways, roads, and other areas where the avoidance of surface disturbance is desirable (Figure 3). Directional boring machines are essentially horizontal drilling rigs and have a drill bit that is steerable. The drill bit is guided by the operator as it progresses along the desired boring path. After boring, the drill pipe is pulled out and conduit is threaded through the bore. In "drill and leave" installations, the drill pipe is left in place and serves as the conduit.

Two boring pits for bore ingress and egress would be required for each canal crossing installation—one on each side of the canal. These bore pits would be located at varying distances from the canals and roads. The depth of the bore would be a minimum of 1.5 m (5.0 feet) below the bottom of the canals and roads, and the bore lengths would be variable. The bores would be of sufficient diameter to accommodate the 5-cm (2-inch) conduit and would be drilled using drilling fluid "mud." This mud is nontoxic, consisting of clay, bentonite, and water; and it would be disposed of accordingly.

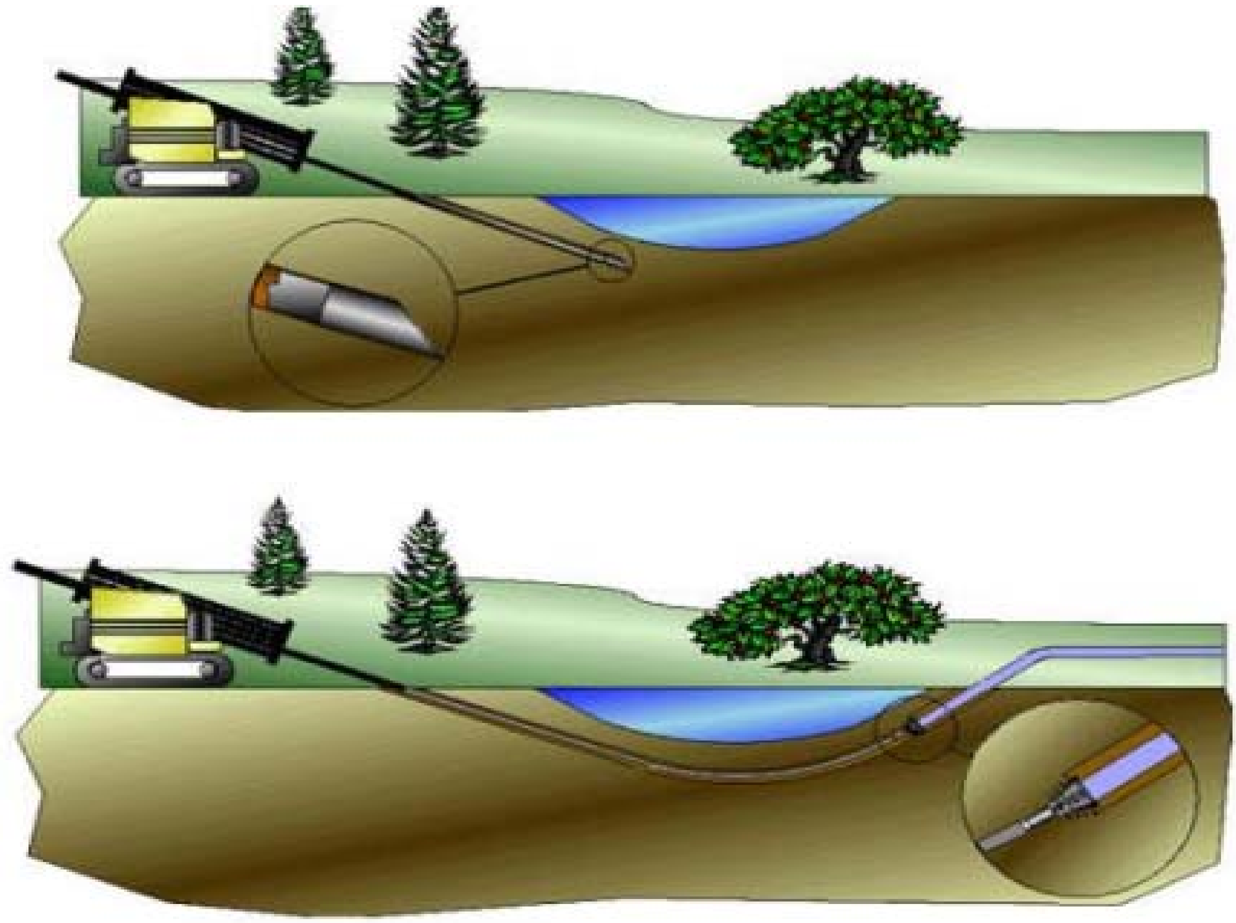

Figure 3. Example of a directional bore beneath a waterway.

Following the installation of the pipe beneath the canal or road, the bore pits would be filled in and compacted and the ground surface restored to its original contour. The locations of all canal bores associated with the project are summarized in Table 2. Ground disturbance associated with the bored conduit installations will occur within the same 2.4-m-wide (8.0-foot-wide) corridor as the plowed installations.

1.2.3 Project Schedule

The anticipated start date for the proposed project is mid-January, 2016 and construction would take approximately two months.

Table 2. Canal Bore Locations

Map No.	Canal Name	Location	Canal Width
1	Reservation Main Drain	Stahlnacker Road	20.5 m (67 feet)
2	Unnamed canal	Fisher and Parkman Roads	3.6 m (12 feet)
3	Reservation Main Drain	Fisher Road	19.6 m (64 feet)
4	Hopi Canal	Bard and Whitmore Roads	6.3 m (21 feet)
5	Cocopah Canal	Ross Road	9.0 m (30 feet)
6	Unnamed canal	Fisher and Ross Roads	5.3 m (17 feet)
7	Papago Canal	Perez Road	4.5 m (15 feet)
8	Pima Canal	Haughtelin and Perez Roads	4.5 m (15 feet)
9	Cocopah Canal	Flood and Arnold Roads	7.0 m (23 feet)
10	Navajo Canal	Picacho and Jackson Roads	7.3 m (24 feet)
11	Reservation Main Drain	Picacho Road	27.3 m (90 feet)
12	Pima Canal	Picacho and Haughtelin Roads	3.7 m (12 feet)
13	Pueblo Canal	Picacho and Indian Rock Roads	3.6 m (12 feet)
14	Cocopah Canal	Picacho Road	8.3 m (27 feet)
15	Reservation Main Drain	Arnold Road	27.3 m (90 feet)
16	Yuma Main Canal	Arnold Road	46.0 m (151 feet)
17	Walapai Canal	Arnold Road	2.4 m (8 feet)

1.3 Applicable Environmental Regulations

1.3.1 Federal Requirements for Species Protection

***Endangered Species Act*—**The U.S. Fish and Wildlife Service (FWS) and the National Oceanographic and Atmospheric Administration's National Marine Fisheries Service (NMFS) enforce the provisions stipulated within the Endangered Species Act (ESA) of 1973 (16 USC Section 1531 et seq.). Threatened and Endangered species on the Federal list (50 CFR Section 17.11 and 17.12) are protected from take, defined as direct or indirect harm, unless a Section 10 permit is granted to an entity other than a Federal agency or a Biological Opinion with incidental take provisions is rendered to a Federal lead agency via a Section 7 consultation. Pursuant to the requirements of the ESA, an agency reviewing a proposed project within its jurisdiction must determine whether any Federally listed species may be present in the project site and determine whether the proposed project will have a potentially significant impact upon such species. Under the ESA, habitat loss is considered to be an impact to a species. In addition, the agency is required to determine whether the project is likely to jeopardize the continued existence of any species that is proposed for listing under the ESA or to result in the destruction or adverse modification of critical habitat proposed or designated for such species (16 USC 1536[3], [4]). Therefore, project-related impacts to these species or their habitats would be considered significant and would require mitigation.

Executive Order 13186: Migratory Bird Treaty Act— The Migratory Bird Treaty Act (MBTA) of 1918 (United States Code, Title 16, Chapter 7, Subchapter II) prohibits the "pursuit, hunt, take, capture, kill, attempt to take, capture, or kill, possess, offer for sale, sell, offer to barter, barter, offer to purchase, purchase, deliver for shipment, ship, export, import, cause to be shipped, exported, or imported, deliver for transportation, transport or cause to be transported, carry or cause to be carried, or receive for shipment, transportation, carriage, or export, any migratory bird, any part, nest, or eggs of any such bird, or any product, whether or not manufactured, which consists, or is composed in whole or part, of any such bird or any part, nest, or egg thereof." The ensuing Executive Order 13186, signed January 10, 2001, by President Clinton "directs executive departments and agencies to take certain actions to further implement the (MBTA)." Such actions include the responsibility that Federal agencies "taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations … develop and implement, within 2 years, a Memorandum of Understanding with the Fish and Wildlife Service, that shall promote the conservation of migratory bird populations."

Executive Order 11990: Protection of Wetlands—Executive Order 11990, signed May 24, 1997, directs Federal agencies to refrain from assisting in or giving financial support to projects that encroach on publicly or privately owned wetlands. It further requires that Federal agencies support a policy to minimize the destruction, loss, or degradation of wetlands. A project that encroaches on wetlands may not be undertaken unless the agency has determined that (1) there are no practicable alternatives to construction, (2) the project includes all practicable measures to minimize harm to wetlands affected, and (3) the impact will be minor.

Executive Order 13112: Invasive Species Prevention—On Feb 3, 1999, Executive Order 13112 was signed establishing the National Invasive Species Council. Executive Order 13112 required that each Federal agency whose actions may affect the status of invasive species will, to the extent practicable and permitted by law, (1) identify such actions; (2) subject to the availability of appropriations, and within Administration budgetary limits, use relevant programs and authorities to: (i) prevent the introduction of invasive species, (ii) detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner, (iii) monitor invasive species populations accurately and reliably, (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded, (v) conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species, and (vi) promote public education on invasive species and the means to address them; and (3) not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless, pursuant to guidelines that it has prescribed, the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions. In addition, it requires that Federal agencies will pursue the duties set forth in this section in consultation with the Invasive Species Council, consistent with the Invasive Species Management Plan and in cooperation with stakeholders, as appropriate, and, as approved by the Department of State, when Federal agencies are working with international organizations and foreign nations.

1.3.2 State Requirements for Species Protection

California Endangered Species Act/California Environmental Quality Act—The California Endangered Species Act (CESA) of 1970 (Fish and Game Code Section 2050 et seq., and CCR Title 14, Subsection 670.2, 670.51) prohibits the take (interpreted to mean the direct killing of a species) of species listed under CESA (14 CCR Subsection 670.2, 670.5). Under CESA, State agencies are required to consult with the California Department of Fish and Wildlife (CDFW) (formerly

California Department of Fish and Game [CDFG]) when preparing CEQA documents. Consultation ensures that proposed projects or actions do not have a negative effect on State listed species. During consultation, CDFW determines whether take would occur and identifies "reasonable and prudent alternatives" for the project and conservation of special-status species. CDFW can authorize take of a State-listed species under Sections 2080.1 and 2081(b) of CDFW code in those cases where it is demonstrated that the impacts are minimized and mitigated. Take authorized under Section 2081(b) must be minimized and fully mitigated. A CESA permit must be obtained if a project will result in take of listed species, either during construction or over the life of the project. Under CESA, CDFW is responsible for maintaining a list of Threatened and Endangered species designated under State law (CDFG Code 2070). CDFW also maintains lists of Species of Special Concern, which serve as "watch lists." Pursuant to the requirements of CESA, a State or local agency reviewing a proposed project within its jurisdiction must determine whether any State-listed species may be present in the project area and determine whether the proposed project will have a potentially significant impact upon such species. Project-related impacts to species on the CESA list would be considered significant and would require mitigation. Impacts to Species of Concern and fully protected species would be considered significant under certain circumstances.

The California Environmental Quality Act (CEQA) of 1970 (Subsections 21000-21178) requires that CDFW be consulted during the CEQA review process regarding impacts of proposed projects on rare or Endangered species. These "special status" species are defined under CEQA Guidelines Subsection 15380(b) and (d) as those listed under the ESA and CESA, and species that are not currently protected by statute or regulation, but would be considered rare, Threatened, or Endangered under these criteria, or by the scientific community. Therefore, species that are considered rare or Endangered are addressed in this study regardless of whether they are afforded protection through any other statute or regulation. The California Native Plant Society (CNPS) inventories the native flora of California and ranks species according to rarity; plants on Lists 1A, 1B, and 2 are considered special status species under CEQA.

Although Threatened and Endangered species are protected by specific Federal and State statutes, CEQA Guidelines Section 15380(d) provides that a species not listed on the Federal or State list of protected species may be considered rare or Endangered if it can be shown to meet certain specified criteria. These criteria have been modeled after the definition in the ESA and the section of the California Fish and Game Code dealing with rare or Endangered plants and animals. Section 15380(d) allows a public agency to undertake a review to determine if a significant effect on species that have not yet been listed by either the U.S. Fish and Wildlife Service (USFWS) or CDFW (i.e., Candidate species) would occur. Thus, CEQA provides an agency with the ability to protect a species from the potential impacts of a project until the respective government agency has an opportunity to designate the species as protected, if warranted.

California Native Plant Protection Act—The California Native Plant Protection Act of 1977 (CDFG Code Section 1900-1913) requires all State agencies to use their authority to carry out programs to conserve Endangered and otherwise rare species of native plants. Provisions of the Act prohibit the taking of listed plants from the wild and require the project proponent to notify CDFW at least 10 days in advance of any change in land use, which allows CDFW to salvage listed plants that would otherwise be destroyed.

Nesting Birds—California Fish and Game Code Subsections 3503, 3503.5, and 3800 prohibit the possession, incidental take, or needless destruction of birds, their nests, and eggs. California Fish and Game Code Section 3511 lists birds that are "Fully Protected" as those that may not be taken or possessed except under specific permit.

1.3.3 Protection of Wetlands, Waters of the United States, and Waters of the State

Any person, firm, or agency planning to alter or work in Waters of the U.S. (WUS), including the discharge of dredged or fill material, must first obtain authorization from the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (CWA; 33 U.S.C. 1344). Permits, licenses, variances, or similar authorization may also be required by other Federal, State, and local statutes. Section 10 of the Rivers and Harbors Act of 1899 prohibits the obstruction or alteration of navigable WUS without a permit from USACE (33 U.S.C. 403). The CDFW requires notification prior to commencement and possibly a Streambed Alteration Agreement pursuant to California Fish and Game Code Subsection 1601-1603, 5650F, if a proposed project would result in the alteration or degradation of a stream, river, or lake in California. The Regional Water Quality Control Board (RWQCB) may require State Water Quality Certification (CWA Section 401 permit) prior to the alteration of or discharge to WUS and the State.

WUS are defined as: all waters that are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters that are subject to the ebb and flow of the tide; all interstate waters including interstate wetlands; all other waters such as intrastate lakes, rivers, streams (including intermittent and ephemeral streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes or natural ponds, where the use, degradation, or destruction of which could affect interstate commerce; impoundments of these waters; tributaries of these waters; or wetlands adjacent to these waters (33 CFR Part 328). With non-tidal waters, in the absence of adjacent wetlands, the extent of USACE jurisdiction extends to the ordinary high water mark (OHWM)—the line on the shore established by fluctuations of water and indicated by a clear, natural line impressed on the bank, shelving, changes in soil character, destruction of terrestrial vegetation, or the presence of litter and debris. Waters of the State are defined as "any surface water or groundwater, including saline waters, within the boundaries of the state (California Water Code Section 13050(e)."

Water quality in California is governed by the Porter-Cologne Water Quality Control Act (Porter-Cologne Act) (California Water Code § 13000 et. seq.) This Act delegates responsibility to the State Water Resource Control Board (SWRCB) for water rights and water quality protection and directs the nine statewide RWQCBs to develop and enforce water quality standards within their jurisdiction. The Porter-Cologne Act requires any entity discharging waste or proposing to discharge waste within any region that could affect the quality of the Waters of the State to file a report of waste discharge with the appropriate RWQCB. The appropriate RWQCB then must issue a permit, referred to as a waste discharge requirement (WDR). WDRs implement water quality control plans and take into consideration the beneficial uses to be protected, the water quality objectives reasonably required for that purpose, other waste discharges, and the need to prevent nuisances (California Water Code § 13263).

1.3.4 Lower Colorado River Multi-Species Conservation Program

The Lower Colorado River Multi-Species Conservation Program **(**LCR MSCP) was created to balance the use of the Colorado River water resources with the conservation of native species and their habitats. The program works toward the recovery of species currently listed under the ESA. It also reduces the likelihood of additional species listings. Implemented over a 50-year period, the program accommodates current water diversions and power production and will optimize opportunities for future water and power development by providing ESA compliance through the implementation of a Habitat Conservation Plan (HCP) which was finalized in December 2004. The program area extends over 643.7 km (400 miles) of the lower Colorado River from Lake Mead to the southernmost border with Mexico and includes Lakes Mead, Mohave, and Havasu, as well as the historic 100-year floodplain where the proposed project is located, along the main stem of the lower Colorado River. The HCP calls for the creation of more than 3,278 ha (8,100 acres) of habitat for fish and wildlife species and the production of over 1.2 million native fish to augment existing populations. The plan will benefit at least 26 species, most of which are State or Federally listed Endangered, Threatened, or Sensitive species.

The Bureau of Reclamation (BOR) is the implementing agency for the LCR MSCP. Partnership involvement occurs primarily through the LCR MSCP Steering Committee (currently representing 57 entities, including State and Federal agencies, water and power users, municipalities, Native American Tribes, conservation organizations, and other interested parties), which provides input and oversight functions in support of LCR MSCP implementation. Program costs are evenly divided between the Federal government and non-Federal partners (Lower Colorado River Multi-Species Conservation Program 2013).

1.3.5 Imperial County General Plan

The Imperial County General Plan (GP), which applies to all public and private projects in unincorporated Imperial County, consists of 10 Elements entitled Land Use, Housing, Circulation and Scenic Highways, Noise, Seismic and Public Safety, Agricultural, Conservation and Open Space, Geothermal/Alternative Energy and Transmission, Water, and Parks & Recreation.

The Conservation and Open Space Element of the GP provides detailed plans and measures for the preservation and management of biological and cultural resources, soils, minerals, energy, regional aesthetics, air quality, and open space. The purpose of the Conservation and Open Space Element is to promote the protection, maintenance, and use of the County's natural resources with particular emphasis on scarce resources and to prevent wasteful exploitation, destruction, and neglect of the State's natural resources. Additionally, the purpose of this Element is to recognize that natural resources must be maintained for their ecological value for the direct benefit to the public, protect open space for the preservation of natural resources, the managed production of resources, outdoor recreation, and for public health and safety (Imperial County Planning and Development Services 2014). Recommended mitigation for invasive species control has been included in this report that will be consistent with the conservation objectives of the GP.

2.0 METHODOLOGY

Tierra Right of Way Services, Ltd. (Tierra), senior biologist, Tim Jordan, conducted a reconnaissance survey of the project area on July 15 and 16, 2014 (Table 3). Special status species (listed in Appendix A) were assessed for their potential to occur in the project area based on the existing characteristics that were observed. In addition to special status species and their habitats, the project corridors were assessed for general wildlife species, migratory birds, plant species and noxious weeds, sensitive natural communities, and the presence or absence of waterways.

Table 3. Field Survey Schedule

Date/Weather Conditions	Surveyor	Survey Time/Survey Purpose
7/15/2014; 100–101° F, calm, slight haze	Tim Jordan	1200–1430, general biological
7/16/2014; 82–104° F, calm to slight breeze, clear	Tim Jordan	0700–1230, general biological, canal location recording

For the purposes of this report, the entire area assessed during the reconnaissance survey includes the project corridor centerlines with an approximately 15.2-m (50.0-foot) buffer to either side, which is comprehensively referred to as the study area. All areas within the study area were visually assessed during the surveys.

Prior to the reconnaissance surveys, a comprehensive list of regionally occurring special-status species and sensitive natural communities was compiled from the list of reported occurrences in the CDFW's California Natural Diversity Database (CNDDB) for the Araz, Bard, Imperial Reservoir, Laguna Dam, Little Picacho Peak, Picacho Peak, Yuma East, and Yuma West 7.5-minute USGS topographic quadrangles (CNDDB 2014) (Figure 4) and a list of Natural Resources of Concern that includes Federally listed special-status species for Imperial County that was obtained from the FWS Information, Planning, and Conservation (IPAC) system. CNDDB occurrence records include those that are mapped—meaning that occurrence data has been verified by CDFW—and unprocessed records that have not been verified. The CNDDB and FWS lists are included in Appendix A. Habitats present in the study area were compared to the habitat requirements of these regionally occurring special-status species; this comparison was used to determine which of these species had the potential to occur in the study area. Those species with a potential to occur within the study area and/or be adversely affected by the proposed project are addressed in Section 4.3. Species whose range (geographic or elevation) does not include the study area or for which the study area does not provide suitable habitat, were excluded from further consideration. This analysis is included in Appendix B.

3.0 BIOLOGICAL RESOURCES IN THE PROJECT AREA

3.1 Environmental Setting

The project area is located in southeastern California on the lower Colorado River in an area primarily used for agricultural cultivation. Several irrigation canals operated by the BOR Imperial Irrigation District and Bard Water District either cross or run parallel to the project corridors. Elevations in the project area range from approximately 38–43 m (126–140 feet) above mean sea level (AMSL).

The Western Regional Climate Center (WRCC) recorded seasonal climatic data from 1993–2013 at the Yuma Quartermaster Depot, located just south of the project area (WRCC 2014). These data include average maximum temperature, average minimum temperature, average total precipitation, and average snowfall. The average annual maximum temperature within the project area is 90.1° F (32.2° C); the hottest month of the year is July with an average maximum temperature of 109.4° F (43.0° C). The average annual minimum temperature within the project area is 59.0° F (15.0° C), with December having the coldest average temperature of 43.4° F (6.3° C). The project area receives an average of 6.80 cm (2.67 inches) of precipitation annually; February has the highest average precipitation at 1.20 cm (0.48 inches). The project area receives no snowfall in the average year.

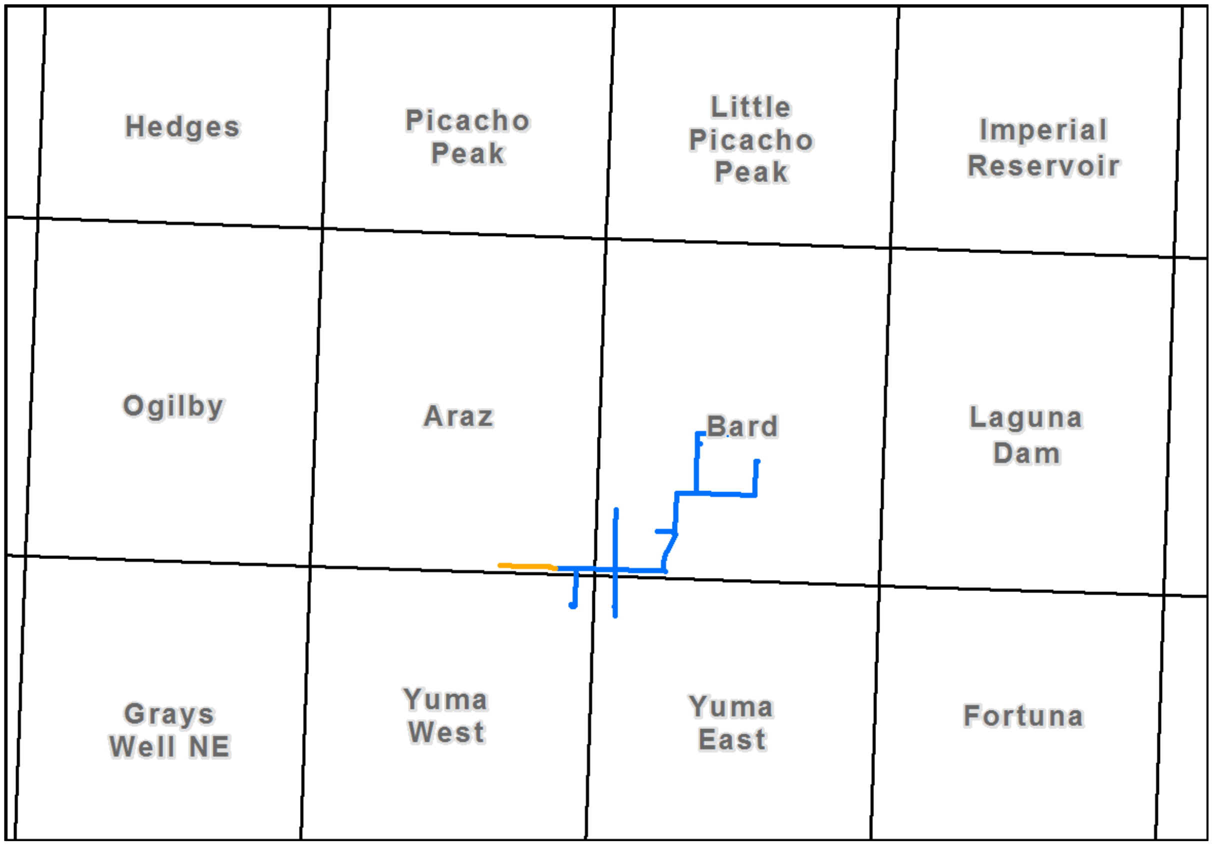

Figure 4. USGS topographic quadrangles in CNDDB search.

3.2 Habitat Types

3.2.1 Terrestrial Habitat

The study area is located within the Colorado Desert, as classified in *A Manual of California Vegetation* (Sawyer and Keeler-Wolf 2009); however, the dominant type of terrestrial habitat present in the project area consists of agricultural land that is being actively cultivated to produce Sudangrass, wheat, cotton, alfalfa, dates, citrus, and other crops. The road shoulders where the proposed telecommunications line is to be installed are mostly devoid of vegetation as a result of blading activities associated with road maintenance and agricultural activities. Because of this previous disturbance, little-to-no native vegetation remains in the project area. Complete lists of plants and wildlife species identified in the study area at the time of the surveys can be found in Appendices C and D.

3.2.2 Aquatic Habitat

Aquatic habitat in the study area is limited to that associated with agricultural canals. There are no ponds or ephemeral or perennial waterways within the study area.

Grass Carp *(Ctenopharyngodon idella)*, a fish species native to southeastern Russia and northwestern China, has been stocked in the Yuma Main Canal by the Yuma County Water User's Association since October 2013 for vegetation control purposes.

3.2.3 Sensitive Natural Communities

Riparian Areas

No sensitive natural communities, as defined by CDFW, are present in the study area. However, the margins of unlined canals in the study area, especially the Reservation Main Drain, contain limited riparian vegetation consisting mostly of dense Common Reed *(Phragmites australis)* and invasive species such as Salt Cedar *(Tamarix ramosissima)* (see Photos 4 and 9 in Appendix E). This vegetation is mostly low-growing, is not structurally complex, and does not have a tree overstory.

Wetlands

Riverine wetlands may be present along the unlined canals that are crossed by the project corridors. These potential wetlands were not delineated during the field surveys because TDS will be boring beneath all of the canals crossed by the line installations with sufficient set backs from either the canal edges or the extent of associated vegetation, if present, thus avoiding any potential impacts to wetlands.

3.3 Special Status Species

Based on the assessment methodology outlined in Section 2.0, seven Special Status wildlife species are either known to occur or have the potential to occur in the study area (Table 4). Because of the previously disturbed nature of the study area and its lack of native vegetation, no Special Status plant species were expected to be found during the surveys, and none were identified.

3.3.1 Special Status Wildlife Species

Table 4. Special Status Species with the Potential to Occur in the Study Area

Scientific Name	Common Name	Status (FWS/State/CNPS)
Amphibians		
Incilius alvarius	Sonoran Desert Toad	–/SSC/–
Lithobates yavapaiensis	Lowland Leopard Frog	–/SSC/–
Birds		
Lanius ludovicianus	Loggerhead Shrike	–/SSC/–
Pyrocephalus rubinus	Vermilion Flycatcher	–/SSC/–
Xanthocephalus xanthocephalus	Yellow-headed Blackbird	–/SSC/–
Mammals		
Corynorhinus townsendii	Townsend's Big-eared Bat	–/CT, SSC/–
Sigmodon hispidus eremicus	Yuma Hispid Cotton Rat	–/SSC/–

Key: SSC = Species of Special Concern, CT = Candidate Threatened.

3.3.1.1 Sonoran Desert (Colorado River) Toad *(Incilius alvarius)*

Federal Status: None

State/CDFW Status: Species of Special Concern

Habitat/Biology: The Colorado River Toad is found in the lower Colorado River and in irrigated lowlands of the extreme southeast portion of Imperial County. In the main part of its range it can be found at elevations from sea level to 1,600 m (5,300 feet) AMSL. It can be found in a variety of desert and semi-arid habitats, including brushy desert with creosote bush, washes with mesquite, and semi-arid grasslands and woodlands. It is semi-aquatic and is usually found associated with large, somewhat permanent streams. It is occasionally found near small springs, temporary rain pools, and human-made canals and irrigation ditches. This species is active from March to July during periods of warm rainfall (CDFW 2014).

Critical Habitat Designation: Not applicable

CNDDB Records: This species has mapped occurrences on the Araz and Bard USGS quadrangles.

Potential to Occur within the Study Area: No Sonoran Desert Toad individuals were identified during the biological survey. Sonoran Desert Toad has a moderate potential to occur along the unlined and vegetated canals crossed by the project corridors because they contain suitable cover, foraging, and general habitat for this species. It would be unlikely for this species to occur along the lined canals crossed by the project corridors and in the remaining portions of the study area located away from the canals because of the general lack of cover in these areas.

3.3.1.2 Lowland Leopard Frog *(Lithobates yavapaiensis)*

Federal Status: None

State/CDFW Status: Species of Special Concern

Habitat/Biology: Historically, the Lowland Leopard Frog ranged from northwestern Arizona through central and southeastern Arizona, southwestern New Mexico, and northern Sonora, Mexico. Populations were also known from southwestern Arizona and southeastern California along the lower Colorado River and in the Coachella Valley. This species inhabits aquatic systems in lower elevation desert grasslands up to mid-elevation pinyon-juniper woodland. They are habitat generalists and breed in a variety of natural and human-made aquatic systems. Natural systems include rivers, permanent streams and permanent pools in intermittent streams, beaver ponds, cienegas, wetlands, and springs; while human-made systems include earthen cattle tanks, livestock drinkers, canals, irrigation sloughs, wells, mine adits, abandoned swimming pools, and ornamental backyard ponds. Most historical localities are from small-to-medium-sized streams and rivers. In these stream and river habitats, Lowland Leopard Frogs are typically concentrated at springs, near debris piles, at heads of pools, and near deep pools associated with root masses (Arizona Game and Fish Department 2006).

Critical Habitat Designation: Not applicable

CNDDB Records: This species has mapped occurrences on the Imperial Reservoir and Laguna USGS quadrangles.

Potential to Occur within the Study Area: No Lowland Leopard Frog individuals were identified during the biological survey. Lowland Leopard Frog has a moderate potential to occur along the unlined and vegetated canals crossed by the project corridors because they contain suitable cover, foraging, and general habitat for this species. It would be unlikely for this species to occur along the lined canals crossed by the project corridors and in the remaining portions of the study area located away from the canals because of the general lack of cover in these areas.

3.3.1.3 Loggerhead Shrike *(Lanius ludovicianus)*

Federal Status: None

State/CDFW Status: Species of Special Concern

Habitat/Biology: Loggerhead Shrike is a common resident and winter visitor in lowlands and foothills throughout California. It prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches. Highest population density occurs in open-canopied valley foothill hardwood, valley foothill hardwood-conifer, valley foothill riparian, pinyon-juniper, juniper, desert riparian, and Joshua tree habitats. This species rarely occurs in heavily urbanized areas but is often found in open cropland. It sometimes uses edges of denser habitats (CDFW 2014).

Critical Habitat Designation: Not applicable

CNDDB Records: This species has an unprocessed occurrence on the Laguna Dam USGS quadrangle.

Potential to Occur within the Study Area: No Loggerhead Shrike individuals were identified during the biological survey. Loggerhead Shrike has a low potential to occur in the study area because of the presence of scattered residences and commercial areas with their associated activity levels; however, the agricultural fields in and adjacent to the study area located away from these developed areas may provide suitable open habitat for this species.

3.3.1.4 Vermilion Flycatcher *(Pyrocephalus rubinus)*

Federal Status: None

State/CDFW Status: Species of Special Concern

Habitat/Biology: Vermilion Flycatcher is a rare, local, yearlong resident along the Colorado River, especially in vicinity of Blythe, Riverside County. Nesting individuals inhabit cottonwood, willow, mesquite, and other vegetation in desert riparian habitat adjacent to irrigated fields, irrigation ditches, pastures and other open, mesic areas in isolated patches throughout central southern California. Populations of this species have declined drastically in the Imperial and Coachella Valleys and along the Colorado River, primarily as a result of loss of habitat. Despite local extirpations in these two valleys, the overall breeding range of Vermilion Flycatcher has expanded in recent years to the north and west (CDFW 2014).

Critical Habitat Designation: Not applicable

CNDDB Records: This species has mapped occurrences on the Yuma East and Laguna USGS quadrangles. It also has unprocessed and mapped occurrences on the Little Picacho Peak and Imperial Reservoir quadrangles.

Potential to Occur within the Study Area: No Vermilion Flycatcher individuals were identified during the biological survey. Vermilion Flycatcher has a low potential to nest in the study area because of the lack of well-developed riparian areas. This species has a moderate potential to occur in the irrigated fields and vegetated canals in and adjacent to the study area because these areas may provide suitable foraging habitat for this species.

3.3.1.5 Yellow-headed Blackbird *(Xanthocephalus xanthocephalus)*

Federal Status: None

State/CDFW Status: Species of Special Concern

Habitat/Biology: In California, the Yellow-headed Blackbird breeds commonly but locally east of the Cascade Range and Sierra Nevada, in the Imperial and Colorado River Valleys, in the Central Valley, and at selected locations in the coast ranges west of the Central Valley. This species nests in fresh emergent wetlands with dense vegetation and deep water, often along the borders of lakes or ponds. Individuals forage in emergent wetlands and moist, open areas, especially cropland and the muddy shores of lakes. Yellow-headed Blackbird has a restricted distribution in the Central Valley in winter, occurring mainly in the western portion. This species is fairly common in winter in the Imperial Valley and it occurs as a migrant and local breeder in desert and along the Orange County coast. Yellow-headed Blackbird has bred, at least irregularly, as high as 2,000 m (6,600 feet) AMSL in the San Bernardino Mountains (CDFW 2014).

Critical Habitat Designation: Not applicable

CNDDB Records: This species has unprocessed occurrences on the Bard and Imperial Reservoir quadrangles.

Potential to Occur within the Study Area: No Yellow-headed Blackbird individuals were identified during the biological survey. There are no emergent wetlands in the study area suitable for nesting Yellow-headed Blackbirds; however, this species has a moderate potential to occur because the agricultural field in and adjacent to the study area may provide suitable foraging habitat.

3.3.1.6 Townsend's Big-eared Bat *(Corynorhinus townsendii)*

Federal Status: None

State/CDFW Status: Candidate Threatened, Species of Special Concern

Habitat/Biology: Townsend's Big-eared Bat is found throughout California, but the details of its distribution are not well-known. This species is found in all but subalpine and alpine habitats, and may be found at any season throughout its range. Once considered common, Townsend's Big-eared Bat is now considered uncommon in California. It is most abundant in mesic habitats. This species requires caves, mines, tunnels, buildings, or other human-made structures for roosting. It may use separate sites for night, day, hibernation, or maternity roosts. Hibernation roosts are cold but not below freezing, and individuals may move within the hibernacula to find suitable temperatures. Maternity roosts are warmer than hibernation roosts.

Small moths are the principal food source for Townsend's Big-eared Bat, although beetles and a variety of soft-bodied insects are also consumed. This species captures prey in flight using echolocation or by gleaning from foliage. Flight is slow and maneuverable, and this bat is capable of hovering (CDFW 2014).

Critical Habitat Designation: Not applicable

CNDDB Records: This species has mapped occurrences on the Bard, Yuma East, Yuma West, Imperial Reservoir, Little Picacho Peak, and Picacho Peak quadrangles.

Potential to Occur within the Study Area: No Townsend's Big-eared Bat individuals or potential roosting sites were identified in the study area during the biological survey. Townsend's Big-eared Bat has a moderate potential to occur in the study area while foraging because the vegetated areas, including agricultural fields, in and adjacent to the study area may provide suitable foraging habitat.

3.3.1.7 Yuma Hispid Cotton Rat *(Sigmodon hispidus eremicus)*

Federal Status: None

State/CDFW Status: Species of Special Concern

Habitat/Biology: In California, Yuma Hispid Cotton Rat occurs only along the Colorado River and in the Imperial Valley. Establishment of cotton rats in the Imperial Valley apparently was in response to agricultural irrigation practices. This species is most common in grassland and cropland habitats near water, including grass-forb understory vegetation in early successional stages of other habitats. Cotton rats also occur in overgrown clearings and herbaceous borders of fields and brushy areas (CDFW 2014). Grass height and density have been documented as important habitat components for hispid cotton rats; they utilize runways through dense herbaceous growth and nests are built of woven grass (BOR 2008).

Critical Habitat Designation: Not applicable

CNDDB Records: This species has mapped occurrences on the Bard, Yuma West, Little Picacho Peak, and Laguna Dam quadrangles. It also has mapped and unprocessed occurrences on the Yuma East quadrangle.

Potential to Occur within the Study Area: No Yuma Hispid Cotton Rat individuals were identified in the study area during the biological survey. Yuma Hispid Cotton Rat has a moderate potential to occur in the study area along the unlined Reservation Main Drain because the dense vegetation present represents suitable cover and foraging habitat. It would be unlikely for this species to occur along the lined canals crossed by the project corridors and in the remaining portions of the study area located away from the canals because of the lack of dense cover vegetation in these areas.

3.3.2 Migratory Birds

The study area and areas adjacent to it were determined to contain suitable habitat for two migratory birds appearing on the American Bird Conservancy's *U.S. Watchlist of Birds of Conservation Concern*. Both of these species were identified in the CNDDB search, which included mapped and unprocessed occurrences of Prairie Falcon *(Falco mexicanus)* on the Picacho Peak quadrangle and unprocessed occurrences of White-faced Ibis *(Plegadis chihi)* on the Bard quadrangle.

No bird nests were observed in the project corridors at the time of the surveys; this lack of nests was because the project corridors being essentially devoid of vegetation large enough to support bird nests. However, areas adjacent to the project corridors and the study area contain trees and other vegetation that may be utilized by migratory birds. A list of bird species appearing on the 2008 FWS Birds of Conservation Concern list for Bird Conservation Region 33, Sonoran and Mojave Deserts U.S. Portion Only, can be found in Table 5.

Table 5. Bird Conservation Region 33 Migratory Bird List

Least Bittern	Elf Owl
Bald Eagle	Burrowing Owl
Peregrine Falcon	Costa's Hummingbird
Prairie Falcon	Gila Woodpecker
Black Rail	Gilded Flicker
Snowy Plover	Bell's Vireo
Mountain Plover	Gray Vireo
Whimbrel	Bendire's Thrasher
Long-billed Curlew	LeConte's Thrasher
Marbled Godwit	Lucy's Warbler
Red Knot	Yellow Warbler
Gull-billed Tern	Rufous-winged Sparrow
Black Skimmer	Black-chinned Sparrow
Yellow-billed Cuckoo	Lawrence's Goldfinch

3.4 Invasive Species

Three invasive plant species appearing on the California Department of Food and Agriculture (CDFA) Noxious Weed Species List and/or the California Invasive Plant Council (CIPC) Invasive Plant Inventory list were identified in the study area. These invasive species include Russian Thistle *(Salsola kali)*, Kariba Weed *(Salvinia molesta)*, and Salt Cedar *(Tamarix ramosissima)* (See Appendix C).

With the exception of Russian Thistle and a few scattered dryland infestations of Salt Cedar, all of these invasive species were found associated with the irrigation canals crossed by the project corridors. The only aquatic invasive species identified, Kariba Weed, was found in the Reservation Main Drain at the proposed corridor crossings on Fisher, Picacho, and Stalnacker, Roads (crossings 7–9 indicated in Figure 2).

Two of the invasive species, Kariba Weed and Salt Cedar, have a High rating assigned by CIPC and the remaining species, Russian Thistle, has a Limited rating. The CIPC rating system is as follows:

> **High**: These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate-to-high rates of dispersal and establishment. Most are widely distributed ecologically.
>
> **Moderate**: These species have substantial and apparent but generally not severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate-to-high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.
>
> **Limited:** These species are invasive, but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low-to-moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

3.5 Jurisdictional Waters

There are no ephemeral drainages such as washes within or in the vicinity of the study area. There are several irrigation canals in the project area, and it was assumed that they flow at least intermittently and in some cases, perennially. An example of the latter would be the Yuma Main Canal and the Reservation Main Drain, two of the largest canals observed during the surveys. In total, the proposed fiber installations would cross irrigation canals at 17 locations.

The USACE and/or CDFW jurisdictional status of the canals in the project area was not determined conclusively because all of the canals would be avoided during the proposed telecommunications line installations (See the *Waterway Delineation and Assessment Report*, under separate cover). No dredge and fill operations will occur within the canals and no subsequent loss of WUS will take place because all canals in the project area will be bored beneath during the proposed installations. Likewise, a stream alteration permit from CDFW is unnecessary for the proposed installations because the canals and any potential wildlife habitat, either in the canals themselves or riparian habitat along the canal margins, will be avoided. A summary of the crossings, including the names of the canals, their locations, and corresponding identification numbers as indicated on Figure 2, can be found in Table 6.

Table 6. Irrigation Canal Crossings in the Study Area

Map No.	Canal Name	Location	Lined?
1	Reservation Main Drain	Stahlnacker Road	no
2	unnamed canal	Fisher and Parkman Roads	no
3	Reservation Main Drain	Fisher Road	no
4	Hopi Canal	Bard and Whitmore Road	no

Map No.	Canal Name	Location	Lined?
5	Cocopah Canal	Ross Road	yes
6	unnamed canal	Fisher and Ross Roads	yes
7	Papago Canal	Perez Road	no
8	Pima Canal	Haughtelin and Perez Roads	yes
9	Cocopah Canal	Flood Road	yes
10	Navajo Canal	Picacho and Jackson Roads	no
11	Reservation Main Drain	Picacho Road	no
12	Pima Canal	Picacho and Haughtelin Roads	yes
13	Pueblo Canal	Picacho and Indian Rock Roads	yes
14	Cocopah Canal	Picacho Road	no
15	Reservation Main Drain	Arnold Road	no
16	Yuma Main Canal	Arnold Road	no
17	Walapai Canal	Arnold Road	no

4.0 IMPACTS OF THE PROPOSED PROJECT

4.1 Significance Criteria

Per the regulatory requirements outlined in Section 1.3, including CEQA and NEPA statutes and guidelines, the proposed project will have a significant adverse impact on biological resources if it will:

- Have a substantial adverse effect, either directly through "take" or indirectly through habitat modifications, on any species identified as Threatened, Endangered, Candidate, or Proposed for Candidacy by FWS, or as Sensitive or as a Special-status Species in local or regional plans, policies, or regulations, or by FWS, CDFW, or CNPS;
- Have a substantial adverse effect on a species' Critical Habitat as designated by USFWS;
- Result in the introduction or spread of an invasive species;
- Have a substantial adverse effect on any sensitive natural community identified in local or regional plans, policies, regulations, or by the FWS or CDFW;
- Have a substantial adverse effect on Federally protected wetlands or other WUS as defined by Sections 10 and 404 of the Clean Water Act, including special aquatic sites such as wetlands, through direct removal, filling, hydrologic disruption, or other means;
- 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;
- Conflict with any local policies or ordinances protecting biological resources;
- Have a substantial adverse effect on habitat for commercially or recreationally important fisheries;
- Have a substantial adverse effect on waterfowl breeding or wintering habitat by reducing acreage or quality, or have a substantial adverse effect on the acreage or quality of migrant or wintering shorebird habitat; 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.

4.2 Effects of the Proposed Project

The proposed project will involve the installation of a buried telecommunications line in the previously disturbed road shoulders of existing roads. Following line installation, the only surface-level ancillary equipment that will be visible will be line markers, splice boxes, and ten equipment cabinets mounted on concrete pads. The majority of the ground disturbance associated with the installation would be temporary and would occur during plowing operations and at the bore pit locations used for the bored installations. The only permanent ground disturbance would occur at the new equipment cabinet locations. Impacts to wildlife and wildlife habitat from the proposed project would be temporary. Equipment noise and the presence of work crews may disturb wildlife in the areas surrounding the project corridors. Because the installations would occur along existing roads that carry regular vehicular traffic, any increases in noise and activity levels during construction would be minimal.

4.3 Impact Assessment and Recommended Avoidance and Minimization Measures

The following impact assessment is based on the criteria summarized in Section 4.1. For each impact identified, recommended avoidance, minimization, or mitigation measures are identified.

4.3.1 Special Status Species

Potential Impact #1: Construction of the proposed project has the potential to impact Sonoran Desert Toad and Lowland Leopard Frog.

Sonoran Desert Toad and Lowland Leopard Frog have the potential to occur along the irrigation canals in the study area. Implementation of the proposed project has the potential to impact these two species if individuals come into contact with construction equipment or personnel or individuals attempt to flee the construction area and are subject to increased chances of predation or other harm. With the implementation of avoidance and minimization measures listed below, impacts are expected to be reduced to a less than significant level.

Recommended Avoidance and Minimization Measures for Impact #1:

- All irrigation canals in the study area will be avoided during construction.
- Bore pits will be placed a minimum distance of 5 m (16 feet) beyond either the top of the canal bank or the maximum extent of any vegetation present along the canal's margin.

Potential Impact #2: Construction of the proposed project has the potential to impact Loggerhead Shrike, Yellow-headed Blackbird, and Townsend's Big-eared Bat.

Loggerhead Shrike and Yellow-headed Blackbird have the potential to occur in the agricultural fields adjacent to the study area. In addition to potentially occurring in the agricultural fields, Townsend's Big-eared Bat has the potential to occur in vegetated areas adjacent to the study area.

Recommended Avoidance and Minimization Measures for Impact #2:

- All agricultural fields will be avoided during construction.
- It is extremely unlikely that any vegetation trimming will be necessary during project implementation; however, if trimming is required to facilitate the installations, it will be kept to the absolute minimum necessary.

Potential Impact #3: Construction of the proposed project has the potential to impact Vermilion Flycatcher and Yuma Hispid Cotton Rat.

Vermilion Flycatcher and Yuma Hispid Cotton Rat have the potential to occur in the agricultural fields adjacent to the study area and along the vegetated irrigation canals within the study area.

Recommended Avoidance and Minimization Measures for Impact #3:

- All agricultural fields will be avoided during construction.
- All irrigation canals in the study area will be avoided during construction.
- Bore pits will be placed a minimum distance of 5 m (16 feet) beyond either the top of the canal bank or the maximum extent of any vegetation present along the canal's margin.

4.3.2 Invasive Species

Potential Impact #4: Construction of the proposed project has the potential to result in the spread of invasive plant species.

Because of the presence of invasive plant species in the study area, implementation of the proposed project has the potential to result in further spread of existing noxious weeds. Invasive species could also be introduced into the study area by construction equipment, vehicles, personnel, or imported fill or other material. Further introduction of invasive plant species could adversely impact the irrigation canals in the project area and their associated riparian areas, where present. However, with the implementation of the avoidance and minimization measures listed below, impacts are expected to be reduced to a less than significant level.

Recommended Avoidance and Minimization Measures for Impact #4:

- All irrigation canals in the study area will be avoided during construction.
- Bore pits will be placed a minimum distance of 5 m (16 feet) beyond either the top of the canal bank or the maximum extent of any vegetation present along the canal's margin.
- All equipment and vehicles will be thoroughly cleaned to remove dirt and weed seeds prior to being transported or driven to or from the study area.

5.0 SUMMARY

This BRE has been prepared for the Winterhaven Last Mile Underserved Broadband Project in order to evaluate the potential for the proposed project to impact sensitive biological resources. Based on the results of the analysis conducted in preparation of this report, the proposed project has the potential to impact special-status species and result in the introduction or spread of invasive species. With the implementation of the proposed avoidance and minimization measures, all potential adverse impacts are expected to be reduced to a less than significant level.

