

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17

APPENDIX C:
ACTION PLANS FOR SOLAR ENERGY ZONES TO BE CARRIED FORWARD

1
2
3
4
5
6
7
8
9
10
11
12
13
14

This page intentionally left blank.

1 **CONTENTS**

2
3
4 **APPENDIX C: ACTION PLANS FOR SOLAR ENERGY ZONES TO BE**
5 **CARRIED FORWARD**..... C-1

6
7 C.1 Arizona Proposed Solar Energy Zones..... C-3
8 C.1.1 Brenda..... C-3
9 C.1.1.1 Summary of Potential Impacts Identified in the Draft Solar
10 Programmatic Environmental Impact Statement..... C-3
11 C.1.1.2 Summary of Comments Received..... C-6
12 C.1.1.3 Changes to the SEZ..... C-6
13 C.1.1.4 Wilderness Character Status of SEZ..... C-6
14 C.1.1.5 Additional Data Collection Recommended..... C-6
15 C.1.1.5.1 Lands and Realty..... C-6
16 C.1.1.5.2 Specially Designated Areas and Lands with
17 Wilderness Characteristics..... C-6
18 C.1.1.5.3 Rangeland Resources..... C-8
19 C.1.1.5.4 Recreation..... C-8
20 C.1.1.5.5 Military and Civilian Aviation..... C-8
21 C.1.1.5.6 Geologic Setting and Soil Resources..... C-8
22 C.1.1.5.7 Minerals..... C-8
23 C.1.1.5.8 Water Resources..... C-8
24 C.1.1.5.9 Ecological Resources..... C-9
25 C.1.1.5.10 Air Quality and Climate..... C-13
26 C1.1.5.11 Visual Resources..... C-13
27 C.1.1.5.12 Acoustic Environment..... C-18
28 C.1.1.5.13 Paleontological Resources..... C-18
29 C.1.1.5.14 Cultural Resources and Native American
30 Concerns..... C-18
31 C.1.1.5.15 Socioeconomics and Environmental Justice..... C-19
32 C.1.1.5.16 Cumulative Impact Considerations..... C-19
33 C.1.2 Gillespie..... C-20
34 C.1.2.1 Summary of Potential Impacts Identified in the Draft Solar
35 Programmatic Environmental Impact Statement..... C-20
36 C.1.2.2 Summary of Comments Received..... C-23
37 C.1.2.3 Changes to the SEZ..... C-23
38 C.1.2.4 Wilderness Character Status of SEZ..... C-23
39 C.1.2.5 Additional Data Collection Recommended..... C-23
40 C.1.2.5.1 Lands and Realty..... C-23
41 C.1.2.5.2 Specially Designated Areas and Lands with
42 Wilderness Characteristics..... C-24
43 C.1.2.5.3 Rangeland Resources..... C-24
44 C.1.2.5.4 Recreation..... C-24
45 C.1.2.5.5 Military and Civilian Aviation..... C-24
46 C.1.2.5.6 Geologic Setting and Soil Resources..... C-24

CONTENTS (Cont.)

1			
2			
3			
4		C.1.2.5.7 Minerals	C-24
5		C.1.2.5.8 Water Resources	C-24
6		C.1.2.5.9 Ecological Resources	C-25
7		C.1.2.5.10 Air Quality and Climate.....	C-29
8		C.1.2.5.11 Visual Resources.....	C-30
9		C.1.2.5.12 Acoustic Environment	C-35
10		C.1.2.5.13 Paleontological Resources	C-35
11		C.1.2.5.14 Cultural Resources and Native American	
12		Concerns	C-35
13		C.1.2.5.15 Socioeconomics and Environmental Justice.....	C-36
14		C.1.2.5.16 Cumulative Impact Considerations.....	C-36
15	C.2	California Proposed Solar Energy Zones.....	C-37
16	C.2.1	Imperial East	C-37
17	C.2.1.1	Summary of Potential Impacts Identified in the Draft Solar	
18	C.2.1.1	Programmatic Environmental Impact Statement.....	C-37
19	C.2.1.2	Summary of Comments Received	C-40
20	C.2.1.3	Changes to the SEZ.....	C-40
21	C.2.1.4	Wilderness Character Status of SEZ.....	C-42
22	C.2.1.5	Additional Data Collection Recommended	C-42
23	C.2.1.5.1	Lands and Realty.....	C-42
24	C.2.1.5.2	Specially Designated Areas and Lands with	
25	C.2.1.5.2	Wilderness Characteristics.....	C-42
26	C.2.1.5.3	Rangeland Resources	C-42
27	C.2.1.5.4	Recreation	C-42
28	C.2.1.5.5	Military and Civilian Aviation.....	C-42
29	C.2.1.5.6	Geologic Setting and Soil Resources	C-42
30	C.2.1.5.7	Minerals	C-43
31	C.2.1.5.8	Water Resources	C-43
32	C.2.1.5.9	Ecological Resources	C-44
33	C.2.1.5.10	Air Quality and Climate.....	C-45
34	C.2.1.5.11	Visual Resources.....	C-49
35	C.2.1.5.12	Acoustic Environment	C-49
36	C.2.1.5.13	Paleontological Resources	C-49
37	C.2.1.5.14	Cultural Resources and Native American	
38	C.2.1.5.14	Concerns	C-51
39	C.2.1.5.15	Socioeconomics and Environmental Justice.....	C-52
40	C.2.1.5.16	Cumulative Impact Considerations.....	C-52
41	C.2.2	Riverside East	C-53
42	C.2.2.1	Summary of Potential Impacts Identified in the Draft Solar	
43	C.2.2.1	Programmatic Environmental Impact Statement.....	C-53
44	C.2.2.2	Summary of Comments Received	C-57
45	C.2.2.3	Changes to the SEZ.....	C-58
46	C.2.2.4	Wilderness Character Status of SEZ.....	C-58

CONTENTS (Cont.)

1
2
3
4 C.2.2.5 Additional Data Collection Recommended C-61
5 C.2.2.5.1 Lands and Realty..... C-61
6 C.2.2.5.2 Specially Designated Areas and Lands with
7 Wilderness Characteristics..... C-61
8 C.2.2.5.3 Rangeland Resources C-61
9 C.2.2.5.4 Recreation C-61
10 C.2.2.5.5 Military and Civilian Aviation..... C-61
11 C.2.2.5.6 Geologic Setting and Soil Resources C-61
12 C.2.2.5.7 Minerals C-61
13 C.2.2.5.8 Water Resources C-62
14 C.2.2.5.9 Ecological Resources C-63
15 C.2.2.5.10 Air Quality and Climate..... C-71
16 C.2.2.5.11 Visual Resources..... C-71
17 C.2.2.5.12 Acoustic Environment C-76
18 C.2.2.5.13 Paleontological Resources C-76
19 C.2.2.5.14 Cultural Resources and Native American
20 Concerns C-77
21 C.2.2.5.15 Socioeconomics and Environmental Justice..... C-78
22 C.2.2.5.16 Cumulative Impact Considerations..... C-78
23 C.3 Colorado Proposed Solar Energy Zones C-79
24 C.3.1 Antonito Southeast..... C-79
25 C.3.1.1 Summary of Potential Impacts Identified in the Draft Solar
26 Programmatic Environmental Impact Statement..... C-79
27 C.3.1.2 Summary of Comments Received C-82
28 C.3.1.3 Changes to the SEZ..... C-83
29 C.3.1.4 Wilderness Character Status of SEZ..... C-83
30 C.3.1.5 Additional Data Collection Recommended C-83
31 C.3.1.5.1 Lands and Realty..... C-83
32 C.3.1.5.2 Specially Designated Areas and Lands with
33 Wilderness Characteristics..... C-85
34 C.3.1.5.3 Rangeland Resources C-85
35 C.3.1.5.4 Recreation C-85
36 C.3.1.5.5 Military and Civilian Aviation..... C-85
37 C.3.1.5.6 Geologic Setting and Soil Resources C-85
38 C.3.1.5.7 Minerals C-85
39 C.3.1.5.8 Water Resources C-85
40 C.3.1.5.9 Ecological Resources C-86
41 C.3.1.5.10 Air Quality and Climate..... C-90
42 C.3.1.5.11 Visual Resources..... C-90
43 C.3.1.5.12 Acoustic Environment C-91
44 C.3.1.5.13 Paleontological Resources C-96
45 C.3.1.5.14 Cultural Resources and Native American
46 Concerns C-96

CONTENTS (Cont.)

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46

- C.3.1.5.15 Socioeconomics and Environmental Justice..... C-97
- C.3.1.5.16 Cumulative Impact Considerations..... C-97
- C.3.2 De Tilla Gulch..... C-98
 - C.3.2.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic Environmental Impact Statement..... C-98
 - C.3.2.2 Summary of Comments ReceivedC-101
 - C.3.2.3 Changes to the SEZ.....C-102
 - C.3.2.4 Wilderness Character Status of SEZ.....C-102
 - C.3.2.5 Additional Data Collection RecommendedC-102
 - C.3.2.5.1 Lands and Realty.....C-102
 - C.3.2.5.2 Specially Designated Areas and Lands with Wilderness Characteristics.....C-102
 - C.3.2.5.3 Rangeland ResourcesC-102
 - C.3.2.5.4 RecreationC-104
 - C.3.2.5.5 Military and Civilian Aviation.....C-104
 - C.3.2.5.6 Geologic Setting and Soil ResourcesC-104
 - C.3.2.5.7 MineralsC-104
 - C.3.2.5.8 Water ResourcesC-104
 - C.3.2.5.9 Ecological ResourcesC-105
 - C.3.2.5.10 Air Quality and Climate.....C-106
 - C.3.2.5.11 Visual Resources.....C-108
 - C.3.2.5.12 Acoustic EnvironmentC-111
 - C.3.2.5.13 Paleontological ResourcesC-111
 - C.3.2.5.14 Cultural Resources and Native American ConcernsC-111
 - C.3.2.5.15 Socioeconomics and Environmental Justice.....C-112
 - C.3.2.5.16 Cumulative Impact Considerations.....C-112
- C.3.3 Fourmile East.....C-113
 - C.3.3.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic Environmental Impact Statement.....C-113
 - C.3.3.2 Summary of Comments ReceivedC-116
 - C.3.3.3 Changes to the SEZ.....C-117
 - C.3.3.4 Wilderness Character Status of SEZ.....C-117
 - C.3.3.5 Additional Data Collection RecommendedC-117
 - C.3.3.5.1 Lands and Realty.....C-117
 - C.3.3.5.2 Specially Designated Areas and Lands with Wilderness Characteristics.....C-119
 - C.3.3.5.3 Rangeland ResourcesC-119
 - C.3.3.5.4 RecreationC-119
 - C.3.3.5.5 Military and Civilian Aviation.....C-119
 - C.3.3.5.6 Geologic Setting and Soil ResourcesC-119
 - C.3.3.5.7 MineralsC-119
 - C.3.3.5.8 Water ResourcesC-119

CONTENTS (Cont.)

1
2
3
4 C.3.3.5.9 Ecological ResourcesC-120
5 C.3.3.5.10 Air Quality and Climate.....C-124
6 C.3.3.5.11 Visual Resources.....C-124
7 C.3.3.5.12 Acoustic EnvironmentC-128
8 C.3.3.5.13 Paleontological ResourcesC-128
9 C.3.3.5.14 Cultural Resources and Native American
10 ConcernsC-128
11 C.3.3.5.15 Socioeconomics and Environmental Justice.....C-129
12 C.3.3.5.16 Cumulative Impact Considerations.....C-129
13 C.3.4 Los Mogotes East.....C-130
14 C.3.4.1 Summary of Potential Impacts Identified in the Draft Solar
15 Programmatic Environmental Impact Statement.....C-130
16 C.3.4.2 Summary of Comments ReceivedC-133
17 C.3.4.3 Changes to the SEZ.....C-134
18 C.3.4.4 Wilderness Character Status of SEZ.....C-134
19 C.3.4.5 Additional Data Collection RecommendedC-134
20 C.3.4.5.1 Lands and Realty.....C-134
21 C.3.4.5.2 Specially Designated Areas and Lands with
22 Wilderness Characteristics.....C-134
23 C.3.4.5.3 Rangeland ResourcesC-134
24 C.3.4.5.4 RecreationC-136
25 C.3.4.5.5 Military and Civilian Aviation.....C-136
26 C.3.4.5.6 Geologic Setting and Soil ResourcesC-136
27 C.3.4.5.7 MineralsC-136
28 C.3.4.5.8 Water ResourcesC-136
29 C.3.4.5.9 Ecological ResourcesC-137
30 C.3.4.5.10 Air Quality and Climate.....C-140
31 C.3.4.5.11 Visual Resources.....C-141
32 C.3.4.5.12 Acoustic EnvironmentC-141
33 C.3.4.5.13 Paleontological ResourcesC-145
34 C.3.4.5.14 Cultural Resources and Native American
35 ConcernsC-145
36 C.3.4.5.15 Socioeconomics and Environmental Justice.....C-146
37 C.3.4.5.16 Cumulative Impact Considerations.....C-146
38 C.4 Nevada Proposed Solar Energy Zones.....C-147
39 C.4.1 Amargosa ValleyC-147
40 C.4.1.1 Summary of Potential Impacts Identified in the Draft Solar
41 Programmatic Environmental Impact Statement.....C-147
42 C.4.1.2 Summary of Comments ReceivedC-150
43 C.4.1.3 Changes to the SEZ.....C-151
44 C.4.1.4 Wilderness Character Status of SEZ.....C-153
45 C.4.1.5 Additional Data Collection RecommendedC-153
46 C.4.1.5.1 Lands and Realty.....C-153

CONTENTS (Cont.)

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46

- C.4.1.5.2 Specially Designated Areas and Lands with Wilderness Characteristics.....C-153
- C.4.1.5.3 Rangeland ResourcesC-153
- C.4.1.5.4 RecreationC-153
- C.4.1.5.5 Military and Civilian Aviation.....C-153
- C.4.1.5.6 Geologic Setting and Soil Resources.....C-154
- C.4.1.5.7 MineralsC-154
- C.4.1.5.8 Water ResourcesC-154
- C.4.1.5.9 Ecological ResourcesC-155
- C.4.1.5.10 Air Quality and Climate.....C-159
- C.4.1.5.11 Visual Resources.....C-159
- C.4.1.5.12 Acoustic EnvironmentC-162
- C.4.1.5.13 Paleontological ResourcesC-162
- C.4.1.5.14 Cultural Resources and Native American ConcernsC-162
- C.4.1.5.15 Socioeconomics and Environmental Justice.....C-164
- C.4.1.5.16 Cumulative Impact Considerations.....C-164
- C.4.2 Dry LakeC-166
 - C.4.2.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic Environmental Impact Statement.....C-166
 - C.4.2.2 Summary of Comments ReceivedC-169
 - C.4.2.3 Changes to the SEZ.....C-169
 - C.4.2.4 Wilderness Character Status of SEZ.....C-171
 - C.4.2.5 Additional Data Collection RecommendedC-171
 - C.4.2.5.1 Lands and Realty.....C-171
 - C.4.2.5.2 Specially Designated Areas and Lands with Wilderness Characteristics.....C-171
 - C.4.2.5.3 Rangeland ResourcesC-171
 - C.4.2.5.4 RecreationC-171
 - C.4.2.5.5 Military and Civilian Aviation.....C-172
 - C.4.2.5.6 Geologic Setting and Soil Resources.....C-172
 - C.4.2.5.7 MineralsC-172
 - C.4.2.5.8 Water ResourcesC-172
 - C.4.2.5.9 Ecological ResourcesC-173
 - C.4.2.5.10 Air Quality and Climate.....C-179
 - C.4.2.5.11 Visual Resources.....C-180
 - C.4.2.5.12 Acoustic EnvironmentC-184
 - C.4.2.5.13 Paleontological ResourcesC-184
 - C.4.2.5.14 Cultural Resources and Native American ConcernsC-184
 - C.4.2.5.15 Socioeconomics and Environmental Justice.....C-186
 - C.4.2.5.16 Cumulative Impact Considerations.....C-186

CONTENTS (Cont.)

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46

- C.4.3 Dry Lake Valley NorthC-187
 - C.4.3.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic Environmental Impact StatementC-187
 - C.4.3.2 Summary of Comments ReceivedC-190
 - C.4.3.3 Changes to the SEZ.....C-191
 - C.4.3.4 Wilderness Character Status of SEZ.....C-191
 - C.4.3.5 Additional Data Collection RecommendedC-191
 - C.4.3.5.1 Lands and Realty.....C-191
 - C.4.3.5.2 Specially Designated Areas and Lands with Wilderness CharacteristicsC-191
 - C.4.3.5.3 Rangeland ResourcesC-191
 - C.4.3.5.4 RecreationC-193
 - C.4.3.5.5 Military and Civilian Aviation.....C-193
 - C.4.3.5.6 Geologic Setting and Soil ResourcesC-193
 - C.4.3.5.7 MineralsC-193
 - C.4.3.5.8 Water ResourcesC-193
 - C.4.3.5.9 Ecological ResourcesC-195
 - C.4.3.5.10 Air Quality and Climate.....C-196
 - C.4.3.5.11 Visual Resources.....C-196
 - C.4.3.5.12 Acoustic EnvironmentC-202
 - C.4.3.5.13 Paleontological ResourcesC-202
 - C.4.3.5.14 Cultural Resources and Native American ConcernsC-202
 - C.4.3.5.15 Socioeconomics and Environmental Justice.....C-203
 - C.4.3.5.16 Cumulative Impact Considerations.....C-203
- C.4.4 Gold PointC-204
 - C.4.4.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic Environmental Impact StatementC-204
 - C.4.4.2 Summary of Comments ReceivedC-207
 - C.4.4.3 Changes to the SEZ.....C-207
 - C.4.4.4 Wilderness Character Status of SEZ.....C-209
 - C.4.4.5 Additional Data Collection RecommendedC-209
 - C.4.4.5.1 Lands and Realty.....C-209
 - C.4.4.5.2 Specially Designated Areas and Lands with Wilderness CharacteristicsC-209
 - C.4.4.5.3 Rangeland ResourcesC-209
 - C.4.4.5.4 RecreationC-209
 - C.4.4.5.5 Military and Civilian Aviation.....C-209
 - C.4.4.5.6 Geologic Setting and Soil ResourcesC-209
 - C.4.4.5.7 MineralsC-210
 - C.4.4.5.8 Water ResourcesC-210
 - C.4.4.5.9 Ecological ResourcesC-211
 - C.4.4.5.10 Air Quality and Climate.....C-215

CONTENTS (Cont.)

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46

	C.4.4.5.11	Visual Resources.....	C-215
	C.4.4.5.12	Acoustic Environment	C-218
	C.4.4.5.13	Paleontological Resources	C-218
	C.4.4.5.14	Cultural Resources and Native American Concerns	C-218
	C.4.4.5.15	Socioeconomics and Environmental Justice.....	C-220
	C.4.4.5.16	Cumulative Impact Considerations.....	C-221
C.4.5	Millers.....		C-222
	C.4.5.1	Summary of Potential Impacts Identified in the Draft Solar Programmatic Environmental Impact Statement.....	C-222
	C.4.5.2	Summary of Comments Received	C-225
	C.4.5.3	Changes to the SEZ.....	C-225
	C.4.5.4	Wilderness Character Status of SEZ.....	C-225
	C.4.5.5	Additional Data Collection Recommended	C-227
	C.4.5.5.1	Lands and Realty.....	C-227
	C.4.5.5.2	Specially Designated Areas and Lands with Wilderness Characteristics.....	C-227
	C.4.5.5.3	Rangeland Resources	C-227
	C.4.5.5.4	Recreation	C-227
	C.4.5.5.5	Military and Civilian Aviation.....	C-227
	C.4.5.5.6	Geologic Setting and Soil Resources	C-227
	C.4.5.5.7	Minerals	C-227
	C.4.5.5.8	Water Resources	C-228
	C.4.5.5.9	Ecological Resources	C-229
	C.4.5.5.10	Air Quality and Climate.....	C-230
	C.4.5.5.11	Visual Resources.....	C-230
	C.4.5.5.12	Acoustic Environment	C-235
	C.4.5.5.13	Paleontological Resources	C-235
	C.4.5.5.14	Cultural Resources and Native American Concerns	C-235
	C.4.5.5.15	Socioeconomics and Environmental Justice.....	C-238
	C.4.5.5.16	Cumulative Impact Considerations.....	C-238
C.5	New Mexico Proposed Solar Energy Zones		C-239
	C.5.1	Afton	C-239
	C.5.1.1	Summary of Potential Impacts Identified in the Draft Solar Programmatic Environmental Impact Statement.....	C-239
	C.5.1.2	Summary of Comments Received	C-242
	C.5.1.3	Changes to the SEZ.....	C-243
	C.5.1.4	Wilderness Character Status of SEZ.....	C-245
	C.5.1.5	Additional Data Collection Recommended	C-245
	C.5.1.5.1	Lands and Realty.....	C-245
	C.5.1.5.2	Specially Designated Areas and Lands with Wilderness Characteristics.....	C-245

CONTENTS (Cont.)

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46

	C.5.1.5.3	Rangeland Resources	C-245
	C.5.1.5.4	Recreation	C-245
	C.5.1.5.5	Military and Civilian Aviation.....	C-245
	C.5.1.5.6	Geologic Setting and Soil Resources.....	C-246
	C.5.1.5.7	Minerals	C-246
	C.5.1.5.8	Water Resources	C-246
	C.5.1.5.9	Ecological Resources	C-247
	C.5.1.5.10	Air Quality and Climate.....	C-252
	C.5.1.5.11	Visual Resources.....	C-252
	C.5.1.5.12	Acoustic Environment	C-266
	C.5.1.5.13	Paleontological Resources	C-266
	C.5.1.5.14	Cultural Resources and Native American Concerns	C-266
	C.5.1.5.15	Socioeconomics and Environmental Justice.....	C-268
	C.5.1.5.16	Cumulative Impact Considerations.....	C-268
C.6	Utah Proposed Solar Energy Zones		C-269
C.6.1	Escalante Valley.....		C-269
C.6.1.1	Summary of Potential Impacts Identified in the Draft Solar Programmatic Environmental Impact Statement.....		C-269
C.6.1.2	Summary of Comments Received		C-271
C.6.1.3	Changes to the SEZ.....		C-272
C.6.1.4	Wilderness Character Status of SEZ.....		C-272
C.6.1.5	Additional Data Collection Recommended		C-272
C.6.1.5.1	Lands and Realty.....		C-272
C.6.1.5.2	Specially Designated Areas and Lands with Wilderness Characteristics.....		C-272
C.6.1.5.3	Rangeland Resources		C-274
C.6.1.5.4	Recreation		C-274
C.6.1.5.5	Military and Civilian Aviation.....		C-274
C.6.1.5.6	Geologic Setting and Soil Resources.....		C-274
C.6.1.5.7	Minerals		C-274
C.6.1.5.8	Water Resources		C-274
C.6.1.5.9	Ecological Resources		C-275
C.6.1.5.10	Air Quality and Climate.....		C-280
C.6.1.5.11	Visual Resources.....		C-280
C.6.1.5.12	Acoustic Environment		C-281
C.6.1.5.13	Paleontological Resources		C-281
C.6.1.5.14	Cultural Resources and Native American Concerns		C-281
C.6.1.5.15	Socioeconomics and Environmental Justice.....		C-284
C.6.1.5.16	Cumulative Impact Considerations.....		C-284

CONTENTS (Cont.)

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46

C.6.2 Milford Flats South.....C-285

 C.6.2.1 Summary of Potential Impacts Identified in the Draft Solar
 Programmatic Environmental Impact Statement.....C-285

 C.6.2.2 Summary of Comments ReceivedC-287

 C.6.2.3 Changes to the SEZ.....C-288

 C.6.2.4 Wilderness Character Status of SEZ.....C-288

 C.6.2.5 Additional Data Collection RecommendedC-288

 C.6.2.5.1 Lands and Realty.....C-288

 C.6.2.5.2 Specially Designated Areas and Lands with
 Wilderness Characteristics.....C-290

 C.6.2.5.3 Rangeland ResourcesC-290

 C.6.2.5.4 RecreationC-290

 C.6.2.5.5 Military and Civilian Aviation.....C-290

 C.6.2.5.6 Geologic Setting and Soil ResourcesC-290

 C.6.2.5.7 MineralsC-290

 C.6.2.5.8 Water ResourcesC-290

 C.6.2.5.9 Ecological ResourcesC-291

 C.6.2.5.10 Air Quality and Climate.....C-296

 C.6.2.5.11 Visual Resources.....C-296

 C.6.2.5.12 Acoustic EnvironmentC-298

 C.6.2.5.13 Paleontological ResourcesC-298

 C.6.2.5.14 Cultural Resources and Native American
 ConcernsC-298

 C.6.2.5.15 Socioeconomics and Environmental Justice.....C-301

 C.6.2.5.16 Cumulative Impact Considerations.....C-301

C.6.3 Wah Wah Valley.....C-302

 C.6.3.1 Summary of Potential Impacts Identified in the Draft Solar
 Programmatic Environmental Impact Statement.....C-302

 C.6.3.2 Summary of Comments ReceivedC-305

 C.6.3.3 Changes to the SEZ.....C-305

 C.6.3.4 Wilderness Character Status of SEZ.....C-305

 C.6.3.5 Additional Data Collection RecommendedC-307

 C.6.3.5.1 Lands and Realty.....C-307

 C.6.3.5.2 Specially Designated Areas and Lands with
 Wilderness Characteristics.....C-307

 C.6.3.5.3 Rangeland ResourcesC-307

 C.6.3.5.4 RecreationC-307

 C.6.3.5.5 Military and Civilian Aviation.....C-307

 C.6.3.5.6 Geologic Setting and Soil ResourcesC-307

 C.6.3.5.7 MineralsC-307

 C.6.3.5.8 Water ResourcesC-308

 C.6.3.5.9 Ecological ResourcesC-309

 C.6.3.5.10 Air Quality and Climate.....C-313

CONTENTS (Cont.)

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46

- C.6.3.5.11 Visual Resources.....C-313
- C.6.3.5.12 Acoustic EnvironmentC-316
- C.6.3.5.13 Paleontological ResourcesC-316
- C.6.3.5.14 Cultural Resources and Native American
ConcernsC-317
- C.6.3.5.15 Socioeconomics and Environmental Justice.....C-319
- C.6.3.5.16 Cumulative Impact Considerations.....C-319
- C.7 General Additional Analysis Requirements for SEZsC-321
 - C.7.1 Revised Transmission AnalysisC-321
 - C.7.1.1 General Information.....C-321
 - C.7.1.2 Factors Limiting Predictability of Future Transmission
Needs for the SEZs Assessed in the Solar PEISC-322
 - C.7.1.3 Proposed Methodology for SEZ-Specific Transmission
Analyses for the Final Solar PEISC-324
 - C.7.1.3.1 Methodology for Identifying Likely Load Areas....C-326
 - C.7.1.3.2 Transmission Analysis MethodologiesC-330
 - C.7.1.4 Test Case Transmission Analysis for the Proposed Brenda
SEZC-332
 - C.7.2 Water Resources Action PlanC-339
 - C.7.2.1 Planning-Level Inventory of Water Resources.....C-339
 - C.7.2.2 Floodplain DeterminationsC-340
 - C.7.2.3 Jurisdictional Waters DeterminationsC-341
 - C.7.2.4 Significant Ephemeral Waters Determinations.....C-341
 - C.7.2.5 Long-Term Monitoring ProgramsC-342
 - C.7.2.5.1 Stakeholder Monitoring CommitteeC-342
 - C.7.2.5.2 Surface Water and Groundwater MonitoringC-342
 - C.7.2.6 Modification of Design FeaturesC-342
 - C.7.2.7 Groundwater Analyses.....C-343
 - C.7.3 Visual Resource Design Features for Select SEZsC-343
- C.8 References.....C-345

FIGURES

- C.1.1-1 Proposed Brenda SEZ as Presented in the Draft Solar PEIS C-4
- C.1.1-2 Proposed Brenda SEZ as Described in this Supplement C-7
- C.1.2-1 Proposed Gillespie SEZ as Presented in the Draft Solar PEIS C-21
- C.2.1-1 Proposed Imperial East SEZ as Presented in the Draft Solar PEIS C-38

FIGURES (Cont.)

1
2
3
4 C.2.1-2 Proposed Imperial East SEZ as Described in this Supplement..... C-41
5
6 C.2.2-1 Proposed Riverside East SEZ as Presented in the Draft Solar PEIS C-54
7
8 C.2.2-2 Proposed Riverside East SEZ as Described in this Supplement..... C-59
9
10 C.2.2-3 Area within the Proposed Riverside East SEZ with Wilderness Characteristics.... C-60
11
12 C.3.1-1 Proposed Antonito Southeast SEZ as Presented in the Draft Solar PEIS C-80
13
14 C.3.1-2 Proposed Antonito Southeast SEZ as Described in this Supplement C-84
15
16 C.3.2-1 Proposed De Tilla Gulch SEZ as Presented in the Draft Solar PEIS..... C-99
17
18 C.3.2 -2 Proposed De Tilla Gulch SEZ as Described in this SupplementC-103
19
20 C.3.3-1 Proposed Fourmile East SEZ as Presented in the Draft Solar PEISC-114
21
22 C.3.3-2 Proposed Fourmile East SEZ as Described in this SupplementC-118
23
24 C.3.4-1 Proposed Los Mogotes East SEZ as Presented in the Draft Solar PEIS.....C-131
25
26 C.3.4-2 Proposed Los Mogotes East SEZ as Described in this SupplementC-135
27
28 C.4.1-1 Proposed Amargosa Valley SEZ as Presented in the Draft Solar PEISC-148
29
30 C.4.1-2 Proposed Amargosa Valley SEZ as Described in this Supplement.....C-152
31
32 C.4.2-1 Proposed Dry Lake SEZ as Presented in the Draft Solar PEISC-167
33
34 C.4.2-2 Proposed Dry Lake SEZ as Described in this Supplement.....C-170
35
36 C.4.3-1 Proposed Dry Lake Valley North SEZ as Presented in the Draft Solar PEISC-188
37
38 C.4.3-2 Proposed Dry Lake Valley North SEZ as Described in this Supplement.....C-192
39
40 C.4.4-1 Proposed Gold Point SEZ as Presented in the Draft Solar PEISC-205
41
42 C.4.4-2 Proposed Gold Point SEZ as Described in this Supplement.....C-208
43
44 C.4.5-1 Proposed Millers SEZ as Presented in the Draft Solar PEISC-223
45
46 C.4.5-2 Proposed Millers SEZ as Described in this SupplementC-226

FIGURES (Cont.)

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46

C.5.1-1 Proposed Afton SEZ as Presented in the Draft Solar PEISC-240

C.5.1-2 Proposed Afton SEZ as Described in this Supplement.....C-244

C.6.1-1 Proposed Escalante Valley SEZ as Presented in the Draft Solar PEIS.....C-270

C.6.1-2 Proposed Escalante Valley SEZ as Described in this SupplementC-273

C.6.2-1 Proposed Milford Flats South SEZ as Presented in the Draft Solar PEISC-286

C.6.2-2 Proposed Milford Flats South SEZ as Described in this SupplementC-289

C.6.3-1 Proposed Wah Wah Valley SEZ as Presented in the Draft Solar PEISC-303

C.6.3-2 Proposed Wah Wah Valley SEZ as Described in this SupplementC-306

TABLES

C-1 Summary of Changes for SEZs Being Carried Forward C-2

C.1.1-1 Special Status Species That May Occur in the Vicinity of the Proposed
Brenda SEZ..... C-11

C.1.1-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi
Viewshed of the Proposed Brenda SEZ C-14

C.1.2-1 Special Status Species That May Occur in the Vicinity of the Proposed
Gillespie SEZ..... C-27

C.1.2-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi
Viewshed of the Proposed Gillespie SEZ..... C-31

C.2.1-1 Special Status Species That May Occur near the Proposed Imperial
East SEZ C-46

C.2.1-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi
Viewshed of the Proposed Imperial East SEZ..... C-50

C.2.2-1 Special Status Species That May Occur near the Proposed Riverside
East SEZ C-65

TABLES (Cont.)

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46

C.2.2-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi Viewshed of the Proposed Riverside East SEZ..... C-72

C.3.1-1 Special Status Species That May Occur in the Vicinity of the Proposed Antonito Southeast SEZ C-88

C.3.1-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi Viewshed of the Proposed Antonito Southeast SEZ C-92

C.3.2-1 Special Status Species That May Occur in the Vicinity of the Proposed De Tilla Gulch SEZC-107

C.3.2-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi Viewshed of the Proposed De Tilla Gulch SEZC-109

C.3.3-1 Special Status Species That May Occur in the Vicinity of the Proposed Fourmile East SEZ.....C-122

C.3.3-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi Viewshed of the Proposed Fourmile East SEZC-125

C.3.4-1 Special Status Species That May Occur in the Vicinity of the Proposed Los Mogotes East SEZC-139

C.3.4-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi Viewshed of the Proposed Los Mogotes East SEZC-142

C.4.1-1 Special Status Species That May Occur in the Vicinity of the Proposed Amargosa Valley SEZC-157

C.4.1-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi Viewshed of the Proposed Amargosa Valley SEZC-160

C.4.2-1 Special Status Species That May Occur in the Vicinity of the Proposed Dry Lake SEZ.....C-175

C.4.2-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi Viewshed of the Proposed Dry Lake SEZ.....C-181

C.4.3-1 Special Status Species That May Occur near the Proposed Dry Lake Valley North SEZ.....C-197

TABLES (Cont.)

1

2

3

4 C.4.3-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi
5 Viewshed of the Proposed Dry Lake Valley North SEZ.....C-200

6

7 C.4.4-1 Special Status Species That May Occur in the Vicinity of the Proposed
8 Gold Point SEZ.....C-212

9

10 C.4.4-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi
11 Viewshed of the Proposed Gold Point SEZ.....C-216

12

13 C.4.5-1 Special Status Species That May Occur in the Vicinity of the Proposed
14 Millers SEZ.....C-231

15

16 C.4.5-2 Summary of Potential Visual Impacts on SVLs within the 25-mi Viewshed
17 of the Proposed Millers SEZC-234

18

19 C.5.1-1 Special Status Species That May Occur in the Vicinity of the Proposed
20 Afton SEZ.....C-249

21

22 C.5.1-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi
23 Viewshed of the Proposed Afton SEZ.....C-254

24

25 C.6.1-1 Special Status Species That May Occur in the Vicinity of the Proposed
26 Escalante Valley SEZC-277

27

28 C.6.2-1 Special Status Species That May Occur in the Vicinity of the Proposed
29 Milford Flats South SEZ.....C-293

30

31 C.6.2-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi
32 Viewshed of the Milford Flats South SEZC-297

33

34 C.6.3-1 Special Status Species That May Occur in the Vicinity of the Proposed
35 Wah Wah Valley SEZC-310

36

37 C.6.3-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi
38 Viewshed of the Proposed Wah Wah Valley SEZC-314

39

40 C.7-1 Potential Transmission Schemes, Estimated Solar Markets, and Distances
41 to Load Areas for the Brenda SEZC-334

42

43 C.7-2 Comparison of Potential Transmission Lines with Respect to Net Present
44 Value.....C-335

45

46

TABLES (Cont.)

1
2
3
4
5
6
7
8
9
10
11
12
13

C.7-3	Comparison of the Various Transmission Line Configurations with Respect to Land Use Requirements	C-336
C.7-4	Estimated Spare Capacity on Existing Lines from the Proposed Brenda SEZ to Phoenix and San Diego	C-338
C.7-5	Estimated Spare Capacity on Existing Lines from the Proposed Brenda SEZ to the Los Angeles Area	C-338

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45

APPENDIX C:

ACTION PLANS FOR SOLAR ENERGY ZONES TO BE CARRIED FORWARD¹

Following completion of the Draft Solar Programmatic Environmental Impact Statement (PEIS), the U.S. Department of the Interior Bureau of Land Management (BLM) has reviewed public comments on the proposed solar energy zones (SEZs) and conducted some additional analysis. As a result, the BLM has decided to drop some SEZs from further consideration as part of the Solar PEIS (see Appendix B of this Supplement). The BLM has also decided to adjust the boundaries of some SEZs that will be carried forward in the Solar PEIS and to identify, as necessary, appropriate non-development areas within SEZs. A summary of proposed changes for the SEZs being carried forward is provided in Table C-1.

The Solar PEIS provides in-depth data collection and environmental analysis for proposed SEZs. The primary purpose of this rigorous analysis is to provide documentation from which the BLM can tier future project authorizations, thereby limiting the required scope and effort of project-specific National Environmental Policy Act of 1969 (NEPA) analyses in these areas. As requested by commentors on the Draft Solar PEIS, the BLM is committed to collecting additional SEZ-specific resource data and conducting additional analysis in order to more effectively facilitate future development in SEZs. Note that additional data and analysis will help facilitate development in SEZs but is not required to identify an area as an SEZ as part of the BLM's Solar Energy Program (see Supplement Section 1.5.1).

The BLM has developed action plans for each SEZ that it has decided to carry forward in the Final Solar PEIS; these action plans are presented by state in Sections C.1 through C.6 of this appendix. Section C.7 presents additional analyses generally applicable to all of the SEZs. Section C.7.1 presents a methodology for a proposed revised transmission analyses for all of the SEZs; Section C.7.2 presents a proposed water resources action plan for all of the SEZs; and Section C.7.3 presents revised mitigation measures to address visual resource impacts that would be applicable to some of the SEZs.

Action plans describe data gaps for individual SEZs and propose data sources and methods for collecting additional data. The BLM will prioritize the collection of additional data and analysis in those SEZs that are most likely to be developed in the near future. Some of the items identified in the action plans will be completed by the BLM and presented in the Final Solar PEIS. Data collection not completed by the BLM (as part of the Final Solar PEIS or through other efforts) would likely be required of developers as part of site-specific tiered analysis for future projects.

Data relative to SEZs going forward will be verified and updated as needed prior to the Final Solar PEIS. New information and updated impact analyses resulting from changes in the SEZs described in the sections below will also be presented in the Final Solar PEIS. For example, new viewshed analyses will be run based on the revised boundaries and proposed technology limitations for the SEZs, and impacts on grazing allotments will be updated.

¹ In this appendix, acronyms are defined in each subsection to facilitate use of the subsections as individual resources.

1 **TABLE C-1 Summary of Changes for SEZs Being Carried Forward**

State	SEZ	Area from Draft PEIS (acres)	Revised Area To Be Carried Forward (acres)	Revised Developable Area (acres)	Rationale for Changes
Arizona	Brenda	3,878	No change	3,847	Bouse Wash
	Gillespie	2,618	No change	2,618	NA ^a
California	Imperial East	5,722	No change	5,717	Wetland
	Riverside East	202,896	159,457	147,910	Intermittent lake, major washes, areas identified through approved projects, Joshua Tree National Park, wildlife migration corridor/linkage area
Colorado	Antonito	9,729	No change	9,712	Wetland, lake
	Southeast				
	De Tilla Gulch	1,522	1,064	1,064	Wildlife, Scenic Byway
	Fourmile East	3,882	2,883	2,882	Cultural resources, Scenic Byway, National Historic Trail, wildlife, riparian habitat
	Los Mogotes East	5,918	2,650	2,650	Cultural resources, grazing allotments, riparian area, wildlife, special status species
Nevada	Amargosa Valley	31,625	9,737	8,479	Death Valley National Park, desert tortoise, floodplain
	Dry Lake	15,649	6,186	5,717	Floodplain, wetland, wildlife corridor/linkage area
	Dry Lake Valley North	76,874	28,726	25,069	Sage-grouse, grazing, wetlands/playa
	Gold Point	4,810	No change	4,596	Intermittent stream
	Millers	16,787	No change	16,534	Washes and dry lake areas
New Mexico	Afton	77,623	30,706	29,964	Focus development along existing Section 368 corridor, floodplain, dry lakes
Utah	Escalante Valley	6,614	No change	6,533	Dry lake, dune area
	Milford Flats South	6,480	No change	6,252	Minersville Canal
	Wah Wah Valley	6,097	No change	5,873	Wah Wah wash
Total		677,384		285,417	

^a NA = not applicable.

2
3

1 **C.1 ARIZONA PROPOSED SOLAR ENERGY ZONES**

2
3
4 **C.1.1 Brenda**

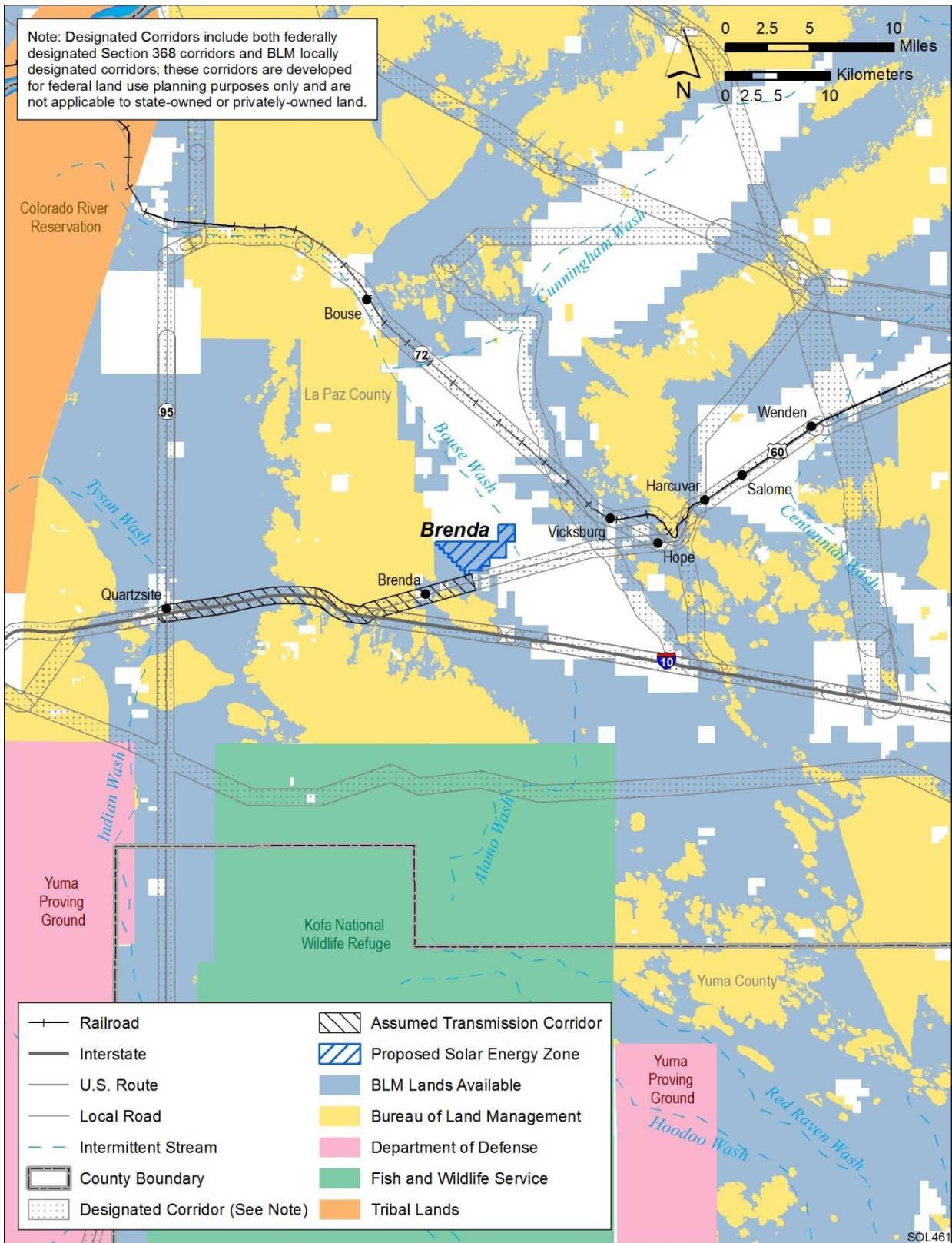
5
6
7 **C.1.1.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic**
8 **Environmental Impact Statement (PEIS)**
9

10 The proposed Brenda solar energy zone (SEZ), as presented in the Draft Solar PEIS, had
11 a total area of 3,878 acres (16 km²). It is located in La Paz County in west-central Arizona
12 (Figure C.1.1-1). The towns of Quartzsite and Salome in La Paz County are about 18 mi (29 km)
13 west of, and 18 mi (29 km) east of, the SEZ, respectively.
14

15 The Draft Solar PEIS identified a 161-kV transmission line 19 mi (31 km) west of the
16 SEZ as the nearest point for connection of the SEZ to the grid. Updated data indicate that a
17 500-kV transmission line exists 12 mi (19 km) from the SEZ. Details on the revised transmission
18 impact assessment to be included in the Final Solar PEIS are provided in Section C.7.1 of this
19 appendix. Analysis of transmission lines and/or access roads will be completed, as necessary, as
20 part of the project-specific environmental reviews (see Section 2.2.2.2.2 of this Supplement).
21

22 Potential adverse impacts identified in the Draft Solar PEIS included the following:

- 23 • Seven specially designated areas within 25 mi (40 km) could be affected by
24 solar energy development.
- 25 • Potential loss of 353 animal unit months in the Crowder-Weisser allotment.
- 26 • Potential loss of recreational use in the adjacent Plomosa Special Recreation
27 Management Area (SRMA), Kofa and New Water Wilderness Areas (WAs),
28 and Dripping Springs Area of Critical Environmental Concern (ACEC).
- 29 • Any development on the SEZ that exceeds 250 ft (76 m) could interfere with
30 military operations in three military training routes that cross the area.
- 31 • Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil
32 erosion and deposition by wind and runoff, sedimentation, and soil
33 contamination) could occur.
- 34 • Groundwater use would deplete the aquifer to the extent that, at a minimum,
35 wet-cooling options would not be feasible.
- 36 • Clearing of a large portion of the proposed SEZ could adversely affect dry
37 wash, dry wash woodland, chenopod scrub habitats, and saguaro cactus
38 communities, depending on the amount of available habitat disturbed. The
39
40
41
42
43
44
45
46



1

2 **FIGURE C.1.1-1 Proposed Brenda SEZ as Presented in the Draft Solar PEIS (Note: Assumed**

3 **transmission corridor from the Draft Solar PEIS is no longer applicable.)**

1 establishment of noxious weeds could result in habitat degradation.
2 Deposition of fugitive dust could cause reduced productivity or changes in
3 plant community structure.
4

- 5 • Potentially suitable habitat for 20 special status species and more than
6 125 wildlife species occurs in the affected area of the proposed SEZ; less than
7 1% of the potentially suitable habitat for any of these species occurs in the
8 region that would be directly affected by development.
9
- 10 • If aquatic biota are present, they could be affected by the direct removal of
11 these surface water features within the construction footprint. If present,
12 aquatic biota could also be affected by a decline in habitat quantity and quality
13 because of water withdrawals and changes in drainage patterns, as well as
14 increased sediment and contaminant inputs associated with ground
15 disturbance and construction activities.
16
- 17 • Temporary exceedances of ambient air quality standards for particulate matter
18 at the SEZ boundaries are possible during construction; however, these high
19 concentrations would be limited to the immediate area surrounding the SEZ
20 boundary.
21
- 22 • Although the SEZ is in an area of low scenic quality, weak to strong visual
23 contrasts could be observed by visitors to the Plomosa SRMA and residents of
24 Brenda, Hope, and Vicksburg. Strong visual contrasts could be expected for
25 travelers on U.S. 60 and Interstate-10 (I-10).
26
- 27 • During operations, noise levels at the nearest residences would be higher
28 than the U.S. Environmental Protection Agency (EPA) guideline level if
29 concentrating solar power facilities with energy storage technologies
30 (which could extend the daily operational time by 6 hours or more) were
31 used at the SEZ.
32
- 33 • The potential for impacts on significant paleontological and cultural resources
34 is unknown, although the SEZ has the potential for containing prehistoric sites
35 and historic resources. There may be Native American concerns about the
36 potential visual effects of solar energy development within the SEZ on the
37 landscape.
38
- 39 • Minority and low-income populations occur within a 50-mi (80-km) radius of
40 the proposed SEZ boundary; thus adverse impacts of solar development could
41 disproportionately affect minority and low-income populations.
42
43
44

1 **C.1.1.2 Summary of Comments Received**
2

3 Most of the comments received on the proposed Brenda SEZ were in favor of identifying
4 the area as an SEZ in the applicable land use plan if the design features for water use are
5 followed (The Wilderness Society et al.,² Sierra Club, and Tonopah Area Coalition). The
6 Wilderness Society also recommended that soils and desert pavement be left in place and that
7 washes in the northwestern and northeastern portion of the SEZ be avoided. The Tonopah Area
8 Coalition suggested moving the western boundary to the east to avoid a significant wash and
9 recommended low water use to avoid subsidence. The Arizona Department of Environmental
10 Quality indicated that air emissions would be acceptable if the mitigation measures specified are
11 implemented.
12

13
14 **C.1.1.3 Changes to the SEZ**
15

16 No boundary revisions were identified for the proposed SEZ. However, areas specified
17 for non-development under SEZ-specific design features were mapped, where data were
18 available. For the proposed Brenda SEZ, 31 acres (0.13 km²) of the Bouse Wash in the
19 northeastern portion of the SEZ were identified as non-development areas (see Figure C.1.1-2).
20 The remaining developable area within the SEZ is 3,847 acres (15.6 km²).
21

22
23 **C.1.1.4 Wilderness Character Status of SEZ**
24

25 A recently maintained inventory of wilderness characteristics was used to determine
26 whether public lands within the Brenda SEZ have wilderness characteristics. The finding of this
27 inventory was that these lands do not contain wilderness characteristics.
28
29

30 **C.1.1.5 Additional Data Collection Recommended**
31

32
33 **C.1.1.5.1 Lands and Realty**
34

35 None.
36
37

38 **C.1.1.5.2 Specially Designated Areas and Lands with Wilderness Characteristics**
39

40 None.
41

² The Wilderness Society, Sonoran Institute, Sierra Club—Grand Canyon Chapter, Arizona Wilderness Coalition, Tucson Audubon Society, Friends of Ironwood Forest, Defenders of Wildlife, Sky Island Alliance, Grand Canyon Wildlands Council, Soda Mountains Wilderness Council, and Sierra Treks submitted joint comments on the proposed Arizona SEZs. Those comments are attributed to The Wilderness Society et al.

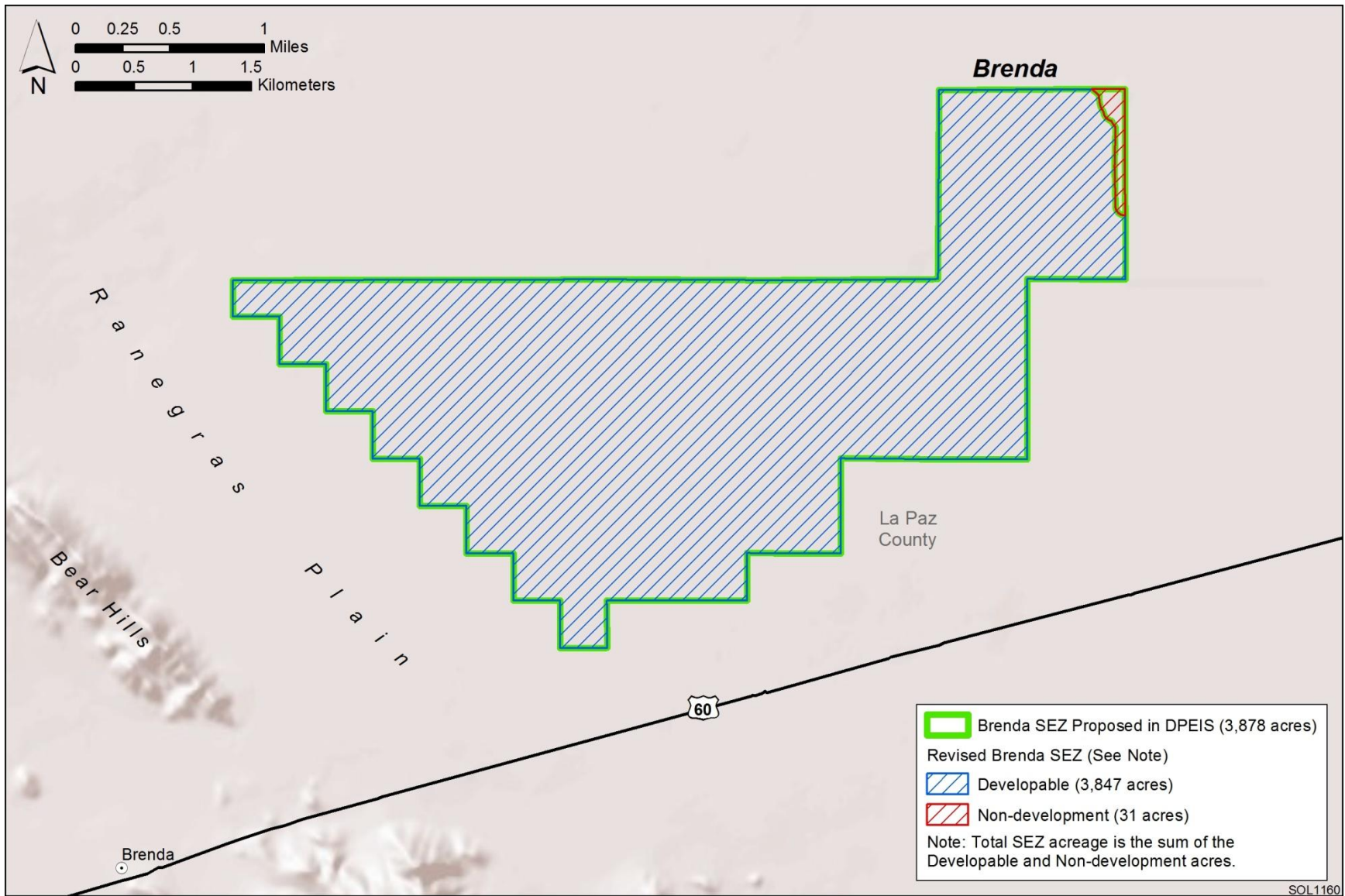


FIGURE C.1.1-2 Proposed Brenda SEZ as Described in this Supplement

1 **C.1.1.5.3 Rangeland Resources**

2
3
4 *Livestock Grazing.* None.

5
6
7 *Wild Horses and Burros.* None.

8
9
10 **C.1.1.5.4 Recreation**

11
12 The U.S. Department of the Interior Bureau of Land Management (BLM) will conduct a
13 review to determine whether the portion of the SEZ on the west side of the county road should be
14 identified as a non-development area to reduce impacts on the Plomosa SRMA.

15
16
17 **C.1.1.5.5 Military and Civilian Aviation**

18
19 The BLM will continue to consult with the U.S. Department of Defense regarding
20 potential issues with military training routes.

21
22
23 **C.1.1.5.6 Geologic Setting and Soil Resources**

24
25 None.

26
27
28 **C.1.1.5.7 Minerals**

29
30 Additional information on leasable and strategic minerals in the vicinity of the proposed
31 SEZ will be provided in the Final Solar PEIS to inform the Department of the Interior's decision
32 on a proposed 20-year withdrawal of SEZ lands.

33
34
35 **C.1.1.5.8 Water Resources**

36
37 The following additional data and actions would help further characterize potential
38 impacts on water resources for the proposed Brenda SEZ. A more detailed discussion of each of
39 these activities is included in the water resources action plan provided in Section C.7.2 of this
40 appendix.

- 41
42
 - 43 • Prepare a planning-level water resources inventory of the Renegras Plain Basin.
 - 44
 - 45 • Identify additional ephemeral stream channels and alluvial fan features for
 - 46 non-development areas through consultation with BLM Arizona, Arizona

1 Game and Fish Department (AZGFD), EPA, and U.S. Army Corps of
2 Engineers (USACE) with a focus on:

- 3 – Alluvial fans and ephemeral wash features surrounding the eastern faces
4 of the Plomosa Mountains and the Bear Hills (potential non-development
5 areas; potentially important ecologically), and
6 – Bouse Wash.

- 7
- 8 • Perform field surveys and hydrologic analyses to support jurisdictional water
9 determinations and floodplain identifications. Tasks include:

- 10 – Surveying select stream channels and alluvial fan features for elevations,
11 high water marks, sediment conditions, and
12 – Conducting hydrologic rainfall-runoff-routing analyses to identify
13 100-year floodplain areas.

- 14
- 15 • Coordinate with the USACE (Los Angeles District) regarding jurisdictional
16 water determinations for the SEZ. Water features to be considered include:
17 – Bouse Wash and its tributaries.

- 18
- 19 • Identify 100-year floodplain non-development areas (if they exist) for Bouse
20 Wash. This task would require coordination with the Federal Emergency
21 Management Agency and the following agencies:

- 22 – Arizona Department of Water Resources (Flood Mitigation Section), and
23 – La Paz County.

- 24
- 25 • Describe the formation of a stakeholder committee to conduct long-term
26 monitoring of water resources. This activity would entail:

- 27 – Identifying key stakeholder agencies,
28 – Discussing general features of a monitoring program,
29 – Providing recommendations for surface monitoring of ephemeral stream
30 networks, and
31 – Working with the U.S. Geological Survey to develop groundwater
32 monitoring well design and numerical groundwater models.

- 33
- 34 • Develop a simple, numerical groundwater model for the Renegras Plain Basin
35 to evaluate the potential impacts of full build-out. This activity would entail:

- 36 – Assessing the potential for drawdown impacts on the basin, which is
37 already in overdraft, including the potential for land subsidence.

38

39

40 **C.1.1.5.9 Ecological Resources**

41

42

43 *Vegetation and Plant Communities.* The following additional data-gathering actions
44 would help further characterize potential impacts on vegetation and plant communities for the
45 proposed Brenda SEZ:
46

- 1 • Identify and map the location and areal extent of desert dry wash, dry wash
2 woodland, and chenopod scrub habitats within the SEZ. Identify and map the
3 location and areal extent of these habitats, as well as mesquite bosque, outside
4 the SEZ that may be affected by hydrologic changes, including groundwater
5 elevations, and changes in water, sediment, and contaminant inputs associated
6 with runoff. Such effort could help determine habitat characteristics, including
7 water source, hydrologic regime, and dominant plant species.
8
- 9 • Identify and map the location and areal extent of saguaro cactus communities
10 within the SEZ.
11

12
13 **Wildlife.** The following additional data-gathering actions would help further characterize
14 potential impacts on wildlife resources for the SEZ:
15

- 16 • Conduct pre-disturbance surveys within the SEZ to determine the use of the
17 SEZ as a movement/migratory corridor or as important habitat for mule deer.
18
- 19 • Identify and map the extent of wash habitat within the SEZ (see
20 Section C.1.1.5.8 above). These areas are important habitat for a number of
21 wildlife species.
22

23
24 **Aquatic Biota.** Investigations recommended under the water resources action plan
25 (Section C.1.1.5.8) would be useful in characterizing and protecting habitat available to aquatic
26 biota. Temporary ponding may occur near Bouse Wash, and seasonal aquatic invertebrate
27 communities may be present. Therefore, Bouse Wash could be surveyed for aquatic
28 invertebrates. Other ephemeral surface water features within the Brenda SEZ may or may not
29 contain aquatic biota; therefore, preliminary evaluations of these surface water features could be
30 conducted to determine the potential for aquatic communities to be present.
31

32
33 **Special Status Species.** The following additional data-gathering actions would be useful
34 in further characterizing and protecting habitat available to special status species:
35

- 36 • Conduct pre-disturbance surveys within the SEZ to determine the presence
37 and abundance of those special status species that are (1) federally listed,
38 proposed for listing, or candidates for listing under the Endangered Species
39 Act (ESA); or (2) designated as sensitive by the Arizona BLM State Office.
40 These species are listed in Table C.1.1-1. Surveys should focus on areas
41 identified as potentially suitable, and the suitability of these habitats to support
42 these special status species should be determined in the field. All field-
43 determined suitable habitats for special status species should be mapped.
44 Target species and survey protocols should be developed in coordination with
45 the USFWS and AZGFD.
46

1 **TABLE C.1.1-1 Special Status Species That May Occur in the Vicinity of the Proposed**
 2 **Brenda SEZ^a**

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
Amphibians			
Lowland leopard frog	<i>Lithobates yavapaiensis</i>	BLM-S	Aquatic systems in desert grasslands, pinyon-juniper woodlands, and agricultural areas, including rivers, streams, beaver ponds, springs, earthen cattle tanks, livestock guzzlers, canals, and irrigation sloughs. Nearest recorded quad-level occurrence is approximately 22 mi ^d east of the SEZ. About 189,500 acres ^e of potentially suitable habitat occurs within the SEZ region.
Reptiles			
Desert rosy boa	<i>Charina trivirgata gracia</i>	BLM-S	Scrublands, rocky deserts, and canyons with permanent or intermittent streams. Nearest recorded quad-level occurrence is approximately 7 mi east of the SEZ. About 3,583,000 acres of potentially suitable habitat occurs within the SEZ region.
Desert tortoise (Sonoran population)^f	<i>Gopherus agassizii</i>	ESA-C; BLM-S	Desert creosotebush communities on firm soils for digging burrows; often along riverbanks, washes, canyon bottoms, creosote flats, and desert oases. Quad-level occurrences for this species intersect the SEZ. About 3,381,000 acres of potentially suitable habitat occurs within the SEZ region.
Birds			
American peregrine falcon	<i>Falco peregrinus anatum</i>	BLM-S	Year-round resident in the SEZ region. Open habitats, including deserts, shrublands, and woodlands that are associated with high, near-vertical cliffs and bluffs above 200 ft. ^g When not breeding, activity is concentrated in areas with ample prey, such as farmlands, marshes, lakes, rivers, and urban areas. Nearest recorded quad-level occurrence is from the vicinity of Alamo Lake, approximately 40 mi northeast of the SEZ. About 4,315,000 acres of potentially suitable habitat occurs within the SEZ region.
Ferruginous hawk	<i>Buteo regalis</i>	BLM-S	Winter resident in the SEZ region. Grasslands, sagebrush, and saltbrush habitats, as well as the periphery of pinyon-juniper woodlands throughout the project area. Populations are known to occur in La Paz County, Arizona. About 216,500 acres of potentially suitable foraging habitat occurs within the SEZ region.
Great egret	<i>Ardea alba</i>	BLM-S	Year-round resident in the lower Colorado River Valley. Transient in the SEZ affected area. Primarily associated with open water areas such as marshes, estuaries, lagoons, lakes, ponds, rivers and flooded fields. Nearest recorded quad-level occurrence is from the Colorado River, approximately 35 mi west of the SEZ. About 27,700 acres of potentially suitable year-round foraging and nesting habitat occurs within the SEZ region.

3

TABLE C.1.1-1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
Birds (Cont.)			
Western burrowing owl	<i>Athene cunicularia hypugaea</i>	BLM-S	Year-round resident in the SEZ region. Open grasslands and prairies, as well as disturbed sites such as golf courses, cemeteries, and airports throughout the SEZ region. Nests in burrows constructed by mammals (prairie dogs, badgers, etc.). Nearest recorded quad-level occurrence is approximately 50 mi southwest of the SEZ. About 4,124,000 acres of potentially suitable habitat occurs within the SEZ region.
Mammals			
California leaf-nosed bat	<i>Macrotus californicus</i>	BLM-S	Year-round resident in southern California and southwestern Arizona. May be locally common in some areas. Occurs in desert riparian, desert wash, desert scrub, and palm oasis habitats at elevations below 2,000 ft. Roosts in mines, caves, and buildings. Quad-level occurrences for this species intersect the SEZ. About 3,576,500 acres of potentially suitable habitat occurs within the SEZ region.
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	BLM-S	Near forests and shrubland habitats below 9,000-ft elevation throughout the SEZ region. The species may use caves, mines, and buildings for day roosting and winter hibernation. May be a summer or year-round resident throughout the SEZ region. Nearest recorded quad-level occurrence is approximately 20 mi south of the SEZ. About 4,434,500 acres of potentially suitable habitat occurs within the SEZ region.
Western yellow bat	<i>Lasiurus xanthinus</i>	BLM-S	Year-round resident in desert riparian, desert wash, and palm oasis habitats at elevations below 2,000 ft. Roosts in trees. Nearest recorded quad-level occurrence is approximately 20 mi south of the SEZ. About 4,068,000 acres of potentially suitable habitat occurs within the SEZ region.

^a The listings for (1) federally listed, proposed for listing, or candidates for listing under the ESA, and (2) Arizona BLM State Office sensitive species have been updated since the release of the Draft Solar PEIS.

^b BLM-S = listed as a sensitive species by the BLM; ESA-C = candidate for listing under the ESA.

^c For plant species, potentially suitable habitat was determined by using Southwest Regional Gap Analysis Project (SWReGAP) land cover types (USGS 2005). For terrestrial vertebrate species, potentially suitable habitat was determined by using SWReGAP habitat suitability and land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.

^d To convert mi to km, multiply by 1.609.

^e To convert acres to km², multiply by 0.004047.

^f Species in bold text have been recorded or have designated critical habitat in the affected area.

^g To convert ft to m, multiply by 0.3048.

1 The Draft Solar PEIS presents a table of Special Status Species for which
2 potential impacts need to be evaluated prior to development in the proposed
3 Brenda SEZ. The list of species presented in Table 8.1.12.1-1 of the Draft
4 Solar PEIS also includes species listed by the State of Arizona and species
5 ranked by the State of Arizona as S1 or S2. Based on the design features
6 presented in the Draft Solar PEIS, the potential for impacts on these additional
7 species will also need to be addressed before development could occur in the
8 SEZ.

- 9
- 10 • Identify and map the location and areal extent of wetland and riparian habitats
11 within the SEZ, including habitat characteristics (such as water source,
12 hydrologic regime, and dominant plant species) both within the wetland
13 boundaries and in adjacent non-wetland habitats. A species potentially
14 associated with these habitats includes the lowland leopard frog.

15

16 **C.1.1.5.10 Air Quality and Climate**

17
18
19 None.

20
21

22 **C1.1.5.11 Visual Resources**

23
24 A summary of the Draft Solar PEIS visual contrast analysis for the proposed Brenda SEZ
25 is provided in Table C.1.1-2. This table includes only those resources that would be subject to
26 moderate or strong visual contrast. The Draft Solar PEIS visual impact analysis predicted these
27 levels of visual contrast from solar energy development in the Brenda SEZ for the following
28 sensitive visual resource areas (SVRAs) and sensitive viewing locations (SVLs):

- 29
- 30 • New Water Mountains Wilderness Area
 - 31
 - 32 • Plomosa Backcountry Byway
 - 33
 - 34 • Plomosa Bouse Plain
 - 35
 - 36 • Plomosa Mountains
 - 37
 - 38 • I-10
 - 39
 - 40 • U.S. 60
 - 41
 - 42 • Community of Brenda.
 - 43
 - 44

TABLE C.1.1-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi (40-km) Viewshed of the Proposed Brenda SEZ

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes
WAs	New Water Mountains	24,628 acres	6.5 mi south of the SEZ	4,124 acres	16.7	Minimal to weak levels of visual contrast would be expected, with potentially moderate levels of contrast expected for the highest elevations within the WA that have clear lines of sight to the SEZ. The highest contrast levels would be expected for peaks in the northern part of the WA, with lower contrasts expected for lower elevations and viewpoints in the southern part of the WA. Visibility extends to about 8.5 mi from the southern boundary of the SEZ. The SEZ is visible above the large gap in the Bear Hills southwest of SEZ.
SRMAs	Plomosa Backcountry Byway	5,987 acres	9.2 mi northwest of the SEZ	5,371 acres	89.7	For those portions of the SRMA east of the Plomosa Mountains and within a few miles of the SEZ, strong visual contrasts associated with solar energy development within the SEZ would be expected, while viewpoints farther north in the unit would experience lower levels of contrast as the distance to the SEZ increased. The high peaks in the eastern part of the Plomosa Mountains with clear lines of sight to the SEZ could be subject to moderate to strong impacts depending on distance to the SEZ. Other areas in the SRMA would be subject to lower

TABLE C.1.1-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes
SRMAs (Cont.)						levels of contrast, and expected contrast levels for the Plomosa Backcountry Byway unit would be minimal, due primarily to very limited visibility of the SEZ. Visibility extends from the closest approach from the SEZ to about 16 mi within the SRMA.
	Plomosa Bouse Plain	75,085 acres	0.2 mi west of the SEZ	38,228 acres	50.9	For those portions of the SRMA east of the Plomosa Mountains and within a few miles of the SEZ, strong visual contrasts associated with solar energy development within the SEZ would be expected, while viewpoints farther north in the unit would experience lower levels of contrast as the distance to the SEZ increased. The high peaks in the eastern part of the Plomosa Mountains with clear lines of sight to the SEZ could be subject to moderate to strong impacts depending on distance to the SEZ. Other areas in the SRMA would be subject to lower levels of contrast. Visibility extends to about 18 mi from the northwestern boundary of the SEZ.

TABLE C.1.1-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes
SRMAs (Cont.)	Plomosa Mountains	28,112 acres	1 mi west of the SEZ	10,579 acres	37.6	For those portions of the SRMA east of the Plomosa Mountains and within a few miles of the SEZ, strong visual contrasts associated with solar energy development within the SEZ would be expected, while viewpoints farther north in the unit would experience lower levels of contrast as the distance to the SEZ increased. The high peaks in the eastern part of the Plomosa Mountains with clear lines of sight to the SEZ could be subject to moderate to strong impacts depending on distance to the SEZ. Other areas in the SRMA would be subject to lower levels of contrast. Visibility extends approximately 6.5 mi from the western boundary of the SEZ.
Other Areas of Interest (non-management areas)	I-10 ^e	2,460 mi	Within 3.3 mi and is in the viewshed of the SEZ for about 20 mi	NA ^f	NA	Visual contrasts associated with solar energy development within the SEZ would be highly dependent on viewer location on I-10; solar facility type, size, and location within the SEZ; and other visibility factors. Weak to moderate visual contrast levels would be expected. Approximately 5 mi is located within the 5-mi viewshed.

TABLE C.1.1-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes
Other Areas of Interest (non-management areas) (Cont.)	U.S. 60	NA	0.4 mi at the point of closest visible approach	NA	NA	Visual contrasts associated with solar energy development within the SEZ would be highly dependent on viewer location on U.S. 60; solar facility type, size, and location within the SEZ; and other visibility factors. Weak to strong visual contrast levels would be expected. Approximately 13.4 mi is located within the 5-mi viewshed.
	Brenda	NA	2.5 mi southwest of the SEZ	NA	NA	Moderate to strong visual contrast levels would be expected, depending on viewers' locations within Brenda. The far northeastern end of Brenda is 2.3 mi southwest of the SEZ, and the far southwestern end is about 3.1 mi southwest of the SEZ.

^a To convert mi to km, multiply by 1.609.

^b To convert acres to km², multiply by 0.004047.

^c Mileage (within all columns) is used only for trails or roads, unless otherwise specified.

^d Distances are based on the Draft Solar PEIS analysis dated December 2010; any alterations to the SEZ boundaries may result in changes to the distance at the point of closest approach.

^e Length of I-10: AARoads' Interstate Guide (2006b).

^f NA = data not available.

1 The following steps could be taken to better understand potential impacts on these
2 SVRAs and SVLs from solar development in the Brenda SEZ:

- 3
- 4 • Identify key observation points (KOPs) within these areas through working
5 with the management agency or other local stakeholders.
- 6
- 7 • Conduct viewshed analyses from the KOPs to determine how much of the
8 SEZ would be in view from each KOP.
- 9
- 10 • As deemed necessary, based on viewshed analysis results, prepare wireframe
11 Google Earth™ visualizations of hypothetical solar facilities in the SEZ
12 depicting the 80% development scenario to better estimate potential impacts.
- 13

14 This additional analysis may help judge potential visual contrast more accurately for most
15 KOPs. For KOPs of particularly high sensitivity, a site visit with photography and
16 superimposition of the wireframe models onto the photos might be required or desired.

17

18 In addition, according to the Draft Solar PEIS, a Visual Resource Inventory (VRI) was
19 conducted for the area, including the Brenda SEZ, in 2010. Data from this evaluation were not
20 available for preparation of the Draft Solar PEIS. Available VRI data at the time consisted of
21 maps dated September 2006 and May 2007. Updated data, to the extent available, will be
22 incorporated into the Final Solar PEIS. If necessary, some additional SVRAs and/or SVLs may
23 need to be evaluated based on these new data.

24

25

26 **C.1.1.5.12 Acoustic Environment**

27 None.

28

29

30

31 **C.1.1.5.13 Paleontological Resources**

32

33 The BLM Regional Paleontologist will be contacted to determine whether additional
34 information is available regarding Potential Fossil Yield Classification (PFYC) identifications in
35 Arizona. A preliminary paleontological survey could be conducted to determine the PFYC of the
36 SEZ, in order to update the temporary assignment of PFYC Class 3b used in the Draft Solar
37 PEIS.

38

39

40 **C.1.1.5.14 Cultural Resources and Native American Concerns**

41

42 None of the proposed Brenda SEZ has been surveyed for cultural resources; thus, absent
43 specific information, impacts are unknown but possible. Prehistoric sites are likely and historic
44 sites related to World War II military activity and ranching/homesteading are also possible
45 within the SEZ. The SEZ is near several BLM-designated areas (ACECs and Special Cultural
46 Resource Management Areas) that are rich in cultural resources. Therefore, potential impacts

1 could also include visual and auditory impacts on sacred sites and traditional use areas within
2 these designated areas and possible destruction of segments of trails and associated sites. The
3 destruction or degradation of important plant resources and the destruction of habitat or
4 impediments to the movement of culturally important wildlife are also potential impacts of
5 concern within the SEZ.

6
7 The following additional data collection efforts could reduce the uncertainty about
8 potential impacts:

- 9
10 • Conduct a Class I literature file search to better understand (1) the site
11 distribution pattern in the vicinity of the SEZ, (2) potential trail networks
12 through existing ethnographic reports, and (3) overall cultural sensitivity of
13 the landscape.
- 14
15 • Conduct a Class II Stratified Random Sample Survey of the SEZ to obtain a
16 10% sample (roughly 388 acres [1.6 km²]).³ Areas of interest, as determined
17 through a Class I review, should also be identified prior to establishing the
18 survey design and sampling strategy. If appropriate, some subsurface testing
19 of dune areas should be considered in the sampling strategy as well.
- 20
21 • Prepare a cultural sensitivity map based on results of the Class II survey and
22 Class I review.
- 23
24 • Continue with government-to-government consultation as described in
25 Section 2.4.3, including follow-up to recent ethnographic studies with Tribes
26 not included in the original studies to determine whether those Tribes have
27 similar concerns. The Brenda SEZ falls in the traditional use area of primarily
28 the Yavapai, Quechan, and Mohave. Potential topics to be discussed during
29 consultation include the Ranegras Plain, Granite Wash Pass, Harquahala
30 Mountains, bighorn sheep, nearby ACECs and Special Cultural Resource
31 Management Areas, and plant and animal resources.

32 33 34 **C.1.1.5.15 Socioeconomics and Environmental Justice**

35
36 None.

37 38 39 **C.1.1.5.16 Cumulative Impact Considerations**

40
41 None.

42
43

³ The BLM plans to conduct a Class II survey of 5% of this SEZ prior to the Final Solar PEIS. Additional areas could be surveyed as funding becomes available.

