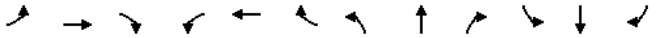
AM Existing
11: Ferrell Rd & SR-98

HCM Unsignalized Intersection Capacity Analysis



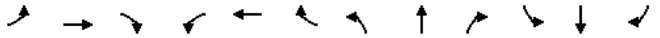
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	30	5	62	242	20	4	8	1	7	75	43
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	33	5	67	263	22	4	9	1	8	82	47
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	285			38			536	459	35	454	451	274
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	285			38			536	459	35	454	451	274
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			99	98	100	98	83	94
cM capacity (veh/h)	1277			1572			360	476	1037	491	481	765

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	40	352	14	136
Volume Left	2	67	4	8
Volume Right	5	22	1	47
cSH	1277	1572	450	552
Volume to Capacity	0.00	0.04	0.03	0.25
Queue Length 95th (ft)	0	3	2	24
Control Delay (s)	0.4	1.7	13.3	13.6
Lane LOS	A	A	B	B
Approach Delay (s)	0.4	1.7	13.3	13.6
Approach LOS			B	B

Intersection Summary				
Average Delay	4.9			
Intersection Capacity Utilization	37.9%	ICU Level of Service	A	
Analysis Period (min)	15			

AM Existing
12: Ferrell Rd & Anza Rd

HCM Unsignalized Intersection Capacity Analysis



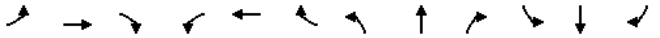
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	1	0	0	4	6	0	2	0	15	2	18
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	1	0	0	4	7	0	2	0	16	2	20
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	11			1			40	23	1	21	20	8
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	11			1			40	23	1	21	20	8
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	98	100	98
cM capacity (veh/h)	1608			1622			942	868	1083	988	871	1075

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	7	11	2	38
Volume Left	5	0	0	16
Volume Right	0	7	0	20
cSH	1608	1622	868	1022
Volume to Capacity	0.00	0.00	0.00	0.04
Queue Length 95th (ft)	0	0	0	3
Control Delay (s)	6.0	0.0	9.2	8.7
Lane LOS	A		A	A
Approach Delay (s)	6.0	0.0	9.2	8.7
Approach LOS			A	A

Intersection Summary				
Average Delay	6.7			
Intersection Capacity Utilization	19.7%	ICU Level of Service	A	
Analysis Period (min)	15			

PM Existing
1: Forrester Road & I-8 WB Ramp

HCM Unsignalized Intersection Capacity Analysis



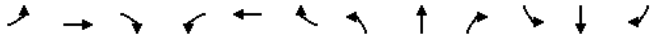
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	28	0	49	22	131	0	0	143	30
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	30	0	53	24	142	0	0	155	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						2						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	389	362	172	362	378	142	188			142		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	389	362	172	362	378	142	188			142		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	95	100	94	98			100		
cM capacity (veh/h)	530	556	872	586	544	905	1386			1440		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	84	166	188
Volume Left	30	24	0
Volume Right	53	0	33
cSH	1423	1386	1700
Volume to Capacity	0.06	0.02	0.11
Queue Length 95th (ft)	5	1	0
Control Delay (s)	10.0	1.2	0.0
Lane LOS	B	A	
Approach Delay (s)	10.0	1.2	0.0
Approach LOS	B		

Intersection Summary					
Average Delay	2.4				
Intersection Capacity Utilization	30.8%	ICU Level of Service		A	
Analysis Period (min)	15				

PM Existing
2: Forrester Road & I-8 EB Ramp

HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	73	0	0	0	0	0	0	93	66	115	45	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	79	0	0	0	0	0	0	101	72	125	49	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			2									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	436	472	49	436	436	137	49			173		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	436	472	49	436	436	137	49			173		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	84	100	100	100	100	100	100			91		
cM capacity (veh/h)	495	447	1020	495	468	912	1558			1404		

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	79	173	174
Volume Left	79	0	125
Volume Right	0	72	0
cSH	490	1700	1404
Volume to Capacity	0.16	0.10	0.09
Queue Length 95th (ft)	14	0	7
Control Delay (s)	13.8	0.0	5.8
Lane LOS	B		A
Approach Delay (s)	13.8	0.0	5.8
Approach LOS	B		

Intersection Summary					
Average Delay	4.9				
Intersection Capacity Utilization	31.7%	ICU Level of Service		A	
Analysis Period (min)	15				

PM Existing
3: Forrester Road & McCabe Rd

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	127	27	1	0	8	10	1	1	1	13	0	11
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	138	29	1	0	9	11	1	1	1	14	0	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	20			30			332	326	30	322	321	14
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	20			30			332	326	30	322	321	14
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	91			100			100	100	100	98	100	99
cM capacity (veh/h)	1597			1582			574	541	1045	588	545	1066

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	168	20	3	26
Volume Left	138	0	1	14
Volume Right	1	11	1	12
cSH	1597	1582	660	740
Volume to Capacity	0.09	0.00	0.00	0.04
Queue Length 95th (ft)	7	0	0	3
Control Delay (s)	6.2	0.0	10.5	10.0
Lane LOS	A		B	B
Approach Delay (s)	6.2	0.0	10.5	10.0
Approach LOS			B	B

Intersection Summary				
Average Delay	6.2			
Intersection Capacity Utilization	25.2%	ICU Level of Service	A	
Analysis Period (min)	15			

PM Existing
4: Brockman Rd & Lyons Rd

HCM Unsignalized Intersection Capacity Analysis

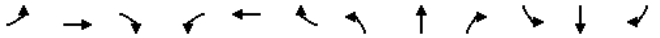
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1	0	0	2	1	0	135	5	0	16	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1	0	0	2	1	0	147	5	0	17	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	171	171	19	169	170	149	21			152		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	171	171	19	169	170	149	21			152		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	100	100			100		
cM capacity (veh/h)	790	722	1059	794	723	897	1595			1429		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	1	3	152	21
Volume Left	0	0	0	0
Volume Right	0	1	5	3
cSH	722	773	1595	1429
Volume to Capacity	0.00	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	10.0	9.7	0.0	0.0
Lane LOS	A	A		
Approach Delay (s)	10.0	9.7	0.0	0.0
Approach LOS	A	A		

Intersection Summary				
Average Delay	0.2			
Intersection Capacity Utilization	17.4%	ICU Level of Service	A	
Analysis Period (min)	15			