6.0 REPORT PREPARERS AND CERTIFICATION

Tierra believes that the proposed project would not violate any of the regulatory requirements outlined in Section 1.3, provided that all recommended avoidance and minimization measures indicated in Section 1.4 are implemented during construction. Results and conclusions contained in this report are based on actual field reconnaissance and represent my best professional judgment, based on information provided by the project proponent, applicable agencies, and other sources.

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11/17/2014

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APPENDIX A. REGIONALLY OCCURRING SPECIAL STATUS SPECIES LISTS

Table A.1. Regionally Occurring Special Status Species Lists

Element Type	Scientific Name	Common Name	Element Code	Federal Status	State Status	CDFW Status	CA Rare Plant Rank	Quad Code	Quad Name	Data Status	Taxonomic Sort
Animals - Amphibians	*Incilius alvarius*	Sonoran Desert Toad	AAABB01010	none	none	SSC	-	3211475	Bard	mapped	Animals - Amphibians - *Bufonidae* - *Incilius alvarius*
Animals - Amphibians	*Incilius alvarius*	Sonoran Desert Toad	AAABB01010	none	none	SSC	-	3211476	Araz	mapped	Animals - Amphibians - *Bufonidae* - *Incilius alvarius*
Animals - Amphibians	*Lithobates yavapaiensis*	Lowland (=Yavapai, San Sebastian, and San Felipe) Leopard Frog	AAABH01250	none	none	SSC	-	3211484	Imperial Reservoir	mapped	Animals - Amphibians - *Ranidae* - *Lithobates yavapaiensis*
Animals - Amphibians	*Lithobates yavapaiensis*	Lowland (=Yavapai, San Sebastian, and San Felipe) Leopard Frog	AAABH01250	none	none	SSC	-	3211474	Laguna Dam	mapped	Animals - Amphibians - *Ranidae* - *Lithobates yavapaiensis*
Animals - Birds	*Accipiter cooperii*	Cooper's Hawk	ABNKC12040	none	none	WL	-	3211474	Laguna Dam	mapped	Animals - Birds - *Accipitridae* - *Accipiter cooperii*
Animals - Birds	*Accipiter cooperii*	Cooper's Hawk	ABNKC12040	none	none	WL	-	3211484	Imperial Reservoir	unprocessed	Animals - Birds - *Accipitridae* - *Accipiter cooperii*
Animals - Birds	*Accipiter cooperii*	Cooper's Hawk	ABNKC12040	none	none	WL	-	3211475	Bard	mapped and unprocessed	Animals - Birds - *Accipitridae* - *Accipiter cooperii*
Animals - Birds	*Aquila chrysaetos*	Golden Eagle	ABNKC22010	none	none	FP; WL	-	3211485	Little Picacho Peak	unprocessed	Animals - Birds - *Accipitridae* - *Aquila chrysaetos*

Element Type	Scientific Name	Common Name	Element Code	Federal Status	State Status	CDFW Status	CA Rare Plant Rank	Quad Code	Quad Name	Data Status	Taxonomic Sort
Animals - Birds	*Haliaeetus leucocephalus*	Bald Eagle	ABNKC10010	delisted	Endangered	FP	-	3211485	Little Picacho Peak	unprocessed	Animals - Birds - *Accipitridae* - *Haliaeetus leucocephalus*
Animals - Birds	*Haliaeetus leucocephalus*	Bald Eagle	ABNKC10010	delisted	Endangered	FP	-	3211484	Imperial Reservoir	unprocessed	Animals - Birds - *Accipitridae* - *Haliaeetus leucocephalus*
Animals - Birds	*Pandion haliaetus*	Osprey	ABNKC01010	none	none	WL	-	3211475	Bard	unprocessed	Animals - Birds - *Accipitridae* - *Pandion haliaetus*
Animals - Birds	*Chaetura vauxi*	Vaux's Swift	ABNUA03020	none	none	SSC	-	3211475	Bard	unprocessed	Animals - Birds - *Apodidae* - *Chaetura vauxi*
Animals - Birds	*Chaetura vauxi*	Vaux's Swift	ABNUA03020	none	none	SSC	-	3211466	Yuma West	unprocessed	Animals - Birds - *Apodidae* - *Chaetura vauxi*
Animals - Birds	*Ardea herodias*	Great Blue Heron	ABNGA04010	none	none	-	-	3211475	Bard	mapped	Animals - Birds - *Ardeidae* - *Ardea herodias*
Animals - Birds	*Ardea herodias*	Great Blue Heron	ABNGA04010	none	none	-	-	3211484	Imperial Reservoir	unprocessed	Animals - Birds - *Ardeidae* - *Ardea herodias*
Animals - Birds	*Ardea herodias*	Great Blue Heron	ABNGA04010	none	none	-	-	3211485	Little Picacho Peak	unprocessed	Animals - Birds - *Ardeidae* - *Ardea herodias*
Animals - Birds	*Ixobrychus exilis*	Least Bittern	ABNGA02010	none	none	SSC	-	3211485	Little Picacho Peak	unprocessed	Animals - Birds - *Ardeidae* - *Ixobrychus exilis*
Animals - Birds	*Ixobrychus exilis*	Least Bittern	ABNGA02010	none	none	SSC	-	3211484	Imperial Reservoir	mapped and unprocessed	Animals - Birds - *Ardeidae* - *Ixobrychus exilis*
Animals - Birds	*Ixobrychus exilis*	Least Bittern	ABNGA02010	none	none	SSC	-	3211474	Laguna Dam	unprocessed	Animals - Birds - *Ardeidae* - *Ixobrychus exilis*

Element Type	Scientific Name	Common Name	Element Code	Federal Status	State Status	CDFW Status	CA Rare Plant Rank	Quad Code	Quad Name	Data Status	Taxonomic Sort
Animals - Birds	*Nycticorax nycticorax*	Black-Crowned Night Heron	ABNGA11010	none	none	-	-	3211466	Yuma West	unprocessed	Animals - Birds - *Ardeidae* - *Nycticorax nycticorax*
Animals - Birds	*Nycticorax nycticorax*	Black-Crowned Night Heron	ABNGA11010	none	none	-	-	3211484	Imperial Reservoir	unprocessed	Animals - Birds - *Ardeidae* - *Nycticorax nycticorax*
Animals - Birds	*Mycteria americana*	Wood Stork	ABNGF02010	none	none	SSC	-	3211484	Imperial Reservoir	unprocessed	Animals - Birds - *Ciconiidae* - *Mycteria americana*
Animals - Birds	*Coccyzus americanus occidentalis*	Western Yellow-Billed Cuckoo	ABNRB02022	Proposed Threatened	Endangered	-	-	3211484	Imperial Reservoir	mapped	Animals - Birds - *Cuculidae* - *Coccyzus americanus occidentalis*
Animals - Birds	*Coccyzus americanus occidentalis*	Western Yellow-Billed Cuckoo	ABNRB02022	Proposed Threatened	Endangered	-	-	3211475	Bard	mapped	Animals - Birds - *Cuculidae* - *Coccyzus americanus occidentalis*
Animals - Birds	*Coccyzus americanus occidentalis*	Western Yellow-Billed Cuckoo	ABNRB02022	Proposed Threatened	Endangered	-	-	3211465	Yuma East	unprocessed	Animals - Birds - *Cuculidae* - *Coccyzus americanus occidentalis*
Animals - Birds	*Coccyzus americanus occidentalis*	Western Yellow-Billed Cuckoo	ABNRB02022	Proposed Threatened	Endangered	-	-	3211466	Yuma West	mapped	Animals - Birds - *Cuculidae* - *Coccyzus americanus occidentalis*

Element Type	Scientific Name	Common Name	Element Code	Federal Status	State Status	CDFW Status	CA Rare Plant Rank	Quad Code	Quad Name	Data Status	Taxonomic Sort
Animals - Birds	*Coccyzus americanus occidentalis*	Western Yellow-Billed Cuckoo	ABNRB02022	Proposed Threatened	Endangered	-	-	3211474	Laguna Dam	mapped and unprocessed	Animals - Birds - *Cuculidae* - *Coccyzus americanus occidentalis*
Animals - Birds	*Coccyzus americanus occidentalis*	Western Yellow-Billed Cuckoo	ABNRB02022	Proposed Threatened	Endangered	-	-	3211485	Little Picacho Peak	mapped	Animals - Birds - *Cuculidae* - *Coccyzus americanus occidentalis*
Animals - Birds	*Melozone aberti*	Abert's Towhee	ABPBX74050	none	none	-	-	3211484	Imperial Reservoir	unprocessed	Animals - Birds - *Emberizidae* - *Melozone aberti*
Animals - Birds	*Melozone aberti*	Abert's Towhee	ABPBX74050	none	none	-	-	3211466	Yuma West	unprocessed	Animals - Birds - *Emberizidae* - *Melozone aberti*
Animals - Birds	*Melozone aberti*	Abert's Towhee	ABPBX74050	none	none	-	-	3211475	Bard	unprocessed	Animals - Birds - *Emberizidae* - *Melozone aberti*
Animals - Birds	*Spizella passerina*	Chipping Sparrow	ABPBX94020	none	none	-	-	3211475	Bard	unprocessed	Animals - Birds - *Emberizidae* - *Spizella passerina*
Animals - Birds	*Falco mexicanus*	Prairie Falcon	ABNKD06090	none	none	WL	-	3211486	Picacho Peak	mapped and unprocessed	Animals - Birds - *Falconidae* - *Falco mexicanus*
Animals - Birds	*Xanthocephalus xanthocephalus*	Yellow-Headed Blackbird	ABPBXB3010	none	none	SSC	-	3211484	Imperial Reservoir	unprocessed	Animals - Birds - *Icteridae* - *Xanthocephalus xanthocephalus*
Animals - Birds	*Xanthocephalus xanthocephalus*	Yellow-Headed Blackbird	ABPBXB3010	none	none	SSC	-	3211475	Bard	unprocessed	Animals - Birds - *Icteridae* - *Xanthocephalus xanthocephalus*

Element Type	Scientific Name	Common Name	Element Code	Federal Status	State Status	CDFW Status	CA Rare Plant Rank	Quad Code	Quad Name	Data Status	Taxonomic Sort
Animals - Birds	*Lanius ludovicianus*	Loggerhead Shrike	ABPBR01030	none	none	SSC	-	3211474	Laguna Dam	unprocessed	Animals - Birds - *Laniidae* - *Lanius ludovicianus*
Animals - Birds	*Toxostoma crissale*	Crissal Thrasher	ABPBK06090	none	none	SSC	-	3211474	Laguna Dam	mapped	Animals - Birds - *Mimidae* - *Toxostoma crissale*
Animals - Birds	*Toxostoma crissale*	Crissal Thrasher	ABPBK06090	none	none	SSC	-	3211466	Yuma West	unprocessed	Animals - Birds - *Mimidae* - *Toxostoma crissale*
Animals - Birds	*Toxostoma crissale*	Crissal Thrasher	ABPBK06090	none	none	SSC	-	3211475	Bard	mapped	Animals - Birds - *Mimidae* - *Toxostoma crissale*
Animals - Birds	*Toxostoma crissale*	Crissal Thrasher	ABPBK06090	none	none	SSC	-	3211484	Imperial Reservoir	mapped and unprocessed	Animals - Birds - *Mimidae* - *Toxostoma crissale*
Animals - Birds	*Toxostoma crissale*	Crissal Thrasher	ABPBK06090	none	none	SSC	-	3211485	Little Picacho Peak	mapped	Animals - Birds - *Mimidae* - *Toxostoma crissale*
Animals - Birds	*Toxostoma lecontei*	Le Conte's Thrasher	ABPBK06100	none	none	SSC	-	3211476	Araz	unprocessed	Animals - Birds - *Mimidae* - *Toxostoma lecontei*
Animals - Birds	*Toxostoma lecontei*	Le Conte's Thrasher	ABPBK06100	none	none	SSC	-	3211475	Bard	unprocessed	Animals - Birds - *Mimidae* - *Toxostoma lecontei*
Animals - Birds	*Dendroica occidentalis*	Hermit Warbler	ABPBX03090	none	none	-	-	3211475	Bard	unprocessed	Animals - Birds - *Parulidae* - *Dendroica occidentalis*
Animals - Birds	*Dendroica occidentalis*	Hermit Warbler	ABPBX03090	none	none	-	-	3211484	Imperial Reservoir	unprocessed	Animals - Birds - *Parulidae* - *Dendroica occidentalis*

Element Type	Scientific Name	Common Name	Element Code	Federal Status	State Status	CDFW Status	CA Rare Plant Rank	Quad Code	Quad Name	Data Status	Taxonomic Sort
Animals - Birds	*Dendroica occidentalis*	Hermit Warbler	ABPBX03090	none	none	-	-	3211466	Yuma West	unprocessed	Animals - Birds - *Parulidae* - *Dendroica occidentalis*
Animals - Birds	*Dendroica petechia brewsteri*	Yellow Warbler	ABPBX03018	none	none	SSC	-	3211474	Laguna Dam	unprocessed	Animals - Birds - *Parulidae* - *Dendroica petechia brewsteri*
Animals - Birds	*Dendroica petechia brewsteri*	Yellow Warbler	ABPBX03018	none	none	SSC	-	3211484	Imperial Reservoir	unprocessed	Animals - Birds - *Parulidae* - *Dendroica petechia brewsteri*
Animals - Birds	*Dendroica petechia sonorana*	Sonoran Yellow Warbler	ABPBX03017	none	none	SSC	-	3211484	Imperial Reservoir	unprocessed	Animals - Birds - *Parulidae* - *Dendroica petechia sonorana*
Animals - Birds	*Dendroica petechia sonorana*	Sonoran Yellow Warbler	ABPBX03017	none	none	SSC	-	3211475	Bard	mapped and unprocessed	Animals - Birds - *Parulidae* - *Dendroica petechia sonorana*
Animals - Birds	*Dendroica petechia sonorana*	Sonoran Yellow Warbler	ABPBX03017	none	none	SSC	-	3211474	Laguna Dam	mapped and unprocessed	Animals - Birds - *Parulidae* - *Dendroica petechia sonorana*
Animals - Birds	*Dendroica petechia sonorana*	Sonoran Yellow Warbler	ABPBX03017	none	none	SSC	-	3211466	Yuma West	unprocessed	Animals - Birds - *Parulidae* - *Dendroica petechia sonorana*
Animals - Birds	*Dendroica petechia sonorana*	Sonoran Yellow Warbler	ABPBX03017	none	none	SSC	-	3211465	Yuma East	unprocessed	Animals - Birds - *Parulidae* - *Dendroica petechia sonorana*

Element Type	Scientific Name	Common Name	Element Code	Federal Status	State Status	CDFW Status	CA Rare Plant Rank	Quad Code	Quad Name	Data Status	Taxonomic Sort
Animals - Birds	*Dendroica petechia sonorana*	Sonoran Yellow Warbler	ABPBX03017	none	none	SSC	-	3211485	Little Picacho Peak	unprocessed	Animals - Birds - *Parulidae* - *Dendroica petechia sonorana*
Animals - Birds	*Icteria virens*	Yellow-Breasted Chat	ABPBX24010	none	none	SSC	-	3211485	Little Picacho Peak	mapped and unprocessed	Animals - Birds - *Parulidae* - *Icteria virens*
Animals - Birds	*Icteria virens*	Yellow-Breasted Chat	ABPBX24010	none	none	SSC	-	3211465	Yuma East	unprocessed	Animals - Birds - *Parulidae* - *Icteria virens*
Animals - Birds	*Icteria virens*	Yellow-Breasted Chat	ABPBX24010	none	none	SSC	-	3211466	Yuma West	unprocessed	Animals - Birds - *Parulidae* - *Icteria virens*
Animals - Birds	*Icteria virens*	Yellow-Breasted Chat	ABPBX24010	none	none	SSC	-	3211474	Laguna Dam	mapped and unprocessed	Animals - Birds - *Parulidae* - *Icteria virens*
Animals - Birds	*Icteria virens*	Yellow-Breasted Chat	ABPBX24010	none	none	SSC	-	3211484	Imperial Reservoir	mapped and unprocessed	Animals - Birds - *Parulidae* - *Icteria virens*
Animals - Birds	*Icteria virens*	Yellow-Breasted Chat	ABPBX24010	none	none	SSC	-	3211475	Bard	mapped and unprocessed	Animals - Birds - *Parulidae* - *Icteria virens*
Animals - Birds	*Oreothlypis luciae*	Lucy's Warbler	ABPBX01090	none	none	SSC	-	3211484	Imperial Reservoir	unprocessed	Animals - Birds - *Parulidae* - *Oreothlypis luciae*
Animals - Birds	*Oreothlypis luciae*	Lucy's Warbler	ABPBX01090	none	none	SSC	-	3211474	Laguna Dam	unprocessed	Animals - Birds - *Parulidae* - *Oreothlypis luciae*
Animals - Birds	*Oreothlypis luciae*	Lucy's Warbler	ABPBX01090	none	none	SSC	-	3211465	Yuma East	unprocessed	Animals - Birds - *Parulidae* - *Oreothlypis luciae*
Animals - Birds	*Oreothlypis luciae*	Lucy's Warbler	ABPBX01090	none	none	SSC	-	3211485	Little Picacho Peak	unprocessed	Animals - Birds - *Parulidae* - *Oreothlypis luciae*

Element Type	Scientific Name	Common Name	Element Code	Federal Status	State Status	CDFW Status	CA Rare Plant Rank	Quad Code	Quad Name	Data Status	Taxonomic Sort
Animals - Birds	*Phalacrocorax auritus*	Double-Crested Cormorant	ABNFD01020	none	none	WL	-	3211484	Imperial Reservoir	unprocessed	Animals - Birds - *Phalacrocoracidae* - *Phalacrocorax auritus*
Animals - Birds	*Colaptes chrysoides*	Gilded Flicker	ABNYF10040	none	Endangered	-	-	3211484	Imperial Reservoir	mapped and unprocessed	Animals - Birds - *Picidae* - *Colaptes chrysoides*
Animals - Birds	*Colaptes chrysoides*	Gilded Flicker	ABNYF10040	none	Endangered	-	-	3211475	Bard	mapped	Animals - Birds - *Picidae* - *Colaptes chrysoides*
Animals - Birds	*Colaptes chrysoides*	Gilded Flicker	ABNYF10040	none	Endangered	-	-	3211465	Yuma East	mapped and unprocessed	Animals - Birds - *Picidae* - *Colaptes chrysoides*
Animals - Birds	*Colaptes chrysoides*	Gilded Flicker	ABNYF10040	none	Endangered	-	-	3211466	Yuma West	mapped	Animals - Birds - *Picidae* - *Colaptes chrysoides*
Animals - Birds	*Colaptes chrysoides*	Gilded Flicker	ABNYF10040	none	Endangered	-	-	3211474	Laguna Dam	mapped and unprocessed	Animals - Birds - *Picidae* - *Colaptes chrysoides*
Animals - Birds	*Colaptes chrysoides*	Gilded Flicker	ABNYF10040	none	Endangered	-	-	3211485	Little Picacho Peak	unprocessed	Animals - Birds - *Picidae* - *Colaptes chrysoides*
Animals - Birds	*Melanerpes lewis*	Lewis' Woodpecker	ABNYF04010	none	none	-	-	3211475	Bard	unprocessed	Animals - Birds - *Picidae* - *Melanerpes lewis*
Animals - Birds	*Melanerpes uropygialis*	Gila Woodpecker	ABNYF04150	none	Endangered	-	-	3211475	Bard	mapped	Animals - Birds - *Picidae* - *Melanerpes uropygialis*
Animals - Birds	*Melanerpes uropygialis*	Gila Woodpecker	ABNYF04150	none	Endangered	-	-	3211484	Imperial Reservoir	mapped and unprocessed	Animals - Birds - *Picidae* - *Melanerpes uropygialis*

Element Type	Scientific Name	Common Name	Element Code	Federal Status	State Status	CDFW Status	CA Rare Plant Rank	Quad Code	Quad Name	Data Status	Taxonomic Sort
Animals - Birds	*Melanerpes uropygialis*	Gila Woodpecker	ABNYF04150	none	Endangered	-	-	3211474	Laguna Dam	mapped and unprocessed	Animals - Birds - *Picidae* - *Melanerpes uropygialis*
Animals - Birds	*Melanerpes uropygialis*	Gila Woodpecker	ABNYF04150	none	Endangered	-	-	3211466	Yuma West	mapped	Animals - Birds - *Picidae* - *Melanerpes uropygialis*
Animals - Birds	*Melanerpes uropygialis*	Gila Woodpecker	ABNYF04150	none	Endangered	-	-	3211485	Little Picacho Peak	mapped	Animals - Birds - *Picidae* - *Melanerpes uropygialis*
Animals - Birds	*Laterallus jamaicensis coturniculus*	California Black Rail	ABNME03041	none	Threatened	FP	-	3211485	Little Picacho Peak	mapped	Animals - Birds - *Rallidae* - *Laterallus jamaicensis coturniculus*
Animals - Birds	*Laterallus jamaicensis coturniculus*	California Black Rail	ABNME03041	none	Threatened	FP	-	3211466	Yuma West	mapped	Animals - Birds - *Rallidae* - *Laterallus jamaicensis coturniculus*
Animals - Birds	*Laterallus jamaicensis coturniculus*	California Black Rail	ABNME03041	none	Threatened	FP	-	3211474	Laguna Dam	mapped and unprocessed	Animals - Birds - *Rallidae* - *Laterallus jamaicensis coturniculus*
Animals - Birds	*Laterallus jamaicensis coturniculus*	California Black Rail	ABNME03041	none	Threatened	FP	-	3211484	Imperial Reservoir	mapped and unprocessed	Animals - Birds - *Rallidae* - *Laterallus jamaicensis coturniculus*

Element Type	Scientific Name	Common Name	Element Code	Federal Status	State Status	CDFW Status	CA Rare Plant Rank	Quad Code	Quad Name	Data Status	Taxonomic Sort
Animals - Birds	*Laterallus jamaicensis coturniculus*	California Black Rail	ABNME03041	none	Threatened	FP	-	3211475	Bard	mapped	Animals - Birds - *Rallidae - Laterallus jamaicensis coturniculus*
Animals - Birds	*Rallus longirostris yumanensis*	Yuma Clapper Rail	ABNME0501A	Endangered	Threatened	FP	-	3211475	Bard	mapped	Animals - Birds - *Rallidae - Rallus longirostris yumanensis*
Animals - Birds	*Rallus longirostris yumanensis*	Yuma Clapper Rail	ABNME0501A	Endangered	Threatened	FP	-	3211484	Imperial Reservoir	mapped and unprocessed	Animals - Birds - *Rallidae - Rallus longirostris yumanensis*
Animals - Birds	*Rallus longirostris yumanensis*	Yuma Clapper Rail	ABNME0501A	Endangered	Threatened	FP	-	3211474	Laguna Dam	mapped	Animals - Birds - *Rallidae - Rallus longirostris yumanensis*
Animals - Birds	*Rallus longirostris yumanensis*	Yuma Clapper Rail	ABNME0501A	Endangered	Threatened	FP	-	3211466	Yuma West	mapped	Animals - Birds - *Rallidae - Rallus longirostris yumanensis*
Animals - Birds	*Rallus longirostris yumanensis*	Yuma Clapper Rail	ABNME0501A	Endangered	Threatened	FP	-	3211465	Yuma East	mapped and unprocessed	Animals - Birds - *Rallidae - Rallus longirostris yumanensis*
Animals - Birds	*Rallus longirostris yumanensis*	Yuma Clapper Rail	ABNME0501A	Endangered	Threatened	FP	-	3211485	Little Picacho Peak	mapped and unprocessed	Animals - Birds - *Rallidae - Rallus longirostris yumanensis*
Animals - Birds	*Micrathene whitneyi*	Elf Owl	ABNSB09010	none	Endangered	-	-	3211474	Laguna Dam	mapped	Animals - Birds - *Strigidae - Micrathene whitneyi*

Element Type	**Scientific Name**	**Common Name**	**Element Code**	**Federal Status**	**State Status**	**CDFW Status**	**CA Rare Plant Rank**	**Quad Code**	**Quad Name**	**Data Status**	**Taxonomic Sort**
Animals - Birds	*Micrathene whitneyi*	Elf Owl	ABNSB09010	none	Endangered	-	-	3211484	Imperial Reservoir	mapped	Animals - Birds - *Strigidae* - *Micrathene whitneyi*
Animals - Birds	*Micrathene whitneyi*	Elf Owl	ABNSB09010	none	Endangered	-	-	3211475	Bard	mapped	Animals - Birds - *Strigidae* - *Micrathene whitneyi*
Animals - Birds	*Polioptila melanura*	Black-Tailed Gnatcatcher	ABPBJ08030	none	none	-	-	3211475	Bard	mapped	Animals - Birds - *Sylviidae* - *Polioptila melanura*
Animals - Birds	*Polioptila melanura*	Black-Tailed Gnatcatcher	ABPBJ08030	none	none	-	-	3211484	Imperial Reservoir	mapped and unprocessed	Animals - Birds - *Sylviidae* - *Polioptila melanura*
Animals - Birds	*Polioptila melanura*	Black-Tailed Gnatcatcher	ABPBJ08030	none	none	-	-	3211474	Laguna Dam	mapped and unprocessed	Animals - Birds - *Sylviidae* - *Polioptila melanura*
Animals - Birds	*Polioptila melanura*	Black-Tailed Gnatcatcher	ABPBJ08030	none	none	-	-	3211466	Yuma West	unprocessed	Animals - Birds - *Sylviidae* - *Polioptila melanura*
Animals - Birds	*Piranga rubra*	Summer Tanager	ABPBX45030	none	none	SSC	-	3211466	Yuma West	unprocessed	Animals - Birds - *Thraupidae* - *Piranga rubra*
Animals - Birds	*Piranga rubra*	Summer Tanager	ABPBX45030	none	none	SSC	-	3211465	Yuma East	unprocessed	Animals - Birds - *Thraupidae* - *Piranga rubra*
Animals - Birds	*Piranga rubra*	Summer Tanager	ABPBX45030	none	none	SSC	-	3211474	Laguna Dam	mapped and unprocessed	Animals - Birds - *Thraupidae* - *Piranga rubra*

Element Type	Scientific Name	Common Name	Element Code	Federal Status	State Status	CDFW Status	CA Rare Plant Rank	Quad Code	Quad Name	Data Status	Taxonomic Sort
Animals - Birds	*Piranga rubra*	Summer Tanager	ABPBX45030	none	none	SSC	-	3211484	Imperial Reservoir	mapped and unprocessed	Animals - Birds - *Thraupidae* - *Piranga rubra*
Animals - Birds	*Piranga rubra*	Summer Tanager	ABPBX45030	none	none	SSC	-	3211475	Bard	mapped and unprocessed	Animals - Birds - *Thraupidae* - *Piranga rubra*
Animals - Birds	*Piranga rubra*	Summer Tanager	ABPBX45030	none	none	SSC	-	3211485	Little Picacho Peak	unprocessed	Animals - Birds - *Thraupidae* - *Piranga rubra*
Animals - Birds	*Plegadis chihi*	White-Faced Ibis	ABNGE02020	none	none	WL	-	3211475	Bard	unprocessed	Animals - Birds - *Threskiornithidae* - *Plegadis chihi*
Animals - Birds	*Calypte costae*	Costa's Hummingbird	ABNUC47020	none	none	-	-	3211466	Yuma West	unprocessed	Animals - Birds - *Trochilidae* - *Calypte costae*
Animals - Birds	*Contopus cooperi*	Olive-Sided Flycatcher	ABPAE32010	none	none	SSC	-	3211466	Yuma West	unprocessed	Animals - Birds - *Tyrannidae* - *Contopus cooperi*
Animals - Birds	*Empidonax traillii extimus*	Southwestern Willow Flycatcher	ABPAE33043	Endangered	Endangered	-	-	3211474	Laguna Dam	mapped	Animals - Birds - *Tyrannidae* - *Empidonax traillii extimus*
Animals - Birds	*Myiarchus tyrannulus*	Brown-Crested Flycatcher	ABPAE43080	none	none	WL	-	3211474	Laguna Dam	mapped and unprocessed	Animals - Birds - *Tyrannidae* - *Myiarchus tyrannulus*
Animals - Birds	*Myiarchus tyrannulus*	Brown-Crested Flycatcher	ABPAE43080	none	none	WL	-	3211465	Yuma East	unprocessed	Animals - Birds - *Tyrannidae* - *Myiarchus tyrannulus*
Animals - Birds	*Myiarchus tyrannulus*	Brown-Crested Flycatcher	ABPAE43080	none	none	WL	-	3211475	Bard	mapped	Animals - Birds - *Tyrannidae* - *Myiarchus tyrannulus*

Element Type	Scientific Name	Common Name	Element Code	Federal Status	State Status	CDFW Status	CA Rare Plant Rank	Quad Code	Quad Name	Data Status	Taxonomic Sort
Animals - Birds	*Myiarchus tyrannulus*	Brown-Crested Flycatcher	ABPAE43080	none	none	WL	-	3211484	Imperial Reservoir	mapped and unprocessed	Animals - Birds - *Tyrannidae* - *Myiarchus tyrannulus*
Animals - Birds	*Myiarchus tyrannulus*	Brown-Crested Flycatcher	ABPAE43080	none	none	WL	-	3211485	Little Picacho Peak	mapped and unprocessed	Animals - Birds - *Tyrannidae* - *Myiarchus tyrannulus*
Animals - Birds	*Pyrocephalus rubinus*	Vermilion Flycatcher	ABPAE36010	none	none	SSC	-	3211484	Imperial Reservoir	mapped and unprocessed	Animals - Birds - *Tyrannidae* - *Pyrocephalus rubinus*
Animals - Birds	*Pyrocephalus rubinus*	Vermilion Flycatcher	ABPAE36010	none	none	SSC	-	3211475	Bard	mapped and unprocessed	Animals - Birds - *Tyrannidae* - *Pyrocephalus rubinus*
Animals - Birds	*Pyrocephalus rubinus*	Vermilion Flycatcher	ABPAE36010	none	none	SSC	-	3211465	Yuma East	mapped	Animals - Birds - *Tyrannidae* - *Pyrocephalus rubinus*
Animals - Birds	*Pyrocephalus rubinus*	Vermilion Flycatcher	ABPAE36010	none	none	SSC	-	3211474	Laguna Dam	mapped	Animals - Birds - *Tyrannidae* - *Pyrocephalus rubinus*
Animals - Birds	*Vireo bellii arizonae*	Arizona Bell's Vireo	ABPBW01111	none	Endangered	-	-	3211474	Laguna Dam	mapped and unprocessed	Animals - Birds - *Vireonidae* - *Vireo bellii arizonae*
Animals - Birds	*Vireo bellii arizonae*	Arizona Bell's Vireo	ABPBW01111	none	Endangered	-	-	3211465	Yuma East	mapped and unprocessed	Animals - Birds - *Vireonidae* - *Vireo bellii arizonae*

Element Type	Scientific Name	Common Name	Element Code	Federal Status	State Status	CDFW Status	CA Rare Plant Rank	Quad Code	Quad Name	Data Status	Taxonomic Sort
Animals - Birds	*Vireo bellii arizonae*	Arizona Bell's Vireo	ABPBW01111	none	Endangered	-	-	3211466	Yuma West	mapped	Animals - Birds - *Vireonidae* - *Vireo bellii arizonae*
Animals - Birds	*Vireo bellii arizonae*	Arizona Bell's Vireo	ABPBW01111	none	Endangered	-	-	3211475	Bard	mapped	Animals - Birds - *Vireonidae* - *Vireo bellii arizonae*
Animals - Birds	*Vireo bellii arizonae*	Arizona Bell's Vireo	ABPBW01111	none	Endangered	-	-	3211484	Imperial Reservoir	mapped and unprocessed	Animals - Birds - *Vireonidae* - *Vireo bellii arizonae*
Animals - Birds	*Vireo bellii arizonae*	Arizona Bell's Vireo	ABPBW01111	none	Endangered	-	-	3211485	Little Picacho Peak	mapped and unprocessed	Animals - Birds - *Vireonidae* - *Vireo bellii arizonae*
Animals - Fish	*Xyrauchen texanus*	Razorback Sucker	AFCJC11010	Endangered	Endangered	FP	-	3211484	Imperial Reservoir	mapped	*Animals - Fish - Catostomidae - Xyrauchen texanus*
Animals - Fish	*Xyrauchen texanus*	Razorback Sucker	AFCJC11010	Endangered	Endangered	FP	-	3211475	Bard	mapped	*Animals - Fish - Catostomidae - Xyrauchen texanus*
Animals - Fish	*Xyrauchen texanus*	Razorback Sucker	AFCJC11010	Endangered	Endangered	FP	-	3211474	Laguna Dam	mapped	*Animals - Fish - Catostomidae - Xyrauchen texanus*
Animals - Fish	*Ptychocheilus lucius*	Colorado Pikeminnow	AFCJB35020	Endangered	Endangered	FP	-	3211474	Laguna Dam	mapped	*Animals - Fish - Cyprinidae - Ptychocheilus lucius*
Animals - Fish	*Ptychocheilus lucius*	Colorado Pikeminnow	AFCJB35020	Endangered	Endangered	FP	-	3211475	Bard	mapped	*Animals - Fish - Cyprinidae - Ptychocheilus lucius*

Element Type	**Scientific Name**	**Common Name**	**Element Code**	**Federal Status**	**State Status**	**CDFW Status**	**CA Rare Plant Rank**	**Quad Code**	**Quad Name**	**Data Status**	**Taxonomic Sort**
Animals - Mammals	*Ovis canadensis nelsoni*	Desert Bighorn Sheep	AMALE04013	none	none	FP	-	3211486	Picacho Peak	mapped and unprocessed	Animals - Mammals - *Bovidae - Ovis canadensis nelsoni*
Animals - Mammals	*Neotoma albigula venusta*	Colorado Valley Woodrat	AMAFF08031	none	none	-	-	3211484	Imperial Reservoir	mapped	Animals - Mammals - *Muridae - Neotoma albigula venusta*
Animals - Mammals	*Neotoma albigula venusta*	Colorado Valley Woodrat	AMAFF08031	none	none	-	-	3211485	Little Picacho Peak	mapped	Animals - Mammals - *Muridae - Neotoma albigula venusta*
Animals - Mammals	*Neotoma albigula venusta*	Colorado Valley Woodrat	AMAFF08031	none	none	-	-	3211475	Bard	mapped	Animals - Mammals - *Muridae - Neotoma albigula venusta*
Animals - Mammals	*Neotoma albigula venusta*	Colorado Valley Woodrat	AMAFF08031	none	none	-	-	3211466	Yuma West	mapped	Animals - Mammals - *Muridae - Neotoma albigula venusta*
Animals - Mammals	*Sigmodon hispidus eremicus*	Yuma Hispid Cotton Rat	AMAFF07013	none	none	SSC	-	3211474	Laguna Dam	mapped	Animals - Mammals - *Muridae - Sigmodon hispidus eremicus*
Animals - Mammals	*Sigmodon hispidus eremicus*	Yuma Hispid Cotton Rat	AMAFF07013	none	none	SSC	-	3211466	Yuma West	mapped	Animals - Mammals - *Muridae - Sigmodon hispidus eremicus*

Element Type	**Scientific Name**	**Common Name**	**Element Code**	**Federal Status**	**State Status**	**CDFW Status**	**CA Rare Plant Rank**	**Quad Code**	**Quad Name**	**Data Status**	**Taxonomic Sort**
Animals - Mammals	*Sigmodon hispidus eremicus*	Yuma Hispid Cotton Rat	AMAFF07013	none	none	SSC	-	3211465	Yuma East	mapped and unprocessed	Animals - Mammals - *Muridae* - *Sigmodon hispidus eremicus*
Animals - Mammals	*Sigmodon hispidus eremicus*	Yuma Hispid Cotton Rat	AMAFF07013	none	none	SSC	-	3211475	Bard	mapped	Animals - Mammals - *Muridae* - *Sigmodon hispidus eremicus*
Animals - Mammals	*Sigmodon hispidus eremicus*	Yuma Hispid Cotton Rat	AMAFF07013	none	none	SSC	-	3211485	Little Picacho Peak	mapped	Animals - Mammals - *Muridae* - *Sigmodon hispidus eremicus*
Animals - Mammals	*Taxidea taxus*	American Badger	AMAJF04010	none	none	SSC	-	3211485	Little Picacho Peak	mapped	Animals - Mammals - *Mustelidae* - *Taxidea taxus*
Animals - Mammals	*Taxidea taxus*	American Badger	AMAJF04010	none	none	SSC	-	3211484	Imperial Reservoir	mapped	Animals - Mammals - *Mustelidae* - *Taxidea taxus*
Animals - Mammals	*Taxidea taxus*	American Badger	AMAJF04010	none	none	SSC	-	3211476	Araz	mapped	Animals - Mammals - *Mustelidae* - *Taxidea taxus*
Animals - Mammals	*Taxidea taxus*	American Badger	AMAJF04010	none	none	SSC	-	3211475	Bard	mapped	Animals - Mammals - *Mustelidae* - *Taxidea taxus*

Element Type	Scientific Name	Common Name	Element Code	Federal Status	State Status	CDFW Status	CA Rare Plant Rank	Quad Code	Quad Name	Data Status	Taxonomic Sort
Animals - Mammals	*Macrotus californicus*	California Leaf-Nosed Bat	AMACB01010	none	none	SSC	-	3211475	Bard	mapped	Animals - Mammals - *Phyllostomidae* - *Macrotus californicus*
Animals - Mammals	*Macrotus californicus*	California Leaf-Nosed Bat	AMACB01010	none	none	SSC	-	3211484	Imperial Reservoir	unprocessed	Animals - Mammals - *Phyllostomidae* - *Macrotus californicus*
Animals - Mammals	*Corynorhinus townsendii*	Townsend's Big-Eared Bat	AMACC08010	none	Candidate Threatened	SSC	-	3211484	Imperial Reservoir	mapped	Animals - Mammals - *Vespertilionidae* - *Corynorhinus townsendii*
Animals - Mammals	*Corynorhinus townsendii*	Townsend's Big-Eared Bat	AMACC08010	none	Candidate Threatened	SSC	-	3211485	Little Picacho Peak	mapped	Animals - Mammals - *Vespertilionidae* - *Corynorhinus townsendii*
Animals - Mammals	*Corynorhinus townsendii*	Townsend's Big-Eared Bat	AMACC08010	none	Candidate Threatened	SSC	-	3211486	Picacho Peak	mapped	Animals - Mammals - *Vespertilionidae* - *Corynorhinus townsendii*
Animals - Mammals	*Corynorhinus townsendii*	Townsend's Big-Eared Bat	AMACC08010	none	Candidate Threatened	SSC	-	3211475	Bard	mapped	Animals - Mammals - *Vespertilionidae* - *Corynorhinus townsendii*
Animals - Mammals	*Corynorhinus townsendii*	Townsend's Big-Eared Bat	AMACC08010	none	Candidate Threatened	SSC	-	3211466	Yuma West	mapped	Animals - Mammals - *Vespertilionidae* - *Corynorhinus townsendii*

Element Type	Scientific Name	Common Name	Element Code	Federal Status	State Status	CDFW Status	CA Rare Plant Rank	Quad Code	Quad Name	Data Status	Taxonomic Sort
Animals - Mammals	*Corynorhinus townsendii*	Townsend's Big-Eared Bat	AMACC08010	none	Candidate Threatened	SSC	-	3211465	Yuma East	mapped	Animals - Mammals - *Vespertilionidae - Corynorhinus townsendii*
Animals - Mammals	*Myotis lucifugus*	Little Brown Bat	AMACC01010	none	none	-	-	3211475	Bard	unprocessed	Animals - Mammals - *Vespertilionidae - Myotis lucifugus*
Animals - Mammals	*Myotis occultus*	Arizona Myotis	AMACC01160	none	none	SSC	-	3211475	Bard	mapped	Animals - Mammals - *Vespertilionidae - Myotis occultus*
Animals - Mammals	*Myotis occultus*	Arizona Myotis	AMACC01160	none	none	SSC	-	3211465	Yuma East	mapped	Animals - Mammals - *Vespertilionidae - Myotis occultus*
Animals - Mammals	*Myotis yumanensis*	Yuma Myotis	AMACC01020	none	none	-	-	3211475	Bard	mapped	Animals - Mammals - *Vespertilionidae - Myotis yumanensis*
Animals - Reptiles	*Heloderma suspectum cinctum*	Banded Gila Monster	ARACE01011	none	none	SSC	-	3211484	Imperial Reservoir	mapped	Animals - Reptiles - *Helodermatidae - Heloderma suspectum cinctum*
Animals - Reptiles	*Kinosternon sonoriense*	Sonoran Mud Turtle	ARAAE01040	none	none	SSC	-	3211475	Bard	mapped	Animals - Reptiles - *Kinosternidae - Kinosternon sonoriense*

Element Type	**Scientific Name**	**Common Name**	**Element Code**	**Federal Status**	**State Status**	**CDFW Status**	**CA Rare Plant Rank**	**Quad Code**	**Quad Name**	**Data Status**	**Taxonomic Sort**
Animals - Reptiles	*Kinosternon sonoriense*	Sonoran Mud Turtle	ARAAE01040	none	none	SSC	-	3211465	Yuma East	mapped	Animals - Reptiles - *Kinosternidae* - *Kinosternon sonoriense*
Animals - Reptiles	*Kinosternon sonoriense*	Sonoran Mud Turtle	ARAAE01040	none	none	SSC	-	3211474	Laguna Dam	mapped	Animals - Reptiles - *Kinosternidae* - *Kinosternon sonoriense*
Animals - Reptiles	*Kinosternon sonoriense*	Sonoran Mud Turtle	ARAAE01040	none	none	SSC	-	3211466	Yuma West	mapped	Animals - Reptiles - *Kinosternidae* - *Kinosternon sonoriense*
Animals - Reptiles	*Phrynosoma mcallii*	Flat-Tailed Horned Lizard	ARACF12040	none	none	SSC	-	3211466	Yuma West	mapped	Animals - Reptiles - *Phrynosomatidae* - *Phrynosoma mcallii*
Animals - Reptiles	*Phrynosoma mcallii*	Flat-Tailed Horned Lizard	ARACF12040	none	none	SSC	-	3211465	Yuma East	mapped	Animals - Reptiles - *Phrynosomatidae* - *Phrynosoma mcallii*
Animals - Reptiles	*Phrynosoma mcallii*	Flat-Tailed Horned Lizard	ARACF12040	none	none	SSC	-	3211475	Bard	mapped	Animals - Reptiles - *Phrynosomatidae* - *Phrynosoma mcallii*
Animals - Reptiles	*Phrynosoma mcallii*	Flat-Tailed Horned Lizard	ARACF12040	none	none	SSC	-	3211476	Araz	mapped and unprocessed	Animals - Reptiles - *Phrynosomatidae* - *Phrynosoma mcallii*

Element Type	Scientific Name	Common Name	Element Code	Federal Status	State Status	CDFW Status	CA Rare Plant Rank	Quad Code	Quad Name	Data Status	Taxonomic Sort
Animals - Reptiles	*Gopherus agassizii*	Desert Tortoise	ARAAF01012	Threatened	Threatened	-	-	3211466	Yuma West	mapped	Animals - Reptiles - *Testudinidae - Gopherus agassizii*
Community - Terrestrial	*Sonoran Cottonwood Willow Riparian Forest*	Sonoran Cottonwood Willow Riparian Forest	CTT61810CA	none	none	-	-	3211466	Yuma West	mapped	Community - Terrestrial - *Sonoran Cottonwood Willow Riparian Forest*
Community - Terrestrial	*Sonoran Cottonwood Willow Riparian Forest*	Sonoran Cottonwood Willow Riparian Forest	CTT61810CA	none	none	-	-	3211474	Laguna Dam	mapped	Community - Terrestrial - *Sonoran Cottonwood Willow Riparian Forest*
Community - Terrestrial	*Sonoran Cottonwood Willow Riparian Forest*	Sonoran Cottonwood Willow Riparian Forest	CTT61810CA	none	none	-	-	3211475	Bard	mapped	Community - Terrestrial - *Sonoran Cottonwood Willow Riparian Forest*
Community - Terrestrial	*Sonoran Cottonwood Willow Riparian Forest*	Sonoran Cottonwood Willow Riparian Forest	CTT61810CA	none	none	-	-	3211484	Imperial Reservoir	mapped	Community - Terrestrial - *Sonoran Cottonwood Willow Riparian Forest*
Community - Terrestrial	*Sonoran Cottonwood Willow Riparian Forest*	Sonoran Cottonwood Willow Riparian Forest	CTT61810CA	none	none	-	-	3211485	Little Picacho Peak	mapped	Community - Terrestrial - *Sonoran Cottonwood Willow Riparian Forest*

Element Type	Scientific Name	Common Name	Element Code	Federal Status	State Status	CDFW Status	CA Rare Plant Rank	Quad Code	Quad Name	Data Status	Taxonomic Sort
Plants - Vascular	*Palafoxia arida var. gigantea*	Giant Spanish-Needle	PDAST6T012	none	none	-	1B.3	3211466	Yuma West	mapped	Plants - Vascular - *Asteraceae - Palafoxia arida var. gigantea*
Plants - Vascular	*Cryptantha holoptera*	Winged Cryptantha	PDBOR0A180	none	none	-	4.3	3211466	Yuma West	unprocessed	Plants - Vascular - *Boraginaceae - Cryptantha holoptera*
Plants - Vascular	*Cryptantha holoptera*	Winged Cryptantha	PDBOR0A180	none	none	-	4.3	3211474	Laguna Dam	unprocessed	Plants - Vascular - *Boraginaceae - Cryptantha holoptera*
Plants - Vascular	*Cryptantha holoptera*	Winged Cryptantha	PDBOR0A180	none	none	-	4.3	3211476	Araz	unprocessed	Plants - Vascular - *Boraginaceae - Cryptantha holoptera*
Plants - Vascular	*Cryptantha holoptera*	Winged Cryptantha	PDBOR0A180	none	none	-	4.3	3211485	Little Picacho Peak	unprocessed	Plants - Vascular - *Boraginaceae - Cryptantha holoptera*
Plants - Vascular	*Cryptantha holoptera*	Winged Cryptantha	PDBOR0A180	none	none	-	4.3	3211484	Imperial Reservoir	unprocessed	Plants - Vascular - *Boraginaceae - Cryptantha holoptera*
Plants - Vascular	*Cryptantha holoptera*	Winged Cryptantha	PDBOR0A180	none	none	-	4.3	3211486	Picacho Peak	unprocessed	Plants - Vascular - *Boraginaceae - Cryptantha holoptera*

Element Type	Scientific Name	Common Name	Element Code	Federal Status	State Status	CDFW Status	CA Rare Plant Rank	Quad Code	Quad Name	Data Status	Taxonomic Sort
Plants - Vascular	*Nama stenocarpum*	Mud Nama	PDHYD0A0H0	none	none	-	2B.2	3211466	Yuma West	mapped	Plants - Vascular - *Boraginaceae - Nama stenocarpum*
Plants - Vascular	*Nama stenocarpum*	Mud Nama	PDHYD0A0H0	none	none	-	2B.2	3211465	Yuma East	mapped	Plants - Vascular - *Boraginaceae - Nama stenocarpum*
Plants - Vascular	*Carnegiea gigantea*	Saguaro	PDCAC12010	none	none	-	2B.2	3211474	Laguna Dam	mapped and unprocessed	Plants - Vascular - *Cactaceae - Carnegiea gigantea*
Plants - Vascular	*Carnegiea gigantea*	Saguaro	PDCAC12010	none	none	-	2B.2	3211475	Bard	mapped	Plants - Vascular - *Cactaceae - Carnegiea gigantea*
Plants - Vascular	*Carnegiea gigantea*	Saguaro	PDCAC12010	none	none	-	2B.2	3211484	Imperial Reservoir	mapped	Plants - Vascular - *Cactaceae - Carnegiea gigantea*
Plants - Vascular	*Carnegiea gigantea*	Saguaro	PDCAC12010	none	none	-	2B.2	3211485	Little Picacho Peak	mapped	Plants - Vascular - *Cactaceae - Carnegiea gigantea*
Plants - Vascular	*Koeberlinia spinosa ssp. tenuispina*	Slender-Spined All-Thorn	PDCPP05012	none	none	-	2B.2	3211486	Picacho Peak	mapped	Plants - Vascular - *Capparaceae - Koeberlinia spinosa ssp. tenuispina*
Plants - Vascular	*Croton wigginsii*	Wiggins' Croton	PDEUP0H140	none	rare	-	2B.2	3211475	Bard	mapped	Plants - Vascular - *Euphorbiaceae - Croton wigginsii*