1 **C.1.2 Gillespie**

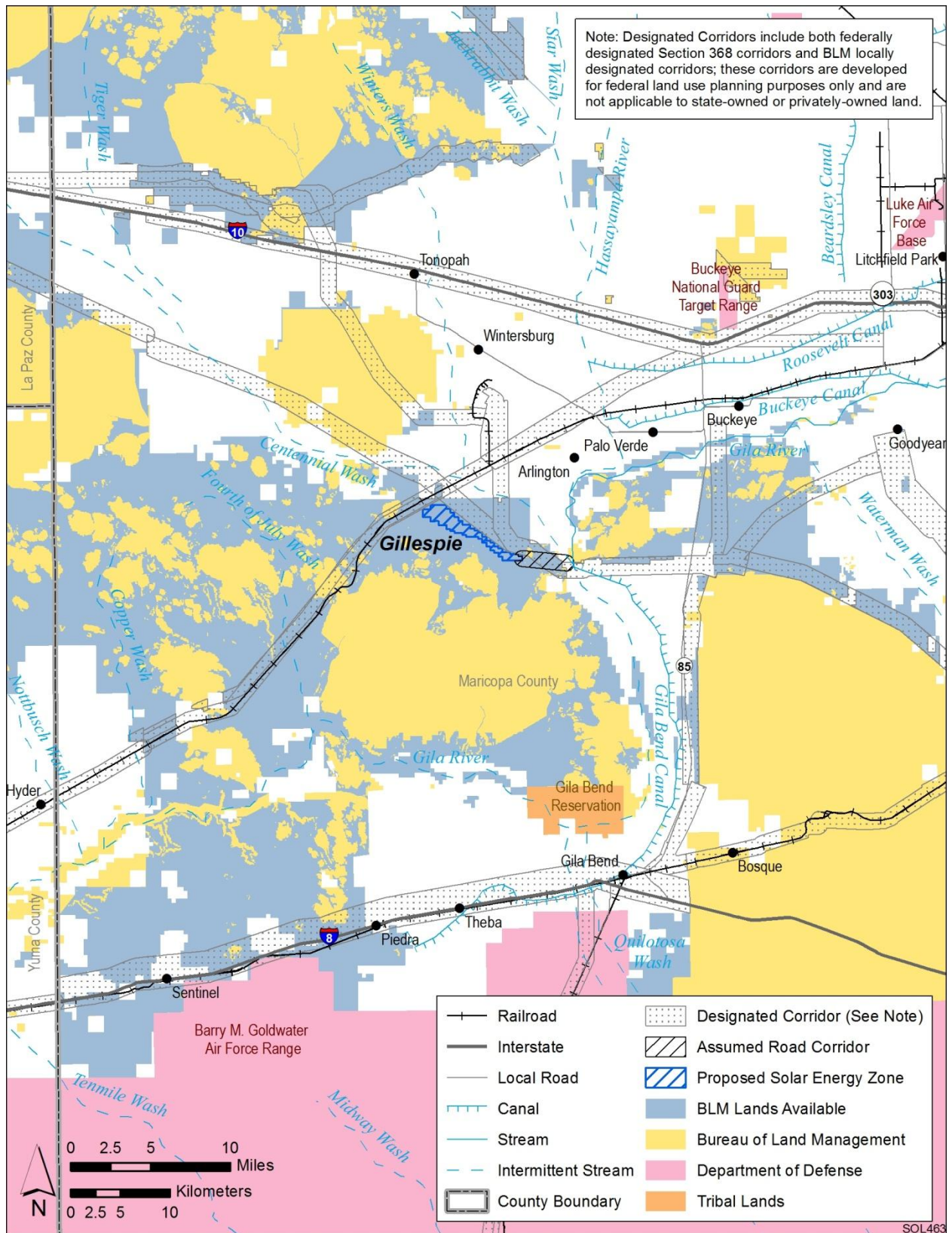
2
3
4 **C.1.2.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic**
5 **Environmental Impact Statement (PEIS)**
6

7 The proposed Gillespie solar energy zone (SEZ), as presented in the Draft Solar PEIS,
8 had a total area of 2,618 acres (11 km²). It is located in Maricopa County in west-central Arizona
9 (Figure C.1.2-1). The towns of Arlington and Buckeye are about 7 mi (11 km) and 17 mi
10 (27 km) northeast of the SEZ, respectively.
11

12 The Draft Solar PEIS identified Old U.S. 80, located about 3 mi (5 km) to the east of the
13 SEZ, as the nearest major road, and assumed that a new access road would be constructed from
14 the proposed SEZ to Old U.S. 80 to support development. The location of a new access road that
15 could be constructed in the future may be different from that assumed in the Draft Solar PEIS.
16 The Draft Solar PEIS also identified a 500-kV transmission line adjacent to the SEZ as the
17 nearest point for connection of the SEZ to the grid. Details on the revised transmission impact
18 assessment to be included in the Final Solar PEIS are provided in Appendix C, Section C.7.1 of
19 this appendix. Additional analysis of transmission lines and/or access roads will be completed, as
20 necessary, as part of the project-specific environmental reviews (see Section 2.2.2.2.2 of this
21 Supplement).
22

23 Potential adverse impacts identified in the Draft Solar PEIS included the following:
24

- 25 • Wilderness values in the Woolsey Peak and Signal Mountain Wilderness
26 Areas (WAs) would be adversely affected and solar development would
27 contribute to a further reduction in the scenic viewshed of the Saddle
28 Mountain Special Recreation Management Area (SRMA). A new access
29 road would also contribute to adverse impacts on wilderness values.
30
- 31 • There would be about a 15% reduction in future ephemeral grazing
32 authorizations in the Layton grazing allotment.
33
- 34 • Inventoried off-highway vehicle routes in the SEZ would be closed to
35 recreational use; there could be a loss of recreational use in the nearby WAs
36 and SRMA.
37
- 38 • Any development on the SEZ that exceeds 250 ft (76 m) could interfere with
39 U.S. Department of Defense (DoD) operations in the military training route
40 (MTR) that crosses the SEZ.
41
- 42 • Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil
43 erosion by wind and runoff), sedimentation, and soil contamination) could
44 occur.
45
46



1

2 **FIGURE C.1.2-1 Proposed Gillespie SEZ as Presented in the Draft Solar PEIS**

- 1 • Groundwater use would deplete the aquifer to the extent that, at a minimum,
2 wet-cooling options would not be feasible. Clearing of a large portion of the
3 proposed SEZ could adversely affect desert dry washes, dry wash woodland,
4 and wetland habitats, and saguaro cactus communities, depending on the
5 amount of available habitat disturbed.
6
- 7 • Potentially suitable habitat for 29 special status species and more than
8 125 wildlife species occurs in the affected area of the proposed SEZ; less than
9 1% of the potentially suitable habitat for any of these species occurs in the
10 region that would be directly affected by development.
11
- 12 • Impacts on aquatic biota could result from the direct removal of ephemeral
13 washes and small wetlands within the construction footprint. Aquatic biota in
14 surface water features could also be affected by a decline in habitat quantity
15 and quality due to water withdrawals and changes in drainage patterns, as well
16 as increased sediment and contaminant inputs associated with ground
17 disturbance and construction activities.
18
- 19 • Temporary exceedances of ambient air quality standards for particulate
20 matter at the SEZ boundaries are possible during construction. These high
21 concentrations, however, would be limited to the immediate area surrounding
22 the SEZ boundary.
23
- 24 • Although the SEZ is in an area of low scenic quality, weak to strong visual
25 contrasts could be observed by visitors to Signal Peak WA, Woolsey Peak
26 WA, and Saddle Mountain SRMA, and travelers on the Agua Caliente Road,
27 Salome Highway and Old U.S. 80. Residents of the town of Arlington could
28 observe strong visual contrasts, and weak visual contrasts could be observed
29 by the residents of the towns of Palo Verde, Buckeye, and Wintersburg.
30 Because of these potential impacts, it was recommended that development of
31 power tower facilities be prohibited within the SEZ.
32
- 33 • The potential for impacts on significant paleontological and cultural resources
34 is unknown. Impacts on cultural resources are also possible in areas related to
35 the assumed access road. Paleontological and cultural resources surveys will
36 likely be needed to identify any potential impacts. It is possible that there will
37 be Native American concerns about the potential visual effects of solar energy
38 development within the SEZ on the landscape, as well as from the elimination
39 of traditionally important plants and animals.
40
- 41 • Minority populations occur within a 50-mi (80-km) radius of the proposed
42 SEZ boundary; thus adverse impacts of solar development could
43 disproportionately affect minority and low-income populations.
44
45

1 **C.1.2.2 Summary of Comments Received**
2

3 Most of the comments received from environmental groups on the proposed Gillespie
4 SEZ were generally in favor of identifying the area as an SEZ, with boundary adjustments
5 (The Wilderness Society et al.⁴). The Wilderness Society et al., Tonopah Area Coalition, and
6 the Sierra Club recommended that the southern boundary be adjusted north of the Agua Caliente
7 Road. The Nature Conservancy suggested that the northwest portion of the Gillespie SEZ be
8 reshaped into a more compact area. The Western Watersheds Project and others expressed
9 concern for visual impacts on the Sonoran Desert National Monument, Signal Peak Wilderness,
10 and Woolsey Peak Wilderness, and suggested that U.S. Department of the Interior Bureau of
11 Land Management (BLM) include the retirement of grazing allotments as a mitigation measure.
12 The Wilderness Society et al. had concerns about groundwater withdrawals and the potential
13 impacts on riparian habitats and species.
14

15
16 **C.1.2.3 Changes to the SEZ**
17

18 No boundary revisions were identified for the proposed SEZ. The Draft Solar PEIS
19 identified potential visual impacts on the Woolsey Peak WA. To reduce the visual resource
20 impacts on this area and on Agua Caliente Road from solar development within the SEZ,
21 allowable solar technologies within the SEZ will be limited to photovoltaic systems with height
22 of panels no greater than 10 ft (3.3 m), or technologies with comparable or lower heights and
23 reflectivity. Additional required mitigation measures to address potential visual resource impacts
24 are given in Section C.7.3 of this appendix.
25

26
27 **C.1.2.4 Wilderness Character Status of SEZ**
28

29 A recently maintained inventory of wilderness characteristics was used to determine
30 whether public lands within the Gillespie SEZ have wilderness characteristics. The finding of
31 this inventory was that these lands do not contain wilderness characteristics.
32

33
34 **C.1.2.5 Additional Data Collection Recommended**
35

36
37 **C.1.2.5.1 Lands and Realty**
38

39 None.
40

⁴ The Wilderness Society, Sonoran Institute, Sierra Club—Grand Canyon Chapter, Arizona Wilderness Coalition, Tucson Audubon Society, Friends of Ironwood Forest, Defenders of Wildlife, Sky Island Alliance, Grand Canyon Wildlands Council, Natural Resources Defense Council, Soda Mountains Wilderness Council, and Sierra Treks submitted joint comments on the proposed Arizona SEZs. Those comments are attributed to The Wilderness Society et al.

1 **C.1.2.5.2 Specially Designated Areas and Lands with Wilderness Characteristics**

2
3 None

4
5
6 **C.1.2.5.3 Rangeland Resources**

7
8
9 *Livestock Grazing.* None.

10
11
12 *Wild Horses and Burros.* None.

13
14
15 **C.1.2.5.4 Recreation**

16
17 None.

18
19
20 **C.1.2.5.5 Military and Civilian Aviation**

21
22 The proposed technology restrictions described in Sections C.1.2.3 and C.7.3 are
23 expected to minimize or eliminate any potential issues with the MTR that crosses the SEZ;
24 however, the BLM will continue to consult with the DoD regarding potential issues with the
25 MTR.

26
27
28 **C.1.2.5.6 Geologic Setting and Soil Resources**

29
30 None.

31
32
33 **C.1.2.5.7 Minerals**

34
35 Additional information on leasable and strategic minerals in the vicinity of the proposed
36 SEZ will be provided in the Final Solar PEIS to inform the Department of the Interior's decision
37 on a proposed 20-year withdrawal of SEZ lands.

38
39
40 **C.1.2.5.8 Water Resources**

41
42 The following additional data and actions would help further characterize potential
43 impacts on water resources for the proposed Gillespie SEZ. A more detailed discussion of each
44 of these activities is included in the water resources action plan provided Section C.7.2 of this
45 appendix.

- 1 • Prepare a planning-level water resources inventory of the Lower Hassayampa
2 basin.
- 3
- 4 • Identify additional ephemeral stream channels and alluvial fan features
5 for non-development areas through consultation BLM Arizona, Arizona
6 Game and Fish Department (AZGFD), Arizona Department of Water
7 Resources (ADWR), U.S. Environmental Protection Agency, and U.S. Army
8 Corps of Engineers (USACE) with a focus on:
9 – The unnamed wash tributaries to Centennial Wash.
- 10
- 11 • Perform field surveys and hydrologic analyses to support jurisdictional water
12 determinations and floodplain identifications. Tasks include:
13 – Surveying unnamed wash tributaries of Centennial Wash for surface
14 elevations, high water marks, and sediment conditions; and
15 – Conducting hydrologic rainfall-runoff-routing analyses to identify
16 100-year floodplain areas.
- 17
- 18 • Coordinate with the USACE (Los Angeles District) regarding jurisdictional
19 water determinations for the SEZ. Water features that need to be considered
20 include:
21 – The unnamed wash tributaries to Centennial Wash.
- 22
- 23 • Identify 100-year floodplain non-development areas (if they exist) for
24 unnamed wash tributaries to Centennial Wash. This task would require
25 coordination with the Federal Emergency Management Agency (FEMA)
26 and the following agencies:
27 – AZDWR (Flood Mitigation Section), and
28 – The Flood Control District of Maricopa County.
- 29
- 30 • Describe the formation of a stakeholder committee to conduct long-term
31 monitoring of water resources. This activity would entail:
32 – Identifying key stakeholder agencies,
33 – Discussing general features of a monitoring program, and
34 – Working with the U.S. Geological Survey to develop groundwater
35 monitoring well design and numerical groundwater models.
- 36
- 37

38 **C.1.2.5.9 Ecological Resources**

39
40
41 ***Vegetation and Plant Communities.*** The following additional data-gathering actions
42 would help further characterize potential impacts on vegetation and plant communities for the
43 proposed Gillespie SEZ:

- 44
- 45 • Identify and map the location and areal extent of desert dry wash, dry wash
46 woodland, and wetland habitats within the SEZ. Identify and map the location

1 and areal extent of these habitats, as well as mesquite bosque and riparian
2 habitats, outside the SEZ that may be affected by hydrologic changes,
3 including groundwater elevations, and changes in water, sediment, and
4 contaminant inputs associated with runoff. Such effort could help determine
5 habitat characteristics, including water source, hydrologic regime, and
6 dominant plant species.

- 7
- 8 • Identify and map the location and areal extent of saguaro cactus communities
9 within the SEZ. Identify and map the locations of all cacti occurring on the
10 SEZ, including saguaro, pencil cholla, barrel cactus, and others.
- 11
- 12

13 **Wildlife.** None.

14

15

16 **Aquatic Biota.** Investigations recommended under the water resources action plan
17 (Section C.1.2.5.8) would be useful in characterizing and protecting habitat available to aquatic
18 biota. Most washes and wetlands in the SEZ are typically dry and contain water only for brief
19 periods following precipitation. These features may or may not contain aquatic biota; therefore,
20 preliminary evaluations of these surface water features could be conducted to determine the
21 potential for aquatic communities to be present.

22

23

24 **Special Status Species.** The following additional data-gathering actions would be useful
25 in further characterizing and protecting habitat available to special status species:

- 26
- 27 • Conduct pre-disturbance surveys within the SEZ to determine the presence
28 and abundance of those special status species that are (1) federally listed,
29 proposed for listing, or candidates for listing under the Endangered Species
30 Act; or (2) designated as sensitive by the Arizona BLM State Office. These
31 species are listed in Table C.1.2-1. Surveys should focus on areas identified
32 as potentially suitable, and the suitability of these habitats to support these
33 special status species should be determined in the field. All field-determined
34 suitable habitats for special status species should be mapped. Target species
35 and survey protocols should be developed in coordination with the U.S. Fish
36 and Wildlife Service (USFWS) and AZGFD.
- 37

38 The Draft Solar PEIS presents a table of special status species for which
39 potential impacts need to be evaluated prior to development in the proposed
40 Gillespie SEZ. The list of species presented in Table 8.3.12.1-1 of the Draft
41 Solar PEIS also includes species listed by the State of Arizona and species
42 ranked by the State of Arizona as S1 or S2. Based on the design features
43 presented in the Draft Solar PEIS, the potential for impacts on these additional
44 species will also need to be addressed before development could occur in the
45 SEZ.

46

1 **TABLE C.1.2-1 Special Status Species That May Occur in the Vicinity of the Proposed**
 2 **Gillespie SEZ^a**

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
Plants			
Hohokam agave	<i>Agave murpheyi</i>	BLM-S	Endemic to Arizona and Sonora, Mexico on benches or alluvial terraces on gentle bajada slopes above major drainages in desert scrub communities. Elevation ranges between 1,300 and 3,200 ft. ^d Nearest recorded quad-level occurrences are approximately 45 mi ^e north of the SEZ. About 50,800 acres ^f of potentially suitable habitat occurs within the SEZ region.
Tumamoc globeberry	<i>Tumamoca macdougalii</i>	BLM-S	Endemic to southern Arizona and northern Mexico in xeric situations, in shady areas of nurse plants along gullies and sandy washes at elevations below 3,000 ft. Nearest quad-level occurrence is approximately 35 mi southeast of the SEZ. About 50,800 acres of potentially suitable habitat occurs within the SEZ region.
Fish			
Roundtail chub^g	<i>Gila robusta</i>	BLM-S	Larger tributaries in the Colorado Basin, from Wyoming south to Arizona and New Mexico; cool to warm water streams and rivers consisting of pools adjacent to riffles and runs and with boulders, tree roots, submerged trees and branches, and undercut cliff walls. Historic quad-level occurrence intersects the affected area from the Gila River, within 5 mi east of the SEZ. The species is currently not known to occur in the affected area. About 300 mi of potentially suitable habitat within the Gila and Hassayampa Rivers occurs within the SEZ region.
Amphibians			
Lowland leopard frog	<i>Lithobates yavapaiensis</i>	BLM-S	Aquatic systems in desert grasslands, pinyon-juniper woodlands, and agricultural areas, including rivers, streams, beaver ponds, springs, earthen cattle tanks, livestock guzzlers, canals, and irrigation sloughs. Quad-level occurrences intersect the affected area. About 246,500 acres of potentially suitable habitat occurs within the SEZ region.
Reptiles			
Desert tortoise (Sonoran population)	<i>Gopherus agassizii</i>	ESA-C; BLM-S	Desert creosotebush communities on firm soils for digging burrows, along riverbanks, washes, canyon bottoms, creosote flats, and desert oases. Quad-level occurrences intersect the affected area. About 3,750,000 acres of potentially suitable habitat occurs within the SEZ region.
Mexican rosy boa	<i>Charina trivirgata trivirgata</i>	BLM-S	Sonoran Desert near rocky hillsides and rock outcroppings. Nearest quad-level occurrence is approximately 20 mi southeast of the SEZ. About 3,800,000 acres of potentially suitable habitat occurs within the SEZ region.
Tucson shovel-nosed snake	<i>Chionactis occipitalis klauberi</i>	ESA-C	Endemic to Arizona from Pima, Pinal, and Maricopa Counties in creosote-mesquite floodplain habitats with soft sandy loam soils and sparse gravel. Nearest quad-level occurrence is approximately 20 mi southeast of the SEZ. About 1,436,500 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.1.2-1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
<i>Birds</i>			
Ferruginous hawk	<i>Buteo regalis</i>	BLM-S	Winter resident in the SEZ region. Grasslands, sagebrush and saltbrush habitats, as well as the periphery of pinyon-juniper woodlands. Nests in tall trees or on rock outcrops along cliff faces. Known to occur in Maricopa County, Arizona. About 395,000 acres of potentially suitable foraging habitat occurs within the SEZ region.
Great egret	<i>Ardea alba</i>	BLM-S	Year-round resident in the lower Colorado River Valley in open water areas such as marshes, estuaries, lagoons, lakes, ponds, rivers and flooded fields. Nearest quad-level occurrence is from Painted Rock Reservoir, approximately 11 mi (18 km) south of the SEZ. About 28,750 acres of potentially suitable habitat occurs within the SEZ region.
Snowy egret	<i>Egretta thula</i>	BLM-S	Year-round resident in the lower Colorado River Valley in open water areas such as marshes, estuaries, lagoons, lakes, ponds, rivers and flooded fields. Nearest quad-level occurrence is from Painted Rock Reservoir, approximately 11 mi (18 km) south of the SEZ. About 675,200 acres of potentially suitable habitat occurs within the SEZ region. The species is expected to occur as a transient only on the SEZ.
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	ESA-E	Riparian shrublands and woodlands, thickets, scrubby and brushy areas, open second growth, swamps, and open woodlands. Quad-level occurrences intersect the affected area. About 50,000 acres of potentially suitable habitat occurs within the SEZ region.
Western burrowing owl	<i>Athene cunicularia hypugaea</i>	BLM-S	Open grasslands and prairies, as well as disturbed sites such as golf courses, cemeteries, and airports throughout the SEZ region. Nests in burrows constructed by mammals (prairie dog, badger, etc.). Nearest quad-level occurrence is approximately 14 mi (22 km) east of the SEZ. About 4,376,000 acres of potentially suitable habitat occurs within the SEZ region.
Western yellow-billed cuckoo	<i>Coccyzus americanus</i>	ESA-C	Considered to be a riparian obligate, usually found in large tracts of cottonwood/willow habitats with dense sub-canopies. Quad-level occurrences intersect the affected area. About 50,000 acres of potentially suitable habitat occurs within the SEZ region.
Yuma clapper rail	<i>Rallus longirostris yumanensis</i>	ESA-E	Year-round resident in the SEZ region. Freshwater marshes containing dense stands of cattails. Nests on dry hummocks or in small shrubs among dense cattails or bulrushes along the edges of shallow ponds in freshwater marshes with stable water levels. Quad-level occurrences intersect the affected area. About 50,000 acres of potentially suitable habitat occurs within the SEZ region.
<i>Mammals</i>			
California leaf-nosed bat	<i>Macrotus californicus</i>	BLM-S	Year-round resident in desert riparian, desert wash, desert scrub, and palm oasis habitats at elevations below 2,000 ft (600 m). Roosts in mines, caves, and buildings. Quad-level occurrences intersect the affected area. About 3,960,000 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.1.2-1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
<i>Mammals (Cont.)</i>			
Western red bat	<i>Lasiurus blossevillii</i>	BLM-S	Year-round resident in SEZ region. Forages in riparian and other wooded areas. Roosts primarily in cottonwood trees along riparian areas. Nearest recorded quad-level occurrence is from the Hassayampa River, approximately 50 mi north of the SEZ. About 17,400 acres of potentially suitable habitat occurs within the SEZ region.
Western yellow bat	<i>Lasiurus xanthinus</i>	BLM-S	Year-round resident in desert riparian, desert wash, and palm oasis habitats at elevations below 2,000 ft. Roosts in trees. Nearest quad-level occurrence is from the vicinity of Phoenix, approximately 40 mi (64 km) northeast of the SEZ. About 4,407,500 acres of potentially suitable habitat occurs within the SEZ region.

^a The listings for (1) federally listed, proposed for listing, or candidates for listing under the ESA, and (2) Arizona BLM State Office sensitive species have been updated since the release of the Draft Solar PEIS.

^b BLM-S = listed as a sensitive species by the BLM; ESA-C = candidate for listing under the ESA; ESA-E = listed as endangered under the ESA.

^c For plant species, potentially suitable habitat was determined by using Southwest Regional Gap Analysis Project (SWReGAP) land cover types (USGS 2005). For terrestrial vertebrate species, potentially suitable habitat was determined by using SWReGAP habitat suitability and land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.

^d To convert ft to m, multiply by 0.3048.

^e To convert mi to km, multiply by 1.609.

^f To convert acres to km², multiply by 0.004047.

^g Species in bold text have been recorded or have designated critical habitat in the affected area.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17

- Identify and map the areal extent of wetland and riparian habitats within the SEZ, including habitat characteristics (such as water source, hydrologic regime, and dominant plant species) both within the wetland boundaries and in adjacent non-wetland habitats. Species potentially associated with these habitats include the Hohokam agave, Tumamoc globeberry, lowland leopard frog, snowy egret, southwestern willow flycatcher, western yellow-billed cuckoo, Yuma clapper rail, and western yellow bat.

C.1.2.5.10 Air Quality and Climate

None.

1 **C.1.2.5.11 Visual Resources**

2
3 Visual resources will be re-evaluated for the Final Solar PEIS based on proposed
4 technology restrictions described in Section C.1.2.3 of this Supplement. A summary of the Draft
5 Solar PEIS visual contrast analysis for the proposed Gillespie SEZ is provided in Table C.1.2-2.
6 This table includes only the resources that would be subject to moderate or strong visual contrast.
7 The Draft Solar PEIS visual impact analysis predicted these levels of visual contrast from solar
8 energy development in the Gillespie SEZ for the following sensitive visual resource areas
9 (SVRAs) and sensitive viewing locations (SVLs):

- 10
11 • Signal Mountain WA
12
13 • Woolsey Peak WA
14
15 • Saddle Mountain SRMA
16
17 • Agua Caliente Road
18
19 • Salome Highway
20
21 • Old U.S. 80
22
23 • Arlington.

24
25 The following steps could be taken to better understand potential impacts on these
26 SVRAs and SVLs from solar development in the Gillespie SEZ:

- 27
28 • Identify key observation points (KOPs) within these areas through working
29 with the management agency or other local stakeholders.
30
31 • Conduct viewshed analyses from the KOPs to determine how much of the
32 SEZ would be in view from each KOP.
33
34 • As deemed necessary, based on viewshed analysis results, prepare wireframe
35 Google Earth™ visualizations of hypothetical solar facilities in the SEZ
36 depicting the 80% development scenario to better estimate potential impacts.
37

38 This additional analysis may help judge potential visual contrast more accurately for most
39 KOPs. For KOPs of particularly high sensitivity, a site visit with photography and
40 superimposition of the wireframe models onto the photos might be required or desired.

41
42 Additional required mitigation measures to address potential visual resource impacts are
43 given in Section C.7.3 of this appendix.
44

TABLE C.1.2-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi (40-km) Viewshed of the Proposed Gillespie SEZ

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi ^e	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes ^f
WAs	Signal Mountain	13,467 acres	3.5 mi southwest of the SEZ	2,514 acres	18.7	Portions of the WA are within a relatively short distance of the SEZ, and regardless of the elevation of the viewpoints, where open views of the SEZ existed, viewers in these areas could be subjected to strong visual contrasts from solar facilities; in other portions of the WA, topographic screening of portions of the SEZ and lower height facilities would tend to reduce visual contrast levels, as would decreased elevation of viewpoints and increased distance from the SEZ: Visible area of the WA extends about 6.5 mi from the southwestern boundary of the SEZ
	Woolsey Peak	64,465 acres	2.1 mi south of the SEZ	11,389 acres	17.7	WA is sufficiently close to the SEZ that for many viewpoints, and particularly for elevated viewpoints in the northern portion, solar energy development would be expected to result in strong visual contrast levels; lower contrast levels would be expected for lower elevation viewpoints, and for higher elevation viewpoints deeper in the interior of the WA: visible area of the WA extends about 12.5 mi from the southern boundary of the SEZ.

TABLE C.1.2-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi ^e	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes ^f
SRMA	Saddle Mountain	47,696 acres	4.3 mi northwest of the SEZ	27,237 acres	57.1	SRMA is sufficiently close to the SEZ that for some viewpoints within the SRMA, solar energy development within the SEZ would be expected to result in moderate to strong visual contrast levels; lower contrast levels would be expected for lower elevation viewpoints, and for higher elevation viewpoints in the northwestern portion, farther from the SEZ. Visible area extends from the point of closest approach to 12 mi within the SRMA; development likely would be visible from low elevation areas in the southeast of the SRMA, and from the south and east facing slopes of the Saddle Mountain and the Palo Verde Hills
Other Areas of Interest (non-management areas)	Agua Caliente Road (Agua Caliente Scenic Drive)	49 mi	1.6 mi from the southeastern boundary of the SEZ	2.2 mi	4.5	Visual contrast levels arising from solar facilities would vary depending on viewer location and the type, size, location, and layout of solar facilities; weak to strong levels of visual contrast would be expected for travelers, primarily because the road crosses the SEZ several times and otherwise passes very near the SEZ. Proposed BLM Backcountry Byway

TABLE C.1.2-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi ^e	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes ^f
Other Areas of Interest (non-management areas) (Cont.)	Salome Highway	NA ^g	9 to 10 mi northeast of the SEZ	11	NA	Moderate levels of visual contrast would be expected for most viewpoints on the Salome Highway: Portions in viewshed of SEZ are about 9-10 mi northeast of SEZ
	Old U.S. 80 ^h	1,032 mi	2 mi northeast of the southeast corner of the SEZ	29 mi	2.8	Strong levels of visual contrast would be expected to result from solar energy development: viewpoints along Old U.S. 80 are generally slightly lower in elevation than the SEZ, particularly in the southern sections of the road within the SEZ viewshed
	Arlington	NA	7 mi northeast of the SEZ	NA	NA	Strong levels of visual contrast would be expected, as seen from unscreened viewpoints within Arlington: Located approximately 7 mi from northeast of SEZ; A detailed future site-specific NEPA analysis is required to determine visibility precisely

^a To convert mi to km, multiply by 1.609.

^b To convert acres to km², multiply by 0.004047.

^c Mileage (within all columns) is used only for trails or roads, unless otherwise specified.

Footnotes continued on next page.

TABLE C.1.2-2 (Cont.)

- ^d Distances at the point of closest approach are based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these calculations.
- ^e The total acreage/mileage visible within 25 mi (40 km) of the SEZ is based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these acreages/mileages, as well as the percent total acreages/mileages visible within 25 mi (40 km) of the SEZ.
- ^f The assessment of impacts is based the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries may result in reduced impacts in some of the SVRAs/SVLs due to the reduction in the overall footprint of the SEZ.
- ^g NA = data not available.
- ^h Length of U.S. 80: US-Highways.com (2007).

1 **C.1.2.5.12 Acoustic Environment**

2
3 None.

4
5
6 **C.1.2.5.13 Paleontological Resources**

7
8 The BLM Regional Paleontologist will be contacted to determine whether additional
9 information is available regarding Potential Fossil Yield Classification (PFYC) identifications in
10 Arizona. A preliminary paleontological survey could be conducted to determine the PFYC of the
11 SEZ, in order to update the temporary assignment of PFYC Class 3b used in the Draft Solar
12 PEIS.

13
14
15 **C.1.2.5.14 Cultural Resources and Native American Concerns**

16
17 A very small percentage of the proposed Gillespie SEZ has been surveyed for cultural
18 resources, so, absent specific information, impacts are unknown but possible. Five small surveys
19 had been conducted within the SEZ, but no sites were recorded. A spur of the Southern Pacific
20 Railroad, the second transcontinental railroad in the United States, is located 1 mi (1.6 km) north
21 of the SEZ, and the Craig Railroad Station, listed in the *National Register of Historic Places*, is
22 located within 5 mi (8 km). Gillespie Dam Highway Bridge is also listed on the *National*
23 *Register of Historic Places* and is located within 3 mi of the SEZ. The Juan Batista de Anza
24 National Historic Trail is approximately 17 mi (27 km) south of the SEZ, but intervening
25 topography would preclude most visibility of the SEZ—only a 4-mi (6.4 km) stretch of the trail
26 would be within a 25-mi (40-km) viewshed and visual impacts were assessed as minimal.

27
28 Prehistoric sites are likely and historic sites related to the railroad and ranching/
29 homesteading are also possible within the SEZ. The eastern portion of the SEZ, closest to the
30 Gila River, has the most potential for containing sensitive prehistoric archaeological sites. The
31 newly proposed Gila River Terraces Area of Critical Environmental Concern (ACEC) is a
32 corridor containing significant resources that runs along the Gila River.⁵ These resources may
33 extend into the Gillespie SEZ.

34
35 The northern area of the SEZ has the highest potential for historic sites associated with
36 the railroad. Potential impacts could also include visual and auditory impacts on sacred sites and
37 traditional use areas along the Gila River corridor and within the Gila Bend Mountains.
38 Drawdown of groundwater and water rights issues may be of potential concern for the Tohono
39 O’odham Reservation that is located 16 mi (26 km) south of the SEZ. The destruction or
40 degradation of important plant resources and the destruction of habitat or impediments to the
41 movement of culturally important wildlife are also potential impacts of concern within the SEZ.

42
43 The following additional data collection efforts could reduce the uncertainty about
44 potential impacts on cultural resources:

⁵ Information on the proposed Gila River Terraces ACEC is new and was not presented in the Draft Solar PEIS.

- 1 • Conduct a Class I literature file search to better understand (1) the site
2 distribution pattern in the vicinity of the SEZ; (2) potential trail networks; and
3 (3) overall cultural sensitivity of the landscape. A Class I review can
4 determine the actual percentage of survey coverage already conducted within
5 the SEZ.
6
7 • Conduct a Class II Stratified Random Sample Survey of the proposed SEZ to
8 obtain a 10% sample (roughly 262 acres [1.1 km²] or less).⁶ Areas of interest,
9 as determined through a Class I review, should also be identified prior to
10 establishing the survey design and sampling strategy.
11
12 • Prepare a cultural sensitivity map based on results of the Class II survey and
13 Class I review.
14
15 • Continue with government-to-government consultation as described in
16 Section 2.4.3, including follow-up to recent ethnographic studies with Tribes
17 not included in the original studies to determine whether those Tribes have
18 similar concerns. The Gillespie SEZ falls in the traditional use area of
19 primarily the Maricopa, Akimel O’odham (Pima), and Tohono O’odham
20 (Papago). Potential topics to be discussed during consultation include: water
21 rights, the Gila River corridor, sacred mountains in the area, local Hohokam
22 sites, and plant and animal resources.
23
24

25 **C.1.2.5.15 Socioeconomics and Environmental Justice**

26 None.
27
28
29

30 **C.1.2.5.16 Cumulative Impact Considerations**

31 None.
32
33
34

⁶ The BLM plans to conduct a Class II survey of 5% of this SEZ prior to the Final Solar PEIS. Additional areas could be surveyed as funding becomes available.

1 **C.2 CALIFORNIA PROPOSED SOLAR ENERGY ZONES**

2
3
4 **C.2.1 Imperial East**

5
6
7 **C.2.1.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic**
8 **Environmental Impact Statement (PEIS)**
9

10 The proposed Imperial East solar energy zone (SEZ), as presented in the Draft Solar
11 PEIS, had a total area of 5,722 acres (23.2 km²). It is located in Imperial County in southeastern
12 California, near the United States–Mexico border (Figure C.2.1-1). The nearest town is the
13 community of Holtville, located approximately 10 mi (16 km) northwest of the SEZ.
14

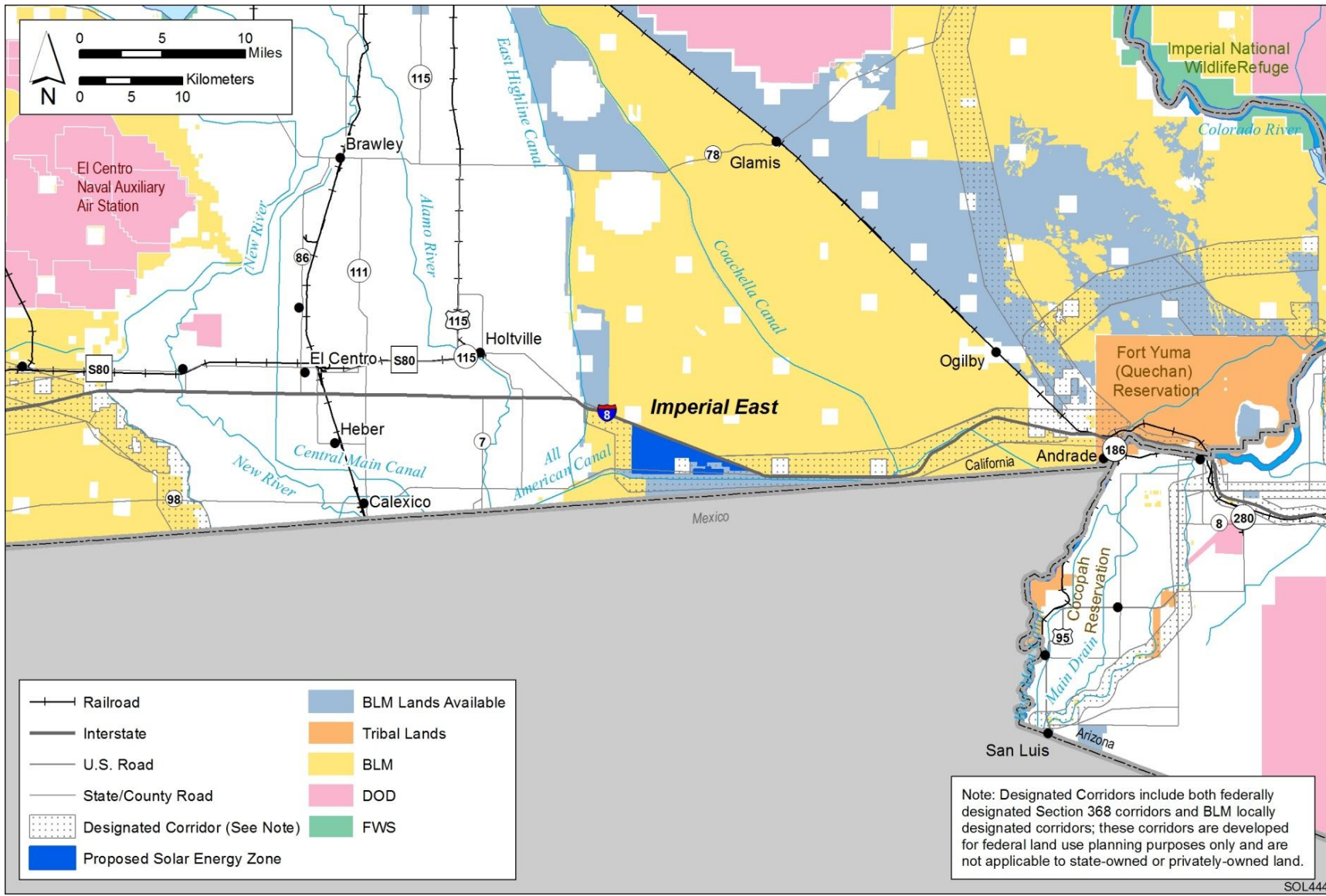
15 A designated Section 368 energy corridor covers about 80% of the SEZ, potentially
16 leaving less than 1,000 acres (4 km²) available for solar development.⁷ This corridor could limit
17 development in the SEZ because solar facilities cannot be constructed under transmission lines.
18 The discussion of impacts of solar energy development in the SEZ in the Draft Solar PEIS
19 acknowledged that the presence of the corridor would reduce the amount of land available for
20 solar power production, and, conversely, that full development of solar facilities within the SEZ
21 would limit use of the transmission corridor.
22

23 The location of new transmission that could be constructed for this SEZ in the future may
24 be different from that assumed in the Draft Solar PEIS. Details on the revised transmission
25 impact assessment to be included in the Final Solar PEIS are provided in Section C.7.1 of this
26 appendix. Analysis of transmission lines and/or access roads will be completed, as necessary, as
27 part of the project-specific environmental reviews (see Section 2.2.2.2.2 of this Supplement).
28

29 Potential adverse impacts identified in the Draft Solar PEIS included the following:

- 30
- 31 • Impacts on two nearby Areas of Critical Environmental Concern (ACECs)
32 with prehistoric resources (Lake Cahuilla C and D) could occur due to
33 increased human traffic.
 - 34 • Development could encroach into military training routes (MTRs) and special
35 use airspace (SUA), thereby creating safety issues and conflicting with
36 military training. Also, power towers could pose some hazard to operation of
37 the Mexicali Airport.
38

⁷ Section 368 of the Energy Policy Act of 2005 (Public Law 109-58) required federal agencies to engage in transmission corridor planning (see Section 1.6.2.1 of the Draft Solar PEIS). As a result of this mandate, the U.S. Department of the Interior Bureau of Land Management (BLM), U.S. Department of Energy (DOE), U.S. Forest Service (USFS), and U.S. Department of Defense (DoD) prepared a PEIS to evaluate the designation of energy corridors on federal lands in 11 western states, including the 6 states evaluated in this study (DOE and DOI 2008). The BLM and USFS issued Records of Decision to amend their respective land use plans to designate numerous corridors, often referred to as Section 368 corridors.



SOL444

FIGURE C.2.1-1 Proposed Imperial East SEZ as Presented in the Draft Solar PEIS

- 1 • Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil
2 erosion and deposition by wind and runoff, sedimentation, and soil
3 contamination) could occur.
- 4
- 5 • About 60% of the SEZ is included within a known geothermal resource area
6 (KGRA); solar development would prevent geothermal resource development.
- 7
- 8 • Groundwater use would deplete the aquifer to the extent that, at a minimum,
9 wet-cooling options would not be feasible.
- 10
- 11 • Runoff of water and sediments from the proposed SEZ could adversely affect
12 the existing wetlands and mitigation wetlands.
- 13
- 14 • Clearing of a large portion of the proposed SEZ could adversely affect
15 wetlands, riparian habitats, desert dry washes, and sand dune habitats,
16 depending on the amount of available habitat disturbed. The establishment of
17 noxious weeds could result in habitat degradation. Deposition of fugitive dust
18 could cause reduced productivity or changes in plant community structure.
- 19
- 20 • Potentially suitable habitat for 35 special status species and 160 wildlife
21 species occurs in the affected area of the proposed SEZ; less than 1% of the
22 potentially suitable habitat for any of these species occurs in the region that
23 would be directly affected by development.
- 24
- 25 • Temporary exceedances of ambient air quality standards for particulate
26 matter at the SEZ boundaries are possible during construction. These high
27 concentrations, however, would be limited to the immediate area surrounding
28 the SEZ boundary.
- 29
- 30 • Generally, there would be minimal visual impacts on communities and highly
31 sensitive visual resource areas; however, portions of the Juan Baptista de
32 Anza Historic Trail auto route lie within the SEZ and the viewshed. Two
33 major roads are also within the SEZ viewshed. Strong visual contrasts could
34 be observed by travelers on these routes.
- 35
- 36 • Noise levels at the nearest residences could be higher during construction
37 than the U.S. Environmental Protection Agency guideline levels. During
38 operations, it was estimated that noise levels at the nearest residences would
39 exceed county regulation levels if concentrating solar power facilities with
40 energy storage technologies (which could extend the daily operational time by
41 6 hours or more) were used at the SEZ.
- 42
- 43 • The potential for impacts on significant paleontological and cultural resources
44 is unknown. It is possible that there will be Native American concerns about
45 the potential for burials within or near the SEZ and visual impacts on
46 landscape features.

- 1 • Minority populations occur within a 50-mi (80-km) radius of the proposed
2 SEZ boundary; thus adverse impacts of solar development could
3 disproportionately affect minority populations.
4
- 5 • Users of California State Route 98 could experience moderate traffic
6 congestion during construction at the SEZ.
7

8 9 **C.2.1.2 Summary of Comments Received**

10
11 Most of the comments received on the proposed Imperial East SEZ were in favor of
12 identifying the area as an SEZ in the applicable land use plan, but with reduction in size to
13 eliminate conflicts (California Public Utilities Commission, California Desert Coalition, Natural
14 Resources Defense Council [NRDC] et al.,⁸ and Center for Biological Diversity). The California
15 Energy Commission and Department of Fish and Game (CDFG) were in favor of expanding the
16 SEZ, assuming Areas of Rare Species Richness could be avoided (these are being evaluated in
17 the Desert Renewable Energy Conservation Plan [DRECP]). However, the Quechan Tribe,
18 Western Watersheds Project, and California State Parks recommended eliminating the SEZ
19 because of cultural, wildlife, and special status species concerns.
20

21 With respect to cumulative impacts, the NRDC requested that information from other
22 solar energy EISs in the vicinity of this SEZ be considered in the Final Solar PEIS. In addition,
23 a member of a wildlife organization noted the absence of a means for prioritizing competing
24 renewable energy interests in a given area, noting that a KGRA underlies the SEZ.
25

26 Several comments from the solar industry requested additional analysis of transmission
27 capacity and details on when, where, and how transmission would be developed.
28
29

30 **C.2.1.3 Changes to the SEZ**

31
32 No boundary revisions were identified for the proposed SEZ. However, areas specified
33 for non-development under SEZ-specific design features were mapped, where data were
34 available. For the proposed Imperial East SEZ, 5 acres (0.02 km²) of wetlands along the southern
35 border of the SEZ were identified as non-development areas (see Figure C.2.1-2). The remaining
36 developable area within the SEZ is 5,717 acres (23.1 km²).
37
38

⁸ The Natural Resources Defense Council, Audubon Society, California Native Plant Society, California Wilderness Coalition, Californians for Western Wilderness, Defenders of Wildlife, the National Parks Conservation Association, Point Reyes Bird Observatory Conservation Science, Sierra Club, The Wilderness Society, and The Wildlands Conservancy submitted joint comments on the proposed California SEZs. Those comments are attributed to The Natural Resources Defense Council et al.

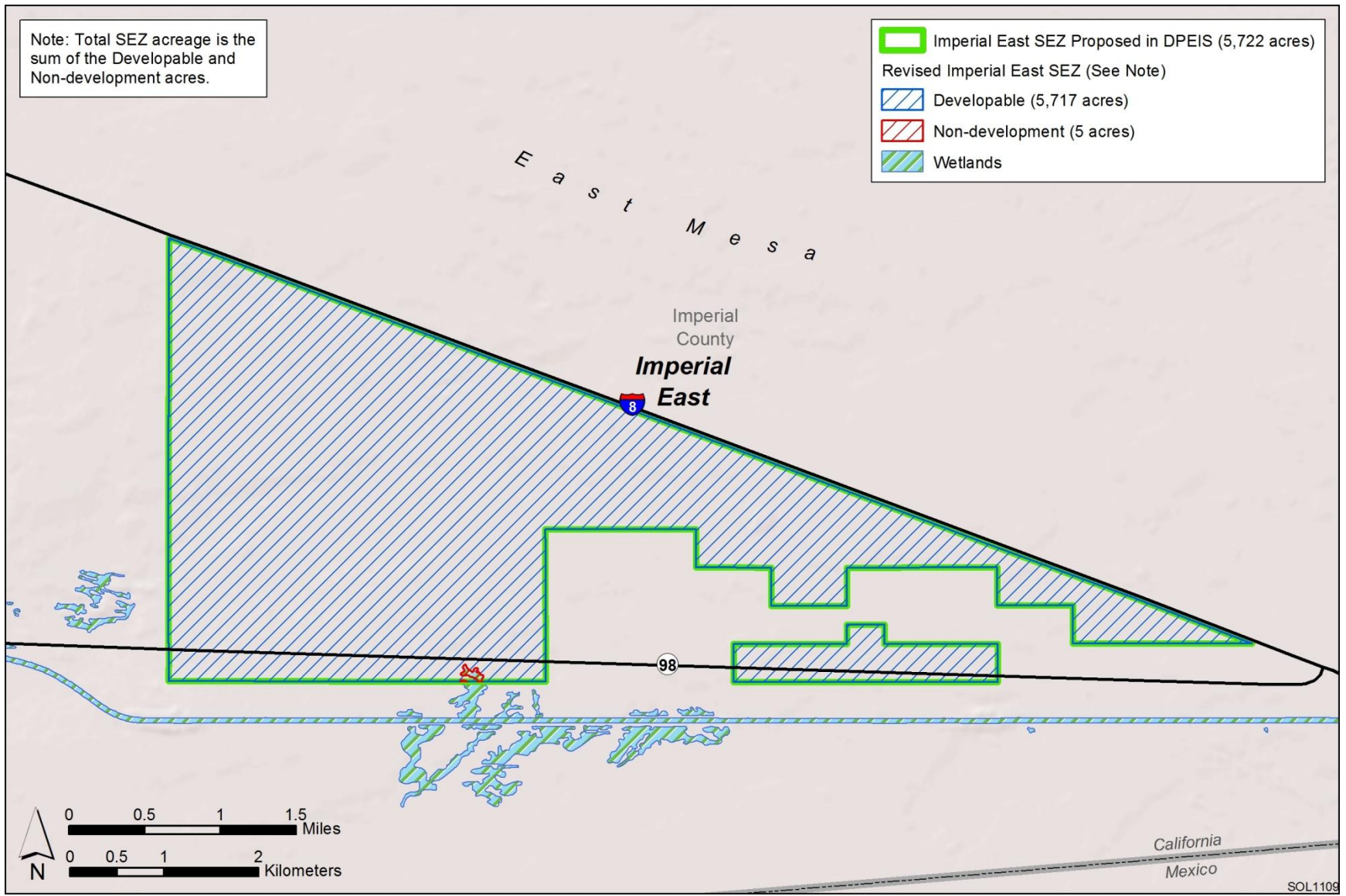


FIGURE C.2.1-2 Proposed Imperial East SEZ as Described in this Supplement

1 **C.2.1.4 Wilderness Character Status of SEZ**

2
3 A recently maintained inventory of wilderness characteristics was used to determine
4 whether public lands within the Imperial East SEZ have wilderness characteristics. The finding
5 of this inventory was that these lands do not contain wilderness characteristics.
6

7
8 **C.2.1.5 Additional Data Collection Recommended**

9
10
11 **C.2.1.5.1 Lands and Realty**

12
13 None.
14

15
16 **C.2.1.5.2 Specially Designated Areas and Lands with Wilderness Characteristics**

17
18 None.
19

20
21 **C.2.1.5.3 Rangeland Resources**

22
23
24 *Livestock Grazing.* None.
25

26
27 *Wild Horses and Burros.* None.
28

29
30 **C.2.1.5.4 Recreation**

31
32 None.
33

34
35 **C.2.1.5.5 Military and Civilian Aviation**

36
37 The BLM will continue to consult with the DoD regarding potential issues with MTRs
38 and SUA. The potential impact of power towers in this SEZ, including the ability of power
39 towers to comply with Federal Aviation Administration regulations pertaining to air navigation
40 obstructions, could be further investigated.
41

42
43 **C.2.1.5.6 Geologic Setting and Soil Resources**

44
45 None.
46

1 **C.2.1.5.7 Minerals**
2

3 Sixty percent of the SEZ is within a KGRA. The compatibility of solar and geothermal
4 development could be further investigated.
5

6 Additional information on leasable and strategic minerals in the vicinity of the proposed
7 SEZ will be provided in the Final Solar PEIS to inform the Department of the Interior’s decision
8 on a proposed 20-year withdrawal of SEZ lands.
9

10 **C.2.1.5.8 Water Resources**
11

12 The following additional data and actions would help further characterize potential
13 impacts on water resources for the proposed Imperial East SEZ. A more detailed discussion of
14 each of these activities is included in the water resources action plan provided in Section C.7.2 of
15 this appendix.
16

- 17
- 18 • Prepare a planning-level water resources inventory of the Imperial Valley
19 Basin.
20
 - 21 • Verify the mitigation wetland enhancement project for jurisdictional water
22 determinations with the U.S. Army Corps of Engineers (USACE)
23 (Los Angeles District) and the Imperial Irrigation District (IID). It is likely
24 these were considered jurisdictional waters during the IID’s restoration
25 efforts. If no jurisdictional water determination has been made for the
26 wetlands along the southern border of SEZ, then:
 - 27 – A field survey should be conducted, and
 - 28 – A jurisdictional water determination should be obtained from the USACE
29 (Los Angeles District).
 - 30
 - 31 • Describe the formation of a stakeholder committee to conduct long-term
32 monitoring of water resources. This activity would entail:
 - 33 – Identifying key stakeholder agencies,
 - 34 – Discussing general features of a monitoring program, and
 - 35 – Working with the U.S. Geological Survey to develop groundwater
36 monitoring well design and numerical groundwater models.
37
 - 38 • Develop a simple, numerical groundwater model for the southern portion of
39 Imperial Valley. This activity would entail:
 - 40 – Assessing the potential for drawdown impacts on the restored, mitigation
41 wetlands located along the All-American Canal, and
 - 42 – Coordinating with the IID to identify any potential groundwater
43 drawdown concerns regarding its operations (e.g., All-American Canal,
44 East Highland Canal, other drainage ditches) to be evaluated in the
45 numerical groundwater model.
46

1 **C.2.1.5.9 Ecological Resources**
2
3

4 **Vegetation and Plant Communities.** The following additional data-gathering actions
5 would help further characterize potential impacts on vegetation and plant communities for the
6 proposed Imperial East SEZ.
7

- 8 • Identify and map the location and areal extent of desert riparian, wash, and
9 wetland habitats within the SEZ. Identify and map the location and areal
10 extent of desert riparian, wash, and wetland habitats outside the SEZ that may
11 be affected by hydrologic changes, including groundwater elevations, and
12 changes in water, sediment, and contaminant inputs associated with runoff.
13 Such effort could determine the habitat characteristics (including water
14 source, hydrologic regime, and dominant plant species) both within the
15 wetland boundaries and in adjacent non-wetland habitats.
16
- 17 • Identify and map the location and areal extent of sand dunes and sand
18 transport systems within the SEZ.
19
20

21 **Wildlife.** The following additional data-gathering actions would help further characterize
22 potential impacts on wildlife resources for the SEZ:
23

- 24 • Conduct pre-disturbance surveys within the SEZ to determine the use of the
25 SEZ as a movement/migratory corridor for desert bighorn sheep.
26
- 27 • Identify and map the location and areal extent of desert riparian wash,
28 wetland, and sand dune and sand transport habitats within the SEZ. These
29 areas are important habitat areas for many game and nongame species of
30 wildlife.
31
32

33 **Aquatic Biota.** Wetlands are present, and, therefore, direct impacts on wetland
34 communities are possible as a result of solar energy development within the SEZ. These areas
35 could be surveyed for aquatic communities. Additionally, the man-made All-American Canal
36 and East Highline Canal and associated palustrine wetlands within 5 mi (8 km) of the SEZ could
37 be indirectly affected by development and operation of solar energy facilities. However, the All-
38 American Canal and associated wetlands have primarily non-native fish, and no protected
39 aquatic biota are known to be present. Thus, impacts on aquatic biota would likely be to invasive
40 or common species. New surveys could be conducted to confirm this, but the primary value of
41 these features is for nonaquatic animals that may consume aquatic biota within the SEZ.
42 Therefore, no surveys are recommended.
43
44
45

1 **Special Status Species.** The following additional data-gathering actions would be useful
2 in further characterizing and protecting habitat available to special status species:

- 3
4 • Conduct pre-disturbance surveys within the SEZ to determine the presence
5 and abundance of those special status species that are (1) federally listed,
6 proposed for listing, or candidates for listing under the Endangered Species
7 Act (ESA); (2) listed by the State of California as endangered, threatened, or
8 fully protected; or (3) designated as sensitive by the California BLM State
9 Office. These species are listed in Table C.2.1-1. Surveys should focus on
10 areas identified as potentially suitable, and the suitability of these habitats to
11 support these special status species should be determined in the field. All
12 field-determined suitable habitats for special status species should be mapped.
13 Target species and survey protocols should be developed in coordination with
14 the U.S. Fish and Wildlife Service and CDFG.

15
16 The Draft Solar PEIS presents a table of special status species for which
17 potential impacts need to be evaluated prior to development in the proposed
18 Imperial East SEZ. The list of species presented in Table 9.1.12.1-1 of the
19 Draft Solar PEIS also includes species listed by the State of California and
20 species ranked by the State of California as S1 or S2. Based on the design
21 features presented in the Draft Solar PEIS, the potential for impacts on these
22 additional species will also need to be addressed before development could
23 occur in the SEZ.

- 24
25 • Identify and map the location and areal extent of desert riparian, wash, and
26 wetland habitats within the SEZ, including habitat characteristics (such as
27 water source, hydrologic regime, and dominant plant species) both within the
28 wetland boundaries and in adjacent non-wetland habitats. Species potentially
29 associated with these habitats include Munz’s cholla, Colorado Desert fringe-
30 toed lizard, California black rail, ferruginous, least bittern, Yuma clapper rail,
31 California leaf-nosed bat, pallid bat, Townsend’s big-eared bat, and western
32 mastiff bat.
- 33
34 • Identify and map the location and areal extent of sand dunes and sand
35 transport systems on the SEZ. Species potentially associated with these
36 habitats include chaparral sand-verbena, flat-seeded spurge, giant Spanish-
37 needle, sand food, Colorado Desert fringe-toed lizard, and flat-tailed horned
38 lizard.

39 40 41 **C.2.1.5.10 Air Quality and Climate**

42
43 None.

1 **TABLE C.2.1-1 Special Status Species That May Occur near the Proposed Imperial East SEZ^a**

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
Plants			
Chaparral sand-verbena	<i>Abronia villosa</i> var. <i>aurita</i>	BLM-S	Endemic to southern California. Chaparral desert sand dunes at elevations between 350 and 5,250 ft. ^d Historically occurred on and in the vicinity of the SEZ; the species has not been recorded in the project area since 1964. Most recent recorded occurrences are 15 mi ^e west of the SEZ. About 190,582 acres ^f of potentially suitable habitat occurs within the SEZ region.
Flat-seeded spurge	<i>Chamaesyce platysperma</i>	BLM-S	Sandy substrates of desert dunes within Sonoran desertscrub communities at elevations below 650 ft. Nearest recorded occurrences are 45 mi from the SEZ. About 1,249,216 acres of potentially suitable habitat occurs within the SEZ region.
Giant Spanish-needle^g	<i>Palafoxia arida</i> var. <i>gigantea</i>	BLM-S	Desert sand dune habitats at elevations below 330 ft. Known to occur in the affected area within 5 mi east of the SEZ. About 190,187 acres of potentially suitable habitat occurs within the SEZ region.
Munz's cholla	<i>Opuntia munzii</i>	BLM-S	Gravelly or sandy to rocky soils, often on lower bajadas, washes, and flats. Also occurs in hills and canyon sides. Occurs in Sonoran Desert creosotebush shrub communities at elevations below 3,280 ft. Nearest recorded occurrences are 25 mi north (upgradient) of the SEZ. About 1,856,676 acres of potentially suitable habitat occurs within the SEZ region.
Sand food	<i>Pholisma sonorae</i>	BLM-S	Sonoran sand dune habitats at elevations below 650 ft. Known to occur in the affected area within 5 mi east of the SEZ. About 190,187 acres of potentially suitable habitat occurs within the SEZ region.
Reptiles			
Colorado Desert fringe-toed lizard	<i>Uma notata</i>	BLM-S	Sparsely vegetated arid areas with windblown sand, including dunes, flats, and washes at elevations below 1,600 ft. Nearest recorded occurrence is 6 mi northeast of the SEZ. About 658,770 acres of potentially suitable habitat occurs within the SEZ region.
Flat-tailed horned lizard	<i>Phrynosoma mcallii</i>	BLM-S	Sandy desert hardpan, gravel flats, and dunes with sparse vegetation of low species diversity at elevations below 850 ft. Known to occur in the affected area within 3 mi north of the SEZ. About 281,300 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.2.1-1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
Birds			
California black rail	<i>Laterallus jamaicensis coturniculus</i>	BLM-S; CA-FP; CA-T	Year-round resident in the Imperial Valley and lower Colorado River in Arizona and California. Locally common in marshes along the Colorado River or canal systems. Known to occur in the affected area from the All-American Canal. About 184,792 acres of potentially suitable habitat occurs within the SEZ region.
Ferruginous hawk	<i>Buteo regalis</i>	BLM-S	Winter resident and migrant at lower elevations and open grasslands, shrublands, and agricultural areas in southern California. Open grasslands, sagebrush flats, desertscrub, desert valleys, and fringes of pinyon-juniper habitats. This species is known to occur in Imperial County, California. About 1,252,826 acres of potentially suitable habitat occurs within the SEZ region.
Least bittern	<i>Ixobrychus exilis</i>	BLM-S	Year-round resident in the lower Colorado River Valley, including the Salton Sea and the Colorado River in California and Arizona. Emergent vegetation of larger bodies of water such as lakes, ponds, and rivers. Nests in dense cattail marshes and thickets of saltcedar. The species occurs near the Colorado River as near as 35 mi and 40 mi east and northwest of the SEZ, respectively. About 206,149 acres of potentially suitable habitat occurs within the SEZ region.
Western burrowing owl	<i>Athene cunicularia hypugaea</i>	BLM-S	Year-round resident within the SEZ region. Open areas with short sparse vegetation, including grasslands, agricultural fields, and disturbed areas. Nests in burrows created by mammals or tortoises. Feeds on insects and small mammals. Nearest recorded occurrence is 10 mi west of the SEZ. About 2,531,363 acres of potentially suitable habitat occurs within the SEZ region.
Yuma clapper rail	<i>Rallus longirostris yumanensis</i>	ESA-E; CA-FP; CA-T	Freshwater marshes containing dense stands of cattails. Nests on dry hummocks or in small shrubs among dense cattails or bulrushes along the edges of shallow ponds in freshwater marshes with stable water levels. Known to occur in the affected area along the All-American Canal within 0.5 mi south of the SEZ. About 185,175 acres of potentially suitable habitat occurs within the SEZ region.
Mammals			
California leaf-nosed bat	<i>Macrotus californicus</i>	BLM-S	Year-round resident in SEZ region. Desert riparian, desert wash, desertscrub, and palm oasis habitats at elevations below 2,000 ft. Roosts in mines, caves, and buildings. Nearest recorded occurrences are 20 mi east of the SEZ. About 1,539,377 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.2.1-1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
Mammals			
(Cont.)			
Pallid bat	<i>Antrozous pallidus</i>	BLM-S	Year-round resident throughout the California solar region. Inhabits low-elevation desert communities, including grasslands, shrublands, and woodlands. Day roosts in caves, crevices, and mines. Nearest recorded occurrence is from the North Algodones Dunes Wilderness, approximately 18 mi north of the SEZ. About 1,403,590 acres of potentially suitable habitat occurs within the SEZ region.
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	BLM-S	Found throughout California, in all but subalpine and alpine habitats, and may be found at any season throughout its range. Roosts in caves, mines, tunnels, buildings, or other man-made structures. Nearest recorded occurrence is approximately 35 mi from the SEZ. About 2,919,158 acres of potentially suitable habitat occurs within the SEZ region.
Western mastiff bat	<i>Eumops perotis californicus</i>	BLM-S	Year-round resident in southern California and southwestern Arizona in many open semiarid habitats, including conifer and deciduous woodlands, shrublands, grasslands, chaparral, and urban areas. Day roosts in crevices in cliff faces, buildings, and tall trees. Nearest recorded occurrence is 16 mi west of the SEZ. About 2,435,906 acres of potentially suitable habitat occurs within the SEZ region.

^a The listings for (1) federally listed, proposed for listing, or candidates for listing under the ESA, and (2) California BLM State Office sensitive species have been updated since the release of the Draft Solar PEIS.

^b BLM-S = listed as a sensitive species by the BLM; CA-FP = listed as fully protected by the State of California; CA-T = listed as threatened by the State of California; ESA-E = listed as endangered under the ESA

^c For plant and invertebrate species, potentially suitable habitat was determined by using California Regional Gap Analysis Project (CAREGAP) and Southwest Regional Gap Analysis Project (SWReGAP) land cover types (USGS 2005, 2010). For reptile, bird, and mammal species, potentially suitable habitat was determined by using CAREGAP and SWReGAP habitat suitability models as well as CAREGAP and SWReGAP land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.

^d To convert ft to m, multiply by 0.3048.

^e To convert mi to km, multiply by 1.609.

^f To convert acres to km², multiply by 0.004047.

^g Species in bold text have been recorded or have designated critical habitat in the affected area.

1
2

1 **C.2.1.5.11 Visual Resources**
2

3 A summary of the Draft Solar PEIS visual contrast analysis for the proposed Imperial
4 East SEZ is provided in Table C.2.1-2. This table includes only those resources that would be
5 subject to moderate or strong visual contrast. The Draft Solar PEIS visual impact analysis
6 predicted these levels of visual contrast from solar energy development in the Imperial East SEZ
7 for the following sensitive visual resource areas (SVRAs) and sensitive viewing locations
8 (SVLs):
9

- 10 • Juan Batista de Anza National Historic Trail
11
12 • Interstate 8 (I-8)
13
14 • State Route 98.
15

16 The following steps could be taken to better understand potential impacts on these
17 SVRAs and SVLs from solar development in the Imperial East SEZ:
18

- 19 • Identify key observation points (KOPs) within these areas through working
20 with the management agency or other local stakeholders.
21
22 • Conduct viewshed analyses from the KOPs to determine how much of the
23 SEZ would be in view from each KOP.
24
25 • As deemed necessary, based on viewshed analysis results, prepare wireframe
26 Google Earth™ visualizations of hypothetical solar facilities in the SEZ
27 depicting the 80% development scenario to better estimate potential impacts.
28

29 This additional analysis may help judge potential visual contrast more accurately for most
30 KOPs. For KOPs of particularly high sensitivity (e.g., the historic trail), a site visit with
31 photography and superimposition of the wireframe models onto the photos might be required or
32 desired.
33

34 **C.2.1.5.12 Acoustic Environment**
35

36 None.
37
38

39 **C.2.1.5.13 Paleontological Resources**
40

41 The BLM Regional Paleontologist will be contacted to determine whether additional
42 information is available regarding Potential Fossil Yield Classification (PFYC) identifications in
43 California. A preliminary paleontological survey could be conducted to determine the PFYC of
44 the SEZ, in order to update the temporary assignment of PFYC Class 3b used in the Draft Solar
45 PEIS. In addition, the San Bernardino County Museum paleontologist could be contacted to
46

TABLE C.2.1-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi (40-km) Viewshed of the Proposed Imperial East SEZ

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/ Mileage ^{a,b} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^c	Total Acreage/ Mileage Visible within 25 mi	Percentage of Total Acreage/ Mileage Visible within 25 mi	Notes
National Historic Trail	Juan Batista de Anza	1,210 mi	10 mi south of the SEZ	4 mi	0.3	Strong visual contrasts observed within and near the SEZ would be anticipated for travelers on the auto tour route. Minimal visual contrast would be experienced by nonmotorized trail users.
Other Areas of Interest (non-management areas)	I-8 and State Route 98	NA ^d	Passes through the southern portion of the SEZ	NA	NA	Strong visual contrasts could be observed within and near the SEZ by travelers on I-8 and State Route 98.

^a To convert mi to km, multiply by 1.609.

^b To convert acres to km², multiply by 0.004047.

^c Distances are based on the Draft Solar PEIS analysis dated December 2010; any alterations to the SEZ boundaries may result in changes to the distance at the point of closest approach.

^d NA = data not available.

1 obtain more detailed information about the potential paleontological resources that may occur in
2 the vicinity of the SEZ.

3 4 5 **C.2.1.5.14 Cultural Resources and Native American Concerns** 6

7 Very little area within the proposed Imperial East SEZ has been surveyed for cultural
8 resources (only about 300 acres [1.2 km²] in the northwest corner); thus, absent specific
9 information, impacts are unknown but possible on archaeological sites. Two sites are recorded in
10 the SEZ, and two burial sites are recorded with the Native American Heritage Commission in
11 Township/Range sections partially included within or near the SEZ. More than 50 sites were
12 recorded south of the SEZ during the All-American Canal survey.

13
14 The SEZ is in the midst of a sacred landscape traversed by a network of trails. The
15 Yuma-San Diego Trail is either close to or goes through the SEZ. This trail links two sacred
16 areas: Pilot Knob (to the east) and Yuha Mesa (to the west). Other related sacred areas with
17 possible viewsheds encompassing the SEZ include the western branch of the Xam Kwatcan Trail
18 at Indian Pass, Gold Basin and Rand Intaglios, and Picacho Peak—all within approximately
19 35 mi (56.3 km) of the SEZ, to the northeast. Potential impacts could include visual and auditory
20 impacts on sacred sites and possible destruction of segments of the trails system and associated
21 sites.

22
23 The destruction or degradation of important plant resources and the destruction of habitat
24 or impediments to the movement of culturally important wildlife are also potential impacts of
25 concern within the SEZ.

26
27 The following additional data collection efforts could reduce the uncertainty about
28 potential impacts on cultural resources:

- 29
- 30 • Conduct a Class I literature file search to better understand (1) the site
31 distribution pattern in the vicinity of the SEZ, (2) the trail networks through
32 existing ethnographic reports, and (3) overall cultural sensitivity of the
33 landscape. (SWCA Environmental Consultants is currently conducting a
34 Class I study of all California SEZs on behalf of the BLM.
 - 35
36 • Conduct a Class II Stratified Random Sample Survey of the SEZ to obtain a
37 10% sample (roughly 572 acres [2.3 km²]).⁹ If the roughly 300 acres
38 (1.2 km²) previously surveyed meets current survey standards, then
39 approximately 272 additional acres (1.1 km²) of survey could satisfy a 10%
40 sample. However, all approximately 300 acres (1.2 km²) are clustered in one
41 area of the SEZ, and additional areas should be considered to provide a more
42 representative sample of the SEZ. Areas of interest as determined through the

⁹ The BLM plans to conduct a Class II survey of 5% of this SEZ prior to the Final Solar PEIS. Additional areas could be surveyed as funding becomes available.

1 Class I review should also be identified when defining the sampling strategy.
2 If appropriate, some subsurface testing of dune areas should be considered in
3 the sampling strategy as well.
4

- 5 • Prepare a cultural sensitivity map based on results of Class I and Class II
6 studies (and incorporation of the results of the DRECP cultural sensitivity
7 map, if applicable for this SEZ).
8
- 9 • Continue with government-to-government consultation as described in
10 Section 2.4.3, including follow-up to recent ethnographic studies with Tribes
11 not included in the original studies to determine whether those Tribes have
12 similar concerns. The Imperial East SEZ falls in the traditional use area of
13 primarily the Quechan, Cocopah, and Cahuilla. Potential topics to be
14 discussed during consultation include two known burials identified in the
15 NAHC database, Indian Pass, Xam Kwatcan Trail, Pilot Knob, Picacho Peak,
16 Yuha Basin, Yuma-San Diego Trail, Lake Cahuilla ACEC Areas C and D,
17 and plant and animal resources.
18

19
20 **C.2.1.5.15 Socioeconomics and Environmental Justice**

21
22 None.
23
24

25 **C.2.1.5.16 Cumulative Impact Considerations**

26
27 None.
28

1 **C.2.2 Riverside East**
2
3

4 **C.2.2.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic**
5 **Environmental Impact Statement (PEIS)**
6

7 The proposed Riverside East solar energy zone (SEZ), as presented in the Draft Solar
8 PEIS, had a total area of 202,896 acres (821 km²). It is located in Riverside County in
9 southeastern California (Figure C.2.2-1). The small town of Desert Center is located at the far
10 southwestern edge of the SEZ, along Interstate 10 (I-10). The towns of Blythe and Indio are about
11 6 mi (10 km) southeast of and 45 mi (72 km) west of the SEZ, respectively.
12

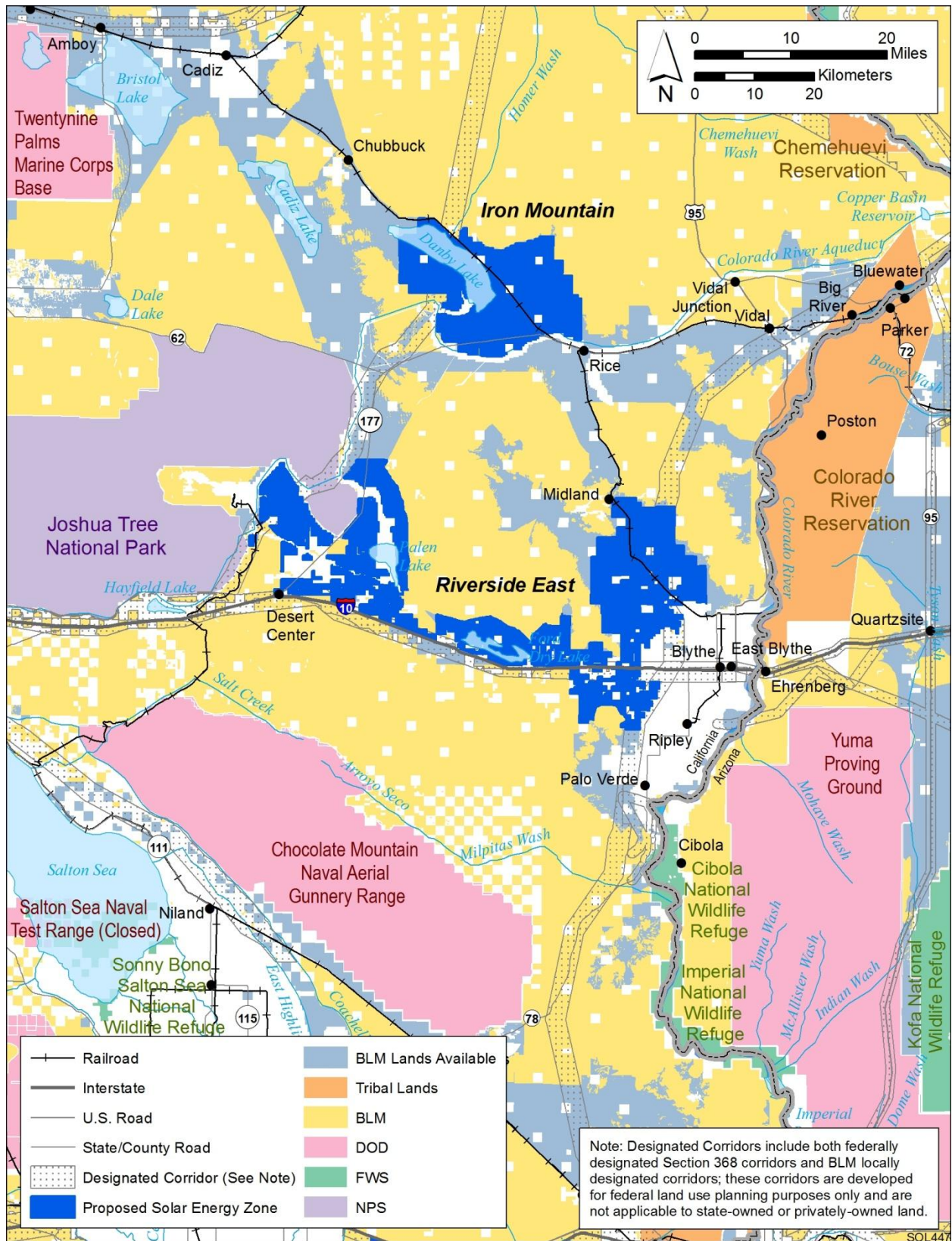
13 The Draft Solar PEIS identified a 500-kV transmission line that runs east–west parallel
14 to the southern SEZ boundary as the nearest point for connection of the SEZ to the grid. In
15 addition, a 230-kV line passes through the far western section of the SEZ, and a 69-kV line
16 passes through the eastern portion of the SEZ. The location of new transmission that could be
17 constructed for this SEZ in the future may be different from that assumed in the Draft Solar
18 PEIS. Details on the updated transmission impact assessment to be included in the Final Solar
19 PEIS are provided in Section C.7.1 of this appendix. Analysis of transmission lines and/or access
20 roads will be completed, as necessary, as part of project-specific environmental reviews (see
21 Section 2.2.2.2.2 of this Supplement).
22

23 A Section 368 federally designated energy corridor overlaps the SEZ along I-10.¹⁰ In
24 addition, there are two north–south corridors within the SEZ; one is located in the western
25 portion of the SEZ, and one is in the eastern portion. These corridors could limit development in
26 the SEZ because solar facilities cannot be constructed under transmission lines. The discussion
27 of impacts of solar energy development in the SEZ in the Draft Solar PEIS acknowledged that
28 the presence of the corridor would reduce the amount of land available for solar power
29 production and that, conversely, full development of solar facilities within the SEZ would limit
30 use of the transmission corridor.
31

32 Potential adverse impacts identified in the Draft Solar PEIS included the following:
33

- 34 • Solar development in the western portion of the SEZ would likely create
35 conflict with existing residential use near Desert Center, Lake Tamarisk
36 Resort, and scattered private residences.
37

¹⁰ Section 368 of the Energy Policy Act of 2005 (Public Law 109-58) required federal agencies to engage in transmission corridor planning (see Section 1.6.2.1 of the Draft Solar PEIS). As a result of this mandate, the U.S. Department of the Interior Bureau of Land Management (BLM), U.S. Department of Energy (DOE), U.S. Forest Service (USFS), and U.S. Department of Defense (DoD) prepared a PEIS to evaluate the designation of energy corridors on federal lands in 11 western states, including the 6 states evaluated in this study (DOE and DOI 2008). The BLM and USFS issued Records of Decision to amend their respective land use plans to designate numerous corridors, often referred to as Section 368 corridors.



2 **FIGURE C.2.2-1 Proposed Riverside East SEZ as Presented in the Draft Solar PEIS**

- 1 • Development in the SEZ would adversely affect wilderness characteristics in
2 the Palen-McCoy, Rice Valley, Big Maria Mountains, Chuckwalla Mountains,
3 and Little Chuckwalla Mountains Wilderness Areas (WAs) and in Joshua Tree
4 National Park (NP). There is potential for adverse impacts on resources within
5 the seven Areas of Critical Environmental concern (ACECs) in and near the
6 SEZ. Solar facility development could adversely affect the scenic view from
7 Joshua Tree NP, the natural soundscape, and the quality of the night sky
8 environment as viewed from the National Park and WAs in the region.
9
- 10 • The BLM Midland Long Term Visitor Area (LTVA) is located within the
11 SEZ, although the impact of solar development on the use of the LTVA by
12 winter visitors is not known. Solar development would discourage recreational
13 use in areas adjacent to the SEZ, including designated wilderness,
14 undesignated public lands, and Joshua Tree NP.
15
- 16 • There is potential for adverse impacts on military use and training in
17 eight military training routes (MTRs). Any solar facility that intrudes into
18 military airspace would adversely affect the use of that airspace. The potential
19 impact on operations of two civilian airports located within or adjacent to the
20 SEZ will need to be considered if solar development is proposed.
21
- 22 • Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil
23 erosion by wind and runoff, sedimentation, and soil contamination) could
24 occur. Palen and Ford Dry Lakes may not be suitable locations for
25 construction.
26
- 27 • Groundwater use would deplete the aquifer to the extent that, at a minimum,
28 wet-cooling options would not be feasible. High total dissolved solids values
29 of groundwater could produce water that is nonpotable and corrosive to
30 infrastructure.
31
- 32 • Clearing of a large portion of the proposed SEZ could primarily affect
33 wetland, riparian, playa, dry wash woodland, and chenopod scrub, depending
34 on the amount of habitat disturbed. The establishment of noxious weeds could
35 result in habitat degradation. Deposition of fugitive dust could cause reduced
36 productivity or changes in plant community structure.
37
- 38 • Potentially suitable habitat for 69 special status species and more than
39 130 wildlife species occurs in the affected area of the proposed SEZ; between
40 1 and 10% of the potentially suitable habitat for most of these species occurs
41 in the region that would be directly affected by development. For several
42 dune-obligate special status species, up to 32% of the potentially suitable
43 habitat in the region occurs in the area of direct effects.
44
- 45 • If aquatic biota exist within McCoy Wash, ephemeral washes, the Palen Lake
46 or Ford Dry Lake, they could be affected by the direct removal of these

1 surface water features within the construction footprint. Some of these
2 features may be defined as non-development areas, and such areas would not
3 be directly affected by ground disturbance. Aquatic biota, if present, could
4 also be indirectly affected by a decline in habitat quantity and quality due to
5 water withdrawals and changes in drainage patterns, as well as increased
6 sediment and contaminant inputs associated with ground disturbance and
7 construction activities.
8

- 9 • Temporary exceedances of ambient air quality standards for particulate
10 matter at the SEZ boundaries are possible during construction. These high
11 concentrations, however, would be limited to the immediate area surrounding
12 the SEZ boundary. Modeling indicates that emissions from construction
13 activities could result in considerable impacts at the nearest Class I area
14 (Joshua Tree NP), but the potential impacts would be temporary.
15
- 16 • Strong visual contrasts could be observed by visitors to Joshua Tree NP,
17 Joshua Tree WA, Big Maria Mountains WA, Rice Valley WA, Corn Springs
18 ACEC, travelers on I-10 and Route 177, and from the communities of Desert
19 Center and Lake Tamarisk. Moderate to strong visual contrasts could be
20 observed by visitors to the Little Chuckwalla Mountains WA. Weak to strong
21 visual contrasts could be observed from the Chuckwalla Mountains WA, the
22 Little Chuckwalla Mountains WA, the Bradshaw Trail BLM Backcountry
23 Byway, and residents of Blythe, East Blythe, and Ripley. Weak to moderate
24 visual contrast would be observed by visitors to the Palo Verde Mountains
25 WA and residents of Ehrenberg and Palo Verde. The SEZ is located within the
26 California Desert Conservation Area (CDCA), and substantial, immitigable
27 visual impacts will occur within the CDCA in the SEZ and surrounding lands.
28
- 29 • During construction, noise levels at the nearest residences could be higher
30 than the U.S. Environmental Protection Agency (EPA) guideline level. During
31 operations, on the basis of analyses presented in the Draft Solar PEIS, noise
32 levels at the nearest residences could be higher than the EPA guideline level if
33 concentrating solar power facilities with energy storage technologies (which
34 could extend the daily operational time by 6 hours or more) or if dish engine
35 technologies were used at the SEZ.
36
- 37 • Impacts on significant paleontological resources are unknown, but could be
38 high in some areas. Direct impacts on significant cultural resources could
39 occur in the SEZ; numerous prehistoric and Native American sites and trails
40 are potentially located within the SEZ and could be affected by solar energy
41 development. Concerns have been expressed in the past over the Salt Song
42 Trail, and solar development within the SEZ is likely to be visible from the
43 trail. Additional features of potential concern include Big Maria, Coxcomb,
44 and Eagle Mountains, Alligator Rock, Black Rock, and McCoy Springs. The
45 Soboba Band of Luiseno Indians and the Quechan have expressed concern
46 over highly sensitive areas within their Tribal Traditional Use Areas.