PM Existing
5: Brockman Rd & Kubler Rd

HCM Unsignalized Intersection Capacity Analysis



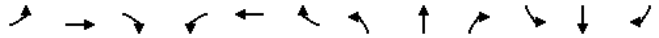
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	4	0	3	0	0	4	0	136	4	3	6	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	0	3	0	0	4	0	148	4	3	7	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	167	165	7	166	163	150	7			152		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	167	165	7	166	163	150	7			152		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	100	100	100	100			100		
cM capacity (veh/h)	791	726	1076	794	728	896	1614			1429		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	8	4	152	10
Volume Left	4	0	0	3
Volume Right	3	4	4	0
cSH	893	896	1614	1429
Volume to Capacity	0.01	0.00	0.00	0.00
Queue Length 95th (ft)	1	0	0	0
Control Delay (s)	9.1	9.0	0.0	2.5
Lane LOS	A	A		A
Approach Delay (s)	9.1	9.0	0.0	2.5
Approach LOS	A	A		

Intersection Summary				
Average Delay	0.8			
Intersection Capacity Utilization	18.0%	ICU Level of Service		A
Analysis Period (min)	15			

PM Existing
6: Brockman Rd & SR-98

HCM Unsignalized Intersection Capacity Analysis



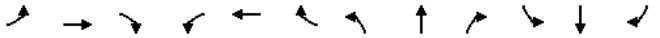
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	36	140	6	0	29	3	14	106	92	2	10	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	39	152	7	0	32	3	15	115	100	2	11	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	35			159			273	268	155	424	270	33
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	35			159			273	268	155	424	270	33
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			98	81	89	99	98	100
cM capacity (veh/h)	1577			1421			657	622	890	404	620	1040

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	198	35	230	14
Volume Left	39	0	15	2
Volume Right	7	3	100	1
cSH	1577	1421	718	590
Volume to Capacity	0.02	0.00	0.32	0.02
Queue Length 95th (ft)	2	0	35	2
Control Delay (s)	1.6	0.0	12.4	11.3
Lane LOS	A		B	B
Approach Delay (s)	1.6	0.0	12.4	11.3
Approach LOS			B	B

Intersection Summary				
Average Delay	7.0			
Intersection Capacity Utilization	36.5%	ICU Level of Service		A
Analysis Period (min)	15			

PM Existing
7: Brockman Rd & Anza Rd

HCM Unsignalized Intersection Capacity Analysis



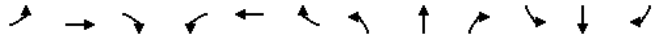
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	11	0	0	6	5	0	0	0	11	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	12	0	0	7	5	0	0	0	12	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	12			12			29	30	12	28	28	9
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	12			12			29	30	12	28	28	9
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	99	100	100
cM capacity (veh/h)	1607			1607			978	861	1069	980	864	1072

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	15	12	0	13
Volume Left	3	0	0	12
Volume Right	0	5	0	1
cSH	1607	1607	1700	987
Volume to Capacity	0.00	0.00	0.00	0.01
Queue Length 95th (ft)	0	0	0	1
Control Delay (s)	1.6	0.0	0.0	8.7
Lane LOS	A		A	A
Approach Delay (s)	1.6	0.0	0.0	8.7
Approach LOS			A	A

Intersection Summary				
Average Delay	3.4			
Intersection Capacity Utilization	13.3%	ICU Level of Service	A	
Analysis Period (min)	15			

PM Existing
8: La Brucherie Rd & McCabe Rd

HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	23	101	11	2	57	83	15	72	8	87	55	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	110	12	2	62	90	16	78	9	95	60	13

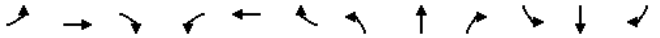
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	147	154	103	167
Volume Left (vph)	25	2	16	95
Volume Right (vph)	12	90	9	13
Hadj (s)	0.02	-0.31	0.02	0.10
Departure Headway (s)	4.8	4.5	4.9	4.9
Degree Utilization, x	0.20	0.19	0.14	0.23
Capacity (veh/h)	698	749	686	691
Control Delay (s)	9.0	8.5	8.7	9.3
Approach Delay (s)	9.0	8.5	8.7	9.3
Approach LOS	A	A	A	A

Intersection Summary				
Delay	8.9			
HCM Level of Service	A			
Intersection Capacity Utilization	40.6%	ICU Level of Service	A	
Analysis Period (min)	15			

PM Existing

9: La Brucherie Rd & Wahl Rd

HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	12	2	1	5	3	6	101	7	17	30	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	13	2	1	5	3	7	110	8	18	33	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	9			15			47	32	14	92	31	7
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	9			15			47	32	14	92	31	7
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	87	99	98	96	100
cM capacity (veh/h)	1611			1603			923	859	1066	797	859	1075

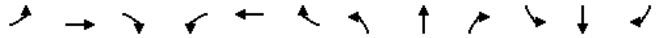
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	18	10	124	52
Volume Left	3	1	7	18
Volume Right	2	3	8	1
cSH	1611	1603	872	840
Volume to Capacity	0.00	0.00	0.14	0.06
Queue Length 95th (ft)	0	0	12	5
Control Delay (s)	1.3	0.8	9.8	9.6
Lane LOS	A	A	A	A
Approach Delay (s)	1.3	0.8	9.8	9.6
Approach LOS			A	A

Intersection Summary				
Average Delay	8.5			
Intersection Capacity Utilization	18.6%	ICU Level of Service	A	
Analysis Period (min)	15			

PM Existing

10: Ferrell Rd/La Brucherie Rd & Kubler Rd

HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	12	3	4	2	0	2	13	102	3	1	32	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	3	4	2	0	2	14	111	3	1	35	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											436	
pX, platoon unblocked												
vC, conflicting volume	180	179	35	184	178	112	35			114		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	180	179	35	184	178	112	35			114		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	100	100	100	100	99			100		
cM capacity (veh/h)	774	708	1038	766	709	940	1577			1475		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	21	4	128	36
Volume Left	13	2	14	1
Volume Right	4	2	3	0
cSH	805	844	1577	1475
Volume to Capacity	0.03	0.01	0.01	0.00
Queue Length 95th (ft)	2	0	1	0
Control Delay (s)	9.6	9.3	0.9	0.2
Lane LOS	A	A	A	A
Approach Delay (s)	9.6	9.3	0.9	0.2
Approach LOS	A	A		

Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	21.6%	ICU Level of Service	A	
Analysis Period (min)	15			

PM Existing
11: Ferrell Rd & SR-98

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	31	197	1	11	32	13	3	61	33	22	22	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	34	214	1	12	35	14	3	66	36	24	24	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	49			215			363	355	215	417	348	42
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	49			215			363	355	215	417	348	42
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			99	88	96	95	96	100
cM capacity (veh/h)	1558			1355			559	553	825	464	558	1029

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	249	61	105	51
Volume Left	34	12	3	24
Volume Right	1	14	36	3
cSH	1558	1355	623	524
Volume to Capacity	0.02	0.01	0.17	0.10
Queue Length 95th (ft)	2	1	15	8
Control Delay (s)	1.2	1.6	11.9	12.6
Lane LOS	A	A	B	B
Approach Delay (s)	1.2	1.6	11.9	12.6
Approach LOS			B	B

Intersection Summary				
Average Delay	4.9			
Intersection Capacity Utilization	30.6%	ICU Level of Service	A	
Analysis Period (min)	15			

PM Existing
12: Ferrell Rd & Anza Rd

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	18	16	1	0	3	3	0	1	0	11	0	8
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	17	1	0	3	3	0	1	0	12	0	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	7			18			71	64	18	62	62	5
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	7			18			71	64	18	62	62	5
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	99	100	99
cM capacity (veh/h)	1614			1598			905	817	1061	923	818	1078

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	38	7	1	21
Volume Left	20	0	0	12
Volume Right	1	3	0	9
cSH	1614	1598	817	982
Volume to Capacity	0.01	0.00	0.00	0.02
Queue Length 95th (ft)	1	0	0	2
Control Delay (s)	3.8	0.0	9.4	8.7
Lane LOS	A		A	A
Approach Delay (s)	3.8	0.0	9.4	8.7
Approach LOS			A	A

Intersection Summary				
Average Delay	5.0			
Intersection Capacity Utilization	23.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Appendix J

Project Description Details

PROJECT DESCRIPTION
Wistaria Ranch Solar Energy Center
9/4/2013

The Wistaria Ranch Solar Energy Center project (Project) is a proposed solar photovoltaic (PV) energy-generating facility located in Imperial County, California, approximately six miles southwest of the city of El Centro, California and 5.5 miles directly west of Calexico, California. The geographic center of the Project roughly corresponds with 32° 41' 48" North and 115° 37' 00" West, at an elevation of 13 feet below sea level. The U.S./Mexico border is located immediately south of the Project area. The Project is located on privately owned, agricultural land. Figure 1 shows the general location of the Project.

The Project is being developed by Wistaria Ranch Solar, LLC(WRS, or Project Proponent) to sell its electricity and all renewable and environmental attributes to an electric utility purchaser under a long-term contract to help meet California Renewable Portfolio Standards (RPS) goals.

The Project site is generally located south of Wahl Road, east of Brockman and Rockwood Roads, north of the U.S./Mexico border, and west of Ferrell and Corda Roads. Figure 2 shows the boundary of the Project site and the included parcels which total approximately 2,793 acres of private lands that have been used for agriculture. Table 1 provides the Assessor Parcel Numbers (APNs), zoning, and approximate acreages that comprise the Project site.

Table 1 – Project Site Parcels

APN	Acres	Zoning 1	APN	Acres	Zoning 1
052-170-014	36.98	A2R	052-210-029	73.33	A2R
052-180-001	36.56	A2R	052-350-022	2.01	A2R
052-180-002	40.42	A3	052-350-001	159.59	A2R
052-180-011	115.26	A3	052-350-002	23.2	A3
052-180-012	153.62	A2R	052-350-003	12.9	A3
052-180-015	148.54	A3	052-350-004	6.57	A3
052-180-028	71.25	A2R	052-350-020	76.65	A2R
052-180-034	77.16b	A2R	052-350-021	150.12	A2R
052-180-039	152.43	A2R	052-360-008	75.54	A2R
052-180-045	162.93	A2R	052-360-009	4.83	A3
052-180-054	82.72	A2R	052-410-006	51.54	A3
052-210-006	0.38	A2R	052-440-003	3.05	A2R
052-210-019	123.54	A3	052-440-004	156.85	A2R
052-210-020	436.03	A3	052-440-005	160	A2R
052-210-025	55.54	A2	052-440-006	79.82	A2R
052-210-026	61.38	A2	052-440-009	2.1	A2R

Sources: Wistaria Ranch Solar, LLC, 2012
Imperial County Planning and Development Services, 2012
California Department of Conservation, 2008

Notes:
1: Imperial County Zoning Areas
A2 = Agricultural, General
A2R = General Agricultural Rural Zone
A3 = Agricultural, Heavy

2: According to Imperial County Planning and Development Services, the acreage of APN 052-180-034 is 82.16 acres; however, 5 acres will be retained by the landowner as an agricultural homesite and are not included in the total parcel or Project site acreage estimates.

The Project site is designated agricultural by the Imperial County General Plan Land Use Element[1], and the Project site parcels are comprised of lands zoned as A-3 (Agricultural, Heavy), A-2-R (General Agricultural Rural Zone), and A-2 (Agricultural, General).[2]

The Project's generation interconnection *(*gen-tie*)* transmission line also anticipates being co-located with previously approved interconnection facilities (Figure 3) located on portions of the properties listed in Table 2. The Mt. Signal Solar project has constructed most of the required interconnection facilities and the Project will install additional arms and hang its conductor on the existing Mt. Signal Solar gentie line.

Table 2 – Project Gen-tie Parcels*

Preferred Route
APN
052-190-022
052-190-037
052-190-012
052-190-011
052-210-016
052-210-015

- APNs that are identified as part of the Project site parcels are not included in the gentie APNs. The northern portion of the Project will be connected to the central portion via a corridor along the western boundary of APN 052-180-048. The central portion of the Project will be connected with the southern portion via a corridor along the boundary of APN 052-210-016 and APN 052-210-015.