Element Type	**Scientific Name**	**Common Name**	**Element Code**	**Federal Status**	**State Status**	**CDFW Status**	**CA Rare Plant Rank**	**Quad Code**	**Quad Name**	**Data Status**	**Taxonomic Sort**
Plants - Vascular	*Croton wigginsii*	Wiggins' Croton	PDEUP0H140	none	rare	-	2B.2	3211476	Araz	mapped	Plants - Vascular - *Euphorbiaceae - Croton wigginsii*
Plants - Vascular	*Ditaxis claryana*	Glandular Ditaxis	PDEUP080L0	none	none	-	2B.2	3211486	Picacho Peak	mapped and unprocessed	Plants - Vascular - *Euphorbiaceae - Ditaxis claryana*
Plants - Vascular	*Ditaxis claryana*	Glandular Ditaxis	PDEUP080L0	none	none	-	2B.2	3211485	Little Picacho Peak	mapped	Plants - Vascular - *Euphorbiaceae - Ditaxis claryana*
Plants - Vascular	*Astragalus insularis var. harwoodii*	Harwood's Milk-Vetch	PDFAB0F491	none	none	-	2B.2	3211476	Araz	mapped	Plants - Vascular - *Fabaceae - Astragalus insularis var. harwoodii*
Plants - Vascular	*Astragalus insularis var. harwoodii*	Harwood's Milk-Vetch	PDFAB0F491	none	none	-	2B.2	3211466	Yuma West	mapped	Plants - Vascular - *Fabaceae - Astragalus insularis var. harwoodii*
Plants - Vascular	*Calliandra eriophylla*	Pink Fairy-Duster	PDFAB0N040	none	none	-	2B.3	3211486	Picacho Peak	mapped	Plants - Vascular - *Fabaceae - Calliandra eriophylla*
Plants - Vascular	*Juncus acutus ssp. leopoldii*	Southwestern Spiny Rush	PMJUN01051	none	none	-	4.2	3211484	Imperial Reservoir	unprocessed	Plants - Vascular - *Juncaceae - Juncus acutus ssp. leopoldii*

Element Type	Scientific Name	Common Name	Element Code	Federal Status	State Status	CDFW Status	CA Rare Plant Rank	Quad Code	Quad Name	Data Status	Taxonomic Sort
Plants - Vascular	*Horsfordia newberryi*	Newberry's Velvet-Mallow	PDMAL0J020	none	none	-	4.3	3211486	Picacho Peak	unprocessed	Plants - Vascular - *Malvaceae - Horsfordia newberryi*
Plants - Vascular	*Digitaria californica var. californica*	Arizona Cottontop	PMPOA27051	none	none	-	2B.3	3211475	Bard	mapped	Plants - Vascular - *Poaceae - Digitaria californica var. californica*
Plants - Vascular	*Panicum hirticaule ssp. hirticaule*	Roughstalk Witch Grass	PMPOA4K170	none	none	-	2B.1	3211466	Yuma West	mapped	Plants - Vascular - *Poaceae - Panicum hirticaule ssp. hirticaule*
Plants - Vascular	*Panicum hirticaule ssp. hirticaule*	Roughstalk Witch Grass	PMPOA4K170	none	none	-	2B.1	3211465	Yuma East	mapped	Plants - Vascular - *Poaceae - Panicum hirticaule ssp. hirticaule*
Plants - Vascular	*Colubrina californica*	Las Animas Colubrina	PDRHA05030	none	none	-	2B.3	3211486	Picacho Peak	mapped	Plants - Vascular - *Rhamnaceae - Colubrina californica*
Plants - Vascular	*Colubrina californica*	Las Animas Colubrina	PDRHA05030	none	none	-	2B.3	3211485	Little Picacho Peak	mapped	Plants - Vascular - *Rhamnaceae - Colubrina californica*
Plants - Vascular	*Condalia globosa var. pubescens*	Spiny Abrojo	PDRHA06031	none	none	-	4.2	3211485	Little Picacho Peak	unprocessed	Plants - Vascular - *Rhamnaceae - Condalia globosa var. pubescens*

Element Type	**Scientific Name**	**Common Name**	**Element Code**	**Federal Status**	**State Status**	**CDFW Status**	**CA Rare Plant Rank**	**Quad Code**	**Quad Name**	**Data Status**	**Taxonomic Sort**
Plants - Vascular	*Condalia globosa var. pubescens*	Spiny Abrojo	PDRHA06031	none	none	-	4.2	3211486	Picacho Peak	unprocessed	Plants - Vascular - *Rhamnaceae - Condalia globosa var. pubescens*
Plants - Vascular	*Condalia globosa var. pubescens*	Spiny Abrojo	PDRHA06031	none	none	-	4.2	3211475	Bard	unprocessed	Plants - Vascular - *Rhamnaceae - Condalia globosa var. pubescens*
Plants - Vascular	*Penstemon pseudospectabilis ssp. pseudospectabilis*	Desert Beardtongue	PDSCR1L562	none	none	-	2B.2	3211475	Bard	mapped	Plants - Vascular - *Scrophulariaceae - Penstemon pseudospectabilis ssp. pseudospectabilis*
Plants - Vascular	*Penstemon pseudospectabilis ssp. pseudospectabilis*	Desert Beardtongue	PDSCR1L562	none	none	-	2B.2	3211486	Picacho Peak	mapped	Plants - Vascular - *Scrophulariaceae - Penstemon pseudospectabilis ssp. pseudospectabilis*

APPENDIX B. LISTED, PROPOSED SPECIES, AND CRITICAL HABITAT POTENTIALLY OCCURRING OR KNOWN TO OCCUR IN THE PROJECT REGION EXCLUDED FROM FURTHER CONSIDERATION

Table B.1. Listed, Proposed Species, and Critical Habitat Potentially Occurring or Known to Occur in the Project Region Excluded from Further Consideration

Scientific Name	Common Name	Status (FWS/State/CNPS)	Habitat[a]	Exclusion Justification
Birds				
Accipiter cooperii	Cooper's Hawk	-/WL/-	low-to-mid-elevation riparian areas, woodlands, and forests	no suitable riparian, woodland, or forest habitat present in study area
Aquila chrysaetos	Golden Eagle	-/FP,WL/-	open habitats, including tundra, grasslands and desert; nesting cliffs, with typical heights of at least 30 m (100 feet), are normally directly adjacent to foraging habitat of desert grasslands or desert scrub	no suitable cliff habitat for nesting or open desert habitat for foraging present in study area
Chaetura vauxi	Vaux's Swift	-/SSC/-	Redwood and Douglas-fir habitats with nest-sites in large hollow trees and snags, especially tall, burned-out stubs; a fairly common migrant throughout most of the state in April and May and August and September; a few individuals winter irregularly in southern coastal lowlands	no suitable habitat present in study area. may occur in the vicinity of the study area as a transient during migration, but not in the study area itself
Coccyzus americanus occidentalis	Western Yellow-billed Cuckoo	PT/E/-	dense cottonwood/willow stands in areas of standing water	no suitable riparian habitat present in study area
Colaptes chrysoides	Gilded Flicker	-/E/-	upper and lower Sonoran Desert with Saguaros	no suitable Sonoran desert habitat present in study area
Contopus cooperi	Olive-sided Flycatcher	-/SSC/-	forest and woodland habitats below 2,800 m (9,000 feet) throughout California exclusive of the deserts, the central valley, and other lowland valleys and basins; preferred nesting habitats include mixed conifer, montane hardwood-conifer, Douglas-fir, redwood, red fir, and lodgepole pine; arrives from South American wintering areas in mid-April (southern California) to early May (northern California), with transient individuals still moving north in early June; departs breeding areas in August; most have left the state by early October	no suitable habitat present in study area. may occur in the vicinity of the study area as a transient during migration, but not in the study area itself

Scientific Name	Common Name	Status (FWS/State/CNPS)	Habitat[a]	Exclusion Justification
Dendroica petechia brewsteri	Yellow Warbler	-/SSC/-	riparian areas with cottonwoods, willows, and alder	no suitable riparian habitat present in study area
Dendroica petechia sonorana	Sonoran Yellow Warbler	-/SSC/-	riparian areas including tamarisk thickets	no suitable riparian or tamarisk thicket habitat present in study area
Empidonax traillii extimus	Southwestern Willow Flycatcher	E/E/-	dense and layered willow, cottonwood, and tamarisk thickets and woodland along streams and rivers	no suitable riparian or tamarisk thicket habitat present in study area
Haliaeetus leucocephalus	Bald Eagle	-/E,FP/-	open areas, forest edges, and mountains near large lakes and rivers; requires tall trees for nesting	no suitable habitat in the vicinity of large waterbodies present in study area
Icteria virens	Yellow-breasted Chat	-/SSC/-	riparian thickets with willows and other brushy vegetation near watercourses	no suitable riparian habitat present in study area
Ixobrychus exilis	Least Bittern	-/SSC/-	densely vegetated emergent wetlands near sources of fresh water and desert riparian areas including tamarisk thickets	no suitable riparian or tamarisk thicket habitat present in study area
Kinosternon sonoriense	Sonoran Mud Turtle	-/SSC/-	rivers, streams, stock tanks, ponds, and reservoirs	no suitable aquatic habitat present in study area
Laterallus jamaicensis coturniculus	California Black Rail	-/T,FP/-	tidal salt marshes. Also occurs in brackish and fresh-water marshes, all at low elevations	no suitable marsh habitat present in study area
Melanerpes uropygialis	Gila Woodpecker	-/E/-	desert riparian and wash habitats. Cottonwoods and other desert riparian trees, shade trees, and date palms supply cover	no suitable riparian or wash habitat present in study area
Micrathene whitneyi	Elf Owl	-/E/-	desert riparian areas with cottonwood, sycamore, willow, or mesquite; absent from habitats dominated by tamarisk	no suitable riparian habitat present in study area
Mycteria americana	Wood Stork	-/SSC/-	breeds in Mexico, Central and South America, and along the southeastern U.S. coast; this species is a locally common post-breeding visitor to California, with several hundred birds occurring in Imperial County from late May to October in marshes at the south end of the Salton Sea	no suitable marsh habitat present in study area. may occur in the vicinity of the study area as a transient during migration, but not in the study area itself
Myiarchus tyrannulus	Brown-crested Flycatcher	-/WL/-	riparian areas with cottonwood, willow, or mesquite; desert scrub and tamarisk thickets often used for foraging	no suitable riparian, tamarisk thicket, or desertscrub habitat present in study area

Scientific Name	Common Name	Status (FWS/State/CNPS)	Habitat[a]	Exclusion Justification
Oreothlypis luciae	Lucy's Warbler	-/SSC/-	desert washes and riparian areas dominated by mesquite; also found in tamarisk and other thickets	no suitable wash, riparian, or tamarisk thicket habitat present in study area
Pandion haliaetus	Osprey	-/WL/-	riparian areas near large, fish-bearing bodies of water	no suitable riparian habitat near large bodies of water present in study area
Phalacrocorax auritus	Double-crested Cormorant	-/WL/-	large, open bodies of water including slow-moving rivers, lakes, and reservoirs	no suitable large waterbody habitat present in study area.
Piranga rubra	Summer Tanager	-/SSC/-	desert riparian areas dominated by cottonwoods and willows	no suitable riparian habitat present in study area
Rallus longirostris yumanensis	Yuma Clapper Rail	E/T,FP/-	freshwater and brackish marshes. Prefers dense cattails, bulrushes, and other aquatic vegetation; nests in riverine wetlands near upland, in shallow sites dominated by mature vegetation, often in the base of a shrub; prefers denser cover in winter than in summer	no suitable marsh habitat present in study area
Toxostoma crissale	Crissal Thrasher	-/SSC/-	dense vegetation along streams and washes with mesquite, willows, and arrowweed	no suitable riparian or desert wash habitat present in study area
Toxostoma lecontei	Le Conte's Thrasher	-/SSC/-	arid and sparsely vegetated desertscrub with saltbush and creosote scrub	no suitable desertscrub habitat present in study area
Vireo bellii arizonae	Arizona Bell's Vireo	-/E/-	riparian areas along the Colorado River from Needles to Blythe	no suitable riparian habitat present in study area
Vireo bellii pusillus	Least Bell's Vireo	E/E/-	riparian areas with willows	no suitable riparian habitat present in study area
Fish				
Cyprinodon macularius	Desert Pupfish	E/E/-	shallow waters of springs, small streams, and marshes. Often associated with areas of soft substrates and clear water	no suitable aquatic habitat present in study area
Ptychocheilus lucius	Colorado Pikeminnow	E/E,FP/-	large-to-medium-sized rivers (adults) and backwaters (juveniles)	no suitable aquatic habitat present in study area
Xyrauchen texanus	Razorback Sucker	E/E,FP/-	large to medium-sized rivers including backwaters	no suitable aquatic habitat present in study area
Invertebrates				

Scientific Name	Common Name	Status (FWS/State/CNPS)	Habitat[a]	Exclusion Justification
Euphydryas editha quino	Quino Checkerspot Butterfly	E/-/-	coastal sage scrub, open chaparral, juniper woodland, and grassland	no suitable scrub, chaparral, woodland, or grassland habitat present in study area
Mammals				
Macrotus californicus	California Leaf-nosed Bat	-/SSC/-	desert riparian, wash, scrub, alkali scrub, and succulent shrub	no suitable riparian, wash, or scrub habitat present in study area
Myotis occultus	Arizona Myotis	-/SSC/-	desert riparian areas	no suitable riparian habitat present in study area
Ovis canadensis nelsoni	Peninsular Bighorn Sheep	E/T,FP/-	arid, precipitous terrain with rocky ridges, slopes, cliffs, and rugged canyons; typical vegetation consists of low shrubs, grasses, and forbs	no suitable rocky cliff habitat present in study area
Taxidea taxus	American Badger	-/SSC/-	drier open stages of most shrub, forest, and herbaceous habitats, with friable soils	no suitable habitat present in study area and no individuals of or burrows attributable to this species observed during surveys
Plants				
Astragalus insularis var. harwoodii	Harwood's Milkvetch	-/-/2B.2	sandy or gravelly areas in Mojavean desertscrub including dunes	no suitable Mojavean desertscrub or dune habitat present in study area and no individuals of this species observed during surveys
Astragalus magdalenae v. peirsonii	Peirson's Milkvetch	T/E/1B.2	desert dunes	no suitable dune habitat present in study area and no individuals of this species observed during surveys
Calliandra eriophylla	Pink Fairy Duster	-/-/2B.3	sandy or rocky Sonoran desertscrub	no suitable Sonoran desertscrub habitat present in study area and no individuals of this species observed during surveys
Carnegiea gigantea	Saguaro	-/-/2B.2	rocky Sonoran desertscrub	no suitable Sonoran desertscrub habitat present in study area and no individuals of this species observed during surveys

Scientific Name	Common Name	Status (FWS/State/CNPS)	Habitat[a]	Exclusion Justification
Colubrina californica	Las Animas Colubrina	-/-/2B.3	Mojavean and Sonoran desertscrub	no suitable desertscrub habitat present in study area and no individuals of this species observed during surveys
Condalia globosa var. pubescens	Spiny Abrojo	-/-/4.2	Sonoran desertscrub	no suitable desertscrub habitat present in study area and no individuals of this species observed during surveys
Croton wigginsii	Wiggins' Croton	-/R/2B.2	sandy Sonoran desertscrub and desert dunes	no suitable desertscrub or dune habitat present in study area and no individuals of this species observed during surveys
Cryptantha holoptera	Winged Cryptantha	-/-/2B.3	Mojavean and Sonoran desertscrub	no suitable desertscrub habitat present in study area and no individuals of this species observed during surveys
Digitaria californica v. californica	Arizona Cottontop	-/-/2B.2	Mojavean and Sonoran desertscrub	no suitable desertscrub habitat present in study area and no individuals of this species observed during surveys
Ditaxis claryana	Glandular Ditaxis	-/-/2B.3	sandy Mohavean and Sonoran desertscrub	no suitable desertscrub habitat present in study area and no individuals of this species observed during surveys
Horsfordia newberryi	Newberry's Velvet Mallow	-/-/4.2	rocky Sonoran desertscrub	no suitable desertscrub habitat present in study area and no individuals of this species observed during surveys
Juncus acutus ssp. leopoldii	Southwestern Spiny Rush	-/-/2B.2	mesic coastal dunes, alkaline seeps, and coastal salt marshes and swamps	no suitable dune or marsh habitat present in study area and no individuals of this species observed during surveys

Scientific Name	Common Name	Status (FWS/State/CNPS)	Habitat[a]	Exclusion Justification
Koeberlinia spinosa ssp. tenuispina	Slender-spined Allthorn	-/-/4.3	riparian woodland and Sonoran desertscrub	no suitable riparian or desertscrub habitat present in study area and no individuals of this species observed during surveys
Nama stenocarpum	Mud Nama	-/-/2B.3	marshes and swamps on lake margins and riverbanks	no suitable marsh habitat present in study area and no individuals of this species observed during surveys
Palafoxia arida v. gigantea	Giant Spanish Needle	-/-/2B.2	desert dunes	no suitable dune habitat present in study area and no individuals of this species observed during surveys
Panicum hirticaule ssp. hirticaule	Roughstalk Witchgrass	-/-/2B.1	sandy, silty depressions in desert dunes and Mojavean and Sonoran desertscrub	no suitable dune or desertscrub habitat present in study area and no individuals of this species observed during surveys
Penstemon pseudospectabilis ssp. pseudospectabilis	Desert Beardtongue	-/-/4.2	sandy, sometimes rocky, washes in Mojavean and Sonoran desertscrub	no suitable desertscrub habitat present in study area and no individuals of this species observed during surveys
Reptiles				
Gopherus agassizii	Mohave Desert Tortoise	T/T/-	valleys, bajadas, and hills in Mojavean and Sonoran desertscrub with sandy loam to rocky soils	no suitable desertscrub habitat present in study area
Heloderma suspectum cinctum	Banded Gila Monster	-/SSC/-	Mojavean desertscrub, primarily in desert mountain ranges	no suitable desertscrub habitat present in study area
Phrynosoma mcallii	Flat-tailed Horned Lizard	-/SSC/-	desert and alkali scrub, washes, and succulent shrub areas with fine sand and sparse vegetation	no suitable desertscrub habitat present in study area

[a]Habitat descriptions from California Department of Fish and Wildlife California Wildlife Habitat Relation System, California Native Plant Society Rare and Endangered Plant Inventory, and Arizona Game and Fish Department Heritage Data Management System online species abstracts and U.S. Fish and Wildlife Service Environmental Conservation Online System species bjoprofiles.

Key: FWS = U.S. Fish and Wildlife Service; CNPS = California Native Plant Society; E = Endangered; T = Threatened; C = Candidate; P = Proposed; SSC = Species of Special Concern; R = Rare; FP = Fully Protected; WL = Watchlist; 1B = Plants Rare, Threatened, or Endangered in California and Elsewhere; 2B = Plants Rare, Threatened, or Endangered in California, but More Common Elsewhere; 4 = Plants of Limited Distribution – A Watch List; .1 = Seriously Threatened in California; .2 = Moderately Threatened in California; .3 = Not Very Threatened in California.

APPENDIX C. PLANT SPECIES OBSERVED

Table C.1. Plant Species Observed

Family	Scientific Name	Common Name	Noxious Weed Rating
Amaranthaceae	*Amaranthus palmeri*	Carelessweed	-
Asteraceae	*Ambrosia dumosa*	White Bursage	-
Chenopodiaceae	*Atriplex canescens*	Fourwing Saltbush	-
Chenopodiaceae	*Chenopodium album*	Lambsquarters	-
Boraginaceae	*Cryptantha angustifolia*	Narrow-leaved Popcornflower	-
Poaceae	*Cynodon dactylon*	Bermuda Grass	-
Onagraceae	*Gaura coccinea*	Tall Gaura	-
Malvaceae	*Gossypium hirsutum*	Cotton	-
Asteraceae	*Helianthus annum*	Common Sunflower	-
Asteraceae	*Lactuca serriola*	Prickly Lettuce	-
Malvaceae	*Malva parviflora*	Cheeseweed	-
Fabacea	*Medicago sativa*	Alfalfa	-
Fabacea	*Parkinsonia aculeata*	Mexican Palo Verde	-
Arecaceae	*Phoenix dactylifera*	Date Palm	-
Poaceae	*Phragmites australis*	Common Reed	-
Asteraceae	*Pluchea sericea*	Arrow Weed	-
Portulacaceae	*Portulaca oleraceae*	Portulaca	-
Fabacea	*Prosopis glandulosa*	Honey Mesquite	-
Chenopodiaceae	*Salsola kali*	Russian Thistle	limited (CIPC)
Salviniaceae	*Salvinia molesta*	Kariba Weed	high (CIPC)
Poaceae	*Sorghum bicolor*	Sudangrass	-
Tamaricaceae	*Tamarix ramosissima*	Salt Cedar	high (CIPC), listed (CDFA)
Typhaceae	*Typha latifolia*	Cattail	-

Key: CIPC = California Invasive Plant Coucil, CDFA = California Department of Food and Agriculture.

APPENDIX D. WILDLIFE SPECIES OBSERVED

Table D.1. Wildlife Species Observed.

Scientific Name	**Common Name**
Ardea alba	Great Egret
Callipepla gambellii	Gambel's Quail
Canis latrans	Coyote
Columba livia	Pigeon
Quiscalus neomexicanus	Grackle
Riparia riparia	Bank Swallow
Zenaida asiatica	White-winged Dove

APPENDIX E. REPRESENTATIVE SITE PHOTOGRAPHS

Photo E.1. First Avenue and E Street, view to north.

Photo E.2. Arnold Road and First Avenue, view to west.

Photo E.3. West end of project corridor on Arnold, view to east.

Photo E.4. Reservation Main Drain at Arnold Road, view to south.

Photo E.5. Arnold and Picacho Roads, view to east.

Photo E.6 Cocopah Canal at Arnold Road, view to north.

Photo E.7. Haughtelin and Perez Roads, view to north.

Photo E.8. Ross and Fisher Roads, view to west.

Photo E.9. Reservation Main Drain at Stalnacker Road, view to north. Note Kariba Weed in canal.

Photo E.10.North end of project corridor on Bard Road, view to south.

Photo E.11. Cocopah Canal at Picacho Road, view to east.

Photo E.12. Pima Canal at Picacho Road, view to east.

APPENDIX D. WATERWAY DELINEATION AND ASSESSMENT REPORT

TDS Telecom
Winterhaven Last Mile Underserved Broadband Project
Imperial County, California

Waterway Delineation and Assessment Report

Prepared by:
Tim Jordan, Senior Biologist,

Prepared for:
TDS Telecommunications Corporation
Attn: Nate Stanislawski
525 Junction Road
Madison, Wisconsin, 53717

Submitted by:
Tierra Right of Way Services, Ltd.
1575 East River Road, Suite 201
Tucson, Arizona 85718

April 17, 2015

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Appendix A. Waterway Crossings Identified in the Project Area A.1

1.0 INTRODUCTION

This report provides regulatory information, methods, and results for a delineation of waterways potentially affected by the proposed construction of the Winterhaven Last Mile Underserved Broadband Project. The purpose of the delineation is to assess the limits of potential waters of the United States (WUS) and/or waters of the State of California (WS) within and adjacent to the project area that may be subject to regulation by the U.S. Army Corps of Engineers (USACE), the Regional Water Quality Control Board (RWQCB), and/or the California Department of Fish and Wildlife (CDFW).

2.0 PROJECT LOCATION

The project area is located in southeastern Imperial County, California, just north of Yuma, Arizona, and the Colorado River. Baseline Road, which runs north-south, marks the boundary between the Fort Yuma–Quechan Reservation (the Reservation) and private land; the Reservation is west of Baseline Road and private land is to the east. The southern edge of the project area is roughly bounded by the Union Pacific Railroad (UPRR) tracks, the community of Winterhaven, and the Paradise Casino on Picacho Road. The Cocopah Canal runs along the eastern boundary of the project area, and the community of Bard is located at the northeastern limits of the project area. Stalnacker and Ross Roads, along with the community of Ross Corner, make up the approximate northern limits of the project area, and the western edge of the project area is near Arnold Road, where the road approaches the UPRR. Specifically, the project area is located in portions of Section 2, Township 15 South, Range 24 East; Sections 11, 14, and 21–27, Township 16 South, Range 22 East; and Sections 4, 5, 7–9, 18, and 19, Township 16 South, Range 23 East, San Bernardino Baseline and Meridian (SBB&M), as depicted on the Araz, Bard, Yuma East, and Yuma West, AZ/CA, 7.5-minute U.S. Geological Survey (USGS) topographic quadrangle maps (Figures 1 and 2).

3.0 PROJECT DESCRIPTION

The proposed project involves the construction of a second-generation, very-high-bit-rate, digital subscriber line (VDSL2) fiber-optic network capable of 25 Mbps/5 Mbps (download/upload) speeds. In total, approximately 24.65 km (15.31 miles) of new fiber-optic cable will be buried within protective conduit along existing roads in the project area. Approximately 2.25 km (1.40 miles) of existing buried copper line will be used to connect a proposed DLC site on Arnold Road to the new system. A summary of the associated lengths to be installed on and off the Fort Yuma–Quechan Reservation can be found in Table 1. The buried line installation, which consists of the telecommunications cable and its protective conduit, will be performed using plowing construction techniques, and a directional boring machine will be used to install the line at canal and road crossings. Ancillary equipment to be installed includes 10 new equipment cabinets that will serve as connecting "nodes" for customers, splice boxes, and line markers. The equipment cabinets will be approximately 0.6 m by 1.0 m by 1.2 m (2.0 feet by 3.0 feet by 4.0 feet) in size and will be installed on top of buried concrete vaults within an approximately 6-m-square (20-foot-square) area. Splice boxes are small rectangular metal enclosures that will be installed between lengths of cable. Line markers, which will be installed at intervals of approximately 305 m (1,000 feet), are approximately 1.2 m (4.0 feet) tall and made of flexible fiberglass.

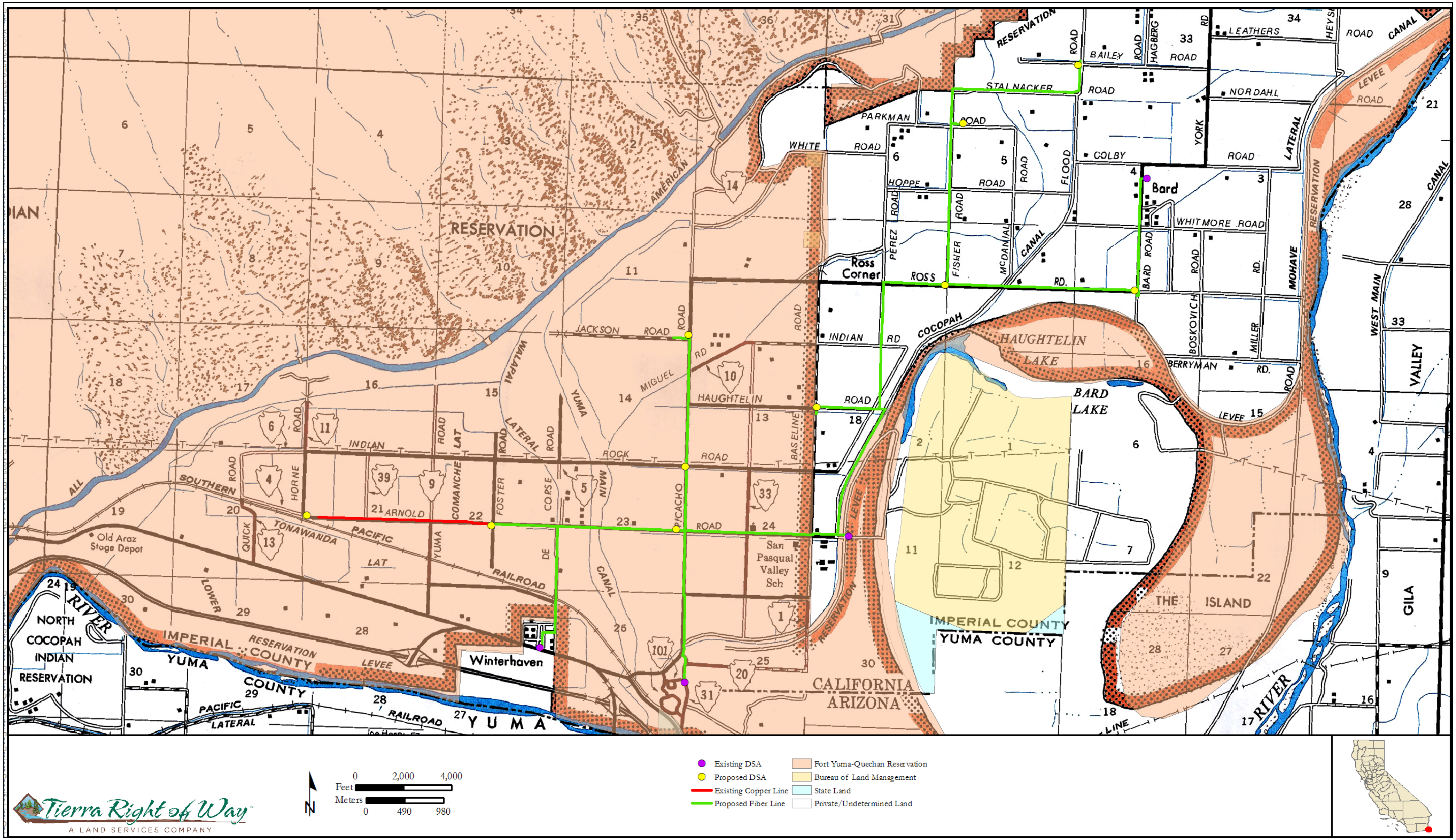

Figure 1. Project location.

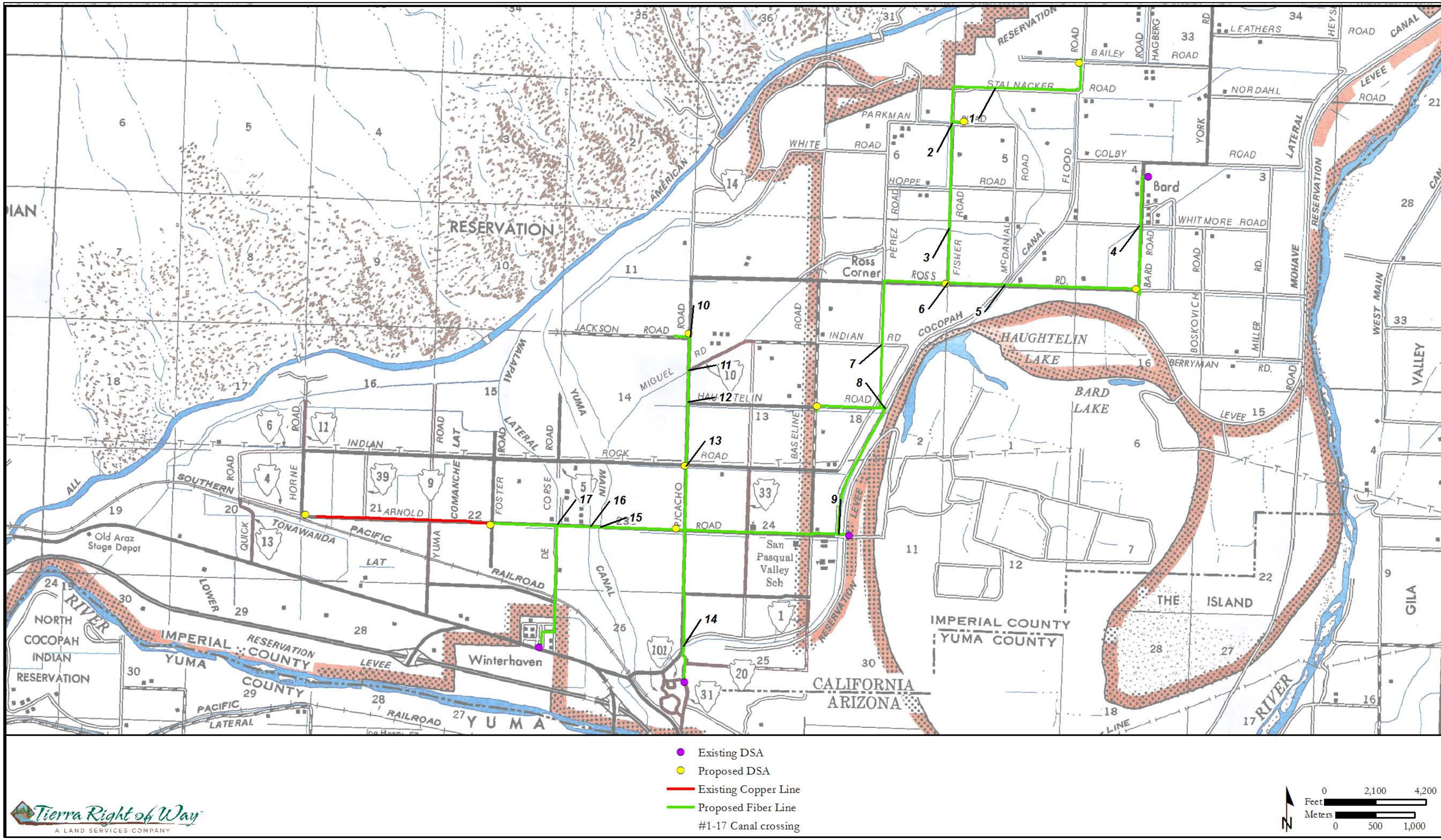

Figure 2. Project area.

Table 1. Cable Installation Lengths

Installation	Length (m)	Length (km)	Length (feet)	Length (miles)
On-Reservation	10,139	10.14	33,264	6.30
Off-Reservation	14,507	14.51	47,595	9.01
Total	**24,646**	**24.65**	**80,859**	**15.31**

The line installation will be performed in two steps. First, a protective conduit for the fiber-optic cable will be installed by either plowing or directional boring construction methods. Second, the fiber-optic cable will be "blown" through the conduit using compressed air. The total combined ground disturbance associated with the project, including both the plowed and bored installations, would not exceed an area approximately 5.1 ha (12.5 acres) in size.

4.0 PHYSICAL SETTING

The project area is located in southeastern California on the Colorado River in an area primarily used for agricultural cultivation. Several irrigation canals operated by the Bureau of Reclamation's (BOR's) Imperial Irrigation District (IID) and Bard Water District (BWD) either cross or run parallel to the project corridors. Elevations in the project area range from approximately 38–43 m (126–140 feet) above mean sea level (AMSL).

The Western Regional Climate Center (WRCC) recorded seasonal climatic data from 1993–2013 at the Yuma Quartermaster Depot, located just south of the project area (WRCC 2013). These data include average maximum temperature, average minimum temperature, average total precipitation, and average snowfall. The average annual maximum temperature within the project area is 90.1° F (32.2° C), with the hottest month of the year being July with an average maximum temperature of 109.4° F (43.0° C). The average annual minimum temperature within the project area is 59.0° F (15.0° C), with December having the coldest average temperature of 43.4° F (6.3° C). The project area receives an average of 6.8 cm (2.67 inches) of precipitation annually, with February having the highest average precipitation at 1.2 cm (0.48 inches). The project area receives no snowfall in the average year.

While the project area is located within the Colorado Desert, as classified in *A Manual of California Vegetation* (Sawyer 2009), the dominant type of terrestrial habitat present in the project area consists of agricultural land that is being actively cultivated to produce Sudangrass (Sorghum × *drummondii*), wheat (*Triticum* sp.), cotton (*Gossypium* sp.), alfalfa, dates *(Phoenix dactylifera)*, citrus, and other crops. The road shoulders where the proposed telecommunications line is to be installed are mostly devoid of vegetation due to blading activities associated with road maintenance and agricultural activities. Due to this previous disturbance, little to no native vegetation remains in the project area.

5.0 JURISDICTIONS

5.1 U.S. Army Corps of Engineers

Wetlands and other WUS that are subject to Section 404 of the Clean Water Act are under the jurisdiction of the USACE. Typically, these waters include naturally occurring traditional navigable waters (TNWs), relatively permanent waters (RPWs), and/or ephemeral waters with a significant nexus to a TNW. Agricultural water conveyance systems, which are manmade and constructed wholly in uplands, are typically only considered jurisdictional if they are RPWs. The most recent guidance on the topic states that "relatively permanent waters typically flow year-round or have continuous flow at least seasonally (e.g. typically three months)" (USACE 2008). Conversely, manmade drainages constructed solely in uplands that are not RPWs are generally not Federally jurisdictional.

5.2 California Department of Fish and Wildlife

The CDFW generally assumes jurisdiction over all stream features, including drains and canals, as WS. The CDFW's jurisdiction extends from the top of bank to the opposite top of bank on these features or to the limits of riparian vegetation if this vegetation extends beyond the top of the banks. Wetlands need to meet only one of the three USACE criteria (hydrophytic vegetation, hydric soils, and/or wetland hydrology) to be considered CDFW jurisdictional wetlands.

Under Section 1600 of the California Fish and Game Code, CDFW's jurisdiction includes "…bed, channel or bank of any river, stream or lake designated by the department in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit…" Canals, aqueducts, irrigation ditches, and other means of water conveyance can also be considered streams if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife (Cylinder 1995).

6.0 METHODOLOGY

The delineation of waterways in the TDS project area began with a review of aerial imagery and topographic maps to determine the locations of waterways along the project corridors that the proposed installations would intersect. Each of the crossings was then digitized as a polygon that included the project corridor centerline and a 15.2-m (50.0-foot) buffer to either side of the centerline along with the extent of any vegetation surrounding the waterway that was evident in the aerial imagery. The crossing polygons were then uploaded as a background file into a Trimble Global Positioning System (GPS) handheld unit. The Trimble was used in the field to navigate to each crossing and the crossings' characteristics, such as canal construction type, presence/absence of water, and vegetation types and extent, were noted and photographs taken. While in the field, all canals intersecting the project corridors, including those not identified prior to the field visit, were recorded. Following the field visit, the pre-field crossing polygons were refined using notes taken in the field to develop the final extents of all waterways and any vegetation associated with the waterways to be crossed and ultimately avoided during the proposed telecommunications line installation.

7.0 RESULTS

Eleven irrigation canals and/or drains were identified in the project area that would be crossed by the proposed installations at 17 locations (Table 2). No USACE wetlands were identified within the project corridors during the field visit; however, WS riverine wetlands may be present along the unlined canals in the project area. The margins of unlined canals in the project area, especially the Reservation Main Drain, contain limited vegetation consisting mostly of Common Reed *(Phragmites australis)* and invasive species such as Salt Cedar *(Tamarix ramosissima)* that may provide habitat for wildlife. This vegetation is only marginally riparian because it is mostly low-growing, not structurally complex, and does not have a tree overstory.

Table 2. Observed Plant Species Wetland Indicator Status

Scientific Name	Common Name	Indicator Status[a]
Phragmites australis	Common Reed	FACW
Pluchea sericea	Arrow Weed	FACW
Salvinia molesta	Kariba Weed	OBL
Typha latifolia	Cattail	OBL

[a] 2012 National Wetland Plant List, USACE Arid West Region.
Key: FACW = facultative wetland, OBL = obligate.

Saturated soil, a primary indicator of wetland hydrology, was observed along the flowing and unlined canals in the project area. Hydrophytic vegetation, including facultative wetland (FACW) and obligate (OBL) plant species, was also observed along the unlined Reservation Main Drain and Tonowanda Canal (see Table 2).

The characteristics of each canal crossing identified in the project area, including the delineated extent to be avoided during construction and other descriptive information, can be found in Appendix A. A summary of the waterways that would be crossed by the proposed installations, including the names of the canals, their locations, and corresponding identification numbers as indicated on Figure 2, can be found in Table 3.

Table 3. Irrigation Canal Crossings in the Project Area

Map No.	Canal Name	Location
1	Reservation Main Drain	Stahlnacker Road
2	unnamed canal	Fisher and Parkman Roads
3	Reservation Main Drain	Fisher Road
4	Hopi Canal	Bard and Whitmore Roads
5	Cocopah Canal	Ross Road
6	unnamed canal	Fisher and Ross Roads
7	Papago Canal	Perez Road
8	Pima Canal	Haughtelin and Perez Roads
9	Cocopah Canal	Flood and Arnold Roads
10	Navajo Canal	Picacho and Jackson Roads
11	Reservation Main Drain	Picacho Road
12	Pima Canal	Picacho and Haughtelin Roads
13	Pueblo Canal	Picacho and Indian Rock Roads
14	Cocopah Canal	Picacho Road
15	Reservation Main Drain	Arnold Road
16	Yuma Main Canal	Arnold Road
17	Walapai Canal	Arnold Road

8.0 DISCUSSION

8.1 Waters of the U.S.

The drains and canals in the project area are part of an agricultural system and therefore, by definition (Environmental Laboratory 1987), are not classified as wetlands, though typical wetland/riparian plant species may be found within canals and drains. It was assumed that the canals and drains in the project area flow at least intermittently and in some cases, perennially. Examples of the latter would be the Yuma Main Canal and the Reservation Main Drain, two of the largest canals in the project area. Because of these assumed flow regimes, at least some of the canals and drains in the project area would be considered RPWs; likewise, they would be considered jurisdictional WUS by USACE (Table 4).

Table 4. Potentially Jurisdictional WUS

<table>
<tr><th>Type</th><th>Name (crossing #)</th><th>Notes</th></tr>
<tr><td>WUS (Wetlands)</td><td>none</td><td>agricultural system</td></tr>
<tr><td rowspan="8">WUS (Streams)</td><td>Cocopah Canal (5, 9, 14)</td><td rowspan="8">assumed RPW</td></tr>
<tr><td>Papago Canal (7)</td></tr>
<tr><td>Reservation Main Drain (1, 3, 11, 15)</td></tr>
<tr><td>Hopi Canal (4)</td></tr>
<tr><td>Unnamed Canal (2)</td></tr>
<tr><td>Unnamed Canal (6)</td></tr>
<tr><td>Pima Canal (8)</td></tr>
<tr><td>Yuma Main Canal (16)</td></tr>
</table>

8.2 Waters of the State

The flowing canals and drains in the project area all have varying capacities to provide habitat for terrestrial and/or aquatic species; therefore, they would be considered streams by the CDFW. Because only one of the three USACE wetland indicators needs to be present for CDFW to consider an area a wetland, several of the unlined canals crossed by the project corridors would also be considered State-jurisdictional wetlands (Table 4).

Table 4. Potentially Jurisdictional WS

<table>
<tr><th>Type</th><th>Name (crossing #)</th><th>Notes</th></tr>
<tr><td>WS (Streams)</td><td>all</td><td>–</td></tr>
<tr><td rowspan="6">WS (Wetlands)</td><td>Cocopah Canal (14)</td><td rowspan="2">wetland hydrology (saturation) present</td></tr>
<tr><td>Papago Canal (7)</td></tr>
<tr><td>Reservation Main Drain (1, 3, 11, 15)</td><td>wetland hydrology (saturation) and vegetation present</td></tr>
<tr><td>Hopi Canal (4)</td><td rowspan="3">wetland hydrology (saturation) present</td></tr>
<tr><td>unnamed canal (2)</td></tr>
<tr><td>Yuma Main Canal (16)</td></tr>
</table>

Type	Name (crossing #)	Notes
Habitat for wildlife and/or aquatic species	all except Pima (12), Pueblo (13), Navajo (10), and Walapai (17) Canals	–

9.0 CONCLUSIONS

No dredge-and-fill operations will occur within the canals in the project area and no subsequent loss of WUS will take place because all canals will be bored beneath during the proposed installations; therefore, a Clean Water Act Section 404 permit from USACE will not be required prior to project implementation. Likewise, no impacts to WS will occur and a stream alteration permit from CDFW is unnecessary because the canals and any potential wildlife habitat, either in the canals themselves or along the canal margins, will be avoided.

APPENDIX A. WATERWAY CROSSINGS IDENTIFIED IN THE PROJECT AREA

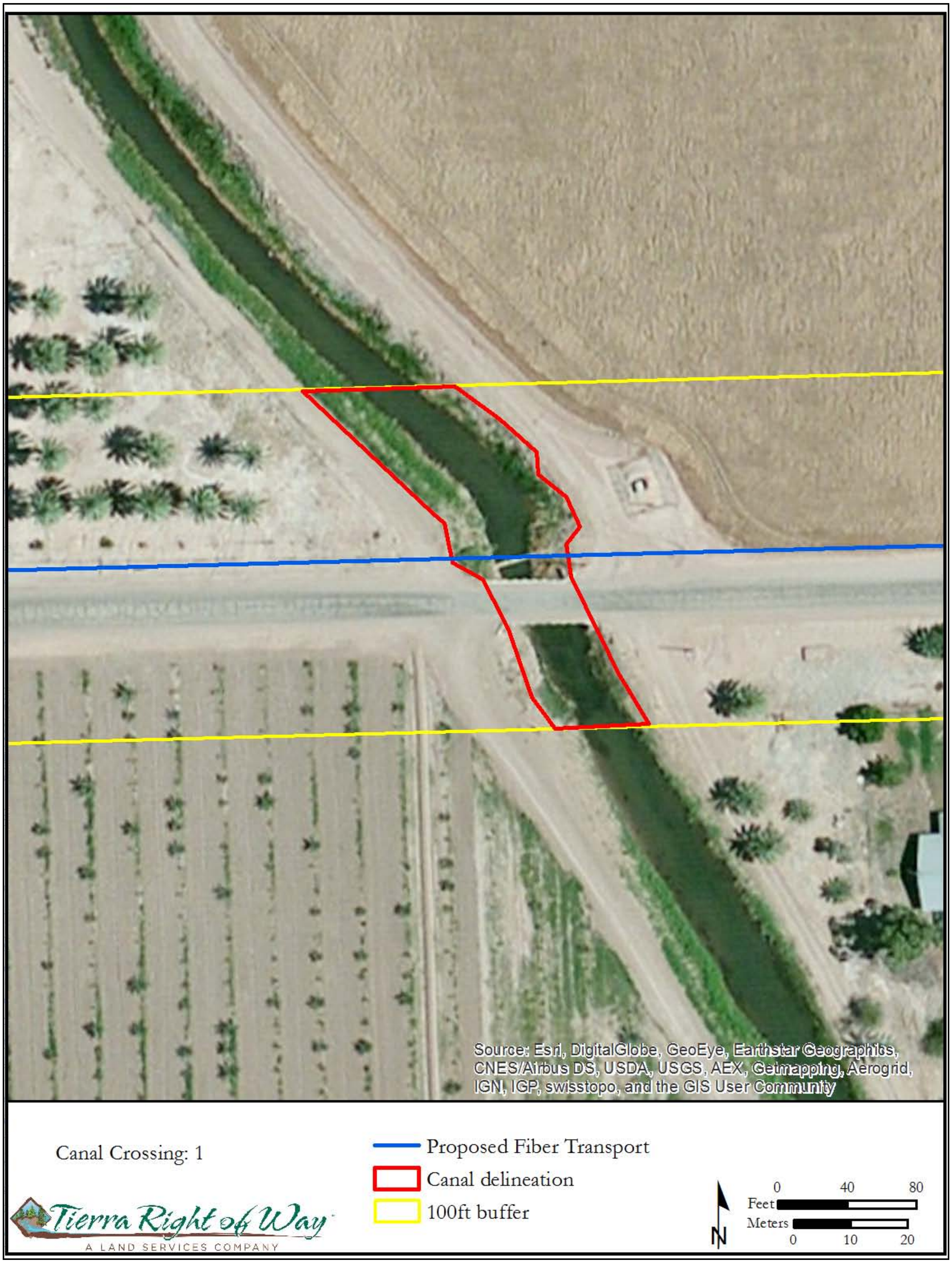

Figure A.1. Canal Crossing 1.

Photo A.1. Crossing 1, view to north.

Table A.1. Crossing 1

Canal Name	Reservation Main Drain
Construction	Earthen
Location Description	Stalnacker Road
Coordinates (NAD 83)	32° 48' 14.825" N, 114° 34' 34.415" W
Vegetation	Dense, low-growing marginal riparian
Potentially Jurisdictional Extent	Edge of vegetation
Delineated Area	0.1283 ha (0.3171 acres)
Approximate Directional Bore Length	61 m (200 feet)

Figure A.2. Canal Crossing 2.

Photo A.2. Crossing 2, view to east.