- 1 • Minority and low-income populations occur within a 50-mi (80-km) radius of
2 the proposed SEZ boundary; thus adverse impacts of solar development could
3 disproportionately affect minority and low-income populations.
4

5
6 **C.2.2.2 Summary of Comments Received**
7

8 Many of the comments received on the proposed Riverside East SEZ were in favor of
9 identifying the area as an SEZ, with boundary adjustments (The California Public Utilities
10 Commission, Center for Biological Diversity, California Energy Commission, Defenders of
11 Wildlife, Natural Resources Defense Council [NRDC] et al.,¹¹ California Native Plant Society,
12 and The Wildlands Conservancy). In particular, the Center for Biological Diversity
13 recommended eliminating all Wildlife Habitat Management Areas (WHMAs) and the sand
14 transport corridor. In addition, NRDC suggested that the microphyll woodlands and habitat
15 connectivity areas also be excluded from solar energy development. The Cultural Resources
16 Preservation Coalition and Partnership for the National Trails System proposed that lands within
17 the western end of the SEZ be eliminated to avoid impacts on Joshua Tree National Park's
18 cultural and natural resources. The National Parks Conservation Association also recommended
19 reconfiguring the SEZ to avoid impacts on Joshua Tree National Park's southern and eastern
20 border.
21

22 Residents of Lake Tamarisk and Desert Center opposed designating the area as an SEZ
23 because of its proximity to the two towns. The California Desert Coalition and the Western
24 Watersheds Project recommended that the Riverside East SEZ be eliminated because of occupied
25 desert tortoise habitat and other wildlife habitat, important cultural sites, and off-highway vehicle
26 use that would be affected by solar energy development. The Big Pine Paiute of the Owens
27 Valley favored eliminating the area as an SEZ because of conflicts with environmentally and/or
28 culturally sensitive resources.
29

30 Many commentors expressed concern for the potential impact on Joshua Tree NP and
31 wildlife corridors. EnXco expressed concern over the proposed visual resource mitigation
32 requirements for the Riverside East SEZ in the Draft Solar PEIS and other restrictions that would
33 constrain solar energy development within the SEZ. The Society for American Archaeology
34 expressed concern for impacts on Native American trails such as the Salt Song Trail and
35 adequacy of government-to-government consultation. The EPA was concerned that full build-out
36 of the Riverside East SEZ would be unlikely, given the groundwater availability and its potential
37 impacts on groundwater resources and groundwater-dependent species. The Metropolitan Water
38 District of Southern California was concerned about the transmission line assumptions made in
39 the Draft Solar PEIS and questioned whether those lines would actually be available for
40 interconnection.

¹¹ The Natural Resources Defense Council, Audubon Society, California Native Plant Society, California
Wilderness Coalition, Californians for Western Wilderness, Defenders of Wildlife, the National Parks
Conservation Association, Point Reyes Bird Observatory Conservation Science, Sierra Club, The Wilderness
Society, and The Wildlands Conservancy submitted joint comments on the proposed California SEZs. Those
comments are attributed to The Natural Resources Defense Council et al.

1 **C.2.2.3 Changes to the SEZ**
2

3 The proposed Riverside East SEZ has been reconfigured to eliminate 43,439 acres
4 (176 km²) in the northwest portion of the SEZ (see Figure C.2.2-2). Excluding this area will
5 reduce impacts on Joshua Tree NP. In addition, 11,547 acres (46.7 km²) within the SEZ
6 boundaries have been identified as non-development areas. These areas consist of intermittent
7 lakes, major washes, and areas identified for non-development through investigations for
8 approved projects. The remaining developable area within the SEZ is 147,910 acres (598.6 km²).
9

10 To reduce the visual resource impacts of solar development within the proposed
11 Riverside East SEZ which is proximate to and at a lower elevation than Joshua Tree NP and
12 several WAs, SEZ-specific visual resource mitigation requirements have been developed.
13 All forms of development within the area identified as needing to meet Visual Resource
14 Management (VRM) Class II-consistent objectives in the Draft Solar PEIS will be limited to
15 10 ft (3.3 m) or under, and technology will be restricted to either photovoltaic technologies of
16 less than 10 ft (3.3 m), or technologies with comparable or lower height and reflectivity. Within
17 the area of the SEZ that was identified as needing to meet VRM Class III-consistent objectives in
18 the Draft Solar PEIS, the solar development will be restricted to either PV technologies of less
19 than 10 ft (3.3 m), or technologies with comparable or lower heights and reflectivity. Additional
20 required mitigation measures to address potential visual resource impacts are given in
21 Section C.7.3 of this appendix.
22

23 The lands that had composed the northwest area of the proposed SEZ that are being
24 eliminated from the SEZ through this Supplement will be considered solar right-of-way
25 exclusion areas; that is, applications for solar development on these lands will not be accepted by
26 the BLM. Additionally, lands within the SEZ identified during investigations for approved
27 projects as areas where solar energy development should not occur will be defined as non-
28 development areas.
29

30 All proposed projects within the Riverside East SEZ will continue to be reviewed by
31 California’s Renewable Energy Action Team (see Section 2.2.2.2.6 of this Supplement) to ensure
32 consistency with the ongoing efforts of the Desert Renewable Energy Conservation Plan,
33 minimize impacts on habitat connectivity, and address other resource concerns in the SEZ area.
34
35

36 **C.2.2.4 Wilderness Character Status of SEZ**
37

38 A recently maintained inventory of wilderness characteristics was used to determine
39 whether public lands within the proposed Riverside East SEZ have wilderness characteristics.
40 The inventory found that approximately 11,925 acres (48.3 km²) on the eastern side of the SEZ
41 (in the area of McCoy Wash) have wilderness characteristics. The lands are shown in
42 Figure C.2.2-3.
43
44

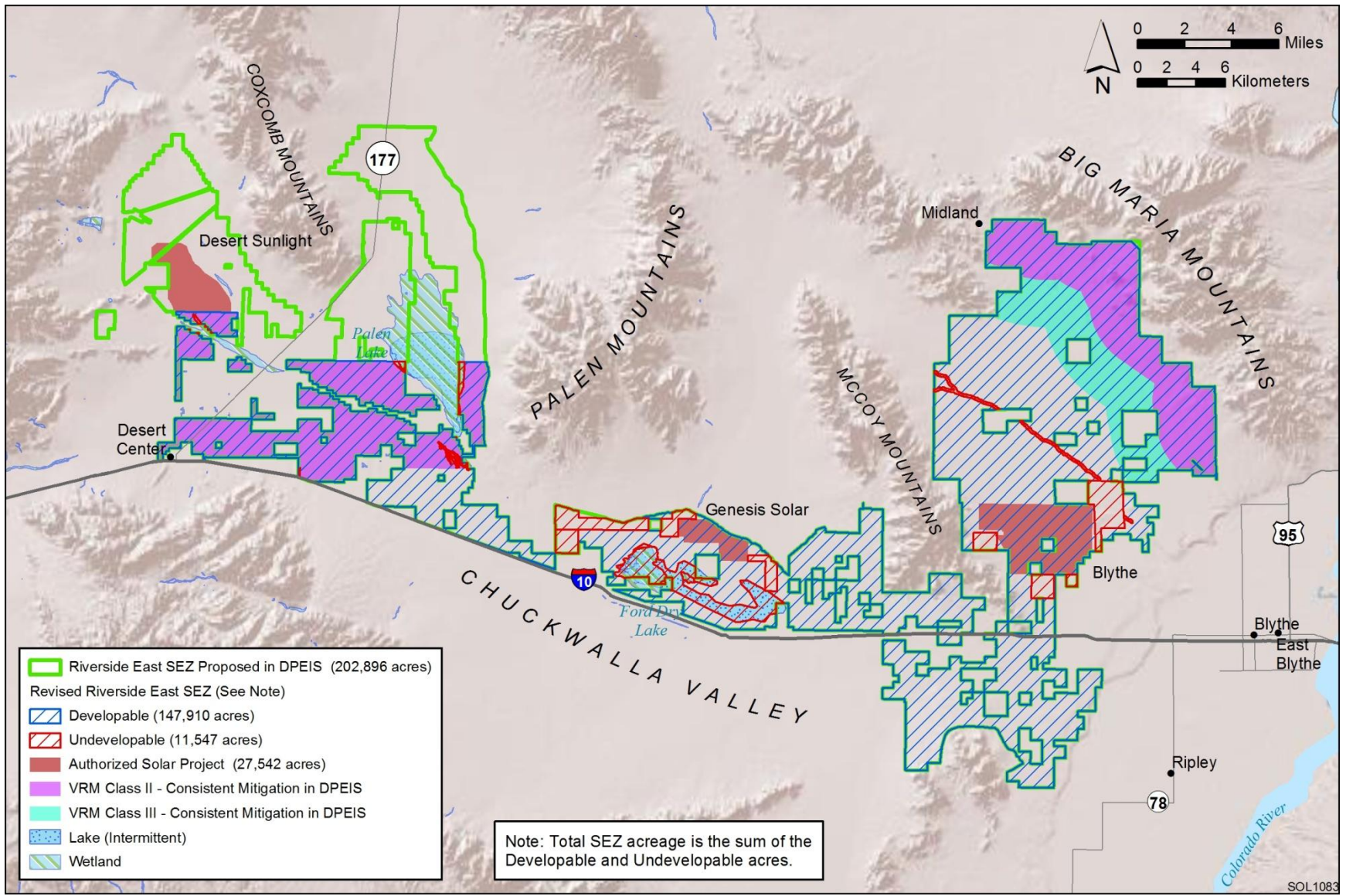
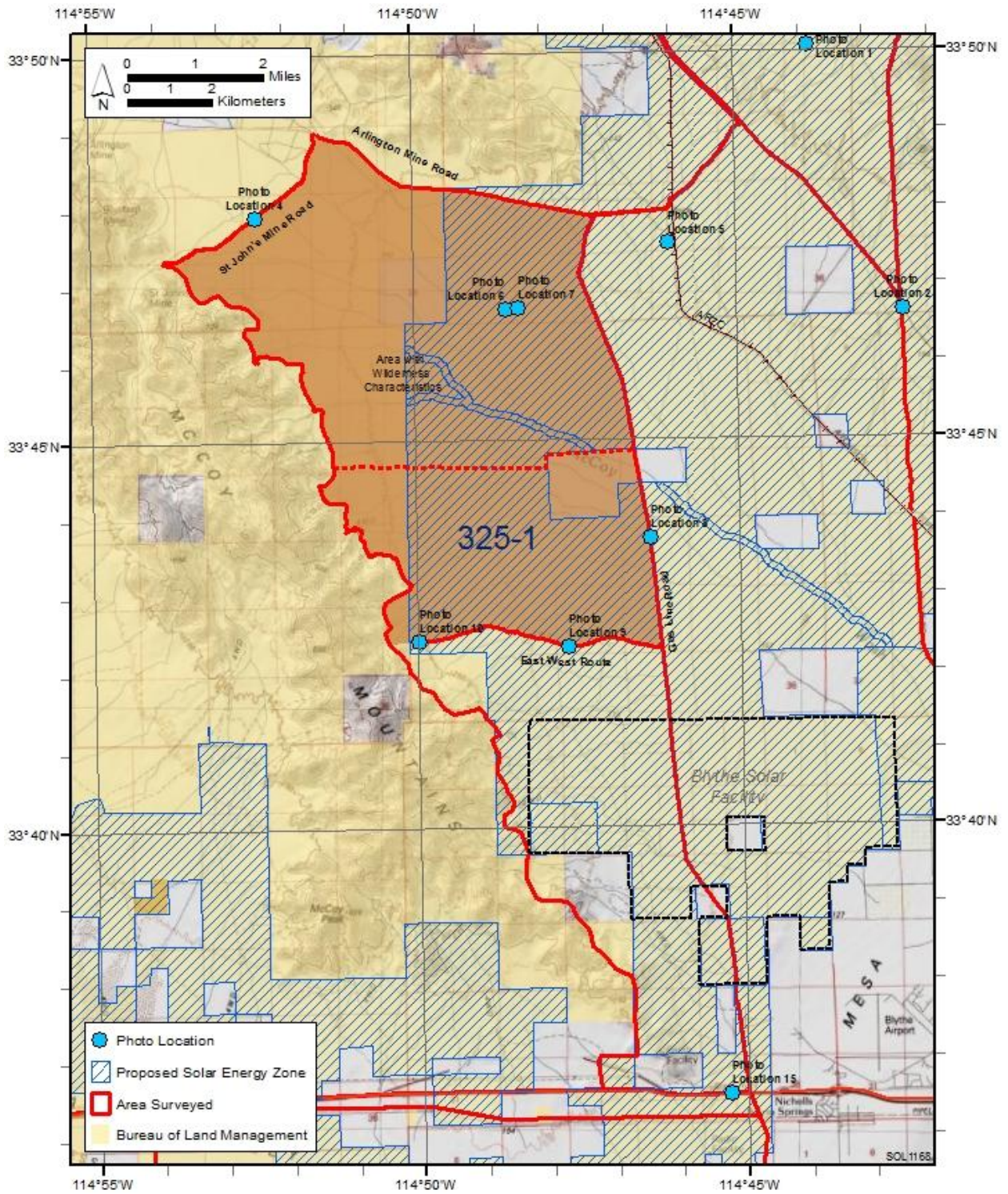


FIGURE C.2.2-2 Proposed Riverside East SEZ as Described in this Supplement

1

2



1

2 **FIGURE C.2.2-3 Area within the Proposed Riverside East SEZ with Wilderness Characteristics**

3

1 **C.2.2.5 Additional Data Collection Recommended**

2
3
4 **C.2.2.5.1 Lands and Realty**

5
6 None.

7
8
9 **C.2.2.5.2 Specially Designated Areas and Lands with Wilderness Characteristics**

10
11 None.

12
13
14 **C.2.2.5.3 Rangeland Resources**

15
16
17 *Livestock Grazing.* None.

18
19
20 *Wild Horses and Burros.* None.

21
22
23 **C.2.2.5.4 Recreation**

24
25 None.

26
27
28 **C.2.2.5.5 Military and Civilian Aviation**

29
30 The BLM will continue to consult with the DoD regarding potential issues with MTRs.
31 The potential impact of power towers in this SEZ, including the ability of power towers to
32 comply with Federal Aviation Administration regulations pertaining to air navigation
33 obstructions, could be further investigated.
34

35
36 **C.2.2.5.6 Geologic Setting and Soil Resources**

37
38 None.

39
40
41 **C.2.2.5.7 Minerals**

42
43 Additional information on leasable and strategic minerals in the vicinity of the proposed
44 SEZ will be provided in the Final Solar PEIS to inform the Department of the Interior's decision
45 on a proposed 20-year withdrawal of SEZ lands.
46

1 **C.2.2.5.8 Water Resources**

2
3 The following additional data and actions would help further characterize potential
4 impacts on water resources for the proposed Riverside East SEZ. A more detailed discussion of
5 each of these activities is included in the water resources action plan provided in Section C.7.2 of
6 this appendix.

- 7
- 8 • Prepare a planning-level water resources inventory of the Chuckwalla and
9 Palo Verde Mesa basins.

 - 10
11 • Identify additional ephemeral stream channels and alluvial fan features for
12 non-development areas through consultation with the California Department
13 of Fish and Game (CDFG), California BLM, EPA, and U.S. Army Corps of
14 Engineers (USACE) with a focus on (moving west to east):
 - 15 – Alluvial fans and sand dune features surrounding Palen Lake and western
16 face of Coxcomb Mountains,
 - 17 – Alluvial fan features on south face of Palen Mountains,
 - 18 – Alluvial fan features on western and southern faces of McCoy Mountains,
 - 19 – Alluvial fan features on western, northern, and eastern faces of Mule
20 Mountains,
 - 21 – Ephemeral headwater channels of McCoy Wash,
 - 22 – Alluvial fan features on eastern face of McCoy Mountains,
 - 23 – Alluvial fan features on southern and eastern faces of Little Maria
24 Mountains, and
 - 25 – Alluvial fan features on western face of Big Maria Mountains.

 - 26
27 • Perform field surveys and hydrologic analyses to support jurisdictional water
28 determinations and floodplain identifications. Tasks include:
 - 29 – Surveying select stream channels and alluvial fan features for elevations,
30 high water marks, and sediment conditions, and
 - 31 – Conducting hydrologic rainfall-runoff-routing analyses to identify
32 100-year floodplain areas.

 - 33
34 • Coordinate with the USACE (Los Angeles District) regarding jurisdictional
35 water determinations. Water features to be considered include:
 - 36 – McCoy Wash and its tributaries.

 - 37
38 • Identify 100-year floodplain exclusion areas for the SEZ. This task would
39 require coordination with the California Department of Water Resources
40 (Division of Flood Management), the Riverside County Flood Control and
41 Water Conservation District, and the Southern California Alluvial Fan Task
42 Force.

 - 43
44 • Describe the formation of a stakeholder committee to conduct long-term
45 monitoring of water resources. This activity would entail:
 - 46 – Identifying key stakeholder agencies;

- 1 – Discussing general features of a monitoring program;
- 2 – Providing recommendations of surface monitoring of ephemeral stream
- 3 networks through consultations with CDFG, California BLM, EPA, and
- 4 USACE; and
- 5 – Working with the U.S. Geological Survey to develop groundwater
- 6 monitoring well design and numerical groundwater models.
- 7
- 8 • Develop a modified version of the Leake et al. (2008) superposition
- 9 groundwater model in order to estimate potential impacts of full-build-out
- 10 groundwater pumping scenarios (according to estimated, technology-specific
- 11 water requirements) to include:
- 12 – Assessing the potential for drawdown impacts on the Colorado River
- 13 Accounting Surface;
- 14 – Coordinating with the U.S. Bureau of Reclamation (managing agency of
- 15 Colorado River Act) regarding results and implications;
- 16 – Assessing the potential for drawdown impacts on Palen Lake (wet playa)
- 17 and other surface water features identified in planning level inventory; and
- 18 – Assessing the potential for drawdown impacts on other groundwater
- 19 users of the Chuckwalla and Palo Verde Mesa basins.
- 20
- 21

22 **C.2.2.5.9 Ecological Resources**

23

24

25 *Vegetation and Plant Communities.* The following additional data-gathering actions

26 would help further characterize potential impacts on vegetation and plant communities for the

27 proposed Riverside East SEZ:

28

- 29 • Identify and map the location and areal extent of desert dry washes, dry wash
- 30 woodland/microphyll woodland (including ironwood forest), riparian
- 31 (including mesquite bosque), desert chenopod scrub, and wetland habitats
- 32 within the SEZ. Identify and map the location and areal extent of these
- 33 habitats, as well as bush seep-weed (*Suaeda moquinii*) communities, outside
- 34 the SEZ that could be affected by hydrologic changes, including groundwater
- 35 elevations, and changes in water, sediment, and contaminant inputs associated
- 36 with runoff. Such efforts could determine habitat characteristics, including
- 37 water source, hydrologic regime, and dominant plant species.
- 38
- 39 • Identify and map the location and areal extent of sand dunes and sand
- 40 transport systems within the SEZ.
- 41
- 42 • Identify and map the location of cactus, including barrel cactus and cholla,
- 43 and *Yucca* species, within the SEZ.
- 44
- 45

1 **Wildlife.** The following additional data-gathering actions would help further characterize
2 potential impacts on wildlife resources for the SEZ:

- 3
- 4 • Conduct pre-disturbance surveys within the SEZ to determine the use of the
- 5 SEZ as a movement/migratory corridor or as important habitat for mule deer.
- 6
- 7 • Identify and map the location and areal extent of wash and playa habitats
- 8 within the SEZ (see Section C.2.2.5.8 above). These areas are important
- 9 habitat for a number of wildlife species.

10

11

12 **Aquatic Biota.** Investigations recommended under the water resources action plan
13 (Section C.2.2.5.8) would be useful in characterizing and protecting habitat available to aquatic
14 biota. No surveys are necessary for surface water features that have been identified as non-
15 development areas (e.g., McCoy Wash). However, if it is determined that the surface water
16 features in the non-development areas could be affected indirectly by water withdrawals,
17 changes in drainage patterns, and construction activities, the potential for aquatic communities in
18 these areas to be affected could require further investigation prior to development. Other surface
19 water features within the SEZ not identified as non-development zones may contain aquatic
20 biota; therefore, preliminary evaluations of these surface water features could be conducted to
21 determine the potential for aquatic communities to be present.

22

23

24 **Special Status Species.** The following additional data-gathering actions would be useful
25 in further characterizing and protecting habitat available to special status species:

- 26
- 27 • Conduct pre-disturbance surveys within the SEZ to determine the presence
- 28 and abundance of those special status species that are federally listed,
- 29 proposed for listing, or candidates for listing under the Endangered Species
- 30 Act; (2) listed by the State of California as endangered, threatened, or fully
- 31 protected; or (3) designated as sensitive by the California BLM State Office.
- 32 These species are listed in Table C.2.2-1. Surveys should focus on areas
- 33 identified as potentially suitable and the suitability of these habitats to support
- 34 these special status species should be determined in the field. All field-
- 35 determined suitable habitats for special status species should be mapped.
- 36 Target species and survey protocols should be developed in coordination with
- 37 the U.S. Fish and Wildlife Service (USFWS) and CDFG.

38

39 The Draft Solar PEIS presents a table of special status species for which
40 potential impacts need to be evaluated prior to development in the proposed
41 Riverside East SEZ. The list of species presented in Table 9.4.12.1-1 of the
42 Draft Solar PEIS also includes species listed by the State of California and
43 species ranked by the States of California or Arizona as S1 or S2, or species of
44 concern by the State of California. Based on the design features presented in
45 the Draft Solar PEIS, the potential for impacts on these additional species will
46 also need to be addressed before development could occur in the SEZ.

47

1 **TABLE C.2.2-1 Special Status Species That May Occur near the Proposed Riverside East SEZ^a**

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
<i>Plants</i>			
Alkali mariposa-lily	<i>Calochortus striatus</i>	BLM-S	Alkaline seeps, springs, and meadows at elevations between 2,600 and 4,600 ft. ^d Nearest recorded occurrences are 40 mi ^e west of the SEZ. About 68,658 acres ^f of potentially suitable habitat occurs within the SEZ region.
Chaparral sand-verbena	<i>Abronia villosa</i> var. <i>aurita</i>	BLM-S	Endemic to southern California. Inhabits chaparral desert sand dunes at elevations between 350 and 5,250 ft. Historically occurred on and in the vicinity of the SEZ; the species has not been recorded in the project area since 1964. Most recent recorded occurrences are 23 mi from the SEZ. About 84,357 acres of potentially suitable habitat occurs within the SEZ region.
Creamy blazing star	<i>Mentzelia tridentata</i>	BLM-S	Mojave desert creosotebush scrub communities on rocky and sandy substrates at elevations below 3,900 ft. Nearest recorded occurrences are 45 mi west of the SEZ. About 2,215,155 acres of potentially suitable habitat occurs within the SEZ region.
Giant spanish-needle	<i>Palafoxia arida</i> var. <i>gigantea</i>	BLM-S	Desert sand dune habitats at elevations below 330 ft. Nearest recorded occurrences are 40 mi south of the SEZ. Suitable habitat may exist on the site. About 84,168 acres of potentially suitable habitat occurs within the SEZ region.
Harwood's eriastrum	<i>Eriastrum harwoodii</i>	BLM-S	Known from fewer than 20 occurrences in southern California on desert dunes and other sandy habitats at elevations between 650 and 3,000 ft. Nearest recorded occurrence is 15 mi northwest of the SEZ in the Pinto Mountains DWMA (Desert Wildlife Management Area). About 84,168 acres of potentially suitable habitat occurs within the SEZ region.
Latimer's woodland-gilia	<i>Saltugilia latimeri</i>	BLM-S	Mojave Desert scrub communities, pinyon-juniper woodlands, and washes on rocky or sandy substrates at elevations between 1,300 and 6,500 ft. Nearest recorded occurrence is 30 mi west of the SEZ. About 2,920,277 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.2.2-1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
Plants (Cont.)			
Little San Bernardino Mountains linanthus	<i>Linanthus maculatus</i>	BLM-S	Known from fewer than 20 occurrences in southern California near Joshua Tree NP in desert dunes and sandy flats with creosotebush scrub and Joshua tree woodland communities at elevations less than 6,900 ft. Nearest recorded occurrences are 30 mi west of the SEZ. About 84,168 acres of potentially suitable habitat occurs within the SEZ region.
Munz's cholla	<i>Opuntia munzii</i>	BLM-S	Gravelly or sandy to rocky soils, often on lower bajadas, washes, flats, hills and canyon sides in Sonoran Desert creosotebush shrub communities at elevations below 3,280 ft. Nearest recorded occurrences are from the Chuckwalla DWMA, approximately 20 mi south of the SEZ. About 4,187,934 acres of potentially suitable habitat occurs within the SEZ region.
Orocopia sage ^g	<i>Salvia greatae</i>	BLM-S	Creosotebush scrub communities and dry washes at elevations less than 2,600 ft. Known to occur in the affected area. Nearest occurrences are from the Chuckwalla DWMA about 2 mi south of the SEZ. About 2,853,196 acres of potentially suitable habitat occurs within the SEZ region.
White-margined beardtongue	<i>Penstemon albomarginatus</i>	BLM-S	Desert sand dune habitats and Mojave Desert scrub communities at elevations below 3,600 ft. Nearest recorded occurrences are 50 mi north of the SEZ. About 2,366,404 acres of potentially suitable habitat occurs within the SEZ region.
Reptiles			
Desert tortoise	<i>Gopherus agassizii</i>	ESA-T; CA-T	Mojave and Sonoran Deserts in desert creosotebush communities on firm soils for digging burrows, along riverbanks, washes, canyon bottoms, creosote flats, and desert oases. Known to occur on the SEZ (western and northeastern portions) and in the affected area. About 4,205,025 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.2.2-1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
Reptiles (Cont.)			
Mojave fringe-toed lizard	<i>Uma scoparia</i>	BLM-S	Sandy habitats in the Mojave Desert from Death Valley south to the Colorado River near Blythe, California and extreme western Arizona. Sparsely-vegetated desert areas with fine windblown sand, including dunes, flats, and washes at elevations below 3,000 ft. Nearest recorded occurrences are 25 mi north of the SEZ. About 1,840,628 acres of potentially suitable habitat occurs within the SEZ region.
Rosy boa	<i>Charina trivirgata</i>	BLM-S	Southeastern California and western Arizona in scrublands, rocky deserts, and canyons with permanent or intermittent streams. Nearest recorded occurrences are from Joshua Tree NP, approximately 25 mi west of the SEZ. About 4,171,153 acres of potentially suitable habitat occurs within the SEZ region.
Birds			
Bendire's thrasher	<i>Toxostoma bendirei</i>	BLM-S	Summer resident in the SEZ region in a variety of desert habitats with fairly large shrubs or cacti and open ground, or open woodland with scattered shrubs and trees, between 0 and 1,180 ft elevation. Nearest recorded occurrence is 2 mi south of the SEZ in the Chuckwalla DWMA. About 2,526,161 acres of potentially suitable habitat occurs within the SEZ region.
Ferruginous hawk	<i>Buteo regalis</i>	BLM-S	Winter resident and migrant in the SEZ region at lower elevations in open grasslands, shrublands, sagebrush flats, desert scrub, desert valleys, and fringes of pinyon-juniper habitats. Occurs in Riverside County, California in the SEZ region. About 1,978,858 acres of potentially suitable habitat occurs within the SEZ region.
Gila woodpecker	<i>Melanerpes uropygialis</i>	CA-E	Year-round resident in the SEZ region along the Colorado River in desert riparian and desert wash habitats, orchards, vineyards, and urban habitats. Nearest recorded occurrence is from the Colorado River, approximately 6 mi east of the SEZ. About 297,582 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.2.2-1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
<i>Birds (Cont.)</i>			
Western burrowing owl	<i>Athene cunicularia hypugaea</i>	BLM-S	Year-round resident in the SEZ region. Open areas with short, sparse vegetation, including grasslands, agricultural fields, and disturbed areas. Nests in burrows created by mammals or tortoises. Known to occur in the affected area. Nearest occurrences are within 1 mi east of the SEZ. About 4,653,092 acres of potentially suitable habitat occurs within the SEZ region.
<i>Mammals</i>			
California leaf-nosed bat	<i>Macrotus californicus</i>	BLM-S	Year-round resident in SEZ region in desert riparian, desert wash, desert scrub, and palm oasis habitats at elevations below 2,000 ft. Roosts in mines, caves, and buildings. Known to occur in the affected area. Nearest recorded occurrences are from the Palen/McCoy Wilderness within 2 mi of the SEZ. About 3,973,317 acres of potentially suitable habitat occurs within the SEZ region.
Cave myotis	<i>Myotis velifer</i>	BLM-S	Year-round resident in SEZ region in desert scrub, shrublands, washes, and riparian habitats. Roosts in colonies in caves. Known to occur in the affected area. Nearest recorded occurrence is from the Mule Mountains ACEC about 2 mi south of the SEZ. About 4,136,719 acres of potentially suitable habitat occurs within the SEZ region.
Nelson's bighorn sheep	<i>Ovis canadensis nelsoni</i>	BLM-S	Open, steep rocky terrain in mountainous habitats of the eastern Mojave and Sonoran Deserts in California. Rarely uses desert lowlands, except as corridors for travel between mountain ranges. Known to occur in the affected area. Nearest recorded occurrences are from the Joshua Tree Wilderness and the Chuckwalla DWMA, about 2 mi north, west, and south of the SEZ. About 1,896,141 acres of potentially suitable habitat occurs within the SEZ region.
Pallid bat	<i>Antrozous pallidus</i>	BLM-S	Year-round resident in SEZ region in low-elevation desert communities, including grasslands, shrublands, and woodlands. Roosts in caves, crevices, and mines. Known to occur in the affected area. Nearest recorded occurrence is from the Chuckwalla Mountains Wilderness approximately 5 mi south of the SEZ. About 3,668,119 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.2.2-1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
Mammals (Cont.)			
Palm Springs pocket mouse	<i>Perognathus longimembris bangsi</i>	BLM-S	Creosote scrub, desert scrub, and grasslands on loose or sandy soils. Nearest recorded occurrence is from the Chuckwalla DWMA, approximately 25 mi west of the SEZ. About 3,749,649 acres of potentially suitable habitat occurs within the SEZ region.
Spotted bat	<i>Euderma maculatum</i>	BLM-S	Year-round resident in SEZ region in deserts, grasslands, and mixed coniferous forests at elevations below 10,000 ft. Roosts in caves, rock crevices, and buildings. Nearest recorded occurrence is 40 mi west of the SEZ. Suitable habitat exists on the site. About 2,363,936 acres of potentially suitable habitat occurs within the SEZ region.
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	BLM-S	Year-round resident in SEZ region in all habitats but subalpine and alpine habitats, and at any season. Roosts in caves, mines, tunnels, buildings, or other man-made structures. Known to occur in the affected area. Nearest recorded occurrences are approximately 4 mi southeast of the SEZ. About 5,065,765 acres of potentially suitable habitat occurs within the SEZ region.
Western mastiff bat	<i>Eumops perotis californicus</i>	BLM-S	Year-round resident in SEZ region in open semiarid habitats, including conifer and deciduous woodlands, shrublands, grasslands, chaparral, and urban areas. Roosts in crevices in cliff faces, buildings, and tall trees. Known to occur in the affected area. Nearest recorded occurrence is 5 mi south of the SEZ. About 4,069,881 acres of potentially suitable habitat occurs within the SEZ region.
Western small-footed myotis	<i>Myotis ciliolabrum</i>	BLM-S	Year-round resident in SEZ region in woodland and riparian habitats at elevations below 9,000 ft. Roosts in caves, buildings, mines, and crevices of cliff faces. Nearest recorded occurrence is from the Chocolate Mountains, approximately 30 mi south of the SEZ. About 661,873 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.2.2-1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
Birds			
Western yellow bat	<i>Lasiurus xanthinus</i>	BLM-S	Year-round resident in SEZ region in desert riparian, desert wash, and palm oasis habitats at elevations below 2,000 ft. Roosts in trees. Nearest recorded occurrence is from Blythe, California, approximately 6 mi east of the SEZ. About 1,340,978 acres of potentially suitable habitat occurs within the SEZ region.

^a The listings for (1) federally listed, proposed for listing, or candidates for listing under the ESA, and (2) California BLM State Office sensitive species have been updated since the release of the Draft Solar PEIS.

^b BLM-S = listed as a sensitive species by the BLM; CA-E = listed as endangered by the State of California; CA-T = listed as threatened by the State of California; ESA-T = listed as threatened under the ESA..

^c For plant and invertebrate species, potentially suitable habitat was determined using California Regional Gap Analysis Project (CAREGAP) and Southwest Regional Gap Analysis Project (SWReGAP) land cover types (USGS 2005, 2010). For reptile, bird, and mammal species, potentially suitable habitat was determined using CAREGAP and SWReGAP habitat suitability models as well as CAREGAP and SWReGAP land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, defined as the area within 50 mi (80 km) of the SEZ center.

^d To convert ft to m, multiply by 0.3048.

^e To convert mi to km, multiply by 1.609.

^f To convert acres to km², multiply by 0.004047.

^g Species in bold text have been recorded or have designated critical habitat in the affected area.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18

- Identify and map the location and areal extent of desert playa and wash habitats within the SEZ, including habitat characteristics (such as water source, hydrologic regime, and dominant plant species) both within the habitat boundaries and in adjacent habitats. Species potentially associated with these habitats include alkali mariposa-lily, California saw-grass, Coves' cassia, Emory's crucifixion-thorn, jackass-clover, Salt Spring checkerbloom, sand evening-primrose, Roberts' rhopalolemma bee, and crissal thrasher.
- Identify and map the location and areal extent of sand dunes and sand transport systems on the SEZ. Species potentially associated with these habitats include chaparral sand-verbena, dwarf germander, giant Spanish-needle, Harwood's eriastrum, jackass-clover, Little San Bernardino Mountains linanthus, and Mojave fringe-toed lizard.
- Identify and map the location and areal extent of woodland habitats on the SEZ should be determined and mapped. Species potentially associated with

1 these habitats include loggerhead shrike, Lucy's warbler, Arizona myotis, and
2 western yellow bat.

- 3
- 4 • Identify and map the location and areal extent of rocky cliff and outcrop
5 habitats on the SEZ. Species potentially associated with these habitats include
6 California leaf-nosed bat (roosting), cave myotis (roosting), Nelson's bighorn
7 sheep, pallid bat (roosting), pocketed free-tailed bat (roosting), spotted bat
8 (roosting), Townsend's big-eared bat (roosting), western mastiff bat
9 (roosting), and western small-footed myotis (roosting).

10
11

12 **C.2.2.5.10 Air Quality and Climate**

13
14 None.

15
16

17 **C.2.2.5.11 Visual Resources**

18
19 Visual resources will be re-evaluated for the Final Solar PEIS based on the boundary
20 adjustments and proposed technology restrictions described in Section C.2.2.3 of this
21 Supplement. A summary of the Draft Solar PEIS visual contrast analysis for the Riverside East
22 SEZ is provided in Table C.2.2-2. This table includes only the resources that would be subject to
23 moderate or strong visual contrast. The Draft Solar PEIS visual impact analysis predicted these
24 levels of visual contrast from solar energy development in the Riverside East SEZ for the
25 following sensitive visual resource areas (SVRAs) and sensitive viewing locations (SVLs):

- 26
- 27 • California Desert Conservation Area
 - 28
 - 29 • Joshua Tree NP
 - 30
 - 31 • Big Maria Mountains WA
 - 32
 - 33 • Chuckwalla Mountains WA
 - 34
 - 35 • Joshua Tree WA
 - 36
 - 37 • Little Chuckwalla Mountains WA
 - 38
 - 39 • Palen-McCoy WA
 - 40
 - 41 • Palo Verde Mountains WA
 - 42
 - 43 • Rice Valley WA
 - 44
 - 45 • Corn Springs ACEC
 - 46

1 **TABLE C.2.2-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi (40-km) Viewshed of the Proposed Riverside**
 2 **East SEZ**

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi ^e	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes ^f
National Conservation Area (NCA)	CDCA	25,919,319 acres	Riverside East SEZ is located within the CDCA.	1,494,552 acres	5.8	Construction and operation of solar facilities would result in strong visual contrasts within the SEZ viewshed that might not be completely mitigated
NP	Joshua Tree	793,331 acres	The eastern boundary of the NP is adjacent to the SEZ's northwestern boundary, and other portions are located between 0.2 and 2.5 mi of the SEZ.	117,591 acres	14.8	Strong visual contrasts could be observed by NP and WA visitors. The 650-ft viewshed extends approximately 14.2 mi into the NP from the northwestern boundary of the SEZ.
Scenic Highway	Bradshaw Trail ^g	70 mi	Near the southeastern corner of the SEZ, passes within 1.7 mi of the SEZ and parallels the SEZ at roughly that distance for more than 6 mi.	23 mi	32.9	Weak to strong visual contrasts could be observed within and near the SEZ by travelers.
WAs	Big Maria Mountains	46,056 acres	0.3 mi east of the SEZ	8,873 acres	19.3	Strong visual contrasts could be observed by WA visitors.
	Chuckwalla Mountains	88,202 acres	1.1 mi south of the western portion of the SEZ	49,952 acres	56.6	Weak to strong visual contrasts could be observed by WA visitors.

TABLE C.2.2-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi ^e	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes ^f
WAs (Cont.)	Joshua Tree	586,623 acres	Same as for the Joshua Tree NP	99,460 acres	17.0	Strong visual contrasts could be observed by NP and WA visitors.
	Little Chuckwalla Mountains	28,708 acres	5.0 mi south of the SEZ	16,679 acres	58.1	Moderate to strong visual contrasts could be observed by WA visitors.
	Palen-McCoy	224,414 acres	Adjacent to the northern and eastern boundaries of the western portion of the SEZ	170,666 acres	76.0	Weak to strong visual contrasts could be observed by WA visitors.
	Palo Verde Mountains	30,403 acres	6.2 mi south of the SEZ	13,254 acres	43.6	Weak to moderate visual contrasts could be observed by WA visitors.
	Rice Valley	43,412 acres	0.5 mi north of the SEZ	35,773 acres	82.4	Strong visual contrasts could be observed by WA visitors; WA includes portion of Big Maria Mountains.
ACECs designated for outstanding scenic values	Corn Springs	2,463 acres	4.8 mi south of the SEZ	1,075 acres	43.6	Strong visual contrasts could be observed by ACEC visitors. Portions of the ACEC within the viewshed extend from the nearest approach to approximately 5.9 mi from the SEZ.

TABLE C.2.2-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi ^e	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes ^f
Other Areas of Interest (non-management areas)	I-10 ^h	2,460 mi	Passes through the SEZ for a distance of approximately 4.0 mi, abuts the southern boundary of the SEZ for an additional 1.7 mi, and is within 0.67 mi of the SEZ for an additional 34 mi.	79 mi	3.2	Strong levels of visual contrast would be expected as travelers in both directions approached and passed through the SEZ.
	State Route 177	NA ⁱ	Passes through or is immediately adjacent to the SEZ for a distance of approximately 8.4 mi.	27	NA ^k	Solar energy development could potentially cause strong visual contrasts for travelers and would likely dominate the view from some locations: generally open views of the SEZ throughout the viewshed. However, solar collector/reflector arrays within the SEZ would be seen nearly edge-on. This would reduce their apparent size, conceal their strong regular geometry, and cause them to repeat the horizontal line of the plain in which the SEZ is situated.
	Blythe ^j	16,013 acres	8.3 mi east of the SEZ	NA	NA	Moderate to strong visual contrasts may be observed.
	East Blythe ^j	326 acres	9.6 mi east of the SEZ	NA	NA	Moderate to strong visual contrasts may be observed.

TABLE C.2.2-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi ^e	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes ^f
Other Areas of Interest (non-management areas) (Cont.)	Ehrenberg ^k	NA	13 mi east of the SEZ	NA	NA	Contrast levels would be expected to be weak to moderate.
	Palo Verde ^j	378 acres	5.8 mi south of the SEZ	NA	NA	Weak to moderate visual contrasts may be observed.
	Ripley ^k	NA	4.5 mi east of the SEZ	NA	NA	Moderate to strong visual contrasts may be observed.
	Desert Center ^k	NA	Adjacent to the southwest boundary of the SEZ	NA	NA	Strong visual contrasts may be observed.

^a To convert mi to km, multiply by 1.609.

^b To convert acres to km², multiply by 0.004047.

^c Mileage (within all columns) is used only for trails or roads, unless otherwise specified.

^d Distances at the point of closest approach are based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these calculations.

^e The total acreage/mileage visible within 25 mi (40 km) of the SEZ is based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these acreages/mileages, as well as the percent total acreages/mileages visible within 25 mi (40 km) of the SEZ.

^f The assessment of impacts is based the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries may result in reduced impacts in some of the SVRAs/SVLs due to the reduction in the overall footprint of the SEZ.

^g Length of Bradshaw Trail: BLM California (2011).

^h Length of I-10: AA Roads' Interstate Guide (2006b).

ⁱ NA = data not available.

^j Acreage of California Towns/Cities: U.S. Bureau of the Census (2011c).

^k Acreage of Arizona Towns: U.S. Bureau of the Census (2011d).

- 1 • Bradshaw Trail Scenic Highway
- 2
- 3 • I-10
- 4
- 5 • State Route 177
- 6
- 7 • Communities of Blythe, East Blythe, Ehrenberg, Palo Verde, Ripley, and
- 8 Desert Center.
- 9

10 The following steps could be taken to better understand potential impacts on these
11 SVRAs and SVLs from solar development in the Riverside East SEZ:

- 12
- 13 • Identify key observation points (KOPs) within these areas through working
- 14 with the management agency or other local stakeholders.
- 15
- 16 • Conduct viewshed analyses from the KOPs to determine how much of the
- 17 SEZ would be in view from each KOP.
- 18
- 19 • As deemed necessary, based on viewshed analysis results, prepare wireframe
- 20 Google Earth™ visualizations of hypothetical solar facilities in the SEZ
- 21 depicting the 80% development scenario to better estimate potential impacts.
- 22

23 This additional analysis may help judge potential visual contrast more accurately for
24 most KOPs. For KOPs of particularly high sensitivity, a site visit with photography and
25 superimposition of the wireframe models onto the photos might be required or desired.

26

27 A visual resource inventory (VRI) was conducted for the area including the Riverside
28 East SEZ in 2010. The area was re-examined in 2011 for maintenance of an inventory for lands
29 with wilderness characteristics. Because these two efforts reached somewhat different
30 conclusions concerning visual resource values on the eastern side of the McCoy Mountains and
31 the western face of the Big Maria Mountains, additional analysis of the visual values in these
32 areas may be needed to determine if adjustments to the SEZ-specific mitigation identified in the
33 Draft Solar PEIS are warranted.

34

35 Additional required mitigation measures to address potential visual resource impacts are
36 given in Section C.7.3 of this appendix.

37

38

39 **C.2.2.5.12 Acoustic Environment**

40

41 None.

42

43

44 **C.2.2.5.13 Paleontological Resources**

45

46 The BLM Regional Paleontologist will be contacted to determine whether additional
47 information is available regarding Potential Fossil Yield Classification (PFYC) identifications in

1 California, such as from recent solar applications in which paleontological surveys were
2 completed. A preliminary paleontological survey could be conducted to determine the PFYC of
3 the SEZ, in order to update the temporary assignment of PFYC 3b used in the Draft Solar PEIS
4 for most of the SEZ.
5
6

7 **C.2.2.5.14 Cultural Resources and Native American Concerns** 8

9 Approximately 108 surveys for cultural resources have occurred in the revised Riverside
10 East SEZ area, identifying about 327 sites within the SEZ. At least six of these sites are
11 considered eligible for listing in the *National Register of Historic Places* (NRHP). At least
12 160 sites have been recorded within 5 mi (8 km) of the larger, original SEZ footprint. As with
13 other SEZs, dune areas and areas along washes and dry lakes have the highest potential for
14 containing significant archaeological resources. Several culturally-important areas have also
15 been identified near the SEZ, including specific mountain ranges and peaks, rock formations,
16 geoglyphs and rock art, sacred trails, ACECs, and important water sources. The destruction and
17 degradation of important plant resources and the destruction of habitat or impediments to the
18 movement of culturally important wildlife are also potential impacts of concern within the SEZ.
19

20 The following additional data collection efforts could reduce the uncertainty about
21 potential impacts on cultural resources:
22

- 23 • Incorporate the Class I literature file search currently being conducted by
24 SWCA Environmental Consultants on behalf of the BLM.
25
- 26 • Conduct a Class II reconnaissance level stratified random sample survey of
27 the SEZ to achieve a 10% sample (a total of approximately 15,959 acres
28 [64.5 km²], but will be less than that once it is determined through the Class I
29 review how many acres have already been sufficiently surveyed).¹² Areas of
30 interest, such as dune areas and along washes and dry lakes, as determined
31 through the Class I review, should also be identified prior to establishing the
32 survey design and sampling strategy. If appropriate, some subsurface testing
33 of dune areas should be considered in the sampling strategy as well.
34
- 35 • Prepare a cultural sensitivity map based on the results of the Class I and
36 Class II studies (and incorporating the results of the Desert Renewable Energy
37 Conservation Plan cultural sensitivity map, if available).
38
- 39 • Continue government-to-government consultation as described in
40 Section 2.4.3, including follow-up to recent ethnographic studies with Tribes
41 not included in the original studies in Utah and Nevada to determine whether
42 those Tribes have similar concerns or whether they would want to participate
43 in a similar ethnographic study. The Riverside East SEZ falls in the traditional

¹² The BLM plans to conduct a Class II survey of 5% of this SEZ prior to the Final Solar PEIS. Additional areas could be surveyed as funding becomes available.

1 use area of the Serrano, Cahuilla, Quechan, Mohave, and Chemehuevi.
2 Potential topics presented in the Draft Solar PEIS to be discussed during
3 consultation include the proposed Prehistoric Trail Network Cultural
4 Landscape/Historic District, which includes the Salt Song Trail, the *Xam*
5 *Kwatcan* Trail, and the Cocomaricopa Trail; effects of workers and increased
6 traffic on sacred sites; the loss of culturally important plants; the use and
7 availability of water and the contamination of groundwater; ecological
8 segmentation; important natural landscape features, such as the Big Marias,
9 Coxcomb Mountains, Eagle Mountain, Alligator Rock, Black Rock, Palen
10 Dry Lake, Ford Dry Lake, McCoy Springs, Corn Springs; local shrines and
11 sacred sites; and several nearby ACECs and NRHP-listed properties, such as
12 the Blythe Intaglios.

13
14
15
16
17
18
19
20
21
22
23
24

C.2.2.5.15 Socioeconomics and Environmental Justice

None.

C.2.2.5.16 Cumulative Impact Considerations

None.

1 **C.3 COLORADO PROPOSED SOLAR ENERGY ZONES**

2
3
4 **C.3.1 Antonito Southeast**

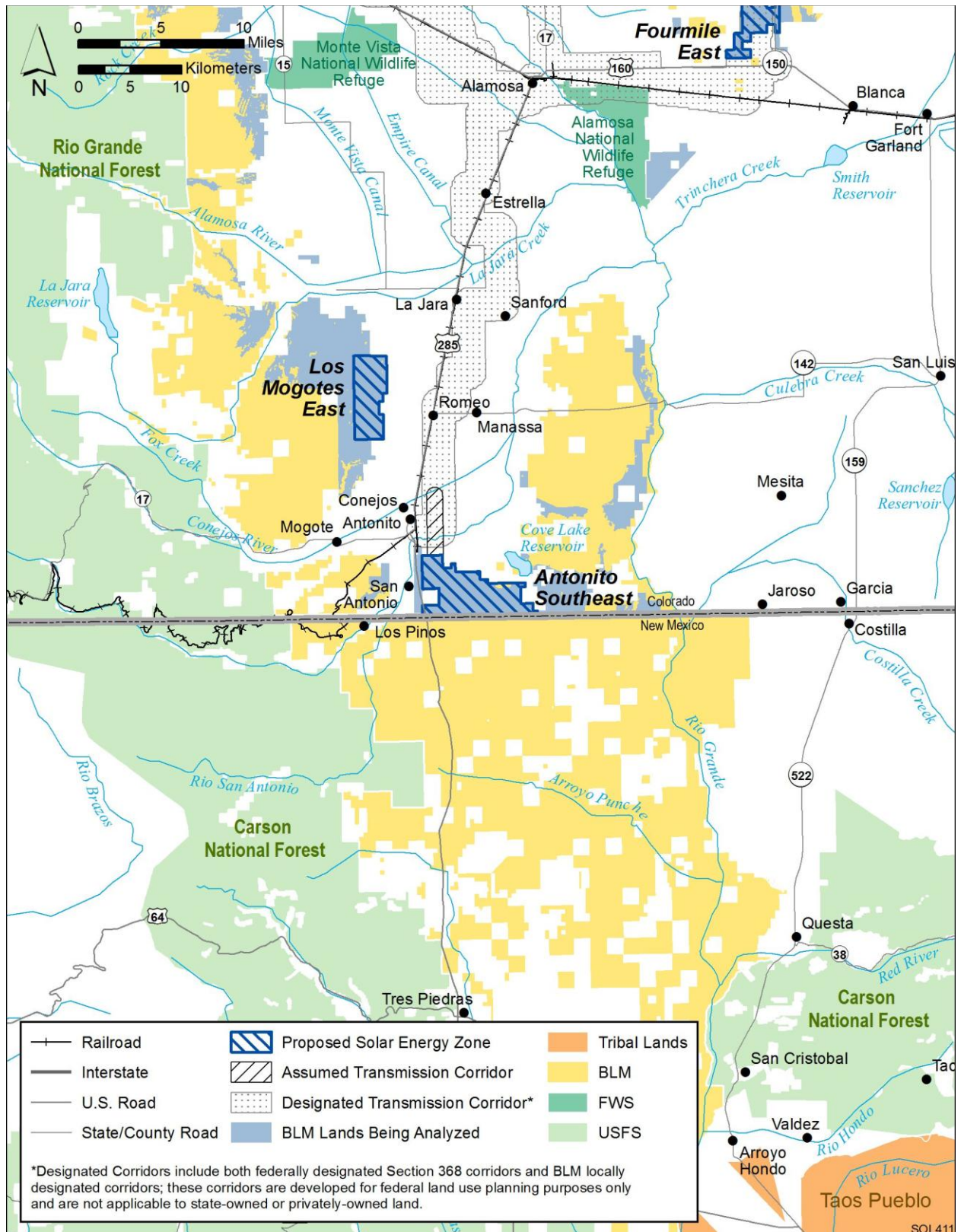
5
6
7 **C.3.1.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic**
8 **Environmental Impact Statement (PEIS)**
9

10 The proposed Antonito Southeast solar energy zone (SEZ), as presented in the Draft
11 Solar PEIS, had a total area of 9,729 acres (39.4 km²). It is located in Conejos County on the
12 southern Colorado state boundary with New Mexico (Figure C.3.1-1). The largest nearby town,
13 Alamosa, is located about 34 mi (55 km) to the north of the SEZ. Several small towns lie closer
14 to the SEZ, with Antonito, Colorado about 2 mi (3 km) to the northwest of the SEZ.
15

16 The Draft Solar PEIS identified a 69-kV transmission line that is located about 4 mi
17 (6 km) north of the SEZ as the nearest point for connection of the SEZ to the grid. The location
18 of new transmission that could be constructed for this SEZ in the future may be different from
19 that assumed in the Draft Solar PEIS. Details on the revised transmission impact assessment to
20 be included in the Final Solar PEIS are provided in Section C.7.1 of this appendix. Analysis of
21 transmission lines and/or access roads will be completed, as necessary, as part of the project-
22 specific environmental reviews (see Section 2.2.2.2.2 of this Supplement).
23

24 Potential adverse impacts identified in the Draft Solar PEIS included the following:
25

- 26 • Access to U.S. Department of the Interior Bureau of Land Management
27 (BLM), state, and private lands to the east and south of the SEZ could be
28 affected by solar development if public access through the SEZ is not
29 maintained. The current boundary of the SEZ would create an isolated parcel
30 of public land that could be difficult to manage.
31
- 32 • The Cumbres & Toltec Area of Environmental Concern (ACEC) could be
33 moderately affected by development within the SEZ, and there is potential
34 that the scenic train ride experience could be diminished for some visitors.
35 Wilderness characteristics within the San Antonio Wilderness Study Area
36 (WSA) in New Mexico could be impaired. Potential impact on use of the
37 Los Caminos Antiguos Scenic Byway is not known. The SEZ is located
38 within the designated Sangre de Cristo National Heritage Area. The SEZ has
39 the potential to adversely affect the West Fork of the North Branch of the Old
40 Spanish Trail.
41
- 42 • Three seasonal grazing allotments would be cancelled and 575 animal unit
43 months would be lost. Five grazing permittees would be displaced and would
44 incur economic and possible social impacts.
45



1
2 **FIGURE C.3.1-1 Proposed Antonito Southeast SEZ as Presented in the Draft Solar PEIS**
3

- 1 • The SEZ is located under two military training routes (MTRs) and any solar
2 facility that impinges into military airspace would interfere with military
3 training activities.
- 4
- 5 • Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil
6 erosion by wind and runoff, sedimentation, and soil contamination) could
7 occur.
- 8
- 9 • Groundwater use would deplete the aquifer to the extent that, at a minimum,
10 wet-cooling options would not be feasible.
- 11
- 12 • Clearing of a large portion of the proposed SEZ could primarily affect semi-
13 desert shrub steppe semi-desert grassland, and may adversely affect desert dry
14 wash or wetland habitats, depending on the amount of habitat disturbed. The
15 establishment of noxious weeds could result in habitat degradation.
- 16
- 17 • Potentially suitable habitat for 38 special status species and more than
18 50 wildlife species occurs in the affected area of the proposed SEZ; less than
19 1% of the potentially suitable habitat for any of these species occurs in the
20 region that would be directly affected by development.
- 21
- 22 • If aquatic biota are present in ephemeral washes and Alta Lake and associated
23 wetlands, they could be affected by the direct removal of surface water
24 features within the construction footprint. Aquatic biota, if present in surface
25 water features within the SEZ, could be indirectly affected by a decline in
26 habitat quantity and quality because of water withdrawals and changes in
27 drainage patterns, as well as increased sediment and contaminant inputs
28 associated with ground disturbance and construction activities.
- 29
- 30 • Temporary exceedances of ambient air quality standards for particulate matter
31 at the SEZ boundaries are possible during construction. These high
32 concentrations, however, would be limited to the immediate area surrounding
33 the SEZ boundary. Modeling indicates that emissions from construction
34 activities could exceed Class I Prevention of Significant Deterioration (PSD)
35 PM₁₀ (particulate matter with an aerodynamic diameter of 10 µm or less)
36 increments at the nearest federal Class I areas (Wheeler Peak Wilderness Area
37 [WA] and Great Sand Dunes WA).
- 38
- 39 • Strong visual contrasts could be observed by visitors to the San Antonio
40 WSA, the Los Caminos Antiguos Scenic Byway, and the Cumbres & Toltec
41 Scenic Railroad depot in Antonito. Moderate visual contrasts could be
42 observed from some locations by visitors to the San Luis Hills WSA and
43 scenic ACEC, and the Cumbres & Toltec Scenic Railroad scenic ACEC.
44 Because of these potential impacts, Visual Resource Management (VRM)
45 Class II- and III-consistent mitigation measures were recommended for
46 application to approximately the western half of the SEZ.

- 1 • During operations, noise levels at the nearest residences could be higher
2 than the U.S. Environmental Protection Agency (EPA) guideline level if
3 concentrating solar power facilities with energy storage technologies (which
4 could extend the daily operational time by 6 hours or more) were used at the
5 SEZ.
6
- 7 • Few impacts on significant paleontological resources are expected because
8 these resources are not exposed and are not likely to occur within the SEZ.
9 Direct impacts on significant cultural resources could occur. Further
10 evaluation is needed to determine the effects of solar energy development on
11 the West Fork of the North Branch of the Old Spanish Trail. Preliminary
12 viewshed analyses indicate that the visual integrity of the Cumbres & Toltec
13 Scenic Railroad Corridor ACEC and depot in the town of Antonito could be
14 affected. It is possible that there will be Native American concerns about
15 potential visual and noise effects of solar energy development in the SEZ on
16 Blanca Peak. Effects on traditionally important plants and animals are also
17 possible.
18
- 19 • Minority populations occur within a 50-mi (80-km) radius of the proposed
20 SEZ boundary; thus adverse impacts of solar development could
21 disproportionately affect minority populations.
22
23

24 **C.3.1.2 Summary of Comments Received**

25
26 Many of the comments received from environmental groups on the proposed Antonito
27 Southeast SEZ were in favor of identifying the area as an SEZ (e.g., The Wilderness
28 Society et al.¹³). Several members of the public commented that development of the SEZ would
29 affect their ranching operations, while others were in support of the designating the area as an
30 SEZ. Conejos County Clean Water, Inc., requested that representatives from the Town of
31 Antonito, the Town of Romeo, and the Conejos County Board of Commissioners be added as
32 cooperating agency officials for further National Environmental Policy Act of 1969 (NEPA)
33 analysis for SEZs.
34

35 The EPA expressed concern with wetland protection in the Antonito Southeast SEZ,
36 including Alta Lake, and suggested that the Final Solar PEIS include specific design criteria for
37 wetland protection. The San Luis Valley Renewable Communities Alliance (SLVRCA) was
38 concerned that the SEZ contains Colorado Department of Wildlife (CDOW)-identified elk severe
39 winter range for pronghorn and recommended that activity should be limited outside of project
40 fencing during severe winters when elk are using these areas.

¹³ The Wilderness Society, Center for Native Ecosystems, Biodiversity Conservation Alliance, Rocky Mountain Recreation Initiative, Colorado Wild, Wild Connections, High Country Citizens' Alliance, Colorado Environmental Coalition, Audubon Colorado, Natural Resources Defense Council, Sierra Club, Soda Mountain Wilderness Council, and Sierra Trek submitted joint comments on the proposed Colorado SEZs. Those comments are attributed to The Wilderness Society et al.

1 The Wilderness Society et al. and SLVRCA were concerned that the SEZ contains a
2 Gunnison prairie dog colony of unknown status and that surveys for the species have not been
3 conducted. The Wilderness Society et al. also provided recommendations to avoid impacts on the
4 Gunnison prairie dog, including avoidance of active colonies, clearance surveys within any area
5 defined by CDOW as having colonies of inactive or unknown status, potential off-site mitigation
6 within areas of high species viability, and project siting that avoids blocking migration corridors
7 used by the species to migrate between colonies. The Conejos County Clean Water, Inc., group
8 was concerned about the potential socioeconomic impact of solar energy development at the
9 proposed Antonito Southeast SEZ.

10 11 12 **C.3.1.3 Changes to the SEZ**

13
14 No boundary revisions were identified for the proposed SEZ. However, areas specified
15 for non-development under SEZ-specific design features were mapped, where data were
16 available. For the proposed Antonito Southeast SEZ, 17 acres (0.07 km²) of non-development
17 wetland and lake areas were identified. (see Figure C.3.1-2). The remaining developable area
18 within the SEZ is 9,712 acres (39.3 km²).

19
20 To reduce the visual resource impacts of solar development within the proposed Antonito
21 Southeast SEZ, SEZ-specific visual resource mitigation requirements have been developed. On
22 the western side of the SEZ that was labeled to meet VRM Class II-consistent objectives in the
23 Draft Solar PEIS, all forms of development will be limited to 10 ft (3.3 m) or under, and the
24 technology will be restricted to either photovoltaic technologies of less than 10 ft (3.3 m), or
25 technologies with comparable or lower height and reflectivity. Within the area of the SEZ that
26 was labeled to meet VRM Class III-consistent objectives in the Draft Solar PEIS, the solar
27 development will be restricted to either PV technologies of less than 10 ft (3.3 m) or
28 technologies with comparable or lower height and reflectivity. Additional required mitigation
29 measures to address potential visual resource impacts are given in Section C.7.3 of this appendix.

30 31 32 **C.3.1.4 Wilderness Character Status of SEZ**

33
34 A recently maintained inventory of wilderness characteristics was used to determine
35 whether public lands within the Antonito Southeast SEZ have wilderness characteristics. The
36 finding of this inventory was that these lands do not contain wilderness characteristics.

37 38 39 **C.3.1.5 Additional Data Collection Recommended**

40 41 42 **C.3.1.5.1 Lands and Realty**

43
44 None.

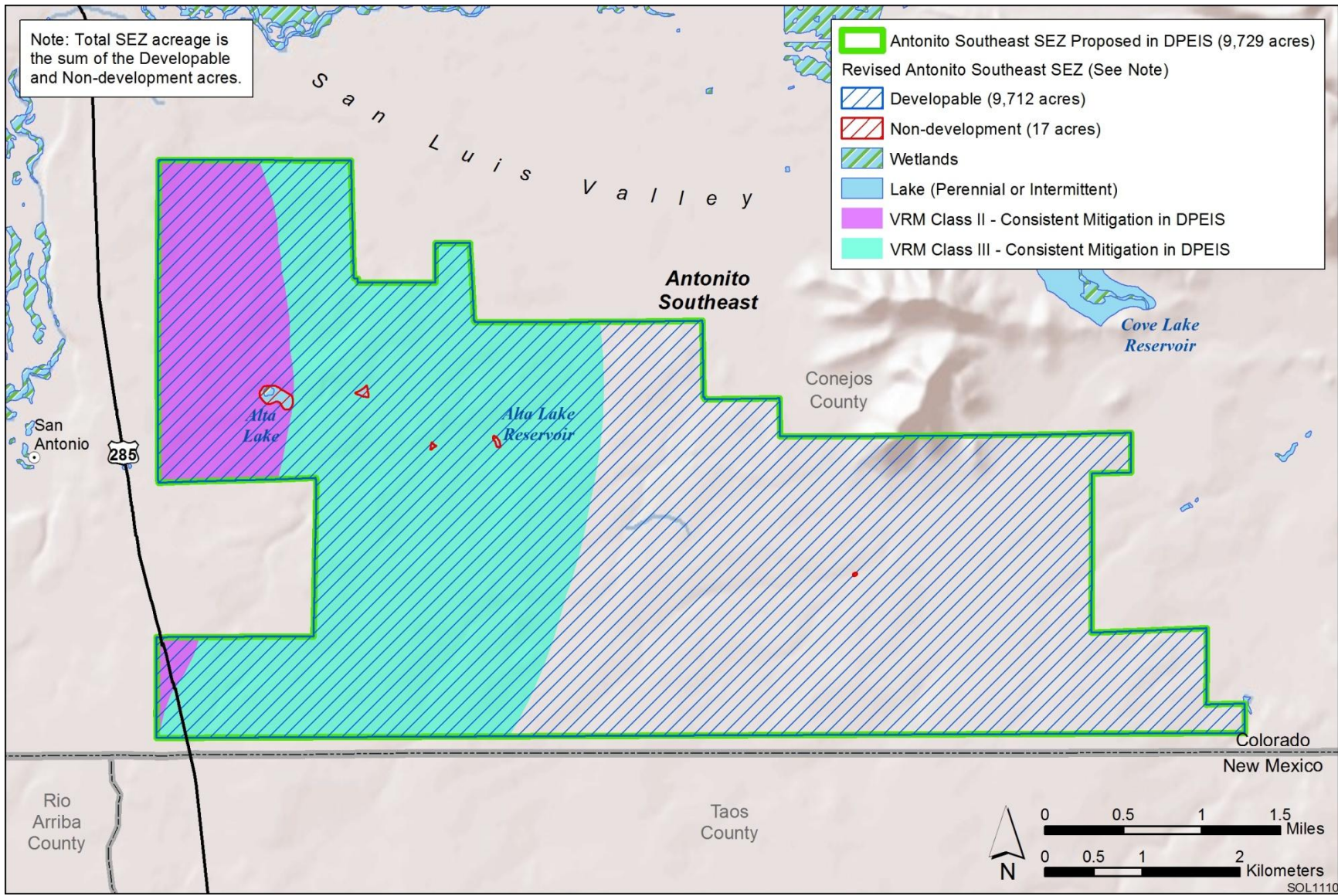


FIGURE C.3.1-2 Proposed Antonito Southeast SEZ as Described in this Supplement

1 **C.3.1.5.2 Specially Designated Areas and Lands with Wilderness Characteristics**

2
3 None.

4
5
6 **C.3.1.5.3 Rangeland Resources**

7
8
9 *Livestock Grazing.* None.

10
11
12 *Wild Horses and Burros.* None.

13
14
15 **C.3.1.5.4 Recreation**

16
17 Additional information on the potential impacts on hunting for big game species would
18 help further characterize impacts on recreation. In addition, the San Luis Valley-wide effort to
19 promote recreational use could warrant additional consideration. The status of off-highway
20 vehicle use designation in the area may also warrant additional consideration.

21
22
23 **C.3.1.5.5 Military and Civilian Aviation**

24
25 The BLM will continue to consult with the U.S. Department of Defense (DoD) regarding
26 potential issues with MTRs.

27
28
29 **C.3.1.5.6 Geologic Setting and Soil Resources**

30
31 None.

32
33
34 **C.3.1.5.7 Minerals**

35
36 Additional information on leasable and strategic minerals in the vicinity of the proposed
37 SEZ will be provided in the Final Solar PEIS to inform the Department of the Interior's decision
38 on a proposed 20-year withdrawal of SEZ lands.

39
40
41 **C.3.1.5.8 Water Resources**

42
43 The following additional data and actions would help further characterize potential
44 impacts on water resources for the proposed Antonito Southeast SEZ. A more detailed discussion
45 of each of these activities is included in the water resources action plan provided in Section C.7.2
46 of this appendix.

- 1 • Prepare a planning-level water resources inventory of the San Luis Valley
2 (southern portion).
3
- 4 • Identify additional ephemeral stream channels and wetland features for non-
5 development areas through consultation with Colorado Division of Water
6 Resources (CDWR) (Division 3), CDOW, EPA, and U.S. Army Corps of
7 Engineers (USACE) with a focus on:
 - 8 – Taos Valley Canal and its tributaries (western half of SEZ),
 - 9 – Unnamed tributaries to Cove Lake Reservoir (western half of SEZ), and
 - 10 – Ephemeral channels flowing southwest to northeast on the eastern half of
11 the SEZ.
- 12
- 13 • Conduct a field survey to:
 - 14 – Survey Taos Valley Canal and ephemeral channels for surface elevations,
15 high water marks, and sediment conditions, and
 - 16 – Conduct hydrologic rainfall-runoff-routing analyses to identify 100-year
17 floodplain areas.
- 18
- 19 • Coordinate with the USACE (Albuquerque District) regarding jurisdictional
20 water determinations for the SEZ. Water features to be considered include:
 - 21 – Taos Valley Canal and its tributaries (western half of SEZ),
 - 22 – Unnamed tributaries to Cove Lake Reservoir (western half of SEZ), and
 - 23 – Ephemeral channels flowing southwest to northeast on eastern half of
24 SEZ.
- 25
- 26 • Identify 100-year floodplain exclusion areas for the SEZ. This task would
27 require coordination with the Federal Emergency Management Agency and
28 the Colorado Water Conservation Board.
- 29
- 30 • Describe the formation of a stakeholder committee to conduct long-term
31 monitoring of water resources. This activity would entail:
 - 32 – Identifying key stakeholder agencies,
 - 33 – Discussing general features of a monitoring program, and
 - 34 – Working with the U.S. Geological Survey and the CDWR (Division 3) to
35 develop groundwater monitoring well design and numerical groundwater
36 models. (Groundwater monitoring should coordinate with the Rio Grande
37 Decision Support System through the CDWR [Division 3].)
- 38

39 **C.3.1.5.9 Ecological Resources**

40
41
42
43 *Vegetation and Plant Communities.* The following additional data-gathering action
44 would help further characterize potential impacts on vegetation and plant communities for the
45 proposed Antonito Southeast SEZ:
46

- Identify and map the location and areal extent of dry wash and wetland communities within the SEZ. Identify and map the location and areal extent of these habitats, as well as riparian and greasewood flats habitats, outside the SEZ that may be affected by hydrologic changes, including groundwater elevations, and changes in water, sediment, and contaminant inputs associated with runoff.. Such effort could help determine habitat characteristics, including water source, hydrologic regime, and dominant plant species.

Wildlife. The following additional data-gathering actions would help further characterize potential impacts on wildlife resources for the SEZ:

- Conduct pre-disturbance surveys within the SEZ to determine the use of the SEZ as a movement/migratory corridor or as important habitat for elk and pronghorn.

Aquatic Biota. Investigations recommended under the water resources action plan (Section C.3.1.5.8) would be useful in characterizing and protecting habitat available to aquatic biota. Alta Lake likely contains aquatic biota and has been designated a non-development area. Therefore, a preliminary survey of Alta Lake is not necessary. However, if it is determined that Alta Lake could be affected indirectly by water withdrawals, changes in drainage patterns, and construction activities, the potential for aquatic communities to be affected in these areas could require further investigation prior to development. Ephemeral streams and wetlands within the SEZ are typically dry and contain water only for brief periods. They may or may not contain aquatic biota; therefore, preliminary evaluations of these surface water features could be conducted to determine the potential for aquatic communities to be present.

Special Status Species. The following additional data-gathering actions would be useful in further characterizing and protecting habitat available to special status species:

- Conduct pre-disturbance surveys within the SEZ to determine the presence and abundance of those special status species that are (1) federally listed, proposed for listing, or candidates for listing under the Endangered Species Act (ESA); or (2) listed by the State of Colorado as threatened or endangered; or (3) designated as sensitive by the Colorado BLM State Office. These species are listed in Table C.3.1-1. Surveys should focus on areas identified as potentially suitable, and the suitability of these habitats to support these special status species should be determined in the field. All field-determined suitable habitats for special status species should be mapped. Target species and survey protocols should be developed in coordination with the U.S. Fish and Wildlife Service (USFWS) and CDOW. The BLM is currently conducting surveys for various special status species (e.g., mountain plover, western burrowing owl, Gunnison prairie dog) within the State of Colorado. In areas where these surveys overlap with the Colorado SEZs and areas of direct

1 **TABLE C.3.1-1 Special Status Species That May Occur in the Vicinity of the Proposed Antonito**
 2 **Southeast SEZ^a**

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
Plants			
Brandegee's milkvetch	<i>Astragalus brandegeei</i>	BLM-S	Sandy or gravelly banks, flats, and stony meadows within pinyon-juniper woodlands. Substrates are usually sandstone with granite or occasional basalt. Elevation ranges between 5,400 and 8,800 ft. ^d Nearest occurrences are approximately 10 mi ^e west of the SEZ. About 1,628,700 acres ^f of potentially suitable habitat occurs within the analysis area.
Ripley's milkvetch ^g	<i>Astragalus ripleyi</i>	BLM-S	Mixed conifer woodlands on rocky volcanic substrates at elevations above 8,000 ft. Known to occur approximately 5 mi west of the SEZ. About 1,819,100 acres of potentially suitable habitat occurs within the analysis area.
Fish			
Rio Grande chub	<i>Gila pandora</i>	BLM-S	Clear, cool, fast-flowing water over rubble or gravel substrates. Quad-level occurrences intersect the affected area north of the SEZ. The nearest potentially suitable habitat is located in the Rio San Antonio, approximately 1 mi north (downgradient) of the SEZ. Approximately 29.3 mi of potentially suitable habitat in the Rio San Antonio, Rio de los Pinos, and the Conejos River occurs within the area of indirect effects.
Rio Grande sucker	<i>Catostomus plebeius</i>	CO-E	Restricted to streams of the Rio Grande Basin in channels and backwaters near rapidly flowing waters. Nearest potentially suitable habitat is located in the Rio San Antonio, approximately 1 mi north (downgradient) of the SEZ. Approximately 29.3 mi of potential habitat in the Rio San Antonio, Rio de los Pinos, and the Conejos River occurs within the area of indirect effects.
Reptiles			
Milk snake	<i>Lampropeltis triangulum</i>	BLM-S	Shortgrass prairie, sandhills, shrubby hillsides, pinyon-juniper woodlands, and arid river valleys at elevations below 8,000 ft. The species is known to occur in Conejos County, Colorado. About 42,000 acres of potentially suitable habitat occurs in the affected area.
Birds			
American peregrine falcon	<i>Falco peregrinus anatum</i>	BLM-S	Year-round resident in the SEZ region. Open spaces associated with high, near vertical cliffs and bluffs above 200 ft in height overlooking rivers. Nearest occurrences are from the Rio Grande National Forest approximately 20 mi west of the SEZ. About 3,747,350 acres of potentially suitable habitat occurs within the analysis area.
Bald eagle	<i>Haliaeetus leucocephalus</i>	CO-T	Year-round resident in the SEZ region. Seldom seen far from water, especially larger rivers, lakes, and reservoirs. Occurs locally in semiarid shrubland habitats where there is an abundance of small mammal prey. Known to occur in riparian habitats along the Rio Grande as near as 7 mi east of the Antonito Southeast SEZ. About 96,000 acres of potentially suitable habitat occurs in the affected area.
Barrow's goldeneye	<i>Bucephala islandica</i>	BLM-S	Winter resident in the SEZ region on larger lakes and rivers. Known to occur in the San Luis Valley. About 150,000 acres of potentially suitable habitat occurs in the affected area.

3

TABLE C.3.1-1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
Birds (Cont.)			
Ferruginous hawk	<i>Buteo regalis</i>	BLM-S	Summer resident in the affected area, but year-round resident in the SEZ region. Grasslands, sagebrush, and saltbrush habitats, as well as the periphery of pinyon-juniper woodlands throughout the project area. Nests in tall trees or on rock outcrops along cliff faces. Known to occur approximately 10 mi east of the Antonito Southeast SEZ. About 28,000 acres of potentially suitable habitat occurs in the affected area.
Mountain plover	<i>Charadrius montanus</i>	BLM-S	Summer resident in the SEZ region. Prairie grasslands and arid plains and fields. Nests in shortgrass prairies associated with prairie dogs, bison, and cattle. More than 50% of the global population nests in the states of Colorado and New Mexico. Known to occur about 5 mi east of the Antonito Southeast SEZ. About 100,000 acres of potentially suitable habitat occurs in the affected area.
Southwestern willow flycatcher	<i>Empidonax traillii eximius</i>	ESA-E; CO-E	Nests in thickets, scrubby and brushy areas, open second growth, swamps, and open woodlands in the Alamosa National Wildlife Refuge along the Rio Grande, approximately 25 mi northeast of the SEZ. About 4,400 acres of potentially suitable habitat occurs in the affected area.
Western burrowing owl	<i>Athene cunicularia hypugaea</i>	BLM-S; CO-T	Open grasslands and prairies, as well as disturbed sites such as golf courses, cemeteries, and airports throughout the SEZ region. Nests in burrows constructed by mammals (prairie dog, badger, etc.). Known to occur in Conejos County, Colorado. About 1,984,700 acres of potentially suitable habitat occurs in the SEZ region.
Mammals			
Gunnison's prairie dog	<i>Cynomys gunnisoni</i>	ESA-C	Mountain valleys, plateaus, and open brush habitats in the project area at elevations between 1,000 and 12,000 ft. Known to occur in the SEZ affected area in Colorado and northern New Mexico. About 83,000 acres of potentially suitable habitat occurs in the affected area.