KEY PROJECT HIGHLIGHTS

The proposed Project will be a benefit to Imperial County. The Project site was carefully chosen so the impacts to the environment would be less than significant with mitigation incorporated. Key considerations in the Project Proponent's site selection were the following:

- The site ranks among the highest in solar resource potential in the nation.
- The Project minimizes the potential impact to the environment by:
  - Locating the Project on disturbed land.
  - Maximizing the use of existing infrastructure (transmission lines, roads, and water sources).
  - Minimizing the potential impacts to threatened and endangered species to the extent practical by avoiding sensitive habitats and designated resource, reserves or protected areas.
- The Project reduces the emission of GHGs from the generation of electricity by using renewable energy.
- The site is located near previously approved solar projects.
- Generation Interconnection Transmission lines will be mostly aligned with existing lines and connect to facilities being constructed by other projects to avoid impacts to Bureau of Land Management (BLM) land and reduce impacts to the farming community.
- The Project provides economic benefits and jobs to Imperial County.

[1] ImperialCounty Planning and Development Services, Land Use Map, accessed from http://www.icpds.com/CMS/Media/LANDUSE-Map.pdf on May 30, 2012.

[2] ImperialCounty Planning and Development Services, Check Your Zoning, accessed from http://www.icpds.com/?pid=614 on June 1, 2012 and Imperial County Planning and Development Services, Ordinances, Title 9, Division 5: Zoning Areas Established, accessed from http://www.icpds.com/CMS/Media/TITLE9Div5_2008.pdf on June 4, 2012.

- This Project reinforces Imperial County's position as a leader in the renewable energy world.
- The Project creates minimal impacts to traffic -- once the facility is constructed, the maintenance is minimal, and therefore there will be minimal traffic around the site.
- The photovoltaic panels do not produce noise or emit any air pollution.
- Construction will require minimal water (~1,200 acre feet/year)
- Panel washing during operation (~60 acre feet/year).

The Project is designed to meet the increasing demand for clean, renewable electrical power. The United States has a greater solar energy resource potential than any other industrialized nation. The multiple benefits associated with developing this resource have been recognized repeatedly by both federal and state policy-makers. Development of solar resources reduces reliance on foreign sources of fuel, promotes national security, diversifies energy portfolios, contributes to the reduction of greenhouse gas emissions, and generates "green" jobs. The Project will contribute much needed on-peak power to the electric grid in California.

In addition, the Project will help California meet its statutory and regulatory goal of increasing renewable power generation. In 2002, California enacted Senate Bill 1078, creating a Renewable Portfolio Standard (RPS) to ensure low emission energy generation, setting a goal of 20 percent renewable energy by 2017. Legislative refinement under Senate Bill 107 in 2006 accelerated the 20 percent goal to 2010. In 2008, Governor Schwarzenegger signed Executive Order S-14-08, which requires retail sellers of electricity to serve 33 percent of their load with renewable energy by the year 2020. The following year, Executive Order S-21-09 directed the California Air Resources Board, under its AB 32 authority, to enact regulations to achieve the goal of 33 percent renewables by 2020. Governor Brown then signed Senate Bill X1-2 (Special Session 1) in 2011 to expand the original goals of the RPS, setting a 33 percent target by 2020, with incremental compliance periods, as set forth in §§ 399.15(b) and 399.13(a)(4)(B). The Project is an eligible renewable resource within the meaning of the California Public Resources Code, and will help the State meet its current and planned goals for increasing renewable generation.

Additionally, the Project will further the development of renewable energy and thereby:

- Support U.S. Secretary of the Interior Salazar's Orders 3283 and 3285 making the production, development and delivery of renewable energy top priorities for the United States;
- Support Senate Bill X1-2, which streamlines California's renewable energy project approval process and increased the State's Renewable Energy Standard to 33 percent renewable power by 2020;
- Support the greenhouse gas reduction goals of Assembly Bill 32 (California Global Warming Solutions Act of 2006)
- Sustain and stimulate the economy of Southern California by helping to ensure an adequate supply of renewable electrical energy, while creating additional construction and operations employment opportunities and increased expenditures with many local businesses[3].

PROJECT DESCRIPTION

The Project will use PV technology to convert sunlight directly into direct current (DC) electricity. The process starts with photovoltaic cells that make up photovoltaic modules (environmentally sealed collections of photovoltaic cells). PV modules are generally non-reflective. Groups of photovoltaic modules are wired together to form a PV array. The DC produced by the array is collected at inverters (power conversion devices) where the DC is converted to alternating current (AC). The voltage of the electricity is increased by a transformer at each power conversion station to a medium voltage level (typically 34.5 kilovolts (kV)). Medium voltage electric lines (underground and/or overhead) are used to collect the electricity from each medium voltage transformer and transmit it to the facility substation, where the voltage is further increased by a high voltage transformer to match the electric grid for export to the point of interconnection at either the Drew Road Switchyard or the Imperial Valley Substation. Disconnect switches, fuses,

[3] Information regarding California's Renewable Portfolio Standard can be found on the California Energy Commission's website at http://www.energy.ca.gov/renewables/

circuit breakers, and other miscellaneous equipment will be installed throughout the system for electrical protection and operations and maintenance purposes.

The Project may include only one PV technology or a combination of various PV technologies, including crystalline silicon-based systems, thin-film systems, and concentrating PV systems.

SITE LAYOUT

At full build-out, most of the Project site will be disturbed by construction of the Project. Temporary construction lay down, construction trailers, and parking areas will be provided within the Project Site. Due to the size of the Project site, the solar field lay down areas will be relocated periodically within the solar field acreage as the solar field is built out.

In addition to the structures associated with the solar field described below, the Project would include an Operations and Maintenance (O&M) building or buildings. The Project may also include additional auxiliary facilities such as raw water/fire water storage, treated water storage, evaporation ponds, water filtration buildings and equipment, and equipment control buildings, septic system(s) and parking. The design and construction of the buildings and solar arrays (panels, etc.) and auxiliary facilities will be consistent with County building standards.

The Project will include electric line and vehicular crossings of IID facilities and County facilities. Due to the nature of the Project and the rapidly changing technology, the exact locations of the crossings are not known at this time. However, it should be assumed for California Environmental Quality Act (CEQA) analysis purposes that wherever an Imperial Irrigation District (IID) facility (drain, irrigation canal, electric line, etc) or County facility (road, etc) intersect the Project, an electric or vehicular access crossing will occur. The Project crossings will not interfere with the purpose of these Agencies' facilities. For instance, where a drain flows, the Project crossing will still allow the drain to flow.