Table A.2. Crossing 2

Canal Name	Unnamed
Construction	Earthen
Location Description	Fisher and Parkman Roads
Coordinates (NAD 83)	32° 47' 59.896" N, 114° 34' 55.217" W
Vegetation	Minimal, non-riparian
Potentially Jurisdictional Extent	Edge of vegetation
Delineated Area	0.0169 ha (0.0418 acres)
Approximate Directional Bore Length	46 m (150 feet)

Figure A.3. Canal Crossing 3.

Photo A.3. Crossing 3, view to west.

Table A.3. Crossing 3

Canal Name	Reservation Main Drain
Construction	Earthen
Location Description	Fisher Road
Coordinates (NAD 83)	32° 47' 16.959" N, 114° 34' 54.695" W
Vegetation	Dense, low-growing marginal riparian
Potentially Jurisdictional Extent	Edge of vegetation
Delineated Area	0.1176 ha (0.2907 acres)
Approximate Directional Bore Length	61 m (200 feet)

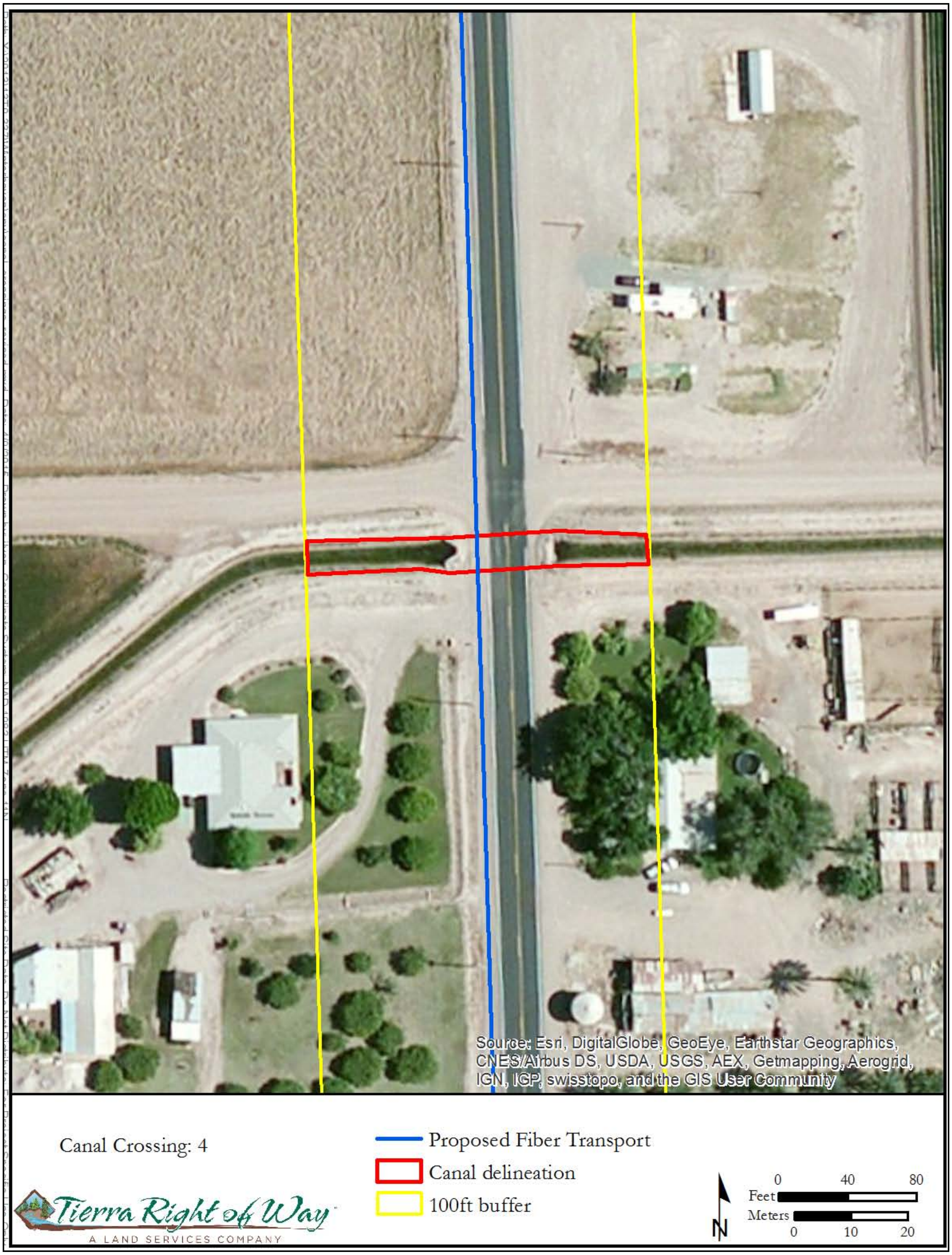

Figure A.4. Canal Crossing 4.

Photo A.4. Crossing 4, view to west.

Table A.4. Crossing 4

Canal Name	Hopi Canal
Construction	Earthen
Location Description	Bard and Whitmore Roads
Coordinates (NAD 83)	32° 47' 20.690" N, 114° 33' 22.047" W
Vegetation	Sparse, non-riparian
Potentially Jurisdictional Extent	Edge of vegetation
Delineated Area	0.0356 ha (0.0879 acres)
Approximate Directional Bore Length	52 m (170 feet)

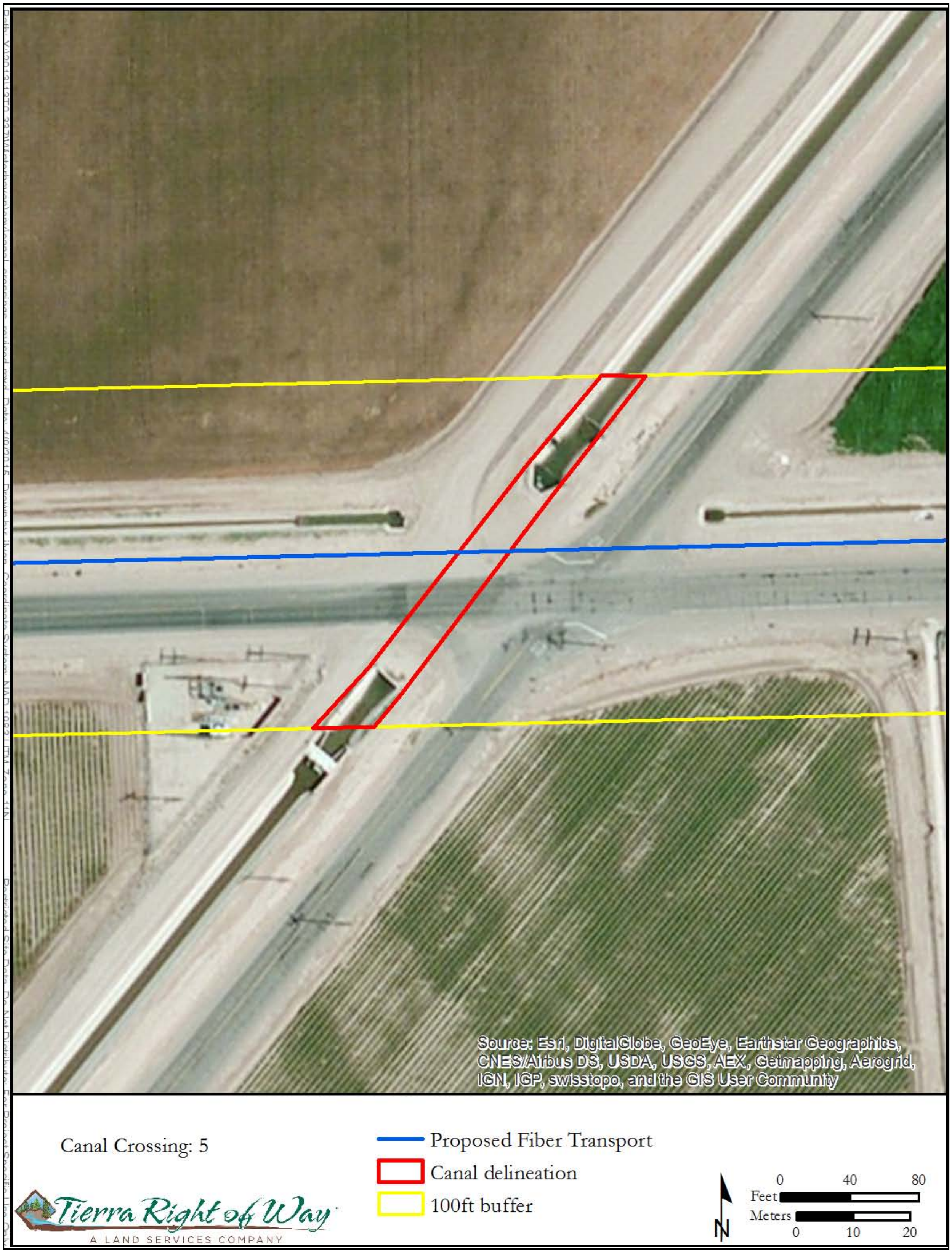

Figure A.5. Canal Crossing 5.

Photo A.5. Crossing 5, view to south.

Table A.5. Crossing 5

Canal Name	Cocopah Canal
Construction	Concrete lined
Location Description	Ross Road
Coordinates (NAD 83)	32° 46' 54.538" N, 114° 34' 26.542" W
Vegetation	Minimal, non-riparian
Potentially Jurisdictional Extent	Edge of vegetation
Delineated Area	0.0550 ha (0.1360 acres)
Approximate Directional Bore Length	146 m (480 feet)

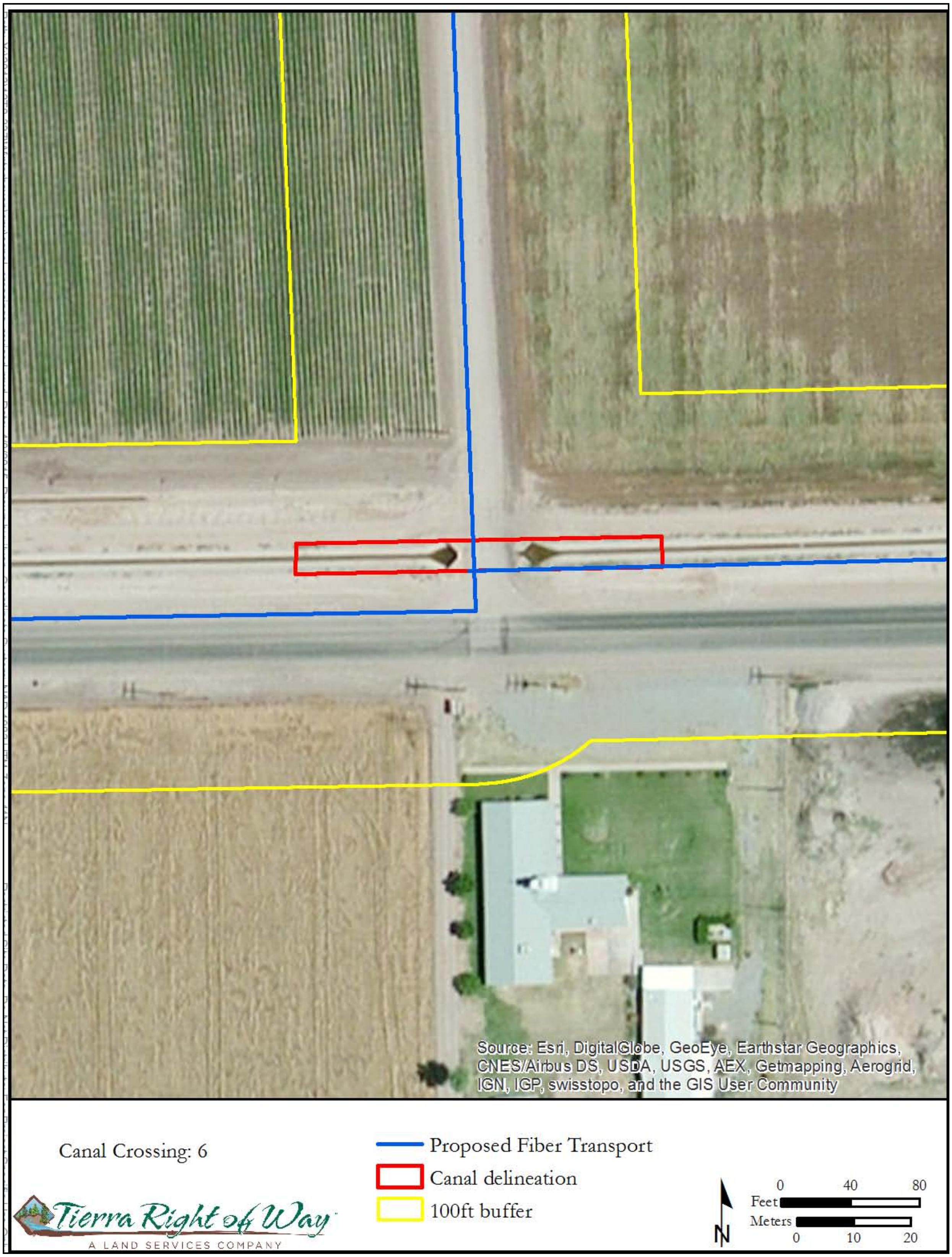

Figure A.6. Canal Crossing 6.

Photo A.6. Crossing 6, view to west.

Table A.6. Crossing 6

Canal Name	Unnamed
Construction	Concrete lined
Location Description	Fisher and Ross Roads
Coordinates (NAD 83)	32° 46' 54.589" N, 114° 34' 54.387" W
Vegetation	Sparse, non-riparian
Potentially Jurisdictional Extent	Edge of vegetation
Delineated Area	0.0343 ha (0.0848 acres)
Approximate Directional Bore Length	49 m (160 feet)

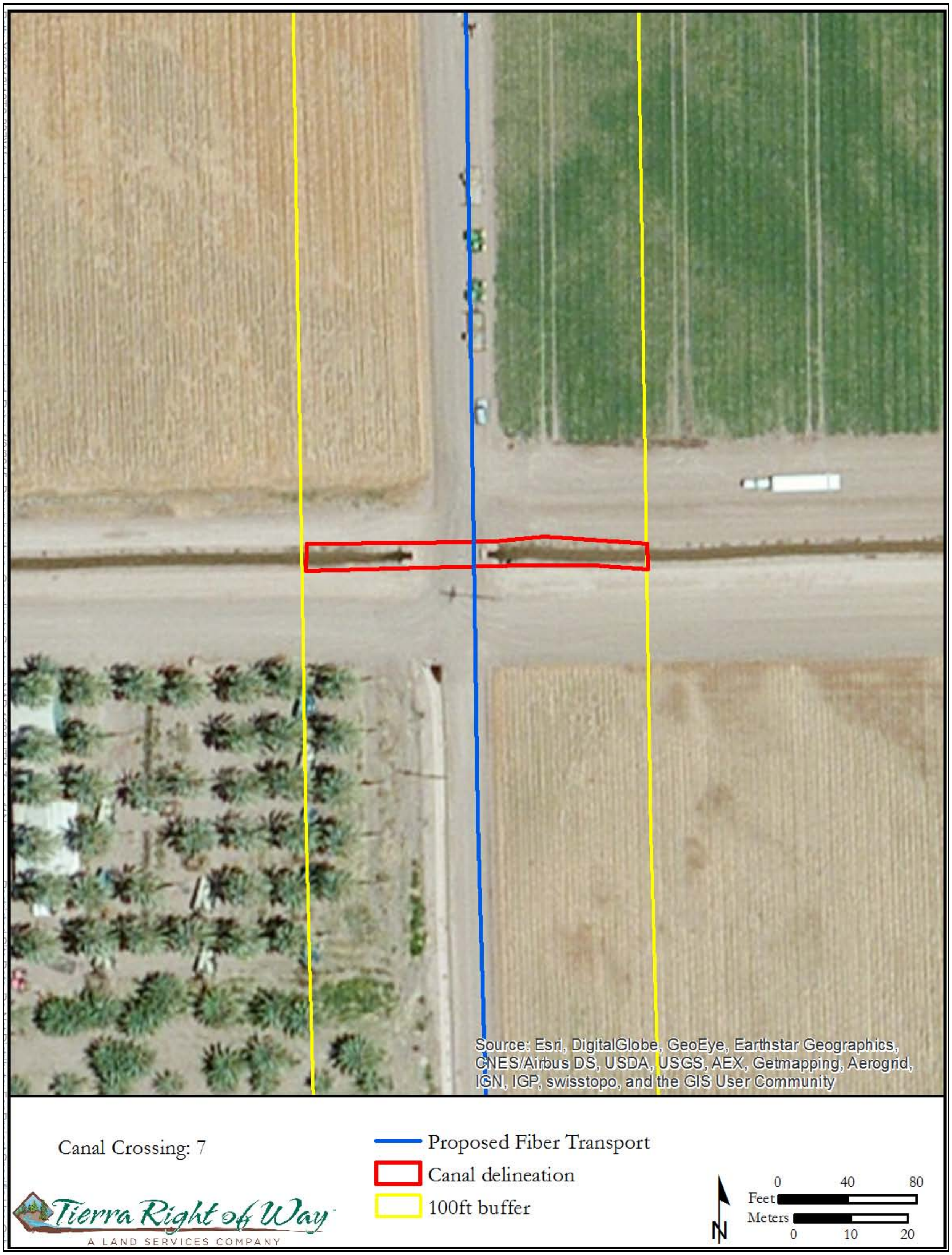

Figure A.7. Canal Crossing 7.

Photo 7: Crossing 7, view to west.

Table A.7. Crossing 7

Canal Name	Papago Canal
Construction	Earthen
Location Description	Perez Road
Coordinates (NAD 83)	32° 46' 28.371" N, 114° 35' 25.516" W
Vegetation	Minimal, non-riparian
Potentially Jurisdictional Extent	Edge of vegetation
Delineated Area	0.0277 ha (0.0684 acres)
Approximate Directional Bore Length	40 m (130 feet)

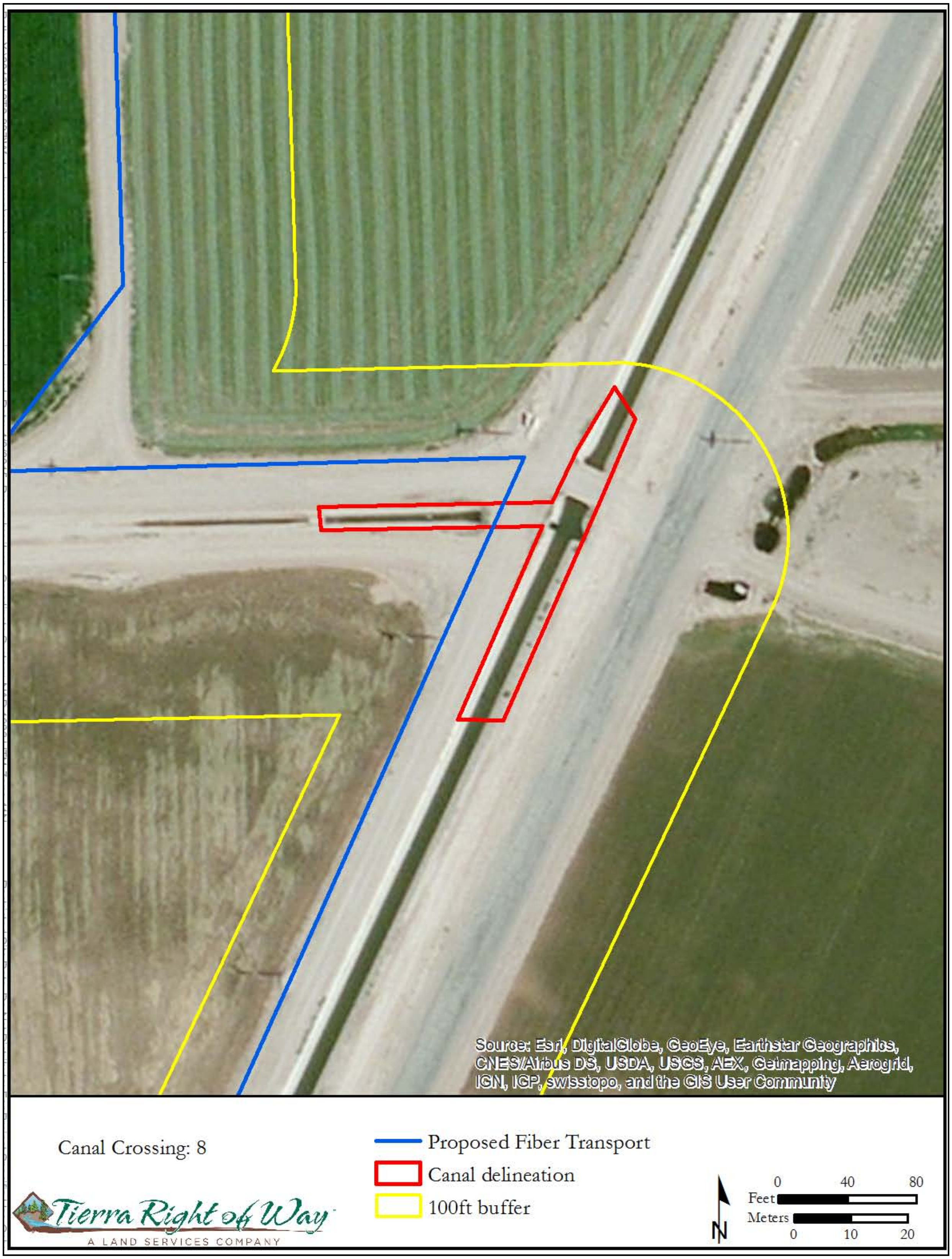

Figure A.8. Canal Crossing 8.

Photo A.8. Crossing 8, view to west.

Table A.8. Crossing 8

Canal Name	Pima Canal
Construction	Concrete lined
Location Description	Haughtelin and Perez Roads
Coordinates (NAD 83)	32° 46' 2.012" N, 114° 35' 26.459" W
Vegetation	Sparse, non-riparian
Potentially Jurisdictional Extent	Edge of vegetation
Delineated Area	0.0259 ha (0.0640 acres)
Approximate Directional Bore Length	24 m (80 feet)

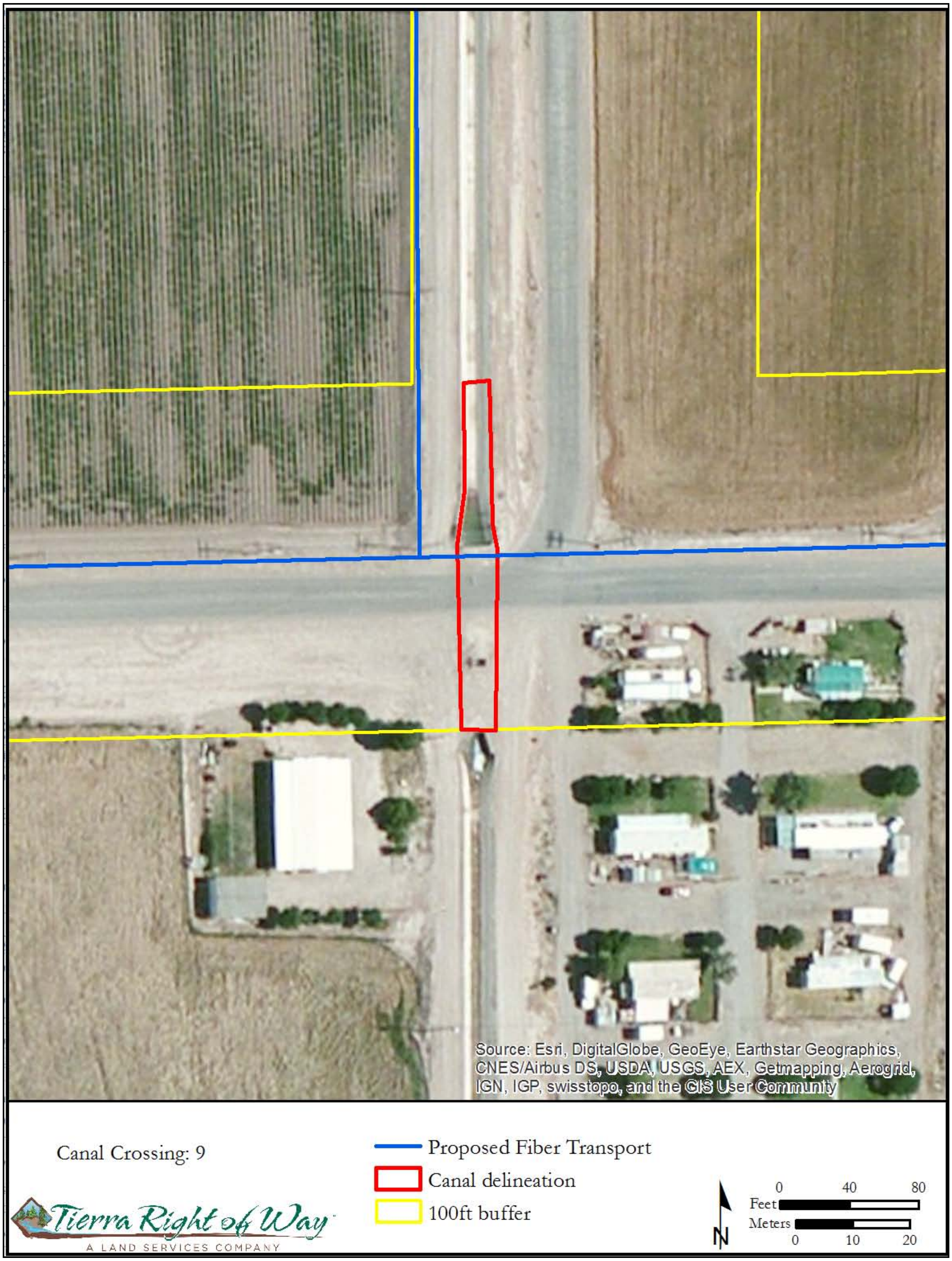

Figure A.9. Canal Crossing 9.

Photo A.9. Crossing 9, view to north.

Table A.9. Crossing 9

Canal Name	Cocopah Canal
Construction	Concrete lined
Location Description	Flood and Arnold Roads
Coordinates (NAD 83)	32° 45' 10.348" N, 114° 35' 43.169" W
Vegetation	Sparse, non-riparian
Potentially Jurisdictional Extent	Top of bank
Delineated Area	0.0360 ha (0.0890 acres)
Approximate Directional Bore Length	49 m (160 feet)

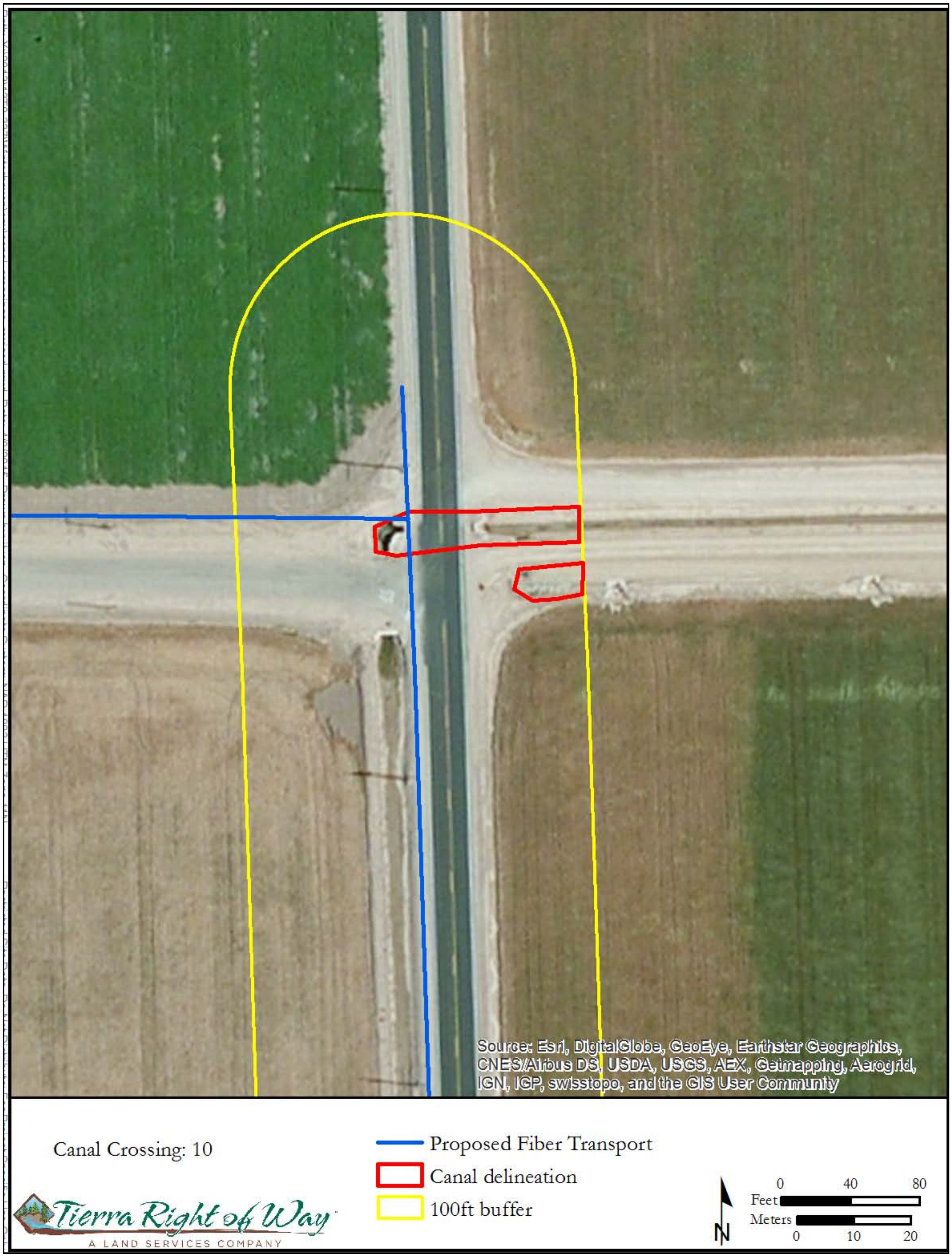

Figure A.10. Canal Crossing 10.

Photo A.10. Crossing 10 northern canal, view to east.

Photo A.11. Crossing 10 southern canal, view to east.

Table A.10. Crossing 10.

Canal Name	Navajo Canal (N)/Unnamed (S)
Construction	Earthen
Location Description	Picacho and Jackson Roads
Coordinates (NAD 83)	32° 46' 28.491" N, 114° 36' 58.913" W
Vegetation	Sparse, non-riparian (N)/none (S)
Potentially Jurisdictional Extent	Top of bank
Delineated Area	0.0292 ha (0.0721 acres)
Approximate Directional Bore Length	58 m (190 feet)

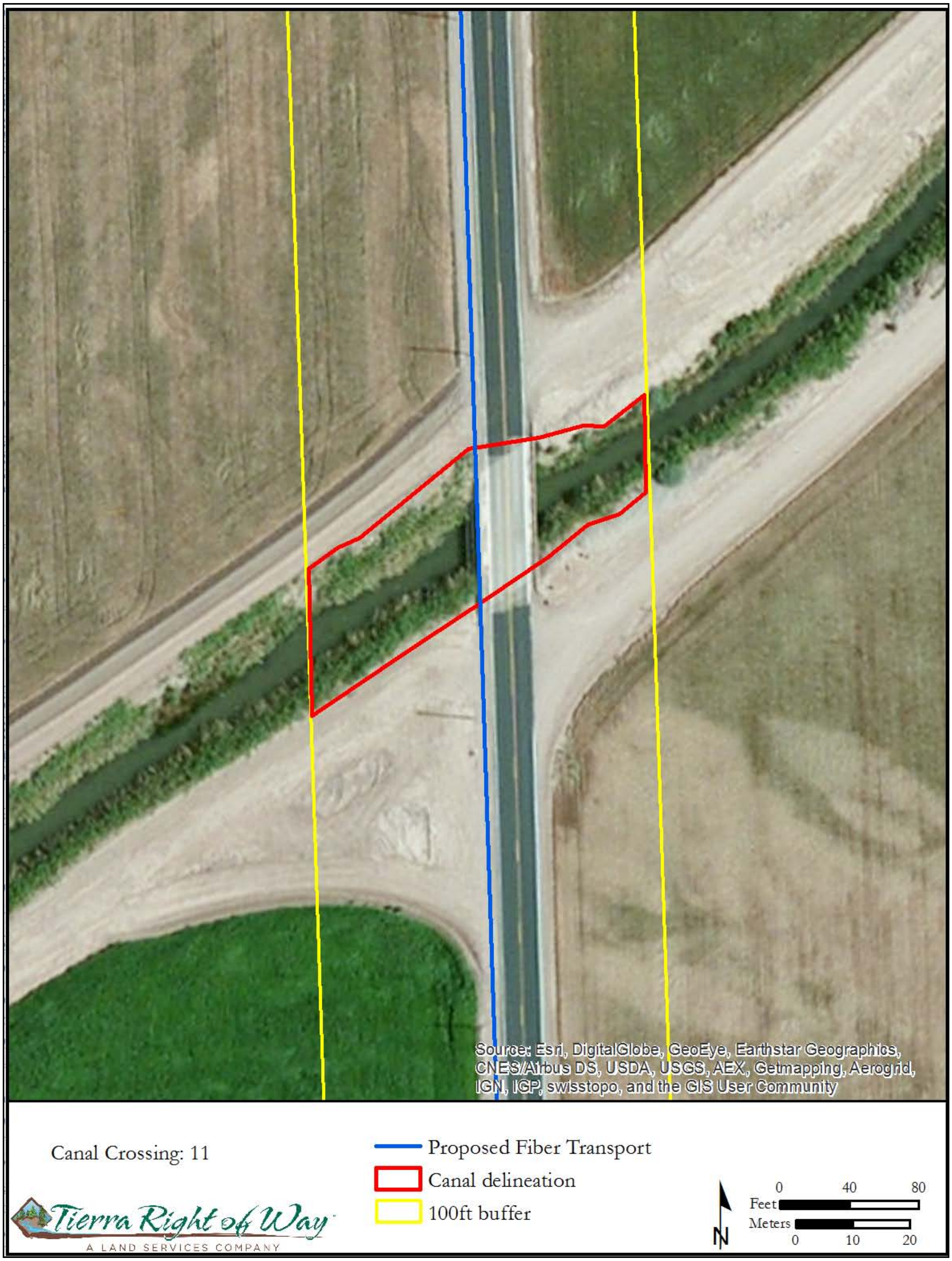

Figure A.11. Canal Crossing 11.

Photo A.12. Crossing 11, view to southwest.

Table A.11. Crossing 12

Canal Name	Reservation Main Drain
Construction	Earthen
Location Description	Picacho Road
Coordinates (NAD 83)	32° 46' 15.206" N, 114° 36' 58.732" W
Vegetation	Dense, low-growing marginal riparian
Potentially Jurisdictional Extent	Edge of vegetation
Delineated Area	0.1401 ha (0.3462 acres)
Approximate Directional Bore Length	128 m (420 feet)

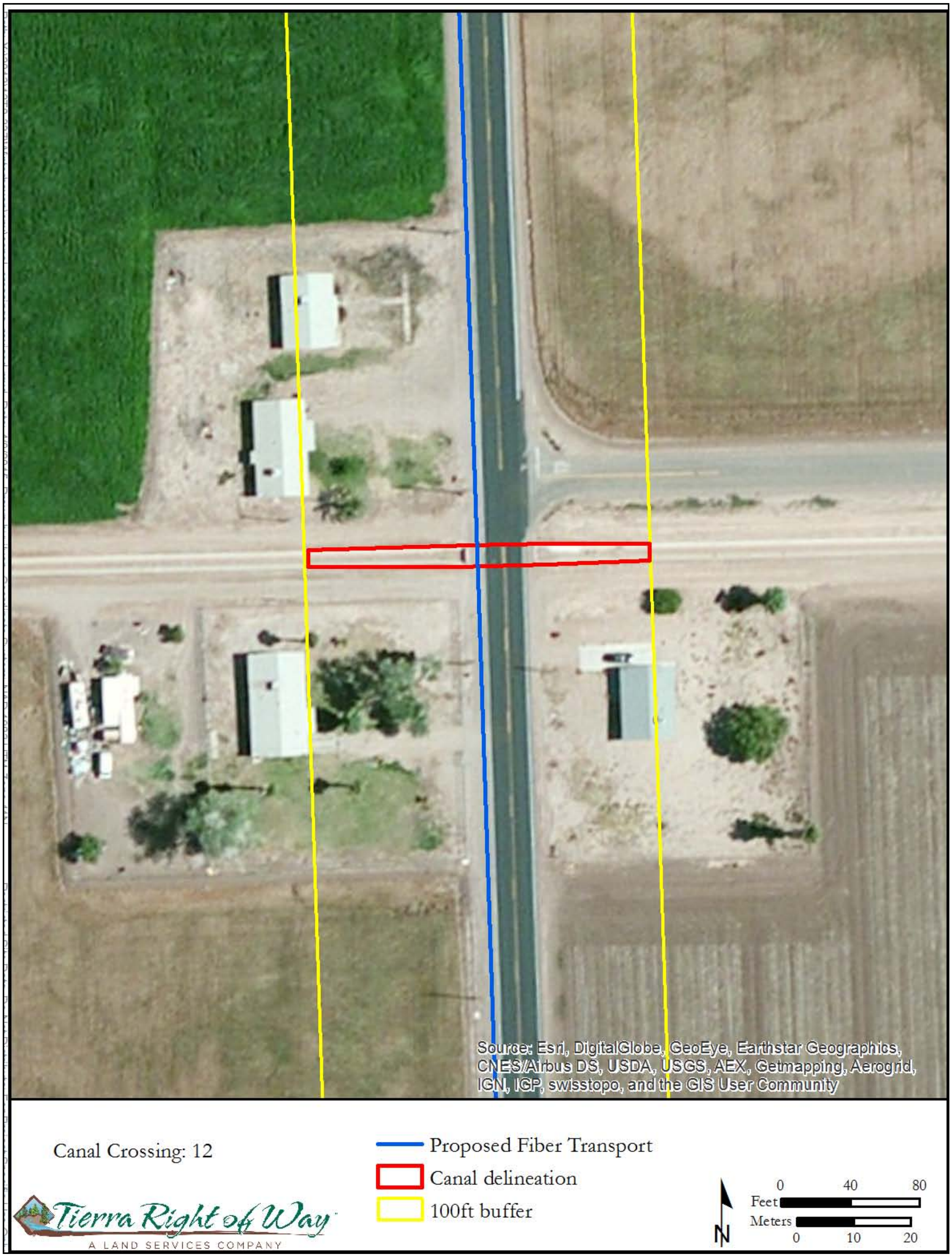

Figure A.12. Canal Crossing 12.

Photo A.13. Crossing 12, view to east.

Table A.12. Crossing 12

Canal Name	Pima Canal
Construction	Concrete lined
Location Description	Picacho and Haughtelin Roads
Coordinates (NAD 83)	32° 46' 1.989" N, 114° 36' 58.551" W
Vegetation	None
Potentially Jurisdictional Extent	Top of bank
Delineated Area	0.0206 ha (0.0509 acres)
Approximate Directional Bore Length	46 m (150 feet)

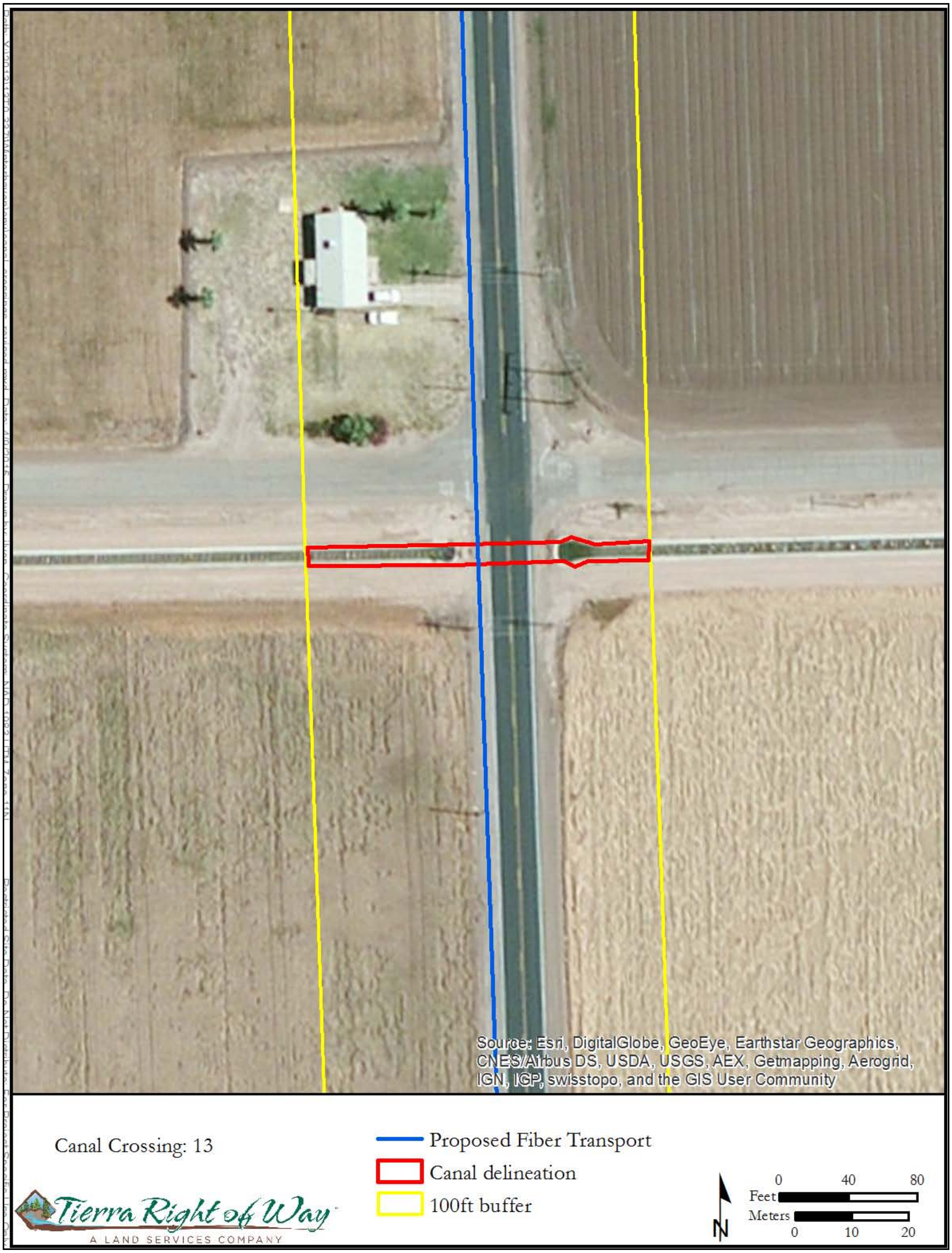

Figure A.13. Canal Crossing 13.

Photo A.14. Crossing 13, view to east.

Table A.13. Crossing 13

Canal Name	Pueblo Canal
Construction	Concrete lined
Location Description	Picacho and Indian Rock Roads
Coordinates (NAD 83)	32° 45' 35.792" N, 114° 36' 58.232" W
Vegetation	Sparse, non-riparian
Potentially Jurisdictional Extent	Top of bank
Delineated Area	0.0210 ha (0.0518 acres)
Approximate Directional Bore Length	46 m (150 feet)

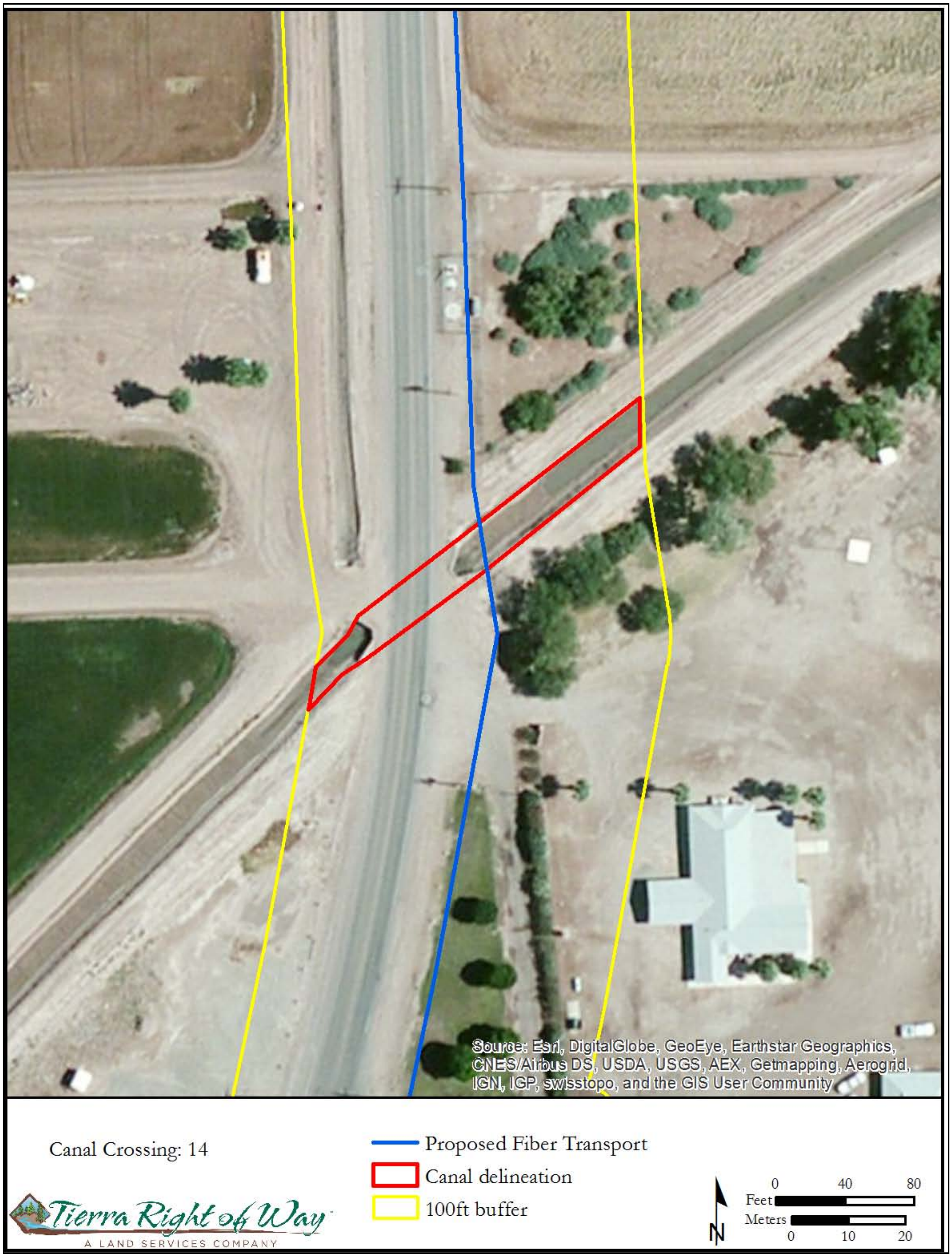

Figure A.14. Canal Crossing 14.

Photo A.15. Crossing 14, view to east.