- ^a The listings for (1) federally listed, proposed for listing, or candidates for listing under the ESA, and (2) Colorado BLM State Office sensitive species have been updated since the release of the Draft Solar PEIS.
- ^b BLM-S = listed as a sensitive species by the BLM; CO-E = listed as endangered by the State of Colorado; CO-T = listed as threatened by the State of Colorado; ESA-C = candidate for listing under the ESA; ESA-E = listed as endangered under the ESA.
- ^c For plant species, potentially suitable habitat was determined by using Southwest Regional Gap Analysis Project (SWReGAP) land cover types (USGS 2005). For terrestrial vertebrate species, potentially suitable habitat was determined by using SWReGAP habitat suitability and land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.
- ^d To convert ft to m, multiply by 0.3048.
- ^e To convert mi to km, multiply by 1.609.
- ^f To convert acres to km², multiply by 0.004047.
- ^g Species in bold text have been recorded or have designated critical habitat in the affected area.

1
2
3

1 effects, the BLM survey information will be used to make appropriate
2 determinations regarding the potential occurrence of species and their habitats.
3 Additional survey efforts may be necessary, as appropriate.
4

5 The Draft Solar PEIS presents a table of special status species for which
6 potential impacts need to be evaluated prior to development in the proposed
7 Antonito Southeast SEZ. The list of species presented in Table 10.1.12.1-1 of
8 the Draft Solar PEIS also includes species listed by the states of Colorado or
9 New Mexico and species ranked by the States of Colorado or New Mexico as
10 S1 or S2 or species of concern. Based on the design features presented in the
11 Draft Solar PEIS, the potential for impacts on these additional species will
12 also need to be addressed before development could occur in the SEZ.
13

- 14 • Identify and map the location and areal extent of grassland habitat within the
15 SEZ. The suitability of this habitat for special status species should be
16 determined. Species potentially associated with grassland habitat include the
17 milk snake, mountain plover, and western burrowing owl.
18
- 19 • Identify and map the location and areal extent of aquatic, wetland, and
20 riparian habitats within the SEZ. The suitability of these habitats for special
21 status species should be determined. Species potentially associated with these
22 habitats include the Rio Grande chub, Rio Grande sucker, milk snake, bald
23 eagle, Barrow's goldeneye, ferruginous hawk, and southwestern willow
24 flycatcher.
25
- 26 • Identify and map the location and areal extent of woodland habitats within the
27 SEZ. The suitability of these habitats for special status species should be
28 determined. Species potentially associated with woodland habitats include the
29 Brandegees' milkvetch, Ripley's milkvetch, milk snake, and ferruginous
30 hawk.
31
- 32 • Identify and map the location and areal extent of active Gunnison prairie dog
33 colonies within the SEZ. Associated burrows also could be used by western
34 burrowing owls.
35

36 **C.3.1.5.10 Air Quality and Climate**

37 None.
38

39 **C.3.1.5.11 Visual Resources**

40
41
42
43
44 Visual resources will be reevaluated for the Final Solar PEIS based on the proposed
45 technology restrictions described in Section C.3.1.3 of this Supplement. A summary of the Draft
46 Solar PEIS visual contrast analysis for the proposed Antonito Southeast SEZ is provided in

1 Table C.3.1-2. This table includes only the resources that would be subject to moderate or strong
2 visual contrast. The Draft Solar PEIS visual impact analysis predicted these levels of visual
3 contrast from solar energy development in the Antonito Southeast SEZ for the following
4 sensitive visual resource areas (SVRAs) and sensitive viewing locations (SVLs):
5

- 6 • San Antonio WSA
- 7
- 8 • San Luis Hills WSA
- 9
- 10 • Los Caminos Antiguos Scenic Highway
- 11
- 12 • Cumbres & Toltec Railroad Corridor ACEC
- 13
- 14 • San Luis Hills ACEC
- 15
- 16 • Antonito
- 17
- 18 • West Fork of the North Branch of the Old Spanish Trail.
- 19

20 The following steps could be taken to better understand potential impacts on these
21 SVRAs and SVLs from solar development in the Antonito Southeast SEZ:
22

- 23 • Identify key observation points (KOPs) within these areas through working
24 with the management agency or other local stakeholders.
- 25
- 26 • Conduct viewshed analyses from the KOPs to determine how much of the
27 SEZ would be in view from each KOP.
- 28
- 29 • As deemed necessary, based on viewshed analysis results, prepare wireframe
30 Google Earth™ visualizations of hypothetical solar facilities in the SEZ
31 depicting the 80% development scenario to better estimate potential impacts.
32

33 This additional analysis may help judge potential visual contrast more accurately for most
34 KOPs. For KOPs of particularly high sensitivity, a site visit with photography and
35 superimposition of the wireframe models onto the photos might be required or desired.
36

37 Additional required mitigation measures to address potential visual resource impacts are
38 given in Section C.7.3 of this appendix.
39

40 **C.3.1.5.12 Acoustic Environment**

41 None.
42
43
44

TABLE C.3.1-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi (40-km) Viewshed of the Proposed Antonito Southeast SEZ

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi ^e	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes ^f
WSAs	San Antonio	7,321 acres	1.5 mi southwest of the SEZ	6,920 acres	94.5	Visual contrast would be highly dependent on viewer location and project location and characteristics. Solar energy development would be expected to create weak to strong visual contrasts as viewed from the WSA; roughly half of the WSA is within 3 to 5 mi of the SEZ.
	San Luis Hills	10,896 acres	6 mi northeast of the SEZ	5,258 acres	48.3	Visual contrast would be dependent on viewer and project locations and the projects' characteristics. Solar energy development would be expected to create weak to moderate visual contrasts. Contrast levels would be highest at high-elevation viewpoints in the southwestern part of the WSA, and lower for low-elevation viewpoints, such as in canyons or on bajadas. Visible areas extend from approximately 6 mi from the northern boundary of the SEZ to approximately 9 mi from the SEZ.
Scenic Highways	Los Caminos Antiguos ^g	129 mi	2 mi northwest of the northwest corner of the SEZ	38 mi	29.5	Range of contrast would be highly dependent on viewer and project locations and design. Solar facilities could attract attention but are not likely to dominate views from the byway. Solar energy development would be expected to create weak to strong visual contrasts.

TABLE C.3.1-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi ^e	Percent Total Acreage/ Mileage Visible within 25 mi	Notes ^f
ACECs designated for Outstanding Scenic Values	Cumbres & Toltec Railroad Corridor	3,868 acres	1.5 mi north-northwest of the SEZ	3,219 acres	83.2	Moderate visual contrasts from solar energy development at some points on the railroad would be expected. In some locations, development might create strong contrasts in form, line, color, and texture, especially if viewed against a sky backdrop. A detailed future site-specific NEPA analysis would be required to determine visibility and potential impacts precisely.
	San Luis Hills	39,421 acres	5 mi north-northeast of the SEZ	12,516 acres	31.7	Range of visual contrasts would depend on viewer and solar facility locations, as well the projects' characteristics. Solar facilities could attract attention but would not likely dominate the view and would be expected to create weak to moderate visual contrasts. Contrast levels would be highest at high-elevation viewpoints in the southern part of the ACEC, and lower for low-elevation viewpoints or high-elevation viewpoints in the northern portion of the ACEC.

TABLE C.3.1-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi ^e	Percent Total Acreage/ Mileage Visible within 25 mi	Notes ^f
Other Areas of Interest (non-management areas)	Antonito ^h	250 acres	1.5 mi north-northwest of the SEZ	NA ⁱ	NA	Where clear views to the SEZ exist, residents and visitors could observe strong visual contrasts. Locations farther north generally would be subject to lower visual contrast due to the increased distance, but also because of the more extensive screening of views of the SEZ by vegetation and buildings within the community. A detailed future site-specific NEPA analysis is required to determine visibility.
	West Fork of the North Branch of the Old Spanish Trail ^j	2,700 mi	Passes within approximately 0.1 mi of the SEZ	NA	NA	Trail users would be expected to observe strong visual contrasts from solar energy development at some points on the trail. The SEZ would be visible from many points along the trail starting approximately 9 mi south of the SEZ to beyond 25 mi north of the SEZ.

^a To convert mi to km, multiply by 1.609.

^b To convert acres to km², multiply by 0.004047.

^c Mileage (within all columns) is used only for trails or roads, unless otherwise specified.

^d Distances at the point of closest approach are based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these calculations.

^e The total acreage/mileage visible within 25 mi (40 km) of the SEZ is based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these acreages/mileages, as well as the percentage of total acreages/mileages visible within 25 mi (40 km) of the SEZ.

Footnotes continued on next page.

TABLE C.3.1-2 (Cont.)

- f The assessment of impacts is based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries may result in reduced impacts in some of the SVRAs and SVLs due to the reduction in the overall footprint of the SEZ.
- g Length of byway: America's Byways (2011a).
- h Acreage of Colorado towns: U.S. Bureau of the Census (2011a).
- i NA = data not available.
- j Length of trail: BLM (2011a).

1 **C.3.1.5.13 Paleontological Resources**
2

3 The potential for impacts on paleontological resources within the proposed Antonito
4 Southeast SEZ is low. Most of the SEZ has a Potential Fossil Yield Classification (PFYC) of
5 Class 1 as noted in the Draft Solar PEIS. Only about 4 acres (0.016 km²) is currently classified
6 as Class 4/5 in an area in the northern part of the SEZ. Prior to development, the depth of the
7 potentially paleontologically significant Alamosa Formation would need to be determined in that
8 small area, and the remainder of the SEZ should be field checked to verify the PFYC
9 classification of Class 1.

10
11 The BLM Regional Paleontologist will be contacted to determine whether additional
12 information is available regarding the paleontological potential of the SEZ.
13

14
15 **C.3.1.5.14 Cultural Resources and Native American Concerns**
16

17 None of the proposed Antonito Southeast SEZ has been systematically surveyed, and
18 consequently no sites have been recorded within the original footprint of the SEZ. About 80 sites
19 (including isolated finds) have been recorded within 5 mi (8 km) of the SEZ. Paleoindian sites
20 could be encountered throughout the San Luis Valley. Several linear features have been noted in
21 the Draft Solar PEIS as being within the SEZ, and, more recently some of these features were
22 spotted on light detection and ranging (LIDAR) imagery. These features may be associated with
23 former railroads, irrigation features, and general trail routes. The West Fork of the North Branch
24 of the Old Spanish Trail is a culturally significant trail that proceeds close to the western
25 boundary of the SEZ. Visual and auditory impacts are possible on the trail and also on Blanca
26 Peak, a sacred mountain to the Navajo northeast of the SEZ. Impacts on the visual integrity of
27 the Cumbres and Toltec Scenic Railroad are also possible. The destruction and degradation of
28 important plant resources and the destruction of habitat or impediments to the movement of
29 culturally important wildlife are also potential impacts of concern within the SEZ.
30

31 The following additional data collection efforts could reduce the uncertainty about
32 potential impacts on cultural resources:
33

- 34 • Conduct a Class I literature file search to better understand (1) the site
35 distribution pattern in the vicinity of the SEZ; (2) trail networks through
36 existing ethnographic reports; and 3) overall cultural sensitivity of the
37 landscape.
- 38
39 • Conduct a Class II Stratified Random Sample Survey of the SEZ to obtain a
40 10% sample (roughly 971 acres [3.9 km²]). Areas of interest, as determined
41 through a Class I review, should also be identified prior to establishing the
42 survey design and sampling strategy. A Class III inventory of linear features
43 detected using LIDAR in the Antonito SEZ is currently under way and will
44 account for a portion of the recommended sample.
45

- 1 • Prepare a cultural sensitivity map based on results of the Class II survey, the
2 Class I review, and the Class III inventory of linear features.
3
- 4 • Identify the integrity and historical significance of the portion of the West
5 Fork of the North Branch of the Old Spanish Trail in the vicinity of the SEZ,
6 and conduct viewshed analyses from key points along the trail. If this portion
7 of the trail is determined significant, a mitigation strategy would need to be
8 developed to address unavoidable impacts on the trail.
9
- 10 • Continue with government-to-government consultation as described in
11 Section 2.4.3., including follow-up to recent ethnographic studies covering
12 some SEZs in Nevada and Utah with Tribes not included in the original
13 studies to determine whether those Tribes have similar concerns. The
14 Antonito Southeast SEZ was used by Tribes historically for hunting and
15 trading rather than long-term settlement. The Ute, Jicarilla Apache, Navajo,
16 Kiowa, Comanche, Arapaho, Pueblo groups, and Cheyenne may all have
17 traditional interests in the valley. Potentially significant sites and landscapes
18 for the Navajo, Upper Rio Grande Pueblo (Tewa), and Taos Pueblo are
19 present in the San Luis Valley (Blanca Peak, Great Sand Dunes, San Luis
20 Lakes). Potential topics to be discussed during consultation include the above-
21 mentioned places, trail systems, mountain springs and other water sources,
22 mineral resources, burial sites, ceremonial areas, and plant and animal
23 resources. An ethnographic study of the SEZs in the San Luis Valley is
24 currently proposed; results of the study will be incorporated into the Final
25 Solar PEIS, if available at the time of publication.
26

27 **C.3.1.5.15 Socioeconomics and Environmental Justice**

28 None.
29

30 **C.3.1.5.16 Cumulative Impact Considerations**

31 None.
32
33
34
35
36

1 **C.3.2 De Tilla Gulch**
2
3

4 **C.3.2.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic**
5 **Environmental Impact Statement (PEIS)**
6

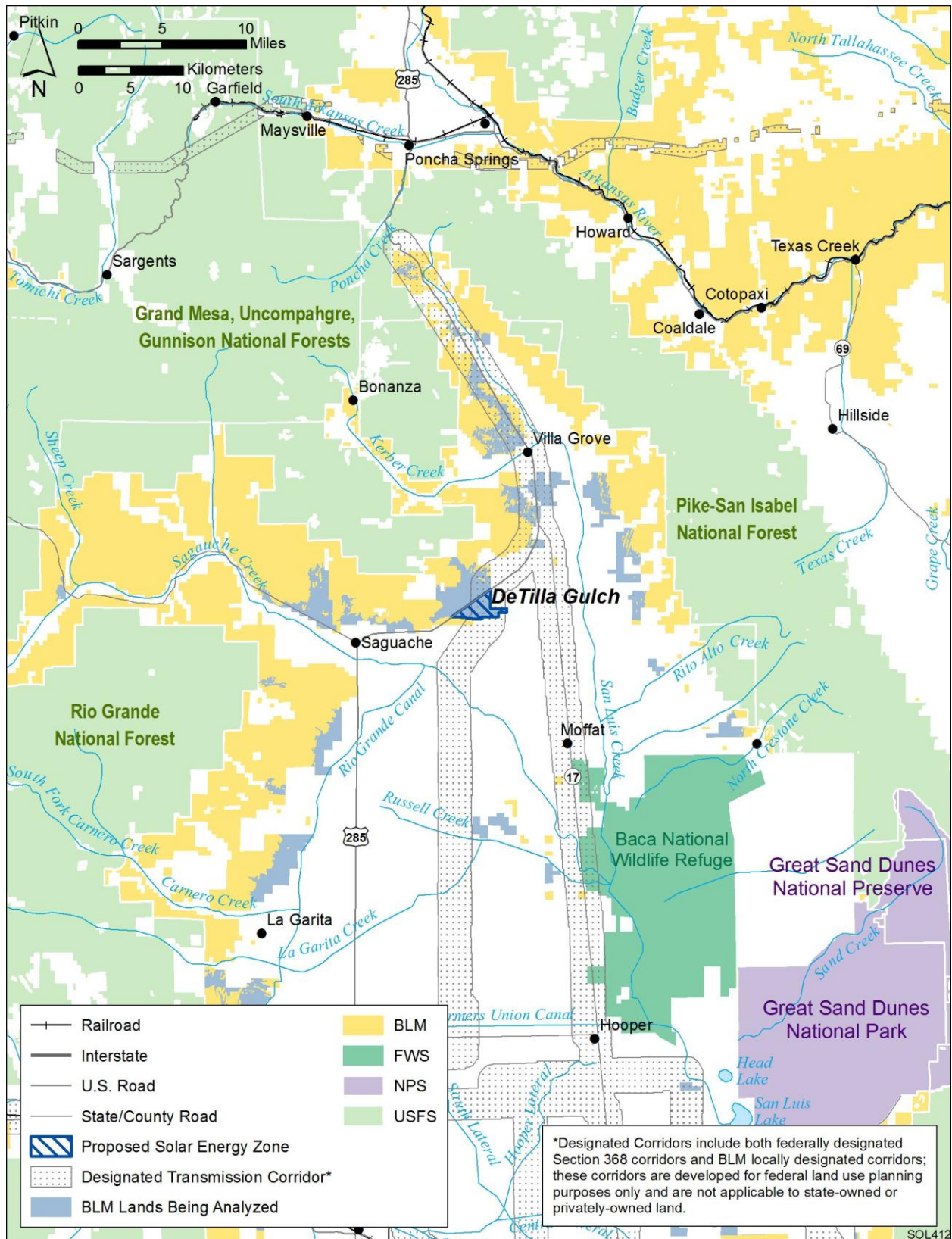
7 The proposed De Tilla Gulch solar energy zone (SEZ), as presented in the Draft Solar
8 PEIS, had a total area of 1,522 acres (6.2 km²). It is located in Saguache County in south-central
9 Colorado (Figure C.3.2-1). The towns of Lund and Zane are about 4 mi (6 km) north of, and 5 mi
10 (8 km) west of, the SEZ, respectively. The town of Saguache is located about 8 mi (12 km) west
11 of the SEZ, and the larger town of Alamosa is located about 50 mi (80 km) to the south.
12

13 A U.S. Department of the Interior Bureau of Land Management (BLM)-designated
14 transmission corridor covers about two-thirds of the SEZ and could limit development in the
15 SEZ because solar facilities cannot be constructed under transmission lines. The discussion of
16 impacts of solar energy development in the SEZ in the Draft Solar PEIS acknowledged that the
17 presence of the corridor would reduce the amount of land available for solar power production,
18 and that, conversely, full development of solar facilities within the SEZ would limit use of the
19 transmission corridor.
20

21 The Draft Solar PEIS identified a 115-kV transmission line adjacent to the proposed
22 De Tilla Gulch SEZ as the nearest point for connection of the SEZ to the grid. The actual
23 location of connection to the transmission grid could be different than that assumed in the Draft
24 Solar PEIS. Details on a revised transmission impact assessment for the SEZs to be included in
25 the Final Solar PEIS are provided in Section C.7.1 of this appendix. Analysis of transmission
26 lines and/or access roads will be completed, as necessary, as part of the project-specific
27 environmental reviews (see Section 2.2.2.2.2 of this Supplement).
28

29 Potential adverse impacts identified in the Draft Solar PEIS included the following:
30

- 31 • Development of the site could further fragment the public land in the area and
32 could make the remaining lands more difficult to manage. Non-mitigable
33 impacts on private and state lands related to changes in existing land uses may
34 occur.
35
- 36 • The historic setting of the designated Old Spanish National Historic Trail and
37 future management of the trail would be adversely affected.
38
- 39 • The SEZ is located in an area under a military training route (MTR) and is
40 identified as being a consultation area for the U.S. Department of Defense
41 (DoD). Development of any solar or transmission facilities that impinge into
42 airspace used by the military would be of concern to the military and could
43 interfere with military training activities.
44



1

2 **FIGURE C.3.2-1 Proposed De Tilla Gulch SEZ as Presented in the Draft Solar PEIS**

- 1 • Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil
2 erosion by wind and runoff, sedimentation, and soil contamination) could
3 occur.
- 4
- 5 • Clearing of a large portion of the proposed SEZ could primarily affect
6 semidesert shrub steppe and may adversely affect desert dry wash and
7 greasewood flats habitats, depending on the amount of habitat disturbed.
8 The establishment of noxious weeds could result in habitat degradation.
9 Deposition of fugitive dust could cause reduced productivity or changes in
10 plant community structure.
- 11
- 12 • Potentially suitable habitat for 13 special status species and more than
13 50 wildlife species occurs in the affected area of the proposed SEZ; less than
14 1.0% of the potentially suitable habitat for any of these species occurs in the
15 region that would be directly affected by development.
- 16
- 17 • If aquatic biota exist within the small ephemeral washes, they could be
18 affected by the direct removal of these surface water features within the
19 construction footprint, a decline in habitat quantity and quality due to water
20 withdrawals and changes in drainage patterns, as well as increased sediment
21 and contaminant inputs associated with ground disturbance and construction
22 activities.
- 23
- 24 • Temporary exceedances of ambient air quality standards for particulate matter
25 at the SEZ boundaries are possible during construction. These high
26 concentrations, however, would be limited to the immediate area surrounding
27 the SEZ boundary. Modeling indicates that emissions from construction
28 activities could exceed Class I Prevention of Significant Deterioration (PSD)
29 PM₁₀ (particulate matter with an aerodynamic diameter of 10 µm or less)
30 increments at the nearest Class I area (the Great Sand Dunes Wilderness
31 Area), but the potential impacts would be moderate and temporary.
- 32
- 33 • Strong visual contrasts could be observed by visitors along the Old Spanish
34 National Historic Trail and travelers on U.S. 285. Weak to moderate visual
35 contrasts could be observed from the northern portions of the Baca National
36 Wildlife Refuge (NWR), and weak visual contrast would be observed by
37 residents of Moffat. Because of these potential impacts, it was recommended
38 that development of power tower facilities be prohibited within the SEZ.
- 39
- 40 • During operations, noise levels at the nearest residences could be higher than
41 the U.S. Environmental Protection Agency (EPA) guideline level if
42 concentrating solar power facilities with energy storage technologies (which
43 could extend the daily operational time by 6 hours or more) were used at the
44 SEZ.
- 45

- 1 • Impacts on significant paleontological and cultural resources are unknown.
2 Further investigation is needed to determine the possibility of the Old Spanish
3 National Historic Trail crossing through a portion of the SEZ. It is possible
4 that there will be Native American concerns about potential visual and noise
5 effects of solar energy development in the SEZ on culturally significant
6 locations within the valley.
7
8

9 **C.3.2.2 Summary of Comments Received**

10
11 Many of the comments received on the proposed De Tilla Gulch SEZ were in favor of
12 identifying the area as an SEZ with proper siting, design, and mitigation (The Wilderness
13 Society et al.¹⁴ and others).
14

15 The residents of Saguache, Colorado, commented that they expect to be involved in any
16 solar energy development that takes place on the SEZ. The Wilderness Society et al. proposed
17 adjusting the boundary to remove the active prairie dog colony that overlaps the northern edge of
18 the SEZ. Also, if surveys performed within the intersection area of the SEZ and Mineral Hot
19 Springs Potential Conservation Area (PCA) indicate that there is significant activity by special
20 status species within the SEZ, boundary adjustments should be considered to eliminate the PCA.
21 Because the SEZ contains Colorado Division of Wildlife (CDOW)-identified severe winter range
22 for elk and winter concentration habitat for pronghorn, The Wilderness Society et al.
23 recommended that disturbance during the winter season be avoided or minimized in these areas.
24 The CDOW recommends that the BLM and U.S. Department of Energy consider re-evaluating
25 the magnitude of impacts of habitat loss within each SEZ for individual species or groups of
26 species.
27

28 The Cultural Resources Preservation Coalition recommended the removal of the De Tilla
29 Gulch SEZ because of potential impacts on the Old Spanish National Historic Trail. If the area is
30 retained as an SEZ, the coalition suggested that solar development should be restricted to areas
31 that do not have the potential to adversely affect the setting of the trail, and a combination of
32 mitigation measures should be required to minimize impacts on high-potential route segments
33 located within the SEZ viewshed.
34

35 The EPA suggested that if wet cooling is considered as an option for the De Tilla Gulch
36 SEZ, the Final Solar PEIS should clearly identify the level of groundwater withdrawal that can
37 be maintained without adversely affecting groundwater levels in the area. The CDOW
38 recommended that SEZ-specific design features be adopted that require off-site habitat
39 improvement projects and/or compensatory mitigation that offsets habitats losses in order to
40 minimize displacement of big game and lost hunting opportunities for pronghorn.

¹⁴ The Wilderness Society, Center for Native Ecosystems, Biodiversity Conservation Alliance, Rocky Mountain Recreation Initiative, Colorado Wild, Wild Connections, High Country Citizens' Alliance, Colorado Environmental Coalition, Audubon Colorado, Natural Resources Defense Council, Sierra Club, Soda Mountain Wilderness Council, and Sierra Trek submitted joint comments on the proposed Colorado SEZs. Those comments are attributed to The Wilderness Society et al.

1 **C.3.2.3 Changes to the SEZ**

2
3 The proposed De Tilla Gulch SEZ has been reconfigured to eliminate 458 acres
4 (1.9 km²) along the northwest edge of the SEZ (i.e., the area that had bordered U.S. 285)
5 (see Figure C.3.2-2). Excluding this area will avoid impacts on an active Gunnison prairie dog
6 colony, on pronghorn winter range and winter concentration area, and on the proposed
7 Cochetopa Scenic Byway. The remaining SEZ area is 1,064 acres (4.3 km²). No additional areas
8 for non-development were identified within the SEZ.
9

10 Because of the extensive potential impacts from solar development in the portion of the
11 De Tilla Gulch SEZ that has been eliminated, those lands will be considered solar right-of-way
12 exclusion areas; that is, applications for solar development on those lands will not be accepted by
13 the BLM.
14

15
16 **C.3.2.4 Wilderness Character Status of SEZ**

17
18 A recently maintained inventory of wilderness characteristics was used to determine
19 whether public lands within the De Tilla Gulch SEZ have wilderness characteristics. The finding
20 of this inventory was that these lands do not contain wilderness characteristics.
21

22
23 **C.3.2.5 Additional Data Collection Recommended**

24
25
26 **C.3.2.5.1 Lands and Realty**

27
28 None.
29

30
31 **C.3.2.5.2 Specially Designated Areas and Lands with Wilderness Characteristics**

32
33 None.
34

35
36 **C.3.2.5.3 Rangeland Resources**

37
38
39 ***Livestock Grazing.*** The potential impact on the Crow grazing allotment will be
40 re-evaluated based on the revised boundaries.
41

42
43 ***Wild Horses and Burros.*** None.
44
45

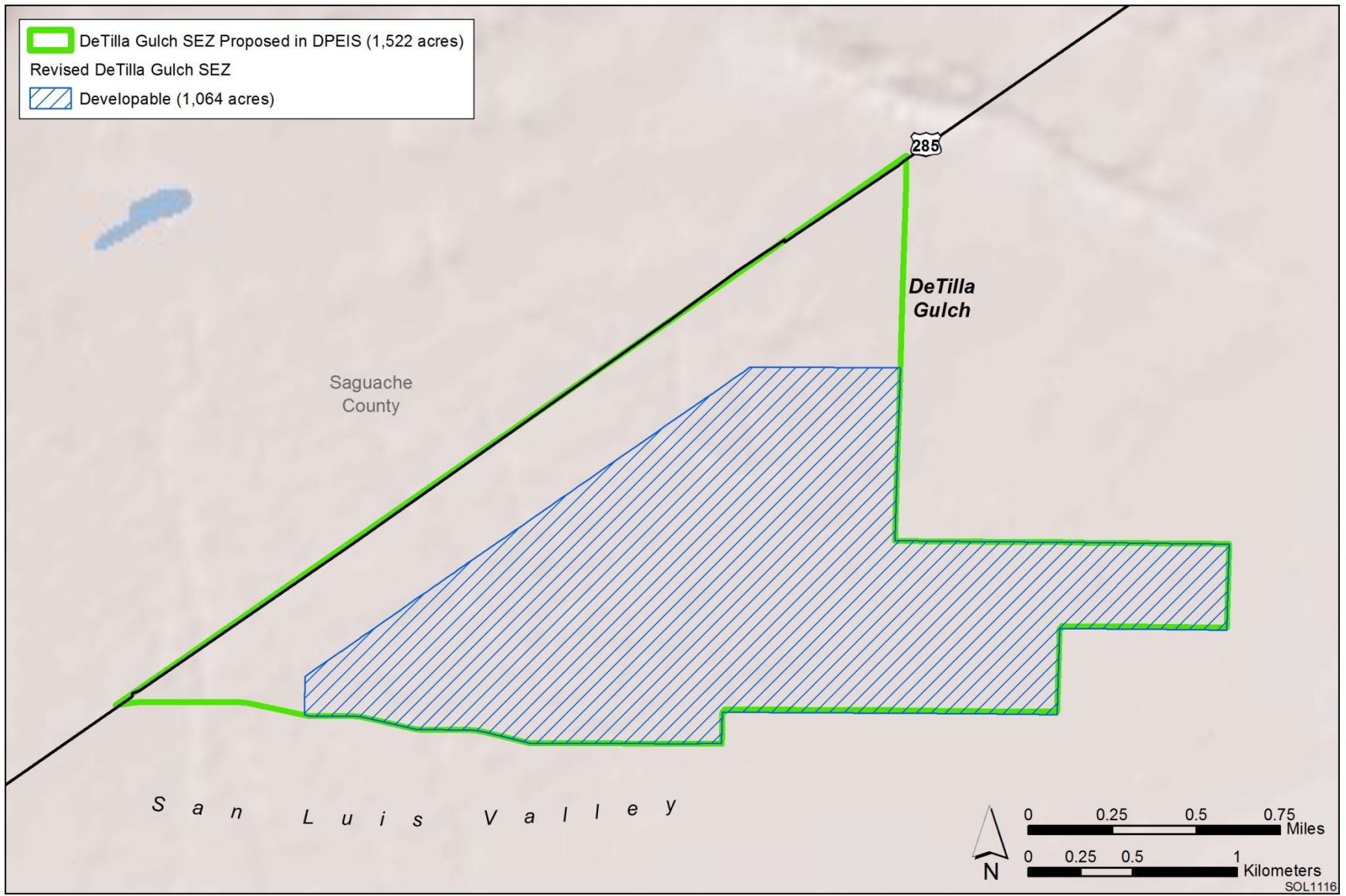


FIGURE C.3.2-2 Proposed De Tilla Gulch SEZ as Described in this Supplement

1 **C.3.2.5.4 Recreation**

2
3 Additional information on the potential impacts on hunting for big game species would
4 help further characterize impacts on recreation. In addition, the San Luis Valley-wide effort to
5 promote recreational use could warrant additional consideration. The status of off-highway
6 vehicle use designation in the area may also warrant additional consideration.
7

8
9 **C.3.2.5.5 Military and Civilian Aviation**

10 None.
11
12

13
14 **C.3.2.5.6 Geologic Setting and Soil Resources**

15 None.
16
17

18
19 **C.3.2.5.7 Minerals**

20
21 Additional information on leasable and strategic minerals in the vicinity of the proposed
22 SEZ will be provided in the Final Solar PEIS to inform the Department of the Interior’s decision
23 on a proposed 20-year withdrawal of SEZ lands.
24

25
26 **C.3.2.5.8 Water Resources**

27
28 The following additional data and actions would help further characterize potential
29 impacts on water resources for the proposed De Tilla Gulch SEZ. A more detailed discussion of
30 each of these activities is included in the water resources action plan provided in Section C.7.2 of
31 this appendix.
32

- 33 • Prepare a planning-level water resources inventory of the San Luis Valley
34 (northern portion).
- 35
36 • Identify additional ephemeral stream channels and wetland features for non-
37 development areas through consultation with the Colorado Division of Water
38 Resources (CDWR) (Division 3), CDOW, EPA, and U.S. Army Corps of
39 Engineers (USACE) with a focus on:
 - 40 – Several ephemeral channels that cross the SEZ from northwest to
41 southeast (including De Tilla Gulch and Schecker Gulch).
- 42
43 • Conduct a field survey to:
 - 44 – Survey the ephemeral channels for surface elevations, high water marks,
45 and sediment conditions, and

- 1 – Conduct hydrologic rainfall-runoff-routing analyses to identify 100-year
2 floodplain areas.
- 3
- 4 • Coordinate with the USACE (Albuquerque District) regarding jurisdictional
5 water determinations for the SEZ. Water features to be considered include:
6 – Several ephemeral channels that cross the SEZ from northwest to
7 southeast (including De Tilla Gulch and Schecker Gulch).
- 8
- 9 • Identify 100-year floodplain exclusion areas for the SEZ. This task would
10 require coordination with the Federal Emergency Management Agency and
11 the Colorado Water Conservation Board.
- 12
- 13 • Describe the formation of a stakeholder committee to conduct long-term
14 monitoring of water resources. This activity would entail:
15 – Identifying key stakeholder agencies;
16 – Discussing general features of a monitoring program; and
17 – Working with the U.S. Geological Survey and CDWR (Division 3) to
18 develop groundwater monitoring well design and numerical groundwater
19 models. (Groundwater monitoring should coordinate with the Rio Grande
20 Decision Support System through the CDWR [Division 3].)
- 21

22

23 **C.3.2.5.9 Ecological Resources**

24

25

26 ***Vegetation and Plant Communities.*** The following additional data-gathering action
27 would help further characterize potential impacts on vegetation and plant communities for the
28 proposed De Tilla Gulch SEZ.

- 29
- 30 • Identify and map the location and areal extent of dry wash and greasewood
31 flat communities within the SEZ. Identify and map the location and areal
32 extent of these habitats, as well as wetland and riparian habitats, outside the
33 SEZ that may be affected by hydrologic changes, including groundwater
34 elevations, and changes in water, sediment, and contaminant inputs associated
35 with runoff. Such efforts could help determine habitat characteristics,
36 including water source, hydrologic regime, and dominant plant species.
- 37

38

39 ***Wildlife.*** The following additional data-gathering action would help further characterize
40 potential impacts on wildlife resources for the SEZ.

- 41
- 42 • Conduct pre-disturbance surveys within the SEZ to determine the use of the
43 SEZ as a movement/migratory corridor or as important habitat for the elk,
44 mule deer, and pronghorn.
- 45
- 46

1 **Aquatic Biota.** Investigations recommended under the water resources action plan
2 (Section C.3.2.5.8) would be useful in characterizing and protecting habitat available to aquatic
3 biota. Most washes in the SEZ are typically dry and contain water only for brief periods. They
4 may or may not contain aquatic biota; therefore, preliminary evaluations of these surface water
5 features could be conducted to determine the potential for aquatic communities to be present.
6 Any aquatic biota found in these features would likely be desiccation-adapted aquatic
7 invertebrates typical of the region, and the primary value may be as food sources to nonaquatic
8 animals.

9
10
11 **Special Status Species.** The following additional data-gathering actions would be useful
12 in further characterizing and protecting habitat available to special status species.

- 13
14 • Conduct pre-disturbance surveys within the SEZ to determine the presence
15 and abundance of those special status species that are (1) federally listed,
16 proposed for listing, or candidates for listing under the Endangered Species
17 Act (ESA); or (2) listed by the State of Colorado as threatened or endangered;
18 or (3) designated as sensitive by the Colorado BLM State Office. These
19 species are listed in Table C.3.2-1. Surveys should focus on areas identified as
20 potentially suitable, and the suitability of these habitats to support these
21 special status species should be determined in the field. All field-determined
22 suitable habitats for special status species should be mapped. Target species
23 and survey protocols should be developed in coordination with the U.S. Fish
24 and Wildlife Service (USFWS) and CDOW. The BLM is currently conducting
25 surveys for various special status species (e.g. mountain plover, western
26 burrowing owl, Gunnison prairie dog) within the State of Colorado. In areas
27 where these surveys overlap with the Colorado SEZs and areas of direct
28 effects, the BLM survey information will be used to make appropriate
29 determinations regarding the potential occurrence of species and their habitats.
30 Additional survey efforts may be necessary, as appropriate.

31
32 The Draft Solar PEIS presents a table of special status species for which
33 potential impacts need to be evaluated prior to development in the proposed
34 De Tilla Gulch SEZ. The list of species presented in Table 10.2.12.1-1 of the
35 Draft Solar PEIS also includes species listed by the State of Colorado and
36 species ranked by the State of Colorado as S1 or S2 or species of concern. On
37 the basis of design features presented in the Draft Solar PEIS, the potential for
38 impacts on these additional species will also need to be addressed before
39 development could occur in the SEZ.

40 41 42 **C.3.2.5.10 Air Quality and Climate**

43
44 None.

1 **TABLE C.3.2-1 Special Status Species That May Occur in the Vicinity of the Proposed De Tilla**
 2 **Gulch SEZ^a**

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
Birds			
American peregrine falcon	<i>Falco peregrinus anatum</i>	BLM-S	Year-round resident in the SEZ region. Open spaces associated with high, near vertical cliffs and bluffs above 200 ft ^d in height overlooking rivers. Nearest occurrences are from the Rio Grande National Forest approximately 16 mi ^e southwest of the SEZ. Suitable foraging habitat for this species may occur within the affected area. About 3,375,750 acres ^f of potentially suitable habitat occurs in the SEZ region.
Bald eagle	<i>Haliaeetus leucocephalus</i>	CO-T	Year-round resident in the SEZ region. Seldom seen far from water, especially larger rivers, lakes, and reservoirs. Also occurs locally in semiarid shrubland habitats where there is an abundance of small mammal prey. Known from the San Luis Creek in the Baca NWR as near as 12 mi southeast (downgradient) of the SEZ. About 1,443,500 acres of potentially suitable habitat occurs in the SEZ region.
Ferruginous hawk	<i>Buteo regalis</i>	BLM-S	Summer resident in the SEZ region. Grasslands, sagebrush, and saltbush habitats, as well as the periphery of pinyon-juniper woodlands throughout the San Luis Valley. Known to occur in the Baca NWR about 30 mi southeast of the SEZ. About 950,500 acres of potentially suitable habitat occurs in the SEZ region.
Gunnison sage-grouse	<i>Centrocercus minimus</i>	ESA-UR; BLM-S	Year-round resident in the SEZ region. Primarily found in the Gunnison Basin in south-central Colorado, the species inhabits large expanses of sagebrush with mixed grasses and forbs. Populations have been observed as near as 10 mi north of the SEZ. About 657,100 acres of potentially suitable habitat occurs in the SEZ region.
Mountain plover	<i>Charadrius montanus</i>	BLM-S	Summer resident in the SEZ region. Prairie grasslands and arid plains and fields. Nests in shortgrass prairies associated with prairie dogs, bison, and cattle. Known to occur within 10 mi west (upgradient) of the SEZ. About 970,750 acres of potentially suitable habitat occurs in the SEZ region.
Western burrowing owl	<i>Athene cunicularia hypugaea</i>	BLM-S; CO-T	Open grasslands and prairies, as well as disturbed sites such as golf courses, cemeteries, and airports throughout the SEZ region. Nests in burrows constructed by mammals (prairie dog, badger, etc.). Known to occur in Saguache County, Colorado. About 1,135,500 acres of potentially suitable habitat occurs in the SEZ region.
Mammals			
Big free-tailed bat	<i>Nyctinomops macrotis</i>	BLM-S	Roosts in rock crevices on cliff faces or in buildings. Forages primarily in coniferous forests and arid shrublands to feed on moths. About 1,246,800 acres of potentially suitable habitat occurs in the SEZ region.

TABLE C.3.2-1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
Gunnison's prairie dog	<i>Cynomys gunnisoni</i>	ESA-C	Mountain valleys, plateaus, and open brush habitats in southwestern and south-central Colorado at elevations between 6,000 and 12,000 ft. Known to occur about 35 mi southwest of the SEZ. About 1,470,200 acres of potentially suitable habitat occurs in the SEZ region.

^a The listings for (1) federally listed, proposed for listing, or candidates for listing under the ESA, and (2) Colorado BLM State Office sensitive species have been updated since the release of the Draft Solar PEIS.

^b BLM-S = listed as a sensitive species by the BLM; CO-T = listed as threatened by the State of Colorado; ESA-C = candidate for listing under the ESA; ESA-E = listed as endangered under the ESA; ESA-UR = under review for listing under the ESA.

^c For bird and mammal species, potentially suitable habitat was determined by using Southwest Regional Gap Analysis Project (SWReGAP) habitat suitability models (USGS 2005). Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.

^d To convert ft to m, multiply by 0.3048.

^e To convert mi to km, multiply by 1.609.

^f To convert acres to km², multiply by 0.004047.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

C.3.2.5.11 Visual Resources

Visual resources will be reevaluated for the Final Solar PEIS based on the revisions to boundaries described in Section C.4.3.3 of this Supplement. A summary of the Draft Solar PEIS visual contrast analysis for the proposed De Tilla Gulch SEZ is provided in Table C.3.2-2. This table includes only the resources that would be subject to moderate or strong levels of visual contrast. The Draft Solar PEIS visual impact analysis predicted these levels of visual contrast from solar energy development in the De Tilla Gulch SEZ for the following sensitive visual resource areas (SVRAs) and sensitive viewing locations (SVLs):

- Old Spanish National Historic Trail
- U.S. 285.

The following steps could be taken to better understand potential impacts on these SVRAs and SVLs from solar development in the De Tilla Gulch SEZ:

- Identify key observation points (KOPs) within these areas through working with the management agency or other local stakeholders.
- Conduct viewshed analyses from the KOPs to determine how much of the SEZ would be in view from each KOP.

TABLE C.3.2-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi (40-km) Viewshed of the Proposed De Tilla Gulch SEZ

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi ^e	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes ^f
National Historic Trail	Old Spanish ^g	2,700 mi	Passes within 0.6 to 0.25 mi of the SEZ as it parallels the entire southern boundary of the SEZ	34.6 mi	1.3	Westbound trail users would have extended views of solar facilities as they crossed the lower slopes of the Sangre de Cristo Mountains, then turned west to cross the San Luis Valley, and approached the SEZ directly. Visual contrast levels from solar facilities would gradually increase until they reached strong levels in the vicinity of the SEZ. Topographic screening would prevent eastbound trail users from seeing the SEZ until they were about 5 mi from the SEZ, at which point contrast levels would rise quickly to strong levels.
Other Areas of Interest (non-management areas)	U.S. 285 ^h	835 mi	2.9 mi of the highway is immediately adjacent to the SEZ	NA ⁱ	NA	As highway users passed the extreme southern tip of McIntyre Ridge (approximately 1.3 mi west of the SEZ), the entire SEZ would come into view. As users travel along the northwest side of the SEZ, facilities located within the SEZ would strongly attract the eye and would likely dominate views from U.S. 285.

^a To convert mi to km, multiply by 1.609.

^b To convert acres to km², multiply by 0.004047.

Footnotes continued on next page.

TABLE C.3.2-2 (Cont.)

- ^c Mileage (within all columns) is used only for trails or roads, unless otherwise specified.
- ^d Distances at the point of closest approach are based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these calculations.
- ^e The total acreage/mileage visible within 25 mi (40 km) of the SEZ is based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these acreages/mileages, as well as the percent total acreages/mileages visible within 25 mi (40 km) of the SEZ.
- ^f The assessment of impacts is based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries may result in reduced impacts in some of the SVRAs/SVLs due to the reduction in the overall footprint of the SEZ.
- ^g Length of Old Spanish National Historic Trail: BLM (2011a).
- ^h Length of U.S. 285: US-Highways.com (2010).
- ⁱ NA = data not available.

- 1 • As deemed necessary, based on viewshed analysis results, prepare wireframe
2 Google Earth™ visualizations of hypothetical solar facilities in the SEZ
3 depicting the 80% development scenario to better estimate potential impacts.
4

5 This additional analysis may help judge potential visual contrast more accurately for
6 most KOPs. For KOPs of particularly high sensitivity, a site visit with photography and
7 superimposition of the wireframe models onto the photos might be required or desired.
8

9
10 **C.3.2.5.12 Acoustic Environment**

11 None.
12

13
14
15 **C.3.2.5.13 Paleontological Resources**

16
17 The BLM Regional Paleontologist will be contacted to determine whether additional
18 information is available regarding the paleontological potential of the SEZ. A preliminary
19 paleontological survey could be conducted to verify the Potential Fossil Yield Classification
20 (PFYC) of the SEZ as Class 3b as used in the Draft Solar PEIS and determine whether
21 paleontological resources are likely to be affected.
22

23
24 **C.3.2.5.14 Cultural Resources and Native American Concerns**

25
26 Approximately 3.8% of the original 1,522-acre (6.2-km²) proposed De Tilla Gulch SEZ
27 has been surveyed (roughly 51 acres [0.2 km²]; however, one of the larger surveys conducted
28 was in an area no longer included in the SEZ; thus the amount of survey coverage of the revised
29 1,089 acres (4.4 km²) is less than that. No sites have been recorded to date within the SEZ.
30 Fifteen sites have been recorded within 5 mi (8 km) of the SEZ. Paleoindian sites could be
31 encountered throughout the San Luis Valley. The Old Spanish National Historic Trail is mapped
32 as within 0.25 mi (0.4 km) of the SEZ, but this segment of the trail has not been ground-truthed
33 and may actually cross the SEZ; a high-potential segment of that trail is located within the
34 viewshed of the SEZ. The West Fork of the Old Spanish Trail is a significant cultural resource,
35 although not part of the National Historic Trail system, and is also located within the viewshed
36 of the SEZ. The destruction or degradation of important plant resources and the destruction of
37 habitat or impediments to the movement of culturally important wildlife are also potential
38 impacts of concern within the SEZ.
39

40 The following additional data collection efforts could reduce the uncertainty about
41 potential impacts on cultural resources:

- 42
43 • Conduct a Class I literature file search to better understand (1) the site
44 distribution pattern in the vicinity of the SEZ, (2) trail networks through
45 existing ethnographic reports, and (3) overall cultural sensitivity of the
46 landscape.

- 1 • Conduct a Class II Stratified Random Sample Survey of the SEZ to obtain a
2 10% sample (roughly 109 acres [0.4 km²]). Areas of interest, as determined
3 through a Class I review, should also be identified prior to establishing the
4 survey design and sampling strategy. A Class III inventory of linear features
5 detected using LIDAR in the De Tilla Gulch SEZ is currently underway and
6 will account for a portion of the recommended sample.
7
- 8 • Prepare a cultural sensitivity map based on results of the Class II survey and
9 Class I review.
10
- 11 • Identify the location of the Old Spanish National Historic Trail in the vicinity
12 of the SEZ and viewshed analyses from key points along the trail. High-
13 potential segments of the trail have been identified to the east between
14 Crestone, Colorado, and the Fourmile East SEZ and also to the west, west
15 of Saguache, Colorado. The trail segment to the east would be within the
16 viewshed at about 16 mi (26 km) regardless of solar technology type. Also
17 within the viewshed at about 6 mi (10 km) would be the West Fork of the Old
18 Spanish Trail, not currently part of the National Historic Trail system, but still
19 an important trail and significant cultural resource that would be visually
20 affected along an approximately 20-mi (32-km) stretch of the trail.
21
- 22 • Continue with government-to-government consultation as described in
23 Section 2.4.3, including follow-up to recent ethnographic studies with Tribes
24 not included in the original studies to determine whether those Tribes have
25 similar concerns. The De Tilla Gulch SEZ falls in the traditional use area of
26 primarily the Northern Cheyenne and the Northern Arapaho, although
27 potentially significant sites and landscapes for the Navajo and the Pueblos
28 may also be present near the SEZ (Blanca Peak, Great Sand Dunes, San Luis
29 Lakes). Potential topics to be discussed during consultation include the above-
30 mentioned places, trail systems, mountain springs, mineral resources, burial
31 sites, ceremonial areas, and plant and animal resources.
32

33 **C.3.2.5.15 Socioeconomics and Environmental Justice**

34 None.
35

36 **C.3.2.5.16 Cumulative Impact Considerations**

37 None.
38
39
40
41
42

1 **C.3.3 Fourmile East**

2
3
4 **C.3.3.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic**
5 **Environmental Impact Statement (PEIS)**
6

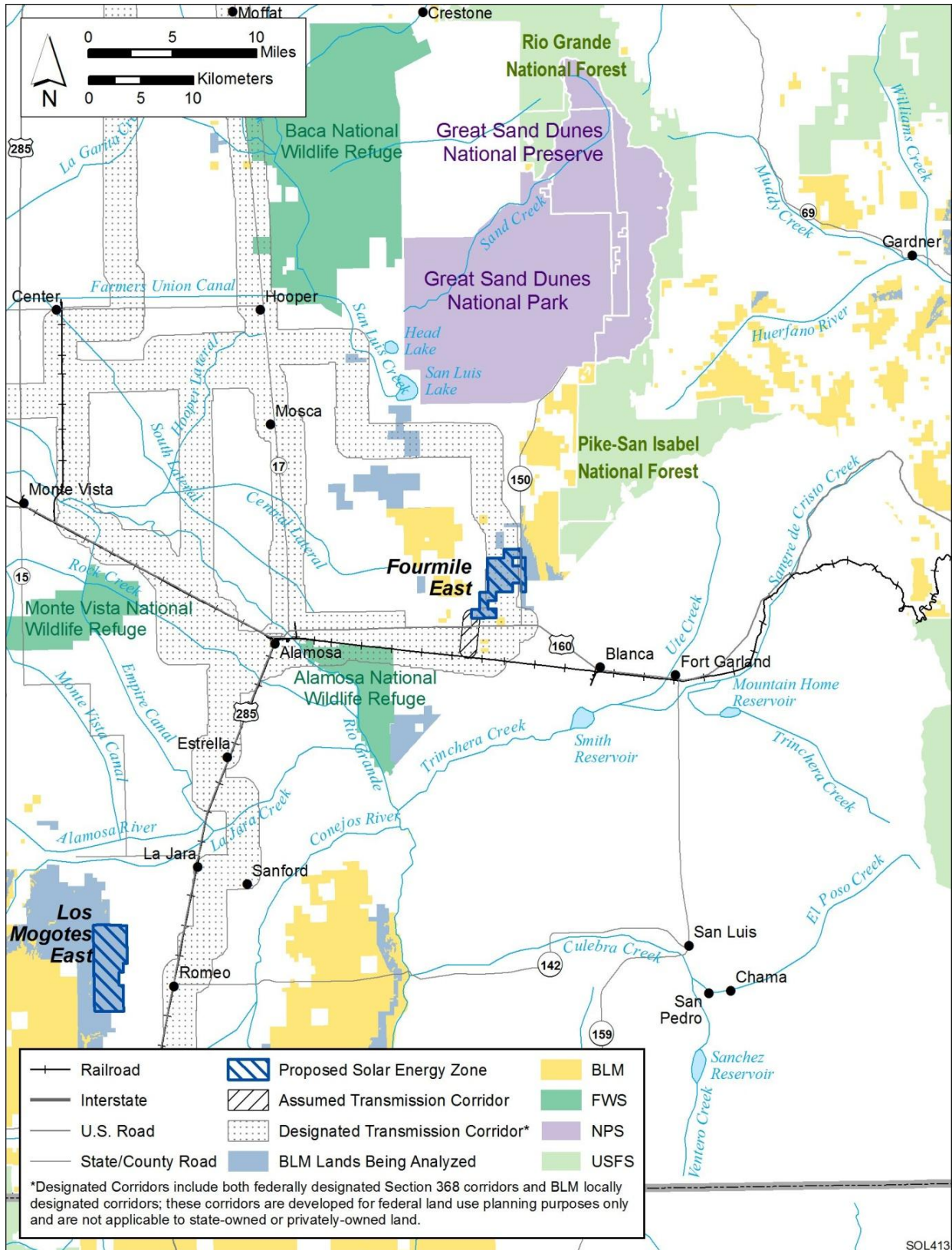
7 The proposed Fourmile East solar energy zone (SEZ), as presented in the Draft Solar
8 PEIS, had a total area of 3,882 acres (15.7 km²). It is located in Alamosa County in south–central
9 Colorado (Figure C.3.3-1). The town of Alamosa is located about 13 mi (21 km) west of the
10 SEZ.

11
12 A U.S. Department of the Interior Bureau of Land Management (BLM)-designated
13 transmission corridor that does not currently contain any transmission facilities passes through
14 most of the SEZ. This corridor could limit development in the SEZ because solar facilities
15 cannot be constructed under transmission lines. The Draft Solar PEIS discussion of impacts of
16 solar energy development in the SEZ acknowledged that the presence of the corridor could
17 reduce the amount of land available for solar power production, and that conversely, full
18 development of solar facilities within the SEZ would limit the use of the transmission corridor.
19

20 The Draft Solar PEIS identified a 69-kV transmission line that ends about 2 mi (3 km)
21 south of the SEZ as the nearest point of connection of the SEZ to the grid. There is also a 230-kV
22 line located about 8 mi (13 km) to the north of the SEZ. The location of new transmission that
23 could be constructed for this SEZ in the future may be different from that assumed in the Draft
24 Solar PEIS. Details on the updated transmission impact assessment to be included in the Final
25 Solar PEIS are provided in Section C.7.1 of this appendix. Analysis of transmission lines and/or
26 access roads will be completed as necessary as part of the project-specific environmental reviews
27 (see Section 2.2.2.2.2 of this Supplement).
28

29 Potential adverse impacts identified in the Draft Solar PEIS included the following:

- 30
- 31 • Possible non-mitigable impacts are related to induced changes to existing land
32 uses on nearby state and private lands.
33
 - 34 • SEZ development would have a significant effect on recreational users of
35 the Blanca Area of Critical Environment Concern/Special Recreation
36 Management Area (ACEC/SRMA), and there would be an adverse impact
37 on wilderness characteristics in a small portion of the Sangre de Cristo
38 Wilderness Area (WA). There is potential for adverse impacts on night sky
39 viewing opportunities in Great Sand Dunes National Park (NP) and in other
40 specially designated areas near the SEZ. The historic setting along 12 mi
41 (19 km) of the Old Spanish National Historic Trail would be adversely
42 affected, and there would be potential impact on 14 mi (23 mi) of the
43 Los Caminos Antiguos Scenic Byway. There may be an adverse impact on
44 Native American religious values associated with Blanca Peak. Because the
45 SEZ is located within the recently designated Sangre de Cristo National
46 Heritage Area, solar development could be inconsistent with this new
47 designation.



1

2 **FIGURE C.3.3-1 Proposed Fourmile East SEZ as Presented in the Draft Solar PEIS**

- 1 • One seasonal grazing allotment would likely be cancelled and 139 animal unit
2 months would be lost. One grazing permittee would be displaced and would
3 incur economic and possible social impacts.
- 4
- 5 • Development of the SEZ would be a dominating factor for the scenic byway
6 that passes through the SEZ and for a portion of the scenic railway route that
7 passes south of the SEZ. Because of the large number of specially designated
8 areas, scenic resources, and sensitive recreation resources near the SEZ, it is
9 likely that there would be unmitigated adverse impacts on recreational use
10 from development of the SEZ.
- 11
- 12 • The SEZ is located under a military training route (MTR), and any solar
13 facility that impinges into military airspace could interfere with military
14 training and would be a concern to the military.
- 15
- 16 • Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil
17 erosion by wind and runoff, sedimentation, and soil contamination) could
18 occur.
- 19
- 20 • Groundwater use would deplete the aquifer to the extent that, at a minimum,
21 wet-cooling options would not be feasible.
- 22
- 23 • Clearing of a large portion of the proposed SEZ could primarily affect
24 semidesert shrub steppe and greasewood flat, and may adversely affect desert
25 dry wash, playa, wetland, greasewood flat, and sand dune habitats, depending
26 on the amount of habitat disturbed. The establishment of noxious weeds could
27 result in habitat degradation.
- 28
- 29 • Potentially suitable habitat for 59 special status species and more than
30 50 wildlife species occurs in the affected area of the proposed SEZ; less than
31 1% of the potentially suitable habitat for any of these species occurs in the
32 region that would be directly affected by development.
- 33
- 34 • If aquatic biota are present in the small wetlands along the western boundary
35 of the proposed SEZ, they could be affected by the direct removal of surface
36 water features within the construction footprint, a decline in habitat quantity
37 and quality due to water withdrawals and changes in drainage patterns, as well
38 as increased sediment and contaminant inputs associated with ground
39 disturbance and construction activities.
- 40
- 41 • Temporary exceedances of ambient air quality standards for particulate matter
42 at the SEZ boundaries are possible during construction. These high
43 concentrations, however, would be limited to the immediate area surrounding
44 the SEZ boundary. Modeling indicates that emissions from construction
45 activities could exceed Class I Prevention of Significant Deterioration (PSD)

1 PM₁₀ (particulate matter with an aerodynamic diameter of 10 µm or less)
2 increments at the nearest federal Class I area (the Great Sand Dunes WA).

- 3
4 • Strong visual contrasts could be observed by visitors to the Old Spanish
5 National Historic Trail and Blanca Wetlands SRMA/ACEC, and from some
6 locations along the Los Caminos Antiguos Scenic Byway and along State
7 Highway 150 and U.S. 160. Weak to strong visual contrasts could be observed
8 by visitors to the Sangre de Cristo WA, while moderate visual contrasts could
9 be observed by visitors to the Zapata Falls SRMA and Blanca Peak.
- 10
11 • There is potential for impacts on significant paleontological and cultural
12 resources. Further evaluation is needed to determine the effects of solar
13 energy development on a high-potential segment of the Old Spanish National
14 Historic Trail. It is possible that there would be Native American concerns
15 about culturally significant archaeological sites, the potential for Native
16 American human remains and associated cultural items to be present within
17 the proposed SEZ, and the potential for visual and noise effects of solar
18 energy development on culturally significant locations within the valley as
19 consultation continues and additional analyses are undertaken. Effects on
20 traditionally important plants and animals are also possible.
- 21
22 • Minority populations occur within a 50-mi (80-km) radius of the proposed
23 SEZ boundary; thus adverse impacts of solar development could
24 disproportionately affect minority populations.

25 26 27 **C.3.3.2 Summary of Comments Received**

28
29 Most of the comments received from environmental groups on the proposed Fourmile
30 East SEZ were in favor of identifying the area as an SEZ (e.g., The Wilderness Society et al.¹⁵).
31 However, these groups proposed adjusting the eastern boundary 0.25 mi (0.40 km) west of State
32 Highway 150 to avoid adverse impacts on the Old Spanish National Historic Trail and the
33 Los Caminos Antiguos Scenic Byway (The Wilderness Society et al., Cultural Resources
34 Preservation Coalition, and Partnership for the National Trails System). The San Luis Valley
35 Renewable Communities Alliance was concerned that the SEZ contains winter range for
36 pronghorn. Also, the southern tip of the SEZ intersects a Gunnison prairie dog colony of
37 unknown status, and surveys for the species have not been conducted. The Wilderness Society
38 provided recommendations to avoid impacts on the Gunnison prairie dog, including avoidance of
39 active colonies, clearance surveys within any area defined by the Colorado Division of Wildlife
40 (CDOW) as having colonies of inactive or unknown status, potential off-site mitigation within

¹⁵ The Wilderness Society, Center for Native Ecosystems, Biodiversity Conservation Alliance, Rocky Mountain Recreation Initiative, Colorado Wild, Wild Connections, High Country Citizens' Alliance, Colorado Environmental Coalition, Audubon Colorado, Natural Resources Defense Council, Sierra Club, Soda Mountain Wilderness Council, and Sierra Trek submitted joint comments on the proposed Colorado SEZs. Those comments are attributed to The Wilderness Society et al.

1 areas of high species viability, and project siting that avoids blocking migration corridors used
2 by the species to migrate between colonies.
3
4

5 **C.3.3.3 Changes to the SEZ**

6

7 The proposed Fourmile East SEZ has been reconfigured to eliminate 999 acres (4 km²),
8 mainly along the eastern boundary of the SEZ, and also a small area on the west side of the
9 proposed SEZ (see Figure C.3.3-2). Excluding these areas will avoid impacts on known cultural
10 resources, a historic playa basin, Caminos Antiguos Scenic Byway, the Old Spanish National
11 Historic Trail, the Pike National Historic Trail, big game winter range, and important riparian
12 habitat. Small additional wetland areas with a total area of about 1-acre (0.004-km²) have been
13 identified as non-development areas within the SEZ. The remaining developable area within the
14 SEZ area is 2,882 acres (11.7 km²).
15

16 To reduce the visual resource impacts of solar development within the proposed Fourmile
17 East SEZ, SEZ-specific visual resource mitigation requirements have been developed. Within
18 the area of the SEZ that was labeled to meet Visual Resource Management (VRM) Class II-
19 consistent objectives in the Draft Solar PEIS, all forms of development will be limited to 10 ft
20 (3.3 m) or less, and the technology must be restricted to either photovoltaic technologies of less
21 than 10 ft (3.3 m), or technologies with comparable or lower heights and reflectivity. For all
22 remaining portions of the SEZ, the solar development will be restricted to either PV technologies
23 of less than 3.3 m (10 ft), or technologies with comparable or lower height and reflectivity.
24 Additional required mitigation measures to address potential visual resource impacts are
25 described in Section C.7.3 of this appendix.
26

27 Because of the extensive potential impacts from solar development in the portion of the
28 Fourmile East SEZ that has been eliminated, those lands will be considered solar right-of-way
29 exclusion areas; that is, applications for solar development on those lands will not be accepted by
30 the BLM.
31
32

33 **C.3.3.4 Wilderness Character Status of SEZ**

34

35 A recently maintained inventory of wilderness characteristics was used to determine
36 whether public lands within the Fourmile East SEZ have wilderness characteristics. The finding
37 of this inventory was that these lands do not contain wilderness characteristics.
38
39

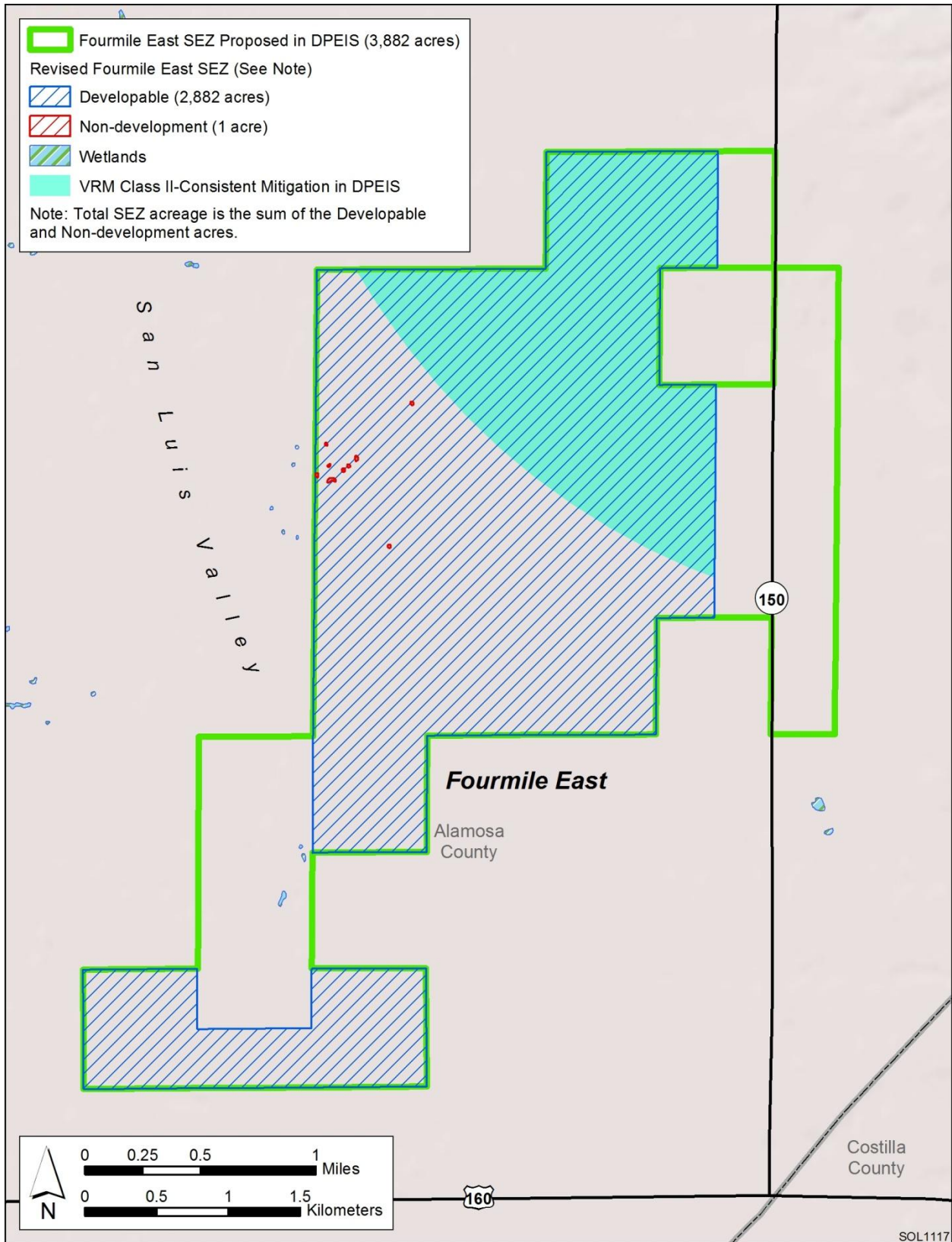
40 **C.3.3.5 Additional Data Collection Recommended**

41

42 **C.3.3.5.1 Lands and Realty**

43

44 None.
45
46



1

2 **FIGURE C.3.3-2 Proposed Fourmile East SEZ as Described in this Supplement**

1 **C.3.3.5.2 Specially Designated Areas and Lands with Wilderness Characteristics**

2
3 None.

4
5
6 **C.3.3.5.3 Rangeland Resources**

7
8
9 *Livestock Grazing.* The potential impact on the Tobin Creek and Foothills grazing
10 allotments will be re-evaluated based on the revised boundaries.

11
12
13 *Wild Horses and Burros.* None.

14
15
16 **C.3.3.5.4 Recreation**

17
18 The San Luis Valley-wide effort to promote recreational use could warrant additional
19 consideration. The status of off-highway vehicle use designation in the area may also warrant
20 additional consideration.

21
22
23 **C.3.3.5.5 Military and Civilian Aviation**

24
25 The proposed technology restrictions described in Sections C.3.3.3 and C.7.3 are
26 expected to minimize or eliminate any potential issues with MTRs; however, the BLM will
27 continue to consult with the U.S. Department of Defense regarding potential issues with MTRs.

28
29
30 **C.3.3.5.6 Geologic Setting and Soil Resources**

31
32 None.

33
34
35 **C.3.3.5.7 Minerals**

36
37 Additional information on leasable and strategic minerals in the vicinity of the proposed
38 SEZ will be provided in the Final Solar PEIS to inform the Department of the Interior's decision
39 on a proposed 20-year withdrawal of SEZ lands.

40
41
42 **C.3.3.5.8 Water Resources**

43
44 The following additional data and actions would help further characterize potential
45 impacts on water resources for the proposed Fourmile East SEZ. A more detailed discussion of

1 each of these activities is included in the water resources action plan provided in Section C.7.2 of
2 this appendix.

- 3
- 4 • Prepare a planning-level water resources inventory of the San Luis Valley
5 (eastern portion).
- 6
- 7 • Perform field surveys and hydrologic analyses to support jurisdictional water
8 determinations and floodplain identifications. Tasks include:
 - 9 – Surveying wetland and low-lying areas for surface elevations, high water
10 marks, and sediment conditions; and
 - 11 – Conducting hydrologic rainfall-runoff-routing analyses to identify
12 100-year floodplain areas.
- 13
- 14 • Coordinate with the U.S. Army Corps of Engineers (USACE) (Albuquerque
15 District) regarding jurisdictional water determinations for the SEZ. Water
16 features to be considered include:
 - 17 – Small wetland features.
- 18
- 19 • Identify 100-year floodplain exclusion areas for the SEZ. This task would
20 require coordination with the Federal Emergency Management Agency and
21 the Colorado Water Conservation Board.
- 22
- 23 • Describe the formation of a stakeholder committee to conduct long-term
24 monitoring of water resources. This activity would entail:
 - 25 – Identifying key stakeholder agencies,
 - 26 – Discussing general features of a monitoring program, and
 - 27 – Working with the U.S. Geological Survey and Colorado Division of Water
28 Resources (CDWR) (Division 3) to develop groundwater monitoring well
29 design and numerical groundwater models. (Groundwater monitoring
30 should coordinate with the Rio Grande Decision Support System through
31 the CDWR [Division 3].)
- 32

33 34 **C.3.3.5.9 Ecological Resources**

35
36
37 *Vegetation and Plant Communities.* The following additional data-gathering actions
38 would help further characterize potential impacts on vegetation and plant communities for the
39 proposed Fourmile East SEZ:

- 40
- 41 • Identify and map the location and areal extent of dry wash, playa, wetland,
42 and greasewood flat communities within the SEZ. Identify and map the
43 location and areal extent of these habitats, as well as riparian habitats, outside
44 the SEZ that may be affected by hydrologic changes, including groundwater
45 elevations, and changes in water, sediment, and contaminant inputs associated

1 with runoff. Such effort may help determine habitat characteristics, including
2 water source, hydrologic regime, and dominant plant species.

- 3
4 • Identify and map the location and areal extent of sand dunes and sand
5 transport systems within the SEZ.
6

7
8 **Wildlife.** The following additional data-gathering action would help further characterize
9 potential impacts on wildlife resources for the SEZ:

- 10
11 • Conduct pre-disturbance surveys within the SEZ to determine the use of the
12 SEZ as a movement/migratory corridor or as important habitat for elk, mule
13 deer, and pronghorn.
14

15
16 **Aquatic Biota.** Investigations recommended under the water resources action plan
17 (Section C.3.3.5.8) would be useful in characterizing and protecting habitat available to aquatic
18 biota. Wetlands identified within the SEZ may or may not contain aquatic biota; therefore,
19 preliminary evaluations of these surface water features could be conducted to determine the
20 potential for aquatic communities to be present.
21

22 **Special Status Species.** The following additional data-gathering actions would be useful
23 in further characterizing and protecting habitat available to special status species:
24

- 25 • Conduct pre-disturbance surveys within the SEZ to determine the presence
26 and abundance of those special status species that are (1) federally listed,
27 proposed for listing, or candidates for listing under the Endangered Species
28 Act (ESA); or (2) listed by the State of Colorado as threatened or endangered;
29 or (3) designated as sensitive by the Colorado BLM State Office. These
30 species are listed in Table C.3.3-1. Surveys should focus on areas identified as
31 potentially suitable, and the suitability of these habitats to support these
32 special status species should be determined in the field. All field-determined
33 suitable habitats for special status species should be mapped. Target species
34 and survey protocols should be developed in coordination with the U.S. Fish
35 and Wildlife Service and CDOW. The BLM is currently conducting surveys
36 for various special status species (e.g., mountain plover, western burrowing
37 owl, Gunnison prairie dog) within the State of Colorado. In areas where these
38 surveys overlap with the Colorado SEZs and areas of direct effects, the BLM
39 survey information will be used to make appropriate determinations regarding
40 the potential occurrence of species and their habitats. Additional survey
41 efforts may be necessary, as appropriate.
42

43 The Draft Solar PEIS presents a table of special status species for which
44 potential impacts need to be evaluated prior to development in the proposed
45 Fourmile East SEZ. The list of species presented in Table 10.3.12.1-1 of the
46 Draft Solar PEIS also includes species listed by the State of Colorado and

1 **TABLE C.3.3-1 Special Status Species That May Occur in the Vicinity of the Proposed Fourmile**
 2 **East SEZ^a**

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
Plants			
Brandegee's milkvetch	<i>Astragalus brandegeei</i>	BLM-S	Sandy or gravelly banks, flats, and stony meadows within pinyon-juniper woodlands. Substrates are usually sandstone with granite or basalt. Elevation ranges between 5,400 and 8,800 ft. ^d Nearest occurrences are located 40 mi ^e southwest of the SEZ. About 733,938 acres ^f of potentially suitable habitat occurs within the SEZ region.
Fragile rockbrake	<i>Cryptogramma stelleri</i>	BLM-S	Moist soils on shaded limestone cliffs at elevations greater than 7,000 ft and often in association with mosses. The nearest known occurrences are located in the San Juan Mountains, about 50 mi to the west of the SEZ. About 12,297 acres of potentially suitable habitat occurs within the SEZ region.
Many-stemmed spider-flower ^g	<i>Cleome multicaulis</i>	BLM-S	San Luis Valley on saturated soils created by waterfowl management on public lands. Nearest occurrences intersect the affected area from the Blanca Wetlands, about 3 mi west and northwest of the SEZ. About 4,439 acres of potentially suitable habitat occurs within the SEZ region in the Blanca Wetlands.
Ripley's milkvetch	<i>Astragalus ripleyi</i>	BLM-S	Mixed conifer and shrubland habitats on rocky substrates at elevations above 8,000 ft. The nearest known occurrences are located 30 mi to the west of the SEZ. About 394,308 acres of potentially suitable habitat occurs within the SEZ region.
Rock-loving aletes	<i>Neoparrya lithophila</i>	BLM-S	Igneous rock outcrops on north-facing cliffs and ledges within pinyon-juniper woodlands at elevations greater than 7,000 ft. Endemic to south-central Colorado. Found as near as 15 mi southwest of the SEZ. About 434,485 acres of potentially suitable habitat occurs within the SEZ region.
Birds			
American peregrine falcon	<i>Falco peregrinus anatum</i>	BLM-S	Year-round resident in the SEZ region. Open spaces associated with high, near- vertical cliffs and bluffs above 200 ft in height overlooking rivers. Nearest occurrences are from the Rio Grande National Forest about 40 mi northwest of the SEZ. About 3,277,511 acres of potentially suitable habitat occurs within the SEZ region.
Bald eagle	<i>Haliaeetus leucocephalus</i>	CO-T	Year-round resident in the SEZ region. Seldom seen far from water, especially larger rivers, lakes, and reservoirs. Occurs locally in semiarid shrubland habitats where there is an abundance of small mammal prey. Known to occur in riparian habitats along the Rio Grande about 10 mi west of the SEZ. About 2,072,279 acres of potentially suitable habitat occurs within the SEZ region.
Ferruginous hawk	<i>Buteo regalis</i>	BLM-S	Summer resident in the affected area, but year-round resident in portions of the SEZ region. Grasslands, sagebrush, and saltbrush habitats, as well as the periphery of pinyon-juniper woodlands. Known to occur in San Luis State Park and Wildlife Area, about 10 mi northwest of the SEZ. About 1,360,614 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.3.3-1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
Birds (Cont).			
Mountain plover	<i>Charadrius montanus</i>	BLM-S	Summer resident in the SEZ region. Prairie grasslands and arid plains and fields. Nests in shortgrass prairies associated with prairie dogs, bison, and cattle. Known to occur within 25 mi southeast of the SEZ. About 1,709,413 acres of potentially suitable habitat occurs within the SEZ region.
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	ESA-E; CO-E	Nests in thickets, scrubby and brushy areas, open second growth, swamps, and open woodlands in the Alamosa National Wildlife Refuge along the Rio Grande, about 7.5 mi southwest of the SEZ. Suitable habitats may occur in the Blanca Wetlands about 3 mi west of the SEZ. About 210,962 acres of potentially suitable habitat occurs within the SEZ region.
Western burrowing owl	<i>Athene cunicularia hypugaea</i>	BLM-S; CO-T	Open grasslands and prairies, as well as disturbed sites such as golf courses, cemeteries, and airports throughout the SEZ region. Nests in burrows constructed by mammals (prairie dog, badger, etc.). Known to occur in the San Luis Valley. About 2,209,000 acres of potentially suitable habitat occurs in the SEZ region.
Mammals			
Big free-tailed bat	<i>Nyctinomops macrotis</i>	BLM-S	Year-round resident in the SEZ region. Roosts in rock crevices on cliff faces or in buildings. Forages primarily in coniferous forests and arid shrublands to feed on moths. May occur in the San Luis Valley. About 2,745,262 acres of potentially suitable habitat occurs within the SEZ region.
Gunnison's prairie dog	<i>Cynomys gunnisoni</i>	ESA-C	Mountain valleys, plateaus, and open brush habitats in the project area at elevations between 6,000 and 12,000 ft. Known to occur as near as 20 mi south of the SEZ. About 1,938,641 acres of potentially suitable habitat occurs within the SEZ region.
Pale Townsend's big-eared bat	<i>Corynorhinus townsendii pallescens</i>	BLM-S	Year-round resident in the SEZ region. Semiarid shrublands, pinyon-juniper woodlands, and montane forests to elevations of 9,500 ft. Roosts in caves, mines, rock crevices, under bridges, or within buildings. Known to occur in the San Luis Valley about 25 mi southwest of the SEZ. About 3,075,160 acres of potentially suitable habitat occurs within the SEZ region.

- ^a The listings for (1) federally listed, proposed for listing, or candidates for listing under the ESA, and (2) Colorado BLM State Office sensitive species have been updated since the release of the Draft Solar PEIS.
- ^b BLM-S = listed as a sensitive species by the BLM; CO-E = listed as endangered by the State of Colorado; CO-T = listed as threatened by the State of Colorado; ESA-C = candidate for listing under the ESA; ESA-E = listed as endangered under the ESA.
- ^c For plant species, potentially suitable habitat was determined by using Southwest Regional Gap Analysis Project (SWReGAP) land cover types (USGS 2005). For terrestrial vertebrate species, potentially suitable habitat was determined by using SWReGAP habitat suitability and land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.
- ^d To convert ft to m, multiply by 0.3048.
- ^e To convert mi to km, multiply by 1.609.
- ^f To convert acres to km², multiply by 0.004047.
- ^g Species in bold text have been recorded or have designated critical habitat in the affected area.