Project Phasing

The proposed Project consists of a solar PV generating facility approximately 250 megawatts (MW) in size. The ultimate energy output is dependent on several variables, including offtake arrangements and the evolving efficiency of PV panels, so it is possible that the Project could generate more or less than 250 MW. The Project may be constructed at one time over an 18 month period, or it may be built out over an approximately ten year period. A conceptual phasing plan is shown in Figure 18. The phased project would allow utilities greater flexibility in obtaining renewable energy to meet ratepayer needs. The Project Proponent is requesting that a Conditional Use Permit (CUP) be issued for each phase of the Project. The Project Proponent has filed an application for 17 CUPs. The construction equipment, materials, and labor involved in building the Project remain similar whether the project is constructed in phases over time or built out over an 18 month period. The 18 month buildout of the entire Project at once results in greater intensity of labor and equipment during the construction period. Each phase of the project may have its own offtaker and operate independently from the other phases. The phases shown on the phasing plan are conceptual and will not be constructed in any particular order. The phases may be aggregated during construction and operations/maintenance so that multiple phases could be built at one time. All phases are anticipated to utilize the gentie line that runs from the Project site to the Imperial Solar Energy Center South (ISECS) switchyard. The phases are anticipated to use main project switchyard; however, each phase may independently construct its own up to 230kv step up transformer and switchyard. A list of the conceptual phases along with the APNs and approximate acreage is provided below.

TABLE 3 PROJECT CONCEPTUAL PHASING

Showing APN and Acreage

Phase 1	
052-210-025	55.54
052-210-026	61.38
052-210-029	73.33
052-210-006	0.38
Total	**190.63**

Phase 2	
052-180-028	71.25
052-180-039	152.43
Total	**223.68**

Phase 3	
052-180-045	162.93

Phase 4	
052-180-034	77.16
052-180-054	82.72
Total	**159.88**

Phase 5	
052-180-015	148.54

Phase 6	
052-180-012	153.62

Phase 7	
052-180-011	115.26
052-170-014	36.98
052-180-002	40.42
052-180-001	36.56
052-440-009	2.1
Total	**231.32**

Phase 8	
052-350-021	150.12
052-350-022	2.01
Total	**152.13**

Phase 9	
052-440-006	79.82

Phase 10	
052-350-020	76.65

Phase 11	
052-350-001	159.59
052-350-002	23.2
052-350-003	12.9
052-350-004	6.57
Total	**202.26**

Phase 12	
052-360-008	75.54
052-360-009	4.83
052-410-006	51.54
Total	**131.91**

Phase 13	
052-440-005	160

Phase 14	
052-440-004	156.85
052-440-003	3.05
Total	**159.9**

Phase 15	
052-210-019	123.54

Phase 16	
052-210-020	241.98

Phase 17	
052-210-020	194.05

Development Agreement

WRS requests a Development Agreement with Imperial County to enable and control a phased build out of the Project. WRS desires an up to 10 year period from recordation of the CUPs to commencement of construction. WRS will use best efforts to commence construction as quickly as possible; however, given current market conditions and changing utility procurement plans, WRS needs the flexibility to meet this dynamic market. WRS understands that currently CUPs are valid for 30 years with an ability to extend them for another 10 years. The Project would have the same 40-year total CUP life as current CUPs. The requested Development Agreement would provide flexibility regarding the start of construction and the size of the phases. Additionally, it would provide for administrative amendments, phasing of infrastructure, and provide a mechanism for assignment and delegation of responsibilities to enable flexible financing structures. Moreover, this Development Agreement would allow the County to require extraordinary benefits such as a community or agricultural benefit payment which could be phased with the project's phasing.

Project Facilities

The proposed Project consists of a solar PV generating facility approximately 250 megawatts (MW) in size. The major components of the proposed Project are described below.

Photovoltaic Solar Modules

The Project will utilize conventional PV modules (either crystalline or thin-film) or concentrated photovoltaic (CPV) modules.

When sunlight strikes a PV module, the energy absorbed is transferred to electrons in the atoms of the semiconductor causing them to escape from their normal positions and become part of the current in an electrical circuit. The PV modules convert the sunlight directly into low-voltage DC electricity that is subsequently transformed to AC electricity through an inverter. The system only operates when the sun is shining during daylight hours. The system operates at peak output when the sunlight is most intense, though it also produces power in low light conditions.

CPV modules use Fresnel lenses and/or mirrors to concentrate sunlight and focus it onto small, highly efficient solar cells that convert the sunlight directly into electrical energy. The CPV modules are non-reflective and convert sunlight directly into electricity.

CPV trackers vary among technology providers. Currently, leading CPV manufacturers' trackers range between 30 and 50 feet in height and 50 to 75 feet in width. Inside each of leading CPV manufacturer's module are 135 cells connected in a series providing a nominal power output of 153 watts (W) per module or 1.83 kW per supermodule. Twelve (12) CPV modules collectively form a supermodule that is 8' wide x 16' long. Twelve supermodules are mounted atop a two-axis elevation-overazimuth tracker that follows the sun's daily trajectory across the sky to provide the highest possible level of energy production – particularly in the high-energy demand afternoon hours. Collectively, all of the trackers are wired to a centralized inverter for reliable feed-in to the power grid. Tracker details are shown in Figure 4 and a typical 1 MW block layout is shown in Figure 5.

Fixed-Tilt and Tracker Structures

Depending on the selected manufacturer for the PV or CPV modules, the modules will be mounted on fixed-tilt, single or dual-axis tracking structures. The modules will be grouped in nominal 1 to 2MW-AC arrays. Fixed tilt arrays will be oriented in east-west rows and will face in a generally southern orientation with a tilt angle between 10 and 35 degrees to maximize the amount of incidental solar radiation absorbed over the year. Single-axis trackers typically rotate ±45 degrees (0 degrees is horizontal) along a nominally north-south axis to track the sun's movement throughout the day. Structural support elements will be constructed of corrosion-resistant steel, aluminum, or equivalent members that are attached to circular piers or I-beam posts that will be driven into the prepared base grade of the site.

CPV modules will be mounted on top of a dual-axis tracker. The mast will either be secured to a foundation below grade or vibratory driven into the ground, in which case the mast would serve as the foundation and the supporting structure. The solar array field is arranged in groups called "blocks." Figures 5, 6, 7, and 8 show typical array layouts. The entire array block is connected to an inverter and transformer station to convert the current from DC to AC and step up the voltage to a higher voltage which is more efficient for transmitting power to the project substation.