Table A.14. Crossing 14

Canal Name	Cocopah Canal
Construction	Earthen
Location Description	Picacho Road
Coordinates (NAD 83)	32° 44' 21.987" N, 114° 36' 56.446" W
Vegetation	Minimal, non-riparian
Potentially Jurisdictional Extent	Edge of vegetation
Delineated Area	0.0494 ha (0.1222 acres)
Approximate Directional Bore Length	134 m (440 feet)

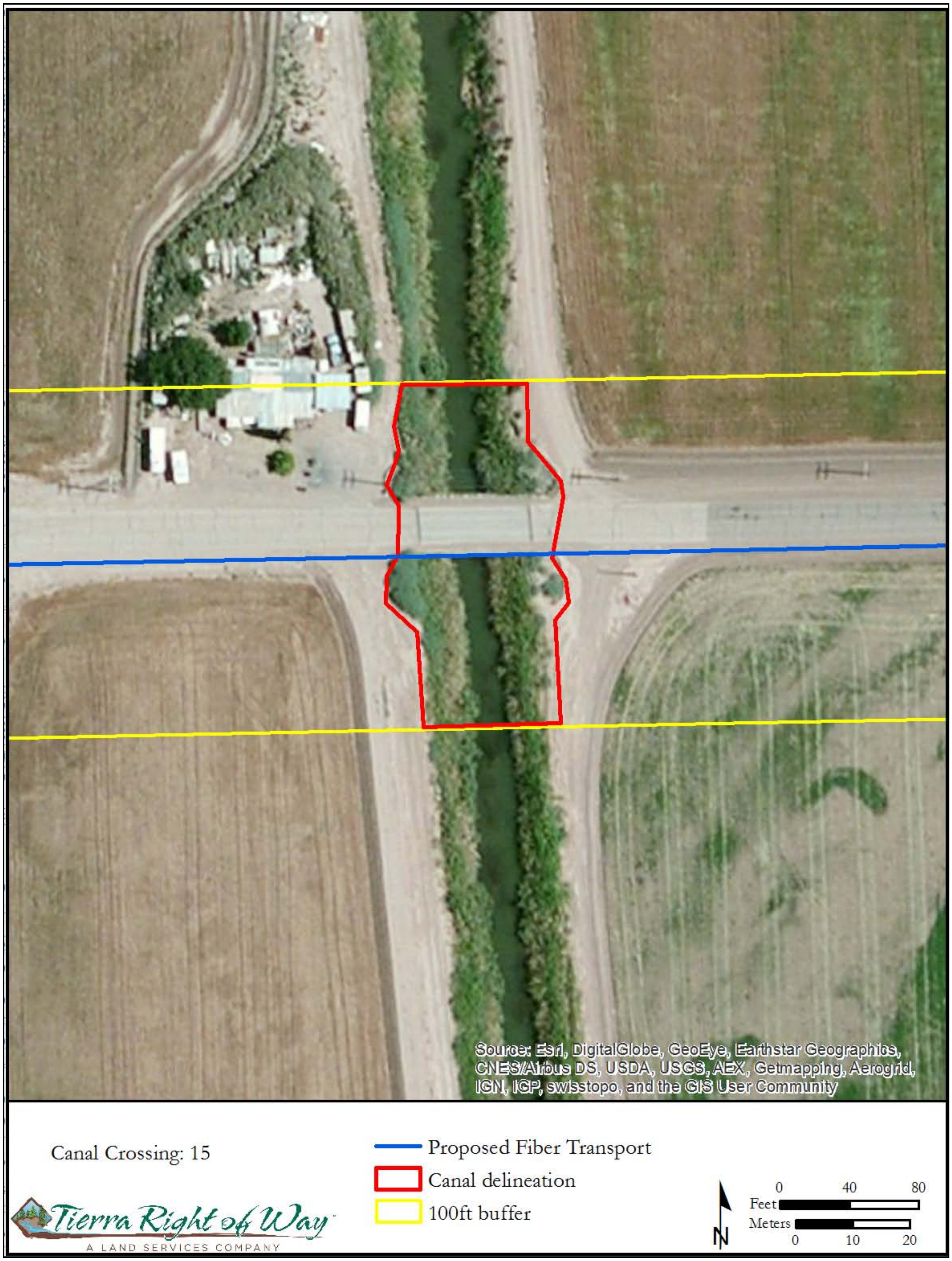

Figure A.15. Canal Crossing 15.

Photo A.16. Crossing 15, view to south.

Table A.15. Crossing 15

Canal Name	Yuma Main Canal
Construction	Earthen
Location Description	Arnold Road
Coordinates (NAD 83)	32° 45' 9.849" N, 114° 37' 43.537" W
Vegetation	Sparse, non-riparian
Potentially Jurisdictional Extent	Edge of vegetation
Delineated Area	0.2583 ha (0.6384 acres)
Approximate Directional Bore Length	354 m (1,160 feet) bored with #15

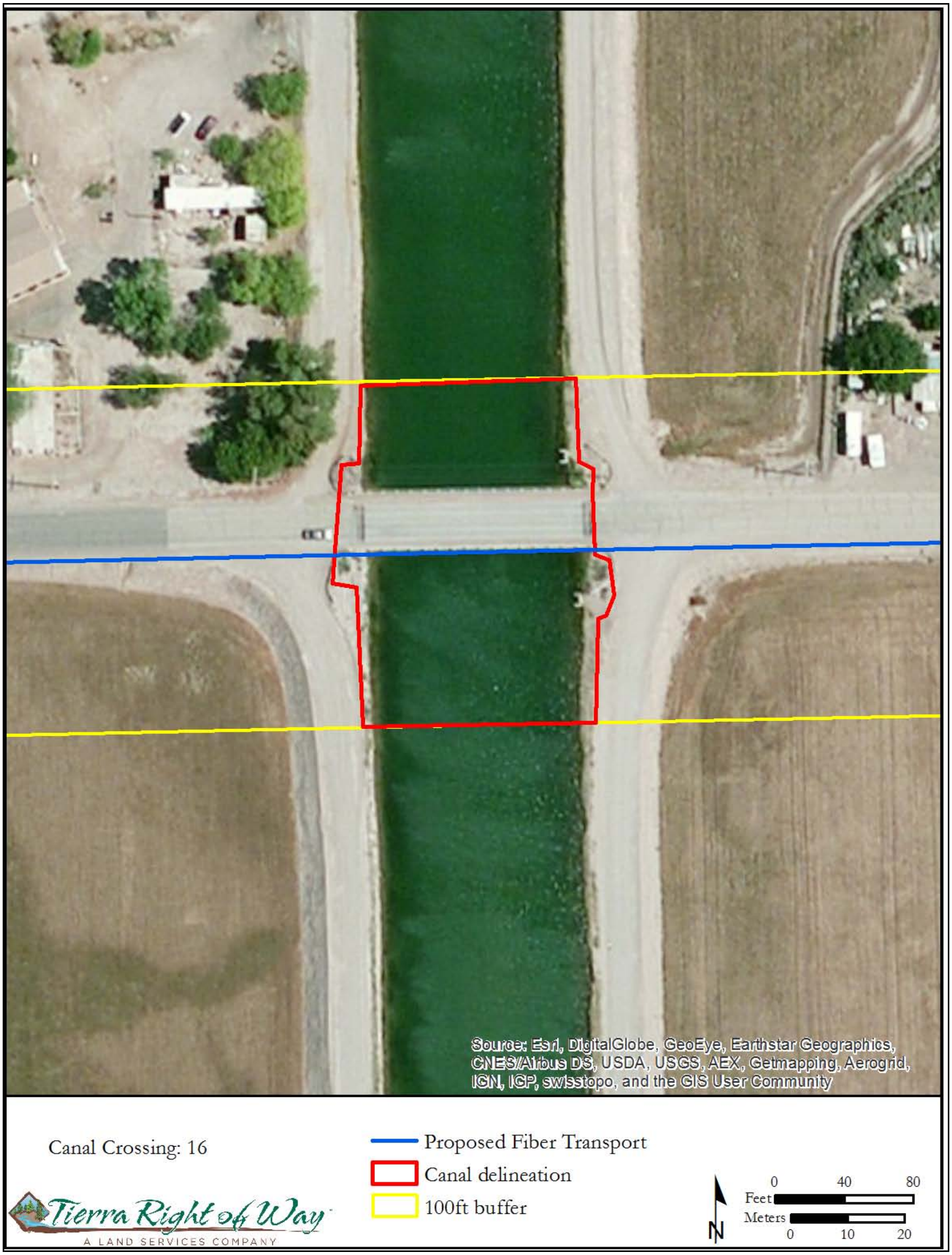

Figure A.16. Canal Crossing 16.

Photo A.17. Crossing A.16, view to west.

Table A.16. Crossing 16

Canal Name	Yuma Main Canal
Construction	Earthen
Location Description	Arnold Road
Coordinates (NAD 83)	32° 45' 9.849" N, 114° 37' 43.537" W
Vegetation	Sparse, non-riparian
Potentially Jurisdictional Extent	Edge of vegetation
Delineated Area	0.2583 ha (0.6384 acres)
Approximate Directional Bore Length	354 m (1,160 feet) bored with #15

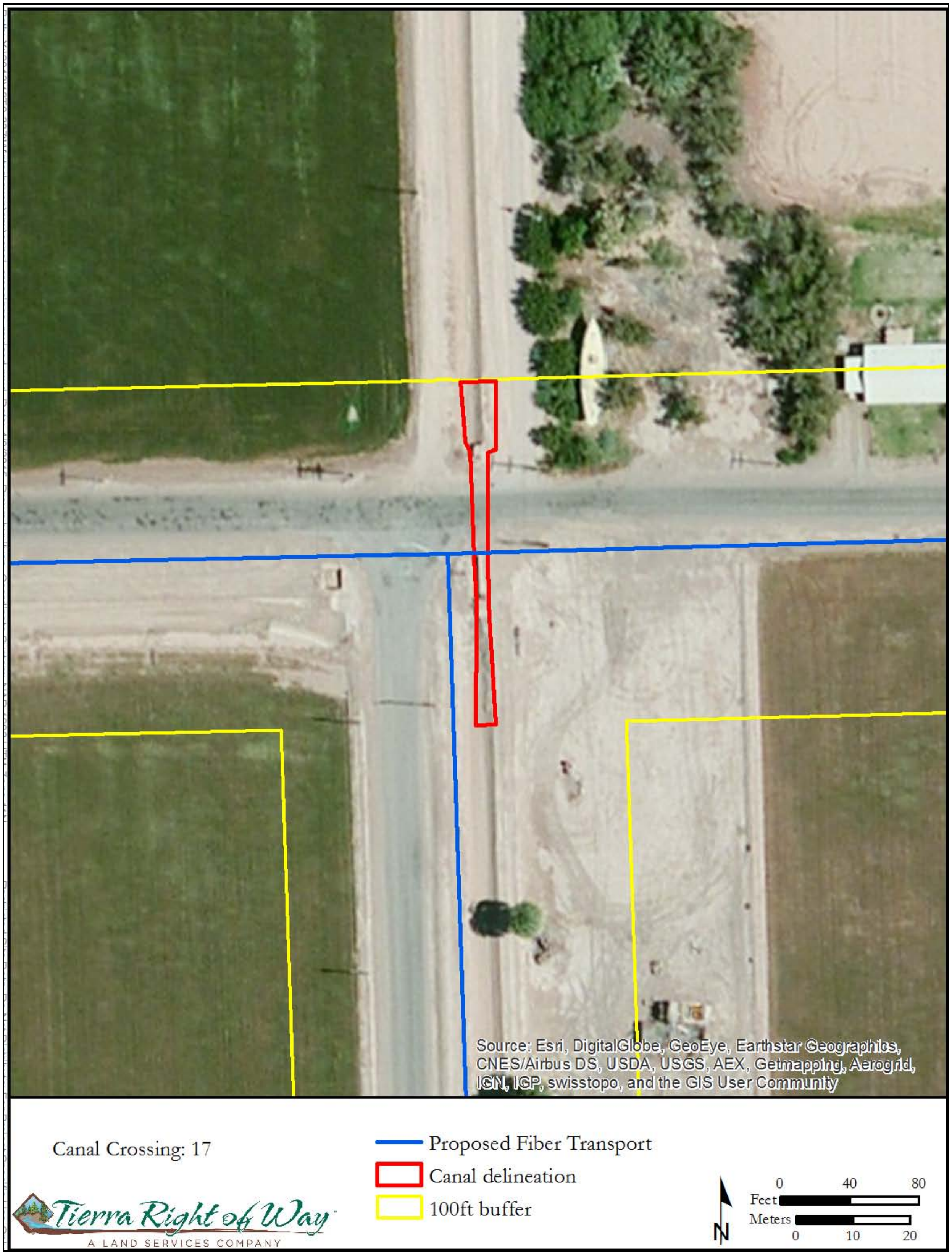

Figure A.17. Canal Crossing 17.

Photo A.18. Crossing 17, view to south.

Table A.17. Crossing 17

Canal Name	Walapai Canal
Construction	Earthen
Location Description	Arnold and De Corse Roads
Coordinates (NAD 83)	32° 45' 9.826" N, 114° 37' 59.821" W
Vegetation	Sparse, non-riparian
Potentially Jurisdictional Extent	Top of bank
Delineated Area	0.0199 ha (0.0493 acres)
Approximate Directional Bore Length	49 m (160 feet)

APPENDIX E. CLASS III CULTURAL RESOURCES SURVEY REPORT AND CULTURAL RESOURCES CORRESPONDENCE

Tierra Right of Way
A LAND SERVICES COMPANY

A Class III Cultural Resources Survey for a Proposed Buried Telecommunications Fiber-Optic Line near Winterhaven, in Imperial County, California

Prepared by:
Joseph Howell, M.A.

Tierra Archaeological Report No. 2014-141
Tierra Job No. 13T0-337
March 2, 2015 (revised)

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Tierra Archaeological Report No. 2014-141
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March 2, 2015 (revised)

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ABSTRACT

PROJECT TITLE:	A Class III Cultural Resource Survey for a Proposed Buried Telecommunications Fiber-Optic Line, in Imperial County, California
LAND STATUS:	Fort Yuma–Quechan Indian Reservation, Imperial County, private, Bureau of Reclamation (BOR)
AGENCY:	Bureau of Indian Affairs (BIA), Fort Yuma–Quechan Indian Reservation, BOR
PROJECT DESCRIPTION:	A Class III cultural resources survey of approximately 26.46 linear km (16.44 linear miles) was conducted in anticipation of a proposed buried fiber-optic telecommunications line installation.
TIERRA PROJECT NO.:	13T0-337
TIERRA REPORT NO.:	2014-141
DATES OF FIELDWORK:	July 15 and 16, 2014
PROJECT LOCATION:	The project area is located in Sections 31, 32, and 33 of Township 15 South, Range 23 East; Sections 11–14 and 21–27 of Township 16 South, Range 22 East; and Sections 4–9, 18, and 19 of Township 16 South, Range 23 East, San Bernardino Baseline and Meridian, on the Bard (1965), Yuma East (1965), Yuma West (1965; photorevised 1979), and Araz (1964, photoinspected 1973) 7.5-minute U.S. Geological Survey (USGS) quadrangles, in Imperial County, California.
AREA SURVEYED:	Approximately 199.3 acres (80.6 ha)
NO. OF SITES RECOMMENDED AS NRHP ELIGIBLE:	6
NO. OF ISOLATED OCCURRENCES:	10
MANAGEMENT RECOMMENDATIONS:	Six sites, ten isolated occurrences, and one modern cemetery were encountered during the current survey. Four of the sites consist of historic canals that remain in active use. The other two sites consist of the historic Pilot Knob-Tap Drop 4 161kV Transmission Line and

the historic route of the Southern Pacific Railroad. It is anticipated that the canals, transmission line, and railroad will remain unaffected by the proposed construction activities, and, therefore, there will be No Adverse Effect to these resources. Tierra recommends that the proposed undertaking be allowed to proceed; however, monitoring by a qualified archaeologist and/or Tribal member is recommended during construction work in the vicinity of the Fort Yuma–Quechan Indian Reservation Cemetery.

The clients and all subcontractors are reminded that if human remains or funerary objects are uncovered during future ground-disturbing activities, California Environmental Quality Act (CEQA) Statute 15064.5(e) requires that all work must be stopped in the area of discovery and that the coroner of the County in which the remains are discovered be contacted to determine that no investigation into the cause of death is required. If the discovery is on Indian land and the coroner determines the remains to be Native American, the Quechan Tribe shall be notified immediately to make arrangements for the disposition of the remains. If not on Indian land, the coroner shall contact the Native American Heritage Commission, which will identify the person or persons it believes to be the most likely descendents of the deceased Native American. The most likely descendent may make recommendations to the landowner or the person responsible for the excavation work as to the means of treating or disposing of the human remains and any associated grave goods with appropriate dignity, as provided in Public Resources Code Section 5097.98.

INTRODUCTION

At the request of Nate Stanislawski of TDS Telecommunications Corporation (TDS), Tierra Right of Way Services, Ltd. (Tierra), performed a Class III cultural resources survey of approximately 26.46 linear km (16.44 linear miles) in anticipation of the replacement of buried fiber-optic telecommunications lines on the Fort Yuma–Quechan Indian Reservation and on unincorporated land in Imperial County, California. TDS is proposing to upgrade their existing network using California Advanced Services Fund (CASF) funds. Because the project is a public utility, it falls under the regulation of the California Public Utilities Commission (CPUC). The Bureau of Indian Affairs (BIA) will be approached to approve a grant of easement for right-of-way across the reservation and is the lead reviewing agency for the cultural resources component of the project; as such, the project is subject to the regulatory guidelines established by the National Environmental Policy Act (NEPA) and by Section 106 of the National Historic Preservation Act (NHPA) of 1966. The BIA Western Regional Office determined that an Archeological Resources Protection Act (ARPA) permit was not necessary for the non-collection/non-excavation survey (McVey 2014).

The project, as proposed, will consist of the installation of new fiber-optic cable and 10 nodes. The project will extend high-speed internet service to the communities of Winterhaven, Bard, and surrounding areas on the Fort Yuma–Quechan Indian Reservation. Because the fiber-optic project is being permitted through the CPUC, the survey was conducted according to the environmental permitting guidelines for cultural resources mandated by the California Environmental Quality Act (CEQA) (California Public Resources Code 21000–21177). In addition to the CPUC and BIA, the Bureau of Reclamation (BOR) and Imperial County are also participating regulatory agencies. The proposed route of the telecommunications line will cross (via horizontal directional boring) several canals administered by the BOR and is located within the Reservation Division of the Yuma Project, which is administered by the BOR and the Bard Water District. Because part of its length follows portions of Picacho and Ross Roads, Imperial County has been included as a participatory agency.

Of the total fiber-optic line, about 13.98 km (8.68 miles) will be installed on Tribal land, and 12.48 km (7.75 miles) will be installed on lands within unincorporated Imperial County, including the settlements of Winterhaven and Bard.

The survey was conducted by Joseph Howell, M.A. (field director), and Ben Wright (field technician), on July 15 and 16, 2014. Henri Koteen served as Tribal monitor. A total of four person-field-days was required to complete the survey. Barbara K. Montgomery, Ph.D., was principal investigator for the project. Renee Darling served as project manager through September 2014. Tom Euler took over as project manager in October 2014.

THE PROJECT AREA

The project area, or area of potential effects (APE), consists of approximately 26.46 linear km (16.44 linear miles) of buried utility corridors. Previously installed utilities, in the form of copper telephone cable and other utilities, already exist within the corridors. However, fiber-optic line has not been previously installed in any of the corridors, and all trenches excavated within the APE will be new. The plow insertion of the fiber-optic lines requires trenches measuring between 1 and 2 feet (0.3 to 0.6 m) in width, and 4 feet (1.2 m) in depth. Roughly half of the APE is located on the Fort Yuma–Quechan Indian Reservation, with the remainder located on unincorporated Imperial County land east of the reservation. A small portion is located within the town of Winterhaven, California.

The width of the APE, which corresponds to the surveyed area, was 30 m (98 feet). In total, the project area was approximately 80.6 ha (199.3 acres). The project area is located in Sections 31, 32, and 33 of Township 15 South, Range 23 East; Sections 11–14 and 21–27 of Township 16 South, Range 22 East; and Sections 4–9, 18, and 19 of Township 16 South, Range 23 East, San Bernardino Baseline and Meridian (SBB&M), on the Bard (1965), Yuma East (1965), Yuma West (1965; photorevised 1979), and Araz (1964, photoinspected 1973) 7.5-minute U.S. Geological Survey (USGS) quadrangles, in Imperial County, California (Figure 1).

The utility corridors follow existing roads, and the majority are located between road shoulders and cultivated fields. The major roads paralleled by the project corridor/APE include Picacho Road, Arnold Road (Photos 1 and 2), First Avenue (Photo 3), Cocopah Road (Photo 4), Perez Road (Photos 5 and 6), Ross Road (Photo 7), Bard Road (Photo 8), Fisher Road (Photo 9), Avenue E, Haughtelin Road (Photo 10), and Stalnacker Road (Photo 11). Short segments also exist along Quechan Drive, Parkman Road (Photo 12), E Street (in Winterhaven) (Photo 13), and Railroad Avenue (also in Winterhaven). In a few locations, the APE runs past private residences or businesses. Most of the surface area of the 30-m-wide (98-foot-wide) corridor is covered by asphalt, extends into cultivated areas, and has been leveled and graded during road construction. The leveled and graded areas consist of open raw land. However, several roads are unpaved (e.g., Haughtelin, Perez, and Fisher Roads), which allowed for a more extensive examination than areas where only raw land was visible. Except for cultivated plants in the fields (e.g., cotton [*Gossypium* sp.], maize *[Zea mays]*, and Sudangrass *[Sorghum x drumondii]*) and riparian species near canal crossings, little vegetation was noted within the APE.

The environment of the APE is dominated by intensively cultivated land on an alluvial plain of the Colorado River. This flat, open surface is part of the larger Salton Trough landform that includes the Imperial, Coachella, and Mexicali Valleys. The Salton Trough is a physical remnant of Lake Cahuilla, a large prehistoric freshwater lake that reached a maximum extent of 161 km (100 miles) long by 56 km (35 miles) wide, and extended from the Colorado River delta to the vicinity of Indio (Heuberger n.d.:17–18; Singer 2014). Much of the fertile agricultural land of the Imperial and Coachella Valleys is the result of silts deposited in Lake Cahuilla by the Colorado River, which flowed into it for many centuries. Soils within the project area include Gadsden clay, Glenbar silty clay loam, Holtville clay, Indio silt loam, Kofa clay, Lagunita loamy sand, Lagunita silt loam, and Ripley silt loam (USDA 2014). Detailed descriptions of these soil types can be seen in Appendix A.

CULTURE HISTORY

Cultural resource surveys conducted during the past two decades have shed new light on the settlement patterns of southeastern California and southwestern Arizona. Sites in the region have traditionally been thought of as ephemeral, shallow deposits consisting of cleared areas in the desert pavement (sleeping circles), trails, trail markers, rock rings, intaglios, and sparse artifact scatters (Hartmann 1986). Relatively few subsurface investigations have taken place, leaving many research questions unanswered. This section presents an overview of the major themes in prehistoric, protohistoric, and historic cultural patterns in the Colorado River region of southwestern North America.

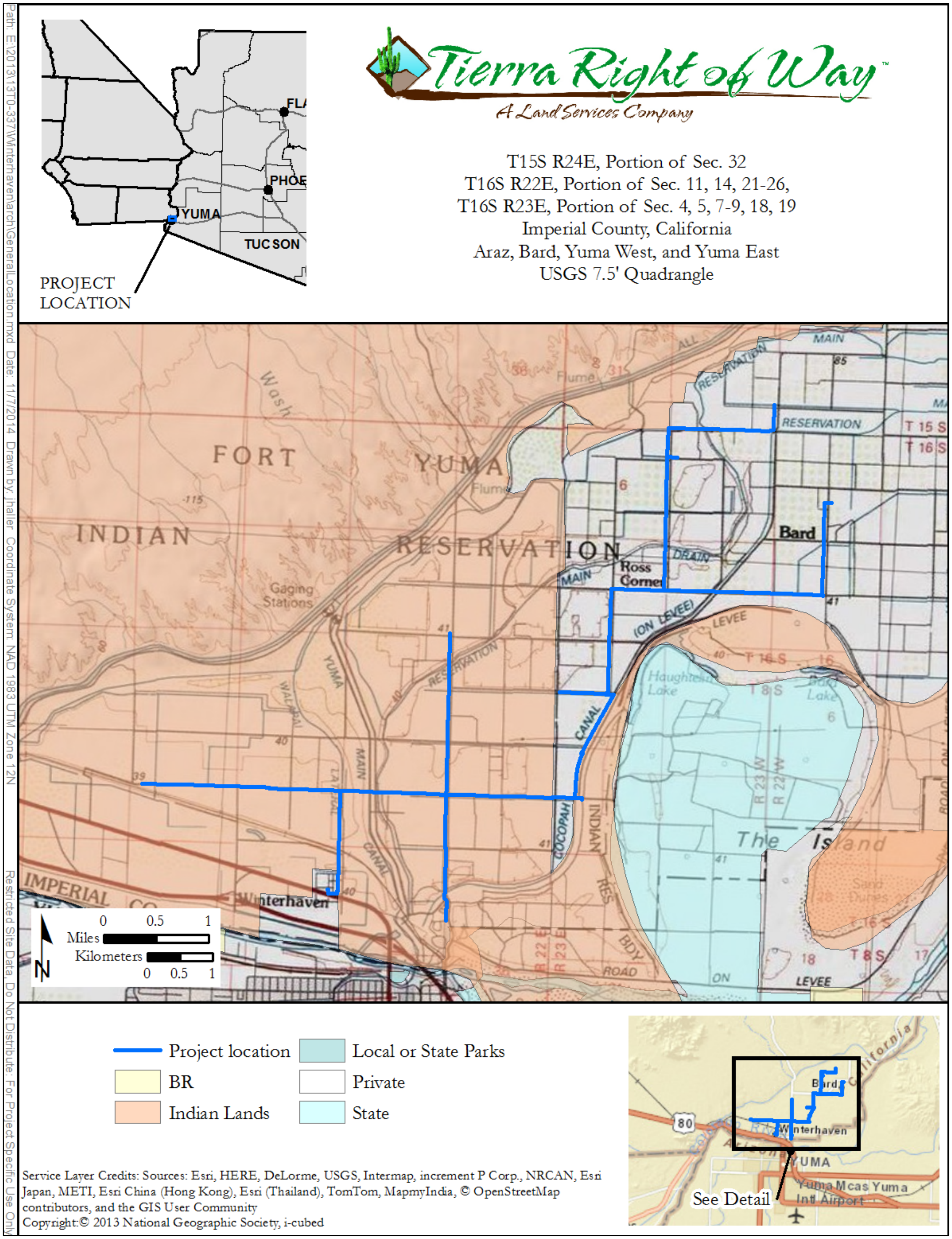

Figure 1. Location of the APE.

Photo 1. Arnold Road, from Picacho Road intersection. View is to the west.

Photo 2. Arnold Road, from westernmost end of APE. View is to the east.

Photo 3. First Avenue, from E Street intersection in Winterhaven. View is to the north.

Photo 4. Cocopah Road. View is to the north-northeast.

Photo 5. Perez Road. View is to the north.

Photo 6. Perez Road, from junction with Ross Road. View is to the south.

Photo 7. Ross Road, from Flood/Cocopah Road intersection. View is to the west.

Photo 8. Bard Road, from Whitmore Road intersection. View is to the south.

Photo 9. Fisher Road, from Hoppe Road intersection. View is to the north.

Photo 10. Haughtelin Road, from Perez Road intersection. View is to the west.

Photo 11. Stalnacker Road. View is to the east.

Photo 12. Parkman Road. View is to the east.

Photo 13. E Street, Winterhaven. View is to the west.

Paleoindian Adaptations (11,300–8,500 B.C.)

Although there may have been an earlier human presence in North America (cf. Wisner 1997), the earliest securely dated occupation of the southwestern United States was by nomadic bands of hunters collectively referred to as Paleoindians. In the classic formulation (cf. Willey and Phillips 1958), between roughly 13,000–8,000 B.P., a succession of discrete Paleoindian cultures, distinguished in part by their use of distinctive types of projectile point suited to the hunting of particular game species, roamed over broad areas in pursuit of wide-ranging herds of generally large game, although smaller species and plant resources were used as well (Cordell 1984). What is apparently the earliest of these cultures, the Clovis culture, used a bifacial lanceolate point, fluted on both sides and with a concave base; it is perhaps the most distinctive pre-ceramic artifact in the Americas (Hester 1972; Irwin-Williams 1979). Clovis peoples ranged widely over the Americas (Clovis points have been found in situ as far south as Chile), but the vast majority of Clovis sites are located in North America, south of a line (the Mason-Quimby Line) marking the limit of terminal Pleistocene glaciation. The Clovis culture is known largely from excavations conducted at "kill sites" such as Blackwater Draw (Hester 1972) in eastern New Mexico and Naco (Haury 1953), Lehner (Haury and others 1959), and Murray Springs (Haynes 1970) in the San Pedro Valley of southeastern Arizona. Clovis points have been found in association with the remains of many species, including now-extinct forms of elephant, horse, camel, and other species that populated the grasslands of the Southwest (Huckell 1984), but it is their association with mammoth bones that first singled these points out as being extremely old. The Clovis occupation has most recently been dated to a very narrow window of time, between 11,050 and 10,800 *radiocarbon* years B.P. (tentatively interpreted as translating to an actual span between 11,300 and 10,850 B.C.; Waters and Stafford 2007).

Mammoth died out in North America around the same time as the Clovis occupation, and other types of megafauna followed in fairly short order. It was once widely believed (cf. Martin 1967)—and is still thought possible by some (cf. Haynes and Eiselt 1998; Steadman et al 2005)—that these terminal Pleistocene extinctions were caused wholly or partly by "overkill." It was supposed that Clovis hunters came to the Americas from Asia and immediately began to efficiently obliterate an animal population that had not evolved to fear human hunters, driving the least adaptable creatures to extinction in a very short time. Most now believe that the extinction happened instead because of environmental change (Grayson and Meltzer 2003; Guthrie 2006), although several different mechanisms have been proposed by which this might have taken place.

Whether Clovis hunters were the cause of the extinction or not, hunters did stop using Clovis points when mammoths went extinct. In some areas of the Southwest, the Clovis culture appears to have been more or less directly succeeded by another tradition that made use of fluted projectile points known as the Folsom culture. However, virtually no remains associated with this or other post-Clovis Paleoindian groups have been documented in central Arizona (Reid and Whittlesey 1997). One explanation that has been suggested is that with the end of the Pleistocene era and the onset of the notably wetter Early Holocene, the broad expanses of parkland across which large-game species once roamed were broken up by wet patches that the animals could not cross, rendering a Paleoindian lifeway unsustainable in this part of the Southwest. It has been speculated that the descendants of the Paleoindian hunters might have migrated northward to the Great Plains, where appropriate conditions persisted until as late as 5000 B.C.

It is against this backdrop of early human activity in North America that the San Dieguito Complex was formulated. This model was proposed as the local variation on the Clovis and later cultures in southern California and southwestern Arizona.

The San Dieguito Complex

The San Dieguito complex was first identified in San Diego County, California, in the 1920s by archaeologist Malcolm Rogers. It is certainly one of considerable antiquity. Some researchers (cf. Hayden 1976) have speculated that the roots of this tradition date back as far as 30,000–40,000 B.C., but in truth very few radiocarbon or other absolute dates have been obtained for this tradition. Instead, there has long been a dependence on the notion that San Dieguito artifacts simply look older than others based on the degree to which artifacts have acquired a glossy "desert varnish," which is produced by exposure to wind, sun, and biological processes. Unfortunately, efforts to place dating through desert varnish on a scientific basis have failed, and at present, there is still no viable means for dating the typical San Dieguito site. San Dieguito artifact assemblages are generally distinguished by the presence of large, crude, desert-varnished scrapers, scraper planes, and choppers, which, in the opinion of some researchers, were best suited for the processing of wood and similar materials rather than foodstuffs. However, assemblages also include heavy, apparently highly specialized projectile points and other tools characterized by the complete removal of cortex from the initial blank (Robbins-Wade 2003), in some cases with the apparent intention of producing plano-convex artifacts (i.e., having one side intentionally flattened and the other left bulging) that could be further refined into specialized tools (Rogers 1966). Percussion flaking was utilized to the virtual exclusion of pressure flaking, at least through the earlier parts of the San Dieguito sequence. Felsite, a mineral with notably good flaking characteristics, is a preferred raw material for the more finely worked artifacts in San Dieguito assemblages. Features typical of San Dieguito sites include "sleeping circles," roughly circular areas several meters across from which desert pavement has apparently been raked away; trails and cobble shrines adjacent to them used perhaps as route markers or for ceremonial purposes; and rock alignments of uncertain purpose.

Rogers (1939) initially laid out a three-phase sequence for the San Dieguito, the earliest phase being labeled Malpais, followed by the Playa I and Playa II phases. He later renamed these three phases San Dieguito I, II, and III (see Rogers 1966:27–29 for a discussion of the historical development of the San Dieguito nomenclature). Unfortunately, because of the relative simplicity of these sites, the lack of dates, and the general lack of consensus as to what was going on, researchers have tended to fly off in many different directions when trying to evaluate the place and significance of this complex. Hayden (1976) decided, based largely on findings of shell which he dated to 37,000 B.C. (a date derived, perhaps, from a misinterpretation of the manner in which desert-paved surfaces are formed), added a fourth phase to the beginning of the sequence, reusing the term "Malpais" to describe it. Because of the general similarity between Hayden's Malpais sites and what Rogers originally labeled Malpais, this choice has contributed heavily to the confusion. The principal difference between Hayden's Malpais and San Dieguito I is the appearance of great age and the fact that a number of Hayden's Malpais sites had, along with the normal San Dieguito I assortment of features, earth figures (intaglios) in association. These features are, like sleeping circles, made by raking gravels from parts of a desert-paved surface. In the case of intaglios, however, this was done in order to produce large-scale artistic designs visible from above. While Hayden was clear in stating that Malpais was merely the oldest manifestation of the San Dieguito complex (going back perhaps somewhat farther than conventional archaeological sequences), later researchers have cited his work as support for an "Early Man" presence in the Southwest going back perhaps hundreds of thousands of years. Hayden's concept of a Malpais tradition has suffered from the backlash generated by these assertions. Many have chosen to discount the existence of this phase entirely, and it is doubtful, in any case, if this represents any sort of loss to interpretation, given the similarities between Malpais and San Dieguito I and the fact that the starting date for San Dieguito I has never been firmly established.

Setting aside the Malpais, the three San Dieguito phases are distinguished from one another by increasing complexity in the tool kit. San Dieguito I kits consist almost entirely of large, percussion-flaked objects (choppers, spokeshaves, and scraper planes), while San Dieguito II craftsmen added smaller, more finely made blades and points and a wider range of scraper and chopper types to the assemblage. San Dieguito III peoples added pressure-flaked items such as leaf-shaped points, plano-convex scrapers, crescent-shaped objects, and elongated bifacial knives, along with (possibly) portable manos and metates, at least at coastal sites (Iverson et al 2010). It has been suggested, based on ethnographic parallels, that processing of seeds and mesquite might have been done using wooden tools, which would not have survived in the archaeological record (Pendleton 1986).

In 1966, Malcolm Rogers, in his final writings on the subject, subdivided the San Dieguito range into four spatially discrete "aspects," with the deserts of southwestern Arizona falling within the range of the "Southeastern Aspect" of the San Dieguito complex. He believed that, while the San Dieguito I complex could be found across the entire extent of this aspect, during San Dieguito II times (which corresponds to the warm, dry period known as the Altithermal), San Dieguito peoples retreated to the Colorado River Valley, and that by San Dieguito III, they had departed from the Southeastern Aspect altogether (Rogers 1966). Subsequent work (Hayden 1976, Huckell 1998) has largely supported this interpretation.

Archaic Traditions (8500 B.C.–ca. A.D. 200/300)

Paleobotanical evidence recovered from packrat middens indicates that a significant change in climate began around 11,000 years ago, marking the beginning of the Holocene period in Arizona (Van Devender and Spaulding 1979). Continental glaciers retreated, leading to an increase in temperature and aridity and an upward and northward shift in vegetation communities. Many of the large game animals hunted by Paleoindian people became extinct (Martin 1967), and, in response, the relatively simplistic Paleoindian subsistence systems built around following game herds wherever they wandered evolved into a more complex foraging and hunting economy built around a pattern of exploiting resources available seasonally at different locations visited in the course of a yearly round. Such an economy was labeled a Mesoindian, or Archaic, lifeway (Willey and Phillips 1958). Two discrete Archaic traditions have been defined in areas bordering on west-central Arizona: the Amargosa tradition and the Cochise culture.

The Amargosa Tradition

The Amargosa tradition was first defined during Rogers' (1939, 1966) studies of sites near playas and stream channels in the Mojave Desert of southern California. Rogers originally defined a sequence of three phases termed Pinto-Gypsum, Amargosa I, and Amargosa II. As with Rogers' San Dieguito sequence, this original sequence was revised as a result of Haury's (1950:532–538) investigations at Ventana Cave. The revised phase designations slipped backward somewhat, the term Amargosa I coming to be applied to finds with Pinto and/or Amargosa points, Amargosa II to finds with Gypsum points, and Amargosa III to the later part of the sequence (formerly Amargosa II), a period when elongated knives and primitive brown ware ceramics were beginning to appear in artifact assemblages. Basically, the Amargosa tradition is defined by the addition of formal grinding implements and various projectile point styles to the San Dieguito lithic assemblage (Rogers 1939, 1966). As with the San Dieguito complex, dating remains problematic with the Amargosa tradition, since sites tend not to contain elements that can yield absolute dates (i.e., hearths or posts), and, again, early attempts at dating were based largely on measurements of relative degrees of patination on artifacts. While the use of this method has been largely discredited (although experimentation continues even now), a highly varied set of date ranges for Amargosa findings, based largely on the use of this technique, has appeared in the literature, and is still occasionally cited. Rogers (1966) suggested that the San Dieguito to Amargosa transition occurred by 5000 B.C., while Antevs (1955) gave a date range of 8000–3000 B.C. for the sequence. Haury (1950) suggested a range of 3000 B.C.–A.D. 1, and Irwin-Williams (1979) suggested 3000–500 B.C.

The Cochise Culture

The Cochise culture was first defined by Sayles and Antevs (1941; Sayles 1983) based on deeply buried cultural deposits found in arroyo banks in southeastern Arizona. Sayles and Antevs defined a series of three stages for the Cochise culture: the Sulphur Spring stage (8500–6800 B.C.), characterized by the use of small ground-stone implements suitable for seed processing and (misleadingly) by an absence of projectile points; the Chiricahua stage (3500–1500 B.C.), characterized by distinctive projectile points and the appearance of "protopestles" for processing new types of resources; and the San Pedro stage (1500–800 B.C.), characterized, among other things, by the first appearance of habitation structures (Sayles 1983). In the 1950s, the existence of a fourth stage in between the Sulphur Spring and Chiricahua was postulated (Sayles 1983). This was essentially a more hunting-oriented manifestation than the otherwise generally similar Sulphur Spring stage, but it was never widely accepted by scholars (cf. Whalen 1971) and was ultimately dropped, consensus having decided that this was simply a variation on the Sulphur Spring adaptation. Dates for these phases were ultimately obtained from excavations done at rock shelter sites in the Mogollon area. The gap between the Sulphur Spring and Chiricahua phases has been explained as a possible result of drying conditions, which may have caused populations to abandon the low desert valleys of southeastern Arizona in favor of higher ground elsewhere.

The Cochise-Amargosa Interface

While the Cochise culture is reasonably well documented in southeastern Arizona, as is the Amargosa tradition in southern California and southwestern Arizona, relatively little is known about the lifeways of peoples living in between the core areas for these cultures during Archaic times. Excavations in the Harquahala Valley in west-central Arizona have been interpreted as representing a mixture of Amargosa and Cochise traits (Bostwick 1988:326–327), and a similar mixture of traits was noted at Ventana Cave (Haury 1950). Haury (1950:531–533) suggested that Ventana Cave was a "meeting ground" between the Amargosa and Cochise traditions, and that by the Late Archaic (San Pedro) phase, the Cochise culture had expanded into western and southwestern Arizona, subsuming the Amargosa tradition. Other explanations for the apparent mixture of Amargosa and Cochise materials have been presented (Bostwick 1988:326–328), and in fact, the very notion that there is a dichotomy between the Amargosa tradition and the Cochise culture has been challenged (Berry and Marmaduke 1982:118; McGuire 1982:177).

Because discussions in which the archaeology of little-studied areas is characterized as a combination of traits from traditions not local to those areas can bias discussions of the archaeology of understudied regions, many archaeologists, following the lead of Bruce Huckell, have attempted in recent years to invoke a pan-Southwestern phase sequence to replace the more localized Cochise, Amargosa, and other sequences that have previously been developed for the Southwest. Under this formulation (Huckell 1996), a three-stage sequence replaces the older sequences and consists of an Early Archaic period dating to between ca. 7500–4300 B.C., a Middle Archaic period dating to between ca. 4300–1800 B.C., and a Late Archaic period dating to between ca. 1800 B.C.–A.D. 1. Each stage is distinguished largely by projectile point and ground stone tool types. This formulation also makes it unnecessary to speak of findings from a given area in terms specific to neighboring regions, an approach that has found greater favor in the area spanned by the Cochise culture than elsewhere.

Ceramic Period (Prehistoric and Protohistoric) (ca. A.D. 200/300–1500)

As the designation implies, this period is characterized by the presence of ceramic vessels. This new storage and food processing technology is generally viewed as an indication of a trend toward a more sedentary lifeway. Early agricultural groups in southeastern Arizona may have begun experimenting with ceramic technology as early as 800 B.C., but vessels large enough for the storage of seeds and small serving bowls did not appear until roughly the beginning of the first millennium A.D. (e.g., Heidke 2005).

In the lower Colorado region, the ancestral Yuman cultural tradition is not as well understood and has not received the same intense interest from archaeologists as the Hohokam tradition to the east. The Patayan (the designation for the archaeological material culture or tradition) cultural sequence was initially developed by Malcolm Rogers (1945), was based largely on ceramic attributes, and was further refined by Waters (1982a, 1982b). The three phases (Patayan I, Patayan II, and Patayan III) were assigned temporal ranges based on the cross-dating of Lower Colorado Buff Ware (Patayan) and occasional Hohokam Buff Ware sherds found in association.

The Patayan tradition is associated with plain and decorated Lower Colorado Buff Ware, floodwater farming along the lower Colorado and lower Gila Rivers, wild resource procurement and processing camps in the surrounding deserts, and limited activity loci where one or few resources were procured over a short period of time (e.g., Doelle 1980; Huckell 1979; Slaughter et al. 2000; Waters 1982a, 1982b). These settlement units were linked together by an elaborate system of trails that were often associated with dedicatory offerings such as broken partial vessels and trail shrines. Patayan peoples practiced agriculture as part of their subsistence strategy, but apparently to a lesser degree than neighboring cultures. While some Patayans practiced floodwater farming and lived at least part of the time in agricultural hamlets consisting of clusters of shallow pit structures or elongated surficial "lodges" along the Colorado River, many lived (or at least spent most of their time) away from the rivers, continuing to dwell, as had Amargosan peoples, in extremely ephemeral structures. Sleeping circles on desert-paved surfaces are the only visible remains of these "habitations" (Ahlstrom et al 2000).

Evidence of socioreligious activity is generally found near permanent or quasi-permanent water sources—*tinajas* (rock tanks), springs, seeps, *pozos* (wells)—in the form of broken partial vessels, wood sticks, petroglyphs, pictographs, and special bedrock grinding features such as slicks, cupules, and mortars (e.g., Hartmann and Thurtle 2000). Temporary camps in the desert region include cleared areas in the desert pavement associated with sparse artifact scatters of ground stone, flaked stone, ceramics, and, often, thermal features (e.g., Hartmann and Thurtle 2000; Slaughter et al. 2000; Tucker 2000). Cremation burial was practiced, but, in contrast to Hohokam practices, the burned ash was not collected after cremation, but rather scattered to the wind.

Malcolm Rogers believed that the differences between Patayan and Hohokam practices were substantial enough to rule out significant influence from the latter, believing instead that Patayan peoples immigrated to the area from southern California, bringing in ideas of their own (Rogers 1939, 1966). In contrast, Albert Schroeder (1957, 1979) believed that Patayan culture developed in situ in the western deserts and that Hohokam influences (as indicated by the use of paddle-and-anvil techniques in pottery making and the adoption of red-on-brown decoration) were indeed critical in the development of the culture. Others have noted influences, particularly in the early phases, from the Basketmaker/Anasazi peoples to the north (Reid and Whittlesey 1997).

Following Rogers (1945), Waters (1982a:Figure 7.3) devised the Patayan ceramic complexes that include Patayan I (A.D. 600–1050) (Black Mesa Buff, Colorado Beige, and Colorado Red), Patayan II (A.D. 1000–1500) (Tumco Buff, Salton Buff, and Topoc Buff), and Patayan III (A.D. 1000–1850) (Palomas Buff, Parker Buff, Tumco Buff, Topoc Buff, and Salton Buff). For both researchers, "traits of primary importance for establishing temporally sensitive Lowland Patayan pottery types are changes in surface treatment, jar rim forms, and vessel form. Temper, a fourth trait, is given secondary importance" (Waters 1982a:281). According to Waters (1982a, 1982b), stucco finish on the exterior surface of cooking pots was a type of surface manipulation found solely in Patayan II and Patayan III vessels.

Except for the Patayan I types (which are distinctive in vessel form, rim [notched] and shoulder shape [Colorado shoulder], and in their decorative elements), the later types are not time sensitive. Patayan I vessel morphological and decorative attributes include the sharp Colorado shoulder, rim notching, incised decorations, burnishing, red clay slip, and, occasionally, loop and lug handles. Patayan II vessels are characterized by the absence of these characteristics. New traits include recurved rims, high and straight necks, and tear-shaped water jars. Patayan III pottery is comparable to the Patayan II pottery with the occasional addition of folded rims.

Salton Buff pottery is distinct in its tempering agent, which consists of shell from Lake Cahuilla. The production center of Salton Buff is limited to the shores of Lake Cahuilla in southern California. Patayan III pottery was manufactured throughout the Protohistoric period and into the Historic period (Waters 1982a:281–297). A tighter ceramic chronology is unlikely until well-stratified sites are examined through excavation (and such sites are likely buried under deep alluvium along the shores and floodplains of the lower Colorado and lower Gila Rivers).

An increased occurrence of Lower Colorado Buff Ware along the Gila River to Gila Bend and eastward has been observed after A.D. 1100–1150 when small settlement units consisting of dispersed *rancherías* with Lower Colorado Buff Ware dominate and Hohokam settlements (including the large villages with ball courts) are depopulated (e.g., Breternitz 1957; Vivian 1964; Wasley and Johnson 1965). The Patayan expansion, as indicated by *rancherías* settlements and Patayan III pottery, has been interpreted as early evidence of Yuman groups participating in alliances and trade networks that became more apparent and solidified in historic times.

Historic Era (A.D. 1500–1960)

Spanish Period

The first entry into what is now Arizona by people of European descent came in the late 1530s. A group of four men, including Álvar Nuñez Cabeza de Vaca, who survived a 1528 shipwreck on the coast of the Gulf of Mexico and then wandered across the Southwest before finally reaching Spanish-held territory in Sonora in 1536, may have passed through the state, although this has been questioned in recent years (cf. Chipman 1987). Marcos de Niza, a priest dispatched as an advance scout for an expedition into the lands through which the Cabeza de Vaca party supposedly passed, likely explored the eastern part of the state in 1539, although his activities, too, have been called into question by modern researchers (cf. Sauer 1971). The first European to unequivocally enter Arizona was Francisco Vasquéz de Coronado, who passed through the state on his way to the Pueblo area in New Mexico in 1540. As an adjunct to Coronado's expedition, Hernando de Alarcón was sent by sea up the west coast of Mexico, with the intention of linking up with Coronado at some unspecified place. Alarcón discovered the mouth of the Colorado River and a crossing spot at Yuma, but his visit would not lead to any permanent Spanish presence in western Arizona (Weber 1992). A few months later, the spot was visited by a second Spanish expedition led by Melchior Díaz, who traveled overland from Sonora via a trail that he would name the Camino del Diablo in order to meet up with Alarcón. Díaz was too late to meet up with Alarcón, but found a message left by his countryman (Flint and Flint 2004). Alarcón and Díaz described the lower Colorado River area as a war-torn region and mentioned native groups they identified as the Quiquima or Quicoma and Koxwan or Ciana (*koxkha'n*). It is not clear who these people were, but they are thought to be the Quechan or Kouanas (Greystone Environmental Consultants 2005:3.2-6). Additional information about the Quechan culture is presented in the Ethnography, below.