1 species ranked by the State of Colorado as S1 or S2 or species of concern.
2 Based on the design features presented in the Draft Solar PEIS, the potential
3 for impacts on these additional species will also need to be addressed before
4 development could occur in the SEZ.
5
6

7 **C.3.3.5.10 Air Quality and Climate**

8
9 None.
10

11 **C.3.3.5.11 Visual Resources**

12
13
14 Visual resources will be re-evaluated for the Final Solar PEIS based on the boundary
15 adjustments and proposed technology restrictions described in Section C.3.3.3 of this
16 Supplement. A summary of the Draft Solar PEIS visual contrast analysis for the proposed
17 Fourmile East SEZ is provided in Table C.3.3-2. This table includes only those resources that
18 would be subject to moderate or strong visual contrast. The Draft Solar PEIS visual impact
19 analysis predicted these levels of visual contrast from solar energy development in the Fourmile
20 East SEZ for the following sensitive visual resource areas (SVRAs) and sensitive viewing
21 locations (SVLs):
22

- 23 • Old Spanish National Historic Trail
- 24
- 25 • Sangre de Cristo WA
- 26
- 27 • Blanca Wetlands SRMA
- 28
- 29 • Zapata Falls SRMA
- 30
- 31 • Blanca Peak
- 32
- 33 • Rio Grande Scenic Railroad.
- 34

35 The following steps could be taken to better understand potential impacts on these
36 SVRAs and SVLs from solar development in the Fourmile East SEZ:
37

- 38 • Identify key observation points (KOPs) within these areas through working
39 with the management agency or other local stakeholders.
- 40
- 41 • Conduct viewshed analyses from the KOPs to determine how much of the
42 SEZ would be in view from each KOP.
- 43
- 44 • As deemed necessary, based on viewshed analysis results, prepare wireframe
45 Google Earth™ visualizations of hypothetical solar facilities in the SEZ
46 depicting the 80% development scenario to better estimate potential impacts.

1 **TABLE C.3.3-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi (40-km) Viewshed of the Proposed Fourmile**
 2 **East SEZ**

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi ^e	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes ^f
National Historic Trail	Old Spanish National Historic Trail ^g	2,700 mi	Passes within 0.86 mi on the east side of the SEZ	50 mi	1.9	A high potential segment of the trail begins 1.25 mi northeast of the northeast corner of the SEZ; approximately 25 mi of the high-potential segment is within the 25-mi viewshed. Nearby elevated locations with open views of the SEZ could be subject to strong levels of visual contrast. Some viewpoints at lower elevations would have expansive views of the SEZ, but because of the lower viewing angle, these would be expected to be subjected to lower levels of visual contrast. Contrast levels would range from minimal levels for distant or low-elevation points to strong levels for locations close to the SEZ and for those points on the trail at higher elevations than the SEZ.
WAs	Sangre de Cristo	217,702 acres	2.8 mi northeast of the SEZ	10,479 acres	4.8	Solar energy development would be expected to create weak to strong visual contrasts for viewers. Visible portions extend up to 4.5 mi from the northern boundary of the SEZ.

TABLE C.3.3-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi ^d of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi	Percent Total Acreage/Mileage Visible within 25 mi	Notes ^f
SRMAs	Blanca Wetlands	8,598 acres	Southern unit is located 0.5 mi (0.8 km) from the western edge of the SEZ; the northern unit is located 1.8 mi from the northwest corner of the SEZ	8,598 acres	100.0	Solar energy development would be expected to cause weak to strong visual contrasts with the generally natural-appearing surroundings. The SEZ is visible from within the SRMA at distances between 0.5 and 6.7 mi.
	Zapata Falls	3,702 acres	4.6 mi from the northeast corner of the SEZ	2,338 acres	63.2	Solar development would be expected to create weak to moderate contrasts as seen from visible locations within the SRMA. The visible area extends from the point of closest approach to 7.0 mi from the SEZ.
Other Areas of Interest (non-management areas)	Blanca Peak	NA ^h	7 mi (11 km) northeast of the SEZ	NA	NA	As seen from Blanca Peak, the SEZ would occupy a substantial part of the observer's field of view; solar energy development would be likely to attract attention, though it would not be expected to dominate the view and would thus be expected to create moderate levels of visual contrasts.

TABLE C.3.3-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi	Percent Total Acreage/Mileage Visible within 25 mi	Notes ^f
Other Areas of Interest (non-management areas) (Cont.)	Rio Grande Scenic Railroad	NA	Passes within 2.3 mi of the southern boundary of the SEZ	NA	NA	Solar energy development would be expected to cause strong visual contrasts with the generally natural-appearing surroundings. Because this viewpoint is near the closest point on the railroad to the SEZ, other potential viewpoints on the railroad would be subject to similar or lower contrast levels.

^a To convert mi to km, multiply by 1.609.

^b To convert acres to km², multiply by 0.004047.

^c Mileage (within all columns) is used only for trails or roads, unless otherwise specified.

^d Distances at the point of closest approach are based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these calculations.

^e The total acreage/mileage visible within 25 mi (40 km) of the SEZ is based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these acreages/mileages, as well as the percentage of total acreages/mileages visible within 25 mi (40 km) of the SEZ.

^f The assessment of impacts is based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries may result in reduced impacts in some of the SVRAs/SVLs due to the reduction in the overall footprint of the SEZ.

^g Length of trail: BLM (2011a).

^h NA = data not available.

1 This additional analysis may help judge potential visual contrast more accurately for most
2 KOPs. For KOPs of particularly high sensitivity, a site visit with photography and
3 superimposition of the wireframe models onto the photos might be required or desired.
4

5 Additional required mitigation measures to address potential visual resource impacts are
6 given in Section C.7.3 of this appendix.
7

8 9 **C.3.3.5.12 Acoustic Environment**

10
11 None.
12

13 14 **C.3.3.5.13 Paleontological Resources**

15
16 The BLM Regional Paleontologist will be contacted to determine whether additional
17 information is available regarding the paleontological potential of the SEZ. A preliminary
18 paleontological survey could be conducted to verify the Potential Fossil Yield Classification
19 (PFYC) of the SEZ as Class 4/5 as used in the Draft Solar PEIS and determine whether
20 paleontological resources are likely to be affected.
21

22 23 **C.3.3.5.14 Cultural Resources and Native American Concerns**

24
25 None of the proposed Fourmile East SEZ has been systematically surveyed, although
26 six sites have been recorded to date within the original footprint of the SEZ. More than 100 sites
27 (including isolated finds) have been recorded within 5 mi (8 km) of the SEZ. Paleoindian sites
28 could be encountered throughout the San Luis Valley, and well-known Folsom sites are recorded
29 in similar dune areas just north of the SEZ. Burials have been noted in the nearby Great Sand
30 Dunes NP and Preserve and have been encountered as a result of shifting dunes. The Old
31 Spanish National Historic Trail is mapped as slightly more than 1.0 mi (1.6 km) from the SEZ
32 and includes a high-potential segment of that trail that would be visually affected. Blanca Peak,
33 reportedly a sacred mountain of the Navajo, is located just to the east, and the SEZ is within view
34 of that location. The destruction or degradation of important plant resources and the destruction
35 of habitat or impediments to the movement of culturally important wildlife are also potential
36 impacts of concern within the SEZ.
37

38 The following additional data collection efforts could reduce the uncertainty about
39 potential impacts on cultural resources:
40

- 41 • Conduct a Class I literature file search to better understand (1) the site
42 distribution pattern in the vicinity of the SEZ, (2) trail networks through
43 existing ethnographic reports, and (3) overall cultural sensitivity of the
44 landscape.
45

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40

- Conduct a Class II Stratified Random Sample Survey of the SEZ to obtain a 10% sample (roughly 288 acres [1.2 km²]). Areas of interest, as determined through a Class I review, should also be identified prior to establishing the survey design and sampling strategy, such as the dune areas throughout the SEZ. Subsurface testing of dune areas should be a component of the sampling strategy as well.
- Prepare a cultural sensitivity map based on results of the Class II survey and Class I review.
- Identify the location of the Old Spanish National Historic Trail in the vicinity of the SEZ and viewshed analyses from key points along the trail. A high-potential segment of the trail has been identified directly to the northeast from Crestone, Colorado, to the SEZ. It is clearly within the viewshed of the SEZ and would be affected visually. A mitigation strategy would need to be developed to address unavoidable impacts on the National Historic Trail.
- Continue with government-to-government consultation as described in Section 2.4.3, including follow-up to up recent ethnographic studies covering some SEZs in Nevada and Utah with Tribes not included in the original studies to determine whether those Tribes have similar concerns. The Fourmile East SEZ falls in the traditional use area of primarily the Northern Cheyenne and the Northern Arapaho, although potentially significant sites and landscapes for the Navajo and the Pueblos may also be present near the SEZ (Blanca Peak, Great Sand Dunes, San Luis Lakes). Potential topics to be discussed during consultation include the above-mentioned places, trail systems, mountain springs, mineral resources, burial sites, ceremonial areas, water resources, and plant and animal resources.

C.3.3.5.15 Socioeconomics and Environmental Justice

None.

C.3.3.5.16 Cumulative Impact Considerations

None.

1 **C.3.4 Los Mogotes East**
2
3

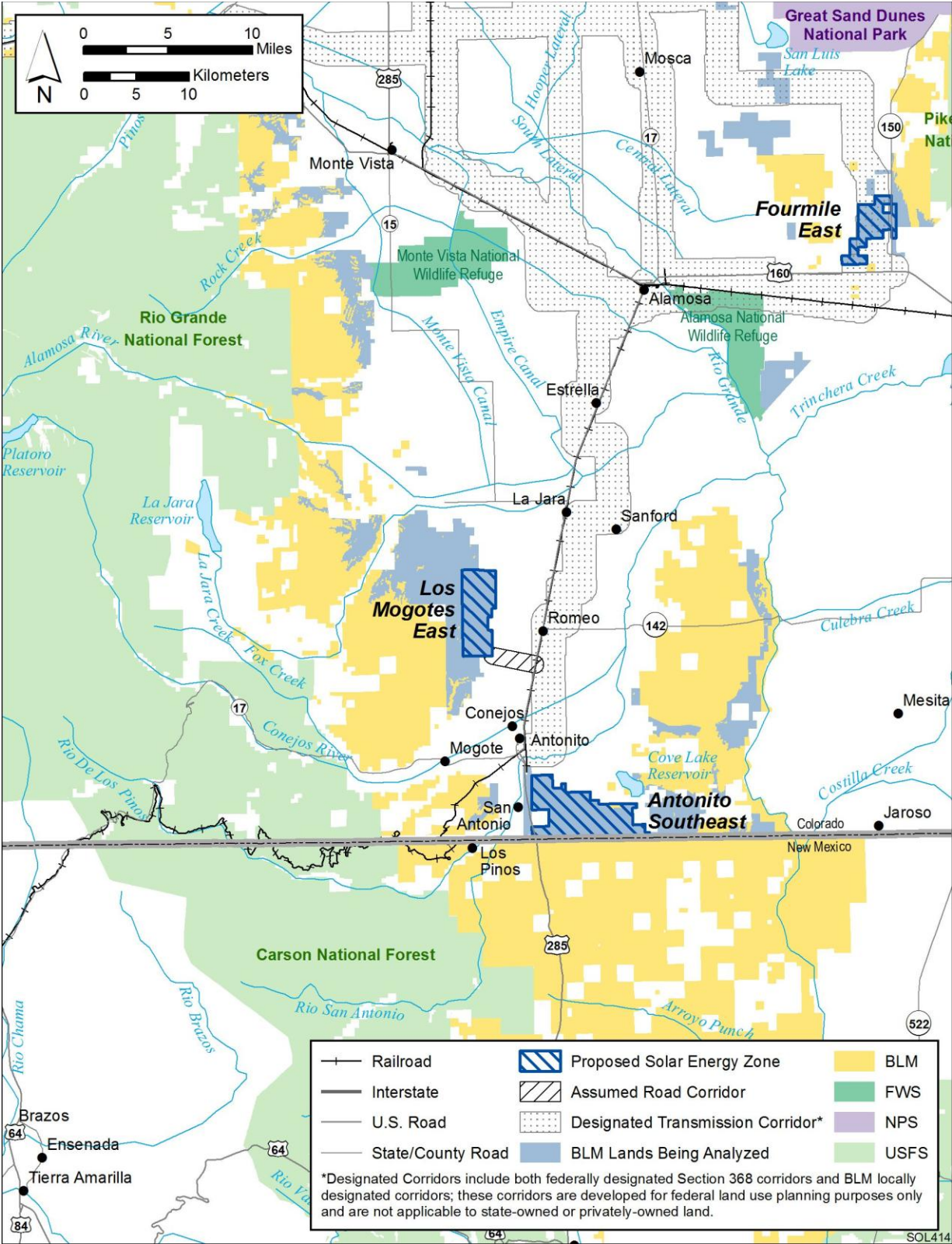
4 **C.3.4.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic**
5 **Environmental Impact Statement (PEIS)**
6

7 The proposed Los Mogotes East solar energy zone (SEZ), as presented in the Draft Solar
8 PEIS, had a total area of 5,918 acres (24 km²). It is located in Conejos County in south–central
9 Colorado, about 12 mi (19 km) north of the New Mexico border (Figure C.3.4-1). The largest
10 nearby town, Alamosa, is located about 22 mi (35 km) northeast of the SEZ. The town of Romeo
11 is located about 3 mi (5 km) directly to the east of the SEZ.
12

13 The Draft Solar PEIS identified a 69-kV transmission line adjacent to the proposed
14 Los Mogotes East SEZ as the nearest point for connection of the SEZ to the grid. The actual
15 location of connection to the transmission grid could be different than that assumed in the Draft
16 Solar PEIS. Details on the updated transmission impact assessment for SEZs to be included in
17 the Final Solar PEIS are provided in Section C.7.1 of this appendix. The Draft Solar PEIS
18 identified U.S. 285, located about 3 mi (5 km) to the east of the SEZ, as the nearest major road,
19 and assumed that a new access road would be constructed from the proposed SEZ to U.S. 285 to
20 support development. The location of a new access road that could be constructed in the future
21 may be different from that assumed in the Draft Solar PEIS. Analysis of transmission lines
22 and/or access roads will be completed as necessary as part of the project-specific environmental
23 reviews (see Section 2.2.2.2.2 of this Supplement).
24

25 Potential adverse impacts identified in the Draft Solar PEIS included the following:
26

- 27 • Access to U.S. Department of the Interior Bureau of Land Management
28 (BLM), state, and private lands to the west of the SEZ could be affected by
29 solar development if public access through the SEZ is not maintained.
30
- 31 • The Los Mogotes Area of Environmental Concern (ACEC) is located within
32 1 mi (1.6 km) of the SEZ and could be affected by its development, with
33 increased vehicular traffic and disturbance that could impair its value to
34 wildlife. The Los Caminos Antiguos Scenic Byway passes within 3 mi (5 km)
35 of the SEZ; any impact of development of the SEZ on the byway and byway
36 users is not known, but it would be highly visible. The SEZ is located within
37 the designated Sangre de Cristo National Heritage Area. The SEZ is within
38 1 mi (1.6 km) of the route of the West Fork of the North Branch of the Old
39 Spanish Trail, and development would have a major impact on the historic
40 and visual integrity of the trail.
41
- 42 • The Ciscom Flat grazing allotment would likely be cancelled, and the Capulin
43 and Little Mogotes allotments would be reduced, resulting in 475 animal unit
44 months lost. Four grazing permittees would be affected.
45



1

2 **FIGURE C.3.4-1 Proposed Los Mogotes East SEZ as Presented in the Draft Solar PEIS**

3

- 1 • Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil
2 erosion by wind and runoff, sedimentation, and soil contamination) could
3 occur.
4
- 5 • Groundwater use would deplete the aquifer to the extent that, at a minimum,
6 wet-cooling options would not be feasible.
7
- 8 • Clearing of a large portion of the proposed SEZ could primarily affect
9 semidesert shrub steppe and may adversely affect dry wash or greasewood flat
10 habitats, depending on the amount of habitat disturbed. The establishment of
11 noxious weeds could result in habitat degradation.
12
- 13 • Potentially suitable habitat for 51 special status species and more than
14 50 wildlife species occurs in the affected area of the proposed SEZ; less than
15 1% of the potentially suitable habitat for any of these species occurs in the
16 region that would be directly affected by development.
17
- 18 • If aquatic biota are present in the small ephemeral washes located in the
19 proposed SEZ, they could be affected by the direct removal of surface water
20 features within the construction footprint, a decline in habitat quantity and
21 quality due to water withdrawals and changes in drainage patterns, as well as
22 increased sediment and contaminant inputs associated with ground
23 disturbance and construction activities.
24
- 25 • Temporary exceedances of ambient air quality standards for particulate matter
26 at the SEZ boundaries are possible during construction. These high
27 concentrations, however, would be limited to the immediate area surrounding
28 the SEZ boundary. Modeling indicates that emissions from construction
29 activities could exceed Class I Prevention of Significant Deterioration (PSD)
30 PM₁₀ (particulate matter with an aerodynamic diameter of 10 µm or less)
31 increments at the nearest federal Class I area (the Great Sand Dunes
32 Wilderness Area [WA]).
33
- 34 • Strong visual contrasts could be observed by visitors to the West Fork of the
35 North Branch of the Old Spanish Trail. Weak to moderate visual contrasts
36 could be observed by visitors to the San Luis Hills Wilderness Study Area
37 (WSA), and weak to strong visual contrasts could be observed by users of the
38 Los Caminos Antiguos Scenic Byway where screening is absent. Where
39 screening is absent, strong visual contrasts could be observed from the
40 community of Romeo. Because of these potential impacts, the Draft Solar
41 PEIS recommended that power tower facilities should be prohibited within the
42 SEZ
43
- 44 • During operations, noise levels at the nearest residences could be higher than
45 the U.S. Environmental Protection Agency (EPA) guideline level if
46 concentrating solar power facilities with energy storage technologies (which

1 could extend the daily operational time by 6 hours or more) were used at the
2 SEZ.

- 3
4 • Few, if any, impacts on significant paleontological resources in a large
5 percentage of the SEZ are likely to occur, although there could be impacts in
6 the eastern 12% of the SEZ. Direct impacts on significant cultural resources
7 could occur. Further evaluation is needed to determine the effects of solar
8 energy development on the West Fork of the North Branch of the Old Spanish
9 Trail. It is possible that there will be Native American concerns about
10 potential visual and noise effects of solar energy development in the SEZ on
11 culturally significant locations within the valley. Effects on traditionally
12 important plants and animals are also possible.
- 13
14 • Minority populations occur within a 50-mi (80-km) radius of the proposed
15 SEZ boundary; thus adverse impacts of solar development could
16 disproportionately affect minority populations.

17 18 19 **C.3.4.2 Summary of Comments Received**

20
21 Most of the comments received from environmental groups on the proposed Los Mogotes
22 East SEZ were in favor of identifying the area as an SEZ (e.g., The Wilderness Society et al.¹⁶).
23 The San Luis Valley Ecosystem Council was concerned with the distance to transmission lines
24 and commented that shallow soils would make development of the SEZ difficult. The National
25 Wildlife Federation was concerned because the Los Mogotes East SEZ contains pronghorn
26 winter concentration areas. The Colorado Division of Wildlife (CDOW) recommended that the
27 BLM require off-site habitat improvement projects and/or compensatory mitigation to offsets
28 habitat losses in order to minimize both displacement of big game and lost hunting opportunities
29 for pronghorn. The San Luis Valley Renewable Communities Alliance (SLVRCA) was
30 concerned that the SEZ contains winter range, severe winter range, and winter concentration
31 areas for pronghorn, severe winter range and winter range for elk, and winter range for mule
32 deer.

33
34 The Wilderness Society and SLVRCA were concerned that the SEZ contains a Gunnison
35 prairie dog colony of unknown status. The SLVRCA also commented that the Old Spanish
36 National Historic Trail is located immediately east of the SEZ, and the area is known to have a
37 number of cultural and historical resources that have not been adequately inventoried. The
38 Conejos County Clean Water, Inc., group was concerned with the socioeconomic impact of solar
39 energy development at the proposed Los Mogotes East SEZ.

40
41

¹⁶ The Wilderness Society, Center for Native Ecosystems, Biodiversity Conservation Alliance, Rocky Mountain
Recreation Initiative, Colorado Wild, Wild Connections, High Country Citizens' Alliance, Colorado
Environmental Coalition, Audubon Colorado, Natural Resources Defense Council, Sierra Club, Soda Mountain
Wilderness Council, and Sierra Trek submitted joint comments on the proposed Colorado SEZs. Those
comments are attributed to The Wilderness Society et al.

1 **C.3.4.3 Changes to the SEZ**
2

3 The proposed Los Mogotes East SEZ has been reconfigured to eliminate more than
4 half of the area, 3,268 acres (13.2 km²) on the western side of the SEZ (see Figure C.3.4-2).
5 Excluding these areas will avoid impacts on significant cultural resources; grazing allotments;
6 an important riparian area; Gunnison prairie dog, burrowing owl, ferruginous hawk, mountain
7 plover, pronghorn birthing and winter habitat; and visual resources.
8

9 To reduce the visual resource impacts of solar development within the proposed
10 Los Mogotes East SEZ, allowable solar technologies within the remaining area comprising the
11 SEZ will be limited to photovoltaic systems with panel heights no greater than 10 ft (3.3 m), or
12 technologies with comparable or less height and reflectivity. Additional required mitigation
13 measures to address potential visual resource impacts are given in Section C.7.3 of this appendix.
14

15 Because of the extensive potential impacts from solar development in the portion of the
16 Los Mogotes East SEZ that has been eliminated, those lands will be considered solar right-of-
17 way exclusion areas; that is, applications for solar development on those lands will not be
18 accepted by the BLM.
19

20
21 **C.3.4.4 Wilderness Character Status of SEZ**
22

23 A recently maintained inventory of wilderness characteristics was used to determine
24 whether public lands within the Los Mogotes East SEZ have wilderness characteristics. The
25 finding of this inventory was that these lands do not contain wilderness characteristics.
26
27

28 **C.3.4.5 Additional Data Collection Recommended**
29
30

31 **C.3.4.5.1 Lands and Realty**
32

33 None.
34
35

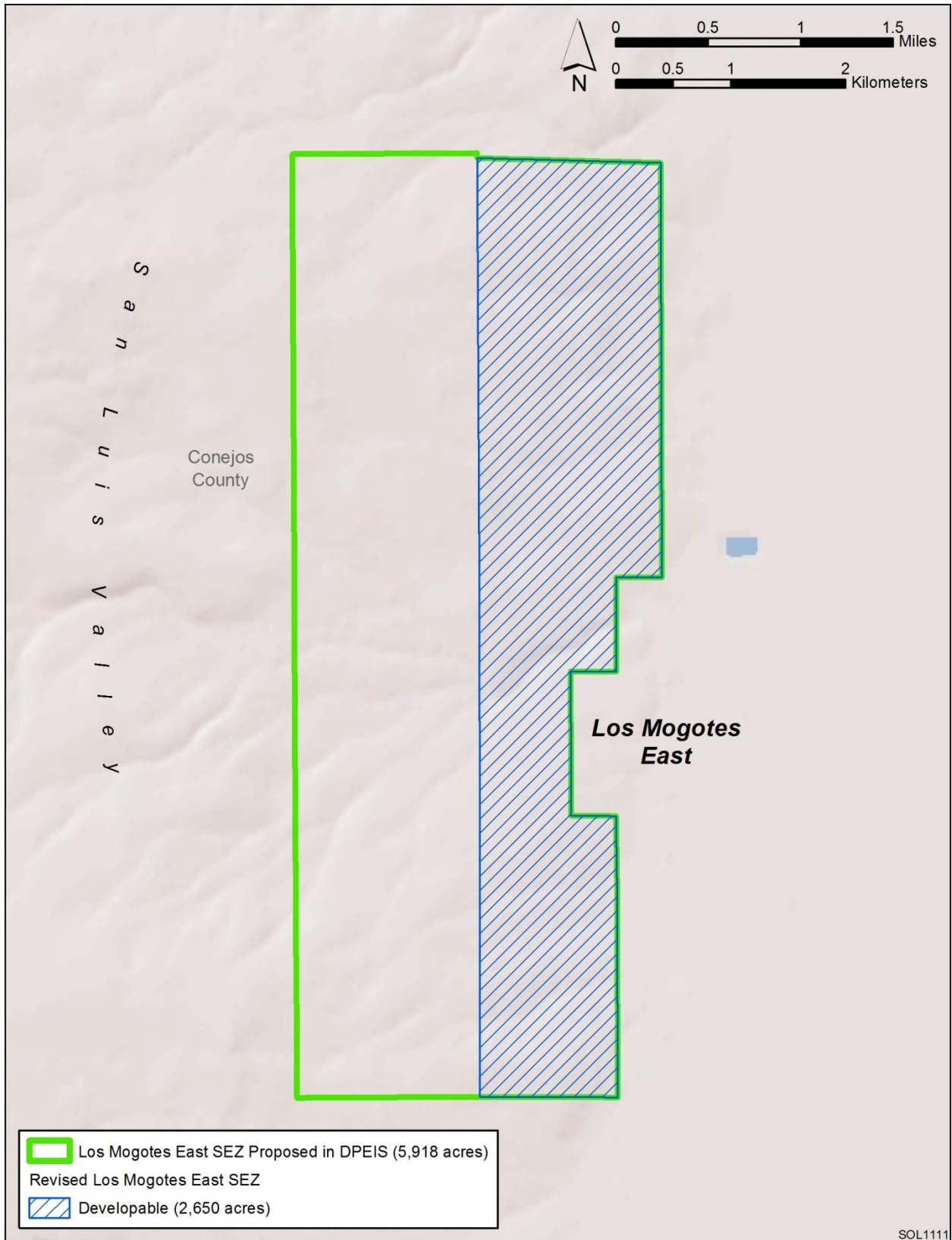
36 **C.3.4.5.2 Specially Designated Areas and Lands with Wilderness Characteristics**
37

38 None.
39
40

41 **C.3.4.5.3 Rangeland Resources**
42
43

44 **Livestock Grazing.** The potential impact on three grazing allotments will be re-evaluated
45 based on the revised boundaries.
46
47

48 **Wild Horses and Burros.** None.



1

2 **FIGURE C.3.4-2 Proposed Los Mogotes East SEZ as Described in this Supplement**

1 **C.3.4.5.4 Recreation**

2
3 Additional information on the potential impacts on hunting for big game species would
4 help further characterize impacts on recreation. In addition, the San Luis Valley-wide effort to
5 promote recreational use could warrant additional consideration. The status of off-highway
6 vehicle use designations in the area may also warrant additional consideration.
7

8
9 **C.3.4.5.5 Military and Civilian Aviation**

10 None.
11
12

13
14 **C.3.4.5.6 Geologic Setting and Soil Resources**

15 None.
16
17

18
19 **C.3.4.5.7 Minerals**

20
21 Additional information on leasable and strategic minerals in the vicinity of the proposed
22 SEZ will be provided in the Final Solar PEIS to inform the Department of the Interior’s decision
23 on a proposed 20-year withdrawal of SEZ lands.
24

25
26 **C.3.4.5.8 Water Resources**

27
28 The following additional data and actions would help further characterize potential
29 impacts on water resources for the proposed Los Mogotes East SEZ. A more detailed discussion
30 of each of these activities is included in the water resources action plan provided in Section C.7.2
31 of this appendix.
32

- 33 • Prepare a planning-level water resources inventory of the San Luis Valley
34 (southern portion).
- 35
36 • Identify additional ephemeral stream channels and wetland features for non-
37 development areas through consultation with the Colorado Division of Water
38 Resources (CDWR) (Division 3), CDOW, EPA, and U.S. Army Corps of
39 Engineers (USACE) with a focus on:
 - 40 – Unnamed ephemeral tributary to Romero Ditch (center of SEZ), and
 - 41 – Several unnamed ephemeral streams flowing west to east across SEZ.
- 42
43 • Perform field surveys and hydrologic analyses to support jurisdictional water
44 determinations and floodplain identifications. Tasks include:
 - 45 – Surveying ephemeral channels for surface elevations, high water marks,
 - 46 and sediment conditions, and

- 1 – Conducting hydrologic rainfall-runoff-routing analyses to identify
- 2 100-year floodplain areas.
- 3
- 4 • Coordinate with the USACE (Albuquerque District) regarding jurisdictional
- 5 water determinations for the SEZ. Water features to be considered include:
- 6 – Ephemeral stream channels within the SEZ.
- 7
- 8 • Identify 100-year floodplain exclusion areas for the SEZ. This task would
- 9 require coordination with the Federal Emergency Management Agency and
- 10 the Colorado Water Conservation Board.
- 11
- 12 • Describe the formation of a stakeholder committee to conduct long-term
- 13 monitoring of water resources. This activity would entail:
- 14 – Identifying key stakeholder agencies,
- 15 – Discussing general features of a monitoring program, and
- 16 – Working with the U.S. Geological Survey and CDWR (Division 3) to
- 17 develop groundwater monitoring well design and numerical groundwater
- 18 models. (Groundwater monitoring should coordinate with the Rio Grande
- 19 Decision Support System through the CDWR [Division 3].)
- 20

21

22 **C.3.4.5.9 Ecological Resources**

23

24

25 ***Vegetation and Plant Communities.*** The following additional data-gathering action

26 would help further characterize potential impacts on vegetation and plant communities for the

27 proposed Los Mogotes East SEZ:

- 28
- 29 • Identify and map the location and areal extent of dry wash and greasewood
- 30 flat communities within the SEZ. Identify and map the location and areal
- 31 extent of these habitats, as well as riparian and wetland habitats, outside the
- 32 SEZ that may be affected by hydrologic changes, including groundwater
- 33 elevations, and changes in water, sediment, and contaminant inputs associated
- 34 with runoff. Such efforts could help determine habitat characteristics,
- 35 including water source, hydrologic regime, and dominant plant species.
- 36

37

38 ***Wildlife.*** The following additional data-gathering action would help further characterize

39 potential impacts on wildlife resources for the SEZ:

- 40
- 41 • Conduct pre-disturbance surveys within the SEZ to determine the use of the
- 42 SEZ as a movement/migratory corridor or as important habitat for pronghorn.
- 43
- 44

45 ***Aquatic Biota.*** Investigations recommended under the water resources action plan

46 (Section C.3.4.5.8) would be useful in characterizing and protecting habitat available to aquatic

1 biota. Most washes in the SEZ are typically dry and contain water only for brief periods. They
2 may or may not contain aquatic biota; therefore, preliminary evaluations of these surface water
3 features could be conducted to determine the potential for aquatic communities to be present.
4 Any aquatic biota found in these features would likely be desiccation-adapted aquatic
5 invertebrates typical of the region, and the primary value may be as food sources to nonaquatic
6 animals.

7
8
9 ***Special Status Species.*** The following additional data-gathering actions would be useful
10 in further characterizing and protecting habitat available to special status species:

- 11
- 12 • Conduct pre-disturbance surveys within the SEZ to determine the presence
13 and abundance of those special status species that are (1) federally listed,
14 proposed for listing, or candidates for listing under the Endangered Species
15 Act (ESA); or (2) listed by the State of Colorado as threatened or endangered;
16 or (3) designated as sensitive by the Colorado BLM State Office. These
17 species are listed in Table C.3.4-1. Surveys should focus on areas identified as
18 potentially suitable, and the suitability of these habitats to support these
19 special status species should be determined in the field. All field-determined
20 suitable habitats for special status species should be mapped. Target species
21 and survey protocols should be developed in coordination with the U.S. Fish
22 and Wildlife Service (USFWS) and CDOW. The BLM is currently conducting
23 surveys for various special status species (e.g., mountain plover, western
24 burrowing owl, Gunnison prairie dog) within the State of Colorado. In areas
25 where these surveys overlap with the Colorado SEZs and areas of direct
26 effects, the BLM survey information will be used to make appropriate
27 determinations regarding the potential occurrence of species and their habitats.
28 Additional survey efforts may be necessary, as appropriate.

29
30 The Draft Solar PEIS presents a table of special status species for which
31 potential impacts need to be evaluated prior to development in the proposed
32 Los Mogotes East SEZ. The list of species presented in Table 10.4.12.1-1 of
33 the Draft Solar PEIS also includes species listed by the State of Colorado and
34 species ranked by the State of Colorado as S1 or S2 or species of concern. On
35 the basis of design features presented in the Draft Solar PEIS, the potential for
36 impacts on these additional species will also need to be addressed before
37 development could occur in the SEZ.

- 38
- 39 • Identify and map the location and areal extent of grassland habitat within the
40 SEZ. The suitability of this habitat for special status species should be
41 determined. Species potentially associated with grassland habitat include the
42 mountain plover, ferruginous hawk, and western burrowing owl.
 - 43
44 • Identify and map the location and areal extent of wetland habitats within the
45 SEZ. The suitability of these habitats for special status species should be
46 determined. Species potentially associated with wetland habitats include the
47 Brandegee's milkvetch and Great Basin silverspot butterfly.

1 **TABLE C.3.4-1 Special Status Species That May Occur in the Vicinity of the Proposed**
 2 **Los Mogotes East SEZ^a**

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
Plants			
Brandegee's milkvetch	<i>Astragalus brandegeei</i>	BLM-S	Sandy or gravelly banks, flats, and stony meadows within pinyon-juniper woodlands. Substrates are usually sandstone with granite or occasional basalt. Elevation ranges between 5,400 and 8,800 ft. ^d Nearest occurrences are located 8 mi ^e southwest of the SEZ. About 769,336 acres ^f of potentially suitable habitat occurs within the SEZ region.
Ripley's milkvetch	<i>Astragalus ripleyi</i>	BLM-S	Mixed conifer and shrubland habitats on rocky substrates at elevations above 8,000 ft. The nearest known occurrences are located 9 mi to the west of the SEZ. About 375,332 acres of potentially suitable habitat occurs within the SEZ region in the San Juan Mountains.
Rock-loving aletes^g	<i>Neoparrya lithophila</i>	BLM-S	Endemic to south-central Colorado on igneous rock outcrops on north-facing cliffs and ledges. Found within pinyon-juniper woodlands at elevations greater than 7,000 ft. Quad-level occurrences intersect the affected area approximately 5 mi west of the SEZ. About 366,037 acres of potentially suitable habitat occurs within the SEZ region.
Invertebrates			
Great Basin silverspot butterfly	<i>Speyeria nokomis nokomis</i>	BLM-S	Streamside meadows and open seepage areas associated with violets (<i>Viola</i> spp.). Nearest potentially suitable habitat is located on BLM lands in the La Jara Front Range approximately 9 mi northwest of the SEZ. About 502,789 acres of potentially suitable habitat occurs within the SEZ region.
Birds			
American peregrine falcon	<i>Falco peregrinus anatum</i>	BLM-S	Year-round resident in the SEZ region. Open spaces associated with high, near-vertical cliffs and bluffs above 200 ft in height overlooking rivers. Nearest occurrences are from the Rio Grande National Forest approximately 17 mi northwest of the SEZ. About 3,653,800 acres of potentially suitable habitat occurs within the SEZ region.
Bald eagle	<i>Haliaeetus leucocephalus</i>	CO-T	Year-round resident in the SEZ region. Seldom seen far from water, especially larger rivers, lakes, and reservoirs. Occurs locally in semiarid shrubland habitats where there is an abundance of small mammal prey. Quad-level occurrences intersect the affected area approximately 5 mi east of the SEZ. About 1,645,504 acres of potentially suitable habitat occurs within the SEZ region.
Ferruginous hawk	<i>Buteo regalis</i>	BLM-S	Summer resident in the affected area, but year-round resident in the SEZ region. Grasslands, sagebrush, and saltbrush habitats, as well as the periphery of pinyon-juniper woodlands throughout the San Luis Valley. Quad-level occurrences intersect the affected area approximately 5 mi west of the SEZ. About 1,388,420 acres of potentially suitable habitat occurs within the SEZ region.
Mountain plover	<i>Charadrius montanus</i>	BLM-S	Summer resident in the SEZ region. Prairie grasslands and arid plains and fields. Nests in shortgrass prairies associated with prairie dogs, bison, and cattle. Known to occur within 5 mi southeast of the SEZ. About 1,344,723 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.3.4-1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
<i>Birds (Cont.)</i>			
Western burrowing owl	<i>Athene cunicularia hypugaea</i>	BLM-S	Open grasslands and prairies as well as disturbed sites such as golf courses, cemeteries, and airports throughout the SEZ region. Nests in burrows constructed by mammals (prairie dog, badger, etc.). Known to occur in Conejos County, Colorado. About 2,036,700 acres of potentially suitable habitat occurs in the SEZ region.
<i>Mammals</i>			
Gunnison's prairie dog	<i>Cynomys gunnisoni</i>	ESA-C	Mountain valleys, plateaus, and open brush habitats in the project area at elevations between 6,000 and 12,000 ft. Known to occur in the San Luis Valley about 5 mi south and west of the SEZ. About 1,831,120 acres of potentially suitable habitat occurs within the SEZ region.

- ^a The listings for (1) federally listed, proposed for listing, or candidates for listing under the ESA, and (2) Colorado BLM State Office sensitive species have been updated since the release of the Draft Solar PEIS.
- ^b BLM-S = listed as a sensitive species by the BLM; CO-T = listed as threatened by the State of Colorado; ESA-C = candidate for listing under the ESA.
- ^c For plant species, potentially suitable habitat was determined by using Southwest Regional Gap Analysis Project (SWReGAP) land cover types (USGS 2005). For terrestrial vertebrate species, potentially suitable habitat was determined by using SWReGAP habitat suitability and land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.
- ^d To convert ft to m, multiply by 0.3048.
- ^e To convert mi to km, multiply by 1.609.
- ^f To convert acres to km², multiply by 0.004047.
- ^g Species in bold text have been recorded or have designated critical habitat in the affected area.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18

- Identify and map the location and areal extent of woodland habitats within the SEZ. The suitability of these habitats for special status species should be determined. Species potentially associated with woodland habitats include the Brandegee's milkvetch, Ripley's milkvetch, rock-loving aletes, and ferruginous hawk.
- Identify and map the location and areal extent of active Gunnison prairie dog colonies within the SEZ should be determined and mapped. Associated burrows also could be used by western burrowing owls.

C.3.4.5.10 Air Quality and Climate

None.

1 **C.3.4.5.11 Visual Resources**

2
3 Visual resources will be re-evaluated for the Final Solar PEIS based on the boundary
4 adjustments and proposed technology restrictions described in Section C.3.4.3 of this
5 Supplement. A summary of the Draft Solar PEIS visual contrast analysis for the proposed Los
6 Mogotes East SEZ is provided in Table C.3.4-2. This table includes only the resources that
7 would be subject to moderate or strong visual contrast. The Draft Solar PEIS visual impact
8 analysis predicted these levels of visual contrast from solar energy development in the Los
9 Mogotes East SEZ for the following sensitive visual resource areas (SVRAs) and sensitive
10 viewing locations (SVLs):

- 11
- 12 • San Luis Hills WSA
 - 13
 - 14 • Los Caminos Antiguos Scenic Highway
 - 15
 - 16 • San Luis Hills ACEC
 - 17
 - 18 • Communities of La Jara, Romeo, Sanford, and Manassa
 - 19
 - 20 • West Fork of the North Branch of the Old Spanish Trail.
- 21

22 The following steps could be taken to better understand potential impacts on these
23 SVRAs and SVLs from solar development in the Los Mogotes East SEZ:

- 24
- 25 • Identify key observation points (KOPs) within these areas through working
26 with the management agency or other local stakeholders.
 - 27
 - 28 • Conduct viewshed analyses from the KOPs to determine how much of the
29 SEZ would be in view from each KOP.
 - 30
 - 31 • As deemed necessary, based on viewshed analysis results, prepare wireframe
32 Google Earth™ visualizations of hypothetical solar facilities in the SEZ
33 depicting the 80% development scenario to better estimate potential impacts.
- 34

35 This additional analysis may help judge potential visual contrast more accurately for most
36 KOPs. For KOPs of particularly high sensitivity, a site visit with photography and
37 superimposition of the wireframe models onto the photos might be required or desired.

38

39 Additional required mitigation measures to address potential visual resource impacts are
40 given in Section C.7.3 of this appendix.

41

42

43 **C.3.4.5.12 Acoustic Environment**

44

45 None.

1 **TABLE C.3.4-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi (40-km) Viewshed of the Proposed**
 2 **Los Mogotes East SEZ**

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes ^f
WSAs	San Luis Hills	10,896 acres	8.8 mi east-southeast of the SEZ	3,311 acres	30.4	Solar energy development would be expected to create weak to moderate visual contrasts; contrast levels would be highest at high-elevation viewpoints in the western part of the WSA, and lower for low-elevation viewpoints such as in canyons or on bajadas. Visible areas within the WSA extend from approximately 8.8 mi to approximately 13 mi from the eastern boundary of the SEZ
ACECs Designated for Outstanding Scenic Values	San Luis Hills	39,421 acres	9.4 mi east of the SEZ	15,610 acres	39.6	Range of visual contrasts would be dependent on viewer location and project locations and the projects' characteristics. Solar energy facilities would be expected to attract attention but would not be likely to dominate views and would be expected to create weak to moderate visual contrasts. Contrast levels would be highest at high-elevation viewpoints in the western part of the ACEC and lower for low-elevation viewpoints, such as in canyons or on bajadas.

TABLE C.3.4-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes
Scenic Highways/ Byways	Los Caminos Antiguos ^e	129 mi	2.6 mi east-southeast of the southeast corner of the SEZ	27.1 mi	21.0	Solar energy development would be expected to create weak to strong visual contrasts, depending on viewer location and other visibility factors. Other features screen many views of the SEZ. The byway runs through the San Luis Valley and is located in close proximity to several of the proposed SEZs.
Other Areas of Interest (non-management areas)	West Fork of the North Branch of the Old Spanish Trail ^h	1,200 mi	1.0 mi from the SEZ	54.0 mi	4.5	Where screening is absent, because of the short distance, strong visual contrasts could be observed by trail users near the point of closest approach. Minimal to strong visual contrasts could be observed from points on the trail farther from the SEZ
	La Jara ⁱ	224 acres	5.3 mi northeast of the proposed SEZ	NA ^j	NA	Moderate levels of visual contrast would be expected. A detailed future site-specific National Environmental Policy Act (NEPA) analysis is required to determine visibility precisely.
	Romeo	NA	3.0 mi east of the proposed SEZ	NA	NA	Where screening is absent, Romeo could experience strong visual contrasts. A detailed future site-specific NEPA analysis is required to determine visibility precisely.



TABLE C.3.4-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes
Other Areas of Interest (non-management areas)	Sanford ⁱ	902 acres	7.7 mi (12.4 km) east northeast of the SEZ	NA	NA	Moderate to strong visual contrasts would be expected where there are unobstructed views to the SEZ. A detailed future site-specific NEPA analysis is required to determine visibility precisely.
	Manassa ^j	602 acres	5.5 mi east of the SEZ	NA	NA	Where screening was absent, the SEZ could potentially stretch across much of the field of view; expected contrast levels would be strong where there are unobstructed views to the SEZ. A detailed future site-specific NEPA analysis is required to determine visibility precisely.

^a To convert mi to km, multiply by 1.609.

^b To convert acres to km², multiply by 0.004047.

^c Mileage (within all columns) is used only for trails or roads, unless otherwise specified.

^d Distances at the point of closest approach are based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these calculations.

^e The total acreage/mileage visible within 25 mi (40 km) of the SEZ is based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these acreages/mileages, as well as the percent total acreages/mileages visible within 25 mi (40 km) of the SEZ.

^f The assessment of impacts is based the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries may result in reduced impacts in some of the SVRAs/SVLs due to the reduction in the overall footprint of the SEZ.

^g Length of byway: America's Byways (2011a).

^h Length of Continental Divide trail managed by the BLM: BLM (2010).

ⁱ Acreage of Colorado towns: U.S. Bureau of the Census (2011a).

^j NA = data not available.

1 **C.3.4.5.13 Paleontological Resources**
2

3 The potential for impacts on paleontological resources is low in 73% of the SEZ, where
4 the Potential Fossil Yield Classification (PFYC) has been identified as Class 1 in the Draft Solar
5 PEIS. Approximately 27% (718 acres [2.9 km²]) of the SEZ, along the eastern edge is classified
6 as Class 4/5. The depth of the Alamosa Formation would need to be determined in that area, and
7 the remainder of the SEZ would need to be field-checked to verify the PFYC classification of
8 Class 1.
9

10 The BLM Regional Paleontologist will be contacted to determine whether additional
11 information is available regarding the paleontological potential of the SEZ.
12
13

14 **C.3.4.5.14 Cultural Resources and Native American Concerns**
15

16 None of the proposed Los Mogotes East SEZ has been systematically surveyed, and
17 consequently no sites have been recorded in the original footprint of the SEZ. About 144 sites
18 (including isolated finds) have been recorded within 5 mi (8 km) of the SEZ. Many significant
19 archaeological sites are recorded just west of the SEZ, which is one of the reasons the size of the
20 original SEZ has been reduced. Paleoindian sites could be encountered throughout the San Luis
21 Valley. Traditional cultural properties of significance to the Hispanic community also may be
22 present in the vicinity of the SEZ. The West Fork of the North Branch of the Old Spanish Trail
23 proceeds close to the eastern boundary of the SEZ. Visual and auditory impacts are possible on
24 the trail and also on Blanca Peak, a sacred mountain of the Navajo that is northeast of the SEZ.
25 Impacts on the visual integrity of the Cumbres and Toltec Scenic Railroad are possible, but the
26 technology limitation described in Section 3.4.3 is expected to significantly reduce such impacts.
27 The destruction and degradation of important plant resources and the destruction of habitat or
28 impediments to the movement of culturally important wildlife are also potential impacts of
29 concern within the SEZ.
30

31 The following additional data collection efforts could reduce the uncertainty about
32 potential impacts on cultural resources:
33

- 34 • Conduct a Class I literature file search to better understand (1) the site
35 distribution pattern in the vicinity of the SEZ, (2) trail networks through
36 existing ethnographic reports, and (3) overall cultural sensitivity of the
37 landscape
38
- 39 • Conduct a Class II Stratified Random Sample Survey of the SEZ to obtain a
40 10% sample (roughly 265 acres [1.1 km²]). Areas of interest, as determined
41 through a Class I review, should also be identified prior to establishing the
42 survey design and sampling strategy.
43
- 44 • Prepare a cultural sensitivity map based on the results of the Class II survey
45 and Class I review.
46

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34

- Identify the integrity and historical significance of the portion of the West Fork of the North Branch of the Old Spanish Trail in the vicinity of the SEZ, and conduct viewshed analyses from key points along the trail. If this portion of the trail is determined significant, a mitigation strategy would need to be developed to address unavoidable impacts on the trail.
- Continue with government-to-government consultation, as described in Section 2.4.3, including follow-up to recent ethnographic studies covering some SEZs in Nevada and Utah with Tribes not included in the original studies to determine whether those Tribes have similar concerns. The Los Mogotes East SEZ area was used by Tribes historically for hunting and trading rather than long-term settlement. The Ute, Jicarilla Apache, Navajo, Kiowa, Comanche, Arapaho, Pueblo groups and Cheyenne may all have traditional interests in the valley. Potentially significant sites and landscapes for the Navajo, Upper Rio Grande Pueblo (Tewa), and Taos Pueblo are present in the San Luis Valley (Blanca Peak, Great Sand Dunes, and San Luis Lakes). Potential topics to be discussed during consultation include the above mentioned places, trail systems, mountain springs and other water sources, mineral resources, burial sites, ceremonial areas, and plant and animal resources. An ethnographic study of the SEZs in the San Luis Valley is currently proposed; results of the study will be incorporated into the Final Solar PEIS, if available at the time of publication.

C.3.4.5.15 Socioeconomics and Environmental Justice

None.

C.3.4.5.16 Cumulative Impact Considerations

None.

1 **C.4 NEVADA PROPOSED SOLAR ENERGY ZONES**

2
3
4 **C.4.1 Amargosa Valley**

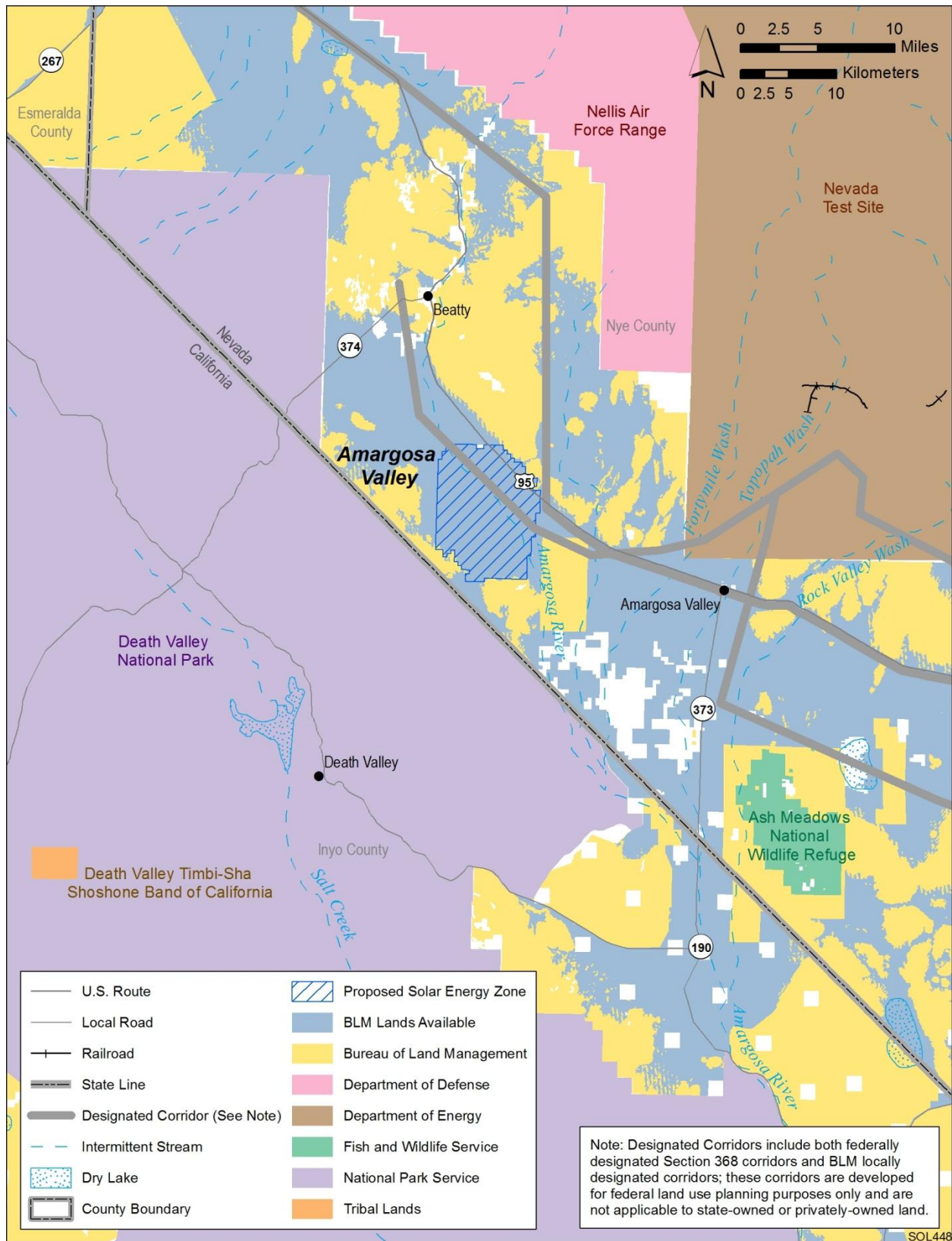
5
6
7 **C.4.1.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic**
8 **Environmental Impact Statement (PEIS)**
9

10 The proposed Amargosa Valley solar energy zone (SEZ), as presented in the Draft Solar
11 PEIS, had a total area of 31,625 acres (128 km²). It is located in Nye County in southern Nevada
12 near the California border (Figure C.4.1-1). The towns of Beatty and Amargosa Valley are
13 located about 11 mi (18 km) north of, and 12 mi (20 km) southeast of, the SEZ respectively.
14

15 The Draft Solar PEIS identified a 138-kV transmission line adjacent to the proposed
16 Amargosa Valley SEZ as the nearest point for connection of the SEZ to the grid. The actual
17 location of connection to the transmission grid could be different than that assumed in the Draft
18 Solar PEIS. Details on the updated transmission impact assessment for SEZs to be included in
19 the Final Solar PEIS are provided in Section C.7.1 of this appendix. Analysis of transmission
20 lines and/or access roads will be completed, as necessary, as part of the project-specific
21 environmental reviews (see Section 2.2.2.2.2 of this Supplement).
22

23 Potential adverse impacts identified in the Draft Solar PEIS included the following:
24

- 25 • Travel on existing dirt roads and in dry washes would be disrupted, resulting
26 in the creation of isolated parcels of public land between the SEZ and the
27 Death Valley National Park (NP) boundary.
28
- 29 • Wilderness characteristics on 19,406 acres (78.5 km²) of designated
30 wilderness within the Death Valley NP would be adversely affected. Night
31 sky viewing from the National Park could be impaired. Additional
32 groundwater withdrawals could adversely affect portions of the Death Valley
33 NP, the National Wildlife Refuge (NWR), and three Areas of Critical
34 Environmental Concern (ACECs) that are dependent on maintaining current
35 water levels.
36
- 37 • Recreation use would be eliminated from portions of the SEZ that would be
38 developed for solar energy production. There would be an impact on the
39 existing off-highway vehicle (OHV) use in the area, but the magnitude is not
40 known. Portions of an approved desert racing and commercial tour route
41 would be lost. Access to public land and National Park Service (NPS) areas
42 south and west of the SEZ would be lost, or, at a minimum, made much more
43 difficult by development of the SEZ.
44
- 45 • The U.S. Department of Defense (DoD) expressed serious concern over solar
46 energy facilities being constructed within the SEZ, and Nellis Air Force Base
47



2 **FIGURE C.4.1-1 Proposed Amargosa Valley SEZ as Presented in the Draft Solar PEIS**

1 indicated that any facilities higher than 50 ft (15 m) may be incompatible with
2 low-level aircraft use of the military training route (MTR). Further, the
3 Nevada Test and Training Range (NTTR) indicated that solar technologies
4 requiring structures higher than 50 ft (15 m) above ground level may present
5 unacceptable electromagnetic compatibility concerns for their test mission.
6

- 7 • Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil
8 erosion by wind and runoff, sedimentation, and soil contamination) could
9 occur.
- 10
- 11 • Groundwater use would deplete the aquifer to the extent that, at a minimum,
12 wet-cooling options would not be feasible.
- 13
- 14 • Clearing of a large portion of the proposed SEZ could primarily affect
15 creosote-white bursage desert scrub, and may adversely affect desert dry
16 washes and playa habitats, depending on the amount of habitat disturbed.
17 The establishment of noxious weeds could result in habitat degradation.
18 Deposition of fugitive dust could cause reduced productivity or changes in
19 plant community structure.
- 20
- 21 • Potentially suitable habitat for 52 special status species and more than
22 75 wildlife species occurs in the affected area of the proposed SEZ; up to
23 2.0% of the potentially suitable habitat for any of these species occurs in the
24 region that would be directly affected by development.
- 25
- 26 • If aquatic biota are present in the Amargosa River, they could be could be
27 indirectly affected by a decline in habitat quantity and quality due to water
28 withdrawals and changes in drainage patterns, as well as increased sediment
29 and contaminant inputs associated with ground disturbance and construction
30 activities.
- 31
- 32 • Temporary exceedances of ambient air quality standards for particulate matter
33 at the SEZ boundaries are possible during construction. These high
34 concentrations, however, would be limited to the immediate area surrounding
35 the SEZ boundary. Modeling indicates that emissions from construction
36 activities could exceed Class I PSD Prevention of Significant Deterioration
37 (PSD) PM₁₀ (particulate matter with an aerodynamic diameter of 10 µm or
38 less) increments at the nearest federal Class I area (John Muir Wilderness
39 Area [WA]).
- 40
- 41 • Strong visual contrasts could be observed by visitors to the Big Dune
42 special recreation management area (SRMA) and travelers on U.S. 95.
43 Weak to strong visual contrasts could be observed by visitors to the California
44 Desert Conservation Area (CDCA) and Death Valley NP and WA. Weak to
45 moderate visual contrasts could be observed by travelers on State Route 374.
46

- 1 • Few, if any, impacts on significant paleontological resources are likely to
2 occur within the SEZ. Direct impacts on significant cultural resources could
3 occur; at least four sites have been recorded within the proposed SEZ, and at
4 least one of them is considered potentially eligible for listing in the *National*
5 *Register of Historic Places* (NRHP). It is possible that Native American
6 concerns will be expressed over potential visual and other effects of solar
7 energy development within the SEZ on specific resources and culturally
8 important landscapes.
9
- 10 • On an individual census block group basis, there are low-income and minority
11 populations within a 50-mi (80-km) radius of the proposed SEZ boundary, so
12 adverse impacts of solar development could disproportionately affect low-
13 income and minority populations.
14

16 **C.4.1.2 Summary of Comments Received**

17
18 Some comments received on the proposed Amargosa Valley SEZ were in favor of
19 identifying the area as an SEZ, provided that specific concerns are addressed in the Final Solar
20 PEIS (e.g., Nevada Wilderness Project, The Wilderness Society et al.¹⁷). Many commentors,
21 however, opposed designating the area as an SEZ because of the potential negative impact on
22 Death Valley wilderness and water resources and endangered desert species, including the
23 Devil’s Hole pupfish. Other commentors recommended that Amargosa Valley be reduced or
24 reconfigured to avoid potential impacts. The Nevada Wilderness Project, Wilderness Society,
25 and others suggested a boundary adjustment to avoid the 100-year flood channel and the
26 secondary wash that is tributary to the Amargosa River, including a buffer to avoid potential
27 impacts on wildlife and plant habitat, for flood control, and the preservation of hydrologic
28 function. The National Parks Conservation Association recommended that the SEZ be moved to
29 an area further from Death Valley NP to avoid impacts on special status species and important
30 water resources.
31

32 The U.S. Fish and Wildlife Service (USFWS) recommended that the SEZ area be
33 reconfigured to address potential impacts on groundwater-dependent species, a national wildlife
34 refuge, and desert tortoise. The Nevada Department of Wildlife (NDOW) recommended that the
35 portion of the SEZ to the northeast of U.S. 95 be eliminated.
36

37 Concerns were expressed over potential impacts of groundwater withdrawals on the Ash
38 Meadows National Wildlife Refuge (NWR), Devil’s Hole, and the Amargosa Mesquite Trees
39 ACEC (Western Watersheds Project, Amargosa Conservancy). The U.S. Environmental
40 Protection Agency (EPA) suggested eliminating the SEZ or restricting technologies to those that
41 use the least amount of water, such as photovoltaic (PV). The Nature Conservancy supported the

¹⁷ The Wilderness Society, Center for Biological Diversity, Defenders of Wildlife, Sierra Club—Toiyabe Chapter, National Parks Conservation Association, Natural Resources Defense Council, Soda Mountains Wilderness Council, and Sierra Trek submitted joint comments on the proposed Nevada SEZs. Those comments are attributed to The Wilderness Society et al.

1 elimination of the Amargosa SEZ, citing the over-allocated groundwater basin, an important
2 corridor for desert tortoise, the potential impact on the Devil’s Hole pupfish, and the presence of
3 Big Dune. The Western Watersheds Project opposed the SEZ because of its location within
4 desert tortoise and other special status species habitat and because the region lacks both
5 groundwater and surface water resources. The Amargosa Conservancy was similarly concerned
6 with the over-allocated Amargosa basin and the potential long-term impacts of solar energy
7 development on the SEZ.
8

9 The Society for the Protection and Care of Wildlife recommended that impacts on water
10 availability, listed species, and viewshed for the Amargosa Valley SEZ should also be discussed
11 in the Draft Solar PEIS in relation to impacts in California. The DoD was concerned that
12 facilities exceeding 50 ft (15 m) in height could be incompatible with low-level aircraft
13 operations conducted in MTRs, and/or present electromagnetic compatibility concerns, and that
14 glare and heat emissions could present both flight and ground safety concerns. The Pahrump
15 Paiute Tribe opposed solar development in Amargosa Valley because of its proximity to
16 numerous unrecorded archaeological sites, religious sites, songscapes, and storyscapes important
17 to Southern Paiute people and the Pahrump Paiute Tribe. The Tribe also requested ethnographic
18 studies be conducted.
19
20

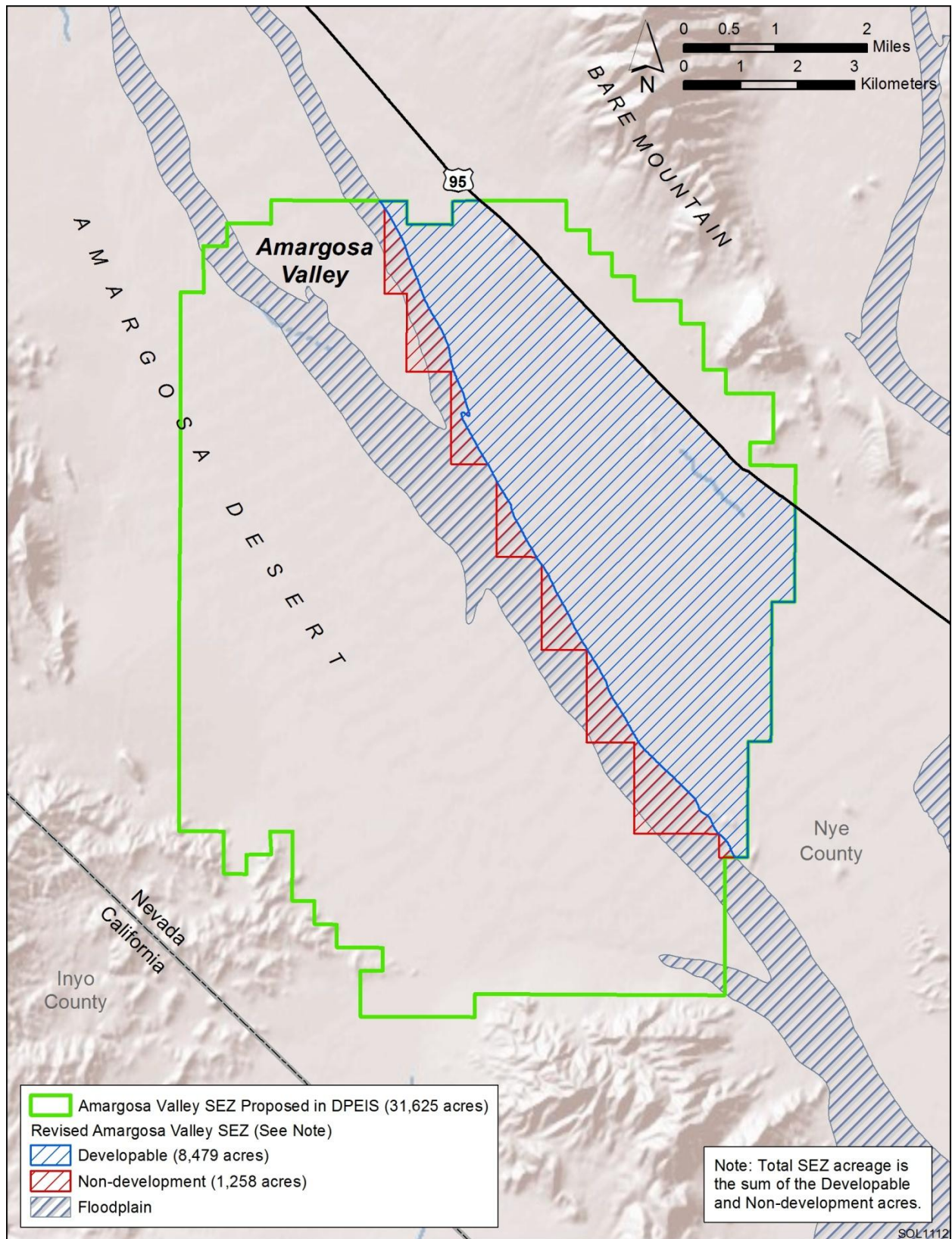
21 **C.4.1.3 Changes to the SEZ**

22
23 The proposed Amargosa Valley SEZ has been reconfigured to eliminate the area south
24 and west of the Amargosa River floodplain and the area northeast of U.S. 95, a total of
25 21,888 acres (88.6 km²) (see Figure C.4.1-2). Excluding these areas will mitigate many potential
26 impacts, including impacts on Death Valley NP and desert tortoise. In addition, 1,258 acres
27 (5.1 km²) within the SEZ boundaries have been identified as non-development areas. These areas
28 consist of lands within the Amargosa River floodplain that were included in the SEZ only to
29 facilitate definition of the boundaries using the Public Land Survey System. The remaining
30 developable area within the SEZ is 8,479 acres (34.3 km²).
31

32 To reduce the visual resource impacts of solar development within the proposed
33 Amargosa Valley SEZ, SEZ-specific visual resource mitigation requirements were presented in
34 the Draft Solar PEIS. However, the area of the SEZ that was labeled to meet Visual Resource
35 Management (VRM) Class II-consistent objectives in the Draft Solar PEIS has been eliminated
36 from the SEZ.
37

38 On the basis of the water impact analysis provided in the Draft Solar PEIS, development
39 within the remaining area of the SEZ may need to be restricted to PV technology or a technology
40 with equivalent or lower water use. Updated analyses taking the revised SEZ boundaries into
41 consideration will be included in the Final Solar PEIS.
42

43 Because of the extensive potential impacts from solar development in the portion of the
44 Amargosa Valley SEZ that has been eliminated, those lands will be considered solar right-of-
45 way exclusion areas; that is, applications for solar development on those lands will not be
46 accepted by the U.S. Department of the Interior Bureau of Land Management (BLM).



1

2 **FIGURE C.4.1-2 Proposed Amargosa Valley SEZ as Described in this Supplement**

1 **C.4.1.4 Wilderness Character Status of SEZ**

2
3 A recently maintained inventory of wilderness characteristics was used to determine
4 whether public lands within the Amargosa Valley SEZ have wilderness characteristics. The
5 finding of this inventory was that these lands do not contain wilderness characteristics.
6

7
8 **C.4.1.5 Additional Data Collection Recommended**

9
10
11 **C.4.1.5.1 Lands and Realty**

12
13 None.
14

15
16 **C.4.1.5.2 Specially Designated Areas and Lands with Wilderness Characteristics**

17
18 The potential impact on wilderness characteristics will be re-evaluated based on the
19 revised boundaries of the proposed Amargosa Valley SEZ.
20

21
22 **C.4.1.5.3 Rangeland Resources**

23
24
25 *Livestock Grazing.* None.
26

27
28 *Wild Horses and Burros.* None.
29

30
31 **C.4.1.5.4 Recreation**

32
33 The potential impacts on recreation use, including OHV, desert racing, and commercial
34 tour use, will be re-evaluated based on the revised boundaries of the of the proposed Amargosa
35 Valley SEZ.
36

37
38 **C.4.1.5.5 Military and Civilian Aviation**

39
40 The DoD has expressed continued concern regarding the potential impact of solar
41 development in this SEZ on military operations. The proposed technology restrictions described
42 in Sections C.4.1.3 and C.7.3 are expected to minimize or eliminate any potential issues with
43 military operations; however, the BLM will continue to consult with the DoD regarding potential
44 issues with MTRs.
45
46

1 **C.4.1.5.6 Geologic Setting and Soil Resources**

2
3 None.

4
5
6 **C.4.1.5.7 Minerals**

7
8 Additional information on leasable and strategic minerals in the vicinity of the proposed
9 SEZ will be provided in the Final Solar PEIS to inform the Department of the Interior’s decision
10 on a proposed 20-year withdrawal of SEZ lands.

11
12
13 **C.4.1.5.8 Water Resources**

14
15 The following additional data and actions would help further characterize potential
16 impacts on water resources for the proposed Amargosa Valley SEZ. A more detailed discussion
17 of each of these activities is included in the water resources action plan provided in Section C.7.2
18 of this appendix.

- 19
20 • Prepare a planning-level water resources inventory of the Amargosa Valley
21 basin.
- 22
23 • Identify additional ephemeral stream channels for non-development areas
24 through consultation with the Nevada BLM, Nevada Division of Water
25 Resources (NDWR), EPA, and U.S. Army Corps of Engineers (USACE) with
26 a focus on:
27 – Unnamed ephemeral streams flowing northwest to southeast across SEZ
28 – Distributary channels of Amargosa River within the SEZ
- 29
30 • Conduct a field survey to:
31 – Survey ephemeral stream channels and distributary channels of the
32 Amargosa River for surface elevations, high water marks, and sediment
33 conditions.
- 34
35 • Coordinate with the USACE (Sacramento District) regarding jurisdictional
36 water determinations for the SEZ. Water features to be considered include:
37 – Channels feeding into the Amargosa River
- 38
39 • Describe the formation of a stakeholder committee to conduct long-term
40 monitoring of water resources. This activity would entail:
41 – Identifying key stakeholder agencies,
42 – Discussing general features of a monitoring program, and
43 – Working with U.S. Geological Survey (USGS) to develop groundwater
44 monitoring well design and numerical groundwater models.
- 45

- 1 • Perform groundwater modeling analyses for the Amargosa Valley in the
2 region of the SEZ to estimate potential impacts of full build-out groundwater
3 pumping scenarios (according to estimated, technology-specific water
4 requirements). Tasks include:
 - 5 – Develop superposition-type groundwater model and modify the regional-
6 scale Death Valley Regional Flow System (DVRFS) model,
 - 7 – Coordinate with USGS-NV regarding modeling analyses and use of
8 DVRFS model, and
 - 9 – Address potential impacts on groundwater relevant to Ash Meadows
10 National Wildlife Reserve and Devil’s Hole.

11 12 13 **C.4.1.5.9 Ecological Resources**

14
15
16 ***Vegetation and Plant Communities.*** The following additional data-gathering actions
17 would help further characterize potential impacts on vegetation and plant communities for the
18 proposed Amargosa Valley SEZ:

- 19
20 • Identify and map the location and areal extent of desert dry washes and playa
21 habitats within the SEZ. Identify and map the location and areal extent of
22 these habitats, as well as wetland, riparian, greasewood flat, desert chenopod
23 scrub, and mesquite bosque habitats, and Amargosa River shrub communities,
24 outside the SEZ that may be affected by hydrologic changes, including
25 groundwater elevations, and changes in water, sediment, and contaminant
26 inputs associated with runoff. Such efforts could help determine habitat
27 characteristics, including water source, hydrologic regime, and dominant plant
28 species.
- 29
30 • Identify and map the location of cactus species within the SEZ.

31
32
33 ***Wildlife.*** The following additional data-gathering actions would help further characterize
34 potential impacts on wildlife resources for the SEZ:

- 35
36 • Conduct pre-disturbance surveys within the SEZ to determine the use of the
37 SEZ as movement/migratory corridor or as important habitat for the mule
38 deer.
- 39
40 • Identify and map the location, areal extent, and wildlife use of intermittent
41 stream habitat (Amargosa River) within the SEZ. These areas provide
42 important habitat for a number of wildlife species.

43
44
45 ***Aquatic Biota.*** Investigations recommended under the water resources action plan
46 (Section C.4.1.5.8) would be useful in characterizing and protecting habitat available to aquatic

1 biota. The Amargosa River floodplain likely contains aquatic biota and has been designated a
2 non-development area. Therefore, a preliminary evaluation of that area is not necessary.
3 However, if it is determined that the Amargosa River or its floodplain could be affected
4 indirectly by water withdrawals, changes in drainage patterns, and construction activities, the
5 potential for aquatic communities to be affected in these areas would require further
6 investigation prior to development.

7
8
9 ***Special Status Species.*** The following additional data-gathering actions would be useful
10 in further characterizing and protecting habitat available to special status species:

- 11
- 12 • Conduct pre-disturbance surveys within the SEZ to determine the presence
13 and abundance of those special status species that are (1) federally listed,
14 proposed for listing, candidates for listing, or under review for listing under
15 the Endangered Species Act; or (2) protected by the State of Nevada; or
16 (3) designated as sensitive by the Nevada BLM State Office. These species
17 are listed in Table C.4.1-1. Surveys should focus on areas identified as
18 potentially suitable, and the suitability of these habitats to support these
19 special status species should be determined in the field. All field-determined
20 suitable habitats for special status species should be mapped. Target species
21 and survey protocols should be developed in coordination with the USFWS
22 and NDOW.

23
24 The Draft Solar PEIS presents a table of special status species for which
25 potential impacts need to be evaluated prior to development in the proposed
26 Amargosa SEZ. The list of species presented in Table 11.1.12.1-1 of the Draft
27 Solar PEIS also includes species listed by the State of Nevada and species
28 ranked by the States of California or Nevada as S1 or S2, or species of
29 concern by the states of California or Nevada. On the basis of the design
30 features presented in the Draft Solar PEIS, the potential for impacts on these
31 additional species will also need to be addressed before development could
32 occur in the SEZ.

- 33
- 34 • Identify and map the location and areal extent of desert wash or riparian
35 habitats within the SEZ. The suitability of these habitats for special status
36 species should be determined. Species potentially associated with these
37 habitats include the Holmgren lupine, Amargosa toad, phainopepla, and
38 western small-footed myotis.
 - 39 • Identify and map the location and areal extent of woodland habitats within the
40 SEZ. The suitability of these habitats for special status species should be
41 determined. Species potentially associated with these habitats include the
42 ferruginous hawk, phainopepla, fringed myotis, pallid bat, spotted bat, and
43 western small-footed myotis.
44
45
46

1 **TABLE C.4.1-1 Special Status Species That May Occur in the Vicinity of the Proposed Amargosa**
 2 **Valley SEZ^a**

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
Plants			
Death Valley beardtongue	<i>Penstemon fruticiformis</i> ssp. <i>amargosae</i>	BLM-S	Known only from the Death Valley region of California and southern Nevada. It inhabits Mojave desert scrub communities at elevations between 2,800 and 4,600 ft. ^d Nearest recorded occurrence is approximately 13 mi ^e east of the SEZ. About 2,424,000 acres ^f of potentially suitable habitat occurs within the SEZ region.
Holmgren lupine	<i>Lupinus holmgrenianus</i>	BLM-S	Known only from the Death Valley region of California and southern Nevada. It inhabits dry desert slopes, washes, and valleys on volcanic substrates, sometimes in association with pinyon-juniper woodlands. The species occurs at elevations between 4,600 and 8,200 ft. Nearest recorded occurrence is from the Death Valley NP, approximately 15 mi northwest of the SEZ. About 132,350 acres of potentially suitable habitat occurs within the SEZ region.
White-margined beardtongue	<i>Penstemon albomarginatus</i>	BLM-S	Inhabits desert sand dune habitats and Mojave desert scrub communities at elevations below 3,600 ft. Nearest recorded occurrence is approximately 17 mi east of the SEZ. About 2,464,200 acres of potentially suitable habitat occurs within the SEZ region.
Amphibians			
Amargosa toad	<i>Bufo nelsoni</i>	ESA-UR; BLM-S; NV-P	Endemic to the Amargosa Valley in Nye County, Nevada, where it is confined to isolated riparian and spring-fed habitats along the Amargosa River. Usually observed near water at the outflow of warm springs. Nearest recorded occurrence is approximately 8 mi north of the SEZ in the vicinity of Beatty, Nevada. About 24,600 acres of potentially suitable habitat occurs within the SEZ region.
Reptiles			
Desert tortoise ^g	<i>Gopherus agassizii</i>	ESA-T; NV-P	Desert creosotebush communities on firm soils for digging burrows. Often found along riverbanks, washes, canyon bottoms, creosote flats, and desert oases. Known to occur on the SEZ. About 2,717,800 acres of potentially suitable habitat occurs within the SEZ region.
Birds			
Ferruginous hawk	<i>Buteo regalis</i>	BLM-S	Winter resident in the SEZ region. Forages in grasslands, shrublands, agricultural lands, and the periphery of pinyon-juniper forests. Known to occur in Nye County, Nevada. About 1,239,000 acres of potentially suitable habitat occurs within the SEZ region.
Phainopepla	<i>Phainopepla nitens</i>	BLM-S; NV-P	Desert scrub, mesquite, and pinyon-juniper woodland communities. Also occurs in desert riparian areas and orchards. Nests in trees or shrubs in riparian habitats from 3 to 45 ft above the ground. About 1,369,100 acres of potentially suitable habitat occurs within the SEZ region.