Inverters and Pad-mounted Transformers

At the center of each array is a power conversion station where inverters take the DC power output from the PV modules and convert it to AC power. Typical inverter stations are shown in Figures 9, 10, and 11. The adjacent pad-mounted transformer steps the voltage up to a medium voltage level. The medium voltage outputs from each of the pad-mounted transformers are collected together in combining switchgear located at discrete locations on the Project site. The medium voltage output from the combining switchgear will be connected to the Project substation where it will then be stepped up to 230-kV for export to the grid. The Project's gen-tie line will co-locate with the Mount Signal Solar Project and interconnect to the Imperial Solar Energy Center South (ISECS) switchyard in order to connect to the Imperial Valley (IV) Substation. The power may flow to the IV Substation via the Drew Road Switchyard or via a line constructed by ISECS directly to the IV Substation.

Substation and Switchyard

An onsite substation will step-up the voltage from the collection level voltage to 230 kV. Breakers, buswork, protective relaying, Supervisory Control and Data Acquisition (SCADA), and associated substation equipment will be constructed on the Project site. The communication system may include above or below ground fiber optic cable or microwave tower. The Project will be interconnected to the regional transmission system from this onsite substation/switchyard via the gen-tie interconnections of the preferred option previously described. Figures 12 and 13 show a conceptual substation.

Transmission Interconnection Facilities

The Project plans to connect to San Diego Gas & Electric's (SDG&E) Imperial Valley Substation.

Whether or not the Project is built in phases or at one time, the use of collector lines to collect electricity from the array fields to the Project substation would remain similar. Skid mounted enclosed switchgear would be used within panel fields/phases to collect and transmit the electricity from the panel array fields to the Project substation.

In order to minimize impacts to the environment, the Project will collocate its generation-tie line (gen-tie) with neighboring solar projects. The Project will share towers with8minutenergy Renewables' andAES Solar's Mount Signal Solar Project to get to the ISECS switchyard. From there, the Project will follow ISECS interconnection to the IV Substation. From the point at which the Project interconnects to the ISECS, WRS's power will flow wherever ISECS power flows, which will either be via interconnection to the Drew Road Switchyard (if the Imperial Irrigation District (IID), or San Diego Gas and Electric (SDGE), and LS Power have built the transmission line and substation) or to SDGE's La Rosita to Imperial Valley 230kv circuit. The Project will hang its own arms, insulators, conductor and related transmission interconnection facilities on Mt. Signal's structures. This will require vehicles and equipment to work at each tower location as well as to utilize several pull sites along the transmission interconnection line path. The structures for the 230kV gen-tie line are expected to be similar to those shown in Figures 14 and 15.

The preferred gen-tie route would involve the construction of an approximately ½ mile 230kv line along Rockwood Rd until it intercepted the Mount Signal Solar gen-tie. This segment would require an encroachment permit from Caltrans to cross State Route 98. From there, the Project would hang its conductors on poles built by Mount Signal Solar for approximately 2 miles to the northeastern edge of the ISECS site. The gen-tie would then run approximately ½ mile South parallel to Pulliam Road and then turn to the West for approximately ½ mile to connect to the ISECS switchyard.

Operations and Maintenance (O&M) Building Complex

The Operations and Maintenance (O&M)Building Complex may contain administrative offices, parts storage, a maintenance shop, plant security systems, a site control center (Figure 16), and plant monitoring equipment. A specific design for the building(s) has not yet been selected as the technology utilized in utility scale solar energy production continues to improve dramatically at a rapid pace. The final layout will be based on the technology selected. A conceptual O&M Building Complex and associated facilities are depicted in Figure 17. The building(s)may have exterior lighting on motion sensors and will have fire and security alarms. The building(s)will be located on a graded area with adjacent worker parking. The parking lot will utilize class II base with a concrete handicap parking space. Additionally, the access road/driveway to the parking lot would be comprised of class II base. The Project will collect wastewater from sanitary facilities such as sinks and toilets in the O&M building(s).This waste stream will be sent to an onsite sanitary waste septic system and leach field to be installed in compliance with standards established by the County Environmental Health Department. Alternatively, the Project may be designed to direct these waste streams to an underground tank for storage until it is pumped out, on a periodic or as-needed basis, and transported for disposal at a licensed waste treatment facility. During periodic major maintenance events, portable restroom facilities may be provided to accommodate additional maintenance workers. An onsite water treatment facility may be constructed. Each phase may have its own O&M Building Complex.

Energy Storage

The Project will likely incorporate an energy storage component and each phase may have its own energy storage component. The field of energy storage is rapidly advancing, thus a single technology or provider has not been selected for the energy storage component of the Project. The storage component of the Project will utilize storage technologies that operate based upon the principles of potential (like pumped storage), chemical (like batteries, mechanical energy (like a flywheel) or any combination thereof. The storage component may be centralized and located adjacent to the substation or switchgear, or alternatively, the energy storage component may be distributed throughout the plant adjacent to individual power conversion centers. The storage component would be housed in a warehouse type building or alternatively in smaller modular structures such as cargo shipping containers.

Grading and Drainage

Site preparation will be planned and designed to minimize the amount of earth movement required for the Project to the extent feasible. The hydrology design will be given first priority in order to protect the Project's facilities and adjacent facilities including any IID/County facilities from large storm events. It is the intent of the Project to support the panels on driven piles. Additional compaction of the soil in order to support the building and traffic loads as well as the PV module supports may be required and is dependent on final project engineering design.

The onsite drainage patterns will be maintained to the greatest extent possible.It may be necessary to remove, relocate and/or fill in portions of the existing drainage ditches or delivery canals to accommodate the final panel layout for the Project. The final engineering designs for these facilities will be reviewed by IID and the County to be sure that the purpose for the facilities (if still needed) will still be met.

Site Access / Traffic and Circulation

There are many County maintained roads providing access throughout the Project site. Access to the Project site will be via County Highway S30, Lyons Road, Rockwood Road, and State Route 98, as well as other roads in the area. Access to components of the solar field will be controlled through security gates at several entrances. Multiple gate restricted access points will be used during construction and operation.
Construction of the Project is expected to take approximately18 months. Daily trip generation during the construction of the Project would be from delivery of equipment and supplies and the commuting of the construction workforce. The number of workers expected onsite during construction of the Project would vary over the construction period and will likely average up to 250 workers per day. Deliveries of equipment

and supplies to the site would also vary over the construction period but have the potential to range from 5 to 40 daily trips, averaging approximately 10 daily trips during the construction period. Parking for Project-related vehicles will be provided onsite during construction. The parking lot will move to adjacent phases as new phases are constructed.