Over the course of the sixteenth and seventeenth centuries, the Spanish pushed their northern frontier inexorably northward from central Mexico. While they penetrated into present-day New Mexico in the late sixteenth century, establishing a colony along the Rio Grande north of present-day Albuquerque in 1598, no comparable presence was established in Arizona until roughly a century later, and this settlement (at least initially) took on a very different form. In the 1680s, Jesuit missionaries, led by the Austrian Eusebio Francisco Kino, began to establish missions in Baja California and northern Sonora (Weber 1992), the Sonoran missions ultimately extending north of the modern International Border into Arizona. Most of the Sonoran missions were located along a north-south axis, which, north of the border, corresponds to the Santa Cruz River Valley. One exception, the most remote of the Sonoran missions, was Nuestra Señora de Loreto y San Marcelo de Sonoyta, located about 80.5 km (50.0 miles) southeast of Dateland. This community was (and is) located on the Camino del Diablo pioneered by Díaz 150 years earlier. The Camino del Diablo never became a heavily traveled route, but it was periodically used by missionaries to move overland between the Sonoran and Baja California missions. In 1774, military officer Juan Batista de Anza used the trail to lead a party of 200 colonists overland to California (U. S. Fish and Wildlife Service n.d.). The colonists settled at Monterrey while Anza himself and a small scouting party proceeded north and reconnoitered the sites for what would become the Presidio of San Francisco and the Mission San Francisco de Asís.

Kino had visited the confluence of the Gila and Colorado Rivers during expeditions in 1700 and 1701 (Greystone Environmental Consultants 2005:3.2-7–3.2-8). Kino was the first to refer to the people inhabiting the region, who called themselves the Kwichyana or Kuchiana, as the Yuma or Yuman (Heuberger n.d.:4). The misnomer "Yuma" possibly derived from the missionaries' misunderstanding of the word "yah-may-o," meaning "son of a captain" or chief (Barnes 1935:499) (see Quechan Ethnography, below, for an alternative origin of the name "Yuma"). Following these visits, interaction between the Spanish and the Quechan increased significantly. Nearly a century later, two missions and accompanying settlements were established north of the confluence. The Spanish recognized the strategic importance of the Colorado River crossing at Yuma and consequently desired to remain on good relations with the Quechan. However, disputes over resources between settlers and natives led to a native uprising in 1781. Following the uprising, interactions between Europeans and the Quechan were minimal until the American period.

American Period

Following a relatively short interval (A.D. 1821−1848) during which California and the Southwest was controlled by newly independent Mexico, the United States gained possession of most of Arizona with the Treaty of Guadalupe Hidalgo; they gained the remainder with the Gadsden Purchase of 1853. California attained statehood in 1850, becoming the 31st state. The 1850s were particularly tumultuous for the Yuman speaking peoples along the lower Colorado River. With the onset of the California Gold Rush following the discovery of gold at Sutter's Mill in 1848, hostilities erupted as increasing numbers of Euroamerican fortune hunters headed west into California. In the lower Colorado River region, the conflicts between Native Americans and would-be miners resulted in the development of Camp Yuma in 1852 (Greystone Environmental Consultants 2005:3.2-8), after which time the Quechan lost control of the lands around the Yuma Crossing. In 1858, the Mohave War began following a Mohave attack on the Beale's Road immigrant trail (the Battle of Beale's Crossing). This led to the establishment of Fort Mohave near Topoc, the second major U.S. military outpost on the Colorado River, in 1859 (Walker and Bufkin 1979:26). In 1860, the U.S. Army defeated the Mohave in the last major conflict in the lower Colorado River region.

The military post of Fort Yuma had originally been established in 1849 as Camp Calhoun, later becoming known as Camp Independence and then Camp Yuma (State of California 2013; Hart 2014). The initial purpose of the camp was to protect the nascent settlement of Colorado City (which would eventually become Yuma) and its strategically located river crossing from the Quechan, who were hostile to the incursion of the settlers. The cost of maintaining the post led to a brief period of abandonment in 1851, but it was re-established in 1852 as thousands of gold seekers began passing through the Yuma Crossing. While the California Gold Rush was the primary impetus for the growth of Colorado City, the settlement expanded when it was recognized that bringing goods via ship to the mouth of the Colorado River and distributing them from the fort was an effective means of getting supplies to other military outposts across the Southwest. This led to the establishment of the U.S. Army Quartermaster Depot, which was in operation from the 1860s until the 1880s (Yuma Visitor's Bureau 2014).

Colorado City burgeoned as the result of being both a seaport and a major crossing point on the river for travelers and immigrants heading west. After virtual destruction resulting from major flooding in 1862, Colorado City was rebuilt and renamed Arizona City. Following the Civil War, rather elaborate plans were made for the city's continued development as a commercial center. Arizona City was formally incorporated in 1871 and renamed once again as Yuma in 1873. In 1876, the Yuma Territorial Prison was constructed on a hill across from the fort, where it operated for 33 years until it was relocated to Florence, Arizona, because of overcrowding (Arizona State Parks 2014). In 1877, the first locomotive to cross the Colorado River entered Arizona at Yuma, inaugurating the long-anticipated establishment of the railroad in Arizona. Four years later, the Southern Pacific Railroad connected with the Texas Pacific Railroad east of El Paso (Walker and Bufkin 1979:46).

In 1884, the Fort Yuma Reservation was established for the Quechan on the western (California) side of the river. Prior to this time, the Quechan occupied six rancherías situated above the Colorado floodplain, moving to family farm plots on the floodplain during the growing season after the spring floods and until autumn. It is estimated that the Quechan derived 30–50 percent of their subsistence from agriculture, supplementing a mixed foraging and hunting economy (Greystone Environmental Consultants 2005:3.2-8–3.2-9). Quechan families gradually abandoned this lifeway following the establishment of the reservation, where they were allocated 4-ha (10-acre) plots of farmland under the Dawes Severalty Act of 1887, which in turn opened up the remainder of the traditional lands for settlement by non-natives (Stene 1996:4). In 1893, the extent of the reservation was drastically reduced by the U.S. government, which limited reservation lands to 2 ha (5 acres) per living person. Much of the original reservation land was returned to the Quechan in the 1970s (Halpern 1997:3).

Fort Yuma itself continued as a military installation until 1883, when its management was transferred to the U.S. Department of the Interior. The end of the Civil War and the declining conflicts with Native Americans further rendered the fort unnecessary. In addition, the arrival of the railroad in 1877 had obviated the need for the military's use of the Quartermaster's as a supply distribution hub (Hart 2014). Military operations in the Yuma region would remain dormant until the establishment of the Yuma Proving Grounds during World War II.

Much of the subsequent history of Yuma pertains to agriculture and the management of the Colorado River. The Yuma Project, an ambitious endeavor to irrigate the lower Colorado River valley, was initiated by the U.S. Reclamation Service (later the Bureau of Reclamation) in 1904. The Reclamation Service took over the abandoned Fort Yuma facilities as its headquarters. The first project was the Laguna Dam, which was constructed from 1905–1909 (Stene 1996:5–6; National Park Service 2014). Laguna Dam, located about 21 km (13 miles) northeast of Yuma (Bureau of

Reclamation 2009), gave rise to the construction of several canals, including the Yuma Main Canal (AZ X:6:67[ASM]) and its laterals and the East Main (AZ X:6:65[ASM]) and West Main Canals (AZ X:6:63[ASM]), both of which split from the Yuma Main in the town of Yuma after diversion beneath the river via the Colorado River Siphon (Stene 1996:8–9). Construction on the Colorado River Siphon (AZ X:6:40[ASM]) began in 1909 and was completed three years later. A 4.2-m-diameter (14.0-foot-diameter) tunnel was excavated through the sandstone underlying the river for a distance of nearly 305 m (1,000 feet); the tunnel was lined with concrete and was connected to two 22.5-m-deep (74.0-foot-deep) vertical shafts on either side of the waterway. The Laguna Dam successfully weathered the severe flooding of 1912 and continued diverting water until 1948, when it was superseded by the Imperial Dam (completed 8 km [5 miles] upstream from the Laguna Dam in 1938) and the All-American Canal (Stene 1996:17). The All-American Canal replaced the Alamo Canal, a significant segment of which flowed through Mexico. In order to establish a canal that was located exclusively on U.S. lands, the All-American Canal was constructed by the Bureau of Reclamation beginning in the 1930s. By 1942, it became the sole water source for Imperial Valley (Imperial Irrigation District 2014). The All-American Canal feeds the Bard Water District, which was established in 1927 by water users from the Reservation Division of the Yuma Project (Stene 1996:19). The Bard Water District maintains the Reservation Division, which consists of 3,058 ha (7,556 acres) of land on the Quechan Indian Reservation, and the Bard Division, which consists of 2,881 ha (7,120 acres) of private land (Border Environment Cooperation Commission 2014).

To encourage travel along the proposed Ocean-to-Ocean Highway (U.S. Highway 80) that would connect southern California with the rest of the United States, the Ocean-to-Ocean Bridge was constructed across the Colorado River at Yuma in 1915. Construction of the bridge was a joint effort of the Office of Indian Affairs and the states of California and Arizona, and it was fervently promoted by Yuma's business community. When completed, it was the only highway bridge crossing the Colorado River for some 1,931 km (1,200 miles) (Baker 1978). For a time during the Great Depression, a checkpoint was established by the State Police on the California side of the bridge to prevent the massive influx of people migrating west in search of employment. If the "Okies" or "Arkies" had no money or lacked proof of a job waiting in California, they were not allowed to enter the state. Many of those who were turned away set up camp in Yuma, and a neighborhood still bears the unofficial designation "Okietown." The bridge continued as a crossing point for vehicular traffic until 1988, when it was determined to have become structurally unsound (Yuma Visitor's Bureau 2014; Drive the Old Spanish Trail 2014). However, at some point, the bridge was reopened to vehicles, as it currently serves as an access point to the Fort Yuma–Quechan Reservation. The bridge is now listed on the National Register of Historic Places.

Following the United States' entry into World War II, combat training centers were established across the desert Southwest. The harsh desert conditions were considered ideal to prepare soldiers for combat overseas, particularly in North Africa. Camp Young, located in the Mojave Desert between Indio and Desert Center, California, served as headquarters of the Desert Training Center (DTC). Major General George S. Patton was Camp Young's first commanding officer and was assigned the task of selecting other desert locations for additional training areas (Bureau of Land Management [BLM] 2013). Ten other camps were established across the California and Arizona deserts. After Patton went to North Africa, the DTC was renamed the California-Arizona Maneuver Area (CAMA). Over a million men trained at the DTC/CAMA from 1942–1944, when the camps were closed. Camp Pilot Knob (in California) and Camp Laguna (in Arizona) were located in the Yuma vicinity. In 1943, the Yuma Test Branch was established downriver from the Laguna Dam for the purpose of testing portable combat bridges (U. S. Army 2014). The Yuma Test Branch closed briefly in 1950 and reopened in 1951 as the Yuma Test Station. The Yuma Test Station became the main artillery and armament testing range in the United States. It was later renamed the Yuma Proving Ground and remains an important military installation today.

QUECHAN ETHNOGRAPHY

As discussed in the foregoing section, the Quechan are a Native American people inhabiting the region around the confluence of the Gila and Colorado Rivers. The name "Quechan" literally means "those who descended" (Bee 1983:97). The name "Yuma" is the Spanish name for the Quechan and likely derives from the Akimel O'odham/Tohono O'odham name for them: *yumi*. They are one of the several Yuman-speaking groups in southern California and western Arizona. For convenience, ethnologists, beginning with Kroeber in 1943 (Stewart 1983a), have placed the Yuman people into four broad geographical groups. The Delta Yumans include such people as the Cocopah in the Colorado delta area; the Upland Arizona Yumans include the Walapai, Havasupai, and Yavapai; and the California Yuman-speakers consist of southern Californian groups such as the Kumeyaay (or Kamia) and Tipai-Ipai (or Diegueño). The fourth group, the River Yumans, comprise two closely related peoples, the Mohave and the Quechan. The Mohave and Quechan were culturally similar and traditionally were allied in opposition to several other groups in the area, including the Halchidhoma, the Maricopa, and the Cocopah (Stewart 1983b:56).

The following brief ethnographic account attempts to form a model of Quechan culture in pre-reservation times (i.e., prior to 1884), while tracing the impacts from Euroamerican interaction with the Quechan people historically.

History and Early Sources

The early records of contact between the Spanish and the Yuman Tribes that lived along the Lower Colorado are sparse. The earliest records—those of the Hernando de Alarcón and Melchior Diaz expeditions in the 1540s—do not mention the Quechan at all (Spicer 1962:262). The first substantial records of the Quechan made by Europeans were made during Juan de Oñate's 1604 expedition of the Colorado River via the Bill Williams Fork (Bean and Brakke Vane 1978:5-44). The next contact with the Spanish occurred during Father Eusubio Kino's expeditions to ascertain whether California was an island or peninsula, beginning in 1698 (Spicer 1962:263–264). Kino was apparently well-received by the different Yuman groups on the Colorado and Gila Rivers. Kino's last visit to the Quechan was in 1702, during his final expedition to determine California's geographical status.

The next visit from the Spanish did not occur until 1748, when the Jesuit missionary Father Jacobo Sedelmayr visited the area. However, unlike Kino, he was greeted with hostility by the Quechan. Part of the reason for this hostility was likely related to widespread epidemics among the Lower Colorado Tribes from diseases that had been introduced by Europeans. In addition, the Spanish slave trade (a practice later adopted by the Quechan) was also causing increasing hostilities elsewhere in the region (Bean and Brakke Vane 1978:5-44). In 1771, the Spanish had become fixated on establishing a permanent route between Sonora and Alta California, via the Colorado-Gila confluence region, or what would eventually come to be known as the Yuma route, or crossing. Spanish presence in the area accordingly intensified. The explorations for this route were led by General de Anza. At the same time, Father Francisco Garcés was busy trying to find a route through Yuma country to the Hopi region for missionizing purposes and was also conducting vigorous missionary activity among the Quechan.

Over the next ten years, Spanish influence on the Quechan and other Lower Colorado Tribes was great due to these activities but also because of the introduction of wheat as a winter crop and domesticated livestock (particularly poultry). The Spanish established two settlements (the pueblos of Yuma and Xuksi'l) near the crossing that consisted of farmers, priests, and soldiers. These settlers allowed their cattle to graze in the Quechan fields, effectively destroying their crops (Bee 1983:94). This would occur again in 1849 during the California gold rush, when vast numbers of people traveled through the crossing (Bean and Brakke Vane 1978:5-47). Warfare related to the ongoing slave trade continued, as did epidemics; syphilis was introduced to the area during the 1774 De Anza expedition (Spicer 1962:264; Bean and Brakke Vane 1978:5-44–5-45).

In the summer of 1781, the Quechan successfully revolted against the Spanish, destroying both settlements and killing 95 settlers, soldiers, and missionaries (including Garcés) and taking 76 people captive (Bean and Brakke Vane 1978:5-45). The route from Sonora to Alta California via the Colorado-Gila confluence area was effectively closed off, and the Quechan remained relatively isolated until 1827, when the Quechan opened the crossing to Mexican travelers taking the slave trade road between Caborca, Sonora, and southern California (Bean and Brakke Vane 1978:5-46).

Because of the sporadic contact between the Spanish and the Quechan and because of the success of the revolt of 1781, the Quechan retained many of their cultural traditions and lifeways, despite the Spanish enculturation of the 1770s. Nevertheless, during the course of the 19th century, the Quechan became increasingly subjected to Euroamerican political, religious, and economic impacts. These included the influx of would-be miners following the discovery of gold in California in 1848, the establishment of Fort Yuma in 1852, the arrival of the railroad in 1877, the establishment of the reservation and Catholic school in the 1880s, and the 1893 introduction of the Federal government's land allotment system (resulting from a local application of the Dawes Act of 1887) and irrigation projects (Bean and Brakke Vane 1978:5-48–5-51; Smith 2010; Bee 1983:94–95).

Territory and Settlement

The Quechan account of their origin states that they, like most of the other Lower Colorado Tribes and other Tribes farther to the west (such as the Kumeyaay in the San Diego area), came from the sacred mountain of Avikame (Newberry Mountain, near Needles, California). It is here that they were created by a creator being known as Kwikumat or Kukumat. From here, they migrated south. The lands regarded as traditional by the Quechan encompass an area extending from Needles to the Gulf of California. An anthropological model hypothesizes that the Quechan, as a tribal identity, formed between the 13th and 18th centuries when several patrilineal bands formed into a tribal affinity. Group proximity during horticultural activities, linguistic affiliation, and warfare may account for this formation (Bee 1983:86).

Geographically, the Quechan were organized into a number of rancherias, each consisting of several hundred people, organized into extended family groups. The rancherias were distributed along the Colorado River, north and south of the Gila confluence, and along the Gila (according to some Spanish accounts, as far as 26 miles east of the confluence). The internal structure of each rancheria changed throughout the year, with each extended family moving to their river bottomlands during the summer farming season and returning to high ground in the winter and during spring flooding. The rancherias also shifted up and down the rivers in response to food shortages and warfare (Bee 1983:87–89). Because of the warm climate, substantial housing was uncommon. Families dwelt in dome-shaped arrowweed houses and ramadas both on high ground and near their fields during the growing season. In each rancheria, one or two larger and more substantial houses were occupied by the leading families. These houses could accommodate other rancheria members in extreme cold (Bee 1983:89–90).

Subsistence

Throughout their history (and presumably prehistory), the Quechan were primarily gatherers and horticulturalists, something attested to by the early Spanish chroniclers (Bee 1983:86). Wild game was not a primary source of nutrition, as the harsh desert conditions beyond the Colorado's floodplains limited the viability of hunting. Cultivated foods included maize, tepary beans, various melons, pumpkins, and wild grass seed; other foods, such as watermelons, black-eyed beans, and wheat, were introduced by Euroamerican immigrants. Interestingly, watermelons, a crop that spread extremely rapidly among North American Native populations upon its introduction, had been adopted by the Quechan prior to Kino's visit in the late 17th century (Rea 1997:299).

The Quechan practiced a diversified horticultural strategy, and planting of the several food crops occurred at different times of year. Maize and melons were planted in February and were not dependent on floodwater farming. Other crops were planted after the spring flooding of the Colorado. Winter wheat was sown in the autumn and harvested just before the floods. The wild grasses, which provided seeds to grind into meal, were sown in less fertile soils. The other main wild foods were mesquite and screw bean pods, which were probably the primary source of nutrition during years of crop failure (Bee 1983:86–87).

As discussed earlier, both cultivated and wild foods were affected by the arrival of Euroamericans, who would allow cattle to graze (or could not prevent them from doing so) in Quechan fields. In 1893, a long-term impact was made on Quechan horticulture by an agreement based on the Dawes Severalty Act of 1877 that persuaded Quechan farmers to limit their land holdings to five acres per person. All remaining land was then sold at public auction. This was a direct move by non-Natives to acquire the fertile bottomlands of the Colorado that the Quechan had farmed for centuries. The five-acre-per-person allotments were increased to ten acres in 1912. Meanwhile, the Yuma Project had been initiated by the U.S. Reclamation Service (later the Bureau of Reclamation) in 1904 and had the effect of disrupting the annual flooding and silt deposition of the Colorado River. By the 1920s and 1930s, farming was no longer a viable occupation, and many Quechans had become wage workers in Yuma. After years of claiming that the agreement was signed under duress and that the U.S government had not fulfilled its terms, 25,000 acres of land that had belonged to the original 1884 reservation were restored to the Quechan Tribe in 1978 (Bee 1983:94–95). Today, most of the farmland is leased to non-Native farmers.

Kinship and Polity

Socially, the Quechan were organized into patrilineal clans. The clans were exogamous units, with clan names borne exclusively by women. Some clan names may have originated from other Tribes such as the Mohave, Maricopa, or the Kumayaay. The rancherias were agamous; that is, anyone could marry outside the rancheria, but men most frequently married women from their own rancheria. Consequently, settlement was in practice bilocal, an important factor for the extended family as the primary economic unit (Bee 1983:89). Clan membership did not necessarily correspond to rancheria affiliation. Clan functions were largely disregarded by the 1960s, and many Quechans had forgotten their affiliation by that time (Bee 1983:90–91).

In general, the clan and rancheria were the basic social units among the Quechan and the extended family was the economic unit, as mentioned above. Tribal consciousness—when all the people identified as "Quechan", rather than as members of the smaller-scale social units of clan and Rancheria—occurred during warfare, harvest gatherings and annual mourning ceremonies (Bee 1983:92).

Early European sources described two main leadership positions among the Quechan, one that focused on civil affairs and one that focused on warfare. However, it seems that these roles may have been largely traditional, rather than consisting of any real political power. In practice, decisions were made by the leaders of individual Rancherias, who probably consulted in council for matters of concern on the Tribal level (Bee 1983:92–93). Although some degree of inheritance may have been a factor in determining leaders, competence was a more powerful attribute. Competence depended upon public approval but also upon personal power bestowed by special dreams (Bee 1983:92–93). The dreams of a leader or candidate for leadership were evaluated by a group of elders, and the individual was required to undergo dreams appropriate to his office, although he was also required to be an effective leader.

Warfare

Warfare was a cornerstone of Quechan culture. Two types of warfare were distinguished: the small raiding party and the war party (Bee 1983:93). The raiding party was focused on creating havoc and obtaining horses or captives. Conflicts involving the war party consisted of a village raid followed by an arranged battle in which the opposing parties faced one another in two lines, ending in a hand-to-hand melee (McCorkle 1978:698). Bee (1983:93) points out that this had greater resemblance to a brutal team sport, where the two sides would agree upon weapons to be used and wait to attack until both sides had fallen into formation. The arsenal consisted of a "potato masher" war club of mesquite wood (typically a tapered cylinder mounted on a handle), wooden spears with fire-hardened tips, and bows. Because of their distinctive war club, the Quechan were sometimes referred to by the Spanish word "Garroteros," literally, "clubbers" (Bee 1983:97; Kroeber 1976:782).

Warfare among all the Yuman Tribes was closely intertwined with myth and ceremony, although casualties were real and occasionally heavy. An account of the first war party is given in the central creation myth. Traditionally, the function of warfare among the Lower Colorado Tribes was connected to Tribal prestige and ritual, rather than conflict over resources or similar, comparatively mundane concerns. For example, when a sorcerer was killed, this was an act that often precipitated group conflict. This is again connected to the importance of dreams in Yuman culture: dreams of success in battle were highly valued and became incorporated into song cycles; in addition, like the rancheria leaders, war leaders, ceremonial managers, and shamans obtained their positions through dreams (McCorkle 1978:698–699).

The Quechan and Mohave (to whom they are closely related culturally and linguistically) did not usually fight one another, but both engaged in conflicts with the Maricopa and Cocopah, who were sometimes allied with the Pima. There was likely a long history of warfare among the Yuman Tribes that predated the arrival of Europeans. However, warfare may have increased in scale and intensity during the 18th and early 19th centuries for economic reasons—a departure from the tradition of "ritual" warfare (Bee 1983:93). The motivation for waging war appears to have been related to the taking of captives to trade to the Spanish and other Tribes for horses and other goods. However, it appears that land acquisition was still not a motivation for war at that time.

Death and Mourning

Mourning, along with dreaming and warfare, was one of the three most important aspects of the Quechan lifeway. Upon an individual's death, all of his or her belongings, including the family home, were destroyed or given away. This sometimes left the deceased's family destitute, and they would be provided for by friends or the rancheria leaders (Bee 1983:89). Inheritance was therefore never an important factor in pre-reservation life. Individual family garden plots were also abandoned, to be used later by non-family members. The *keruk* ceremony, the central mourning ceremony of the Yuman Tribes including the Quechan, was held after the death of an important leader or after an accumulation of deaths to be honored by the families of the deceased (Bee 1983:93). The *keruk* is alternatively known in older literature as *nyimits* (Kroeber 1976) or *nimíts* (Curtis 1906).

A central component of the *keruk* ceremony was a mock battle, prepared for and carried out in the same way as an actual conflict. It also was a reenactment of the battle that was fought following the death of the creator deity Kwikumat. The ceremony also involved the singing of songs commemorating the creation of the world, public mourning, and the destruction of the deceased's property. The ceremony was intertribal and lasted several days, forming an occasion for large-scale social interaction, wherein goods were exchanged, marriages were arranged, and enmities were resolved.

The *keruk* appears to have been associated with a pilgrimage trail between Pilot Knob (approximately 6.75 miles west of modern Winterhaven) and Newberry Mountain (the sacred mountain Avikame). Altschul and Ezzo (1995) have noted that the practice of the *keruk* seems to have intensified during the 18th and 19th centuries, contemporaneous with the intensified conflicts resulting from the horses-for-slaves trade introduced by the Spanish and with an influx of people migrating from the desiccating Lake Cahuilla. They suggest that the *keruk* and the associated pilgrimage was a unifying force transcending conflicts between inimical Tribes. Altschul and Ezzo (1995) likewise suggest that the intaglios along the trail, which are executed in different styles, were the locations of *keruk* rites unique to and performed by different Tribes. The *keruk* has continued into modern times in modified form (Bee 1983:96–97).

PREVIOUS RESEARCH

Prior to fieldwork, a Class I records search was performed. The Class I search examined all previously conducted surveys and previously recorded sites and historic properties within a 1.6-km-radius (1.0-mile-radius) buffer zone extending from the project footprint. Although the APE is located only on the California side of the state line, the buffer zone extends into Arizona as well. The Class I research was completed through consultation with the California Historical Resources Information System (CHRIS) for the California portion of the buffer and via the Arizona State Museum's (ASM's) AZSITE online database for the Arizona portion. The CHRIS data were received from the South Coastal Information Center (SCIC) on June 20, 2014 (Appendix E). These data were obtained in consultation with Arlene Kingery, Historic Preservation Officer for the Quechan Tribe, on May 16, 2014 (Appendix F). The AZSITE search was completed on April 15, 2014. In addition to the Class I searches, a Sacred Lands File (SLF) request was filed with the California Native American Heritage Commission (NAHC).

To ensure the protection of archaeological sites and historic properties, previous project and site locations depicted on maps are placed as a detachable appendix at the end of this report (Appendix

B). For the client copy of this report, Appendix B has been removed, but all agency copies are intact. The results of the Class I search are discussed by state below.

California

The Class I search found that 43 surveys have been previously conducted and 9 sites have been previously recorded within the 1.6-km (1.0-mile) buffer (Tables 1 and 2; see Appendix B, Figure B.1). In addition, one historic address (the Fort Yuma Train Depot) is present within the buffer zone (Table 3).

Three linear, non-canal, sites are present within the buffer. One of these sites, CA-IMP-7158, the historic Pilot Knob-Tap Drop 4 161kV Transmission Line, crosses the APE at two points. The line is supported, at least in the vicinity of the APE, by wooden towers and is currently in use. The line has been upgraded and maintained since its construction in the 1940s. The line crosses the APE near the intersection of Picacho Road and Indian Rock Road and again along Cocopah Road (Photo 14). Another site, CA-IMP-3456, is described as a "road course NE and SW" and is apparently based on a General Land Office (GLO) surveyor's notes from 1856. According to the site card, this site is now in Arizona because of a change in the course of the Colorado River. However, no indications of the site exist in the AZSITE database. Finally, a portion of the historic Southern Pacific Railroad (SPRR), passes through the buffer and crosses the APE along First Avenue. The SPRR (which was purchased by the Union Pacific Railroad in the 1990s) was constructed beginning in the 1870s and ran from the Los Angeles area to Yuma, and subsequently into Arizona. The line has been in active use since its original construction. Over the past several decades, a number of surveys in southern California have recorded segments of the SPRR and various features related to it. One such feature is the railroad bridge over the Colorado River, located adjacent to the Ocean-To-Ocean Bridge. This and several other railroad bridges in the vicinity (such as the bridges that cross the Yuma Main Canal and the All-American Canal) are subsumed under site number CA-IMP-3424.

Table 1. Previous Surveys within a 1.6-km (1.0-Mile) Radius of the Project Area (California)

Project No. (SHPO-ID)	Performing Institution	Report Reference
AEI 02-08	AEI Consultants	AEI Consultants 2002
BIA 96-01	BIA	BIA 1996
BLM 01-50	BLM and California Department of Fish and Game	BLM 2001
BREENJ 08-01	Logan Simpson Design, Inc.	Breen 2008
CROZIS 93-01	unknown	Crozier 1993
DAVISE 13-01	Logan Simpson Design, Inc.	Davis and Hart 2013
DUNCAH 07-01	Transcon Environmental	Duncan and Fertelmes 2007
GREENE 94-02	Bureau of Reclamation	Green and Middleton 1994
GUMERG 73-01	Prescott College	Gumerman and Weed 1973
JSA 99-01	Jones & Stokes Associates	Jones & Stokes Associates 1999
JSA 00-02	Jones & Stokes Associates	Jones & Stokes Associates 2000
KINKAG 03-01	BIA	Kinkade 2003

Project No. (SHPO-ID)	Performing Institution	Report Reference
MAXONJ 84-03	unknown	Maxon 1984
MCDONM 97-02	ASM Affiliates	McDonald and Victorino 1997
MEYERD 11-04	Federal Emergency Management Agency	Meyer 2011
MORENJ 95-01	Western Cultural Resource Management, Inc.	Moreno et al. 1995
MYERSL 05-01	Aztlan Archaeology, Inc.	Myers 2005
NASHB 09-01	Quechan Indian Tribe	Nash-Chrabascz 2009
PFAFFC 92-01	Bureau of Reclamation	Pfaff et al. 1992
PRESCC 73-01	Prescott College	Prescott College 1973
ROSENM 93-23	California Department of Transportation	Rosen 1993
ROXLAK 95-01	Mariah Associates, Inc.	Roxlau and Acklen 1995
SANDEJ 07-02	Chambers Group, Inc.	Sander and Maxon 2007
SCHAEJ 07-74	ASM Affiliates	Schaefer and Becker 2007
SCHAEJ 98-49	ASM Affiliates	Schaefer and O'Neill 1998
SCHAEJ 01-43	ASM Affiliates	Schaefer and O'Neill 2001
STONEL 90-01	Archaeological Research Services, Inc.	Stone and Hathaway 1990
SWART 81-01	Museum of Northern Arizona	Swarthout and Drover 1981
SWCA 06-02	SWCA Environmental Consultants, Inc.	SWCA 2006
TMCI 98-02	Tierra Madre Consultants, Inc.	Tierra Madre Consultants 1998
TRCMA 95-01	TRC Mariah Associates, Inc.	TRC Mariah Associates 1995
UNDERJ 10-18	Tierra Environmental Services	Underwood 2010
UNDERJ 11-19	Tierra Environmental Services	Underwood 2011
VCHP 06-01	Van Citters: Historic Preservation, LLC	Van Citters: Historic Preservation 2006
VONWEJ 96-215	Imperial Valley College Desert Museum	Von Werlhof 1996
VONWEJ 02-207	Imperial Valley College Desert Museum	Von Werlhof 2002a
VONWEJ 02-208	Imperial Valley College Desert Museum	Von Werlhof 2002b
VONWEJ 02-233	Imperial Valley College Desert Museum	Von Werlhof 2002c
VONWEJ 02-234	Imperial Valley College Desert Museum	Von Werlhof 2002d
WALSHM 13-01	Logan Simpson Design, Inc.	Walsh 2013
WHALEN 74-01	Imperial Valley College Musuem	Whalen 1974
WILCOR 93-01	Imperial Valley College Desert Museum	Wilcox 1993
YOSTS 01-01	TRC Mariah Associates, Inc.	Yost et al. 2001

Table 2. Previously Recorded Sites within a 1.6-km (1.0-Mile) Radius of the Project Area (California)

Site Number	Site Name or Description	Temporal Placement	Register Status/Whose Opinion
CA-IMP-158	El Rio site	San Dieguito I; Yuman I and III	not recorded
CA-IMP-3424	Southern Pacific Railroad	Historic (1870s–present)	considered Eligible (Jones & Stokes Associates 1999)
CA-IMP-3456	road course NE and SW	unknown	not recorded
CA-IMP-3476	unknown	unknown	not recorded
CA-IMP-6824	Reservation Main Drain Canal	Historic (constructed 1912–1914)	considered Eligible (Tierra)
CA-IMP-6830	Yuma (California) Main Canal	Historic (constructed 1909–1912)	considered Eligible (Tierra)
CA-IMP-6832	Reservation Main/Cocopah Canal	Historic (constructed beginning in 1907)	considered Eligible (Tierra)
CA-IMP-7130	All-American Canal	Historic (constructed 1934–1940)	not evaluated by recorder
CA-IMP-7158	Pilot Knob-Tap Drop 4 161 kV Transmission Line	Historic (early 1940s)	not evaluated by recorder

Table 3. Previously Recorded Historic Address within a 1.6-km (1.0-Mile) Radius of the Project Area (California)

Resource Name	Primary No.	Other Name	Description
C-YUMA EAST-B-3	P-13-008768	train stop at Fort Yuma	historic Fort Yuma Train Depot; the building consists of two brick structures connected by a breezeway

Photo 14. Wooden towers of the historic Pilot Knob-Tap Drop 4 161kV Transmission Line (CA-IMP-7158).

The remaining three sites are historic canals, each presently in active use. The canals consist of the Yuma Main Canal (CA-IMP-6830), the Cocopah Canal (CA-IMP-6832), and the Reservation Main Drain Canal (CA-IMP-6824). The site records on file at the South Coastal Information Center (SCIC) were updated to reflect observations made where the canals cross the current APE. Descriptions of the canals are provided below.

In addition to the Class I file search conducted through CHRIS, an SLF request was filed with the NAHC. The NAHC maintains inventories of known Native American human burials and sacred places within the State of California. The SLF search indicated that no known burials or sacred sites are present within the APE (Katy Sanchez, Associate Government Program Analyst with the NAHC, personal communication, September 21, 2014). It is emphasized that a negative finding does not preclude the potential presence of unknown or undocumented properties.

Canal Descriptions

Three historic canal sites were updated (see Figure B.1). All three were constructed directly or indirectly as part of the Yuma Project. The construction of a system of smaller laterals coincided with that of the larger canals, and these are presumably represented today by the various ditches paralleling the modern roads in the region. The laterals crossed by the APE include the Papago, Tonowanda, Hopi, Pima, Pueblo, and Navajo Canals. Because these laterals represent components of the larger canal system fed by the main canals, they were not recorded as separate sites. It has not been possible to directly correlate specific laterals with their parent canals. Primary Record; Building, Structure, and Object Record; and Linear Feature Record forms have been prepared for each canal. These forms can be viewed in Appendix C. For the Yuma Main Canal, the Reservation Main/Cocopah Canal, and the Reservation Main Drain, these update earlier Historic Resources Inventory Records or Primary Record forms. The Walapai Canal is newly recorded.

The Yuma Main Canal (CA-IMP-6830)

The APE crosses the Yuma Main Canal (also known as the California Main Canal) at a point along Arnold Road to the west of the Arnold Road/Picacho Road intersection (see Figure B.1). Arnold Road is bridged at the canal crossing. Today, the Yuma Main Canal continues to convey a large volume of water from the All-American Canal to the south (Photos 15 and 16).

The Yuma Main Canal is a large earthen canal. It was constructed as a diversion canal originating from the Laguna Dam. Construction of the canal began in 1909 and was completed by 1912 (Stene 1996:9). The Yuma Main originally diverted water from the Laguna Dam, but this diversion was discontinued in 1941 following the construction of an earthen dike across the canal (Stene 1996:17). After this time, the canal began to divert water from the Siphon Drop Spillway along the All-American canal. The Yuma Main continued through the Reservation Division to the Colorado River Siphon, where it passed beneath the river into Yuma and the Arizona side, and to the Valley Division of the Reclamation Service's (later the Bureau of Reclamation) Yuma Project (Stene 1996:8). In Yuma, the Yuma Main was split into the East and West Main Canals.

In Arizona, the Yuma Main Canal, the Colorado River Siphon, the East Main Canal, and the West Main Canal have all been recorded as archaeological sites (AZ X:6:67, X:6:40, X:6:65, and X:6:63[ASM], respectively). The canals (but not the siphon) have all been determined individually eligible for inclusion on the NRHP by the Arizona State Historic Preservation Office (SHPO).

Photo 15. Yuma Main Canal, from Arnold Road. View is to the north.

Photo 16. Yuma Main Canal, crossing beneath Arnold Road. View is to the west.

However, it does not appear that the California reach of the Yuma Main Canal has been officially recorded as a historic site or been evaluated for its NRHP status.

At the crossing at Arnold Road, the canal measures roughly 38 m (125 feet) in width. Because the canal currently conveys a large volume of water, it was not possible to determine the canal's other dimensions or its shape in cross-section. However, according to the existing Historic Resources Inventory Record for this property, the canal bottom averages 15 m (50 feet) in width, and the sides slope 1.25:1 with a water depth of about 2.7 m (9.0 feet).

Reservation Main/Cocopah Canal (CA-IMP-6832)

Construction on the Reservation Main Canal began in 1907 (Stene 1996:9); construction on an extensive system of laterals from the Reservation Main commenced the following year. The Reservation Main originally split from the Yuma Main Canal at Indian Heading. The Mojave and Cocopah Canals were split from the Reservation Main. The canal continues to convey a moderate volume of water. Today, the Reservation Main flows westward along Heyser Road and turns south at the interchange of Heyser Road, Stalnacker Road, and Avenue E, where it joins the Cocopah Canal.

The APE does not cross the Reservation Main Canal proper, but it does come within close proximity of it at the road interchange (see Figure B.1). However, the APE does cross the Cocopah Canal along Ross Road, and it parallels the canal along Cocopah Road. The APE also crosses the Cocopah Canal at Picacho Road (Photo 17), Ross Road (Photo 18), and the intersections of Flood Road and Haughtelin and Arnold Roads. Because the Cocopah Canal (along with the Mojave Canal, which is not crossed by the APE) was historically a diversion of the Reservation Main, it is considered a component of the same system and was not recorded as a separate site. Because of the close association of the two properties, the site as a whole is referred to herein as the Reservation Main/Cocopah Canal. Much of the Cocopah Canal has been lined with concrete, but portions of it remain earthen, such as at its crossing at Picacho Road.

Reservation Main Drain Canal (CA-IMP-6824)

The Reservation Main Drain Canal spans the Fort Yuma–Quechan Reservation and serves as a drainage for field runoff (see Figure B.1). It empties into the Colorado River about a 0.8 km (0.5 miles) downstream from the Southern Pacific Railroad Bridge. It was constructed between 1912 and 1914 and was designed to drain excess water from the very flat lands in the river valley, which have a high water table (Pfaff et al. 1992). This waterway may also be indicated as a "Ditch" in Sections 23 and 26 on a BLM plat of Township 16 South, Range 22 East, SBB&M, dated September 7, 1951. However, only a segment of the ditch appears on the map.

The APE crosses the Reservation Main Drain along Picacho Road (Photos 19 and 20), Arnold Road, Fisher Road, and Stalnacker Road. At each location, the canal is of earthen construction with a top width of approximately 7.6 m (25.0 feet). The canal is in active use and it was not possible to estimate its bottom width, but the Historic Resources Inventory Record indicates that its bottom width is 4.3 m (14.0 feet) and its average water depth is 0.9 m (3 feet).

Photo 17. Reservation Main/Cocopah Canal, from Picacho Road. View is to the northeast.

Photo 18. Reservation Main/Cocopah Canal, from Ross Road. View is to the south.

Photo 19. Reservation Main Drain, from Picacho Road. View is to the northeast.

Photo 20. Reservation Main Drain, from Picacho Road. View is to the southwest.

Arizona

The Class I search found that 18 surveys were previously conducted and 22 sites were previously recorded within Arizona portion of the 1.6-km (1.0-mile) buffer zone surrounding the project area (Tables 4 and 5; Figure B.2). There are also 22 historic properties and 3 historic districts listed on the NRHP within the buffer (Tables 6 and 7; Figure B.3). At least two of the properties, the Ocean-to-Ocean Bridge and the Gandolfo Theater, are cross-listed as archaeological sites and historic properties. These properties lie within Yuma or along the Colorado River.

Table 4. Previous Surveys within a 1.6-km (1.0-Mile) Radius of the Project Area (Arizona)

Project No.	Performing Institution	Project Name or Description	Report Reference
2003-1362.ASM	Transcon Environmental, Inc.	Baja Norte/Yuma Fiber-Optic Project	Bassett 2002
2003-1282.ASM	Statistical Research, Inc.	Yuma MPG Site Survey	O'Mack 2002
2004-1814.ASM	Western Archaeological and Conservation Center	Yuma Gateway Park	Blythe 2005
2000-437.ASM	Archaeological Consulting Services, Ltd.	Yuma Territorial Prison Parking Lot	Jackman 2000
1994-111.ASM	SWCA Environmental Consultants, Inc.	Yuma Loop Line—Line Replacement Project	Mitchell 1994
1998-479.ASM	Archaeological Consulting Services, Ltd.	Salvage Excavation—Yuma Territorial Prison	Jensen et al. 1999
1994-367.ASM	SWCA Environmental Consultants, Inc.	Monitoring, Natural Gas Line Replacement, Yuma	Doak 1994
1999-587.ASM	SWCA Environmental Consultants, Inc.	PBNS Level 3 Fiber-Optic Line	Doak 1999
2008-467.ASM	SWCA Environmental Consultants, Inc.	EPNG Line 2123 MP0 to MP82	Hesse 2008
1982-203.ASM	Archaeological Research Services, Inc.	Yuma Crossing and Associated Sites, National Historic Landmark	Stone 1983
1999-122.ASM	Archaeological Consulting Services, Ltd.	Yuma Interstate Freeway Survey	DeMaagd 1999
2010-504.ASM	URS Corporation	AZ 4 Yuma North	Erickson 2010
BLM-050-97-25	Statistical Research, Inc.	dredging activities	Sterner 1998
BLM-050-91-20	BLM Yuma Field Office	no information available	no information available
BLM-050-91-48	BLM Yuma Field Office	no information available	no information available
BLM-050-95-51	BLM Yuma Field Office	no information available	no information available
BLM-050-92-54	BLM Yuma Field Office	no information available	no information available
14.35.SHPO	no information available	no information available	no information available

Table 5. Previously Recorded Sites within a 1.6-km (1.0-Mile) Radius of the Project Area (Arizona)

Site Number	Site Name or Description	Temporal Placement	Register Status/Whose Opinion
AZ X:6:11(ASM)	Old Colorado Highway Bridge (Ocean-to-Ocean Bridge)	Historic (A.D. 1500–1950)	not recorded
AZ X:6:90(ASM)	trash dump (Yuma Territorial Prison State Historic Park)	Historic (A.D. 1500–1950)	not recorded
AZ X:6:94(ASM)	water tower foundation and historic trash	Recent (A.D. 1950–present)	not considered Eligible by recorder
AZ X:6:99(ASM)	historic slab and trash scatter	Middle Historic (A.D. 1800–1900); Late Historic (A.D. 1900–1950)	Eligible individually (SHPO)
AZ X:6:43(ASM)	Yuma Valley Railroad	Late Historic (A.D. 1900–1950)	Eligible individually (SHPO)
AZ X:6:67(ASM)	Yuma/ California Main Canal	Late Historic (A.D. 1900–1950)	Eligible individually (SHPO)
AZ X:6:15(ASM)	Yuma Valley Levee	Late Historic (A.D. 1900–1950)	Eligible individually (SHPO)
AZ X:6:63(ASM)	West Main Canal	Late Historic (A.D. 1900–1950)	Eligible individually (SHPO)
AZ X:6:16(ASM)	bifurcation works, East and West Main Canal	Historic (A.D. 1500–1950)	Eligible individually (SHPO)
AZ X:6:65(ASM)	East Main Canal	Late Historic (A.D. 1900–1950	Eligible individually (SHPO)
AZ X:6:44(ASM)	no information available		
AZ X:6:97(ASM)	no information available		
AZ X:6:68(ASM)	Yuma Waterworks And Powerplant	Historic (A.D. 1500–1950)	Eligible individually (SHPO)
AZ X:6:40(ASM)	Colorado River Siphon	Historic (A.D. 1500–1950)	considered Eligible (recorder)
AZ X:6:2(ASM)	Fort Yuma Headquarters Complex	Historic (A.D. 1500–1950)	considered Eligible (recorder)
AZ X:6:12(ASM)	Combined with AZ X:6:1(ASM); also reported to be on Tribal land		
AZ X:6:4(ASM)	Gandolfo Theatre	Historic (A.D. 1500–1950)	considered Eligible (recorder)
AZ X:6:70(ASM)	Residential and commercial features	Historic (A.D. 1500–1950); Recent (A.D. 1950–present)	considered Eligible (recorder)
AZ X:6:45(ASM)	Fifth Street residences	Historic (A.D. 1500–1950)	considered Eligible (recorder)
AZ FF:9:17(ASM)	State Route 80 historic alignment	Historic (A.D. 1500–1950); Recent (A.D. 1950–present)	Eligible individually (SHPO)
AZ X:6:1(ASM)	AZSITE reports site is on Tribal land		
AZ Z:2:40(ASM)	Southern Pacific Railroad Mainline Southern Route	Middle Historic (A.D. 1800–1900); Late Historic (A.D. 1900–1950); Recent (A.D. 1950–present)	Eligible individually (SHPO)

Table 6. Previously Recorded Historic Properties within a 1.6-km (1.0-Mile) Radius of the Project Area (Arizona)

Property Name	NRHP No.	Eligibility
Blaisdell Slow Sand Filter Washing Machine	79000430	listed
Brown House	82001626	listed
Cactus Press—Plaza Paint Building	87000613	listed
Connor House	82001629	listed
Dressing Apartments	82001630	listed
Gandolfo Theater	82001636	listed
Hotel del Ming	82001639	listed
Lee Hotel	84000750	listed
Masonic Temple	84000752	listed
Methodist Episcopal Church	82001645	listed
Methodist Parsonage	82001646	listed
Norton House	82001649	listed
Ocean-to-Ocean Bridge	79000431	listed
Ortiz House	82001650	listed
Pauley Apartments	82001652	listed
San Carlos Hotel	84000754	listed
Southern Pacific Railroad Depot	76000384	listed
Southern Pacific Railroad Passenger Coach Car—SP X-7	00000101	listed
Yuma City Hall	82001660	listed
Yuma County Courthouse	82001661	listed
Yuma City Hall	82001660	listed
Yuma Crossing and Associated Sites	66000197	listed

Table 7. Previously Recorded Historic Districts within a 1.6-km (1.0-Mile) Radius of the Project Area (Arizona)

District Name	NRHP No.	Eligibility
Brinley Avenue Historic District	82001625	listed
Yuma Main Street Historic District	94000068	listed
Yuma Multiple Resource Area (MRA)	–	National Park Service designation, but not an NRHP-listed property or district

General Land Office Maps

General Land Office (GLO) maps for the relevant Township and Range designations within both California and Arizona were also checked for indications of historic properties in the vicinity of the APE (Figure 2). The maps were accessed via the BLM GLO Records website (BLM 2014). All maps on which the APE is located were dated February 6, 1857. The APE itself crosses few properties: a "Cottonwood" along what today would be Picacho Road and an "Indian Field" on the northern end of the APE at Stalnacker Road and Flood Road, which is still a cultivated area today. Within the 1.6-km (1.0-mile) buffer, historic properties include Fort Yuma; the "Settlement of Captain Ankrum," which corresponds approximately to the location of modern Winterhaven; and "Western's House." Several sections note that "there are some Indian villages in this Section."

SURVEY EXPECTATIONS

Because the APE was known to follow road shoulders traversing heavily cultivated farmland, and because previously existing buried utilities (particularly copper telephone cable) were known to be present in the road rights-of-way, surface indications of archaeological sites were not expected. The presence of isolated occurrences and historic structures (such as canals and possibly buildings) was thought to be more likely.

SURVEY METHODS

The survey was conducted in accordance with standards established by the BLM for pedestrian surveys. According to these standards, 100 percent coverage of an area can be claimed if the entire area is surveyed by crews walking transects spaced no more than 15 m (50 feet) apart. The current project corridors were of such a width (100 feet) that they could be surveyed in compliance with these standards by having an archaeologist walk a transect down and back along the length of each corridor segment offset 7.5 m (25 feet) from the center line. A Garmin handheld global positioning system (GPS) unit was used for spatial control, and the project area was photodocumented.

Cultural properties identified during any survey are evaluated in accordance with standards established by California Office of Historic Preservation (OHP 1995), which in turn follow the NRHP standards defined by the National Park Service (National Park Service 1990). These standards generally require a property to be at least 45 years old. The 45-year criterion accounts for a typical 5-year lag between the recording of a resource and the implementation of planning decisions (OHP 1995:2). In some circumstances, a property less than 45 years old may be recorded. For a property to be recorded as a historical resource, it must conform to one of the following resource categories:

> **Building**: A building, such as a house, barn, church, hotel, or similar construction, is created principally to shelter any form of human activity. "Building" may also be used to refer to a historically and functionally related unit, such as a courthouse and jail or a house and barn.
>
> **Structure**: The term "structure" is used to distinguish from buildings those functional constructions made usually for purposes other than creating human shelter.