3

TABLE C.4.1-1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
Birds (Cont.)			
Prairie falcon	<i>Falco mexicanus</i>	BLM-S	Year-round resident in the SEZ region, primarily in open habitats in mountainous areas, steppe, grasslands, or cultivated areas. Typically nests in well-sheltered ledges of rocky cliffs and outcrops. About 2,338,500 acres of potentially suitable habitat occurs within the SEZ region.
Western burrowing owl	<i>Athene cunicularia hypugaea</i>	BLM-S	Open grasslands and prairies, as well as disturbed sites such as golf courses, cemeteries, and airports. Nests in burrows constructed by mammals (prairie dog, badger, etc.). About 4,559,600 acres of potentially suitable habitat occurs within the SEZ region.
Mammals			
Fringed myotis	<i>Myotis thysanodes</i>	BLM-S; NV-P	Year-round resident in the SEZ region in a wide range of habitats including lowland riparian, desert shrub, pinyon-juniper, and sagebrush habitats. Roosts in buildings and caves. Nearest recorded occurrence is from the DOE Nevada Test Site, approximately 13 mi east of the SEZ. About 3,348,000 acres of potentially suitable habitat occurs within the SEZ region.
Nelson's bighorn sheep	<i>Ovis canadensis nelsoni</i>	BLM-S	Open, steep rocky terrain in mountainous habitats of the eastern Mojave Desert. Rarely uses desert lowlands, but may use them as corridors for travel between mountain ranges. Nearest recorded occurrence is from the Funeral Mountains, approximately 2 mi southwest of the SEZ. About 2,343,300 acres of potentially suitable habitat occurs within the SEZ region.
Pallid bat	<i>Antrozous pallidus</i>	BLM-S; NV-P	Year-round resident in the SEZ region in low-elevation desert communities, including grasslands, shrublands, and woodlands. Roosts in caves, crevices, and mines. Nearest recorded occurrence is from the DOE Nevada Test Site, approximately 13 mi east of the SEZ. About 3,500,600 acres of potentially suitable habitat occurs within the SEZ region.
Spotted bat	<i>Euderma maculatum</i>	BLM-S; NV-P	Year-round resident in the SEZ region near forests and shrubland habitats throughout the SEZ region. Roosts and hibernates in caves and rock crevices. About 2,955,200 acres of potentially suitable habitat occurs within the SEZ region.
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	BLM-S; NV-P	Year-round resident in the SEZ region in all but subalpine and alpine habitats, and may be found at any season throughout its range. Roosts in caves, mines, tunnels, buildings, or other man-made structures. Nearest recorded occurrence is approximately 12 mi north of the SEZ. About 3,739,000 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.4.1-1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
<i>Mammals</i>			
<i>(Cont.)</i>			
Western small-footed myotis	<i>Myotis ciliolabrum</i>	BLM-S	Year-round resident in the SEZ region in a variety of woodlands and riparian habitats at elevations below 9,000 ft. Roosts in caves, buildings, mines, and crevices of cliff faces. Nearest recorded occurrence is from the DOE Nevada Test Site, approximately 13 mi east of the SEZ. About 4,194,700 acres of potentially suitable habitat occurs within the SEZ region.

- ^a The listings for (1) federally listed, proposed for listing, or candidates for listing under the ESA, and (2) Nevada BLM State Office sensitive species have been updated since the release of the Draft Solar PEIS.
- ^b BLM-S = listed as a sensitive species by the BLM; ESA-T = listed as threatened under the ESA; ESA-UR = under review for listing under the ESA; NV-P = protected by the State of Nevada.
- ^c For plant species, potentially suitable habitat was determined by using Southwest Regional Gap Analysis (SWReGAP) land cover types (USGS 2005). For terrestrial vertebrate species, potentially suitable habitat was determined by using SWReGAP habitat suitability and land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.
- ^d To convert ft to m, multiply by 0.3048.
- ^e To convert mi to km, multiply by 1.609.
- ^f To convert acres to km², multiply by 0.004047.
- ^g Species in bold text have been recorded or have designated critical habitat in the affected area.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22

C.4.1.5.10 Air Quality and Climate

None.

C.4.1.5.11 Visual Resources

Visual resources will be re-evaluated for the Final Solar PEIS based on the boundary adjustments and proposed technology restrictions described in Section C.4.1.3 of this Supplement. A summary of the Draft Solar PEIS visual contrast analysis for the proposed Amargosa Valley SEZ is provided in Table C.4.1-2. This table includes only those resources that would be subject to moderate or strong visual contrast. The Draft Solar PEIS visual impact analysis predicted these levels of visual contrast from solar energy development in the Amargosa Valley SEZ for the following sensitive visual resource areas (SVRAs) and sensitive viewing locations (SVLs):

- Death Valley NP
- Death Valley WA

1 **TABLE C.4.1-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi (40-mi) Viewshed of the Proposed Amargosa**
 2 **Valley SEZ**

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi ^e	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes ^f
NP	Death Valley	3,397,062 acres	0.7 mi southwest to west of the SEZ	105,519 acres	3.1	Strong visual contrasts would be likely to occur where clear views of the SEZ exist, even beyond the 5 mi limit of the foreground-middle ground zone. There would be very limited visibility from higher elevations on Tucki Mountain and in the Panamint Range, but because of topographic screening and the long distance to the SEZ, expected visual contrasts would be weak. Potential visibility of solar facilities extends beyond 25 mi from the southwestern boundary of the SEZ
WAs	Death Valley	3,074,256 acres	0.7 mi southwest of the SEZ	67,944 acres	2.2	Same as for the Death Valley NP
SRMA	Big Dune	11,572 acres	0.4 mi east of the SEZ	11,198 acres	96.8	Strong levels of visual contrast would be expected in areas with a clear view of the SEZ; contrast would be slightly weaker from viewpoints in the southeastern portion of the SRMA, because the distance to the SEZ is greater.
Other Areas of Interest (non-management areas)	U.S. 95 ^g	1,574 mi	Passes through the northeast corner of the SEZ	31 mi	2.0	Solar facilities would strongly command visual attention and would likely dominate views from some locations along the roadway.

Footnotes on next page.

TABLE C.4.1-2 (Cont.)

- ^a To convert mi to km, multiply by 1.609.
- ^b To convert acres to km², multiply by 0.004047.
- ^c Mileage (within all columns) is used only for trails or roads, unless otherwise specified.
- ^d Distances at the point of closest approach are based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these calculations.
- ^e The total acreage/mileage visible within 25 mi (40 km) of the SEZ is based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these acreages/mileages, as well as the percentage of total acreage/mileage visible within 25 mi (40 km) of the SEZ.
- ^f The assessment of impacts is based the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries may result in reduced impacts in some of the SVRAs/SVLs due to the reduction in the overall footprint of the SEZ.
- ^g Length of U.S. 95: US-Highways.com (2010).

- 1 • Big Dune SRMA
- 2
- 3 • U.S. 95.
- 4

5 The following steps could be taken to better understand potential impacts on these
6 SVRAs and SVLs from solar development in the Amargosa Valley SEZ:

- 7
- 8 • Identify key observation points (KOPs) within these areas through working
9 with the management agency or other local stakeholders.
- 10
- 11 • Conduct viewshed analyses from the KOPs to determine how much of the
12 SEZ would be in view from each KOP.
- 13
- 14 • As deemed necessary, based on viewshed analysis results, prepare wireframe
15 Google Earth™ visualizations of hypothetical solar facilities in the SEZ
16 depicting the 80% development scenario to better estimate potential impacts.
- 17

18 This additional analysis may help judge potential visual contrast more accurately for most
19 KOPs. For KOPs of particularly high sensitivity, a site visit with photography and
20 superimposition of the wireframe models onto the photos might be required or desired.

21

22

23 **C.4.1.5.12 Acoustic Environment**

24 None.

25

26

27

28 **C.4.1.5.13 Paleontological Resources**

29 The BLM Regional Paleontologist will be contacted to determine whether additional
30 information is available regarding Potential Fossil Yield Classification (PFYC) identifications in
31 Nevada. A preliminary paleontological survey could be conducted to determine the PFYC of the
32 SEZ, in order to update the temporary assignment of PFYC Class 2 used in the Draft Solar PEIS
33 that was based on preliminary field findings during a brief 2010 visit and comparable project
34 area findings nearby.

35

36

37

38 **C.4.1.5.14 Cultural Resources and Native American Concerns**

39 Approximately 3% of the original proposed Amargosa Valley SEZ footprint had been
40 surveyed for cultural resources, identifying four sites within the SEZ. Two of the four sites have
41 been determined not eligible for listing in the *National Register of Historic Places*, one is eligible
42 for listing, and the eligibility of the remaining site is undetermined. For the revised footprint,
43 approximately 1.6% has been surveyed (142 acres [0.6 km²]), and only one of the four sites are
44 in the revised portion of the SEZ. The site is a railroad siding associated with the Tonopah and
45 Tidewater Railroad; it has been determined not eligible for a lack of integrity. At least 60 sites
46

1 have been recorded with 5 mi (8 km) of the original SEZ footprint. As with other SEZs, dune
2 areas and areas along washes have the highest potential for containing significant archaeological
3 resources within the SEZ. Several culturally important areas have also been identified near the
4 SEZ, including specific mountain ranges and peaks, dunes, canyons, trails, and water sources.
5 The destruction or degradation of important water resources and plant resources and the
6 destruction of habitat or impediments to the movement of culturally important wildlife are also
7 potential impacts of concern within the SEZ.

8
9 The following additional data collection efforts could reduce the uncertainty about
10 potential impacts on cultural resources:

- 11 • Conduct a Class I literature file search to better understand (1) the site
12 distribution pattern in the vicinity of the SEZ, (2) potential trail networks
13 through existing ethnographic reports, and (3) overall cultural sensitivity of
14 the landscape.
- 15 • Conduct a Class II reconnaissance level stratified random sample survey of
16 the SEZ to obtain a 10% sample (roughly 878 acres [3.6 km²]).¹⁸ Areas of
17 interest, such as dune areas and along washes, as determined through a Class I
18 review, should also be identified prior to establishing the survey design and
19 sampling strategy. If appropriate, some subsurface testing of dune areas
20 should be considered in the sampling strategy as well.
- 21 • Prepare a cultural sensitivity map based on results of the Class II survey and
22 Class I review.
- 23 • Continue with government-to-government consultation as described in
24 Section 2.4.3, including follow-up to recent ethnographic studies with Tribes
25 not included in the original studies to determine whether those Tribes have
26 similar concerns. The Amargosa Valley SEZ falls in the traditional use area of
27 primarily the Western Shoshone and the Southern Paiute, but also of the
28 Owens Valley Paiute. Potential topics presented in the Draft Solar PEIS
29 and/or in an ethnographic study with the Timbisha Shoshone and the Pahrump
30 Paiute to be discussed during consultation include Fortymile Canyon, Bare
31 Mountain, Eagle Mountain, Big Dune, Amargosa River, Ash Meadows, Salt
32 Song and Southern Fox Trails; rock art sites; clay, salt, and pigment sources;
33 water resources; and plant and animal resources. The agencies value the
34 information shared by the Tribes during the ethnographic study and will
35 consider their input in striving to minimize the impacts of solar development
36 in the SEZ. The completed ethnographic study will be available in its entirety
37 on the Solar PEIS Web site (<http://solareis.anl.gov>). A summary of the
38 contents of that report is also provided in the following text box.

39
40
41
42
43
44

¹⁸ The BLM plans to conduct a Class II survey of 5% of this SEZ prior to the Final Solar PEIS. Additional areas could be surveyed as funding becomes available.

1
2
3
4
5
6
7
8
9
10

C.4.1.5.15 Socioeconomics and Environmental Justice

None.

C.4.1.5.16 Cumulative Impact Considerations

None.

Tribal Perspectives on the Significance of the Amargosa Valley SEZ

The lands under consideration in the Amargosa Valley SEZ region were traditionally occupied, used, aboriginally owned, and historically related to the Numic-speaking peoples of the Great Basin and western Colorado Plateau. Tribal representatives involved in Amargosa Valley field consultation summarized here are from the Timbisha Shoshone Tribe, representing the cultural interests of the Western Shoshone, and the Pahrump Paiute Tribe, representing the cultural interests of the Southern Paiutes. These Numic-speaking people have gone on record in past projects and stipulate here again that they are the American Indian people responsible for the cultural resources (natural and man-made) in this study area because their ancestors were placed here by the Creator. According to their traditions, they always have lived in these lands, maintaining and protecting these places, plants, animals, water sources, and cultural signs of their occupation. The involved American Indian Tribal governments and their appointed cultural representatives have participated in this PEIS in order to explain the meaning and cultural centrality of the plants, animals, spiritual trails, healing places, and places of historic encounters that exist in these lands.

Western Shoshone and Southern Paiute Tribal representatives maintain that, in order to understand native people’s connections to the SEZ, it must be placed in context with neighboring places and their associated cultural resources. Thus, the significance of the Amargosa Valley SEZ is expressed in terms of the connections between it and places of importance in the surrounding region.

The Amargosa River has been identified by Tribal representatives as being one of most important features in the SEZ region. The river water is an essential life-giving resource for those in the desert. The Amargosa River is connected to Black Mountain, a powerful ceremonial volcanic mountain located to the north of the SEZ region. The river begins at the top of Black Mountain, and the water flows through the volcanic canyons of Thirsty Canyon and through the Amargosa Valley before reaching Death Valley. The power from the mountain follows the flow of water down the mountain and, like the water, flows into Death Valley.

Geologic resources of the Amargosa Valley SEZ region are complex in composition and cultural meanings. These connections have been formed over millions of years, and Numic-speaking peoples have interacted with this landscape for up to 15,000 years. Geologic resources include a range of culturally significant features such as minerals used as paint sources, salts used in curing, quartz deposits used to make tools, volcanic basalt boulders used to hold the prayers of travelers, mountain tops used for vision questing, and fossil evidence of rivers used as mnemonic devices for teaching about the past. All these geologic resources are alive according to the shared epistemology of these Numic-speaking peoples. The Creator made geologic resources alive by placing *Puha* (or energy) in them when the Earth was formed.

The Amargosa Valley SEZ region contains many important geologic features associated with Numic songs, stories, and ceremonies like Eagle Mountain, Devil’s Hole Canyon, Fortymile Canyon, the Bare Mountains, and the Amargosa River. One important feature three miles southeast of the SEZ is Big Dune. Tribal representatives stated during ethnographic interviews that Big Dune is featured in traditional stories and songs about this part of Numic territory.

11

Tribal Perspectives on the Significance of the Amargosa Valley SEZ (Cont.)

Eagle Mountain is another important geologic feature located in the Amargosa Valley SEZ region. Southern Paiute and Western Shoshone representatives identified it as being a culturally important place linked to Creation stories and songs.

Western Shoshone and Southern Paiute representatives documented archaeological materials such as pieces of worked obsidian and white chert throughout the Amargosa Valley SEZ region. These artifacts were heavily concentrated on the surface along the Amargosa River bed. Much of the material was heavily weathered with a deep patina, which suggests that it may be thousands of years old. Tribal representatives believe that the artifacts found in the study area serve as physical reminders and connect them to their ancestors who lived on and used this land. Tribal representatives also noted that these artifacts were purposely left in the Amargosa Valley SEZ study area as ritually deposited items. The artifacts are associated with prayer and need to be left in place.

The presence of culturally significant plants and animals contributes to the overall meaning of the Amargosa Valley SEZ study area to Indian people. Numerous species of traditional use plants and animals were identified such as Indian tea, creosote, desert tortoise, and mountain sheep. During multiple field visits, Native American representatives identified 15 traditional use plants and 41 traditionally important animals within the proposed project boundary.

According to Southern Paiute beliefs, Eagle Mountain is located along the Salt Song Trail, an important Southern Paiute spiritual trail. The Salt Songs are performed during the Cry Ceremony, which is conducted to guide the soul of a deceased person to the afterlife (Stoffle et al. 2000a). The location of the spirit person traveling the trail to the afterlife is marked at the end of each set of songs. The living people singing the songs know the spirit person's progress and the song notifies the living that journey to the afterlife has been successful (Stoffle et al. 1997).

1
2

1 **C.4.2 Dry Lake**
2
3

4 **C.4.2.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic**
5 **Environmental Impact Statement (PEIS)**
6

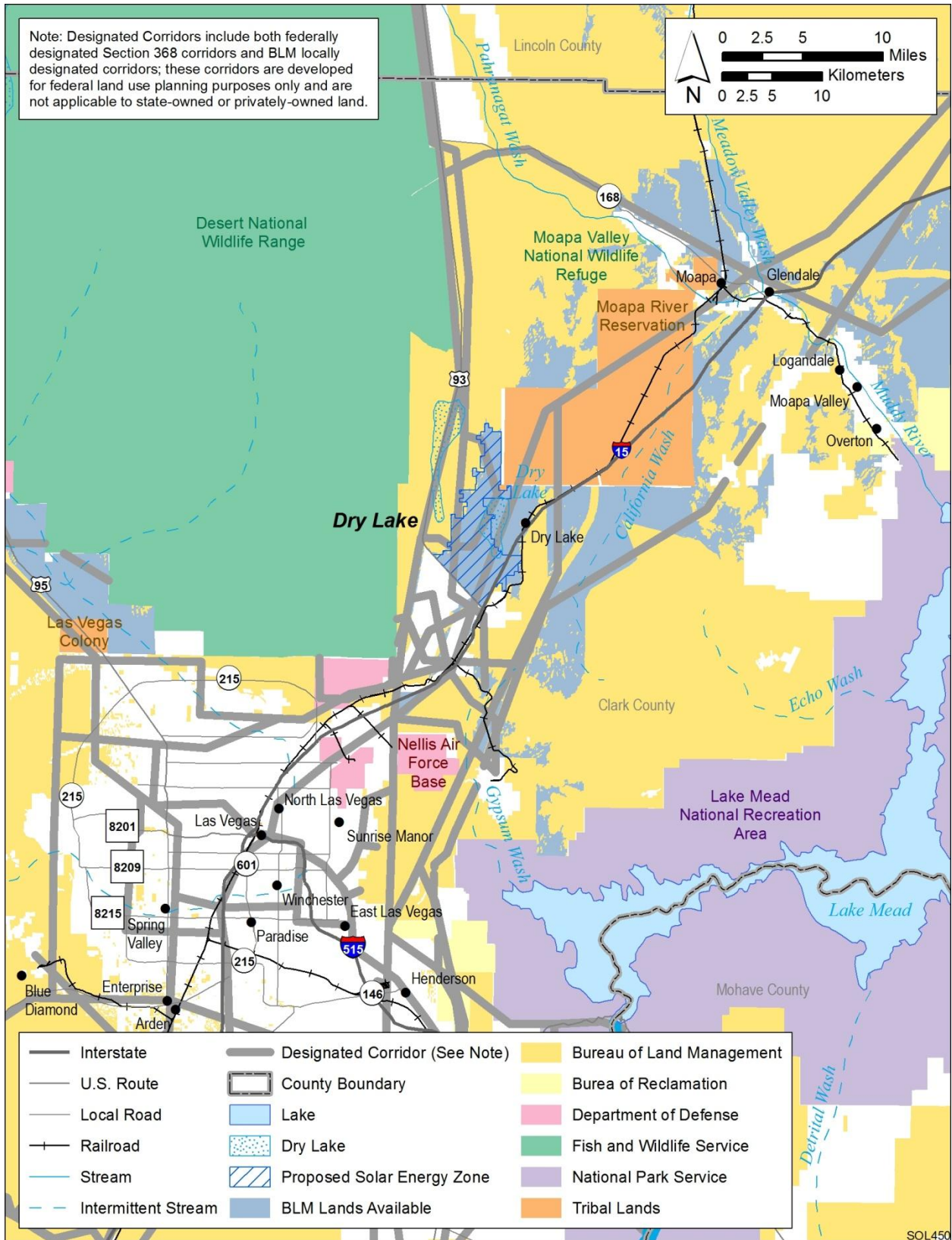
7 The proposed Dry Lake solar energy zone (SEZ), as presented in the Draft Solar PEIS,
8 had a total area of 15,649 acres (63 km²). It is located in Clark County in southern Nevada
9 (Figure C.4.2-1). The towns of Moapa and Overton are about 18 mi (29 km) northeast of, and
10 23 mi (37 km) east of, the SEZ, respectively.
11

12 The Draft Solar PEIS identified three designated transmission corridors that are heavily
13 developed with natural gas, petroleum product, and electric transmission lines (including a
14 500-kV transmission line) that pass through the proposed SEZ. These corridors could limit
15 development in the SEZ because solar facilities cannot be constructed under transmission lines.
16 The discussion of impacts of solar energy development in the SEZ in the Draft Solar PEIS
17 acknowledged that the presence of these corridors would reduce the amount of land available for
18 solar power production, and that, conversely, full development of solar facilities within the SEZ
19 would limit use of the transmission corridors.
20

21 The Draft Solar PEIS identified the 500-kV transmission line passing through the SEZ as
22 the nearest point for connection of the SEZ to the grid. The actual location of connection to the
23 transmission grid could be different than that assumed in the Draft Solar PEIS. Details on the
24 updated transmission impact assessment for SEZs to be included in the Final Solar PEIS are
25 provided in Section C.7.1 of this appendix. Analysis of transmission lines and/or access roads
26 will be completed as necessary as part of the project-specific environmental reviews (see
27 Section 2.2.2.2.2 of this Supplement).
28

29 Potential adverse impacts identified in the Draft Solar PEIS included the following:
30

- 31 • Solar development could sever existing roads that cross the SEZ, making it
32 difficult to access public lands within the SEZ that are not developed or those
33 that are outside of the SEZ.
34
- 35 • Wilderness characteristics in up to 3% of the Arrow Canyon and 13% of the
36 Muddy Mountains Wilderness Areas (WAs) could be adversely affected.
37
- 38 • Recreational use would be eliminated from portions of the SEZ that would be
39 developed for solar energy production. Because the SEZ sits astride numerous
40 roads and trails, construction of the solar energy facilities could sever access
41 to undeveloped lands.
42
- 43 • Nellis Air Force Base expressed concern for solar energy facilities that might
44 affect approach and departure from runways on the base. The Nevada Test
45 and Training Range (NTTR) indicated that structures taller than 50 ft (15 m)



1

2 **FIGURE C.4.2-1 Proposed Dry Lake SEZ as Presented in the Draft Solar PEIS**

- 1 may present unacceptable electromagnetic compatibility concerns for the
2 NTTR test mission.
- 3
- 4 • Groundwater use would deplete the aquifer to the extent that wet-cooling and
5 dry-cooling options would not be feasible.
 - 6
 - 7 • Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil
8 erosion by wind and runoff, sedimentation, and soil contamination) could
9 occur.
 - 10
 - 11 • Clearing of a large portion of the proposed SEZ could primarily affect
12 creosote-white bursage desert scrub and may adversely affect desert dry
13 washes, dry wash woodland, desert chenopod scrub, and wetland habitats,
14 depending on the amount of habitat disturbed. The establishment of noxious
15 weeds could result in habitat degradation. Deposition of fugitive dust could
16 cause reduced productivity or changes in plant community structure
 - 17
 - 18 • Potentially suitable habitat for 13 special status species and more than
19 90 wildlife species occurs in the affected area of the proposed SEZ; less than
20 1.0% of the potentially suitable habitat for any of these species occurs in the
21 region that would be directly affected by development.
 - 22
 - 23 • If aquatic biota exist within dry lake wetlands and unnamed washes, they
24 could be affected by the direct removal of these surface water features within
25 the construction footprint, a decline in habitat quantity and quality due to
26 water withdrawals and changes in drainage patterns, as well as increased
27 sediment and contaminant inputs associated with ground disturbance and
28 construction activities.
 - 29
 - 30 • Temporary exceedances of ambient air quality standards for particulate matter
31 at the SEZ boundaries are possible during construction. These high
32 concentrations, however, would be limited to the immediate area surrounding
33 the SEZ boundary. Modeling indicates that emissions from construction
34 activities could exceed Class I Prevention of Significant Deterioration (PSD)
35 PM₁₀ (particulate matter with an aerodynamic diameter of 10 µm or less)
36 increments at the nearest Class I area (Grand Canyon National Park), but the
37 potential impacts would be moderate and temporary.
 - 38
 - 39 • Strong visual contrasts could be observed by visitors to the Desert National
40 Wildlife Range, the Old Spanish National Historic Trail, Arrow Canyon WA,
41 and travelers on Interstate 15 (I-15) and U.S. 93. Moderate visual contrasts
42 could be observed by visitors to the Muddy Mountains WA, Muddy
43 Mountains Special Recreation Management Area (SRMA), and the Nellis
44 Dunes SRMA.
 - 45

- Few, if any, impacts on significant paleontological resources are likely to occur in 90% of the proposed Dry Lake SEZ. The potential for impacts on significant paleontological resources in the remaining 10% of the SEZ is unknown. Direct impacts on significant cultural resources could occur in the SEZ; dune areas have potential to contain significant sites within the valley floors suitable for solar development. Direct impacts on the Old Spanish Trail/Mormon Road site within the SEZ are possible. It is likely that plant and animal species of cultural importance to the Southern Paiute are present within the SEZ. The culturally important Salt Song Trail approaches or passes through the SEZ and could experience visual and noise impacts by development of solar energy facilities.
- Minority and low-income populations occur within a 50-mi (80-km) radius of the proposed SEZ boundary; thus adverse impacts of solar development could disproportionately affect minority and low-income populations.

C.4.2.2 Summary of Comments Received

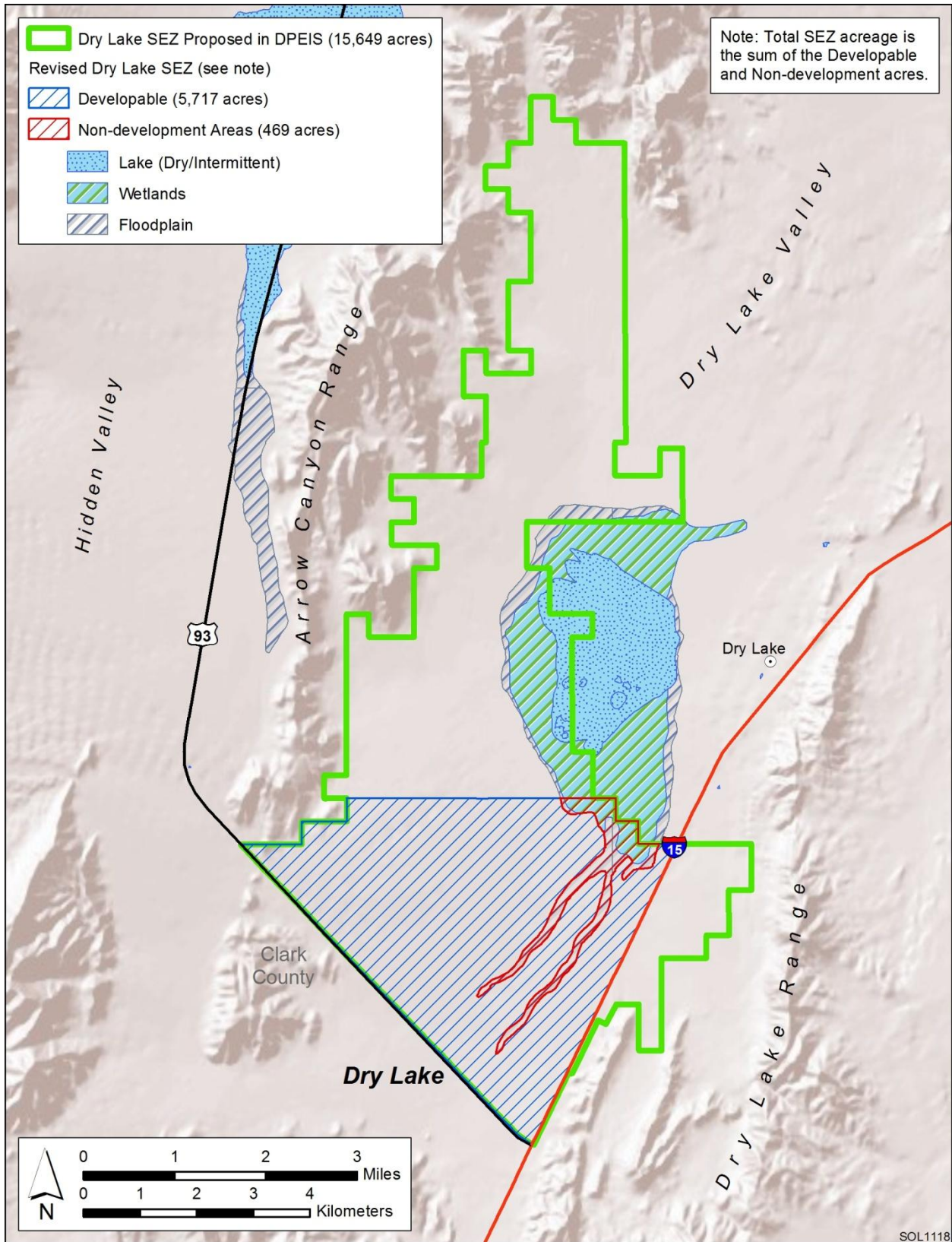
Many of the comments received on the proposed Dry Lake SEZ were in favor of identifying the area as an SEZ with proper siting and design (The Wilderness Society et al.;¹⁹ The Nature Conservancy). For example, The Wilderness Society et al. and the Nevada Wilderness Project recommended excluding the dry lake, playa, and washes to avoid impacts on wildlife and special status species habitat, and removing the portion of the SEZ that is southeast of I-15 to avoid impacts on the Old Spanish National Historic Trail. The Cultural Resources Preservation Coalition and Partnership for the National Trails System also recommended adjusting the SEZ boundary to reduce impacts on the National Historic Trail. The U.S. Department of Defense (DoD) expressed concerns regarding impacts on use of the area for emergency aircraft bailout purposes.

The U.S. Fish and Wildlife Service (USFWS) identified the entire SEZ as an area of concern for desert tortoise recovery. Western Watersheds Project recommended that the Dry Lake SEZ be eliminated to avoid impacts on desert tortoise habitat.

C.4.2.3 Changes to the SEZ

The proposed Dry Lake SEZ has been reconfigured to include only the southernmost area that is northwest of I-15 (see Figure C.4.2-3). Excluding the northern portion of the SEZ will mitigate some potential impacts from development in the SEZ, including impacts on desert tortoise and other wildlife and potential impacts on military operations. The remaining area is

¹⁹ The Wilderness Society, Center for Biological Diversity, Defenders of Wildlife, Sierra Club-Toiyabe Chapter, National Parks Conservation Association, Natural Resources Defense Council, Soda Mountain Wilderness Council, and Sierra Trek submitted joint comments on the proposed Nevada SEZs. Those comments are attributed to The Wilderness Society et al.



1

2 **FIGURE C.4.2-2 Proposed Dry Lake SEZ as Described in this Supplement**

1 6,186 acres (25 km²). In addition, 469 acres (1.9 km²) of floodplain and wetland non-
2 development areas within the remaining SEZ boundaries were identified. The remaining
3 developable area within the SEZ is 5,717 acres (23 km²).
4

5 The lands eliminated from the proposed Dry Lake SEZ will be retained as solar right-of-
6 way variance areas, because the BLM expects that individual projects could be sited in this area
7 to avoid and/or minimize impacts. Any solar development within this area in the future would
8 require appropriate environmental analysis.
9

10 **C.4.2.4 Wilderness Character Status of SEZ**

11

12
13 A recently maintained inventory of wilderness characteristics was used to determine
14 whether public lands within the Dry Lake SEZ have wilderness characteristics. The finding of
15 this inventory was that these lands do not contain wilderness characteristics.
16

17 **C.4.2.5 Additional Data Collection Recommended**

18

19 **C.4.2.5.1 Lands and Realty**

20

21 None.
22

23 **C.4.2.5.2 Specially Designated Areas and Lands with Wilderness Characteristics**

24

25 None.
26

27 **C.4.2.5.3 Rangeland Resources**

28

29 *Livestock Grazing.* None.
30

31 *Wild Horses and Burros.* None.
32

33 **C.4.2.5.4 Recreation**

34

35 None.
36
37
38
39
40
41
42
43
44
45

1 **C.4.2.5.5 Military and Civilian Aviation**

2
3 The DoD has expressed continued concern regarding the potential impact of solar
4 development in this SEZ on military operations. The U.S. Department of the Interior Bureau of
5 Land Management (BLM) will continue to consult with the DoD regarding potential issues with
6 military operations.
7

8
9 **C.4.2.5.6 Geologic Setting and Soil Resources**

10 None.
11
12

13
14 **C.4.2.5.7 Minerals**

15
16 Additional information on leasable and strategic minerals in the vicinity of the proposed
17 SEZ will be provided in the Final Solar PEIS to inform the Department of the Interior’s decision
18 on a proposed 20-year withdrawal of SEZ lands.
19

20
21 **C.4.2.5.8 Water Resources**

22
23 The following additional data and actions would help further characterize potential
24 impacts on water resources for the proposed Dry Lake SEZ. A more detailed discussion of each
25 of these activities is included in the water resources action plan provided in Section C.7.2 of this
26 appendix.
27

- 28 • Prepare a planning-level water resources inventory of the Garnet Valley basin.
- 29
- 30 • Identify additional ephemeral stream channels and alluvial fan features for
31 non-development areas through consultation with Nevada BLM, Nevada
32 Division of Water Resources, U.S. Environmental Protection Agency, and
33 U.S. Army Corps of Engineers (USACE) with a focus on:
 - 34 – Ephemeral stream channels/unnamed washes located throughout the SEZ
35 (drainage from the Las Vegas Range, the Arrow Canyon Range, and the
36 Dry Lake Range toward Dry Lake), and
 - 37 – Alluvial fan features in the northwestern portion of the SEZ (adjacent to
38 the Arrow Canyon Range).
- 39
- 40 • Coordinate with the USACE (Sacramento District) regarding jurisdictional
41 water determinations for the SEZ. Water features to be considered include:
 - 42 – Unnamed washes.
- 43
- 44 • Perform field surveys and hydrologic analyses to support jurisdictional water
45 determinations, if USACE consultation suggests field surveys are needed.
46 Tasks may include:

- 1 – Surveying any unnamed washes identified previously for surface
- 2 elevations, high water marks, and sediment conditions.
- 3
- 4 • Describe the formation of a stakeholder committee to conduct long-term
- 5 monitoring of water resources. This activity would entail:
- 6 – Identifying key stakeholder agencies,
- 7 – Discussing general features of a monitoring program, and
- 8 – Working with the U.S. Geological Survey to develop groundwater
- 9 monitoring well design and numerical groundwater models.
- 10
- 11 • Perform groundwater modeling analyses for the Garnet Valley basin to
- 12 estimate potential impacts of full build-out groundwater pumping scenarios
- 13 (according to estimated, technology-specific water requirements). Tasks
- 14 include:
- 15 – Develop a superposition-type groundwater model for the Garnet Valley
- 16 basin, and
- 17 – Assess the potential for drawdown impacts on water levels in the basin,
- 18 other groundwater uses, the carbonate aquifer system, and surface water-
- 19 groundwater connectivity.
- 20

21

22 **C.4.2.5.9 Ecological Resources**

23

24

25 ***Vegetation and Plant Communities.*** The following additional data-gathering actions

26 would help further characterize potential impacts on vegetation and plant communities for the

27 proposed Dry Lake SEZ:

- 28
- 29 • Identify and map the location and areal extent of desert dry washes, dry wash
- 30 woodland, desert chenopod scrub, and wetland habitats within the SEZ.
- 31 Identify and map the location and areal extent of these habitats, as well as
- 32 playa and mesquite communities, outside the SEZ that may be affected by
- 33 hydrologic changes, including groundwater elevations, and changes in water,
- 34 sediment, and contaminant inputs associated with runoff. Such efforts could
- 35 help determine habitat characteristics, including water source, hydrologic
- 36 regime, and dominant plant species.
- 37
- 38 • Identify and map the location of cactus, including cholla and others, and
- 39 Yucca species within the SEZ.
- 40

41

42 ***Wildlife.*** The following additional data-gathering actions would help further characterize

43 potential impacts on wildlife resources for the SEZ:

- 44
- 45 • Conduct pre-disturbance surveys within the SEZ to determine the use of the
- 46 SEZ as a movement/migratory corridor or as important habitat for mule deer.

- 1 • Identify and map the location and areal extent of wash and playa habitats
2 within the SEZ. These areas are important habitat for a number of wildlife
3 species.
4
5

6 ***Aquatic Biota.*** Investigations recommended under the water resources action plan
7 (Section C.4.2.5.8) would be useful in characterizing and protecting habitat available to aquatic
8 biota. Washes and wetlands in the SEZ are typically dry and contain water only for brief periods.
9 They may or may not contain aquatic biota; therefore, preliminary evaluations of these surface
10 water features could be conducted to determine the potential for aquatic communities to be
11 present.
12
13

14 ***Special Status Species.*** The following additional data-gathering actions would be useful
15 in further characterizing and protecting habitat available to special status species:
16

- 17 • Conduct pre-disturbance surveys within the SEZ to determine the presence
18 and abundance of those special status species that are (1) federally listed,
19 proposed for listing, or candidates for listing under the Endangered Species
20 Act; (2) protected by the state of Nevada;²⁰ or (3) designated as sensitive by
21 the Nevada BLM State Office. These species are listed in Table C.4.2-1.
22 Surveys should focus on areas identified as potentially suitable, and the
23 suitability of these habitats to support these special status species should be
24 determined in the field. All field-determined suitable habitats for special status
25 species should be mapped. Target species and survey protocols should be
26 developed in coordination with the U.S. Fish and Wildlife Service (USFWS)
27 and Nevada Department of Wildlife (NDOW).
28

29 The Draft Solar PEIS presents a table of special status species for which
30 potential impacts need to be evaluated prior to development in the proposed
31 Dry Lake SEZ. The list of species presented in Table 11.3.12.1-1 of the Draft
32 Solar PEIS includes rare species (ranked in the State of Nevada as S1 or S2 or
33 listed as a species of concern by the USFWS). On the basis of design features
34 presented in the Draft Solar PEIS, the potential for impacts on these additional
35 species will also need to be addressed before development could occur in the
36 SEZ.
37
38
39

²⁰ State-protected species for the state of Nevada are those protected under *Nevada Revised Statutes* (NRS) 501.110 (animals) or NRS 527 (plants).

1 **TABLE C.4.2-1 Special Status Species That May Occur in the Vicinity of the Proposed Dry**
 2 **Lake SEZ^a**

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
<i>Plants</i>			
Halfring milkvetch	<i>Astragalus mohavensis</i> var. <i>hemigyris</i>	BLM-S	Endemic to Nevada on carbonate gravels and derivative soils on terraced hills and ledges, open slopes, and along washes within the creosote-bursage, blackbrush, and mixed-shrub habitat communities. Elevation ranges between 3,000 and 5,600 ft. ^d Nearest recorded occurrence is 15 mi ^e northwest of the SEZ in the Desert N WR. About 422,200 acres ^f of potentially suitable habitat occurs in the SEZ region.
Las Vegas bearpoppy ^g	<i>Arctomecon californica</i>	NV-P	Open, dry, spongy or powdery, often dissected or hummocked soils with high gypsum content, typically with well-developed soil crust, in areas of generally low relief on all aspects and slopes, with a sparse cover of other gypsum-tolerant species. Elevation ranges between 1,050 and 3,650 ft. Nearest recorded occurrence is 5 mi south of the SEZ. About 65,400 acres of potentially suitable habitat occurs in the SEZ region.
Las Vegas buckwheat	<i>Eriogonum corymbosum</i> var. <i>nilesii</i>	ESA-C; BLM-S	Restricted to southern Nevada in the vicinity of Las Vegas on or near gypsum soils, in washes, drainages, or in areas of generally low relief. Elevation ranges between 1,900 and 3,850 ft. Nearest recorded occurrence is 12 mi southwest of the SEZ. About 63,000 acres of potentially suitable habitat occurs in the SEZ region.
Parish's phacelia	<i>Phacelia parishii</i>	BLM-S	Aquatic habitats and wetlands in moist to superficially dry, open, flat, mostly barren, salt-crust silty-clay soils on valley bottoms, lake deposits, playa edges in proximity to seepage areas surrounded by saltbush scrub vegetation. Elevation ranges from 2,200 to 5,950 ft. Nearest recorded occurrence is 19 mi southwest of the SEZ. About 81,700 acres of potentially suitable habitat occurs in the SEZ region.
Rock phacelia	<i>Phacelia petrosa</i>	BLM-S	Dry limestone and volcanic talus slopes of foothills, washes, and gravelly canyon bottoms on substrates derived from calcareous material. Inhabits mixed desert scrub, creosotebush, and blackbrush at elevations between 2,500 and 5,800 ft. Nearest recorded occurrence is 9 mi west of the SEZ in the Desert NWR. About 4,242,700 acres of potentially suitable habitat occurs in the SEZ region.
Rosy two-tone beard-tongue	<i>Penstemon bicolor</i> ssp. <i>roseus</i>	BLM-S	Calcareous, granitic, or volcanic soils in washes, roadsides, scree at outcrop bases, rock crevices, or similar places receiving runoff, within creosote-bursage, blackbrush, and mixed-shrub. Elevation ranges between 1,800 and 4,850 ft. Known to occur on the SEZ and throughout the affected area. About 524,100 acres of potentially suitable habitat occurs in the SEZ region.
Rough dwarf greasebush	<i>Glossopetalon pungens</i> var. <i>pungens</i>	BLM-S;	Endemic to the Spring and Sheep ranges in southern Nevada, where the species is known from seven occurrences in the crevices of carbonate cliffs and outcrops, generally avoiding southerly exposures, within pinyon-juniper, mountain mahogany, and montane conifer communities. Elevation ranges from 4,400 to 7,800 ft. Nearest recorded occurrence is 17 mi west of the SEZ in the DNWR. About 606,000 acres of potentially suitable habitat occurs in the SEZ region.

3

TABLE C.4.2-1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
<i>Plants (Cont.)</i>			
Sheep fleabane	<i>Erigeron ovinus</i>	BLM-S	Endemic to Mount Irish and the Sheep and Groom ranges in southern Nevada, where the species is known from fewer than 15 occurrences in crevices of carbonate cliffs and ridgeline outcrops within pinyon-juniper and montane conifer woodland. Elevation ranges from 3,600 to 8,400 ft. Nearest recorded occurrence is 17 mi northwest of the SEZ in the Desert NWR. About 576,650 acres of potentially suitable habitat occurs in the SEZ region.
Sheep Mountain milkvetch	<i>Astragalus amphioxys</i> var. <i>musimonum</i>	BLM-S	Restricted to the foothills of the Sheep Mountains in southern Nevada (historically occurred in Arizona). Occurs in carbonate alluvial gravels, particularly along drainages, roadsides, and in other microsites with enhanced runoff, at elevations between 4,400 and 6,000 ft. Nearest recorded occurrence is 6 mi northwest of the SEZ in the Desert NWR. About 3,884,600 acres of potentially suitable habitat occurs in the SEZ region.
Silverleaf sunray	<i>Enceliopsis argophylla</i>	BLM-S	Nearly entirely confined to Clark County, Nevada, in dry, open, relatively barren areas on gypsum badlands, volcanic gravels, or loose sands, within creosote-bursage habitat. Elevation ranges from 1,200 to 2,400 ft. Nearest recorded occurrence is 15 mi east of the SEZ. About 89,100 acres of potentially suitable habitat occurs in the SEZ region.
Sticky buckwheat	<i>Eriogonum viscidulum</i>	NV-P	Known only from Clark County, Nevada, and Mohave County, Arizona, on deep, loose sandy soils in washes, flats, roadsides, steep aeolian slopes, and stabilized dunes. Elevation ranges from 1,200 to 2,200 ft. Nearest recorded occurrence is 21 mi northeast of the SEZ. About 65,000 acres of potentially suitable habitat occurs in the SEZ region.
Threecorner milkvetch	<i>Astragalus geyeri</i> var. <i>triquetrus</i>	NV-P	Known only from Clark County, Nevada, and Mohave County, Arizona on open, deep sandy soils, desert washes, or dunes, generally stabilized by vegetation and/or a gravel veneer. Elevations range from 1,500 to 2,500 ft. Nearest recorded occurrence is about 1 mi east of the SEZ. About 105,700 acres of potentially suitable habitat occurs in the SEZ region.
White bearpoppy	<i>Arctomecon merriamii</i>	BLM-S	Endemic to the Mojave Desert of California and Nevada in barren gravelly areas, rocky slopes, and limestone outcrops at elevations between 2,000 and 5,900 ft. Nearest recorded occurrence is 19 mi southwest of the SEZ. About 358,000 acres of potentially suitable habitat occurs in the SEZ region.
Yellow two-tone beard-tongue	<i>Penstemon bicolor</i> ssp. <i>bicolor</i>	BLM-S	Endemic to Clark County, Nevada, on mostly BLM lands in the vicinity of Las Vegas on calcareous or carbonate soils in washes, roadsides, rock crevices, or outcrops at elevations between 2,500 and 5,500 ft. Nearest recorded occurrence is from a dry lake approximately 2 mi west of the SEZ. About 524,100 acres of potentially suitable habitat occurs in the SEZ region.

TABLE C.4.2-1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
Invertebrates			
Mojave gypsum bee	<i>Andrena balsamorhizae</i>	BLM-S	Endemic to Nevada on gypsum soils associated with habitats of its single larval host plant, silverleaf sunray. Such habitats include warm desert shrub communities on dry slopes and sandy washes. Nearest recorded occurrence is 8 mi south of the SEZ. About 3,819,500 acres of potentially suitable habitat occurs in the SEZ region.
Mojave poppy bee	<i>Perdita meconis</i>	BLM-S	Known only from Clark County, Nevada where the species is dependent on poppy plants (genus <i>Arctomecon</i>). in roadsides, washes, and barren desert areas on gypsum soils. Nearest recorded occurrence is in the vicinity of Lake Mead, approximately 17 mi south of the SEZ. About 418,000 acres of potentially suitable habitat occurs in the SEZ region.
Reptiles			
Desert tortoise	<i>Gopherus agassizii</i>	ESA-T; NV-P	Desert creosotebush communities on firm soils for digging burrows along riverbanks, washes, canyon bottoms, creosote flats, and desert oases. Known to occur on the SEZ and throughout the affected area. About 2,762,500 acres of potentially suitable habitat occurs in the SEZ region.
Gila monster	<i>Heloderma suspectum</i>	BLM-S; NV-P	Rocky, deeply incised areas of desert scrub, thorn scrub, desert riparian, oak woodland, and semidesert grassland. Occurs in lower mountain slopes, rocky bajadas, canyon bottoms, and arroyos at elevations below 3,950 ft. Known to occur in Clark County, Nevada. About 3,175,900 acres of potentially suitable habitat occurs in the SEZ region.
Birds			
American peregrine falcon	<i>Falco peregrinus</i>	BLM-S; NV-P	Year-round resident in open habitats, including deserts, shrublands, and woodlands associated with high, near vertical cliffs and bluffs above 200 ft. When not breeding, activity is concentrated in areas with ample prey, such as farmlands, marshes, lakes, rivers, and urban areas. Nearest recorded occurrences are from the metropolitan area of Las Vegas, Nevada, approximately 22 mi southwest of the SEZ. About 4,171,400 acres of potentially suitable habitat occurs in the SEZ region.
Crissal thrasher	<i>Toxostoma crissale</i>	BLM-S	Year-round resident in project area. Nests in dense thickets of mesquite or low trees in desert riparian and desert wash habitats. Also occurs in washes within pinyon-juniper habitats. Known to occur in Clark County, Nevada. About 81,000 acres of potentially suitable habitat occurs in the SEZ region.
Ferruginous hawk	<i>Buteo regalis</i>	BLM-S	Winter resident in project area in grasslands, sagebrush, and saltbrush habitats, as well as the periphery of pinyon-juniper woodland. Known to occur in Clark County, Nevada. About 417,500 acres of potentially suitable habitat occurs in the SEZ region.

TABLE C.4.2-1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
Birds (Cont.)			
LeConte's thrasher	<i>Toxostoma lecontei</i>	BLM-S; NV-P	Year-round resident in project area in saltbush-cholla scrub communities in desert flats, dunes, or alluvial fans. Known to occur in Clark County, Nevada. About 3,817,950 acres of potentially suitable habitat occurs in the SEZ region.
Phainopepla	<i>Phainopepla nitens</i>	BLM-S; NV-P	Year-round resident in project area in desert scrub, mesquite, pinyon-juniper woodland, desert riparian areas and orchards. Nests in trees or shrubs. Nearest recorded occurrences are from the Meadow Valley Wash and Muddy River systems, approximately 20 mi east of the SEZ. About 1,038,500 acres of potentially suitable habitat occurs in the SEZ region.
Western burrowing owl	<i>Athene cunicularia hypugaea</i>	BLM-S	Open grasslands and prairies, as well as disturbed sites such as golf courses, cemeteries, and airports throughout the SEZ region. Nests in burrows constructed by mammals (prairie dog, badger, and the like). Known to occur in Clark County, Nevada. About 4,034,600 acres of potentially suitable habitat occurs in the SEZ region.
Mammals			
Big free-tailed bat	<i>Nyctinomops macrotis</i>	BLM-S	Roosts in rock crevices on cliff faces or in buildings. Forages primarily in coniferous forests and arid shrublands to feed on moths. Known to occur in Clark County, Nevada. About 4,048,200 acres of potentially suitable habitat occurs in the SEZ region.
Brazilian free-tailed bat	<i>Tadarida brasiliensis</i>	BLM-S	Forages in desert grassland, old field, savanna, shrubland, and woodland habitats as well as urban areas. Roosts in old buildings, caves, mines, and hollow trees. Known to occur in Clark County, Nevada. About 3,722,850 acres of potentially suitable habitat occurs in the SEZ region.
Pallid bat	<i>Antrozous pallidus</i>	BLM-S; NV-P	Low-elevation desert communities, including grasslands, shrublands, and woodlands. Roosts in caves, crevices, and mines. Nearest recorded occurrences are from the Desert NWR, approximately 10 mi west of the SEZ. About 3,706,300 acres of potentially suitable habitat occurs in the SEZ region.
Silver-haired bat	<i>Lasionycteris noctivagans</i>	BLM-S	High-elevation (1,600 to 8,500 ft) forested areas of aspen, cottonwood, white fir, pinyon-juniper, subalpine fir, willow, and spruce. Roosts in tree foliage, cavities, under loose bark, caves, mines, and under rock ledges. May also forage in arid shrublands. Rarely hibernates in caves. Nearest recorded occurrences are from the Muddy River, approximately 15 mi northeast of the SEZ. About 3,586,800 acres of potentially suitable habitat occurs in the SEZ region.
Spotted bat	<i>Euderma maculatum</i>	BLM-S; NV-P	Near forests and shrubland habitats throughout the SEZ region. Roosts and hibernates in caves and rock crevices. Nearest recorded occurrences are from the vicinity of Las Vegas, approximately 16 mi southwest of the SEZ. About 4,404,950 acres of potentially suitable habitat occurs in the SEZ region.

TABLE C.4.2-1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
<i>Mammals (Cont.)</i>			
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	BLM-S; NV-P	Near forests and shrubland habitats below 9,000 ft elevation throughout the SEZ region. Roosts in caves, mines, and buildings for day roosting. Nearest recorded occurrences are from the Desert NWR, approximately 10 mi west of the SEZ. About 3,861,200 acres of potentially suitable habitat occurs in the SEZ region.
Western small-footed myotis	<i>Myotis ciliolabrum</i>	BLM-S	Woodland and riparian habitats at elevations below 9,000 ft. Roosts in caves, buildings, mines, and crevices of cliff faces. Nearest recorded occurrences are from the Desert NWR, approximately 10 mi west of the SEZ. About 4,325,600 acres of potentially suitable habitat occurs in the SEZ region.

- ^a The listings for (1) federally listed, proposed for listing, or candidates for listing under the ESA and (2) Nevada BLM State Office sensitive species have been updated since the release of the Draft Solar PEIS.
- ^b BLM-S = listed as a sensitive species by the BLM; ESA-C = candidate for listing under the ESA; ESA-T = listed as threatened under the ESA; NV-P = protected in the state of Nevada under NRS 501.110 (animals) or NRS 527 (plants).
- ^c For plant species, potentially suitable habitat was determined by using Southwest Regional Gap Analysis (SWReGAP) land cover types (USGS 20005). For terrestrial vertebrate species, potentially suitable habitat was determined by using SWReGAP habitat suitability and land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.
- ^d To convert ft to m, multiply by 0.3048.
- ^e To convert mi to km, multiply by 1.609.
- ^f To convert acres to km², multiply by 0.004047.
- ^g Species in bold text have been recorded or observed in the affected area.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18

- Identify and map the location and areal extent of ephemeral wetland habitats, including desert wash and playa habitats within the SEZ. Habitat characteristics (including water source, hydrologic regime, and dominant plant species, both within the wetland boundaries and in adjacent non-wetland habitats) should be determined. Species potentially associated with these habitats include the halfring milkvetch, Las Vegas buckwheat, Parish's phacelia, rosy two-tone beardtongue, sticky buckwheat, threecorner milkvetch, and yellow two-tone beardtongue.

C.4.2.5.10 Air Quality and Climate

None.

1 **C.4.2.5.11 Visual Resources**
2

3 Visual resources will be re-evaluated for the Final Solar PEIS based on the revisions to
4 boundaries described in Section C.4.2.3 of this Supplement. A summary of the Draft Solar PEIS
5 visual contrast analysis for the proposed Dry Lake SEZ is provided in Table C.4.2-2. This table
6 includes only those resources that would be subject to moderate or strong visual contrast. The
7 Draft Solar PEIS visual impact analysis predicted these levels of visual contrast from solar
8 energy development in the Dry Lake SEZ for the following sensitive visual resource areas
9 (SVRAs) and sensitive viewing locations (SVLs):

- 10
- 11 • Desert National Wildlife Refuge (NWR)
 - 12
 - 13 • Old Spanish National Historic Trail
 - 14
 - 15 • Arrow Canyon WA
 - 16
 - 17 • Muddy Mountains WA
 - 18
 - 19 • Muddy Mountains SRMA
 - 20
 - 21 • Nellis Dunes SRMA
 - 22
 - 23 • I-15
 - 24
 - 25 • U.S. 93.
 - 26

27 The following steps could be taken to better understand potential impacts on these
28 SVRAs and SVLs from solar development in the Dry Lake SEZ:

- 29
- 30 • Identify key observation points (KOPs) within these areas through working
31 with the management agency or other local stakeholders.
 - 32
 - 33 • Conduct viewshed analyses from the KOPs to determine how much of the
34 SEZ would be in view from each KOP.
 - 35
 - 36 • As deemed necessary, based on viewshed analysis results, prepare wireframe
37 Google Earth™ visualizations of hypothetical solar facilities in the SEZ
38 depicting the 80% development scenario to better estimate potential impacts.
 - 39

40 This additional analysis may help judge potential visual contrast more accurately for most
41 KOPs. For KOPs of particularly high sensitivity, a site visit with photography and
42 superimposition of the wireframe models onto the photos might be required or desired.
43
44

TABLE C.4.2-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi (40-km) Viewshed of the Proposed Dry Lake SEZ

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi ^e	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes ^f
NWR	Desert NWR	1,626,903 acres	2.3 mi west of the SEZ	51,276 acres	3.2	Because of the close proximity to the SEZ and the elevated viewpoints in the NWR, strong visual contrasts could be observed. Areas with potential visibility of solar facilities include the eastern slopes of mountains and ridges of the Las Vegas Range, primarily within 10 mi of the SEZ, but extending for some areas to beyond 15 mi into the NWR, along the peaks of the Sheep Range.
National Historic Trail	Old Spanish Trail ^g	1,200 mi	Passes within 1.3 mi on the southeast side of the SEZ	23 mi	1.9	Because of the close proximity to the SEZ and the elevated viewpoints, strong visual contrasts could be observed. About 8.8 mi of the trail located within the viewshed are high potential segments.
WAs	Arrow Canyon	27,521 acres	2.5 mi north of the SEZ	1,485 acres	5.4	Moderate or even strong levels of visual contrast would be expected for high-elevation viewpoints, with weak levels of visual contrast expected for most lower elevation viewpoints. Areas with potential views of SEZ extend to 9.1 mi from the northern boundary of the SEZ.

TABLE C.4.2-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi ^e	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes ^f
WAs (Cont.)	Muddy Mountains	44,522 acres	6.6 mi southeast of the SEZ	5,798 acres	13.0	Moderate levels of visual contrast would be expected for high-elevation viewpoints, with weak levels of visual contrast expected for most lower-elevation viewpoints. The SEZ would be visible from scattered areas throughout the mountains in the western half.
SRMAs	Muddy Mountains	128,493 acres	4.5 mi southeast of the SEZ	25,741 acres	20.0	Moderate levels of visual contrast would be expected for high-elevation viewpoints, with weak levels of visual contrast expected for most lower-elevation. The visible area extends from point of closest approach to 12 mi into the SRMA from the southeast boundary of the SEZ.
	Nellis Dunes	8,921 acres	4.3 mi south of the SEZ	448 acres	5.0	Because of the elevated viewpoints in the SRMA, moderate visual contrasts could be observed. Areas with view to SEZ are located near northern boundary of the SRMA.
Other Areas of Interest (non-management areas)	I-15 ^h	124 mi	3.7 mi passes along and through the southeastern-most portion of the SEZ	38 mi	30.6	Facilities could be in view from about 38 mi of the roadway, but contrast levels would generally be minimal or weak for I-15 except where the highway passes through the Dry Lake Range and especially the SEZ itself; in these locations contrast levels would likely be strong.

TABLE C.4.2-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi ^e	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes ^f
Other Areas of Interest (non-management areas) (Cont.)	U.S. 93 ⁱ	1,311 mi	4.5 mi of U.S. 93 pass along the SEZ's southwestern boundary	13 mi	1.0	Northbound travelers would first see solar facilities at the I-15 interchange, with strong visual contrasts visible for several minutes until views of the SEZ would be screened by the Arrow Canyon Range. After that point, expected contrast levels would drop to minimal levels. Southbound travelers would see minimal contrast until they passed the Arrow Canyon Range, and they would likely see strong contrasts thereafter until they reached I-15.

^a To convert mi to km, multiply by 1.609.

^b To convert acres to km², multiply by 0.004047.

^c Mileage (within all columns) is used only for trails or roads, unless otherwise specified.

^d Distances at the point of closest approach are based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these calculations.

^e The total acreage/mileage visible within 25 mi (40 km) of the SEZ is based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these acreages/mileages, as well as the percentage of total acreage/mileage visible within 25 mi (40 km) of the SEZ.

^f The assessment of impacts is based the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries may result in reduced impacts in some of the SVRAs/SVLs due to the reduction in the overall footprint of the SEZ.

^g Total length of Old Spanish Trail (not just West Branch): BLM (2011a).

^h Mileage of I-15 through Nevada only: AARoads' Interstate Guide (2007).

ⁱ Total mileage of U.S. 93: DOT (2011a).

1 **C.4.2.5.12 Acoustic Environment**

2
3 None.

4
5
6 **C.4.2.5.13 Paleontological Resources**

7
8 The BLM Regional Paleontologist will be contacted to determine whether additional
9 information is available regarding Potential Fossil Yield Classification (PFYC) identifications in
10 Nevada. A preliminary paleontological survey could be conducted to determine the PFYC of the
11 SEZ, in order to update the temporary assignment of PFYC Class 2 (90%) and Class 3b (10%)
12 used in the Draft Solar PEIS.

13
14
15 **C.4.2.5.14 Cultural Resources and Native American Concerns**

16
17 Approximately 60.2% of the original proposed Dry Lake SEZ footprint has been
18 surveyed for cultural resources, identifying 22 sites within the SEZ. One site is listed in the
19 *National Register of Historic Places* (NRHP), 5 have been determined eligible for listing, and the
20 remaining 15 sites are either not eligible or have not been evaluated for listing in the NRHP. For
21 the revised footprint, approximately 47.9% has been surveyed (2,743 acres [11.1 km²]), and only
22 6 sites have been recorded in this portion of the SEZ. One of these sites is identified as the Old
23 Spanish Trail/Mormon Road, an eligible site located in the southeastern portion of the SEZ. The
24 eligibility status of the other five sites is unknown at this time. At least 229 sites have been
25 recorded within 5 mi (8 km) of the original SEZ footprint. As with other SEZs, dune areas and
26 areas along washes and dry lakes have the highest potential for containing significant
27 archaeological resources within the SEZ. Several culturally important areas have also been
28 identified near the SEZ, including specific valleys, trails, and water sources. The destruction or
29 degradation of important plant and water resources and the destruction of habitat or impediments
30 to the movement of culturally important wildlife are also potential impacts of concern within the
31 SEZ.

32
33 The following additional data collection efforts could reduce the uncertainty about
34 potential impacts:

- 35
36 • Conduct a Class I literature file search to better understand (1) the site
37 distribution pattern in the vicinity of the SEZ, (2) potential trail networks
38 through existing ethnographic reports, and (3) overall cultural sensitivity of
39 the landscape.
- 40
41 • Verify that the surveys that have been conducted in the SEZ meet current
42 survey standards. No Class II surveys are currently being recommended.
- 43
44 • Prepare a cultural sensitivity map based on the results of the Class I review.
- 45

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20

- Identify high-potential segments of the Old Spanish National Historic Trail and watershed analyses from key points along the trail. High-potential segments of the trail have been identified just east of the SEZ; however, it is also reported that a portion of the trail may go through the SEZ.
- Continue with government-to-government consultation as described in Section 2.4.3, including follow-up to recent ethnographic studies with Tribes not included in the original studies to determine whether those Tribes have similar concerns. The Dry Lake SEZ falls in the traditional use area of primarily the Southern Paiute. Potential topics presented in the Final Solar PEIS to be discussed during consultation include the Salt Song Trail and other trail systems, mountain springs, mineral resources, burial sites, ceremonial areas, the Moapa Valley, and plant and animal resources. The agencies value the information shared by the Tribes during the ethnographic study and will consider their input in striving to minimize the impacts of solar development in the SEZ. The completed ethnographic study will be available in its entirety on the Solar PEIS Web site (<http://solareis.anl.gov>). A summary of the contents of that report is also provided in the following text box.

Tribal Perspectives on the Significance of the Dry Lake SEZ

The lands under consideration in the Dry Lake SEZ study area were traditionally occupied, used, aboriginally owned, and historically related to the Numic-speaking peoples of the Great Basin and western Colorado Plateau. The Tribe specifically involved in the field consultation for this SEZ study area is the Moapa Band of Paiute Indians, who represent the cultural interests of Southern Paiute peoples. These Numic-speaking peoples have gone on record in past projects and continue to stipulate here that they are the American Indian people responsible for the cultural resources (natural and man-made) in this SEZ study area because their ancestors were placed here by the Creator. Since time immemorial, they have lived in these lands, maintaining and protecting these places, plants, animals, water sources, and cultural signs of their occupation. The involved American Indian Tribal government and their appointed cultural representatives have participated in this PEIS in order to explain the meaning and cultural centrality of the plants, animals, spiritual trails, healing places, and places of historic encounters that exist in these lands.

The larger SEZ study area extends beyond the boundaries of the proposed SEZ because cultural resources extend into the surrounding landscape. Southern Paiute Tribal representatives maintain that, in order to understand Southern Paiute connections to the SEZ, they must be placed in context with neighboring places and their associated cultural resources found in the SEZ study region.

Rain and snow runoff from the surrounding mountains also flows into the SEZ study area. It is important from a Southern Paiute perspective to understand the hydrological system in this region. The flow of *Puha* (energy or power) follows the flow of water across a given landscape and connects places, people, and other elements. As water drains from the mountains, the water and the *Puha* flow into the valley, connecting these sources to the rest of the watershed, including the Colorado River, the Muddy River, and the Virgin River. Water also holds immense importance in its power to connect near and distant elements. Dry lakes embody this phenomenon by connecting to other dry lakes and all water in the area underground. Water on and below the surface connects water resources in the mountains to the rain. The importance of the water is also highlighted in Tribal representatives' concerns regarding the potential consequences of overdrawing groundwater.

21

Tribal Perspectives on the Significance of the Dry Lake SEZ (Cont.)

The northern portion of the SEZ study region and the Arrow Canyon Range (to the north of the SEZ) are directly connected to the Cry Ceremony and the associated Salt Song Trail. When a Southern Paiute person passes away, the Cry Ceremony is performed and specially trained singers perform the Salt Song. This song and associated spiritual trail carry the soul of the deceased along a thousand mile journey through traditional Southern Paiute territory and neighboring Hualapai territory. During this journey, the deceased transitions from this world into the spiritual world, or afterlife.

The Arrow Canyon Range is associated with Southern Paiute songs, stories, and ceremonies. One story describes how *Shin-au-av* (Coyote) formed the area with a shot of his arrow. Another story links the Arrow Canyon Range to a Creation Being, Potato Woman. Potato Woman is responsible for the creations of a variety of Nah'-gah (Mountain Sheep, *Ovis spp.*) that live exclusively in the Arrow Canyon Range. The Nah'gah, in turn, have and continue to bring songs, stories, and medicine to Indian people. Impacts on the Arrow Canyon Range directly affect the health of Potato Woman and the creation of the Nah'-gah. Areas within the Arrow Canyon Range were used for round dances and balancing ceremonies. In 1890, Southern Paiute people went to the Arrow Canyon Range to perform the Ghost Dance in order to restore balance to the world.

The Arrow Canyon Range was the center of a large traditional district composed of what are now the Moapa and Pahrangat Southern Paiutes prior to colonial disruption (Stoffle and Dobyns 1983). Full-time agricultural settlements were located within the large hydrological system beginning northeast of Pahrangat Valley and continuing down along the Muddy, Virgin, and Colorado Rivers. Arrow Canyon Valley was used for hunting, gathering, and traveling between these agricultural settlements. These continual use patterns account for scattered archaeological remains in the area of the Arrow Canyon Range (Stoffle and Dobyns 1983).

During multiple field visits, Native American representatives identified 15 traditional use plants within the Dry Lake SEZ study area. These included Anderson's wolfberry, Banana yucca, Beavertail Cactus, California barrel cactus, Creosote bush, Desert globemallow, desert trumpet, Golden cholla, Hedgehog cactus, Honey mesquite, Indian tea, Mojave yucca, Nevada Indian tea, Spiny chorianthe, and western wheatgrass. Thirty-four traditional use animals were also identified which included among others Black-tailed jack rabbit, bobcat, cougar, Desert cottontail, Coyote, Kangaroo rat, Grey fox, and a variety of birds. One animal that drew particular attention was the mountain sheep, described in stories and songs associated with the region.

Traditionally, Southern Paiute people were agriculturalists who built complex irrigation systems and tended to numerous plant species. Southern Paiute farmers often grew and managed crops that were generally not recognized as crops by Euro-Americans. For example, Southern Paiutes planted and managed mesquite trees. The trees were often planted in riverine oases throughout Southern Paiute territory. In the Dry Lake Valley SEZ study area, multiple large stands of sweet mesquite were noted by Tribal representatives. They believed that these orchards of mesquite trees were planted and maintained by Southern Paiute people in the past and that this area is an important cultural feature.

C.4.2.5.15 Socioeconomics and Environmental Justice

None.

C.4.2.5.16 Cumulative Impact Considerations

None.

1
2
3
4
5
6
7
8
9
10
11

1 **C.4.3 Dry Lake Valley North**

2
3
4 **C.4.3.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic**
5 **Environmental Impact Statement (PEIS)**
6

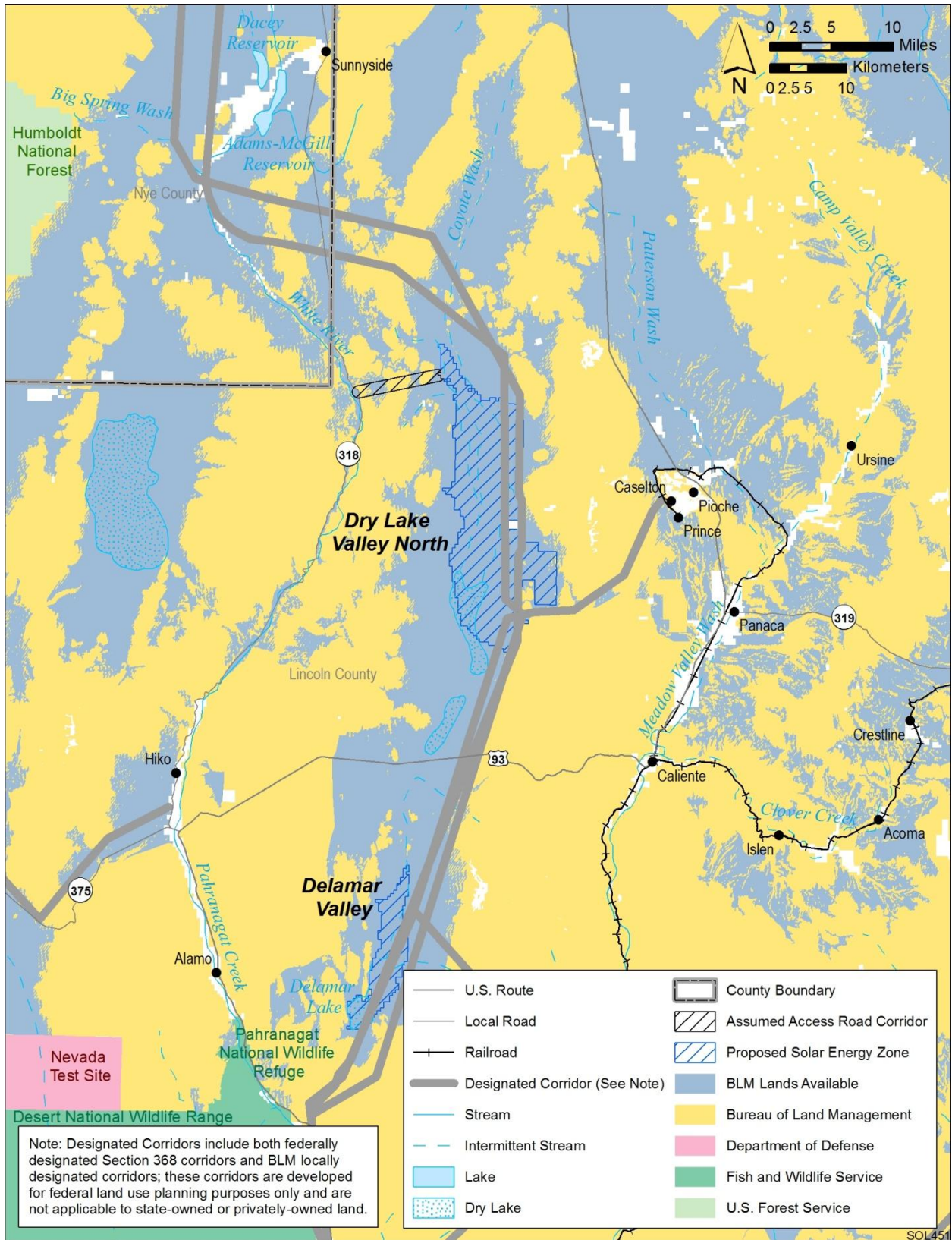
7 The proposed Dry Lake Valley North solar energy zone (SEZ), as presented in the Draft
8 Solar PEIS, had a total area of 76,874 acres (311km²). It is located in Lincoln County in
9 southeastern Nevada (Figure C.4.3-1). The towns of Pioche and Caliente are about 15 mi
10 (24 km) east of, and 15 mi (24 km) southeast of, the SEZ, respectively.
11

12 There are three designated transmission corridors in the proposed SEZ that could limit
13 development in the SEZ because solar facilities cannot be constructed under transmission lines.
14 The discussion of impacts of solar energy development in the SEZ in the Draft Solar PEIS
15 acknowledged that the presence of these corridors would reduce the amount of land available for
16 solar power production, and that, conversely, full development of solar facilities within the SEZ
17 would limit use of transmission corridors.
18

19 The Draft Solar PEIS identified a 69-kV transmission line that passes through the
20 southeast corner of the proposed SEZ as the nearest point for connection of the SEZ to the grid.
21 The actual location of connection to the transmission grid could be different than that assumed in
22 the Draft Solar PEIS. Details on the updated transmission impact assessment for SEZs to be
23 included in the Final Solar PEIS are provided in Section C.7.1 of this appendix. The Draft Solar
24 PEIS also identified State Route 318, located about 7 mi (11 km) to the west of the SEZ, as the
25 nearest major road, and assumed that a new access road would be constructed from the proposed
26 SEZ to State Route 318 to support development. As for a new transmission line, the location of a
27 new access road that could be constructed in the future may be different from that assumed in the
28 Draft Solar PEIS. Analysis of transmission lines and/or access roads will be completed, as
29 necessary, as part of the project-specific environmental reviews (see Section 2.2.2.2.2 of this
30 Supplement).
31

32 Potential adverse impacts identified in the Draft Solar PEIS included the following:
33

- 34 • Because of the extended length of the SEZ, east–west travel across the valley
35 could be cut off, requiring extensive detours for public land users.
36
- 37 • There would be a small adverse impact on wilderness characteristics in the
38 Weepah Spring and Big Rocks Wilderness Areas (WAs). Silver State Off-
39 Highway Vehicle Trail/Byway users seeking a scenic drive experience would
40 be adversely affected.
41
- 42 • The Simpson grazing allotment would be closed, 65% of the Ely Springs
43 Cattle allotment would be lost, and all of the winter range for the permittees in
44 the Dry Lake Valley and Thorley areas of use in the Wilson Creek and
45 Simpson grazing allotments would be lost. A total of 12,163 animal
46



1

2 **FIGURE C.4.3-1 Proposed Dry Lake Valley North SEZ as Presented in the Draft Solar PEIS**

1 unit months would be lost and operations of six permittees would suffer major
2 impacts.

- 3
- 4 • A portion of the Silver King herd management area (HMA) occurs in the
5 affected area of the proposed SEZ; about 5.4% of the HMA would be directly
6 affected by development.
- 7
- 8 • There are potential impacts on two low-level military training routes (MTRs)
9 and the Nevada Test and Training Range (NTTR). The U.S. Department of
10 Defense (DoD) indicated strong concerns over development in this SEZ since
11 there may be adverse impacts on military training and testing activities.
- 12
- 13 • Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil
14 erosion by wind and runoff, sedimentation, and soil contamination) could
15 occur. Portions of the dry lake may not be suitable for construction.
- 16
- 17 • Existing oil and gas leases represent a prior existing right that could affect
18 solar energy development of the SEZ.
- 19
- 20 • Groundwater use would deplete the aquifer to the extent that, at a minimum,
21 wet-cooling options would not be feasible.
- 22
- 23 • Clearing of a large portion of the proposed SEZ could primarily affect mixed
24 salt desertscrub, and may adversely affect dry wash, playa, greasewood flat,
25 and wetland habitats, depending on the amount of habitat disturbed. The
26 establishment of noxious weeds could result in habitat degradation.
27 Deposition of fugitive dust could cause reduced productivity or changes in
28 plant community structure
- 29
- 30 • Potentially suitable habitat for 22 special status species and more than
31 90 wildlife species occurs in the affected area of the proposed SEZ; 8.4% or
32 less (4.0% or less for most wildlife species) of the potentially suitable habitat
33 for any of these species occurs in the region that would be directly affected by
34 development.
- 35
- 36 • If aquatic biota exist within the Coyote Wash, unnamed ephemeral braided
37 washes, and dry lake with associated wetlands, they could be affected by the
38 direct removal of these surface water features within the construction
39 footprint, a decline in habitat quantity and quality due to water withdrawals
40 and changes in drainage patterns, as well as increased sediment and
41 contaminant inputs associated with ground disturbance and construction
42 activities.
- 43
- 44 • Temporary exceedances of ambient air quality standards for particulate matter
45 at the SEZ boundaries are possible during construction. These high

1 concentrations, however, would be limited to the immediate area surrounding
2 the SEZ boundary.

- 3
- 4 • Strong visual contrasts could be observed by visitors to the Chief Mountain
5 Special Recreation Management Area (SRMA) and travelers on the Silver
6 State Trail. Weak to strong visual contrasts could be observed by visitors to
7 Big Rocks and Weepah Spring WAs. Moderate visual contrasts could be
8 observed by travelers on U.S. 93.
- 9
- 10 • Few, if any, impacts on significant paleontological resources are likely to
11 occur in 91% of the proposed SEZ. The potential for impacts on significant
12 paleontological resources in the remaining 9% of the SEZ is unknown. Direct
13 impacts on significant cultural resources could occur in the SEZ; there is a
14 high potential for prehistoric sites, especially in the dry lake and dune areas at
15 the southern end of the SEZ.
- 16
- 17 • Low-income populations occur within a 50-mi (80-km) radius of the proposed
18 SEZ boundary; thus adverse impacts of solar development could
19 disproportionately affect low-income populations.
- 20

21

22 **C.4.3.2 Summary of Comments Received**

23

24 Many of the comments received on the proposed Dry Lake Valley North SEZ were in
25 favor of identifying the area as an SEZ with proper siting and design. The Wilderness
26 Society et al.²¹ and Nevada Wilderness Project recommended boundary adjustments to avoid
27 important wildlife and special status species habitat. Other groups and individual members of the
28 public were in favor of identifying the area as an SEZ, with boundary adjustments due to impacts
29 on grazing (N-4 State Grazing Board, Lincoln County Board of Commissioners). The Lincoln
30 County Board of Commissioners specifically requested that the area of the SEZ be limited to no
31 more than 10,000 acres (40 km²), stating that existing and planned transmission could
32 accommodate only the corresponding amount of power generated. The DoD and Western
33 Watersheds Project requested that the SEZ be eliminated because of conflicts with military
34 operations and training and lack of sufficient groundwater resources.

35

36 The Southern Nevada Water Authority expressed concern for its groundwater
37 development project ROWs and other areas identified for future ROWs that are located within
38 the SEZ. Other comments requested changes to the transmission line and access road analysis.

39

40

41

²¹ The Wilderness Society, Center for Biological Diversity, Defenders of Wildlife, Sierra Club-Toiyabe Chapter, National Parks Conservation Association, Natural Resources Defense Council, Soda Mountain Wilderness Council, and Sierra Trek submitted joint comments on the proposed Nevada SEZs. Those comments are attributed to The Wilderness Society et al.

1 **C.4.3.3 Changes to the SEZ**

2
3 The proposed Dry Lake Valley North SEZ has been reconfigured to eliminate
4 48,148 acres (195 km²), mainly the northern portion of the SEZ (see Figure C.4.3-2). Excluding
5 the northern portion of the SEZ will mitigate some potential impacts from development in the
6 SEZ, including impacts on sage-grouse and other wildlife, impacts on grazing, and impacts on
7 military operations. In addition, about 3,657 acres (15 km²) of wetland and dry lake non-
8 development areas within the SEZ boundaries were identified. The remaining developable area
9 within the SEZ is 25,069 acres (101.5 km²).