Based on the expected trips generated, traffic on the local roads would increase during construction but impacts to current traffic patterns are anticipated to be minimal.

No impact to current traffic patterns would result during operation of the Project. Operation of the site would be expected to generate approximately 4 to 10 trips per day from maintenance and security personnel.

With a phased Project, the total number of trips generated during construction would be about the same, but the number of daily trips would be reduced and the number of days to complete construction would be extended resulting in a decrease in intensity. Operation of multiple phases could result in a need for a few more onsite employees. It is possible that each phase could require approximately 2 full time equivalent personnel to operate the facility; however, the phases may also be supported by one staff which manages the entire project.

Noise

If CPV tracking technology is implemented, the primary noise sources during operation of the Project are anticipated to be from inverter tracking motors and blowers (that are used to remove condensation from solar panels), which would be distributed throughout the facility. Previous noise analyses (Imperial Solar Energy Center – West, Operation Noise and Vibration, AECOM 2011) show that tracking motors would generate an average of 44.4 A-Weighted decibels (dBA) at 10 feet during operation, and blower units would generate average noise levels of 55.1 dBA at 10 feet. Further, inverter fans would generate a noise level of 77dBA at 5 feet, and the transformer would generate a noise level of 60 dBA at 5 feet. These estimates are considered to be conservative, as they did not include the enclosure for the inverters, which would provide additional noise attenuation.

Additional noise may be generated by equipment within the substation; typically this includes switches, protection and control equipment, transformers, and the incoming transmission lines. The noise generated by transmission lines and switches has previously been analyzed to be 25 dBA at 50 feet. Transformers within the substation would generate noise levels similar to those at the inverters. Substation switches do not generate an audible noise, and circuit breakers (70 dBA at 65 feet) would not be a common noise source, as they would only operate for short periods of time during an emergency event in order to protect the switches and transformers within the substation.

PROJECT SUPPORT SYSTEMS

The following Project-systems will control, protect, and support the Project and its operation.These include employees, security, water use, electric service, lighting, communication systems, and fire control as described in the following paragraphs.

Employees

The Project would generate construction jobs. The number of workers on the site is expected to vary over the construction period. However, the number of construction workers onsite is expected to average up to 250 workers daily.

Typical construction work hours are expected to be from 6:00 am to 4:00 pm. However, the schedule may change based on a need to comply with various biological mitigation measures, overall construction timing,

or worker safety such as avoidance of excessive midday heat. Work at night will be performed occasionally within limited areas of the site.

Approximately two to six full-time workers will be employed to operate the generating facility. These personnel will perform maintenance and security functions.

Security

To ensure the safety of the public and the facility, the property will be fenced, security lighting may be installed, and signs will be posted. Access to the site will be controlled, and gates will be installed at the roads entering the property. The fence will be monitored periodically to detect any intrusion into the property. The Project proposes an up to7-foot chain link fence with 3-strand barb wire placed at the top, extending to a total of up to 8 feet. Landscaping and entry monumentation will be maintained at the entrance to the O&M building(s).

Water Use

Wistaria plans to secure water rights from the IID under the IID's Interim Water Supply Policy for Non-Agricultural Projects. In the event this isn't feasible, Wistaria will truck water to the site for operations purposes.

During construction of the Project, water will be required for a variety of construction activities, including dust suppression, earth compaction, the creation of engineered fill, and concrete preparation. Construction-phase water demand will be greatest during site grading which will consist of disc and roll compaction over the site. An estimated total of 1,200 acre-feet of water will be used for the Project dust control and other construction activities during the construction phase of the Project.

The water used during operation will be used for domestic use and fire protection. The Project may also use water to wash the solar modules should it be determined to be beneficial to the Project. Wistaria anticipates a requirement of approximately 60 acre-feet per year during plant operation. Water for fire protection will be stored in a 10,000-gallon tank onsite (similar to that shown here).

Typical system configuration with two 10,000-gallon tanks and plant in building

The Project may also utilize an additional 10,000 gallon storage tank or tanks to store treated water for sanitary uses. Potable water will be trucked to the site.

Electric Service

Permanent electric service may be obtained for the O&M building(s) and for auxiliary loads. Service will be provided by IID. Temporary electric service will be obtained for main construction logistics areas. Generator power may be utilized for temporary portable construction trailer(s), construction and/or for commissioning. Emergency back-up generators may be utilized to move the CPV panels into a stow position in the event of an IID/SDGE power failure and a severe wind event.

Lighting System

The lighting system will provide operation and maintenance personnel with illumination in both normal and emergency conditions. Lighting will be designed to provide the minimum illumination needed to achieve safety and security objectives and will be shielded and oriented to focus illumination on the desired areas, minimizing light spillover.

Communications Systems

The Project will utilize telephone and internet services that will be provided via overhead or underground lines, microwave tower or via cellular service obtained from a local provider.

Fire Control

The PV modules and ancillary equipment are constructed of fire-resistant material. Additionally, routine weed abatement and landscape maintenance will occur. As such, the Project represents a negligible increase in fire potential.

However, a Fire Management Plan will be prepared in accordance with Fire Department requirements for access and will not impact the ability to provide emergency access to the site. Access to nearby properties will not be hindered or restricted by the Project.

CONSTRUCTION SCHEDULE

If the Project is constructed at once, construction would take place over 18 months. If the phases are constructed over time, each phase could take approximately 12monthsand construction of some phases would overlap with one another.

TEMPORARY CONSTRUCTION FACILITIES

During construction, temporary facilities will be developed onsite to facilitate the construction process. These facilities may include construction trailers, a temporary septic system or holding tank, parking areas, material receiving / storage areas, water storage ponds, construction power service, recycling / waste handling areas, and others. These facilities will be located at the construction areas designated on the final site plans.

DECOMMISSIONING PLAN

The planned operational life of the facility is 30 years. However, if the facility continues to be economically viable, it could be operated for a longer period. The Project will create a decommissioning plan that will be implemented at the end of the Project's life, and will adhere to Imperial County's decommissioning requirements, including, but not limited to:

- Description of the proposed decommissioning measures for the facility and for all appurtenances constructed as part of the facility.
- Description of the activities necessary to restore the site to its previous condition.
- Presentation of the costs associated with the proposed decommissioning measures. Discussion of conformance with applicable regulations and with local and regional plans.

In the phased buildout, the phases will be decommissioned independently of one another.