T15S R24E, Portion of Sec. 32
T16S R22E, Portion of Sec. 11, 14, 21-26,
T16S R23E, Portion of Sec. 4, 5, 7-9, 18, 19
Imperial County, California
Araz, Bard, Yuma West, and Yuma East
USGS 7.5' Quadrangle

Figure 2. General Land Office maps showing location of the APE.

Tierra Right of Way
A Land Services Company

> **Object**: The term "object" is used to distinguish from buildings and structures those constructions that are primarily artistic in nature or are relatively small in scale and simply constructed. Although it may be, by nature or design, movable, an object is associated with a specific setting or environment.
>
> **Site**: A site is the location of a significant event, a prehistoric or historic occupation or activity, or a building or structure, whether standing, ruined, or vanished, where the location itself possesses historic, cultural, or archaeological value regardless of the value of any existing structure.
>
> **District**: A district possesses a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development.

A property that cannot be readily classified as one of the five NRHP types defined above may be recorded as a "minor resource" (OHP 1995:3). These resources will be referred to herein as *isolated occurrences*. However, if such a property is considered to be of particular interest for some other reason, it may also be recorded as a site. Examples of such isolated occurrences would include rare types of projectile points or isolated but significant historic features.

Cultural properties are further evaluated with regard to significance, which is assessed largely in terms of a property's eligibility for inclusion on the NRHP. As defined by Code of Federal Regulations Title 36, Part 60.2 (36 CFR 60.2), the NRHP is "an authoritative guide to be used by Federal, State, and local governments, private groups and citizens to identify the Nation's cultural resources and to indicate what properties should be considered for protection from destruction or impairment" (36 CFR 60.2). Pursuant to 36 CFR 60.4, these are the criteria by which properties are evaluated:

> The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and
>
> **A.** That are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> **B.** That are associated with the lives of persons significant in our past; or
>
> **C.** That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> **D.** That have yielded or may be likely to yield, information important in prehistory or history (National Park Service 2004).

The definition and evaluation of prehistoric and historic properties was furthermore guided by the 2014 CEQA guidelines and statutes (California Association of Environmental Professionals 2014). According to §21083.2:

> **(g)** [a] "unique archaeological resource" means an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:
>
> (1) Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
> (2) Has a special and particular quality such as being the oldest of its type or the best available example of its type.
> (3) Is directly associated with a scientifically recognized important prehistoric or historic event or person.
>
> **(h)** As used in this section, "nonunique archaeological resource" means an archaeological artifact, object, or site which does not meet the criteria in subdivision (g). A nonunique archaeological resource need be given no further consideration, other than the simple recording of its existence by the lead agency if it so elects.

SURVEY RESULTS

The entire APE was inspected for cultural remains. No new prehistoric archaeological sites were observed during the survey. One property, the Walapai Canal (Primary Site Number P-13-014813), was newly recorded as a historic site.

In addition to the canal, several isolated occurrences were recorded. Although not considered an archaeological site, the Fort Yuma–Quechan Indian Reservation Cemetery was also noted as an important cultural landmark in proximity to the APE. All of these properties are described below. Finally, five previously recorded linear sites (the Yuma Main Canal, the Reservation Main/Cocopah Canal, the Reservation Main Drain Canal, the Southern/Union Pacific Railroad, and the Pilot Knob-Tap Drop 4 161kV Transmission Line) were crossed by the APE. The three canal sites had their Primary Record, Linear Feature Record, and Building, Structure, and Object Record forms updated. The railroad and transmission line do not retain any of their original attributes where they cross the APE and were not updated. These previously recorded sites were described earlier in this document (see Previous Research, above).

Isolated Occurrences

Ten isolated occurrences were observed (Table D.1; Figure D.1). All of the lithic artifacts (n = 6) could only be tentatively identified as flaked stone. The fact that these isolated occurrences were in each case discovered on road shoulders or near the margins of cultivated fields (that is, highly disturbed areas) raises two issues. First, it is possible that in some cases an item may have been produced by machinery (such as road grading equipment or tractors) impacting naturally occurring rocks. Second, in all cases, it is highly unlikely that the artifacts are in their original locations or contexts. One artifact, a possible quartzite tool (IO 5), is the item most likely to be an actual artifact (Photo 21). Three artifacts were identified as historic or possibly historic glass; at one location, the glass was accompanied by a white earthenware plate fragment. One isolated occurrence consists of a roadside memorial shrine (IO 10) located at the southwest corner of the intersection of Picacho Road and Arnold Road. It does not appear to be historic, but it was recorded with the intent of documenting its location for avoidance.

Walapai Canal (P-13-014813)

The Walapai Canal (assigned primary site number P-13-014813) was constructed between 1908 and 1910 (Stene 1996:9). The Walapai branched from the Yuma Main Canal at the Siphon Drop Power Plant, near the point where the Yuma Main splits from the All-American Canal. From there, it flows 3.10 km (1.93 miles) to its southern terminus. Today, the Walapai Canal appears on maps as the Walapai Lateral (see Figure D.1).

The APE crosses the Walapai Canal along Arnold Road (Photo 22). At the crossing point, the canal is of earthen construction, but there is a concrete distribution box at this location. The canal south of this point was not explored or recorded, but this distribution box appears to form the southern terminal end of the canal, except for an extension to its south measuring a few hundred feet in length paralleling First Avenue. The box measures approximately 9.1 m (30.0 feet) long by 1.8 m (6 feet) wide. It is not clear when the box was constructed, but it uses modern metal gates for its distribution openings; slots remain from the wooden gates that it once used. The canal itself is trapezoidal in cross-section (and close to triangular) and measures approximately 5.5 m (18.0 feet) at its top width with an estimated depth of about 1.5 m (5.0 feet).

Photo 21. Possible quartzite cobble tool.

Photo 22. Walapai Canal, from Arnold Road. View is to the south.

Cemetery

It was noted that the APE passes near the Fort Yuma–Quechan Indian Reservation Cemetery located at the interchange of Quechan Drive, Picacho Road, and Sapphire Lane. The APE does not encroach upon the cemetery; however, the cemetery was noted to allow for the recommendation of monitoring in the vicinity during the construction work (see Conclusions and Recommendations below).

CONCLUSION AND RECOMMENDATIONS

Tierra's Class III survey of 26.46 linear km (16.44 linear miles) of buried fiber-optic telecommunications line corridor recorded 10 isolated occurrences. No new prehistoric sites were discovered. The APE crosses two previously recorded linear sites, the historic Pilot Knob-Tap Drop 4 161kV Transmission Line (CA-IMP-7158), and the Southern Pacific Railroad (today the Union Pacific Railroad) (CA-IMP-3424). Both sites have been in continuous service since their inception and are regularly maintained. The proposed project is not expected to adversely impact either site.

Three previously recorded historic canals were updated, and one previously unrecorded historic canal was recorded. All four canals were constructed directly or indirectly as part of the Reclamation Service's (later the Bureau of Reclamation) historic Yuma Project. Due to this association, each canal may be considered to be a "unique archaeological resource," as defined by CEQA §21083.2(g)(3). Tierra therefore recommends that the canals are eligible for inclusion in the NRHP under Criterion A. However, it is emphasized that the canals are currently in active use, and as active components of the Imperial Valley agricultural infrastructure, they are regularly maintained. It is also likely that the canals have been modified to varying degrees over the years. It is therefore doubtful that the canals retain their original integrity. It is assumed that, because they are in active use, the proposed buried fiber-optic line will avoid impacts to the canals by subsurface directional boring.

The isolated occurrences are considered to be "nonunique" archaeological resources as defined by CEQA §15064.5(c)(4) and §21083.2(h). According to these statutes, a "nonunique archaeological resource need be given no further consideration" and "the effects of the project on those resources shall not be considered a significant effect on the environment. It shall be sufficient that both the resource and the effect on it are noted in the Initial Study or Environmental Impact Report, if one is prepared to address impacts on other resources, but they need not be considered further in the CEQA process" (California Association of Environmental Professionals 2014:35, 134). As such, the documentation of the isolated occurrences is considered complete.

Because the canal sites, the railroad, and the transmission line are not expected to be impacted by construction, and because it is unlikely that the isolated occurrences can yield any additional information beyond that recorded during the survey, Tierra recommends that the proposed undertaking be allowed to proceed. There will be No Adverse Effect to these six cultural resources as a result of project activity (see Table 8 for a summary of management recommendations for each site). However, monitoring by a qualified archaeologist and/or Tribal member is recommended during construction work in the vicinity of the Fort Yuma–Quechan Indian Reservation Cemetery. Given the proximity of the cemetery to the APE (approximately 100 m [328 feet] to the west of the cemetery), monitoring through the APE directly parallel to the western boundary of the cemetery is recommended. Although it is unlikely that human remains will be found, monitoring will ensure proper treatment of these remains if they exist.

A Native American monitor is also recommended during all other construction activities as well. It is expected that a Native American monitor would be present during a project of this nature as a routine practice on the Fort Yuma–Quechan Indian Reservation.

Table 8. Management Recommendations

Site Designation	Eligible	Criteria	Recommended Treatment	Effect
CA-IMP-7158; Pilot Knob-Tap Drop 4 161kV Line	yes	a	avoidance	no adverse effect
CA-IMP-3424; Southern Pacific Railroad	yes	a	avoidance by boring underneath	no adverse effect
CA-IMP-6830; Yuma Main Canal	yes	a	avoidance by boring underneath	no adverse effect
CA-IMP-6832; Reservation Main/Cocopah Canal	yes	a	avoidance by boring underneath	no adverse effect
CA-IMP-6824; Reservation Main Drain Canal	yes	a	avoidance by boring underneath	no adverse effect
P-13-014813; Walapai Canal	yes	a	avoidance by boring underneath	no adverse effect

The clients and all subcontractors are reminded that if human remains or funerary objects are uncovered during future ground-disturbing activities, CEQA Statute 15064.5(e) requires that all work must be stopped in the area of discovery and that the coroner of the County in which the remains are discovered be contacted to determine that no investigation into the cause of death is required. If the discovery is on Indian land and the coroner determines the remains to be Native American, the Quechan Tribe shall be notified immediately to make arrangements for the disposition of the remains. If not on Indian land, the coroner shall contact the Native American Heritage Commission within 24 hours. The Native American Heritage Commission shall identify the person or persons it believes to be the most likely descendents of the deceased Native American. The most likely descendent may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of the human remains and any associated grave goods with appropriate dignity, as provided in Public Resources Code Section 5097.98.

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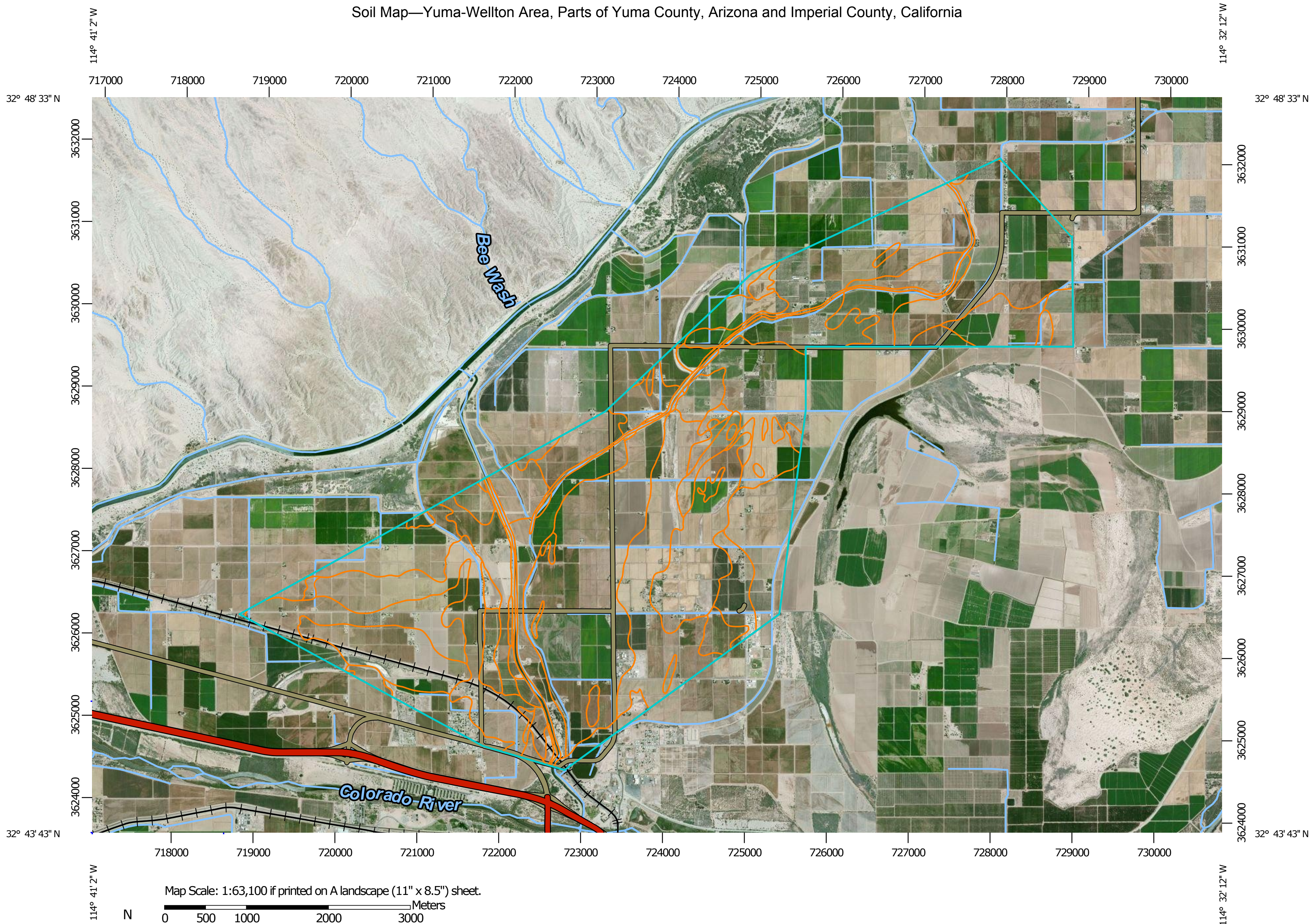
APPENDIX A. SOIL TYPES



Map Scale: 1:63,100 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0, 500, 1000, 2000, 3000

Feet: 0, 3000, 6000, 12000, 18000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California
Survey Area Data: Version 9, Dec 15, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 29, 2011—May 30, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California (AZ649)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
8	Gadsden clay	1,408.9	21.7%
10	Glenbar silty clay loam	14.2	0.2%
12	Holtville clay	1,858.7	28.7%
13	Indio silt loam	950.6	14.7%
17	Kofa clay	1,604.1	24.7%
18	Lagunita loamy sand	70.5	1.1%
19	Lagunita silt loam	13.9	0.2%
24	Ripley silt loam	472.9	7.3%
35	Water	93.9	1.4%
Totals for Area of Interest		**6,487.6**	**100.0%**

Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California

8—Gadsden clay

Map Unit Setting

Elevation: 80 to 600 feet
Mean annual precipitation: 0 to 0 inches
Mean annual air temperature: 72 to 76 degrees F
Frost-free period: 250 to 325 days

Map Unit Composition

Gadsden and similar soils: 100 percent

Description of Gadsden

Setting

Landform: Flood plains, terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed alluvium

Typical profile

Ap - 0 to 10 inches: clay
C - 10 to 60 inches: clay

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Very slightly saline to moderately saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 60.0
Available water storage in profile: High (about 9.6 inches)

Interpretive groups

Farmland classification: Prime farmland if irrigated and reclaimed of excess salts and sodium
Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: D

Data Source Information

Soil Survey Area: Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California
Survey Area Data: Version 9, Dec 15, 2013

Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California

10—Glenbar silty clay loam

Map Unit Setting

Elevation: 80 to 600 feet
Mean annual precipitation: 0 to 0 inches
Mean annual air temperature: 72 to 76 degrees F
Frost-free period: 250 to 325 days

Map Unit Composition

Glenbar and similar soils: 100 percent

Description of Glenbar

Setting

Landform: Terraces, flood plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Recent mixed alluvium

Typical profile

Ap - 0 to 16 inches: silty clay loam
C - 16 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 30 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (2.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 50.0
Available water storage in profile: High (about 12.0 inches)

Interpretive groups

Farmland classification: Prime farmland if irrigated and reclaimed of excess salts and sodium
Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 7c

Hydrologic Soil Group: B

Data Source Information

Soil Survey Area: Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California
Survey Area Data: Version 9, Dec 15, 2013

Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California

12—Holtville clay

Map Unit Setting

Elevation: 80 to 600 feet
Mean annual precipitation: 0 to 0 inches
Mean annual air temperature: 72 to 76 degrees F
Frost-free period: 250 to 325 days

Map Unit Composition

Holtville and similar soils: 100 percent

Description of Holtville

Setting

Landform: Flood plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed alluvium

Typical profile

Ap - 0 to 13 inches: clay
C1 - 13 to 23 inches: clay
2C2 - 23 to 75 inches: stratified silty clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to strongly saline (2.0 to 32.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 13.0
Available water storage in profile: Very high (about 12.2 inches)

Interpretive groups

Farmland classification: Prime farmland if irrigated and reclaimed of excess salts and sodium
Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: C

Data Source Information

Soil Survey Area: Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California
Survey Area Data: Version 9, Dec 15, 2013

Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California

13—Indio silt loam

Map Unit Setting

Elevation: 80 to 600 feet
Mean annual precipitation: 0 to 0 inches
Mean annual air temperature: 72 to 76 degrees F
Frost-free period: 250 to 325 days

Map Unit Composition

Indio and similar soils: 100 percent

Description of Indio

Setting

Landform: Flood plains, alluvial fans
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed alluvium

Typical profile

Ap - 0 to 6 inches: silt loam
C - 6 to 63 inches: stratified very fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 30 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 13.0
Available water storage in profile: High (about 10.8 inches)

Interpretive groups

Farmland classification: Prime farmland if irrigated and reclaimed of excess salts and sodium
Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 7c

Hydrologic Soil Group: B

Data Source Information

Soil Survey Area: Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California
Survey Area Data: Version 9, Dec 15, 2013

Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California

17—Kofa clay

Map Unit Setting

Elevation: 80 to 600 feet
Mean annual precipitation: 0 to 0 inches
Mean annual air temperature: 72 to 76 degrees F
Frost-free period: 250 to 325 days

Map Unit Composition

Kofa and similar soils: 100 percent

Description of Kofa

Setting

Landform: Flood plains, stream terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Recent mixed alluvium

Typical profile

Ap - 0 to 12 inches: clay
C1 - 12 to 28 inches: clay
2C2 - 28 to 60 inches: sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 30 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 5.0
Available water storage in profile: Moderate (about 6.1 inches)

Interpretive groups

Farmland classification: Prime farmland if irrigated
Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: D

Data Source Information

Soil Survey Area: Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California
Survey Area Data: Version 9, Dec 15, 2013

Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California

19—Lagunita silt loam

Map Unit Setting

Elevation: 100 to 600 feet
Mean annual precipitation: 0 to 0 inches
Mean annual air temperature: 72 to 76 degrees F
Frost-free period: 250 to 325 days

Map Unit Composition

Lagunita and similar soils: 100 percent

Description of Lagunita

Setting

Landform: Alluvial fans, terraces, drainageways, flood plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Recent mixed alluvium

Typical profile

A - 0 to 12 inches: silt loam
C - 12 to 60 inches: sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 30.0
Available water storage in profile: Low (about 5.2 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: A

Data Source Information

Soil Survey Area: Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California
Survey Area Data: Version 9, Dec 15, 2013

Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California

18—Lagunita loamy sand

Map Unit Setting

Elevation: 80 to 600 feet
Mean annual precipitation: 0 to 0 inches
Mean annual air temperature: 72 to 76 degrees F
Frost-free period: 250 to 325 days

Map Unit Composition

Lagunita and similar soils: 100 percent

Description of Lagunita

Setting

Landform: Terraces, alluvial fans, flood plains, drainageways
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Recent mixed alluvium

Typical profile

A - 0 to 8 inches: loamy sand
C - 8 to 60 inches: loamy sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 30.0
Available water storage in profile: Low (about 3.9 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: A

Data Source Information

Soil Survey Area: Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California
Survey Area Data: Version 9, Dec 15, 2013

Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California

24—Ripley silt loam

Map Unit Setting

Elevation: 80 to 600 feet
Mean annual precipitation: 0 to 0 inches
Mean annual air temperature: 72 to 76 degrees F
Frost-free period: 250 to 325 days

Map Unit Composition

Ripley and similar soils: 100 percent

Description of Ripley

Setting

Landform: Terraces, flood plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed alluvium

Typical profile

Ap - 0 to 6 inches: silt loam
C1 - 6 to 25 inches: very fine sandy loam
2C2 - 25 to 60 inches: sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 13.0
Available water storage in profile: Low (about 5.4 inches)

Interpretive groups

Farmland classification: Prime farmland if irrigated
Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: B

Data Source Information

Soil Survey Area: Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California
Survey Area Data: Version 9, Dec 15, 2013

APPENDIX B

Class I Research

<u>CONFIDENTIAL</u>

This appendix contains information on the locations of cultural properties discussed in the report:

A Class III Cultural Resource Survey for a Proposed Telecommunications Fiber-Optic Line Installation, in Imperial County, California

APPENDIX C

Site Forms

CONFIDENTIAL

This appendix contains information on the locations of cultural properties discussed in the report:

A Class III Cultural Resource Survey for a Proposed Telecommunications Fiber-Optic Line Installation, in Imperial County, California

APPENDIX D

Results

CONFIDENTIAL

This appendix contains information on the locations of cultural properties discussed in the report:

A Class III Cultural Resource Survey for a Proposed Telecommunications Fiber-Optic Line Installation, in Imperial County, California

APPENDIX F. LETTER FROM THE QUECHAN HISTORIC PRESERVATION OFFICER

Quechan Indian Tribe
Historic Preservation Office
350 Picacho Road
Winterhaven, CA 92283
760/572-0213

May 16, 2014
Tierra Right of Way Services, Ltd.
1575 East River Road
Tucson, AZ 85718

SUBJECT: **Permission to Release Date to Tierra Right of Way Services, Ltd for TDS Telecom CASF Winterhaven Fiber Project**

To Whom It May Concern:
Tierra Right of Way Services, Ltd has permission to receive information from CA SHPO/CHRIS on any previous archeological surveys and previous listed archeological sites on the Quechan Indian Reservation.

Thank you,

Arlene Kingery

Arlene F. Kingery
Historic Preservation Officer

APPENDIX G. ADDENDUM TO A CLASS III CULTURAL RESOURCES SURVEY FOR A PROPOSED BURIED TELECOMMUNICATIONS FIBER-OPTIC LINE NEAR WINTERHAVEN, IN IMPERIAL COUNTY, CALIFORNIA

INTRODUCTION

In February of 2015, TDS introduced six minor changes to the route of the proposed fiber-optic line. Five of these changes consist of short extensions of the line at various points along the route, and one consists of moving a segment of the proposed line a short distance to the west of its originally proposed location. These changes necessitated that an addition to the Class III survey, which was conducted in July of 2014, be completed. This addendum will describe the changes to the route and the results of the additional Class III survey.

The additional survey was conducted on March 12, 2015, by Joseph Howell, M.A. (field director). Mr. Henri Koteen again served as monitor for the Quechan Tribe. The fiber-optic line extensions are located at the intersections of Railroad Avenue and G Street (in Winterhaven); Foster Road and Arnold Road; Jackson Road and Picacho Road; Baseline Road and Haughtelin Road; and Ross Road and Levee Road (south of Bard). The relocated segment lies along Cocopah Road. The total combined length of the changes is 2.63 km (1.64 miles), with a total area of 8.0 ha (19.8 acres). All of the lines examined during the survey are located along graded road shoulders or berms, and, with the exception of historic canal laterals (discussed in greater depth below), no cultural resources were located during the survey. Most locations also appear to coincide with or are parallel to previously installed buried utilities. Each of the extensions and the relocated segment is described in greater detail below. An overview of the changes can be seen in Figures G.1–G.4. Figures G.2–G.4 provide views at the scale of 1:24,000.

RESULTS OF ADDITIONAL SURVEY

Extension No. 1

Extension No. 1 is located in the Town of Winterhaven (Figure G.5). It begins on the west shoulder of Railroad Avenue adjacent to the TDS building (Photo G.1). It then proceeds north to G Street and continues along the north side of that street to 1st Avenue (Photo G.2). The extension totals about 311 m (1,020 feet) in length. No cultural resources were located within this extension.

Extension No. 2

Extension No. 2 is located along the western shoulder of Foster Road, beginning at the intersection with Arnold Road and extending south for approximately 50 m (164 feet) (Figure G.6; Photo G.3). No cultural resources were located within this extension.

Extension No. 3

Extension No. 3 begins at Picacho Road and extends west for approximately 199 m (653 feet) along Jackson Road, ending near the southeast corner of a private lot (Figure G.7; Photo G.4). No cultural resources were located within Extension No. 3.

Extension No. 4

Extension No. 4 begins at a point along the northern shoulder of Haughtelin Road east of the Baseline Road intersection (Figure G.8; Photo G.5). From this point, it continues west and turns south at the intersection, continuing along the eastern shoulder of Baseline Road (Photo G.6). The total length of the extension is 161 m (528 feet).

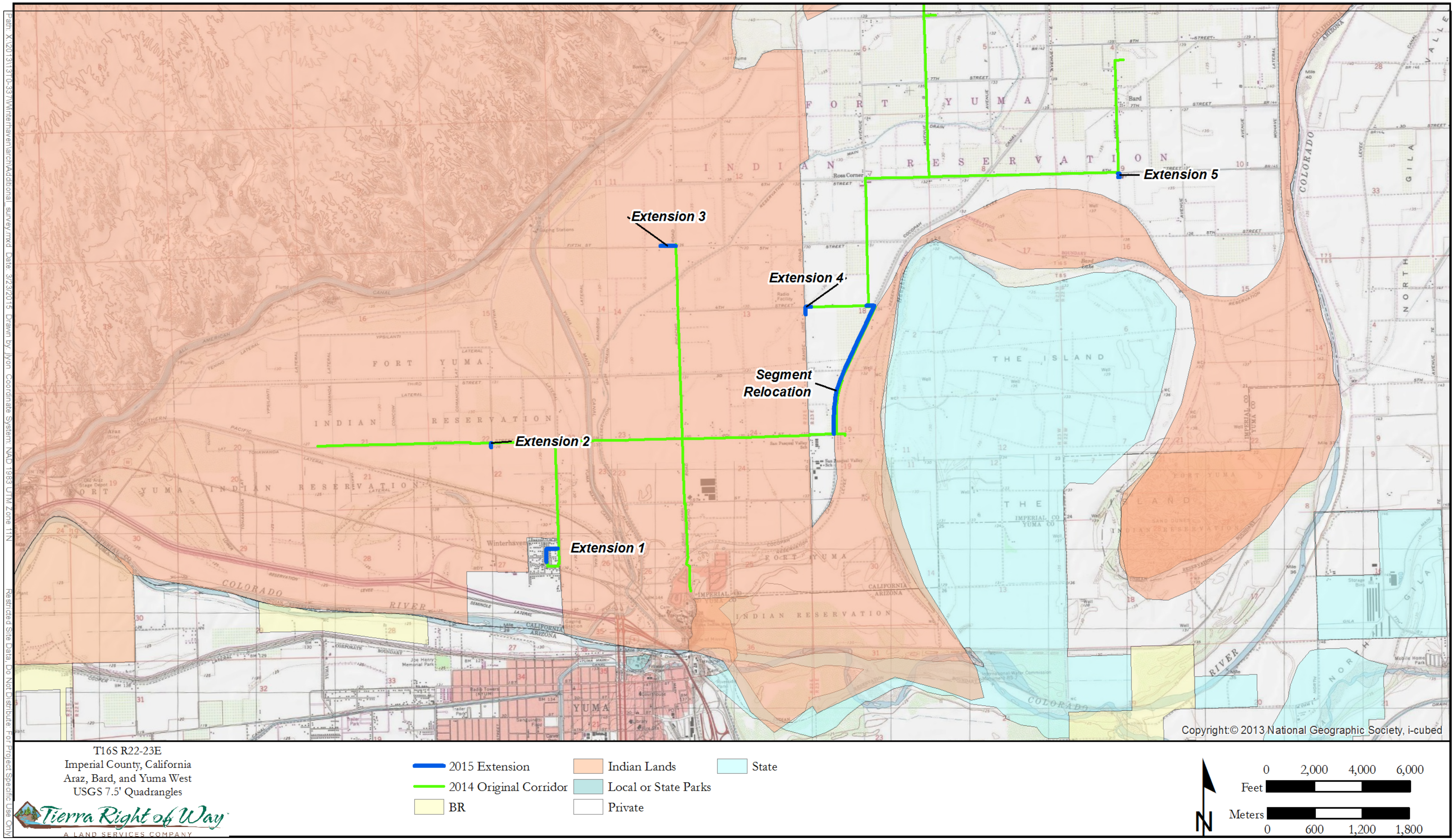


Figure G.1. Location of the original project corridor and the subsequent route extensions and relocated segment.

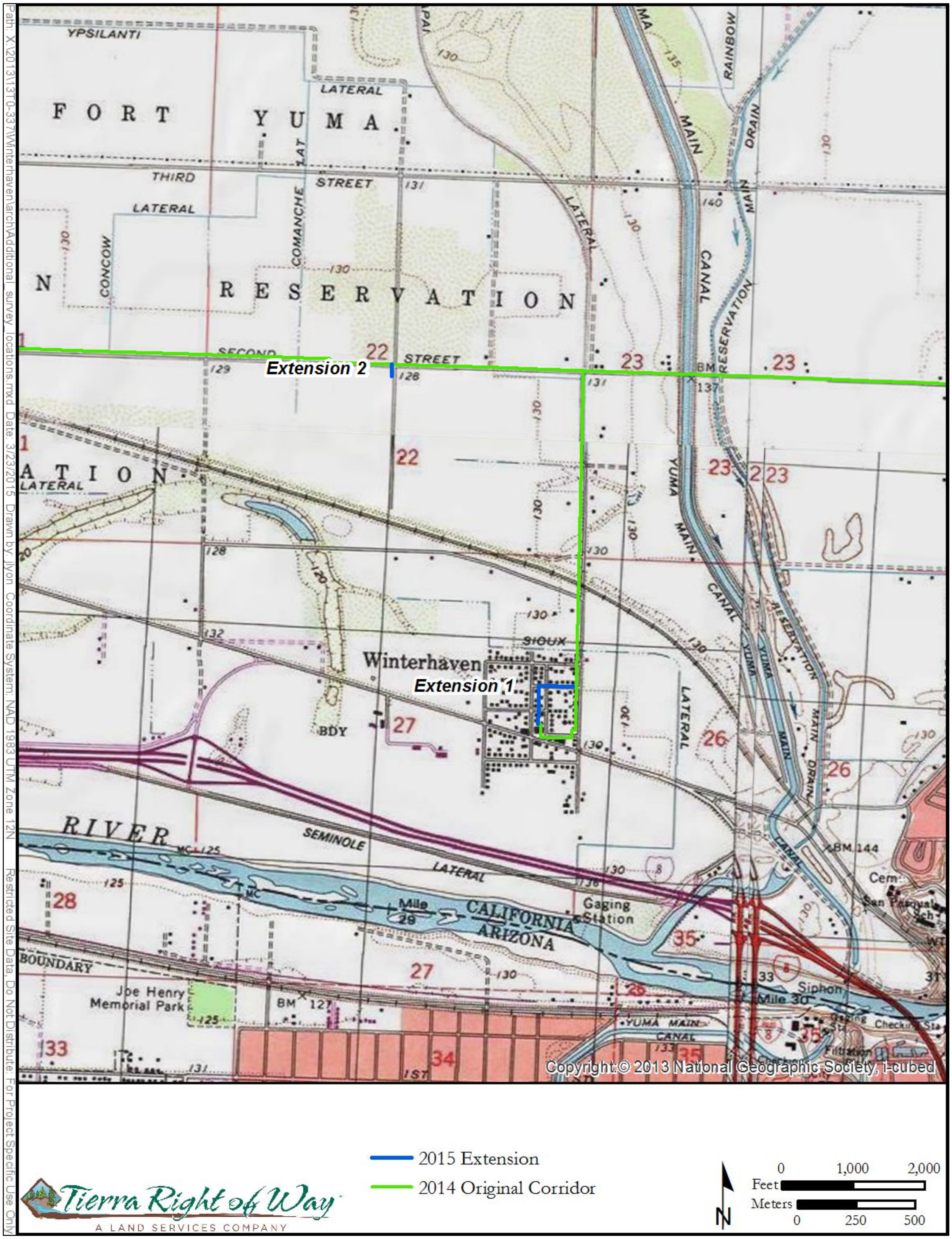


Figure G.2. Location of Extensions No. 1 and No. 2.

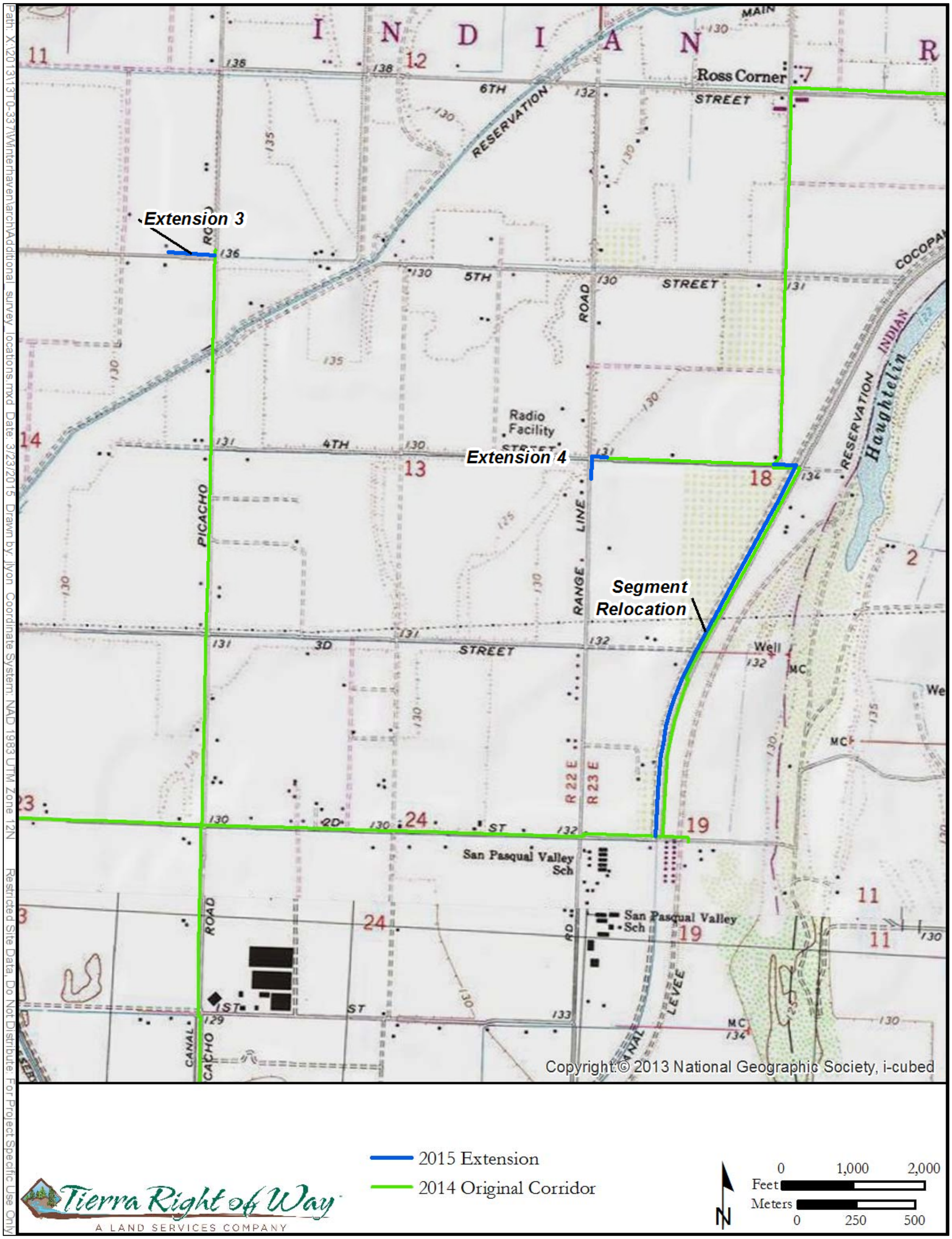


Figure G.3. Location of Extensions No. 3 and No. 4, and relocated segment.

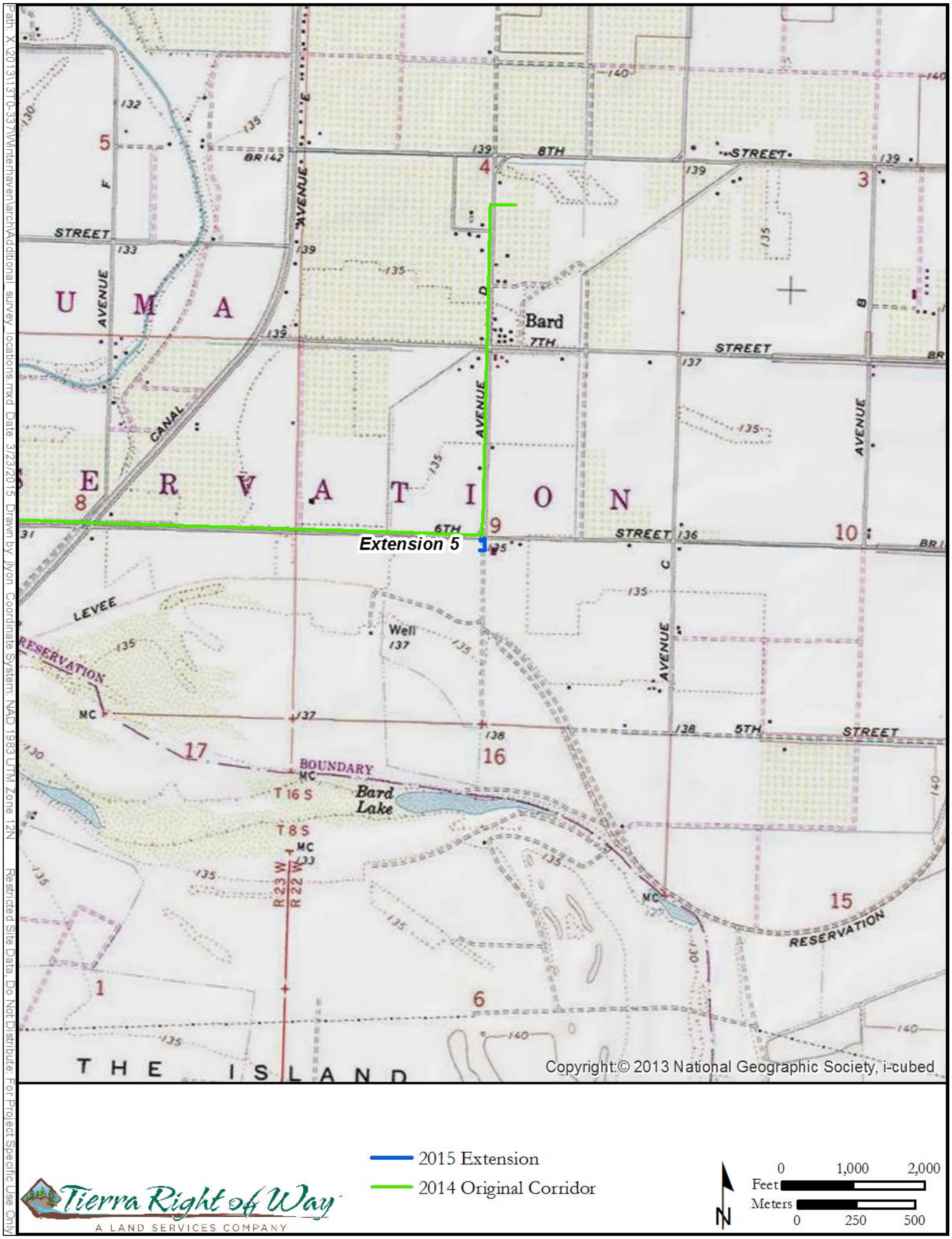


Figure G.4. Location of Extension No. 5.

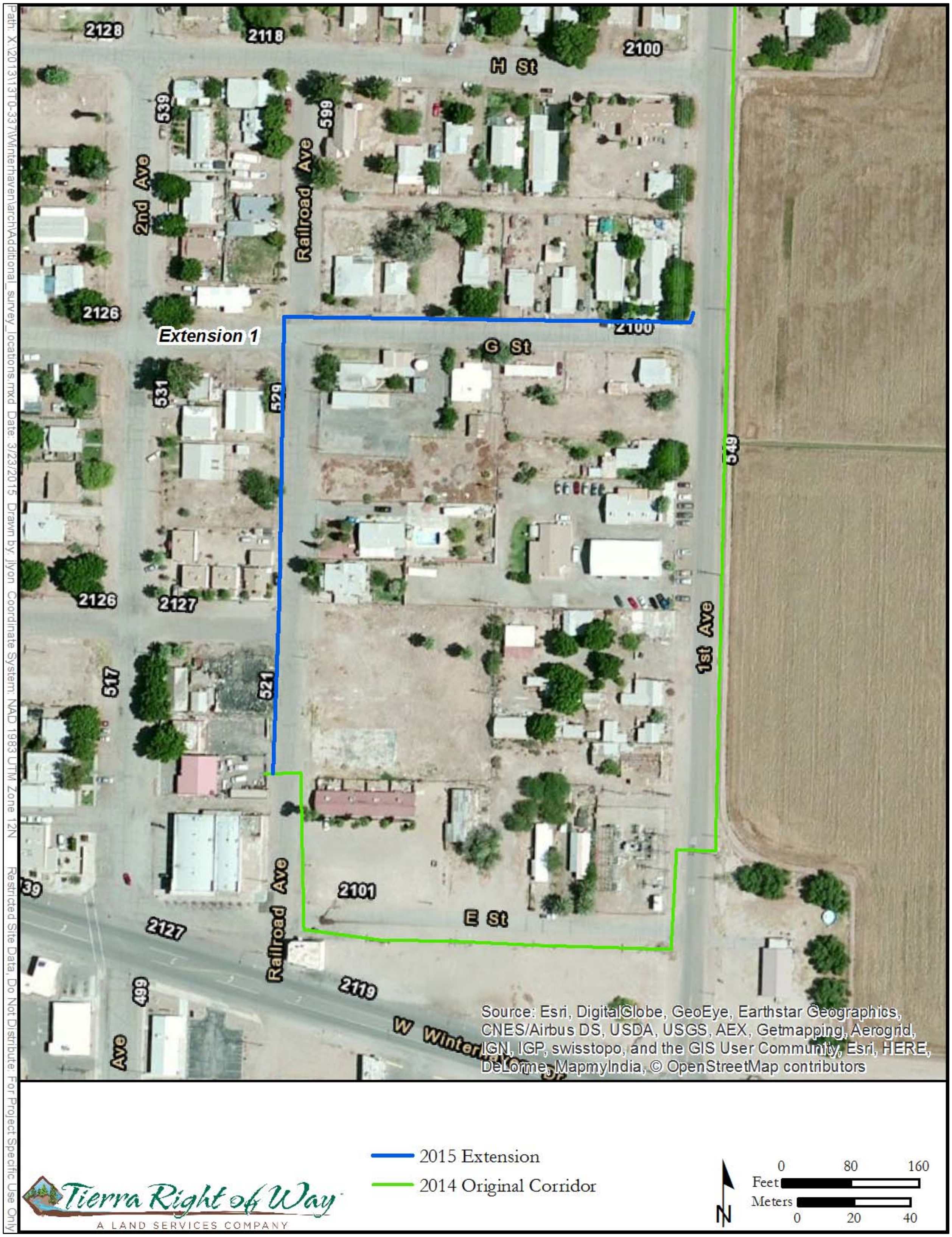


Figure G.5. Aerial view of Extension No. 1.

Photo G.1. Extension No. 1, from TDS building. View is to the north.

Photo G.2. Extension No. 1, from 1st Avenue. View is to the west.

Figure G.6. Aerial view of Extension No. 2.

Photo G.3. Extension No. 2, looking south along Foster Road from Arnold Road.

Photo G.4. Extension No. 3, looking west from Picacho Road.

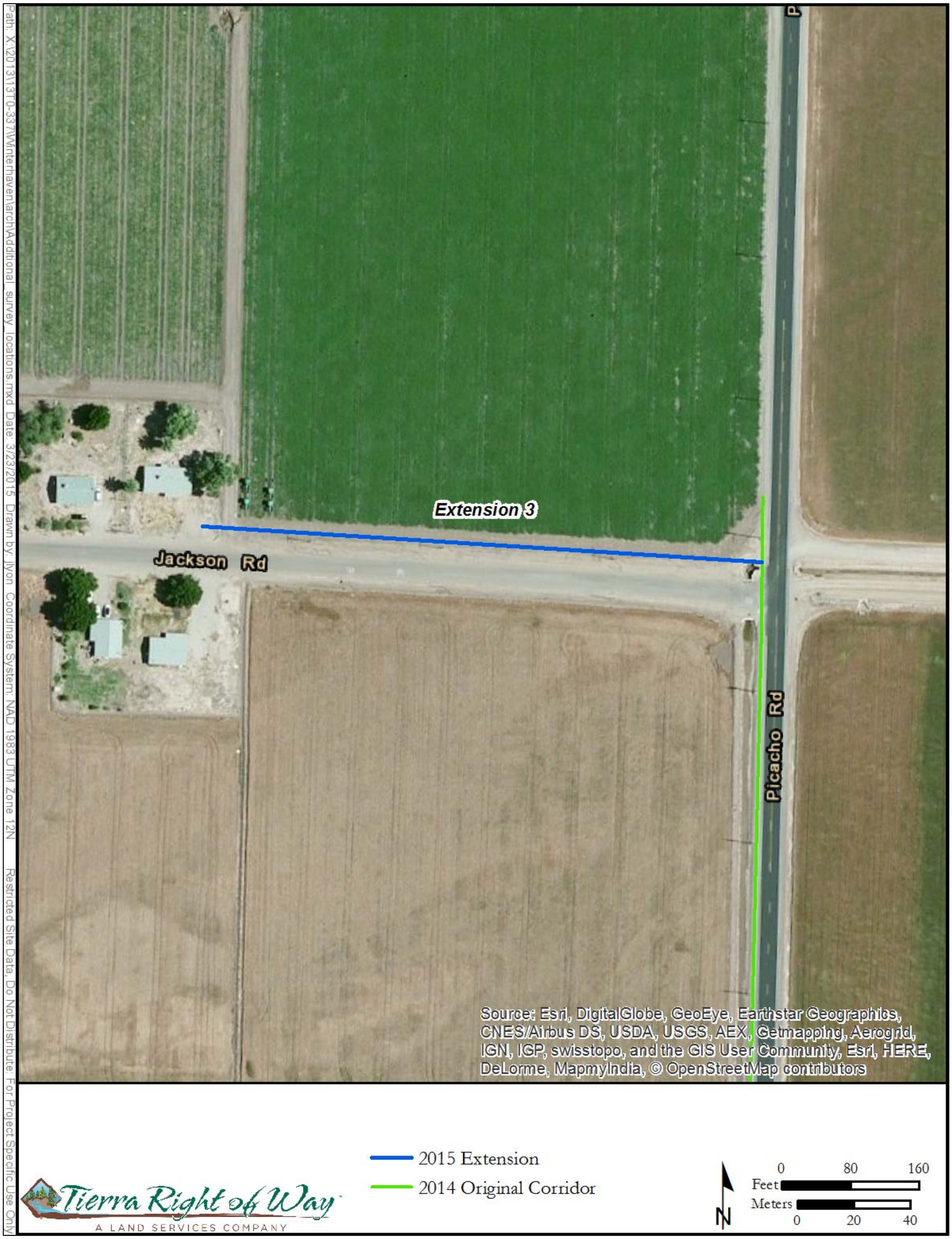


Figure G.7. Aerial view of Extension No. 3.

Figure G.8. Aerial view of Extension No. 4.

Photo G.5. Extension No. 4, along Haughtelin Road. View is to the east.

Photo G.6. Extension No. 4, along Baseline Road. View is to the south.