10
11 The lands eliminated from the proposed Dry Lake Valley North SEZ will be retained as
12 solar right-of-way variance areas, because the BLM expects that individual projects could be
13 sited in this area to avoid and/or minimize impacts. Any solar development within this area in the
14 future would require appropriate environmental analysis.

15
16
17 **C.4.3.4 Wilderness Character Status of SEZ**

18
19 A recently maintained inventory of wilderness characteristics was used to determine
20 whether public lands within the Dry Lake Valley North SEZ have wilderness characteristics. The
21 finding of this inventory was that these lands do not contain wilderness characteristics.

22
23
24 **C.4.3.5 Additional Data Collection Recommended**

25
26
27 **C.4.3.5.1 Lands and Realty**

28 None.

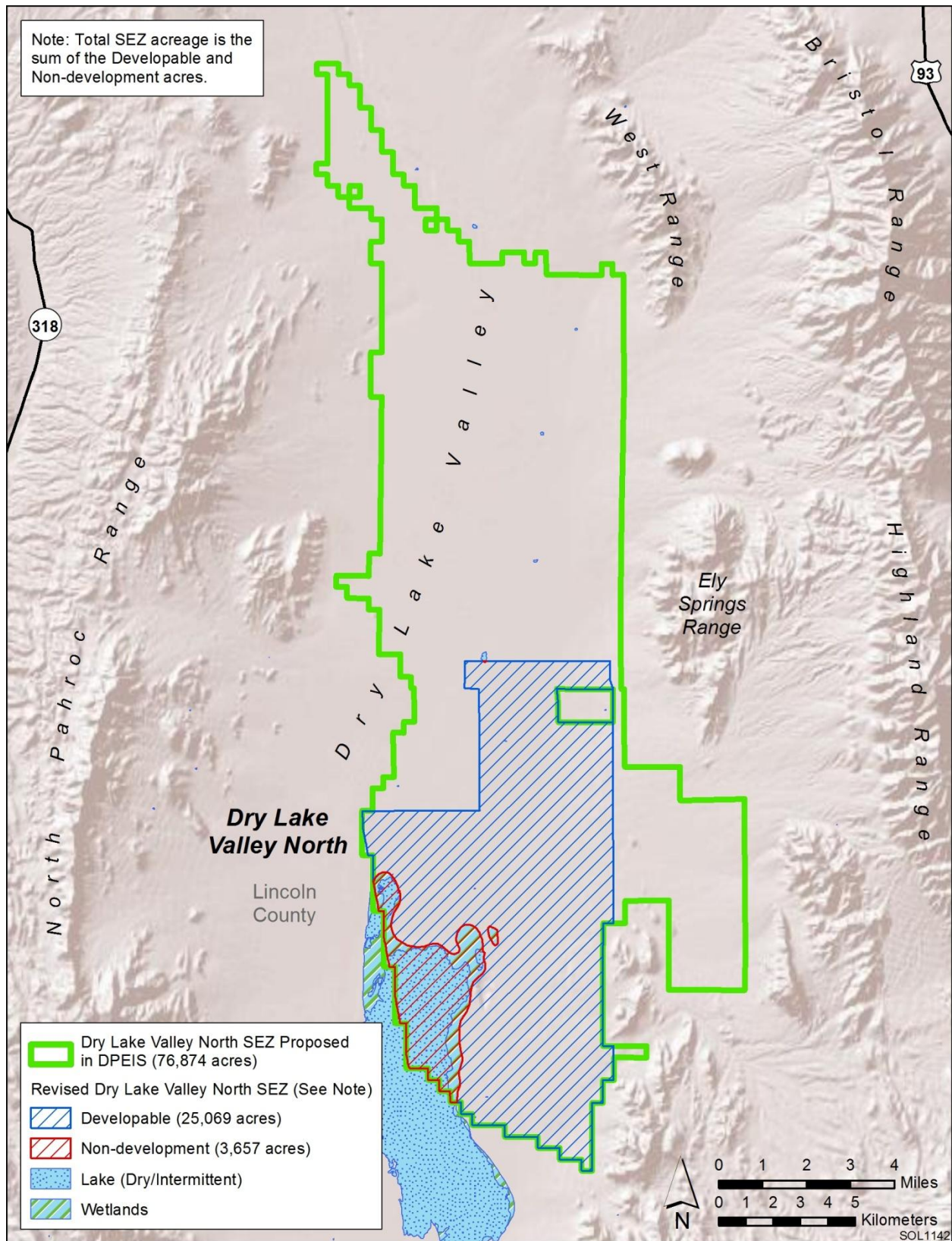
29
30
31
32 **C.4.3.5.2 Specially Designated Areas and Lands with Wilderness Characteristics**

33 None.

34
35
36
37 **C.4.3.5.3 Rangeland Resources**

38
39
40 **Livestock Grazing.** The impact on grazing will be re-evaluated based on the revised
41 boundaries.

42
43
44 **Wild Horses and Burros.** The potential for impacts on the HMA will likely be reduced
45 as a result of the boundary revisions to the SEZ. Pre-disturbance surveys could be conducted
46 within the SEZ to determine the use of the remaining SEZ area by wild horses and whether the



1

2 **FIGURE C.4.3-2 Proposed Dry Lake Valley North SEZ as Described in this Supplement**

1 area of the HMA not affected by proposed solar development could sustain the wild horses
2 present within the HMA.

3 4 5 **C.4.3.5.4 Recreation**

6
7 The impacts on recreational use of the Silver State Trail and off-highway vehicle racing
8 will be re-evaluated based on the revised boundaries.

9 10 11 **C.4.3.5.5 Military and Civilian Aviation**

12
13 The DoD has expressed continued concern regarding the potential impact of solar
14 development in this SEZ on military operations. The U.S. Department of the Interior Bureau of
15 Land Management (BLM) will continue to consult with the DoD regarding potential issues with
16 military operations.

17 18 19 **C.4.3.5.6 Geologic Setting and Soil Resources**

20
21 None.

22 23 24 **C.4.3.5.7 Minerals**

25
26 Additional information on leasable and strategic minerals in the vicinity of the proposed
27 SEZ will be provided in the Final Solar PEIS to inform the Department of the Interior's decision
28 on a proposed 20-year withdrawal of SEZ lands.

29 30 31 **C.4.3.5.8 Water Resources**

32
33 The following additional data and actions would help further characterize potential
34 impacts on water resources for the proposed Dry Lake Valley North SEZ. A more detailed
35 discussion of each of these activities is included in the water resources action plan provided in
36 Section C.7.2 of this appendix.

- 37
- 38 • Prepare a planning-level water resources inventory of the Dry Lake Valley
39 basin.
 - 40
41 • Identify additional ephemeral stream channels and alluvial fan features for
42 non-development areas through consultation with Nevada BLM, Nevada
43 Division of Water Resources (NDWR), U.S. Environmental Protection
44 Agency, and U.S. Army Corps of Engineers (USACE) with a focus on:
 - 45 – Dry Lake,
 - 46 – Coyote Wash and its tributaries,

- 1 – Ephemeral stream channels/unnamed washes located throughout the SEZ
2 (drainage from Ely Springs Range, Robber Roost Hills, Highland Range,
3 Black Canyon Range, the Bluffs, Chief Range and Burnt Springs Range
4 toward Dry Lake), and
5 – Alluvial fan features in the southeastern portion of the SEZ.
6
7 • Perform field surveys and hydrologic analyses to support jurisdictional water
8 determinations and floodplain identifications, if USACE consultation suggests
9 field surveys are needed. Tasks may include:
10 – Surveying Dry Lake and ephemeral channels identified previously for
11 surface elevations, high water marks, and sediment conditions; and
12 – Conducting hydrologic rainfall-runoff-routing analyses to identify
13 100 year floodplain areas.
14
15 • Coordinate with the USACE (Sacramento District) regarding jurisdictional
16 water determinations for the SEZ. Water features to be considered include:
17 – Dry Lake and
18 – Ephemeral stream channels within the SEZ.
19
20 • Identify 100-year floodplain non-development areas for the SEZ. This task
21 would require coordination with the Federal Emergency Management Agency
22 and the following agencies:
23 – NDWR (Floodplain Management Program) and
24 – Lincoln County.
25
26 • Describe the formation of a stakeholder committee to conduct long-term
27 monitoring of water resources. This activity would entail:
28 – Identifying key stakeholder agencies,
29 – Discussing general features of a monitoring program, and
30 – Working with the U.S. Geological Survey to develop groundwater
31 monitoring well design and numerical groundwater models.
32
33 • Perform groundwater modeling analyses for the Dry Lake Valley basin to
34 estimate potential impacts of full build-out on groundwater pumping scenarios
35 (according to estimated, technology-specific water requirements): Tasks
36 include:
37 – Develop a superposition-type groundwater model for the Dry Lake Valley
38 basin; and
39 – Assess the potential for drawdown impacts on water levels in the basin,
40 other groundwater users, the carbonate aquifer system, and surface water-
41 groundwater connectivity.
42
43
44

1 **C.4.3.5.9 Ecological Resources**
2
3

4 **Vegetation and Plant Communities.** The following additional data-gathering action
5 would help further characterize potential impacts on vegetation and plant communities for the
6 proposed Dry Lake Valley North SEZ:
7

- 8 • Identify and map the location and areal extent of desert dry washes, playa,
9 greasewood flat, and wetland habitats within the SEZ. Identify and map the
10 location and areal extent of these habitats, as well as riparian communities,
11 outside the SEZ that could be impacted by hydrologic changes, including
12 groundwater elevations, and changes in water, sediment, and contaminant
13 inputs associated with runoff. Such efforts could help determine habitat
14 characteristics, including water source, hydrologic regime, and dominant plant
15 species.
16
17

18 **Wildlife.** The following additional data-gathering actions would help further characterize
19 potential impacts on wildlife resources for the SEZ:
20

- 21 • Conduct pre-disturbance surveys within the SEZ to determine the use of the
22 SEZ as a movement/migratory corridor or as important habitat for elk, mule
23 deer, and pronghorn.
24
25 • Identify and map the location and areal extent of wash and playa habitats
26 within the SEZ. These areas are important habitat for a number of wildlife
27 species.
28
29

30 **Aquatic Biota.** Investigations recommended under the water resources action plan
31 (Section C.4.3.5.8) would be useful in characterizing and protecting habitat available to aquatic
32 biota. Washes and wetlands in the SEZ are typically dry and contain water only for brief periods
33 following runoff from adjacent mountains. They may or may not contain aquatic biota; therefore,
34 preliminary evaluations of these surface water features could be conducted to determine the
35 potential for aquatic communities to be present.
36
37

38 **Special Status Species.** The following additional data-gathering actions would be useful
39 in further characterizing and protecting habitat available to special status species:
40

- 41 • Conduct pre-disturbance surveys within the SEZ to determine the presence
42 and abundance of those special status species that are (1) federally listed,
43 proposed for listing, or candidates for listing under the Endangered Species
44 Act; (2) protected by the state of Nevada²²; or (3) designated as sensitive by

²² State-protected species for the state of Nevada are those protected under *Nevada Revised Statutes* (NRS) 501.110 (animals) or NRS 527 (plants).

1 the Nevada BLM State Office. These species are listed in Table C.4.3-1.
2 Surveys should focus on areas identified as potentially suitable, and the
3 suitability of these habitats to support these special status species should be
4 determined in the field. All field-determined suitable habitats for special status
5 species should be mapped. Target species and survey protocols should be
6 developed in coordination with the U.S. Fish and Wildlife Service (USFWS)
7 and Nevada Department of Wildlife (NDOW).
8

9 The Draft Solar PEIS presents a table of special status species for which
10 potential impacts need to be evaluated prior to development in the
11 proposed Dry Lake Valley North SEZ. The list of species presented in
12 Table 11.4.12.1-1 of the Draft Solar PEIS also includes rare species (ranked in
13 the State of Nevada as S1 or S2 or listed as a species of concern by the
14 USFWS). On the basis of design features presented in the Draft Solar PEIS,
15 the potential for impacts on these additional species will also need to be
16 addressed before development could occur in the SEZ.
17

- 18 • Identify and map the location and areal extent of desert playa and wash
19 habitats within the area of direct effects, including habitat characteristics
20 (such as water source, hydrologic regime, and dominant plant species) both
21 within the habitat boundaries and in adjacent habitats. Species potentially
22 associated with these habitats include Blaine fishhook cactus, Needle
23 Mountains milkvetch, western snowy plover, Desert Valley kangaroo mouse,
24 and Pahranaagat Valley montane vole.
25

26 **C.4.3.5.10 Air Quality and Climate**

27 None.
28

29 **C.4.3.5.11 Visual Resources**

30
31
32 Visual resources will be re-evaluated for the Final Solar PEIS based on the revisions to
33 boundaries described in Section C.4.3.3 of this Supplement. A summary of the Draft Solar PEIS
34 visual contrast analysis for the Dry Lake Valley North SEZ is provided in Table C.4.3-2. This
35 table includes only the resources that would be subject to moderate or strong visual contrast. The
36 Draft Solar PEIS visual impact analysis predicted these levels of visual contrast from solar
37 energy development in the Dry Lake Valley North SEZ for the following sensitive visual
38 resource areas (SVRAs) and sensitive viewing locations (SVLs):
39
40

- 41 • Big Rocks WA
42
43 • Weepah Springs WA
44
45 • Chief Mountain SRMA
46

TABLE C.4.3-1 Special Status Species That May Occur near the Proposed Dry Lake Valley North SEZ^a

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
<i>Plants</i>			
Blaine fishhook cactus^d	<i>Sclerocactus blaneii</i>	BLM-S; NV-P	Endemic to southeastern Nevada and southwestern Utah on alkaline substrates and volcanic gravels in valley bottoms. Elevation ranges between 5,100 and 5,300 ft. ^e There are only three known occurrences of this species. One of these occurrences is located in the Dry Lake Valley. About 20,150 acres ^f of potentially suitable habitat occurs within the SEZ region.
Eastwood milkweed	<i>Asclepias eastwoodiana</i>	BLM-S	Endemic to Nevada on public and private lands in Esmeralda, Lander, Lincoln, and Nye Counties in open areas on a wide variety of basic (pH usually >8) soils, including calcareous clay knolls, sand, carbonate, or basaltic gravels, or shale outcrops, generally barren and lacking competition. Frequently in small washes or other moisture-accumulating microsites at elevations between 4,700 and 7,100 ft. Known to occur on the SEZ. About 413,100 acres of potentially suitable habitat occurs within the SEZ region.
Long-calyx milkvetch	<i>Astragalus oophorus</i> var. <i>lonchocalyx</i>	BLM-S	Regionally endemic to the Great Basin in western Utah and eastern Nevada in pinyon-juniper woodlands, sagebrush, and mixed shrub communities at elevations between 5,800 and 7,500 ft. Nearest recorded occurrence is 8 mi ^g east of the SEZ. About 4,351,850 acres of potentially suitable habitat occurs within the SEZ region.
Needle Mountains milkvetch	<i>Astragalus eurylobus</i>	BLM-S	Gravel washes and sandy soils in alkaline desert and arid grasslands at elevations between 4,250 and 6,250 ft. Nearest recorded occurrence is 15 mi southeast of the SEZ. About 39,650 acres of potentially suitable habitat occurs within the SEZ region.
Pioche blazingstar	<i>Mentzelia argillicola</i>	BLM-S	Endemic to Nevada on dry, soft, silty clay soils on knolls and slopes with sparse vegetation consisting mainly of sagebrush. Nearest recorded occurrence is from Patterson Wash, approximately 12 mi east of the SEZ. About 2,869,000 acres of potentially suitable habitat occurs within the SEZ region.
Tiehm blazingstar	<i>Mentzelia tiehmii</i>	BLM-S	Endemic to Nevada on hilltops of white soil, sparsely vegetated white calcareous knolls and bluffs with scattered perennials. Nearest recorded occurrence is from the White River, approximately 7 mi west of the SEZ. About 2,326,100 acres of potentially suitable habitat occurs within the SEZ region.
<i>Birds</i>			
Ferruginous hawk	<i>Buteo regalis</i>	BLM-S	Winter resident in grasslands, sagebrush and saltbrush habitats, as well as the periphery of pinyon-juniper woodlands. Nests in tall trees or on rock outcrops along cliff faces. Known to occur in Lincoln County, Nevada. About 2,071,600 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.4.3-1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
Birds (Cont.)			
Prairie falcon	<i>Falco mexicanus</i>	BLM-S	Year-round resident in open habitats in mountainous areas, steppe, grasslands, or cultivated areas. Typically nests in well-sheltered ledges of rocky cliffs and outcrops. Known to occur in Lincoln County, Nevada. About 1,690,150 acres of potentially suitable habitat occurs within the SEZ region.
Swainson's hawk	<i>Buteo swainsoni</i>	BLM-S; NV-P	Summer breeding resident in the SEZ region in savannas, open pine-oak woodlands, grasslands, and cultivated lands. Nests in solitary trees, bushes, or small groves. Known to occur in Lincoln County, Nev. About 2,114,200 acres of potentially suitable habitat occurs within the SEZ region.
Western burrowing owl	<i>Athene cunicularia hypugaea</i>	BLM-S	Summer breeding resident in open grasslands and prairies, as well as disturbed sites such as golf courses, cemeteries, and airports. Nests in burrows constructed by mammals (especially prairie dogs and badgers). Known to occur in Lincoln County, Nevada. About 3,159,500 acres of potentially suitable habitat occurs within the SEZ region.
Western snowy plover	<i>Charadrius alexandrinus nivosus</i>	BLM-S; NV-P	Summer breeding resident on alkali flats around reservoirs and sandy shorelines. Nearest recorded occurrence is from the Adams-McGill Reservoir, approximately 23 mi northwest of the SEZ. About 66,000 acres of potentially suitable habitat occurs within the SEZ region.
Mammals			
Desert Valley kangaroo mouse	<i>Microdipodops megacephalus albiventer</i>	BLM-S; NV-P	Endemic to central Nevada in desert areas at playa margins and in dune habitats. Known to occur on the SEZ in association with the dry lake along the southwestern portion of the SEZ. About 1,257,700 acres of potentially suitable habitat occurs within the SEZ region.
Fringed myotis	<i>Myotis thysanodes</i>	BLM-S; NV-P	Year-round resident in a wide range of habitats including lowland riparian, desert shrub, pinyon-juniper, and sagebrush habitats. Roosts in buildings and caves. Known to occur in Lincoln County, Nevada. About 4,645,300 acres of potentially suitable habitat occurs within the SEZ region.
Nelson's bighorn sheep	<i>Ovis canadensis nelsoni</i>	BLM-S	Visually open, steep rocky terrain in mountainous habitats of the eastern Mojave and Sonoran Deserts. Rarely uses desert lowlands, but may use them as corridors for travel between mountain ranges. Known to occur in Lincoln County, Nevada. About 1,771,100 acres of potentially suitable habitat occurs within the SEZ region.
Pahranagat Valley montane vole	<i>Microtus montanus fucosus</i>	BLM-S; NV-P	Endemic to Lincoln County, Nevada, where it is restricted to springs in the Pahranagat Valley. Within that area, isolated populations utilize mesic montane and desert riparian patches. Nearest recorded occurrence is from Pahranagat Creek, approximately 27 mi southwest of the SEZ. About 23,900 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.4.3-1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
<i>Mammals (Cont.)</i>			
Pygmy rabbit	<i>Brachylagus idahoensis</i>	BLM-S; NV-P	Sagebrush-shrubland habitats throughout the SEZ region. Prefers loose soils to dig burrows. Nearest recorded occurrence is from BLM-administered lands approximately 20 mi northwest of the SEZ. About 1,325,950 acres of potentially suitable habitat occurs within the SEZ region.
Spotted bat	<i>Euderma maculatum</i>	BLM-S; NV-P	Year-round resident in forests and shrubland habitats. Uses caves and rock crevices for day roosting and winter hibernation. Nearest recorded occurrence is from the vicinity of Panaca, Nevada, approximately 13 mi east of the SEZ. About 3,952,400 acres of potentially suitable habitat occurs within the SEZ region.
Western small-footed myotis	<i>Myotis ciliolabrum</i>	BLM-S	Year-round resident in a variety of woodlands and riparian habitats at elevations below 9,000 ft. Roosts in caves, buildings, mines, and crevices of cliff faces. Known to occur in Lincoln County, Nevada. About 5,016,400 acres of potentially suitable habitat occurs within the SEZ region.

^a The listings for (1) federally listed, proposed for listing, or candidates for listing under the ESA, (2) species protected by the state of Nevada, and (3) Nevada BLM State Office sensitive species have been updated since the release of the Draft Solar PEIS.

^b BLM-S = listed as a sensitive species by the BLM; NV-P = protected in the state of Nevada under NRS 501.110 (animals) or NRS 527 (plants).

^c For plant and invertebrate species, potentially suitable habitat was determined by using California Regional Gap Analysis Project (CAREGAP) and Southwest Regional Gap Analysis Project (SWReGAP) land cover types (USGS 2005, 2010). For reptile, bird, and mammal species, potentially suitable habitat was determined using CAREGAP and SWReGAP habitat suitability models as well as CAREGAP and SWReGAP land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, defined as the area within 50 mi (80 km) of the SEZ center.

^d Species in bold text have been recorded or have designated critical habitat in the affected area.

^e To convert ft to m, multiply by 0.3048.

^f To convert acres to km², multiply by 0.004047.

^g To convert mi to km, multiply by 1.609.

- Silver State Trail Scenic Highway
- U.S. 93.

The following steps could be taken to better understand potential impacts on these SVRAs and SVLs from solar development in the Dry Lake Valley North SEZ:

- Identify key observation points (KOPs) within these areas through working with the management agency or other local stakeholders.

TABLE C.4.3-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi (40-km) Viewshed of the Proposed Dry Lake Valley North SEZ

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi ^e	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes ^f
WAs	Big Rocks	12,929 acres	8.2 mi southwest of the SEZ	1,590 acres	12.3	Weak to strong visual contrasts could be observed; visible area of the WA extends from approximately 9.1 to 12 mi from the southwestern boundary of the SEZ.
	Weepah Spring	51,309 acres	8.4 mi at the west of the SEZ	13,600 acres	26.5	Visual contrasts associated with solar facilities would depend on the numbers, types, sizes and locations and other visibility factors. Very weak to strong visual contrasts could be observed by WA visitors. Visible area of the WA extends to approximately 15 mi from the western boundary of the SEZ.
Scenic Highway	U.S. 93	149 mi	8.1 mi east and south of the SEZ	10 mi	6.7	Moderate visual contrasts could be observed within the SEZ by travelers on U.S. 93. There would be a full view from U.S. 93 in both directions.
	Silver State Trail ^g	260 mi	Less than 3 mi from the SEZ	100 mi	38.5	Strong visual contrasts could be observed by travelers because of the close proximity of the byway to the SEZ and the elevated viewpoints from some locations. Minimal to weak contrasts are anticipated at the longest distances.

TABLE C.4.3-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi ^e	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes ^f
SRMA	Chief Mountain	111,151 acres	Adjacent to portions of the southeast boundary of the SEZ	39,076 acres	35.2	Strong visual contrasts could be observed. The actual contrast levels experienced would depend on project location, the types of solar facilities and their designs, and other visibility factors. The visible area of the SRMA extends from point of closest approach to 10 mi into the SRMA from the southeast boundary of the SEZ.

^a To convert mi to km, multiply by 1.609.

^b To convert acres to km², multiply by 0.004047.

^c Mileage (within all columns) is used only for trails or roads, unless otherwise specified.

^d Distances at the point of closest approach are based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these calculations.

^e The total acreage/mileage visible within 25 mi (40 km) of the SEZ is based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these acreages/mileages, as well as the percentage of total acreage/mileage visible within 25 mi (40 km) of the SEZ.

^f The assessment of impacts is based the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries may result in reduced impacts in some of the SVRAs/SVLs due to the reduction in the overall footprint of the SEZ.

^g Length of Silver State Trail: Nevada Commission on Tourism (2011).

- 1 • Conduct viewshed analyses from the KOPs to determine how much of the
2 SEZ would be in view from each KOP.
- 3
- 4 • As deemed necessary, based on viewshed analysis results, prepare wireframe
5 Google Earth™ visualizations of hypothetical solar facilities in the SEZ
6 depicting the 80% development scenario to better estimate potential impacts.
7

8 This additional analysis may help judge potential visual contrast more accurately for
9 most KOPs. For KOPs of particularly high sensitivity, a site visit with photography and
10 superimposition of the wireframe models onto the photos might be required or desired.
11

12 **C.4.3.5.12 Acoustic Environment**

13 None.
14

15 **C.4.3.5.13 Paleontological Resources**

16 The BLM Regional Paleontologist will be contacted to determine whether additional
17 information is available regarding Potential Fossil Yield Classification (PFYC) identifications in
18 Nevada. A preliminary paleontological survey could be conducted to determine the PFYC) of the
19 SEZ, in order to update the temporary assignment of PFYC Class 3b used in the Draft Solar
20 PEIS.
21

22 **C.4.3.5.14 Cultural Resources and Native American Concerns**

23 Approximately 2.8% of the original proposed Dry Lake Valley North SEZ footprint has
24 been surveyed for cultural resources, identifying 53 sites within the SEZ. Four of the 53 sites
25 are potentially eligible for listing in the *National Register of Historic Places* (NRHP), and
26 either the remaining 51 sites are not eligible for listing in the NRHP or their eligibility has not
27 been determined. For the revised footprint, approximately 3% has been surveyed (880 acres
28 [3.6 km²]), and 21 sites have been recorded. The four sites that are potentially eligible are still
29 in the revised SEZ footprint. These four sites are prehistoric, temporary camps associated with
30 the resource procurement and processing potential of the dry lake. At least 153 sites have been
31 recorded within 5 mi (8 km) of the original SEZ footprint. As with other SEZs, dune areas
32 and areas along washes and dry lakes have the highest potential for containing significant
33 archaeological resources within the SEZ. Several culturally important areas have also been
34 identified near the SEZ, including specific mountain ranges and peaks, valleys, trails, and
35 water sources. The destruction or degradation of important plant and water resources, and the
36 destruction of habitat or impediments to the movement of culturally important wildlife, are also
37 potential impacts of concern within the SEZ.
38

39 The following additional data collection efforts could reduce the uncertainty about
40 potential impacts on cultural resources:
41
42
43
44
45
46

- 1 • Conduct Class I literature file search to better understand (1) the site
2 distribution pattern in the vicinity of the SEZ, (2) potential trail networks
3 through existing ethnographic reports, and (3) overall cultural sensitivity of
4 the landscape.
5
- 6 • Conduct a Class II reconnaissance level stratified random sample survey of
7 the SEZ to obtain a 10% sample (roughly 1,992 acres [8 km²]).²³ If the
8 approximately 880 acres (3.6 km²) previously surveyed meets current survey
9 standards, then approximately 1,112 acres (4.5 km²) of survey could satisfy a
10 10% sample. Areas of interest, such as dune areas and along washes and the
11 dry lake, as determined through a Class I review, should also be identified
12 prior to establishing the survey design and sampling strategy. If appropriate,
13 some subsurface testing of dune areas should be considered in the sampling
14 strategy as well.
15
- 16 • Prepare a cultural sensitivity map based on results of the Class I survey and
17 Class I review.
18
- 19 • Continue government-to-government consultation as described in
20 Section 2.4.3, including follow-up to recent ethnographic studies with Tribes
21 not included in the original studies to determine whether those Tribes have
22 similar concerns. The Dry Lake Valley North SEZ falls in the traditional use
23 area of primarily the Southern Paiute, but also the Western Shoshone.
24 Potential topics presented in the Draft Solar PEIS to be discussed during
25 consultation include Meadow Valley Wash and surrounding mountains, trail
26 systems, mountain springs and other water sources, mineral resources, burial
27 sites, ceremonial areas, rock art areas, and plant and animal resources.
28
29

30 **C.4.3.5.15 Socioeconomics and Environmental Justice**

31 None.
32
33

34 **C.4.3.5.16 Cumulative Impact Considerations**

35 None.
36
37
38
39

²³ The BLM plans to conduct a Class II survey of 5% of this SEZ prior to the Final Solar PEIS. Additional areas could be surveyed as funding becomes available.

1 **C.4.4 Gold Point**
2
3

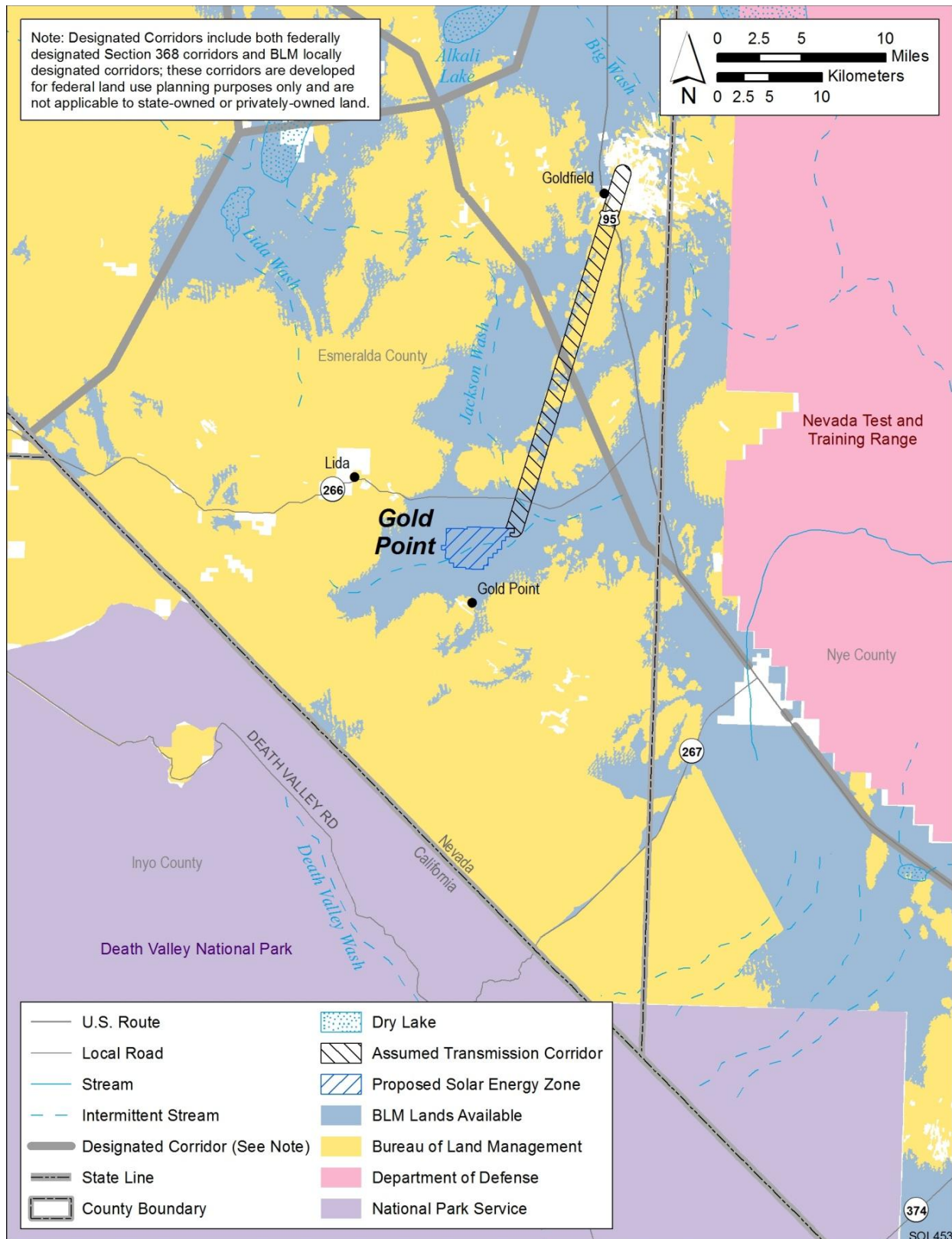
4 **C.4.4.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic**
5 **Environmental Impact Statement (PEIS)**
6

7 The proposed Gold Point solar energy zone (SEZ), as presented in the Draft Solar PEIS,
8 had a total area of 4,810 acres (19 km²). It is located in Esmeralda County in southwestern
9 Nevada (Figure C.4.4-1). The nearest residences are in Gold Point, a well-preserved ghost town
10 and point of interest for tourists about 2 mi (3.2 km) south of the SEZ. The town is located on
11 U.S. Department of the Interior Bureau of Land Management (BLM)-administered lands; it
12 thrived in the early 1900s, but most of the town was abandoned in the 1940s when mining
13 operations ceased. The town currently has only a few occupied residences
14

15 The Draft Solar PEIS identified a 120-kV transmission line 22 mi (35 km) west of the
16 SEZ as the nearest point for connection of the SEZ to the grid. Updated data indicates that a
17 345-kV proposed line adjacent to the SEZ has become operational. Details on the revised
18 transmission impact assessment to be included in the Final Solar PEIS are provided in
19 Section C.7.1 of this appendix. Analysis of transmission lines and/or access roads will be
20 completed, as necessary, as part of the project-specific environmental reviews (see
21 Section 2.2.2.2.2 of this Supplement).
22

23 Potential adverse impacts identified in the Draft Solar PEIS included the following:
24

- 25 • New transmission lines could cause visual impacts on specially designated
26 areas.
- 27
- 28 • Light from solar facilities could adversely affect night sky viewing
29 opportunities from Death Valley National Park and BLM Wilderness Study
30 Areas (WSAs).
- 31
- 32 • Wild horse and burros would incur small direct and indirect impacts from
33 the construction of the assumed transmission line in the Goldfield Herd
34 Management Area.
- 35
- 36 • Development could encroach into military training route airspace that crosses
37 the SEZ; structures higher than 50 ft (15 m) above ground level may present
38 unacceptable electromagnetic compatibility concerns for the Nevada Test and
39 Training Range test mission.
- 40
- 41 • Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil
42 erosion and deposition by wind and runoff, sedimentation, and soil
43 contamination) could occur.
44



2 **FIGURE C.4.4-1 Proposed Gold Point SEZ as Presented in the Draft Solar PEIS (Note: Assumed**
 3 **transmission corridor from the Draft Solar PEIS is no longer applicable.)**

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45

- Groundwater use would deplete the aquifer to the extent that, at a minimum, wet-cooling options would not be feasible.
- Clearing of a large portion of the proposed SEZ could adversely affect dry wash, playa, greasewood flat, and riparian habitats, depending on the amount of available habitat disturbed. The establishment of noxious weeds could result in habitat degradation. Deposition of fugitive dust could cause reduced productivity or changes in plant community structure.
- Potentially suitable habitat for 21 special status species and more than 125 wildlife species occurs in the affected area of the proposed SEZ. For most of these species, less than 1% of the potentially suitable habitat in the region occurs in the area that would be directly affected by development.
- If aquatic biota are present in intermittent or ephemeral streams in the SEZ, they could be affected by the direct removal of these surface water features within the construction footprint. If present, aquatic biota in surface water features could also be affected by a decline in habitat quantity and quality due to water withdrawals and changes in drainage patterns, as well as increased sediment and contaminant inputs associated with ground disturbance and construction activities.
- Temporary exceedances of ambient air quality standards for particulate matter at the SEZ boundaries are possible during construction. These high concentrations, however, would be limited to the immediate area surrounding the SEZ boundary.
- Although the SEZ is in an area of low scenic quality, moderate visual contrasts could be observed by visitors to the Queer Mountain WSA and viewers on Magruder Mountain. Strong visual contrasts would be expected for nearby viewpoints on State Route 266 and within the community of Gold Point.
- During operations, noise levels at the nearest residences would be higher than the U.S. Environmental Protection Agency (EPA) guideline level if concentrating solar power facilities with energy storage technologies (which could extend the daily operational time by 6 hours or more) or dish engine facilities were used at the SEZ.
- The potential for impacts on significant paleontological and cultural resources is unknown. It is possible that there will be Native American concerns about the potential visual and other effects of solar development on specific resources within the SEZ, including culturally important landscapes.

1 **C.4.4.2 Summary of Comments Received**
2

3 Some of the comments received on the proposed Gold Point SEZ were in support of
4 identifying the area as an SEZ, while others were in favor of eliminating it. Residents of the town
5 of Gold Point wanted the SEZ eliminated because of impacts on the town and its residents. The
6 Nature Conservancy and Western Watersheds recommended eliminating the SEZ due to pristine
7 conditions and lack of water (or alternatively, reducing its size to include only the degraded area
8 near U.S. 95 and State Route 266). The Nature Conservancy also recommended eliminating the
9 SEZ because the area is remote and ecologically intact and contains pronghorn and sage grouse
10 habitat.

11
12 Other environmental groups supported designation of the area as an SEZ but requested
13 that the proposed transmission line run along existing highways to avoid fragmentation and
14 impacts on recreation, and suggested that the BLM may need to scale back the peak construction
15 year and full build-out scenarios, given limited water availability (The Wilderness Society,²⁴
16 Center for Biological Diversity, Defenders of Wildlife, Sierra Club—Toiyabe Chapter, National
17 Parks Conservation Association, and Natural Resources Defense Council). The Wilderness
18 Society et al. also suggested that the project design take into consideration access to forage and
19 water for antelope, particularly during dry periods.

20
21 The U.S. Department of Defense (DoD) reiterated concerns over encroachment into
22 military training route airspace and structures higher than 50 ft (15 m) that were expressed
23 during scoping for the Draft Solar PEIS. Esmeralda County commented that the Draft Solar PEIS
24 did not include input from the county, and it provided recommended alternate locations for
25 renewable energy development. The Nevada Wilderness Project requested that the BLM include
26 a study of the flood potential of the unnamed wash that bisects the SEZ for the Final Solar PEIS.

27
28
29 **C.4.4.3 Changes to the SEZ**
30

31 No boundary revisions were identified for the proposed SEZ. However, areas specified
32 for non-development under SEZ-specific design features were mapped, where data were
33 available. For the proposed Gold Point SEZ, 214 acres (0.87 km²) of a significant unnamed
34 intermittent stream passing east–west through the center of the SEZ were identified as non-
35 development areas (Figure C.4.4-2). The remaining developable area within the SEZ is
36 4,596 acres (18.6 km²).
37

²⁴ The Wilderness Society, Center for Biological Diversity, Defenders of Wildlife, Sierra Club-Toiyabe Chapter, National Parks Conservation Association, Natural Resources Defense Council, Soda Mountain Wilderness Council, and Sierra Trek submitted joint comments on the proposed Nevada SEZs. Those comments are attributed to The Wilderness Society et al.

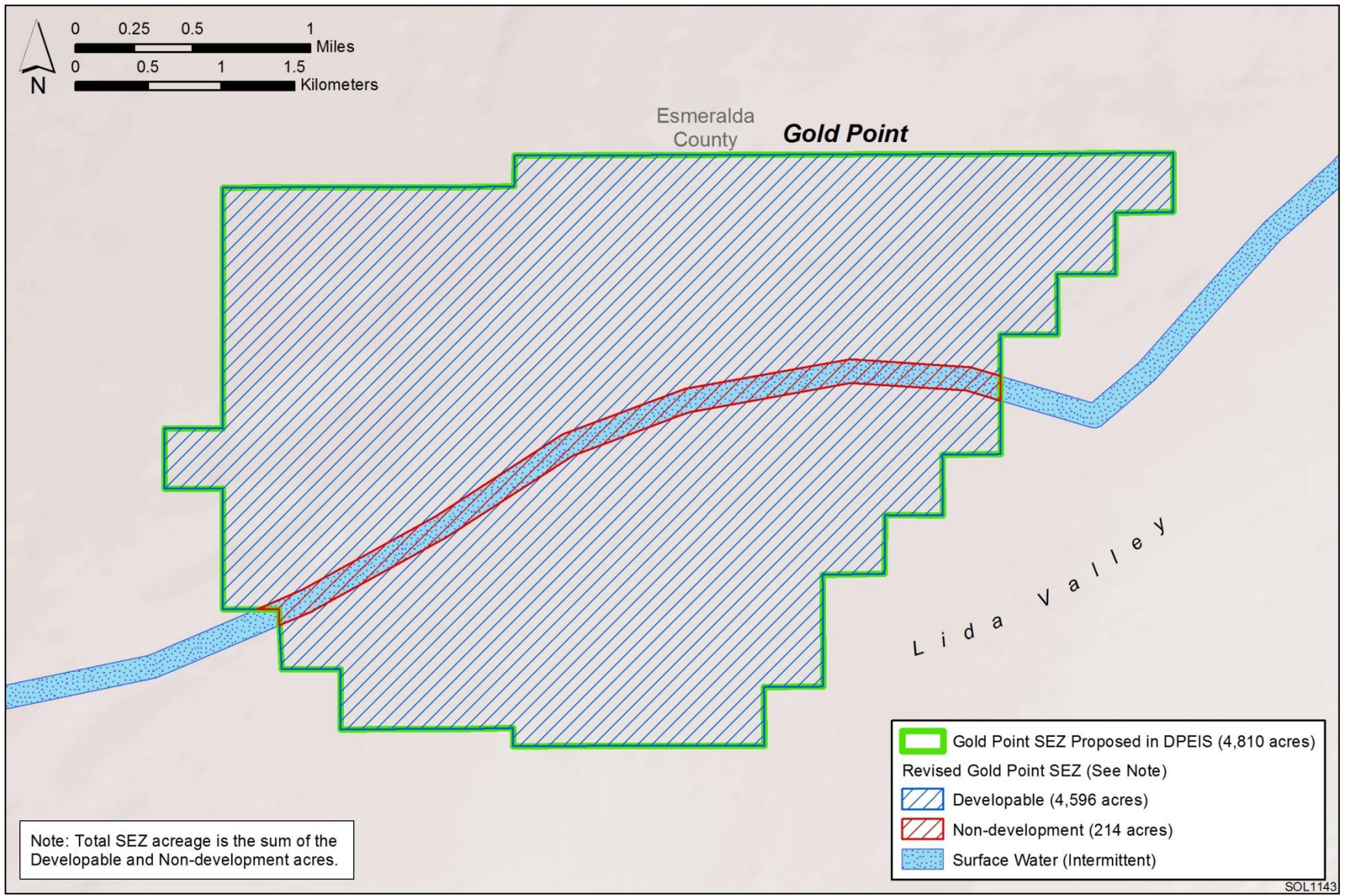


FIGURE C.4.4-2 Proposed Gold Point SEZ as Described in this Supplement

1 **C.4.4.4 Wilderness Character Status of SEZ**

2
3 A recently maintained inventory of wilderness characteristics was used to determine
4 whether public lands within the Gold Point SEZ have wilderness characteristics. The finding of
5 this inventory was that these lands do not contain wilderness characteristics.
6

7
8 **C.4.4.5 Additional Data Collection Recommended**

9
10
11 **C.4.4.5.1 Lands and Realty**

12
13 None.
14

15
16 **C.4.4.5.2 Specially Designated Areas and Lands with Wilderness Characteristics**

17
18 None.
19

20
21 **C.4.4.5.3 Rangeland Resources**

22
23
24 *Livestock Grazing.* None.
25

26
27 *Wild Horses and Burros.* None.
28

29
30 **C.4.4.5.4 Recreation**

31
32 None.
33

34
35 **C.4.4.5.5 Military and Civilian Aviation**

36
37 The DoD has expressed continued concern regarding the potential impact of solar
38 development in this SEZ on military operations. The BLM will continue to consult with the
39 DoD regarding potential issues with military operations.
40

41
42 **C.4.4.5.6 Geologic Setting and Soil Resources**

43
44 None.
45
46

1 **C.4.4.5.7 Minerals**
2

3 Additional information on leasable and strategic minerals in the vicinity of the proposed
4 SEZ will be provided in the Final Solar PEIS to inform the Department of the Interior’s decision
5 on a proposed 20-year withdrawal of SEZ lands.
6

7
8 **C.4.4.5.8 Water Resources**
9

10 The following additional data and actions would help further characterize potential
11 impacts on water resources for the proposed Gold Point SEZ. A more detailed discussion of each
12 of these activities is included in the water resources action plan provided in Section C.7.2 of this
13 appendix.
14

- 15 • Prepare a planning-level water resources inventory of the Lida Valley Basin.
- 16
- 17 • Identify additional ephemeral stream channels and alluvial fan features for
18 non-development areas through consultation with BLM Nevada, Nevada
19 Division of Water Resources (NDWR), the EPA, and U.S. Army Corps of
20 Engineers (USACE) with a focus on:
 - 21 – Tributaries to the unnamed intermittent stream non-development area, and
 - 22 – Alluvial fan base features located in the northwestern portion of the SEZ.
- 23
- 24 • Perform field surveys and hydrologic analyses to support jurisdictional water
25 determinations and floodplain identifications. Tasks include:
 - 26 – Surveying tributaries of the unnamed intermittent stream and the alluvial
27 fan base in the northwestern portion of SEZ for surface elevations, high
28 water marks, sediment conditions, and
 - 29 – Conducting hydrologic rainfall-runoff-routing analyses to identify
30 100-year floodplain areas.
- 31
- 32 • Coordinate with the USACE (Sacramento District) regarding jurisdictional
33 water determinations for the SEZ. Water features to be considered include:
 - 34 – The unnamed intermittent stream.
- 35
- 36 • Identify 100-year floodplain non-development areas (if they exist) for the
37 unnamed intermittent stream. This task would require coordination with the
38 Federal Emergency Management Agency and the following agencies:
 - 39 – NDWR (Floodplain Management Program), and
 - 40 – Esmeralda County.
- 41
- 42 • Describe the formation of a stakeholder committee to conduct long-term
43 monitoring of water resources. This activity would entail:
 - 44 – Identifying key stakeholder agencies,
 - 45 – Discussing general features of a monitoring program, and
 - 46 – Working with the U.S. Geological Survey to develop groundwater
47 monitoring well design and numerical groundwater models.
- 48

1 **C.4.4.5.9 Ecological Resources**
2
3

4 **Vegetation and Plant Communities.** The following additional data-gathering action
5 would help further characterize potential impacts on vegetation and plant communities for the
6 proposed Gold Point SEZ:
7

- 8 • Identify and map the location and areal extent of desert riparian, desert dry
9 wash, greasewood flat, and playa habitats within the SEZ. Identify and map
10 the location and areal extent of these habitats outside the SEZ that may be
11 affected by hydrologic changes, including groundwater elevations, and
12 changes in water, sediment, and contaminant inputs associated with runoff.
13 Such efforts could help determine habitat characteristics, including water
14 source, hydrologic regime, and dominant plant species.
15

16
17 **Wildlife.** The following additional data-gathering actions would help further characterize
18 potential impacts on wildlife resources for the SEZ:
19

- 20 • Conduct pre-disturbance surveys within the SEZ to determine the use of the
21 SEZ as a movement/migratory corridor or as important habitat for mule deer.
22
23 • Identify and map the location and areal extent of wash and playa habitat
24 within the SEZ. These areas are important habitat for a number of wildlife
25 species.
26

27
28 **Aquatic Biota.** Investigations recommended under the water resources action plan
29 (Section C.4.4.5.8) would be useful in characterizing and protecting habitat available to aquatic
30 biota. Most washes and dry lakes in the SEZ are typically dry and contain water only for brief
31 periods following precipitation. They may or may not contain aquatic biota; therefore,
32 preliminary evaluations of these surface water features could be conducted to determine the
33 potential for aquatic communities to be present. Any aquatic biota found in these features would
34 likely be desiccation-adapted aquatic invertebrates typical of the region. The primary value of
35 these features may be to nonaquatic animals that consume aquatic biota within the SEZ.
36
37

38 **Special Status Species.** The following additional data-gathering actions would be useful
39 in further characterizing and protecting habitat available to special status species:
40

- 41 • Conduct pre-disturbance surveys within the SEZ to determine the presence
42 and abundance of those special status species that are (1) federally listed,
43 proposed for listing, or candidates for listing under the Endangered Species
44 Act (ESA); (2) protected by the State of Nevada; or (3) designated as sensitive
45 by the Nevada BLM State Office. These species are listed in Table C.4.4-1.
46 Surveys should focus on areas identified as potentially suitable, and the

1 **TABLE C.4.4-1 Special Status Species That May Occur in the Vicinity of the Proposed Gold**
 2 **Point SEZ^a**

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
Plants			
Eastwood milkweed	<i>Asclepias eastwoodiana</i>	BLM-S	Endemic to Nevada in Esmeralda, Lander, Lincoln, and Nye Counties in open areas on a wide variety of basic (pH usually >8) soils, including calcareous clay knolls, sand, carbonate or basaltic gravels, or shale outcrops, generally barren and lacking competition. Frequently occurs in small washes or other moisture-accumulating microsites at elevations between 4,700 and 7,100 ft. ^d Nearest recorded occurrence is 30 mi ^e northeast of the SEZ. About 37,900 acres ^f of potentially suitable habitat occurs in the SEZ region.
Holmgren lupine	<i>Lupinus holmgrenianus</i>	BLM-S	Inhabits dry desert slopes, washes, and valleys on volcanic substrates, in association with sagebrush and pinyon-juniper woodland. Elevation ranges between 4,600 and 8,200 ft. Nearest recorded occurrence is 9 mi west of the SEZ. About 119,700 acres of potentially suitable habitat occurs in the SEZ region.
Tonopah pincushion cactus	<i>Sclerocactus nyensis</i>	BLM-S; NV-P	Endemic to Esmeralda and Nye Counties, Nevada, on dry rocky soils and low outcrops of rhyolite, tuff, and possibly other rock types, on gentle slopes in open areas or under shrubs in the upper salt desert and lower sagebrush zones. Elevation ranges between 5,700 and 5,800 ft. Known to occur in Esmeralda County, Nevada. About 2,370,300 acres of potentially suitable habitat occurs in the SEZ region.
Birds			
Ferruginous hawk	<i>Buteo regalis</i>	BLM-S	Winter resident in project area in grasslands, sagebrush and saltbrush habitats, as well as the periphery of pinyon-juniper woodlands throughout the project area. Known to occur in Esmeralda County, Nevada. About 790,000 acres of potentially suitable habitat occurs in the SEZ region.
Greater sage-grouse	<i>Centrocercus urophasianus</i>	ESA-C; BLM-S	Plains, foothills, and mountain valleys dominated by sagebrush. Lek sites are located in relatively open areas surrounded by sagebrush or in areas where sagebrush density is low. Nesting usually occurs on the ground where sagebrush density is higher. Some populations may travel up to 60 mi between summer and winter habitats. Known to occur in Esmeralda County, Nevada. About 312,800 acres of potentially suitable habitat occurs in the SEZ region.
Prairie falcon	<i>Falco mexicanus</i>	BLM-S	Year-round resident in the project area, primarily in open habitats in mountainous areas, steppe, grasslands, or cultivated areas. Nests in well-sheltered ledges of rocky cliffs and outcrops. Known to occur in Esmeralda County, Nevada. About 2,387,300 acres of potentially suitable habitat occurs in the SEZ region.
Swainson's hawk	<i>Buteo swainsoni</i>	BLM-S; NV-P	Summer breeding resident in the SEZ region. Savanna, open pine-oak woodlands, grasslands, and cultivated lands. Nests typically in solitary trees, bushes, or small groves; sometimes nests near urban areas. Known to occur in Esmeralda County, Nevada. About 735,600 acres of potentially suitable habitat occurs in the SEZ region.

TABLE C.4.4-1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
Birds (Cont.)			
Western burrowing owl	<i>Athene cunicularia hypugaea</i>	BLM-S	Open grasslands and prairies, as well as disturbed sites such as golf courses, cemeteries, and airports throughout the SEZ region. Nests in burrows constructed by mammals (prairie dog, badger, etc.). Known to occur in Esmeralda County, Nevada. About 3,082,700 acres of potentially suitable habitat occurs in the SEZ region.
Mammals			
Brazilian free-tailed bat	<i>Tadarida brasiliensis</i>	BLM-S; NV-P	Year-round resident in project area. Forages in desert grassland, old fields, savanna, shrubland, and woodland habitats as well as urban areas. Roosts in old buildings, caves, mines, and hollow trees. Nearest recorded occurrence is 15 mi west of the SEZ. About 2,651,850 acres of potentially suitable habitat occurs in the SEZ region.
Fringed myotis	<i>Myotis thysanodes</i>	BLM-S; NV-P	Year-round resident in project area. Wide range of habitats, including lowland riparian, desert shrub, pinyon-juniper, and sagebrush habitats. Roosts in buildings and caves. Known to occur in Esmeralda County, Nevada. About 3,051,200 acres of potentially suitable habitat occurs in the SEZ region.
Nelson's bighorn sheep	<i>Ovis canadensis nelsoni</i>	BLM-S	Visually open, steep rocky terrain in mountainous habitats of the eastern Mojave and Sonoran Deserts in California. Rarely uses desert lowlands but may use them as corridors for travel between mountain ranges. Known to occur in Esmeralda County, Nevada. About 941,500 acres of potentially suitable habitat occurs in the SEZ region.
Pale kangaroo mouse	<i>Microdipodops pallidus</i>	NV-P	Known from southwestern Nevada and southeastern California. Inhabits fine sands in alkali sink and desertscrub dominated by shadscale (<i>Atriplex confertifolia</i>) or big sagebrush (<i>Artemisia tridentata</i>). Often burrows in areas of soft, windblown sand piled at the bases of shrubs. Known to occur in Esmeralda County, Nevada. About 1,251,250 acres of potentially suitable habitat occurs in the SEZ region.
Pallid bat	<i>Antrozous pallidus</i>	BLM-S; NV-P	Year-round resident in project area. Low-elevation desert communities, including grasslands, shrublands, and woodlands. Day roosts in caves, crevices, and mines. Nearest recorded occurrence is 15 mi west of the SEZ. About 2,616,400 acres of potentially suitable habitat occurs in the SEZ region.
Silver-haired bat	<i>Lasionycteris noctivagans</i>	BLM-S	Year-round resident in project area. Primarily high-elevation (1,600 to 8,500 ft) forested areas comprising aspen, cottonwood, white fir, pinyon-juniper, subalpine fir, willow, and spruce communities. Roost and nursery sites occur in tree foliage, cavities, or under loose bark. Rarely hibernates in caves. Nearest recorded occurrence is 15 mi west of the SEZ. About 2,609,400 acres of potentially suitable habitat occurs in the SEZ region.
Spotted bat	<i>Euderma maculatum</i>	BLM-S; NV-P	Year-round resident in project area. Near forests and shrubland habitats throughout the SEZ region. Uses caves and rock crevices for day roosting and winter hibernation. Nearest recorded occurrence is 15 mi west of the SEZ. About 2,605,300 acres of potentially suitable habitat occurs in the SEZ region.

TABLE C.4.4-1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
<i>Mammals (Cont.)</i>			
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	BLM-S; NV-P	Year-round resident in project area. Near forests and shrubland habitats below 9,000-ft elevation throughout the SEZ region. Roosts and hibernates in caves, mines, and buildings. Nearest recorded occurrence is 8 mi west of the SEZ. About 2,347,800 acres of potentially suitable habitat occurs in the SEZ region.
Western small-footed myotis	<i>Myotis ciliolabrum</i>	BLM-S	Year-round resident in project area. Variety of woodlands and riparian habitats at elevations below 9,000 ft. Roosts in caves, buildings, mines, and crevices of cliff faces. Nearest recorded occurrence is 9 mi south of the SEZ. About 3,374,000 acres of potentially suitable habitat occurs in the SEZ region.

^a The listings for (1) federally listed, proposed for listing, or candidates for listing under the ESA, and (2) Nevada BLM State Office sensitive species have been updated since the release of the Draft Solar PEIS.

^b BLM-S = listed as a sensitive species by the BLM; ESA-C = candidate for listing under the ESA; NV-P = protected in the state of Nevada under *Nevada Revised Statutes* (NRS) 501.110 (animals) or NRS 527 (plants).

^c For plant species, potentially suitable habitat was determined by using Southwest Regional Gap Project (SWReGAP) land cover types (USGS 2005). For terrestrial vertebrate species, potentially suitable habitat was determined by using SWReGAP habitat suitability and land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.

^d To convert ft to m, multiply by 0.3048.

^e To convert mi to km, multiply by 1.609.

^f To convert acres to km², multiply by 0.004047.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19

suitability of these habitats to support these special status species should be determined in the field. All field-determined suitable habitats for special status species should be mapped. Target species and survey protocols should be developed in coordination with the U.S. Fish and Wildlife Service and Nevada Department of Wildlife.

The Draft Solar PEIS presented a table of special status species for which potential impacts need to be evaluated prior to development in the proposed Gold Point SEZ. The list of species presented in Table 11.6.12.1-1 of the Draft Solar PEIS also includes species listed by the State of Nevada and species ranked by the State of Nevada as S1 or S2 or species of concern. Based on the design features presented in the Draft Solar PEIS, the potential for impacts on these additional species will also need to be addressed before development could occur in the SEZ.

- Identify and map the location and areal extent of ephemeral wetland habitats, including desert wash and playa habitats within the SEZ, including habitat

1 characteristics (such as water source, hydrologic regime, and dominant plant
2 species), both within the wetland boundaries and in adjacent non-wetland
3 habitats. A species potentially associated with these habitats includes the
4 Eastwood milkweed.
5
6

7 **C.4.4.5.10 Air Quality and Climate**

8 None.
9
10

11 **C.4.4.5.11 Visual Resources**

12 A summary of the Draft Solar PEIS visual contrast analysis for the proposed Gold Point
13 SEZ is provided in Table C.4.4-2. This table includes only the resources that would be subject to
14 moderate or strong visual contrast. The Draft Solar PEIS visual impact analysis predicted these
15 levels of visual contrast from solar energy development in the Gold Point SEZ for the following
16 sensitive visual resource areas (SVRAs) and sensitive viewing locations (SVLs):
17
18

- 19 • Queer Mountain WSA
- 20 • Magruder Mountain
- 21 • State Route 266
- 22 • Community of Gold Point.
23
24
25
26
27

28 The following steps could be taken to better understand potential impacts on these
29 SVRAs and SVLs from solar development in the Gold Point SEZ:
30

- 31 • Key observation points (KOPs) within these areas should be identified
32 through working with the management agency or other local stakeholders.
33
- 34 • Viewshed analyses from the KOPs should be conducted to determine how
35 much of the SEZ would be in view from each KOP.
36
- 37 • As deemed necessary, based on viewshed analysis results, wireframe Google
38 Earth™ visualizations of hypothetical solar facilities in the SEZ depicting the
39 80% development scenario could be prepared to better estimate potential
40 impacts.
41

42 This additional analysis may help judge potential visual contrast more accurately for most
43 KOPs. For KOPs of particularly high sensitivity (e.g., the WSA), a site visit with photography
44 and superimposition of the wireframe models onto the photos might be required or desired.
45
46

TABLE C.4.4-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi (40-km) Viewshed of the Proposed Gold Point SEZ

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes
WSAs	Queer Mountain	85,294 acres	7.0 mi south of the SEZ	1,276 acres	1.5	Moderate levels of visual contrast would be expected for some high-elevation viewpoints in the WSA, with weaker contrasts expected for lower elevation viewpoints in the WSA. Visible area of the WSA is about 8.7 to 12 mi from the southern boundary of the SEZ.
Other Areas of Interest (non-management areas)	Magruder Mountain	NA ^e	8 mi west of the SEZ	NA	NA	Because of the close proximity and elevated viewpoints on Magruder Mountain, moderate visual contrasts could be observed by viewers on the mountain. The mountain is a sacred site to the Timbisha Shoshone; the summit is about 4,000 ft higher than the SEZ.
	State Route 266	40 mi	Within the SEZ viewshed at distances from 2 to 9.5 mi	18 mi	45.0	Because State Route 266 passes within 2 mi of the SEZ, strong visual contrasts would be expected for nearby viewpoints on this highway. Moderate to weak levels of visual contrasts would be expected for viewpoints on State Route 266 farther from the SEZ.

TABLE C.4.4-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes
Other Areas of Interest (non-management areas) (Cont.)	Gold Point	NA ^e	2 mi south of the SEZ	NA	NA	Strong visual contrasts would be expected for viewpoints within the community of Gold Point. Located less than 2 mi directly south of the SEZ. A detailed future site-specific NEPA analysis would be required to determine visibility precisely.

^a To convert mi to km, multiply by 1.609.

^b To convert acres to km², multiply by 0.004047.

^c Mileage (within all columns) is used only for trails or roads, unless otherwise specified.

^d Distances are based on the Draft PEIS analysis dated December 2010; any alterations to the SEZ boundaries may result in changes to the distance at the point of closest approach.

^e NA = data not available.

1 **C.4.4.5.12 Acoustic Environment**
2

3 None.
4
5

6 **C.4.4.5.13 Paleontological Resources**
7

8 The BLM Regional Paleontologist will be contacted to determine whether additional
9 information is available regarding Potential Fossil Yield Classification (PFYC) identifications in
10 Nevada. A preliminary paleontological survey could be conducted to determine the PFYC of the
11 SEZ, in order to update the temporary assignment of PFYC Class 2 used in the Draft Solar PEIS.
12
13

14 **C.4.4.5.14 Cultural Resources and Native American Concerns**
15

16 None of the proposed Gold Point SEZ has been surveyed for cultural resources; thus,
17 absent specific information, impacts are unknown but possible. The SEZ is near the mining town
18 of Gold Point, and historic resources pertaining to this mining area are possible in the SEZ. The
19 cultural landscape of the SEZ is marked by Lida Valley, located between Mount Jackson,
20 Jackson Ridge, Magruder Mountain, and Slate Ridge. Traditionally, camps would have been
21 located near springs in the foothills, and the valley would have been used as a travel corridor.
22 Many of these areas closest to the SEZ have been incorporated into the recently established
23 Timbisha Shoshone Reservation in Lida. Magruder Mountain is reported to have cultural
24 significance for the Timbisha, where the practice of selective burning encouraged the growth of
25 particular plants. Other nearby resources include rockshelters, lithic scatters, and a historic
26 Native American meeting place and ritual area. Potential impacts could include visual and
27 auditory impacts on sacred sites as well as on the historic town site of Gold Point. The
28 destruction or degradation of important plant resources, and the destruction of habitat or
29 impediments to the movement of culturally important wildlife, are also potential impacts of
30 concern within the SEZ.
31

32 The following additional data collection efforts could reduce the uncertainty about
33 potential impacts on cultural resources:
34

- 35 • Conduct a Class I literature file search to better understand (1) the site
36 distribution pattern in the vicinity of the SEZ, (2) potential trail networks
37 through existing ethnographic reports, and (3) overall cultural sensitivity of
38 the landscape.
39
- 40 • Conduct a Class II reconnaissance level stratified random sample survey of
41 the SEZ to obtain a 10% sample (roughly 481 acres [1.95 km²]).²⁵ Areas of
42 interest, such as historic resources pertaining to mining, as determined through
43 a Class I review, should also be identified prior to establishing the survey

²⁵ The BLM plans to conduct a Class II survey of 5% of this SEZ prior to the Final Solar PEIS. Additional areas could be surveyed as funding becomes available.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26

design and sampling strategy. If appropriate, some subsurface testing of dune areas should be considered in the sampling strategy as well.

- Prepare a cultural sensitivity map based on results of the Class II survey and Class I review.
- Continue with government-to-government consultation as described in Section 2.4.3, including follow-up to recent ethnographic studies with Tribes not included in the original studies to determine whether those Tribes have similar concerns. The Gold Point SEZ falls in the traditional use area of primarily the Western Shoshone and the Owens Valley branch of the Northern Paiute. The Timbisha Shoshone are the closest Western Shoshone with lands in Lida, Nevada, approximately 6 mi (9.7 km) from the Gold Point SEZ. Potential topics presented in the Draft Solar PEIS and/or in an ethnographic study with the Timbisha Shoshone Tribe to be discussed during consultation include Magruder Mountain, Mount Jackson, Stonewall Mountain, Pigeon Spring, The Doctor Rock, Lida Valley, spiritual trails, rock art sites, ceremonial areas and healing places, places of historic encounters, and plant and animal resources. The agencies value the information shared by the Tribes during the ethnographic study and will consider their input in striving to minimize the impacts of solar development in the SEZ. The completed ethnographic study will be available in its entirety on the Solar PEIS Web site (<http://solareis.anl.gov>). A summary of the contents of that report is also provided in the following text box.

Tribal Perspectives on the Significance of the Gold Point SEZ

The lands under consideration in the Draft Solar PEIS for the Gold Point SEZ region were traditionally occupied and used, aboriginally owned, and historically related to the Numic-speaking peoples of the Great Basin and western Colorado Plateau. Tribal representatives from the Timbisha Shoshone Tribe were involved in the Gold Point SEZ field consultations to represent the cultural interests of the Western Shoshone. These Numic-speaking people continue to stipulate that they are the American Indians responsible for the cultural resources (natural and man-made) in this study area because their ancestors were placed here by the Creator.

Traditional ecological understandings are carried from generation to generation through the recounting of origin stories occurring in mythic times and by strict cultural and natural resource conservation rules. The involved American Indian Tribal governments and their appointed cultural representatives have participated in this PEIS in order to explain the meaning and cultural centrality of the plants, animals, spiritual trails, healing places, and places of historic encounters that exist in these lands.

Western Shoshone Tribal representatives maintain that, in order to understand Western Shoshone connections to the SEZ, it must be placed in context with neighboring places and their associated cultural resources. During the ethnographic field sessions, Tribal representatives identified the Gold Point SEZ as being part of a larger ceremonial landscape. Specific geographic locations, even though located outside of the SEZ proper, contribute to the significance of the designated SEZ. Regional and world balancing ceremonies occurred at Pigeon Spring and possibly at Indian Spring. Other areas like Mount Jackson and Stonewall Mountain were identified places visited for power acquisition.

27

Tribal Perspectives on the Significance of the Gold Point SEZ (Cont.)

The Gold Point SEZ is located near mountains used in vision questing and ceremony. Timbisha representatives pointed out that the top of Mount Jackson contained ritually deposited items like arrowheads and pieces of pottery. Neighboring Magruder Mountain also was identified as a ceremonial area. It is the headwaters for the hydrological system that flows towards the Round Dance grounds at Pigeon Spring.

Western Shoshone cultural ties to this landscape are confirmed by the presence of a doctor rock, numerous ceremonial-use places, and sacred mountains. The Doctor Rock and the neighboring volcanic knoll were features of particular interest to the Timbisha Tribal representatives.

The Doctor Rock was formed when the Red Volcano erupted and unleashed materials in the form of volcanic bombs. This event likely occurred several thousand years ago. Places like these are considered sacred and powerful locations because they are formed directly from volcanic activity.

Western Shoshone medicine men, or puha'gants, healed and rebalanced an ill individual using the Doctor Rock. The puha'gant used his or her Puha (or energy) and the Puha of the rock and the volcano to aid in the curing ceremonies.

Places that contain the presence of volcanic activity are considered sacred and powerful locations. Western Shoshone people believe that volcanic events are moments when Puha deep inside the Earth is brought to the surface as a way for the land to renew itself or to be reborn. Volcanism is also a way for Puha to be distributed across a landscape.

The Gold Point SEZ region includes volcanic features such as Mount Jackson and Mount Jackson Ridge to the north, Magruder Mountains to the west, and Mount Dunfee to the southeast. It is located in a complex hydrological system that connects the local high volcanic mountains with the northern end of Death Valley. Tribal representatives identified trails along this hydrological system that connect Death Valley to ceremonial areas in the region.

Western Shoshone representatives noted that water is an important feature within the Gold Point SEZ region. Stonewall Mountain, a powerful volcano, serves as the headwaters of the Lida Valley hydrological system. This hydrological system flows through the region and ultimately into Death Valley.

During multiple field visits, Native American representatives identified 21 traditional use plants within the proposed project boundary. The presence of traditionally important animals in an area also contributes to the overall cultural importance of the area to Indian people.

Shoshone villages were located throughout the Lida Valley, particularly near Lida Spring and along the southeastern flank of Magruder Mountain. These communities were agricultural centers that supported people who traveled into the area for ceremony. Lida has been a well-documented place associated with Indian activity. In the 1930s, Julian Steward (1938) described the area as a hub that connected places such as Fish Lake Valley, Gold Mountain, Stonewall Valley, and Clayton Valley. Contemporary ethnographic studies link the Lida community with Tule Canyon and Pigeon Spring. The people of Lida frequently traveled the 10-mi (16-km) trail between these places for economic and ceremonial purposes.

1
2
3
4
5
6
7

C.4.4.5.15 Socioeconomics and Environmental Justice

None.

1 **C.4.4.5.16 Cumulative Impact Considerations**

2

3 None.

4

1 **C.4.5 Millers**

2
3
4 **C.4.5.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic**
5 **Environmental Impact Statement (PEIS)**
6

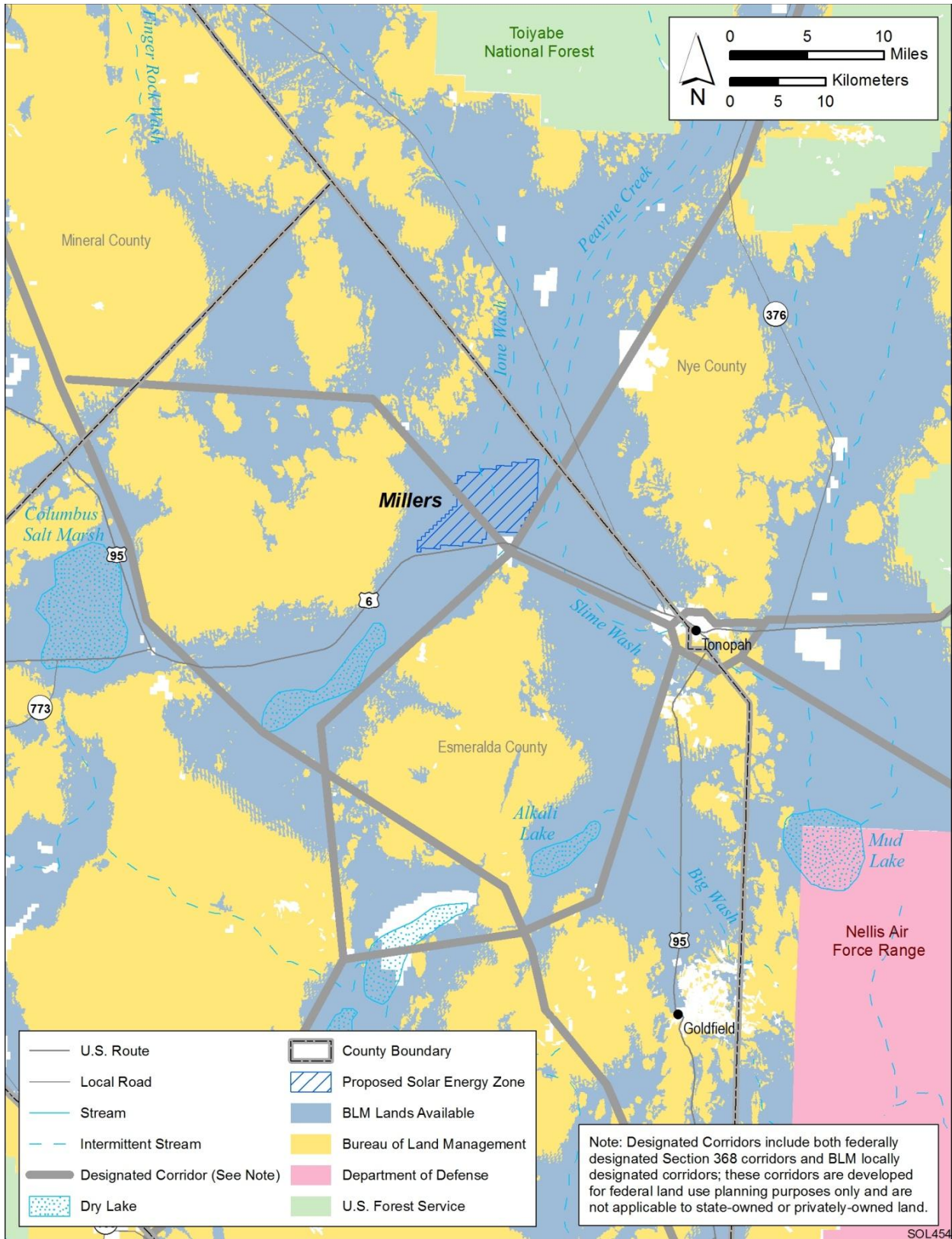
7 The proposed Millers solar energy zone (SEZ), as presented in the Draft Solar PEIS, had
8 a total area of 16,787 acres (68 km²). It is located in Esmeralda County in southern Nevada
9 (Figure C.4.5-1). The nearest town is Tonopah, Nevada, about 15 mi (24 km) west in Nye
10 County, with a population of approximately 1,500.

11
12 A U.S. Department of the Interior Bureau of Land Management (BLM)-designated
13 transmission corridor is located within the SEZ and could limit development in the SEZ because
14 solar facilities cannot be constructed under transmission lines. The discussion of impacts of solar
15 energy development in the SEZ in the Draft Solar PEIS acknowledged that the presence of the
16 corridor would reduce the amount of land available for solar power production, and that,
17 conversely, full development of solar facilities within the SEZ would limit use of the
18 transmission corridor.

19
20 The Draft Solar PEIS identified a 120-kV transmission line that passes through the SEZ
21 as the nearest point for connection of the SEZ to the grid. The actual location of connection to
22 the transmission grid could be different than that assumed in the Draft Solar PEIS. Details on the
23 updated transmission impact assessment for SEZs to be included in the Final Solar PEIS are
24 provided in Section C.7.1 of this appendix. Analysis of transmission lines and/or access roads
25 will be completed, as necessary, as part of the project-specific environmental reviews (see
26 Section 2.2.2.2.2 of this Supplement).

27
28 Potential adverse impacts identified in the Draft Solar PEIS included the following:

- 29
- 30 • Grazing on about 4% of the Monte Cristo allotment would be closed.
 - 31
 - 32 • A portion of an existing route of a competitive off-highway vehicle race
33 course that passes through the SEZ would be closed.
 - 34
 - 35 • Development could encroach into military training route airspace that crosses
36 the SEZ. Structures higher than 50 ft (15 m) above ground level may present
37 unacceptable electromagnetic compatibility concerns for the Nevada Test and
38 Training Range test mission.
 - 39
 - 40 • Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil
41 erosion and deposition by wind and runoff, sedimentation, and soil
42 contamination), as well as potential impacts on Crescent Dunes, could occur.
43 Portions of the dry lake may not be a suitable location for construction.
 - 44
 - 45 • Groundwater use would deplete the aquifer to the extent that, at a minimum,
46 wet-cooling options would not be feasible.



1

2 **FIGURE C.4.5-1 Proposed Millers SEZ as Presented in the Draft Solar PEIS**

- 1 • Clearing of a large portion of the proposed SEZ could adversely affect playa
2 wetlands, other playa, Ione Wash scrub communities, dry washes, and
3 greasewood flats habitats, depending on the amount of available habitat
4 disturbed. The establishment of noxious weeds could result in habitat
5 degradation. Deposition of fugitive dust could cause reduced productivity or
6 changes in plant community structure.
7
- 8 • Candelaria blazingstar (*Mentzelia candelariae*), a plant species on the Nevada
9 Natural Heritage Program (NNHP) watch list, may occur within the SEZ and
10 may be directly affected by solar project development. Potentially suitable
11 habitat for 19 special status species and more than 125 wildlife species occurs
12 in the affected area of the proposed SEZ; no more than 1.6% of the potentially
13 suitable habitat for any of these species occurs in the region that would be
14 directly affected by development.
15
- 16 • If aquatic biota are present in intermittent or ephemeral streams in the SEZ,
17 they could be affected by the direct removal of these surface water features
18 within the construction footprint. If present, aquatic biota in surface water
19 features could also be affected by a decline in habitat quantity and quality due
20 to water withdrawals and changes in drainage patterns, as well as increased
21 sediment and contaminant inputs associated with ground disturbance and
22 construction activities.
23
- 24 • Temporary exceedances of ambient air quality standards for particulate
25 matter at the SEZ boundaries are possible during construction. These high
26 concentrations, however, would be limited to the immediate area surrounding
27 the SEZ boundary.
28
- 29 • Although the SEZ is in an area of low scenic quality, strong visual contrasts
30 could be observed by residents nearest to the SEZ. Weak to strong visual
31 contrasts could be observed within the SEZ by travelers on U.S. 6.
32
- 33 • The potential for impacts on significant paleontological and cultural resources
34 is unknown, but potentially high. It is possible that there will be Native
35 American concerns over potential visual, acoustic, and other effects of solar
36 energy development within the SEZ, including culturally important
37 landscapes.
38
- 39 • Users of U.S. 95 could experience traffic congestion and slowdowns during
40 construction at the SEZ.
41
42
43

1 **C.4.5.2 Summary of Comments Received**
2

3 Many environmental groups providing comments on the Draft Solar PEIS did not identify
4 major conflicts for the Millers SEZ (The Wilderness Society et al.,²⁶ Center for Biological
5 Diversity, Defenders of Wildlife, Sierra Club—Toiyabe Chapter, National Parks Conservation
6 Association, and Natural Resources Defense Council). The Nevada Wilderness Project requested
7 that nearby sand dunes and vegetation communities be avoided and suggested that the BLM may
8 need to scale back the peak construction year and full build-out scenarios, given limited water
9 availability. The Wilderness Society suggested that the BLM include analysis of potential
10 impacts associated with sand dunes and vegetation communities in the Final Solar PEIS, as well
11 as measures to avoid, minimize, or mitigate such impacts.
12

13 The U.S. Department of Defense (DoD) reiterated concerns over encroachment into
14 military training route (MTR) airspace and structures higher than 50 ft (15 m) that were
15 expressed during scoping for the Draft Solar PEIS. The Nevada Department of Wildlife
16 recommended that the Final Solar PEIS include distribution, population size and health, and
17 habitat analysis for kangaroo mice. Esmeralda County commented that the Draft Solar PEIS
18 did not include input from the county, and it provided recommended alternate locations for
19 renewable energy development.
20

21 **C.4.5.3 Changes to the SEZ**
22

23 No boundary revisions were identified for the proposed SEZ. However, areas specified
24 for non-development under SEZ-specific design features were mapped, where data were
25 available. For the proposed Millers SEZ, Ione Wash and a small wetland area in the southern
26 portion of the SEZ, totaling 253 acres (1.0 km²), were identified as non-development areas
27 (Figure C.4.5-2). The remaining developable area within the SEZ is 16,534 acres (66.9 km²).
28
29

30 **C.4.5.4 Wilderness Character Status of SEZ**
31

32 A recently maintained inventory of wilderness characteristics was used to determine
33 whether public lands within the Millers SEZ have wilderness characteristics. The finding of this
34 inventory was that these lands do not contain wilderness characteristics.
35
36
37

²⁶ The Wilderness Society, Center for Biological Diversity, Defenders of Wildlife, Sierra Club-Toiyabe Chapter, National Parks Conservation Association, Natural Resources Defense Council, Soda Mountain Wilderness Council, and Sierra Trek submitted joint comments on the proposed Nevada SEZs. Those comments are attributed to The Wilderness Society et al.