SOCIAL AND ENVIRONMENTAL BENEFITS

The proposed Generating Facility provides a host of social and environmental benefits consistent with California

Public Utilities Code § 399.11 et seq., including:

Increasing the Diversity, Reliability, Public Health and Environmental Benefits of the Energy Mix

California's electric utility companies are required to use renewable energy to produce 20 percent of their power by 2010 and 33 percent by 2020. Due to rapid developments in the solar power industry, coupled with recent cost reductions and the inherent "peak shaving" benefits of solar power, solar energy is poised to contribute a significant amount of the total renewable power needed to achieve these requirements. Because solar generation occurs during on-peak hours, solar power can enhance grid stability by matching generation to the daily electric load profile. Although solar power is an intermittent source of electric energy, the onsite Solar Meteorological Station(s) will provide real-time data for reliable electrical generation predictions and coordination with the California Independent System Operator (CAISO).

Benefits to public health and the environment are addressed in detail below.

Promoting Stable Electricity Prices

Traditional base load energy prices have increased by roughly 4 percent per year in recent years and wholesale electricity pricing during peak hours has also increased with increased demand for energy and the rising cost of fossil fuels. A solar PV plant, such as the proposed facility, can produce electricity during peak demand periods when prices are highest and energy is most needed. This helps to relieve stress on the grid during peak hours, preventing the need to call up more expensive peaker plants. Additionally, photovoltaic solar plants operate without a fuel source thus eliminating potential fuel price volatility and promoting stable electricity prices.

Protecting Public Health

Once the proposed Project is operational, it will produce zero emissions in its electricity generation process. Based on Project build out of approximately250 MW, this will remove approximately 341,200 tons of CO_2 equivalents annually from the atmosphere based on an electricity emission factor of 1,038.6pounds (lbs) of CO_2 equivalents per megawatt-hour (MWh) for the California grid mix (Source: Wolff, G. 2005. Quantifying the Potential Air Quality Impacts from Electric Demand Embedded in Water Management Choices. The Pacific Institute for the California Energy Commission (CEC), Public Interest Energy Research (PIER) Energy-Related Environmental Research, CEC-500-2005-031). Furthermore, a significant amount of criteria pollution emissions will be displaced. This will help to ameliorate respiratory afflictions and other public health conditions that arise from poor air quality.

Stimulating Sustainable Economic Development

Utility-scale solar PV power plants can be constructed and begin commercial operations within a short timeframe relative to fossil-based energy generation. This means that solar PV power plants can commence operation and begin producing revenue much sooner than traditional forms of electricity generation. Imperial County will benefit from millions of dollars in property tax assessments over the course of the Project lifecycle. The current state property tax exemption for solar power applies only to aspects of the facility that generate solar power and not to the rest of the facility. High value items subject to property tax include the increased and re-assessed land value, Project switchyard, operations and maintenance building, and gen-tie line. These funds will be used to provide civil services for the local community. Laborers hired during the construction and operation phases of the Project will gain valuable skills that are in high demand in the emerging "green" economy.

Creating New Employment Opportunities/ Providing Benefits to Communities with a Plurality of Minority or Low-Income Populations

As previously discussed, the proposed Project will provide an estimated 250 construction-related jobs during the construction phase. It will also provide additional jobs during the operation phase related to operations, maintenance, and security.The facility is being constructed near the cities of Calexico and El Centro. Both cities have a large minority and low-income population within Imperial County. The plant is expected to create local employment opportunities both during the construction and operating periods. Furthermore, Imperial County will benefit from millions of dollars in property tax assessments over the course of the Project lifecycle. These funds will be used to provide civil services for local communities.

Reducing Reliance on Imported Fuels

Once the proposed Project is completed it will be able to operate completely independently from any imported fuels given that no fuel source is required in the solar PV electricity generation process.

Ameliorating Air Quality Problems

Because the proposed Project will have zero emissions and burn no fossil fuels, it will eliminate emissions of criteria pollutants that would have otherwise originated from fossil-based electricity production. Table 3 shows the estimated criteria pollutant emission rates from fossil-based power generation in the California grid mix and the amount of emissions displaced by the approximately 250 MW Project annually.

Table 4 - Criteria Pollutant Emission Reductions Created by the Proposed Project

Air Pollutant	Emission Factor (lb/MWh)	Annual Emissions Displaced by Project (lb)
CO	0.465	305,500
NO_X	0.227	149,000
PM_{10}	0.040	26,250
ROGs	0.032	21,000
SO_X	0.0022	14,450

Source: Wolff, G. 2005. *Quantifying the Potential Air Quality Impacts from Electric Demand Embedded in Water Management Choices*. The Pacific Institute for the California Energy Commission (CEC),Public Interest Energy Research (PIER) Energy-Related Environmental Research, CEC-500-2005-031. 250MW project based on a 30% capacity factor.

Improving Public Health by Reducing the Burning of Fossil Fuels

Modern natural gas combined cycle plants have a net heat rate on the order of 7,000 Btu/kWh. Therefore, the proposed Project will offset approximately 4,600,000 million British thermal units (MMBtu) of natural gas use annually.

Compatibility with Surrounding Land Use

The Project site is located in the southwestern portion of Imperial County. There are several other approved solar projects in the immediate vicinity surrounding the Project site. The other projects include Centinela Solar, the Mount

Signal and Calexico Solar projects, and Imperial Solar Energy Center South. The rest of the area is predominantly agricultural with very few residences and agricultural buildings mixed in.

PROJECT APPROVALS

The proposed Project would be subject to the following Imperial County reviews and approvals:

- Conditional Use Permit to develop a Solar Energy Plant on lands zoned A-2, A-2-R, and A-3, per Title 9, Division 5: Zoning Areas Established, Chapter 8, Sections 90508.02 and 90509.02;
- Certification of the Environmental Impact Report per the California Environmental Quality Act by the Imperial County Planning Commission and/or Board of Supervisors; and
- Variance for transmission line structures that are over 120 feet in height. The proposed structures could be up to 140 feet in height.
- Land Conservation Act (Williamson Act) Contract cancellation.
- Development Agreement

Other Responsible and Trustee Agencies that may have discretionary approval of Project actions may include, but are not limited to, the:

- California Department of Fish and Game
- United States Fish and Wildlife Service
- California Regional Water Quality Control Board
- United States Army Corps of Engineers
- California Department of Transportation
- Imperial Irrigation District
- Imperial County Air Pollution Control District
- Imperial County Fire Department
- Imperial County Public Works Department

Appendix K

Imperial County Solar Farm Map