At the intersection, the extension crosses the Pima Canal (Photo G.7), which parallels the south side of Haughtelin Road and crosses beneath Baseline Road via a culvert. It crosses the canal as it turns along Baseline Road. In addition, along Haughtelin Road, the extension ends near another, apparently unnamed, canal that parallels the road on its north edge (Photo G.8).

Apart from the Pima Canal, no cultural resources were located within Extension No. 4. The Pima Canal is a lateral of the Reservation Main/Cocopah Canal (CA-IMP-6832) (Photos G.9 and G.10). It is expected that the installation of the fiber-optic line will avoid the canal by subsurface directional boring. Additional remarks on the Pima Canal will be made under the description of the relocated fiber-optic line segment along Cocopah Road, below.

Extension No. 5

Extension No. 5 extends south along Levee Road from the intersection at Ross Road (Figure G.9). It runs along the eastern shoulder of Levee Road (Photo G.11), then turns west across the road at a point adjacent to a warehouse. There is also a segment that extends from near the line's northern end, across Levee Road, then turns a few feet northward to match up with an existing utility box (Photos G.12 and G.13). The total length of Extension No. 5 is 315 feet (96 m).

Photo G.7. Footprint of Extension No. 4, where it crosses the Pima Canal. View is to the east.

Photo G.8. Unnamed canal along north side of Haughtelin Road. View is to the east.

Photo G.9. Pima Canal, east side of Baseline Road. View is to the east.

Photo G.10. Pima Canal, west side of Baseline Road. View is to the west.

Photo G.11. Extension No. 5, along Levee Road. View is to the south.

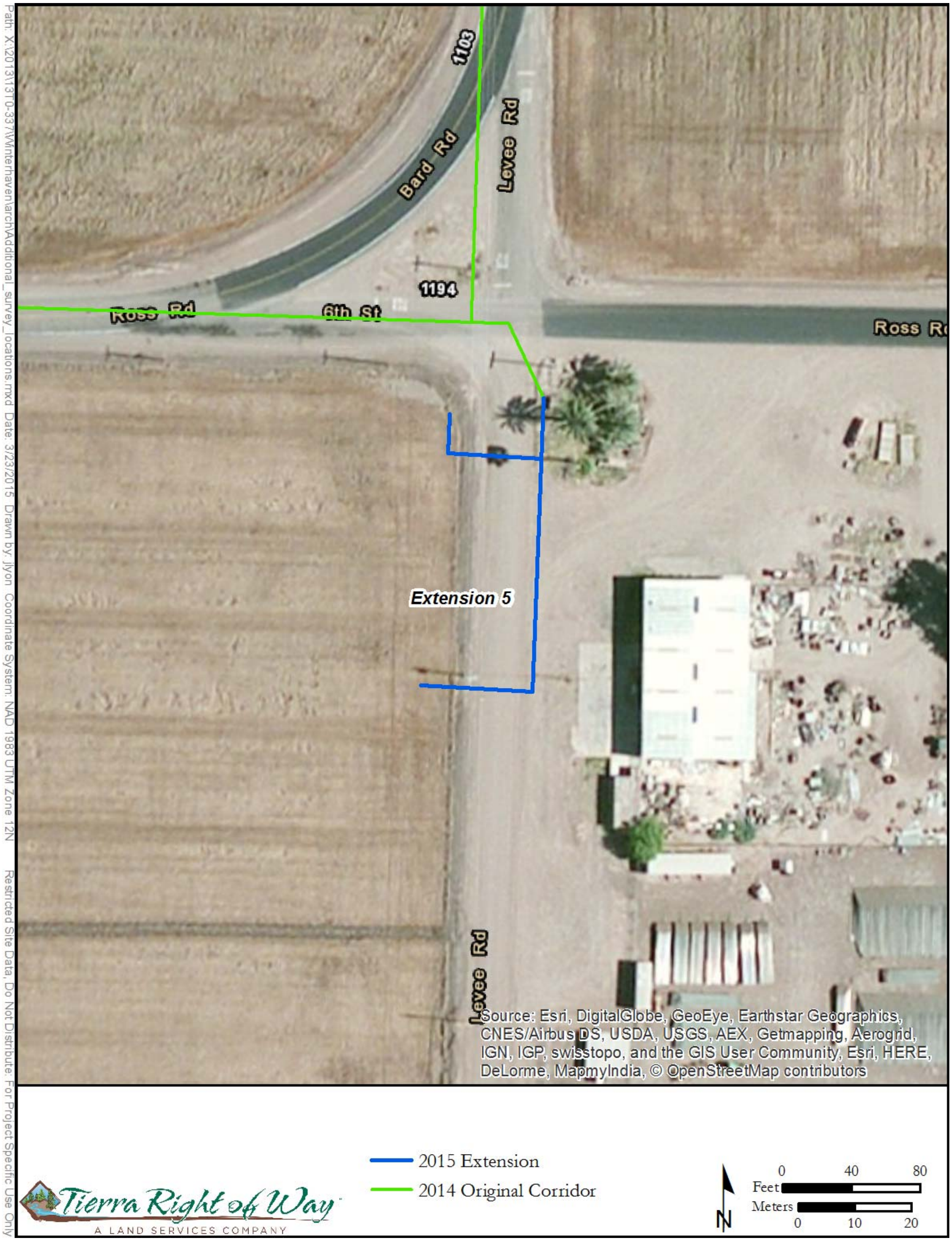


Figure G.9. Aerial view of Extension No. 5.

Photo G.12. Footprint of Extension No. 5, at utility box. View is to the south.

Photo G.13. Extension No. 5, across Levee Road, from utility box. View is to the east.

Segment Relocation

A segment of the proposed fiber-optic line paralleling Cocopah Road between Arnold Road and Haughtelin Road was relocated from the east side of the Reservation Main/Cocopah Canal to the west side of the canal (Figure G.10; Photo G.14). The relocated line runs along the western edge of a berm that parallels the canal and totals 1.82 km (1.13 miles) in length.

The relocated line crosses three linear cultural resources. Two of these are laterals of the Reservation Main/Cocopah Canal. Specifically, the laterals are the Pima Canal (also crossed further to the west by Extension No. 4) and the Pueblo Canal (Photos G.15–G.18). As stated in the Previous Research section of the report, it could not be determined which of the many laterals in the vicinity of the Fort Yuma Indian Reservation were associated with which main canal. However, the current survey demonstrated the Pima and Pueblo Canals are fed (at least today) by the Reservation Main/Cocopah Canal, which has the previous site designation CA-IMP-6832. As discussed in the main body of the report, as laterals of the Reservation Main/Cocopah Canal, the Pima and Pueblo Canals are considered to be components of the overall canal system. As such, they share the site designation of CA-IMP-6832. Both canals cross under the berm via culverts. Both are in active use, and it is expected that the installation of the fiber-optic line will avoid them by subsurface directional boring.

The third linear site that the line crosses is the historic Pilot Knob-Tap Drop 4 161kV Transmission Line (CA-IMP-7158) (Photo G.19; see Figure D.1 in Appendix D). The originally proposed line also crossed this linear utility site, only slightly farther to the east. For additional information on this site, see the Previous Research section in the main body of the report.

No other cultural resources were encountered along the relocated line.

CONCLUSION AND RECOMMENDATIONS

The additional Class III survey for the extensions and partial relocation of the proposed TDS telecommunication fiber-optic line recorded no new cultural resources. The alterations cross three previously recorded properties: the Pilot Knob-Tap Drop 4 161kV Transmission Line (CA-IMP-7158) and the Pima and Pueblo Canals; both canals are components of CA-IMP-6832, the Reservation Main/Cocopah Canal. The transmission line and the canals are currently in use and form aspects of the modern infrastructure of Imperial County. It is not expected that the proposed undertaking will adversely impact these historic properties.

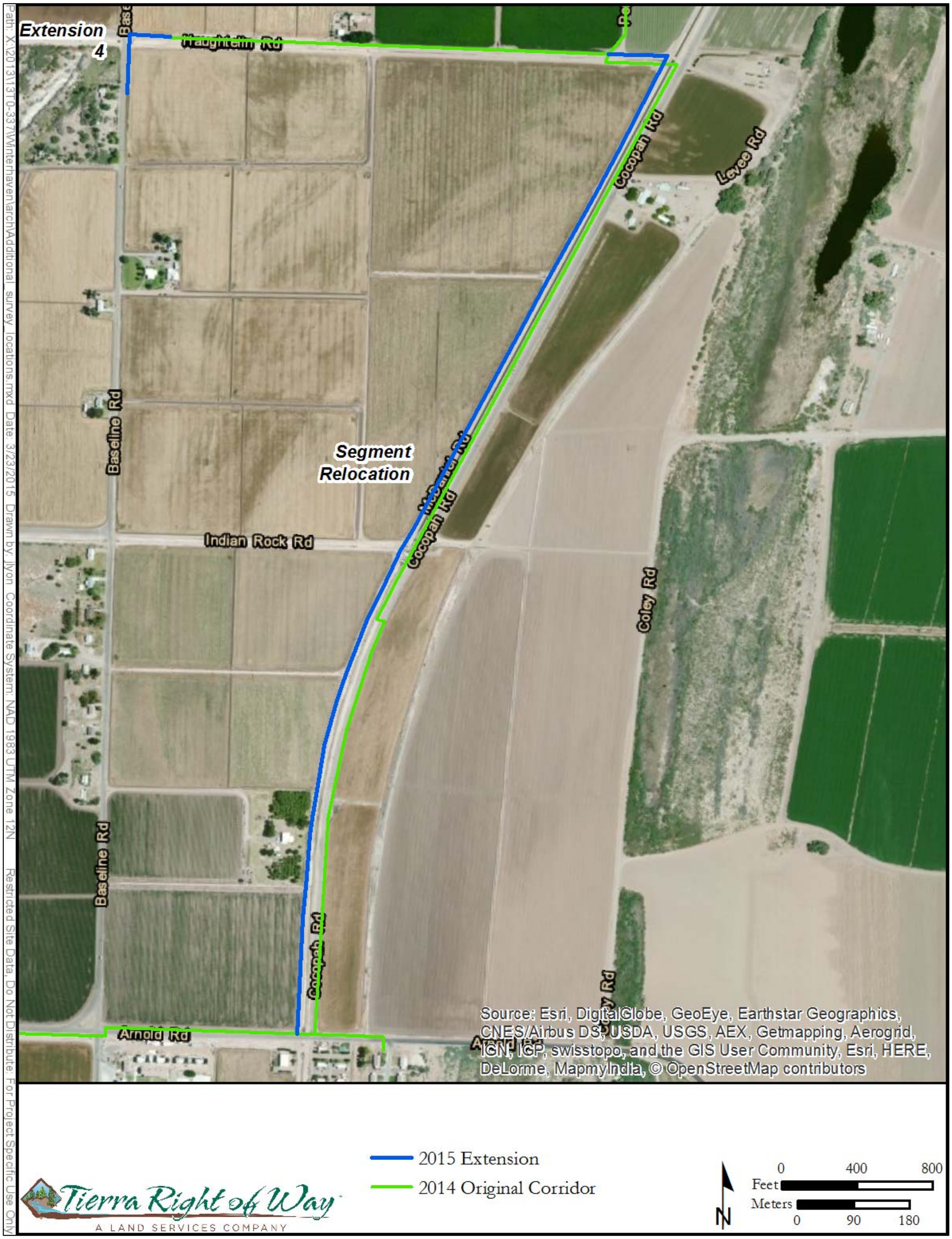


Figure G.10. Aerial view of relocated segment.

Photo G.14. Reservation Main/Cocopah Canal, near Arnold Road. View is to the north.

Photo G.15. Pueblo Canal Headgate on Reservation Main/Cocopah Canal. View is to the east.

Photo G.16. Pueblo Canal. View is to the west.

Photo G.17. Pima Canal Headgate on Reservation Main/Cocopah Canal. View is to the east.

Photo G.18. Pima Canal. View is to the west.

Photo G.19. Pilot Knob-Tap Drop 4 161kV Transmission Line. View is to the east.

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

February 19, 2015 Reply in Reference To: BIA_2015_0120_001
(BIA# 2014-316)

Catherine Wilson
Acting Deputy Regional Director
Bureau of Indian Affairs, Western Regional Office
2600 North Central Avenue
Phoenix, Arizona 85004-3008

RE: Fort Yuma Quechan Indian Reservation Fiber-Optic Line Project; Imperial County, California.

Dear Ms. Wilson:

Thank you for seeking my consultation regarding the above noted undertaking. Pursuant to 36 CFR Part 800 (as amended 8-05-04) regulations implementing Section 106 of the National Historic Preservation Act (NHPA), the Bureau of Indian Affairs (BIA) is seeking my comments regarding the effects that the above named project will have on historic properties.

TDS Telecommunication Corporation (TDS) proposes to install new fiber-optic cable and ten nodes to provide internet service to the communities of Winterhaven, Bard, and the Fort Yuma-Quechan Indian Reservation (Reservation) requiring an easement across Reservation land. This will involve the installation of 8.68 miles of fiber-optic line on Reservation land and 7.75 miles of line within unincorporated Imperial County.

The Area of Potential Effects (APE) consists of a 98-foot wide corridor incorporating all segments of the fiber-optic installation. Trenching to install the fiber optic line will be approximately one to two feet in width to a depth of approximately four feet; therefore the vertical APE for the project will extend to four feet.

In addition to your letter received January 20, 2015, you have submitted *A Class III Cultural Resources Survey for a Proposed Buried Telecommunications Fiber-Optic Line near Winterhaven, in Imperial County, California* (Howell, December 22, 2014) as evidence of your efforts to identify and evaluate historic properties in the project APE.

Archival research included a record search at the South Coastal Information Center in May and June 2014, and the Arizona State Museum's AZSITE online database on April 15, 2014. Five previously recorded sites were determined to lie within the APE for the project:

	Resource Designation	Resource Description	NRHP Eligibility	Project Effect
1	CA-IMP-3424	Southern Pacific Railroad	Eligible; Criteria A	No Adverse Effect
2	CA-IMP-6824	Reservation Main Drain Canal	Eligible; Criteria A	No Adverse Effect
3	CA-IMP-6830	Yuma Main Canal	Eligible; Criteria A	No Adverse Effect
4	CA-IMP-6832	Cocopah Canal	Eligible; Criteria A	No Adverse Effect
5	CA-IMP-7158	Pilot Knob Tap Drop 4 16 kV Line	Eligible; Criteria A	No Adverse Effect

Native American consultation included contact with the Tribal Historic Preservation Officer, Arlene Kingery, on May 16, 2014 regarding knowledge of sites of religious or cultural significance to the tribe in the project area. No such properties were identified through consultation efforts.

A pedestrian surface survey was conducted of the APE utilizing transects spaced fifteen meters apart on July 15 and 16, 2014. One built resource was identified and recorded:

	Resource Designation	Resource Description	NRHP Eligibility	Project Effect
6	P-13-014813	Walapai Canal	Eligible;	No Adverse Effect

Ten isolated finds were also observed within the APE. Six of these isolates are lithic fragments that could only be tentatively identified as flaked stone. All were found in disturbed contexts. Three isolates were possible historic glass; one of which was associated with a fragment of white earthenware. One isolated occurrence was a roadside memorial shrine recorded with the intent to document its location for avoidance.

The BIA has recommended the six resources listed in the tables above as eligible to the NRHP. The ten isolated finds do not qualify as historic properties under Section 106 of the NHPA. Pursuant to 36 CFR §800.5(b) the BIA has determined a *Finding of No Adverse Effect* to historical properties by the proposed project.

I agree the ten isolated finds described do not meet the qualifications as historic properties. Because formal evaluations were not provided for the above listed built environment resources, I cannot make a determination of eligibility to the NRHP. I suggest the resources be assumed eligible to the NRHP for purposes of this project only. Because the project will have no adverse effect to these resources I then concur with the *Finding of No Adverse Effect* for the project. After clarification of information obtained through phone contact, I also concur identification efforts are sufficient and I also have no objections to the delineation of the APE, as depicted in the supporting documentation. For future reference I wish to clarify that canals are considered built resources and not archaeological resources.

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

Sincerely,

Carol Roland-Nawi, Ph.D.

Carol Roland-Nawi, PhD
State Historic Preservation Officer

APPENDIX F. ALLANDS DATA AND RESEARCH, INC., REPORT

Allands

14947 W. Piccadilly Road, Goodyear, AZ 85395 • Phone: 623-535-7800 • Fax: 623-535-7900
www.allands.com • e-mail: sharon@allands.com

Historical Title and Environmental Research

REGULATORY DATABASE (ASTM) SEARCH

YOUR FILE NO:

ALLANDS FILE NO: 2015-04-012D

DATE OF REPORT: April 12, 2015

ALLANDS hereby reports the search results of Federal and State Databases according to ASTM standards for Phase I Environmental Site Assessments E 1527-13. Allands is not responsible for errors in the available records. The total liability is limited to the fee paid for this report. This is a confidential, privileged and protected document for the use of Tierra Right of Way Services.

1. The land referred to in this report is located in Imperial County, California, described as follows:

1/10th of a mile Corridor Study along power line corridor and existing DSA and proposed nodes along Streets and Avenues located on the Fort Yuma - Quechan Indian Reservation and in the vicinity of the towns of Bard and Winterhaven, California, being in Sections 13, 14, 21 to 24, inclusive, 26 & 27, Township 16 South, Range 22East; Sections 32 & 33, Township 15 South, Range 23 East; and in Sections 4 to 9, inclusive and 16 to 19, inclusive, Township 16 South, Range 23 East, San Bernardino Meridian and Base Line.

REGULATORY DATABASE SEARCH SUMMARY

Database	Date of Database	Approximate Minimum Search Distance (miles)	Reported Facilities
Standard Federal ASTM Environmental Record Sources			
NPL (National Priorities List) / Proposed NPL / DOD (Department of Defense Sites)	04/15	Within corridor boundaries	0
Delisted National Priorities List	04/15	Within corridor boundaries	0
CERCLIS (Comprehensive Environmental Response, Compensation and Liability Information System)/No Further Remedial Action Planned (NFRAP)	11/13	Within corridor boundaries	0
RCRA (Resource Conservation and Recovery Act) Large and Small Quantity Generators	04/15	Within corridor boundaries	0
RCRA – CORRACTS TSDFs (Corrective Action Treatment, Storage, and Disposal Facilities)	04/15	Within corridor boundaries	0
RCRA – Non-CORRACTS TSDFs	04/15	Within corridor boundaries	0
ERNS (Emergency Response Notification System)	04/15	Within corridor boundaries	0
Standard State ASTM Environmental Record Sources			
State Priority List	04/15	Within corridor boundaries	0
California Hazardous Materials Incident System (CHMIRS)	02/05	Within corridor boundaries	0
Solid Waste Facilities/Landfill Sites	04/15	Within corridor boundaries	0
CalSites / Envirostor	04/15	Within corridor boundaries	0
Registered USTs (Underground Storage Tanks) LUSTs (Leaking Underground Storage Tanks) Incident Reports (includes Tribal Records)	04/15	Within corridor boundaries	3
Additional Environmental Record Sources			
RCRA Compliance Facilities	04/15	Within corridor boundaries	0
Topographical / Aerial Maps	See text	Within corridor boundaries	2

Standard Federal ASTM Environmental Record Sources

SUPERFUND NATIONAL PRIORITIES LIST (NPL)

Under Section 105 of the Comprehensive Environmental Response, Compensation and Liability Act the Environmental Protection Agency established a National Priorities List (NPL) of Superfund sites. In addition, Proposed NPL and DOD (Department of Defense) Sites are researched in the section. These databases are provided by the EPA, dated April, 2015, and searched to identify all NPL/Proposed NPL/ DOD sites within corridor boundaries.

No National Priorities List (NPL) / Proposed NPL / DOD Sites were found located within corridor boundaries.

DELISTED NATIONAL PRIORITIES LIST

Site may be delisted from the National Priorities List where no further response is appropriate. This database is provided by the Environmental Protection Agency, dated April, 2015, and searched to identify all Delisted NPL Sites within corridor boundaries.

No Delisted National Priorities List (NPL) Sites were found located within corridor boundaries.

FEDERAL CERCLIS / NFRAP LIST

The CERCLIS list contains sites which are either proposed to or on the NPL and sites which are in the screening and assessment phase for possible inclusion on the NPL. Those sites on the NFRAP list have no further remedial action planned. This database is provided by EPA, dated November, 2013, and searched for facilities within corridor boundaries.

No CERCLIS / NFRAP facilities were found located within corridor boundaries.

RESOURCE CONSERVATION AND RECOVERY ACT FACILITIES (RCRA)

Under RCRA the Environmental Protection Agency compiles a database of facilities that are involved in the generation of hazardous materials. This database is from the EPA, dated April, 2015 and checked for Federal RCRA facilities located within corridor boundaries.

No Federal RCRA handlers were found located within corridor boundaries.

CORRACTS FACILITIES

Under RCRA the Environmental Protection Agency compiles a database of Corrective Action Sites, sites with known contamination. Also known as the RCRA CORRACTS List, this is a list maintained by the EPA of RCRA sites at which contamination has been discovered and where some level of corrective clean-up activity has been undertaken. For example, a site may have been on the RCRA TSD or the RCRA Generators site list, and was placed on the CORRACTS list once contamination was discovered and remediation was underway. This database is dated April, 2015, and checked for facilities which occurred within corridor boundaries.

No Facilities were found which occurred within corridor boundaries.

TSD FACILITIES

Under RCRA the Environmental Protection Agency compiles a database of facilities that are involved in the transportation, treatment, storage, or disposal of hazardous materials. This database is from the EPA, dated April, 2015, and checked for Facilities which occurred within corridor boundaries.

No TSD Facilities were found which occurred within corridor boundaries.

FEDERAL EMERGENCY RESPONSE NOTIFICATION SYSTEM (ERNS) LIST

The ERNS list is a national database used to collect information on reported releases of oil and hazardous substances. This database is provided by the National Response Center and the EPA through the Right of Know Net by OMB Watch and Unison Institute from 1983 to April, 2015, and checked for incidents located within corridor boundaries.

No incidents were found located within corridor boundaries.

Standard State ASTM Environmental Record Sources

STATE PRIORITY LIST

The California Department of Toxic Substances Control (DTSC) has developed an electronic database system with information about sites that are known to be contaminated with hazardous substances as well as information on uncharacterized properties where further studies may reveal problems. The database, referred to as "CalSites," is used primarily by DTSC's staff as an informational tool to evaluate and track activities at properties that may have been affected by the release of hazardous substances. This list includes CALSITE Active Workplan (AWP); Sites that are not AWP (Annual workplan) are not actively being remediated, but are stilled being tracked on the State Equivalent CERCLIS List (SCL)

No Sites were found located within corridor boundaries.

CALIFORNIA HAZARDOUS MATERIAL INCIDENT REPORT SYSTEM (CHMIRS)

The California Office of Emergency Services documents spills and incidents involving hazardous materials that are reported to the unit prior to the state of California adopting the National Incident Management System. This database is dated February, 2005 and checked for hazardous material incidents which occurred within corridor boundaries.

Property within corridor boundaries was not found on this list.

SOLID WASTE INFORMATION SYSTEM (SWIS)

The Solid Waste Information System (SWIS) database contains information on solid waste facilities, operations, and disposal sites throughout the State of California. The types of facilities found in this database include landfills, transfer stations, material recovery facilities, composting sites, transformation facilities, waste tire sites, and closed disposal sites.

For each facility, the database contains information about location, owner, operator, facility type, regulatory and operational status, authorized waste types, local enforcement agency and inspection and enforcement records.

The data in the facility database is continuously updated and reviewed April, 2015 for facilities located within corridor boundaries.

No facilities were found located within corridor boundaries.

SITE MITIGATION AND BROWNFIELDS REUSE PROGRAM DATABASE (CALSITES) / DEPARTMENT OF TOXIC SUBSTANCES CONTROL (ENVIROSTOR)

The California Department of Toxic Substances Control (DTSC) has developed an electronic database system with information about sites that are known to be contaminated with hazardous substances.. The Site Mitigation and Brownfields Reuse Program Database was known as CalSites. The Voluntary Cleanup Program (VCP) category contains only those properties undergoing voluntary investigation and/or cleanup and which are listed in the Voluntary Cleanup Program. DTSC recently replaced the “CalSites” database with a new database of hazardous substance release sites, known as the “EnviroStor” database. This database was reviewed April 2015, for facilities located within corridor boundaries.

No facilities were found located within corridor boundaries.

UNDERGROUND STORAGE TANKS
(UST, AST & LUST)

Owners of USTs are required to report any and all releases of tank contents for which an ongoing file documenting the nature of contamination and the status of each such incident is maintained. This database is maintained by the State Water Resources Control Board and individual cities, dated April, 2015 and searched for facilities located within corridor boundaries.

FACILITY	ID	ADDRESS	STATUS
U S A Supersave / Salvador Huerta	T0602500185	2115 Winterhaven Drive	Open - Inactive as of 8/27/2014
Ross Corner Store	T0602592922	1460 West Ross Road	Completed - Case Closed as of 8/5/2013
Bard / Winterhaven Road Yard	T0602500186	1477 Ross Road	Completed - Case Closed as of 2-13-2008

For more information replace "xxx" below with ID from table above
http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=xxx

Additional Environmental Record Sources

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) COMPLIANCE FACILITIES

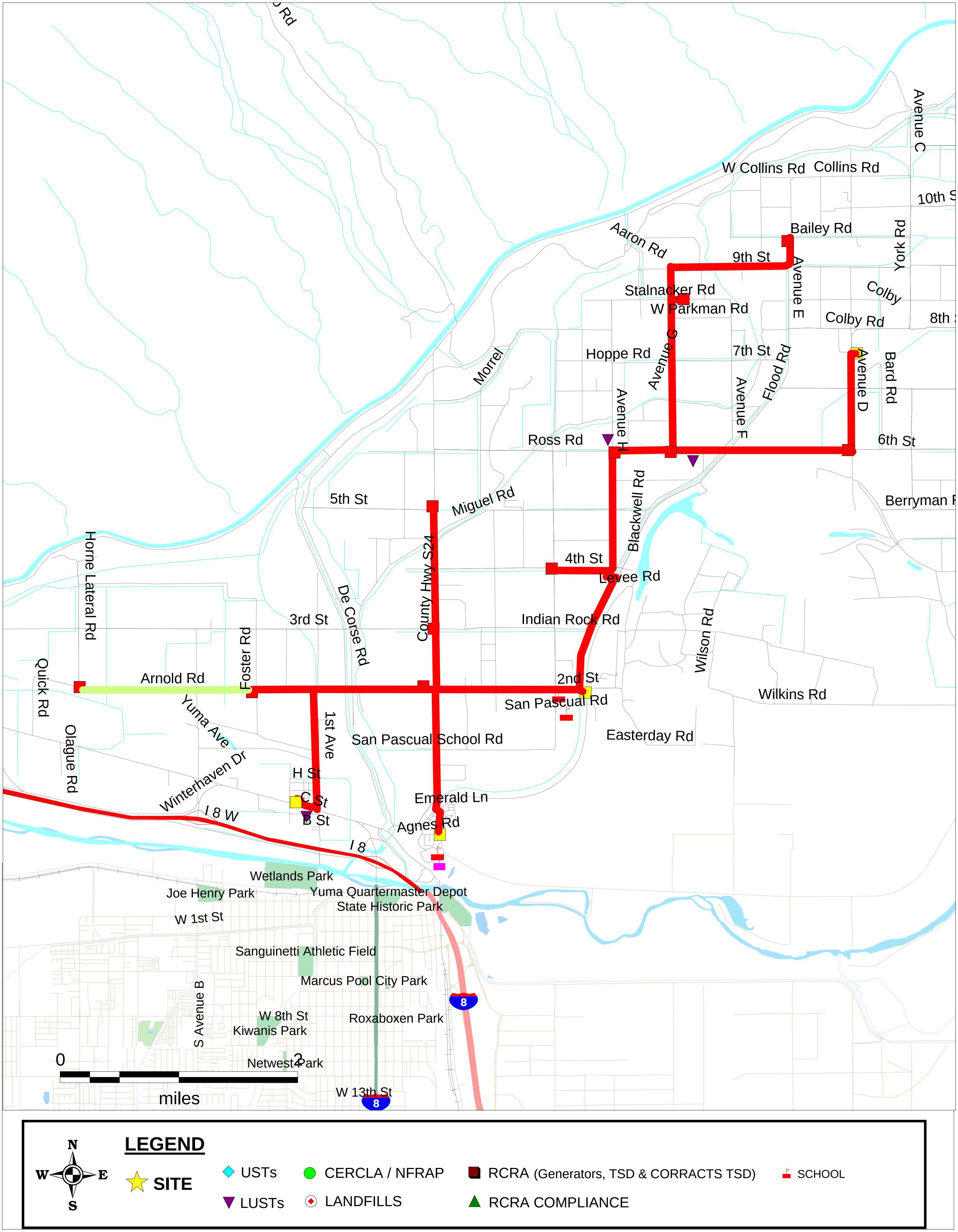
The RCRA Compliance Log lists facilities that have been or presently are under investigation for non-compliance with RCRA regulations. Inclusion of any facility on this list indicates a history of compliance problems and RCRA regulatory violation. This database is from the EPA, dated April, 2015, and searched for compliance facilities within corridor boundaries.

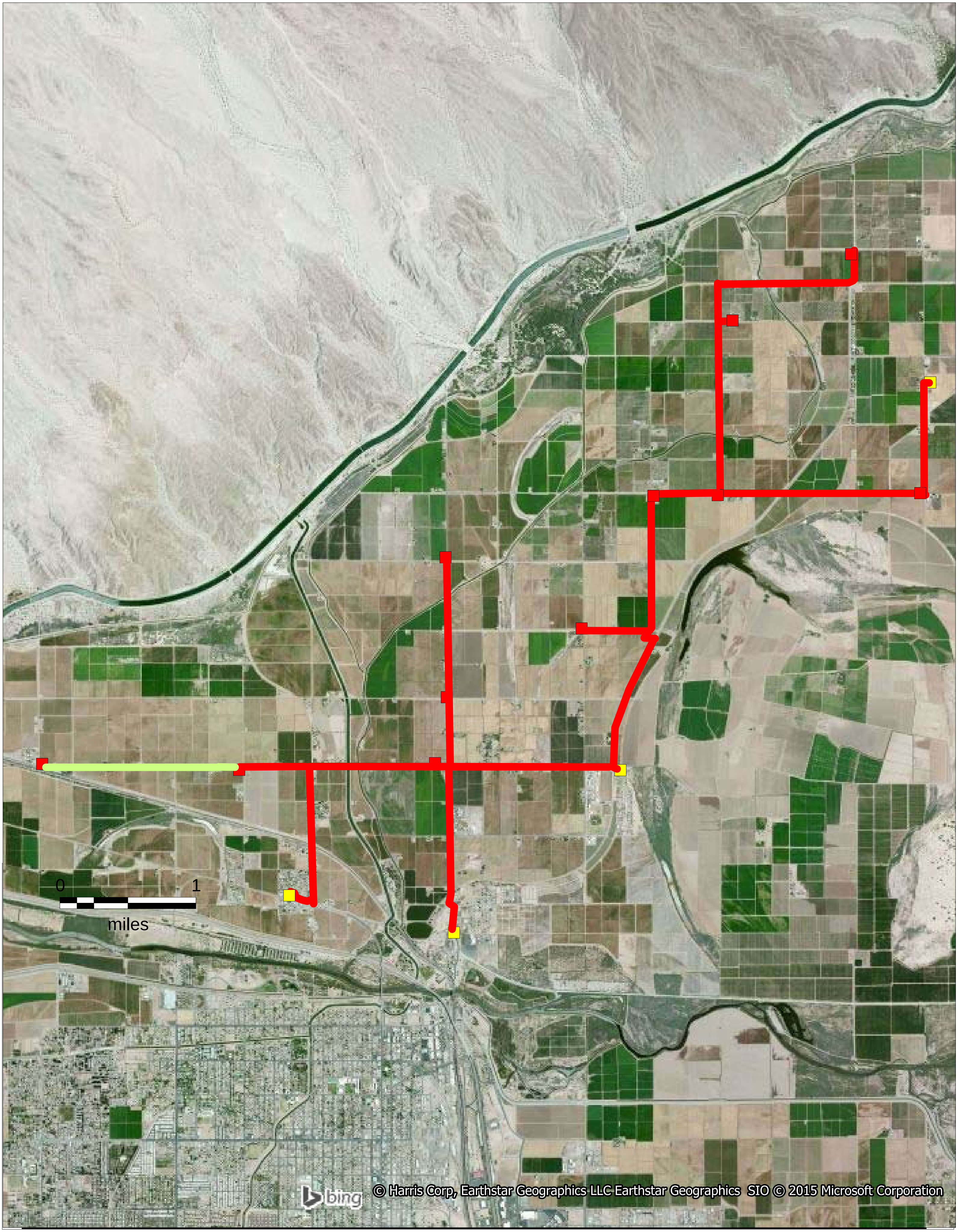
No compliance facilities were found located within corridor boundaries.

USGS 7.5 MINUTE TOPOGRAPHICAL MAPS AERIAL PHOTOS

The United States Geological Survey Topographic maps and Aerial Photos are derived from Terrain Navigator Software from Maptech, Inc. (www.maptech.com) and are for informational purposes only.

NAME	TYPE	DATE
Bard	Topo	1965 revised 1979
Bing Aerial	Aerial	2015


W Collins Rd
Collins Rd
Avenue C
10th St
Bailey Rd
York Rd
Aaron Rd
9th St
Avenue E
Colby
Stalnacker Rd
W Parkman Rd
Colby Rd
8th St
Hoppe Rd
Avenue G
7th St
Flood Rd
Avenue F
Avenue D
Bard Rd
Morrel
Avenue H
Ross Rd
6th St
Blackwell Rd
Berryman Rd
5th St
Miguel Rd
Horne Lateral Rd
4th St
Levee Rd
De Corse Rd
County Hwy S24
3rd St
Indian Rock Rd
Wilson Rd
Quick Rd
Arnold Rd
Foster Rd
2nd St
Wilkins Rd
San Pascual Rd
Yuma Ave
Olague Rd
1st Ave
San Pascual School Rd
Easterday Rd
Winterhaven Dr
H St
C St
B St
I 8 W
Emerald Ln
Agnes Rd
I 8
Wetlands Park
Joe Henry Park
Yuma Quartermaster Depot
State Historic Park
W 1st St
Sanguinetti Athletic Field
Marcus Pool City Park
8
S Avenue B
W 8th St
Kiwanis Park
Roxaboxen Park
Netwest Park
W 13th St
8
0
2
miles
N
W
E
S
LEGEND
SITE
USTs
LUSTs
CERCLA / NFRAP
LANDFILLS
RCRA (Generators, TSD & CORRACTS TSD)
RCRA COMPLIANCE
SCHOOL



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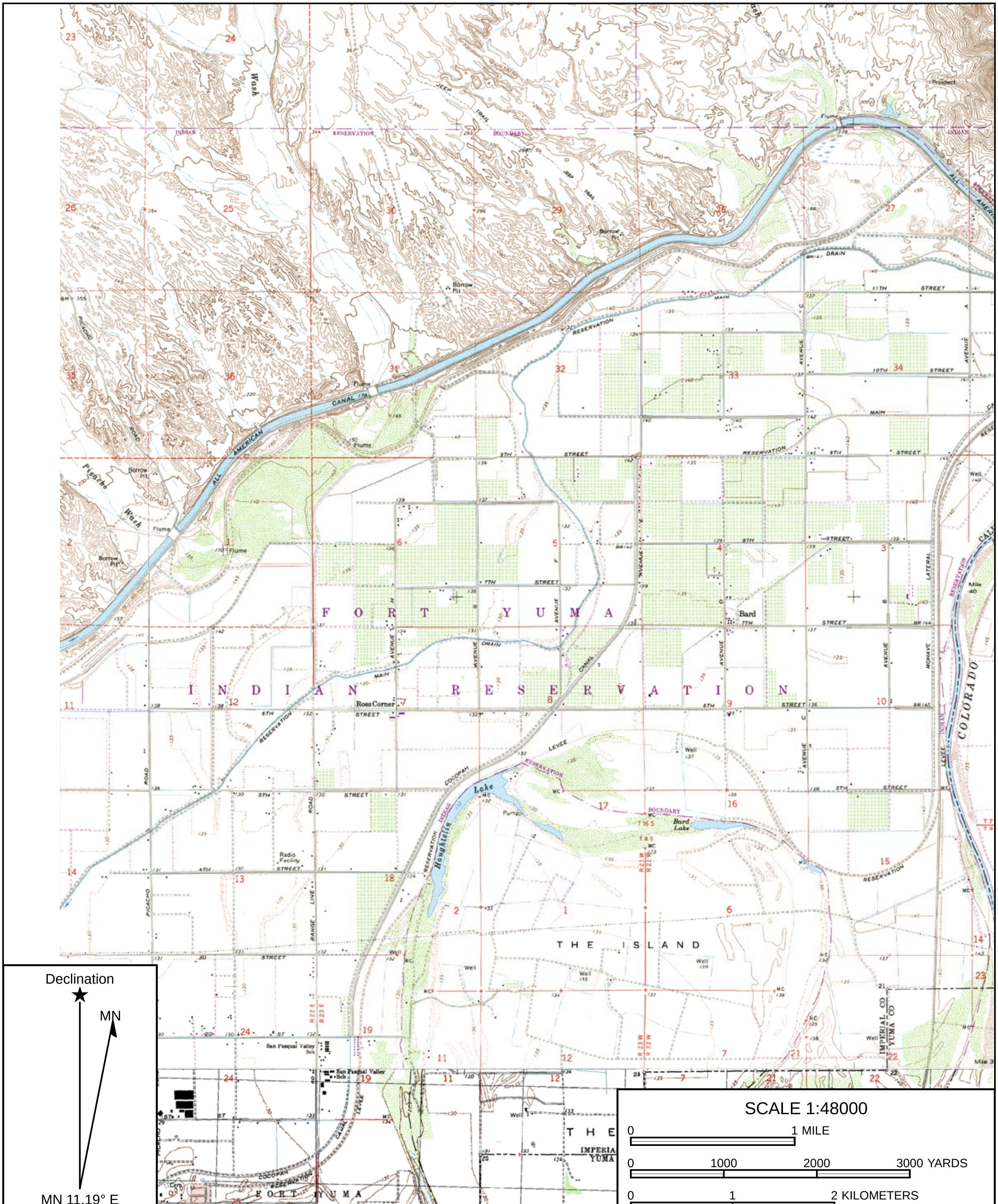
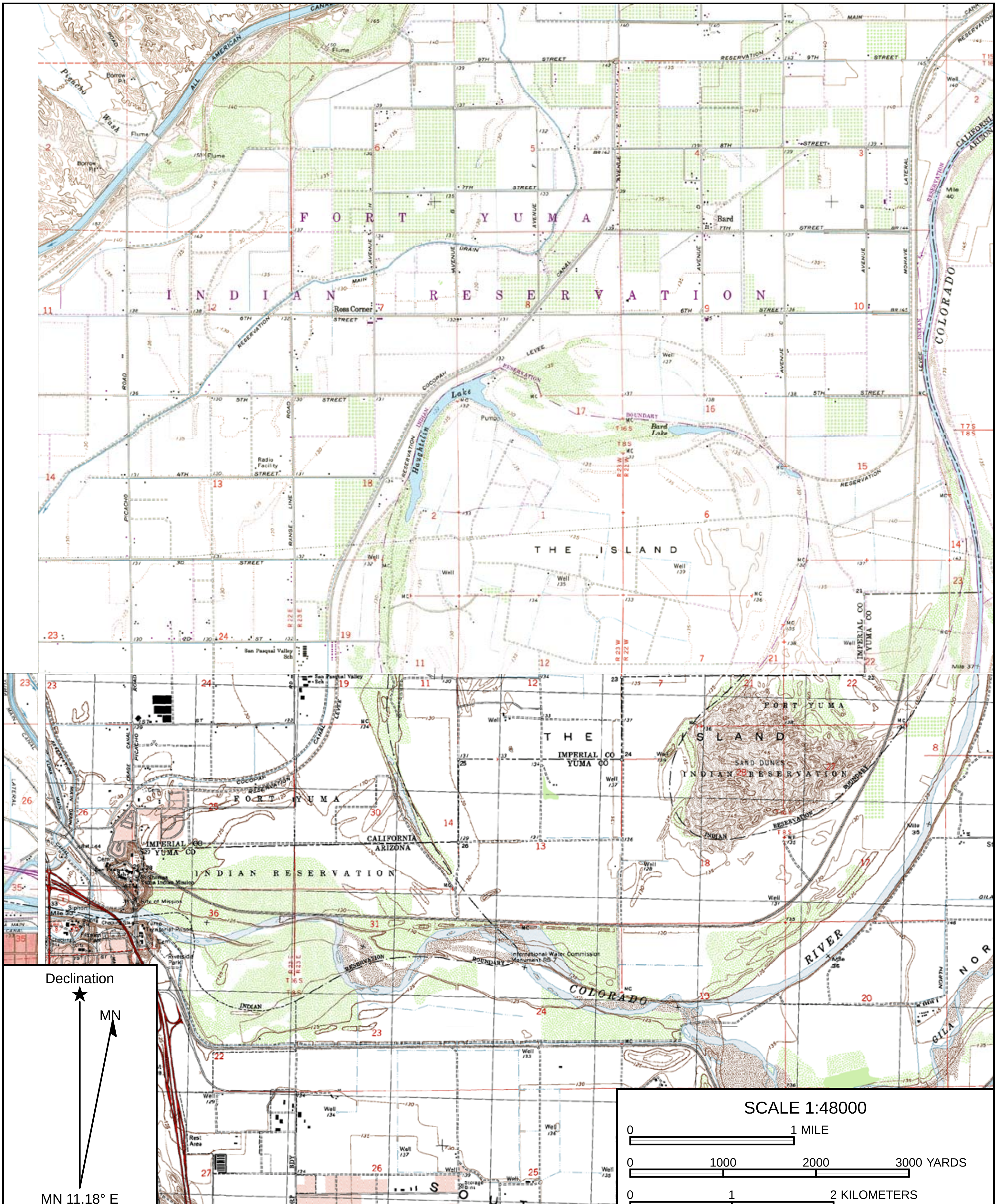
© Harris Corp, Earthstar Geographics LLC Earthstar Geographics SIO © 2015 Microsoft Corporation



Name: BARD
Date: 04/12/15
Scale: 1 inch = 4,000 ft.

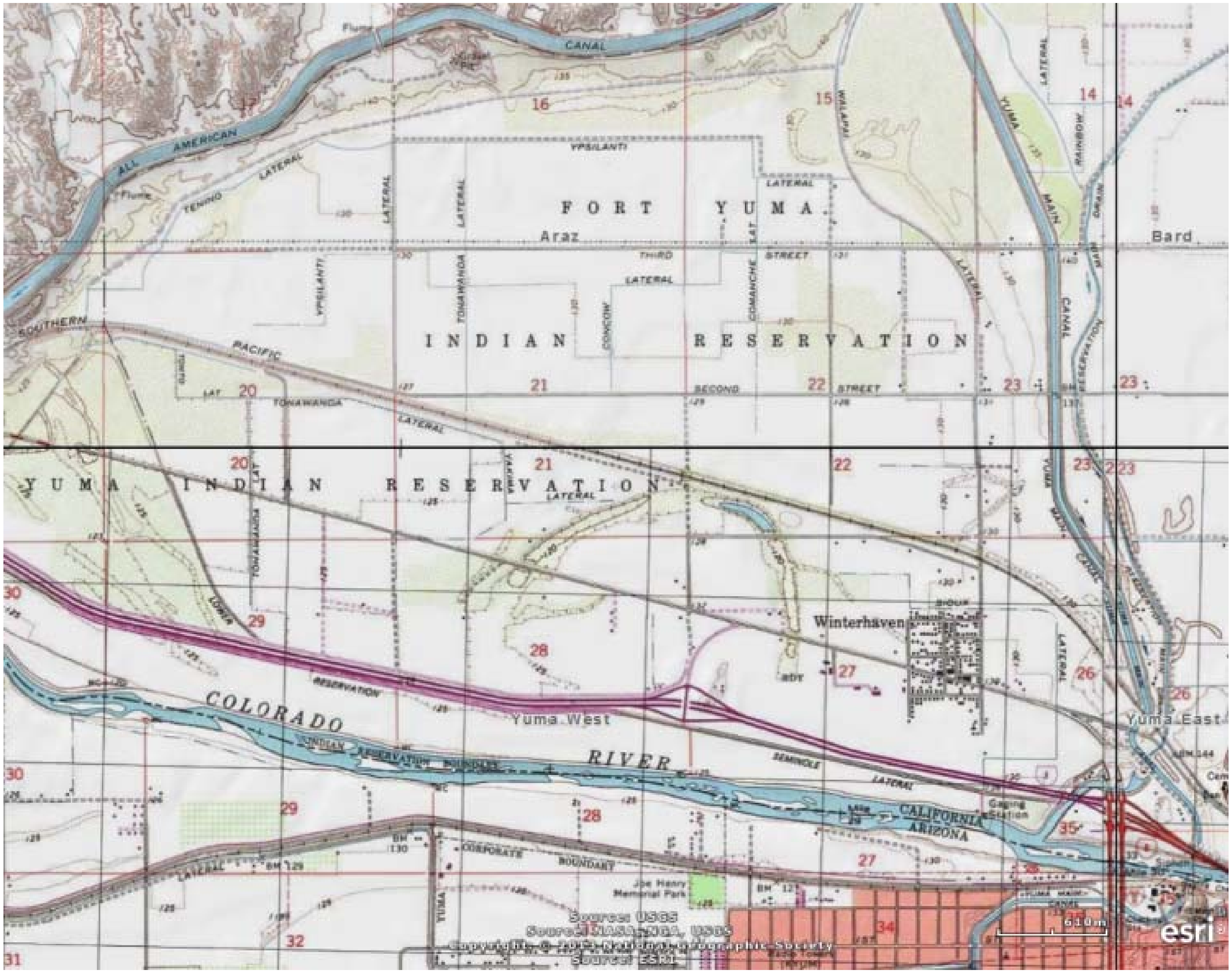
Location: 032° 47' 26.5228" N, 114° 34' 44.2079" W
2015-04-012.north



Name: BARD
Date: 04/12/15
Scale: 1 inch = 4,000 ft.

Location: 032° 45' 21.0674'' N, 114° 34' 36.0000'' W
2015-04-012

Topo West



ALL AMERICAN CANAL
FORT YUMA
INDIAN RESERVATION
Araz
Bard
SOUTHERN PACIFIC
YUMA INDIAN RESERVATION
Winterhaven
Yuma West
Yuma East
COLORADO RIVER
CALIFORNIA
ARIZONA
esri

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www.allands.com • e-mail: sharons@allands.com
Historical Title and Environmental Research

TITLE AND JUDICIAL RECORDS FOR ENVIRONMENTAL LIENS AND ACTIVITY AND USE LIMITATIONS; VOLUNTARY ENVIRONMENTAL MITIGATION USE RESTRICTIONS BY OWNERS (VEMUR) AND DECLARATION OF ENVIRONMENTAL USE RESTRICTIONS (DEUR)

YOUR FILE NO:

ALLANDS FILE NO: 2015-04-012E

Date of Report: April 12, 2015
Title Plant Date***: April 8, 2015
***The Title Plant Date reflects the most current data made available by the information sources used at the time the research was performed.

ALLANDS hereby presents an Environmental Search Report to the land described below The total liability is limited to the fee paid for this report.. Allands is not responsible for errors in the available records. The total liability is limited to the fee paid for this report. This is a confidential, privileged and protected document for the use of Tierra Right of Way Services.

1. The land referred to in this report is located in Imperial County, California.

2. 1/10th of a mile Corridor Study along power line corridor and existing DSA and proposed nodes along Streets and Avenues located on the Fort Yuma - Quechan Indian Reservation and in the vicinity of the towns of Bard and Winterhaven, California, being in Sections 13, 14, 21 to 24, inclusive, 26 & 27, Township 16 South, Range 22East; Sections 32 & 33, Township 15 South, Range 23 East; and in Sections 4 to 9, inclusive and 16 to 19, inclusive, Township 16 South, Range 23 East, San Bernardino Meridian and Base Line.

3. No VEMUR’S, DEUR’S; Environmental Liens, Brownfields, institutional controls, engineering controls, or activity and use limitations, if any, were found currently recorded against the property as searched at the subject county recorder’s office.