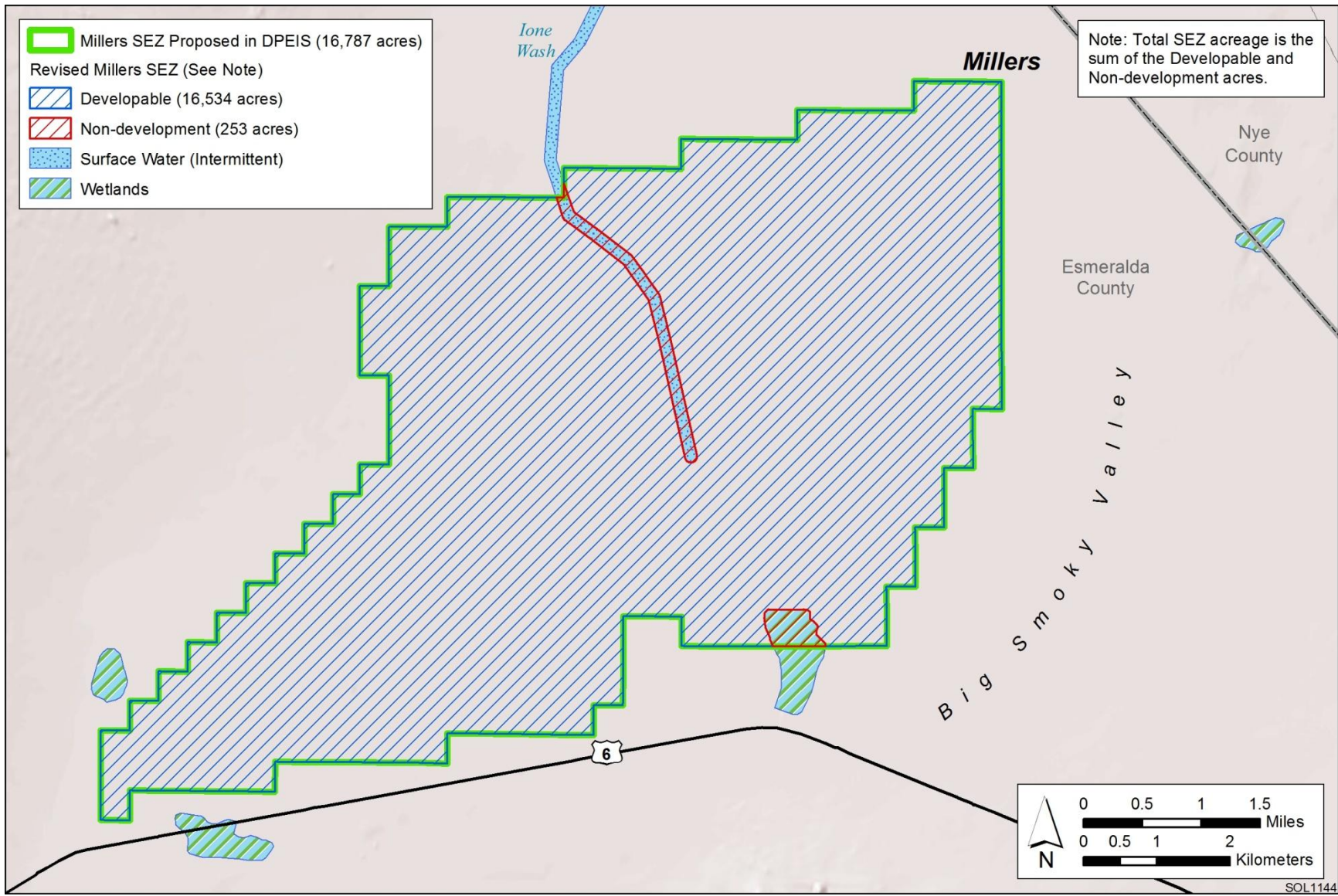


FIGURE C.4.5-2 Proposed Millers SEZ as Described in this Supplement

SOL1144

1 **C.4.5.5 Additional Data Collection Recommended**

2
3
4 **C.4.5.5.1 Lands and Realty**

5
6 None.

7
8
9 **C.4.5.5.2 Specially Designated Areas and Lands with Wilderness Characteristics**

10
11 None.

12
13
14 **C.4.5.5.3 Rangeland Resources**

15
16
17 *Livestock Grazing.* None.

18
19
20 *Wild Horses and Burros.* None.

21
22
23 **C.4.5.5.4 Recreation**

24
25 None.

26
27
28 **C.4.5.5.5 Military and Civilian Aviation**

29
30 The DoD has expressed continued concern regarding the potential impact of solar
31 development in this SEZ on military operations The BLM will continue to consult with the DoD
32 regarding potential issues with military operations.

33
34
35 **C.4.5.5.6 Geologic Setting and Soil Resources**

36
37 None.

38
39
40 **C.4.5.5.7 Minerals**

41
42 Additional information on leasable and strategic minerals in the vicinity of the SEZ will
43 be provided in the Final Solar PEIS to inform the Department of the Interior's decision on a
44 proposed 20-year withdrawal of SEZ lands.

1 **C.4.5.5.8 Water Resources**

2
3 The following additional data and actions would help further characterize potential
4 impacts on water resources for the proposed Millers SEZ. A more detailed discussion of each of
5 these activities is included in the water resources action plan provided in Section C.7.2 of this
6 appendix.
7

- 8 • Prepare a planning-level water resources inventory of the Tonopah Flat
9 portion of the Big Smoky Valley.
- 10
11 • Identify additional ephemeral stream channels and alluvial fan features for
12 non-development areas through consultation with BLM Nevada, Nevada
13 Division of Water Resources (NDWR), U.S. Environmental Protection
14 Agency, and U.S. Army Corps of Engineers (USACE) with a focus on:
 - 15 – Tributaries to Ione Wash,
 - 16 – Alluvial fan base features located adjacent to Ione Wash, and
 - 17 – Ephemeral stream channels located along the eastern edge of the SEZ
18 (e.g., tributaries of Peavine Creek, an intermittent stream just east of the
19 SEZ).
- 20
21 • Perform field surveys and hydrologic analyses to support jurisdictional water
22 determinations and floodplain identifications. Tasks include:
 - 23 – Surveying Ione Wash (and adjacent alluvial fan base), Peavine Creek,
24 and tributaries of these streams for surface elevations, high water marks,
25 sediment conditions; and
 - 26 – Conducting hydrologic rainfall-runoff-routing analyses to identify
27 100-year floodplain areas.
- 28
29 • Coordinate with the USACE (Sacramento District) regarding jurisdictional
30 water determinations for the SEZ. Water features to be considered include:
 - 31 – Ione Wash, and
 - 32 – Peavine Creek (portion adjacent to the SEZ and tributaries within the
33 SEZ).
- 34
35 • Identify 100-year floodplain non-development areas (if they exist) for Ione
36 Wash and Peavine Creek (channel is outside of the SEZ, but its potential
37 floodplain may be inside the SEZ). This task would require coordination with
38 the Federal Emergency Management Agency and the following agencies:
 - 39 – NDWR (Floodplain Management Program), and
 - 40 – Esmeralda County.
- 41
42 • Describe the formation of a stakeholder committee to conduct long-term
43 monitoring of water resources. This activity would entail:
 - 44 – Identifying key stakeholder agencies,
 - 45 – Discussing general features of a monitoring program, and
 - 46 – Working with the U.S. Geological Survey to develop groundwater
47 monitoring well design and numerical groundwater models.
- 48

1 **C.4.5.5.9 Ecological Resources**
2
3

4 **Vegetation and Plant Communities.** The following additional data-gathering actions
5 would help further characterize potential impacts on vegetation and plant communities for the
6 proposed Millers SEZ:
7

- 8 • Identify and map the location and areal extent of desert dry wash, greasewood
9 flat, wetland, and playa habitats, and Ione Wash shrub communities within the
10 SEZ. Identify and map the location and areal extent of these habitats outside
11 the SEZ that may be affected by hydrologic changes, including groundwater
12 elevations, and changes in water, sediment, and contaminant inputs associated
13 with runoff. Such efforts could help determine habitat characteristics,
14 including water source, hydrologic regime, and dominant plant species.
15
- 16 • Survey for candelaria blazing star, a plant species on the NNHP watch list
17 during a period when it is flowering and easily documented. If individuals are
18 located, individuals or populations could be avoided through fencing and
19 flagging of the area, including an appropriate buffer area.
20
21

22 **Wildlife.** The following additional data-gathering actions would help further characterize
23 potential impacts on wildlife resources for the SEZ:
24

- 25 • Conduct pre-disturbance surveys within the SEZ to determine the use of the
26 SEZ as a movement/migratory corridor or as important habitat for the mule
27 deer.
28
- 29 • Identify and map the location and areal extent of wash and playa habitats
30 within the SEZ. These areas are important habitat for a number of wildlife
31 species.
32
33

34 **Aquatic Biota.** Investigations recommended under the water resources action plan
35 (Section C.4.5.5.8) would be useful in characterizing the habitat available to aquatic biota.
36 Most washes and dry lakes in the Millers SEZ are typically dry and contain water only for
37 brief periods following precipitation. They may or may not contain aquatic biota; therefore,
38 preliminary evaluations of these surface water features could be conducted to determine the
39 potential for aquatic communities to be present. Any aquatic biota found in these features would
40 likely be desiccation adapted aquatic invertebrates typical of the region. The primary value of
41 these features may be to nonaquatic animals that consume aquatic biota within the SEZ.
42
43

44 **Special Status Species.** The following additional data-gathering actions would be useful
45 in further characterizing and protecting habitat available to special status species:
46

- 1 • Conduct pre-disturbance surveys within the SEZ to determine the presence
2 and abundance of those special status species that are (1) federally listed,
3 proposed for listing, or candidates for listing under the Endangered Species
4 Act (ESA); (2) protected by the State of Nevada; or (3) designated as sensitive
5 by the Nevada BLM State Office. These species are listed in Table C.4.5-1.
6 Surveys should focus on areas identified as potentially suitable, and the
7 suitability of these habitats to support these special status species should be
8 determined in the field. All field-determined suitable habitats for special status
9 species should be mapped. Target species and survey protocols should be
10 developed in coordination with the U.S. Fish and Wildlife Service and
11 NDOW.
12

13 The Draft Solar PEIS presents a table of special status species for which
14 potential impacts need to be evaluated prior to development in the proposed
15 Millers SEZ. The list of species presented in Table 11.7.12.1-1 of the Draft
16 Solar PEIS also includes species listed by the State of Nevada and species
17 ranked by the State of Nevada as S1 or S2 or species of concern. Based on the
18 design features presented in the Draft Solar PEIS, the potential for impacts on
19 these additional species will also need to be addressed before development
20 could occur in the SEZ.
21

- 22 • Identify and map the location and areal extent of ephemeral wetland habitats,
23 including desert wash and playa habitats within the SEZ, including habitat
24 characteristics (such as water source, hydrologic regime, and dominant plant
25 species), both within the wetland boundaries and in adjacent non-wetland
26 habitats. A species potentially associated with these habitats includes the
27 Eastwood milkweed.
28
29

30 **C.4.5.5.10 Air Quality and Climate**

31 None.
32
33

34 **C.4.5.5.11 Visual Resources**

35 As indicated in the Draft Solar PEIS, no federal, state, or BLM-designated sensitive
36 visual resources areas (SVRAs) are located within a visible distance of 25 mi (40 km) from the
37 proposed Millers SEZ. However, sensitive viewing locations (SVLs) are situated along the
38 alignment of U.S. 6. Weak to strong visual contrasts from solar energy development within the
39 SEZ would be expected for travelers along this roadway. A summary of the Draft Solar PEIS
40 visual contrast analysis for the Millers SEZ is provided in Table C.4.5-2. The table includes only
41 those resources that would be subject to moderate visual contrast.
42
43
44
45

1 **TABLE C.4.5-1 Special Status Species That May Occur in the Vicinity of the Proposed**
 2 **Millers SEZ^a**

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
Plants			
Eastwood milkweed	<i>Asclepias eastwoodiana</i>	BLM-S	Endemic to Nevada from public and private lands in Esmeralda, Lander, Lincoln, and Nye Counties in open areas on a wide variety of basic (pH usually >8) soils, including calcareous clay knolls, sand, carbonate or basaltic gravels, or shale outcrops, generally barren and lacking competition. Frequently in small washes or other moisture-accumulating microsites at elevations between 4,700 and 7,100 ft. ^d Nearest recorded occurrence is 12 mi ^e southeast of the SEZ. About 379,398 acres ^f of potentially suitable habitat occurs within the SEZ region.
Nevada dune beardtongue	<i>Penstemon arenarius</i>	BLM-S	Endemic to western Nevada on sand dunes or deep sand occurring on deep, loose, sandy soils of valley bottoms, aeolian deposits, and dune skirts, often in alkaline areas, sometimes on road banks and other recovering disturbances crossing such soils in shadscale communities. Nearest recorded occurrence is along Peavine Creek, approximately 17 mi northeast of the SEZ. About 97,638 acres of potentially suitable habitat occurs within the SEZ region.
Sanicle biscuitroot	<i>Cymopterus ripleyi</i> var. <i>saniculoides</i>	BLM-S	Endemic to Nevada on loose, sandy to gravelly, often somewhat alkaline soils on volcanic tuff deposits and mixed valley alluvium within blackbrush, mixed-shrub, sagebrush, and lower pinyon-juniper communities. Elevation ranges between 3,150 and 6,700 ft. Nearest recorded occurrence is 12 mi northeast of the SEZ. About 4,039,523 acres of potentially suitable habitat occurs within the SEZ region.
Toquima milkvetch	<i>Astragalus toquimanus</i>	BLM-S	Endemic to Nevada on dry, stiff, sandy to gravelly, basic or calcareous soils along gentle slopes or flats at elevations between 6,500 and 7,500 ft. Nearest recorded occurrence is 21 mi east of the SEZ. About 1,156,759 acres of potentially suitable habitat occurs within the SEZ region.
Invertebrates			
Crescent Dunes aegialian scarab beetle	<i>Aegialia crescenta</i>	ESA-UR; BLM-S	Sand dune obligate species endemic to Nevada on the Crescent Dunes and possibly also to the San Antonio and Game Range Dunes. Nearest recorded occurrence is from the Crescent Dunes Special Recreation Management Area (SRMA), about 6 mi east of the SEZ. About 2,281 acres of potentially suitable habitat occurs within the SEZ region.
Crescent Dunes serican scarab beetle	<i>Serica ammomenisco</i>	ESA-UR; BLM-S	Sand dune obligate species endemic to Nevada on the Crescent Dunes. Nearest recorded occurrence is from the Crescent Dunes SRMA, approximately 6 mi east of the SEZ. About 2,281 acres of potentially suitable habitat occurs within the SEZ region.

3

TABLE C.4.5-1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
Birds			
Ferruginous hawk	<i>Buteo regalis</i>	BLM-S; NV-P	Year-round resident in the SEZ region. Grasslands, sagebrush, and saltbrush habitats, as well as the periphery of pinyon-juniper woodland. Nests in tall trees or on rock outcrops along cliff faces. Known to occur in Esmeralda County, Nevada. About 1,403,676 acres of potentially suitable habitat occurs within the SEZ region.
Greater sage-grouse	<i>Centrocercus urophasianus</i>	ESA-C; BLM-S	Plains, foothills, and mountain valleys dominated by sagebrush. Lek sites are located in relatively open areas surrounded by sagebrush or in areas where sagebrush density is low. Nesting usually occurs on the ground where sagebrush density is higher. Some populations may travel up to 60 mi between summer and winter habitats. Known to occur in Esmeralda County, Nevada. About 1,264,279 acres of potentially suitable habitat occurs within the SEZ region.
Prairie falcon	<i>Falco mexicanus</i>	BLM-S	Year-round resident in open habitats in mountainous areas, steppe, grasslands, or cultivated areas. Nests in well-sheltered ledges of rocky cliffs and outcrops. Known to occur in Esmeralda County, Nevada. About 3,612,314 acres of potentially suitable habitat occurs within the SEZ region.
Swainson's hawk	<i>Buteo swainsoni</i>	BLM-S; NV-P	Summer breeding resident in the SEZ region. Savanna, open pine-oak woodlands, grasslands, and cultivated lands. Nests in solitary trees, bushes, or small groves. Known to occur in Esmeralda County, Nevada. About 847,596 acres of potentially suitable habitat occurs within the SEZ region.
Western burrowing owl	<i>Athene cucularia hypugaea</i>	BLM-S	Open grasslands and prairies, as well as disturbed sites such as golf courses, cemeteries, and airports. Nests in burrows constructed by mammals (prairie dog, badger, etc.). Known to occur in Esmeralda County, Nevada. About 4,035,785 acres of potentially suitable habitat occurs within the SEZ region.
Mammals			
Fringed myotis	<i>Myotis thysanodes</i>	BLM-S; NV-P	Summer or year-round resident in wide range of habitats, including lowland riparian, desert shrub, pinyon-juniper, and sagebrush habitats. Roosts in buildings and caves. Known to occur in Esmeralda County, Nevada. About 4,549,929 acres of potentially suitable habitat occurs within the SEZ region.
Nelson's bighorn sheep	<i>Ovis canadensis nelsoni</i>	BLM-S	Open, steep rocky terrain in mountainous habitats of the eastern Mojave and Sonoran Deserts in California. Uses desert lowland as corridors for travel between mountain ranges. Known to occur in Esmeralda County, Nevada. About 1,866,606 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.4.5-1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
Mammals (Cont.)			
Spotted bat	<i>Euderma maculatum</i>	BLM-S; NV-P	Summer or year-round resident near forests and shrubland habitats. Roosts and hibernates in caves and rock crevices. Nearest recorded occurrence is 30 mi south of the SEZ. About 3,863,972 acres of potentially suitable habitat occurs within the SEZ region.
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	BLM-S; NV-P	Summer or year-round resident near forests and shrubland habitats below 9,000-ft elevation. Roosts and hibernates in caves, mines, and buildings. Nearest recorded occurrence is 7 mi south of the SEZ. About 3,580,069 acres of potentially suitable habitat occurs within the SEZ region.
Western small-footed bat^g	<i>Myotis ciliolabrum</i>	BLM-S	Summer or year-round resident in woodlands and riparian habitats at elevations below 9,000 ft. Roosts in caves, buildings, mines, and crevices of cliff faces. Nearest recorded occurrence is 4 mi north of the SEZ. About 4,949,592 acres of potentially suitable habitat occurs within the SEZ region.

^a The listings for (1) federally listed, proposed for listing, or candidates for listing under the ESA, and (2) Arizona BLM State Office sensitive species have been updated since the release of the Draft Solar PEIS.

^b BLM-S = listed as a sensitive species by the BLM; ESA-C = candidate for listing under the ESA; ESA-UR = under review for listing under the ESA; NV-P = protected in the state of Nevada under *Nevada Revised Statutes* (NRS) 501.110 (animals) or NRS 527 (plants).

^c For plant species, potentially suitable habitat was determined by using Southwest Regional Gap Analysis Project (SWReGAP) land cover types (USGS 2005). For terrestrial vertebrate species, potentially suitable habitat was determined by using SWReGAP habitat suitability and land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.

^d To convert ft to m, multiply by 0.3048.

^e To convert mi to km, multiply by 1.609.

^f To convert acres to km², multiply by 0.004047.

^g Species in bold text have been recorded or have designated critical habitat within 5 mi (8 km) of the SEZ boundary.

1
2
3

TABLE C.4.5-2 Summary of Potential Visual Impacts on SVLs within the 25-mi (40 km) Viewshed of the Proposed Millers SEZ

Management Area Category	SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,c,d} of SVL	Distance from SEZ at Point of Closest Approach ^e	Total Acreage/Mileage Visible within 25 mi	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes
Other Areas of Interest (non-management areas)	U.S. 6 ^b	3,652 mi	Passes within 0.2 mi of the southern boundary of the SEZ	31 mi	0.8	Depending on project location within the SEZ, the types of solar facilities and their designs, and other visibility factors, weak to strong visual contrasts could be observed within the SEZ by travelers on U.S. 6. Also known as the Grand Army of the Republic Highway, U.S. 6 is the second longest highway in the United States.

^a To convert mi to km, multiply by 1.609.

^b Length of U.S. 6: DOT (2011b).

^c To convert acres to km², multiply by 0.004047.

^d Mileage (within all columns) is used only for trails or roads, unless otherwise specified.

^e Distances are based on the Draft Solar PEIS analysis dated December 2010; any alterations to the SEZ boundaries may result in changes to the distance at the point of closest approach.

1 The following steps could be taken to better understand potential impacts on SVLs from
2 solar development in the Millers SEZ:

- 3
- 4 • Key observation points (KOPs) within these areas should be identified
5 through working with the management agency or other local stakeholders.
6
- 7 • Viewshed analyses from the KOPs should be conducted to determine how
8 much of the SEZ would be in view from each KOP.
9
- 10 • As deemed necessary, based on viewshed analysis results, wireframe Google
11 Earth™ visualizations of hypothetical solar facilities in the SEZ depicting the
12 80% development scenario could be prepared to better estimate potential
13 impacts.
14

15 This additional analysis may be sufficient to judge potential visual contrast more
16 accurately for most KOPs. For KOPs of particularly high sensitivity (e.g., U.S. 6), a site visit
17 with photography and superimposition of the wireframe models onto the photos might be
18 required or desired.
19

20

21 **C.4.5.5.12 Acoustic Environment**

22 None.
23
24
25

26 **C.4.5.5.13 Paleontological Resources**

27
28 The BLM Regional Paleontologist will be contacted to determine whether additional
29 information is available regarding Potential Fossil Yield Classification (PFYC) identifications in
30 Nevada. A preliminary paleontological survey could be conducted to determine the PFYC) of the
31 SEZ, in order to update the temporary assignments of PFYC Class 3b (94%) and Class 2 (6%)
32 used in the Draft Solar PEIS.
33
34

35 **C.4.5.5.14 Cultural Resources and Native American Concerns**

36
37 Approximately 4% of the proposed Millers SEZ has been surveyed (approximately
38 671 acres [2.7 km²] out of 4 survey projects), and cultural resource impacts are likely. Thirty
39 sites have been recorded in the SEZ, but none have been evaluated for eligibility for listing in the
40 *National Register of Historic Places*. More than 100 sites have been recorded within 5 mi (8 km)
41 of the SEZ, with at least 16 of these sites designated as potentially eligible (not all have been
42 evaluated). Significant prehistoric resources, including Paleoindian sites, are likely to be located
43 in dune areas and around margins of the Pleistocene lake, Lake Tonopah, within the Millers SEZ.
44 Additional historic period sites are anticipated within the SEZ associated with the potentially
45 eligible Millers town site adjacent to the SEZ.
46

1 The destruction or degradation of important plant resources, such as rice grass fields,
2 sage brush in washes, wolfberries, and other medicinal, ceremonial, and food plants (per a
3 comment from Duckwater Shoshone) and the destruction of habitat or impediments to the
4 movement of culturally important wildlife, are also potential impacts of concern within the SEZ.
5

6 The following additional data collection efforts could reduce the uncertainty about
7 potential impacts on cultural resources:
8

- 9 • Conduct a Class I literature file search to better understand (1) the site
10 distribution pattern in the vicinity of the SEZ, (2) potential trail networks
11 through existing ethnographic reports, and (3) overall cultural sensitivity of
12 the landscape.
13
- 14 • Conduct a Class II Stratified Random Sample Survey of the SEZ to obtain
15 a 10% sample (roughly 1,678 acres [6.8 km²]).²⁷ If the roughly 671 acres
16 (2.7 km²) previously surveyed meets current survey standards, then
17 approximately 1,007 acres (4.1 km²) of survey could satisfy a 10% sample.
18 Areas of interest, as determined through a Class I review, should also be
19 identified prior to establishing the survey design and sampling strategy, such
20 as dune areas and the shoreline of Lake Tonopah. Subsurface testing of dune
21 areas should be a component of the sampling strategy as well.
22
- 23 • Prepare a cultural sensitivity map based on results of the Class II survey and
24 Class I review.
25
- 26 • Continue with government-to-government consultation as described in
27 Section 2.4.3, including follow-up to recent ethnographic studies with Tribes
28 not included in the original studies to determine whether those Tribes have
29 similar concerns. The Millers SEZ falls in the traditional use area of primarily
30 the Western Shoshone and the Northern Paiute. Potential topics to be
31 discussed during consultation include Big Smoky Valley, sites and landscapes
32 around Lake Tonopah, “cumulative effects to the places that gives songs to
33 the Tribes” (per a comment from Duckwater Shoshone), and plant and animal
34 resources, such as those listed above. The agencies value the information
35 shared by the Tribes during the ethnographic study and will consider their
36 input in striving to minimize the impacts of solar development in the SEZ.
37 The completed ethnographic study will be available in its entirety on the Solar
38 PEIS Web site (<http://solareis.anl.gov>). A summary of the contents of that
39 report is also provided in the following text box.
40
41

²⁷ The BLM plans to conduct a Class II survey of 5% of this SEZ prior to the Final Solar PEIS. Additional areas could be surveyed as funding becomes available.

Tribal Perspectives on the Significance of Millers SEZ

The lands under consideration in the Millers SEZ study area related to the Draft Solar PEIS were traditionally occupied and used, aboriginally owned, and historically related to the Numic speaking peoples of the Great Basin. People specifically involved in the Draft Solar PEIS field consultations summarized here are from the Timbisha Shoshone Tribe and Duckwater Shoshone Tribe and are representing the cultural interests of the Western Shoshone people.

Numic-speaking peoples have and continue to stipulate that they are the American Indian peoples responsible for the cultural resources (natural and man-made) in this study area because their ancestors were placed here by the Creator and subsequently, they have lived in these lands, maintaining and protecting these places, plants, animals, water sources, and cultural signs of their occupation. Throughout traditional Numic territory, there are thousands of places connected through songs, oral history, human relations, ceremony, and trails (physical and spiritual). These connections create synergistic relationships between people and place.

These Numic-speaking peoples further stipulate that, because they have lived in these lands since the end of the Pleistocene and throughout the Holocene (or approximately 15,000 years), they deeply understand the dramatic shifts in climate and ecology that have occurred over these millennia. Indian lifeways were dramatically influenced by these natural shifts, but certain religious and ceremonial practices persisted unchanged. These traditional ecological understandings are carried from generation to generation through the recounting of origin stories occurring in mythic times and by strict cultural and natural resource conservation rules. The involved American Indian Tribal governments and their appointed cultural representatives have participated in this PEIS in order to explain the meaning and cultural centrality of the plants, animals, spiritual trails, healing places, and places of historic encounters that exist in these lands.

The Millers Solar SEZ region is located southwest of Big Smoky Valley, which has been culturally central to the lives of Western Shoshone people for thousands of years. They consider Big Smoky Valley to be a Landscape of Origin. Such an area is rare in traditional American Indian lands. Big Smoky Valley is thus especially important in the past, present, and future of American Indian culture.

The Millers SEZ study area extends well beyond the boundaries of the SEZ proper because of the existence of cultural resources in the surrounding landscape. The Millers SEZ study area includes plant and animal communities, geological features, water sources, storied lands, historic events and the trails that would have connected these features.

Lone Mountain to the south of the SEZ was also identified by Western Shoshone consultants as a vision questing location. The vision questing site would have been located on the triangular ridges half way up the mountain. It was noted that vision questing sites were not always at the top of the hill or mountain.

Geologically, the presence of the sand dunes and mountains makes the Millers SEZ region significant. Within Indian culture, powerful places are recognized by their topographic uniqueness. It is in these places that power, or Puha to Numic-speaking people, concentrates. These places of power are often in the form of hot springs, dramatic peaks, canyon constriction, and rivers and sand dunes (Stoffle et al. 2000). Crescent Dunes offers a unique topographic break in the otherwise flat expanse of the Big Smoky Valley. The panoramic views from the top of the dune as well as the acoustic nature (also known as singing sand dunes) of the Crescent Dunes make these dunes a unique place of Puha. The views and acoustics have their own powers that in turn contribute to the power of a place as well as facilitate the performance of ceremonies. (Stoffle et al. 2000). This geological feature has spiritual importance and is connected to the Millers SEZ study area through proximity and trails. The surrounding mountains, as previously discussed, also can power, water sources, mineral resources, and Mythic Time stories. Both mountains and sand dunes were destinations for ceremonial activities.

Tribal Perspectives on the Significance of Millers SEZ (Cont.)

Ecologically, the Millers SEZ study area contains a wide variety of traditional medicinal, ceremonial, and edible plants. The eastern portion of the Millers SEZ region features massive fields of Indian ricegrass, or waii (*Achnatherum hymenoides*), a traditional food of great importance. The western portions of the SEZ region are dominated by Anderson wolfberry (*Lycium* sp.), which is a sweet berry used fresh or dried and often pounded into meat to preserve it.

During multiple field visits, Native American representatives identified 22 traditional use plants within the Millers SEZ study area. These included the medicinal plants rabbitbrush and indigo bush. Tribal representatives identified 35 animals in the Millers SEZ study area. They commented multiple times on the fact that there were Big Horn Sheep trails all though this area. Another animal that drew a large amount of interest from Tribal consultants was the Desert Horned Lizard, or Mon-tah-gay. In Western Shoshone culture, the Mon-tah-gay is associated with medicine and healing.

Historically, in the late 1800s to early 1900s, Western Shoshone people gathered at places in areas like Big Smoky Valley and held annual or seasonal festivals known as big times or fandangos. These events served both social and ceremonial purposes. In addition, Shoshone people discussed how places in Big Smoky Valley, such as the location known as Darrough’s Hot Spring, were used for the Ghost Dance and associated activities. This area is located approximately 12 mi (19 km) northwest of Round Mountain in Smoky Valley.

1
2
3
4
5
6
7
8
9
10
11
12

C.4.5.5.15 Socioeconomics and Environmental Justice

None.

C.4.5.5.16 Cumulative Impact Considerations

None.

1 **C.5 NEW MEXICO PROPOSED SOLAR ENERGY ZONES**

2
3
4 **C.5.1 Afton**

5
6
7 **C.5.1.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic**
8 **Environmental Impact Statement (PEIS)**
9

10 The proposed Afton solar energy zone (SEZ), as presented in the Draft Solar PEIS, had a
11 total area of 77,623 acres (314 km²). It is located in Doña Ana County in southern New Mexico
12 (Figure C.5.1-1). The towns of Las Cruces, Mesilla, Mesquite, University Park, and Vado are
13 all within a 5-mi (8-km) radius of the SEZ. Las Cruces is the largest, with a population of
14 approximately 90,000.
15

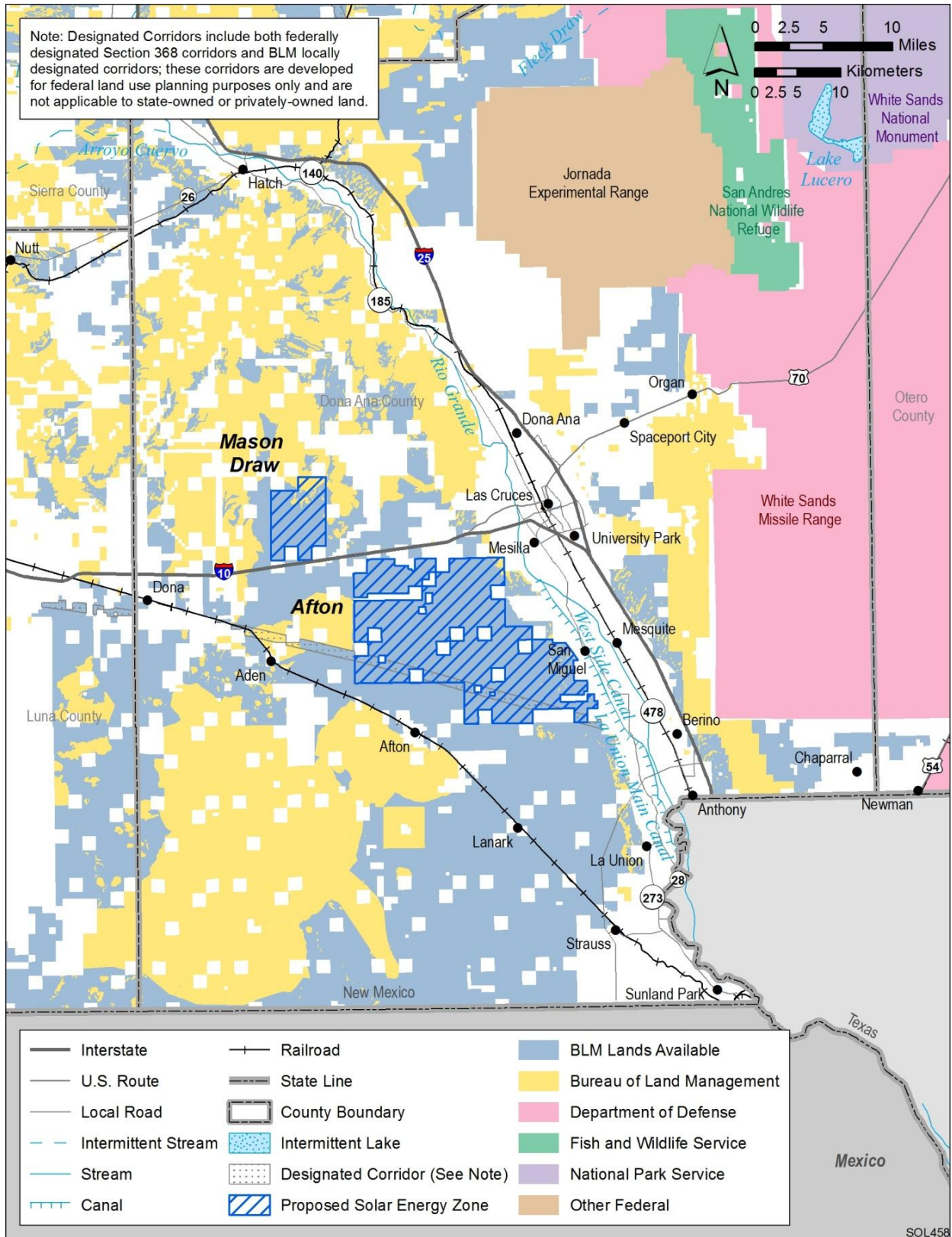
16 A designated Section 368 energy corridor occupies about 5,216 acres (21 km²) of the
17 southern portion of the SEZ and would limit development in the SEZ because solar facilities
18 cannot be constructed under transmission lines or over pipelines.²⁸ This corridor is already
19 heavily used and may need additional capacity in the future. The Draft Solar PEIS discussion of
20 impacts of solar energy development in the SEZ acknowledged that solar facility development
21 on both sides of the corridor would limit the ability to add future corridor capacity.
22

23 The Draft Solar PEIS identified a 345-kV transmission line that passes through the
24 proposed SEZ as the nearest point for connection of the SEZ to the grid. The actual location of
25 connection to the transmission grid could be different than that assumed in the Draft Solar PEIS.
26 Details on the updated transmission impact assessment for SEZs to be included in the Final Solar
27 PEIS are provided in Section C.7.1 of this appendix. Analysis of transmission lines and/or access
28 roads will be completed, as necessary, as part of the project-specific environmental reviews (see
29 Section 2.2.2.2.2 of this Supplement).
30

31 Potential adverse impacts identified in the Draft Solar PEIS included the following:

- 32
- 33 • Wilderness characteristics in the Aden Lava Flow, Organ Mountains,
34 Organ Needles, Pena Blanca, Robledo Mountains, and West Potrillo
35 Mountains/Mt. Riley Wilderness Study Areas (WSAs) would be adversely
36 affected.
37
38

²⁸ Section 368 of the Energy Policy Act of 2005 (Public Law 109-58) required federal agencies to engage in transmission corridor planning (see Section 1.6.2.1 of the Draft Solar PEIS). As a result of this mandate, the U.S. Department of the Interior Bureau of Land Management (BLM), U.S. Department of Energy (DOE), U.S. Forest Service (USFS), and U.S. Department of Defense (DoD) prepared a PEIS to evaluate the designation of energy corridors on federal lands in 11 western states, including the 6 states evaluated in this study (DOE and DOI 2008). The BLM and USFS issued Records of Decision to amend their respective land use plans to designate numerous corridors, often referred to as Section 368 corridors.



1

2 **FIGURE C.5.1-1 Proposed Afton SEZ as Presented in the Draft Solar PEIS**

- 1 • Scenic values and recreational use in the Organ/Franklin Special Recreation
2 Management Area (SRMA)/Area of Environmental Concern (ACEC),
3 Robledo Mountains ACEC, Prehistoric Trackways National Monument,
4 Mesilla Plaza, El Camino Real National Scenic Byway, and El Camino Real
5 de Tierra Adentro National Historic Trail would be adversely affected.
6
- 7 • Grazing permits for the Black Mesa, Home Ranch, and Little Black
8 Mountains allotments would be cancelled and permittees would be displaced.
9 Grazing permits for the Aden Hills, Corralitos Ranch, and La Mesa allotments
10 would be reduced. A total of 5,481 animal unit months would be lost.
11
- 12 • Recreational resources and use in 6 WSAs within 25 mi (40 km) would be
13 adversely affected.
14
- 15 • Because the SEZ is within 3 mi (5 km) of the Las Cruces Airport, Federal
16 Aviation Administration regulations will have to provide necessary safety
17 requirements.
18
- 19 • Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil
20 erosion by wind and runoff, sedimentation, and soil contamination) could
21 occur.
22
- 23 • Groundwater use would deplete the aquifer to the extent that neither wet-
24 cooling nor dry-cooling options would be feasible (effectively limiting the
25 available technologies to either dish engine or photovoltaic [PV]).
26
- 27 • Clearing of a large portion of the proposed SEZ could primarily affect
28 stabilized coppice dune and sand flat scrub and may adversely affect desert
29 dry wash, playa, wetland, riparian, and cliff sand dune habitats, depending on
30 the amount of habitat disturbed. The establishment of noxious weeds could
31 result in habitat degradation.
32
- 33 • Potentially suitable habitat for 35 special status species and more than
34 100 wildlife species occurs in the affected area of the proposed SEZ; 5.6% or
35 less of the potentially suitable habitat for any of these species occurs in the
36 region that would be directly affected by development.
37
- 38 • If aquatic biota are present in intermittent wetlands and ephemeral streams in
39 the SEZ, they could be affected by the direct removal of these surface water
40 features within the construction footprint. If present, aquatic biota could also
41 be affected by a decline in habitat quantity and quality due to water
42 withdrawals and changes in drainage patterns, as well as increased sediment
43 and contaminant inputs associated with ground disturbance and construction
44 activities.
45

- 1 • Temporary exceedances of ambient air quality standards for particulate matter
2 at the SEZ boundaries are possible during construction. These high
3 concentrations, however, would be limited to the immediate area surrounding
4 the SEZ boundary.
5
- 6 • Although the SEZ is in an area of low scenic quality, strong visual contrasts
7 could be observed by visitors to the Aden Lava Flow WSA, Robledo
8 Mountains, Aden Hills SRMA, the El Camino Real de Tierra Adentro
9 National Historic Trail, and the El Camino Real National Scenic Byway, and
10 for some viewpoints on Interstates 10 and 25 (I-10 and I-25). Moderate to
11 strong visual contrasts could be observed by visitors to Prehistoric Trackways
12 National Monument, Organ Mountains WSA, Organ Needles WSA, Pena
13 Blanca WSA, West Potrillo Mountains/Mt. Riley WSA, Doña Ana Mountains
14 SRMA, Organ/Franklin Mountains SRMA, Doña Ana Mountains ACEC,
15 Organ/Franklin Mountains ACEC, Robledo Mountains ACEC, Mesilla Plaza
16 National Historic Landmark, and Kilbourne Hole National Natural Landmark,
17 for some viewpoints on U.S. 70, and for the towns of Las Cruces, University
18 Park, Mesilla, San Miguel, La Mesa, Mesquite, Vado, Berino, Doña Ana, and
19 Anthony. Moderate visual contrast would be expected for some viewpoints on
20 the Butterfield Trail.
21
- 22 • During construction, noise levels at the nearest residences would be higher
23 than the U.S. Environmental Protection Agency (EPA) guidance levels.
24 During operations, it was estimated that noise levels at the nearest residences
25 would be equal to or above EPA guidance levels if concentrating solar power
26 facilities with energy storage technologies (which could extend the daily
27 operational time by 6 hours or more) or dish engine technology were used at
28 the SEZ.
29
- 30 • The potential for impacts on significant paleontological resources is high,
31 especially in the eastern portions of the SEZ along the edge of the mesa.
32
- 33 • Direct impacts on significant cultural resources could occur, especially in the
34 dune areas and areas close to the Mesilla Valley. Views from the Florida and
35 Potrillo Mountains may be of cultural importance to some Chiricahua groups.
36
- 37 • Minority populations occur within a 50-mi (80-km) radius of the proposed
38 SEZ boundary; thus adverse impacts of solar development could
39 disproportionately affect minority populations.
40
41

42 **C.5.1.2 Summary of Comments Received**

43
44 Most of the comments received on the proposed Afton SEZ were in favor of identifying
45 the area as an SEZ, but with required mitigation measures to protect sensitive plants, National

1 Historic Trails, and cultural resources (The Wilderness Society et al.,²⁹ Mesilla Valley Audubon
2 Society, Cultural Resource Preservation Coalition, and Audubon New Mexico). These groups
3 generally supported designation of the SEZ because of its proximity to existing roads and
4 transmission lines. The Nature Conservancy, however, recommended that boundaries of the SEZ
5 be modified to remove the Kenzin Conservation Area and protect its grasslands.
6

7 The New Mexico Department of Agriculture had concerns that the impacts on ranching
8 presented in the Draft Solar PEIS underestimated the true impacts on grazing allotments and
9 suggested that mitigation of and/or compensation to affected ranching operations should be
10 mandatory. The New Mexico Department of Game and Fish (NMDGF) supported designation of
11 the area as an SEZ and agreed with the SEZ-specific design features in the Draft Solar PEIS,
12 including specifying only PV technology and avoiding impacts on special habitat types.
13

14 The Partnership for the National Trails System recommended the removal of the Afton
15 SEZ because of the potential impacts on El Camino Real de Tierra Adentro National Historic
16 Trail, El Camino Real Scenic Byway, Butterfield Scenic Byway, and SRMAs. Full Circle
17 Heritage Services believed that a more assertive effort should be made to consult with the Tribes.
18 The Wilderness Society and others recommended stricter mitigation measures for water
19 resources, including monitoring standards of water quality and groundwater levels.
20

21 22 **C.5.1.3 Changes to the SEZ** 23

24 The proposed Afton SEZ has been significantly reconfigured to eliminate 46,917 acres
25 (190 km²) of land. Lands that have been eliminated are at the north, northeast, southeast, and
26 southwest boundaries (see Figure C.5.1-2). The rationale for the changes was to focus potential
27 solar development in the area along the existing Section 368 corridor, where development
28 already exists. In addition, 742 acres (3 km²) of floodplain and intermittent and dry lake
29 non-development areas within the remaining SEZ boundaries were identified. The remaining
30 developable area within the SEZ is 29,964 acres (121.2 km²).
31

32 To reduce the visual resource impacts of solar development within the proposed SEZ,
33 SEZ-specific visual resource mitigation requirements have been developed. However, most of
34 the areas of the SEZ that were labeled to meet Visual Resource Management (VRM) Class II- or
35 VRM Class III-consistent objectives in the Draft Solar PEIS have been eliminated from the SEZ.
36

37 On the basis of the water impact analysis provided in the Draft Solar PEIS, development
38 within the remaining areas of the SEZ may need to be restricted to photovoltaic technology or a
39 technology with equivalent or lower water use. Updated analyses taking the revised SEZ
40 boundaries into consideration will be included in the Final Solar PEIS.

²⁹ The Wilderness Society, New Mexico Wilderness Alliance, Defenders of Wildlife, Audubon New Mexico, Gila Resources Information Project, Gila Conservation Coalition, Western Environmental Law Center, Southwest Environmental Law Center, Upper Gila Watershed Alliance, Sierra Club, Natural Resources Defense Council, Soda Mountain Wilderness Council, and Sierra Trek submitted joint comments on the proposed New Mexico SEZs. Those comments are attributed to The Wilderness Society et al.

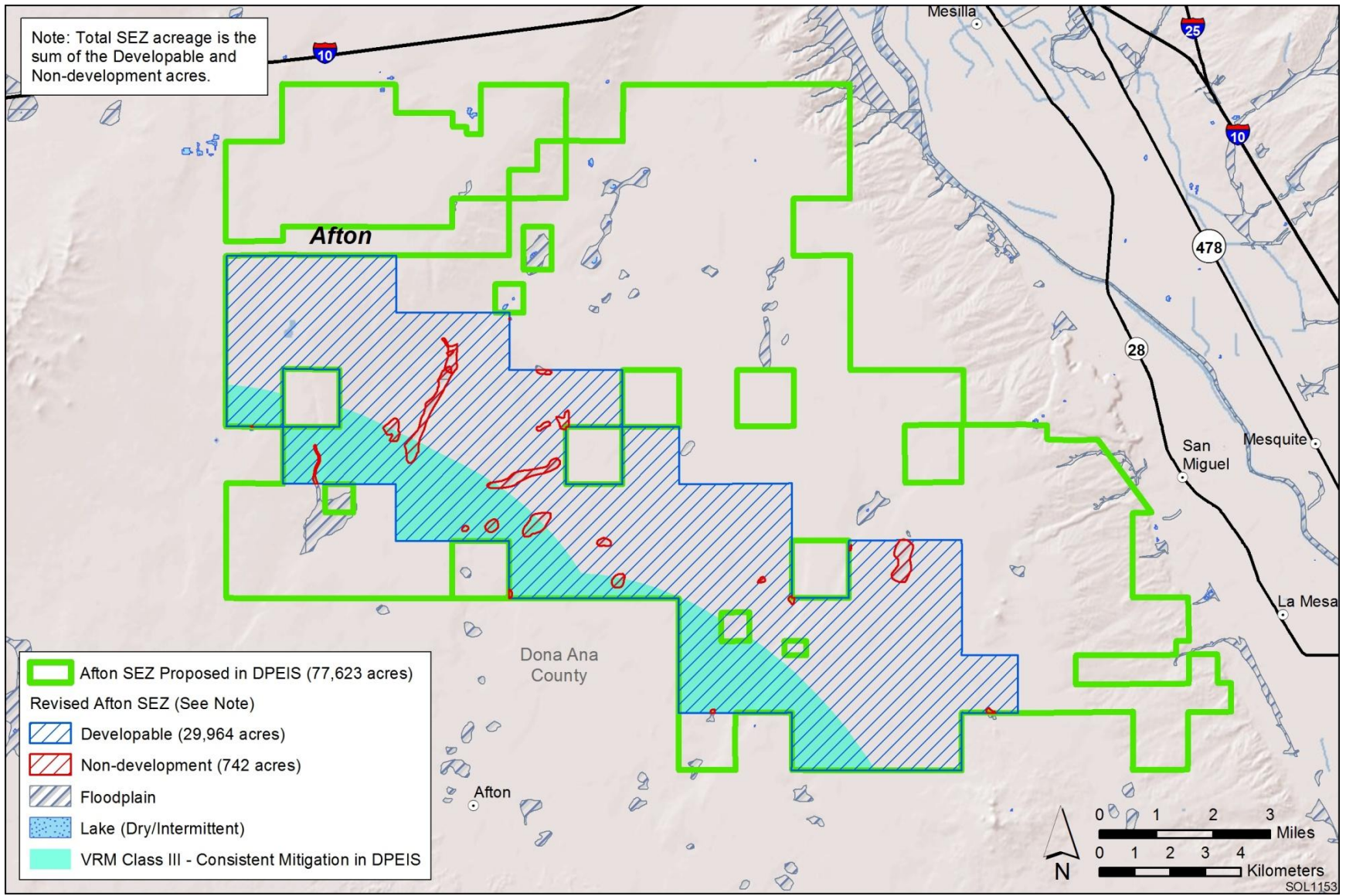


FIGURE C.5.1-2 Proposed Afton SEZ as Described in this Supplement

1 The lands eliminated from the proposed Afton SEZ will be retained as solar right-of-way
2 variance lands, because the BLM expects that individual projects could be sited in this area to
3 avoid and/or minimize impacts. Any solar development within this area in the future would
4 require appropriate environmental analysis.
5

6 7 **C.5.1.4 Wilderness Character Status of SEZ** 8

9 A recently maintained inventory of wilderness characteristics was used to determine
10 whether public lands within the Afton SEZ have wilderness characteristics. The finding of this
11 inventory was that these lands do not contain wilderness characteristics.
12

13 14 **C.5.1.5 Additional Data Collection Recommended** 15

16 17 **C.5.1.5.1 Lands and Realty** 18

19 None.
20

21 22 **C.5.1.5.2 Specially Designated Areas and Lands with Wilderness Characteristics** 23

24 None.
25

26 27 **C.5.1.5.3 Rangeland Resources** 28

29
30 **Livestock Grazing.** The potential impact on grazing allotments will be re-evaluated
31 based on the revised boundaries.
32

33
34 **Wild Horses and Burros.** None.
35

36 37 **C.5.1.5.4 Recreation** 38

39 None.
40

41 42 **C.5.1.5.5 Military and Civilian Aviation** 43

44 The potential for impact on the Las Cruces International Airport will be re-evaluated
45 based on the revised boundaries of the proposed Afton SEZ.
46

1 **C.5.1.5.6 Geologic Setting and Soil Resources**

2
3 None.

4
5
6 **C.5.1.5.7 Minerals**

7
8 Additional information on leasable and strategic minerals in the vicinity of the proposed
9 SEZ will be provided in the Final Solar PEIS to inform the Department of the Interior’s decision
10 on a proposed 20-year withdrawal of SEZ lands.

11
12
13 **C.5.1.5.8 Water Resources**

14
15 The following additional data and actions would help further characterize potential
16 impacts on water resources for the proposed Afton SEZ. A more detailed discussion of each of
17 these activities is included in the water resources action plan provided in Section C.7.2 of this
18 appendix.

- 19
20 • Prepare a planning-level water resources inventory of the Mesilla Basin.
- 21
22 • Identify additional ephemeral stream channels and wetland features for non-
23 development areas through consultation with the New Mexico Water Quality
24 Control Commission (Watershed Protection Section), EPA, and U.S. Army
25 Corps of Engineers (USACE) with a focus on:
26 – Tributaries to the Rio Grande (eastern edge of SEZ), and
27 – Ephemeral stream channels and wetlands located in the north and western
28 portions of the SEZ (region approximately follows County Road B-006
29 from southwest to northeast).
- 30
31 • Perform field surveys and hydrologic analyses to support jurisdictional water
32 determinations and floodplain identifications. Tasks include:
33 – Surveying select stream channels and alluvial fan features for elevations,
34 high water marks, sediment conditions, and
35 – Conducting hydrologic rainfall-runoff-routing analyses to identify
36 100-year floodplain areas.
- 37
38 • Coordinate with the USACE (Albuquerque District) regarding jurisdictional
39 water determinations for the SEZ. Water features to be considered include:
40 – Tributaries to the Rio Grande (eastern edge of SEZ), and
41 – Ephemeral stream channels and wetlands located in the north and western
42 portions of the SEZ (region approximately follows County Road B-006
43 from southwest to northeast)
- 44
45 • Describe the formation of a stakeholder committee to conduct long-term
46 monitoring of water resources. This activity would entail:

- 1 – Identifying key stakeholder agencies,
- 2 – Discussing general features of a monitoring program, and
- 3 – Working with the U.S. Geological Survey (USGS) to develop
- 4 groundwater monitoring well design and numerical groundwater models.
- 5 (Groundwater monitoring should coordinate with the current USGS
- 6 Mesilla Basin Monitoring Program [USGS 2011].)
- 7
- 8 • Develop a superposition groundwater model for the Mesilla Basin in order to
- 9 estimate potential impacts of full build-out groundwater pumping scenarios
- 10 (according to estimated, technology-specific water requirements). This
- 11 activity would entail:
- 12 – Assessing the potential for drawdown impacts on the Rio Grande, other
- 13 groundwater uses, and surface water-groundwater connectivity, and
- 14 – Using the USGS Mesilla Basin groundwater monitoring well program to
- 15 support model development and calibration.
- 16
- 17

18 **C.5.1.5.9 Ecological Resources**

19

20

21 ***Vegetation and Plant Communities.*** The following additional data-gathering actions

22 would help further characterize potential impacts on vegetation and plant communities for the

23 proposed Afton SEZ:

24

- 25 • Identify and map the location and areal extent of desert dry wash, playa,
- 26 wetland, and riparian habitats within the SEZ. Identify and map the location
- 27 and areal extent of these habitats outside the SEZ that may be affected by
- 28 hydrologic changes, including groundwater elevations and changes in water,
- 29 sediment, and contaminant inputs associated with runoff. Such efforts could
- 30 help determine habitat characteristics, including water source, hydrologic
- 31 regime, and dominant plant species.
- 32
- 33 • Identify and map the location and areal extent of cliffs, sand dunes, and sand
- 34 transport systems within the SEZ.
- 35
- 36 • Identify and map the location of all yucca, agave, and ocotillo cacti and other
- 37 succulent plant species.
- 38

39

40 ***Wildlife.*** The following additional data-gathering actions would help further characterize

41 potential impacts on wildlife resources for the SEZ:

42

- 43 • Conduct pre-disturbance surveys within the SEZ to determine the use of the
- 44 SEZ as a movement/migratory corridor or as important habitat for mule deer.
- 45

- 1 • Identify and map the location and areal extent of dry lake and floodplain
2 habitat within the SEZ. These areas are important habitat for a number of
3 wildlife species.
4

5
6 ***Aquatic Biota.*** Investigations recommended under the water resources action plan
7 (Section C.5.1.5.8) would be useful in characterizing and protecting habitat available to aquatic
8 biota. Water may be temporarily present in the intermittent and ephemeral wetlands, pools, and
9 streams located in the Afton SEZ. Therefore, seasonal aquatic invertebrate communities may be
10 present. Wetlands, streams, and pools could be surveyed for aquatic biota.
11

12
13 ***Special Status Species.*** The following additional data-gathering actions would be useful
14 in further characterizing and protecting habitat available to special status species:
15

- 16 • Conduct pre-disturbance surveys within the SEZ to determine the presence
17 and abundance of those special status species that are (1) federally listed,
18 proposed for listing, or candidates for listing under the Endangered Species
19 Act (ESA); or (2) listed by the State of New Mexico as threatened or
20 endangered; or (3) designated as sensitive by the New Mexico BLM State
21 Office. These species are listed in Table C.5.1-1. Surveys should focus on
22 areas identified as potentially suitable, and the suitability of these habitats to
23 support these special status species should be determined in the field. All
24 field-determined suitable habitats for special status species should be mapped.
25 Target species and survey protocols should be developed in coordination with
26 the U.S. Fish and Wildlife Service (USFWS) and NMDGF.
27

28 The Draft Solar PEIS presents a table of Special Status Species for which
29 potential impacts need to be evaluated prior to development in the proposed
30 Afton SEZ. The list of species presented in Table 12.1.12.1-1 of the Draft
31 Solar PEIS also includes species listed by the State of New Mexico and
32 species ranked by the State of New Mexico as S1 or S2, or species of concern.
33 On the basis of design features presented in the Draft Solar PEIS, the potential
34 for impacts on these additional species will also need to be addressed before
35 development could occur in the SEZ.
36

- 37 • Identify and map the location and areal extent of rocky slopes, cliffs, and
38 outcrops within the SEZ. The suitability of these habitats for special status
39 species should be determined. Species potentially associated with these
40 habitats include the Marble Canyon rockcress, New Mexico rock daisy,
41 Sneed's pincushion cactus, American peregrine falcon, fringed myotis, long-
42 legged myotis, Townsend's big-eared bat, and western small-footed myotis.
43
44 • Identify and map the location and areal extent of desert grassland habitat
45 within the SEZ. The suitability of this habitat for special status species should
46 be determined. Species potentially associated with desert grassland habitat

1 **TABLE C.5.1-1 Special Status Species That May Occur in the Vicinity of the Proposed Afton SEZ^a**

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
<i>Plants</i>			
Arizona coralroot	<i>Hexalectris spicata</i> var. <i>arizonica</i>	BLM-S; NM-E	Oak and pinyon-juniper woodland communities in areas of heavy leaf litter. Known to occur in Doña Ana County, New Mexico. About 47,500 acres ^d of potentially suitable habitat occurs in the SEZ region.
Desert night-blooming cereus	<i>Peniocereus greggii</i> var. <i>greggii</i>	BLM-S; NM-E	Sandy to silty gravelly soils in desert grassland communities, gravelly flats, and washes. Nearest recorded occurrence is 6 mi ^e north of the SEZ. About 1,052,000 acres of potentially suitable habitat occurs in the SEZ region.
Gramma grass cactus	<i>Sclerocactus papyracanthus</i>	BLM-S	Pinyon-juniper woodlands and desert grasslands on sandy soils at elevations between 4,900 and 7,200 ft. ^f Nearest recorded occurrence is 29 mi northeast of the SEZ. About 1,037,800 acres of potentially suitable habitat occurs in the SEZ region.
Marble Canyon rockcress	<i>Sibara grisea</i>	BLM-S	Rock crevices and the bases of limestone cliffs in chaparral and pinyon-juniper woodland communities at elevations between 4,500 and 6,000 ft. Known to occur in Doña Ana County, New Mexico. About 82,700 acres of potentially suitable habitat occurs in the SEZ region.
New Mexico rock daisy	<i>Perityle staurophylla</i> var. <i>staurophylla</i>	BLM-S	Endemic to south-central New Mexico in crevices of limestone cliffs and boulders at elevations between 4,900 and 7,000 ft. Known to occur in Doña Ana County, New Mexico. About 4,400 acres of potentially suitable habitat occurs in the SEZ region.
Sand prickly-pear cactus^g	<i>Opuntia arenaria</i>	NM-E	Sandy areas, particularly semi-stabilized sand dunes among open Chihuahuan desertscrub, often associated with sparse cover of grasses at elevations between 3,800 and 4,300 ft. Known to occur on the SEZ and in other portions of the affected area. About 913,000 acres of potentially suitable habitat occurs in the SEZ region.
Sandhill goosefoot	<i>Chenopodium cycloides</i>	BLM-S	Open sandy areas, frequently along the edges of sand dunes. Known to occur in Doña Ana County, New Mexico. About 1,009,000 acres of potentially suitable habitat occurs in the SEZ region.
Sneed's pincushion cactus	<i>Escobaria sneedii</i> var. <i>sneedii</i>	ESA-E; NM-E	Limestone cracks of broken terrain on steep slopes and on limestone edges and rocky slopes in mountainous regions at elevations between 4,000 and 6,000 ft. Nearest recorded occurrences are approximately 10 mi southeast of the SEZ. About 4,500 acres of potentially suitable habitat occurs in the SEZ region.
Villard pincushion cactus	<i>Escobaria villardii</i>	BLM-S; NM-E	Franklin and Sacramento Mountains in Otero and Doña Ana Counties, New Mexico, on loamy soils of desert grassland on broad limestone benches at elevations between 4,500 and 6,500 ft. Known to occur in Doña Ana County, New Mexico. About 1,038,000 acres of potentially suitable habitat occurs in the SEZ region.

TABLE C.5.1-1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
Invertebrates			
Anthony blister beetle	<i>Lytta mirifica</i>	BLM-S	On flowering plants, often in agricultural areas where the species may be a pest of certain crops. Known to occur in Doña Ana County, New Mexico. About 138,500 acres of potentially suitable habitat occurs in the SEZ region.
Reptiles			
Texas horned lizard	<i>Phrynosoma cornutum</i>	BLM-S	Flat, open, generally dry habitats with little plant cover, except for bunchgrass, cactus, and desertscrub in areas of sandy or gravelly soil. Nearest quad-level occurrence intersects the affected area within 5 mi north of the SEZ. About 3,844,800 acres of potentially suitable habitat occurs in the SEZ region.
Birds			
American peregrine falcon	<i>Falco peregrinus anatum</i>	BLM-S; NM-T	Year-round resident in the SEZ region. Open habitats, including deserts, shrublands, and woodlands that are associated with high, near-vertical cliffs and bluffs above 200 ft. When not breeding, activity is concentrated in areas with ample prey, such as farmlands, marshes, lakes, rivers, and urban areas. Known to occur in Doña Ana County, New Mexico. About 1,997,000 acres of potentially suitable habitat occurs in the SEZ region.
Bald eagle	<i>Haliaeetus leucocephalus</i>	BLM-S; NM-T	Winter resident in the SEZ region. Large bodies of water or free-flowing rivers with abundant fish and waterfowl prey. Wintering areas are associated with open water. May occasionally forage in arid shrubland habitats. Known to occur in Doña Ana County, New Mexico. About 1,277,000 acres of potentially suitable habitat occurs in the SEZ region.
Bell's vireo	<i>Vireo bellii</i>	NM-T	Summer breeding resident in the SEZ region. Dense shrublands or woodlands along lower elevation riparian areas among willows, scrub oak, and mesquite. May potentially nest in any successional stage with dense understory vegetation. Known to occur in Doña Ana County, New Mexico. About 386,000 acres of potentially suitable habitat occurs in the SEZ region.
Ferruginous hawk	<i>Buteo regalis</i>	BLM-S	Winter resident in grasslands, sagebrush and saltbrush habitats, and the periphery of pinyon-juniper woodlands. Known to occur in Doña Ana County, New Mexico. About 131,300 acres of potentially suitable habitat occurs in the SEZ region.
Gray vireo	<i>Vireo vicinior</i>	NM-T	Summer breeding resident in the SEZ region. Semiarid, shrubby habitats, especially mesquite and brushy pinyon-juniper woodlands; also chaparral, desertscrub, thorn scrub, oak-juniper woodland, pinyon-juniper, mesquite, and dry chaparral. Nests in shrubs or trees. Known to occur in Doña Ana County, New Mexico. About 549,500 acres of potentially suitable habitat occurs in the SEZ region.
Northern aplomado falcon	<i>Falco femoralis septentrionalis</i>	ESA-E; NM-E	Year-round resident in the SEZ region. Open rangeland and savanna, semiarid grasslands with scattered trees, mesquite, and yucca. Nests in old stick nests of other raptors or ravens that are located in trees or shrubs in desert grassland. Nearest occurrences are 9 mi west of the SEZ. About 2,138,000 acres of potentially suitable habitat occurs in the SEZ region.

TABLE C.5.1-1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
Birds (Cont.)			
Western burrowing owl	<i>Athene cunicularia</i>	BLM-S	Year-round resident in the SEZ region. Open grasslands and prairies, as well as disturbed sites such as golf courses, cemeteries, and airports throughout the SEZ region. Nests in burrows constructed by mammals (prairie dog, badger, etc.). Known to occur in Doña Ana County, New Mexico. About 3,800,000 acres of potentially suitable habitat occurs in the SEZ region.
Western yellow-billed cuckoo	<i>Coccyzus americanus occidentalis</i>	ESA-C	May occur as a summer resident in the SEZ region. Riparian obligate, usually found in large tracts of cottonwood/willow habitats with dense sub-canopies. Known to occur in Doña Ana County, New Mexico. About 9,300 acres of potentially suitable habitat occurs in the SEZ region.
Mammals			
Desert bighorn sheep	<i>Ovis canadensis mexicana</i>	NM-T	Visually open, steep rocky terrain in mountainous habitats in desert regions. Rarely uses desert lowlands, but may use them as corridors for travel between mountain ranges. Known to occur in Doña Ana County, New Mexico. About 208,500 acres of potentially suitable habitat occurs in the SEZ region.
Fringed myotis	<i>Myotis thysanodes</i>	BLM-S	Wide range of habitats, including lowland riparian, desert shrub, pinyon-juniper, and sagebrush habitats. Roosts in buildings and caves. May be a summer or year-round resident in project area. Nearest quad-level occurrence intersects the affected area about 5 mi north of the SEZ. About 3,040,800 acres of potentially suitable habitat occurs in the SEZ region.
Long-legged myotis	<i>Myotis volans</i>	BLM-S	Primarily in montane coniferous forests; also riparian and desert habitats. Hibernates in caves and mines. Roosts in abandoned buildings, rock crevices, and under the bark of trees. Known to occur in Doña Ana County, New Mexico. About 2,705,000 acres of potentially suitable habitat occurs in the SEZ region.
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	BLM-S	Near forests and shrubland habitats below 9,000-ft elevation. Roosts and hibernates in caves, mines, and buildings. May be a summer or year-round resident in the project area. Nearest quad-level occurrence intersects the affected area about 5 mi north of the SEZ. About 2,627,600 acres of potentially suitable habitat occurs in the SEZ region.
Western small-footed myotis	<i>Myotis ciliolabrum</i>	BLM-S	Variety of woodlands and riparian habitats at elevations below 9,000 ft. Roosts in caves, buildings, mines, and crevices of cliff faces. May be a summer or year-round resident in the project area. Known to occur in Doña Ana County, New Mexico. About 3,805,400 acres of potentially suitable habitat occurs in the SEZ region.

^a The listings for (1) federally listed, proposed for listing, or candidates for listing under the ESA, and (2) Arizona BLM State Office sensitive species have been updated since the release of the Draft Solar PEIS.

^b BLM-S = listed as a sensitive species by the BLM; ESA-C = candidate for listing under the ESA; ESA-E = listed as endangered under the ESA; NM-E = listed as endangered by the State of New Mexico; NM-T = listed at threatened by the State of New Mexico.

Footnotes continued on next page.

TABLE C.5.1-1 (Cont.)

- ^c For plant species, potentially suitable habitat was determined by using Southwest Regional Gap Analysis Project (SWReGAP) land cover types (USGS 2005). For terrestrial vertebrate species, potentially suitable habitat was determined by using SWReGAP habitat suitability and land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.
- ^d To convert acres to km², multiply by 0.004047.
- ^e To convert mi to km, multiply by 1.609.
- ^f To convert ft to m, multiply by 0.3048.
- ^g Species in bold text have been recorded or have designated critical habitat in the affected area.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35

include the desert night-blooming cereus, grama grass cactus, Villard pincushion cactus, and northern aplomado falcon.

- Identify and map the location and areal extent of woodland habitat within the SEZ. The suitability of this habitat for special status species should be determined. Species potentially associated with woodland habitat include the Arizona coralroot grama-grass cactus, Marble Canyon rockcress, American peregrine falcon, Bell’s vireo, ferruginous hawk, gray vireo, fringed myotis, and long-legged myotis.
- Identify and map the location and areal extent of riparian habitat within the SEZ. The suitability of this habitat for special status species should be determined. Species potentially associated with riparian habitat include the bald eagle, Bell’s vireo, western yellow-billed cuckoo, and long-legged myotis.
- Identify and map the location and areal extent of sand dune habitat and associated sand transport systems within the SEZ. The suitability of this habitat for special status species should be determined. Species potentially associated with sand dune habitat include the sand prickly-pear cactus and sandhill goosefoot.

C.5.1.5.10 Air Quality and Climate

None.

C.5.1.5.11 Visual Resources

Visual resources will be reevaluated for the Final Solar PEIS based on the revisions to boundaries and proposed technology restrictions described in Section C.5.1.3 of this Supplement. A summary of the Draft Solar PEIS visual contrast analysis for the proposed Afton SEZ is

1 provided in Table C.5.1-2. This table includes only the resources that would be subject to
2 moderate or strong visual contrast. The Draft Solar PEIS visual impact analysis predicted these
3 levels of visual contrast from solar energy development in the Afton SEZ for the following
4 sensitive visual resource areas (SVRAs) and sensitive viewing locations (SVLs):
5

- 6 • Prehistoric Trackways
- 7
- 8 • Aden Lava Flow WS
- 9
- 10 • Organ Mountains, Organ Needles, Pena Blanca, Robledo Mountains, and
- 11 West Potrillo Mountains/Mount Riley WSAs
- 12
- 13 • Aden Hills Off-Highway Vehicle SRMA
- 14
- 15 • Doña Ana Mountain SRMA
- 16
- 17 • Organ/Franklin Mountains Recreation Management Zone SRMA
- 18
- 19 • Doña Ana Mountain ACEC
- 20
- 21 • Organ/Franklin Mountain ACEC
- 22
- 23 • Robledo Mountain ACEC
- 24
- 25 • Mesilla Plaza, a National Historic Landmark
- 26
- 27 • El Camino Real de Tierra Adentro National Historic Trail
- 28
- 29 • El Camino Real Scenic Byway
- 30
- 31 • Kilbourne Hole National Natural Landmark
- 32
- 33 • Butterfield Trail
- 34
- 35 • I-25
- 36
- 37 • I-10
- 38
- 39 • U.S. 70
- 40
- 41 • The towns of Las Cruces, University Park, Mesilla, Doña Ana, San Miguel,
- 42 La Mesa, Mesquite, Vado, and Berino.
- 43
- 44

1 **TABLE C.5.1-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi (40-km) Viewshed of the Proposed**
 2 **Afton SEZ**

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi ^e	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes ^f
National Monument	Prehistoric Trackways	5,255 acres	6.2 mi north of the SEZ	3,007 acres	57.2	Most higher elevation viewpoints would have generally open views of solar developments; for these viewpoints, this would likely result in strong visual contrast levels from solar facilities. Lower elevation views may be partially screened by landforms, and partial visibility of the SEZ, combined with lower viewing angles, would result in lower levels of visual contrast at most viewpoints. The visible area of the monument extends to 9.6 mi from the point of closest approach at the northern boundary of the SEZ.
WSAs	Aden Lava Flow	25,978 acres	1.4 mi south of the SEZ	25,570 acres	98.4	Since the WSA is close to the proposed SEZ and is very flat, there is generally little screening by topography between the WSA and SEZ, and thus locations would have open views of the SEZ. Although the vertical angle of view is low, the SEZ is so large, it would stretch across much of the horizon, resulting in strong visual contrast for most locations. The visible area of the WSA extends from the point of closest approach to 8.9 mi from the southern boundary of the SEZ.

TABLE C.5.1-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi ^e	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes ^f
WSAs	Organ Mountains	7,186 acres	15 mi northeast of the SEZ	3,861 acres	53.7	Higher elevation viewpoints on the western side of the Organ Mountains would have elevated and open views of solar developments that would occupy most of the horizontal field of view, resulting in moderate to strong visual contrast levels. Lower elevation views may be partially screened by landforms, and partial visibility of the SEZ, combined with long distance and low viewing angles, would result in lower levels of visual contrast at most viewpoints. The visible area extends to about 18 mi from the point of closest approach at the northeast boundary of the SEZ.
	Organ Needles	5,936 acres	13 mi northeast of the SEZ	2,349 acres	39.6	Higher elevation viewpoints on the western side of the Organ Mountains would have elevated and open views of solar developments. Because of the SEZ's large size, it would occupy most of the horizontal field of view, resulting in moderate to strong visual contrast levels from solar facilities. Lower elevation views may be partially screened by landforms, and partial visibility of the SEZ, combined with long distance and low viewing angles, would result in lower levels of visual contrast at most, but not all, viewpoints. The visible area extends to about 17 mi from the northeastern boundary of the SEZ.

TABLE C.5.1-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi ^e	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes ^f
WSAs (Cont.)	Pena Blanca	4,648 acres	13 mi east of the SEZ	3,738 acres	80.4	Higher elevation viewpoints on the western side of the Organ Mountains would have elevated and open views of solar developments. Because of the SEZ's large size, it would occupy most of the horizontal field of view, resulting in moderate to strong visual contrast levels from solar facilities. Lower elevation views could be partially screened by landforms, but most viewpoints would have open views of the SEZ, and despite the low viewing angles, would likely be subject to moderate to strong visual contrasts from solar facilities. The visible area of the WSA extends about 15 mi from the northeastern boundary of the SEZ.
	Robledo Mountains	13,049 acres	8.3 mi north of the SEZ	2,622 acres	20.1	Viewpoints on the peaks and south-facing slopes would have elevated and open views of solar developments. Because of the SEZ's large size, it would occupy most of the horizontal field of view. Solar facilities would be likely to present strong visual contrast levels to viewers. Areas within the WSA also could have views of solar facilities within the Mason Draw SEZ, which could increase the perceived visual contrast associated with solar energy

TABLE C.5.1-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi ^e	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes ^f
WSAs (Cont.)	Robledo Mountains (Cont.)					development in the landscape setting. The visible area extends to about 14 mi from the northern boundary of the SEZ.
	West Potrillo Mountains/Mt. Riley	159,323 acres	5.7 mi southwest of the SEZ	52,951 acres	33.2	Higher elevation viewpoints in the northeastern portion of the WSA would have open views of solar developments. Because of the SEZ's large size, it would occupy most of the horizontal field of view; solar facilities would be likely to present moderate to strong visual contrast levels. Some areas could have views of solar facilities within the Mason Draw SEZ, which could increase the perceived visual contrast associated with solar energy development. The visible area of the WSA extends to about 23 mi from the western boundary of the SEZ.
SRMAs	Aden Hills Off-Highway Vehicle Area	8,054 acres	4.6 mi from the SEZ	7,681 acres	95.4	Solar facilities would be so visually prominent that they would be expected to dominate views from the SRMA to the east and would contrast very strongly with the surroundings, as seen from most of the SRMA. A portion of the SRMA within the viewshed extends to beyond 4.6 mi from the SEZ.

TABLE C.5.1-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi ^d of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi ^e	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes ^f
SRMAs (Cont.)	Doña Ana Mountain	8,345 acres	10 mi northeast of the SEZ	5,380 acres	64.5	For lower elevation viewpoints, the vertical angle of view is so low that it would be expected to reduce the visual contrast associated with solar facilities. Although the SRMA is close enough to the SEZ, the SEZ would stretch across most of the southern horizon, and moderate visual contrast would be expected. Because of the slightly higher vertical viewing angles, visual contrast levels would likely be greater for higher elevation viewpoints in the SRMA, even if they might be farther from the SEZ. The visible area extends from the point of closest approach to 16 mi within the SRMA.
	Organ/Franklin Mountains RMZ	60,793 acres	6.1 mi east of the SEZ	43,319 acres	71.3	Most of the area would have open views of solar developments; solar facilities would likely present strong visual contrast levels to viewers within the mountains. At some of the more distant viewpoints, moderate levels of visual contrast would be expected, primarily because the SEZ would occupy a smaller portion of the horizontal field of view. The visible area extends from the point of closest approach to 15 mi within the SRMA.

TABLE C.5.1-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi ^e	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes ^f
ACECs Designated for Outstanding Scenic Values	Doña Ana Mountain	1,427 acres	13 mi north of the SEZ	747 acres	52.3	For lower elevation viewpoints, the vertical angle of view is so low that it would be expected to reduce the visual contrast associated with solar facilities. Although the SRMA is close enough to the SEZ, the SEZ would stretch across most of the southern horizon, and moderate visual contrast would be expected. Because of the slightly higher vertical viewing angles, visual contrast levels would likely be greater for higher elevation viewpoints, even if they might be farther from the SEZ. The visible area of the ACEC extends approximately 15 mi from the northern boundary of the SEZ.
	Organ/Franklin Mountains	58,512 acres	6.1 mi east of the SEZ	41,101 acres	70.2	Most of the area would have open views of solar developments; solar facilities would likely present strong visual contrast levels to viewers. At some of the more distant viewpoints, moderate levels of visual contrast would be expected, primarily because the SEZ would occupy a smaller portion of the horizontal field of view. The visible area of the ACEC extends to more than 18 mi from the eastern boundary of the SEZ.

TABLE C.5.1-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi ^d of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi ^e	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes ^f
ACECs Designated for Outstanding Scenic Values (Cont.)	Robledo Mountains	8,659 acres	8.5 mi north of the SEZ	1,976 acres	22.8	Viewpoints on the peaks and south-facing slopes of the mountains would have elevated and open views of solar development. Because of the SEZ's large size, it would occupy most of the horizontal field of view; solar facilities would likely present strong visual contrast levels to viewers. Some areas also could have views of solar facilities within the Mason Draw SEZ, which could increase the perceived visual contrast. The visible area of the ACEC extends to about 14 mi from the northern boundary of the SEZ.
National Historic Landmark	Mesilla Plaza	NA ^g	Selected viewpoint is about 2.7 mi northeast of the northeast corner of the SEZ	NA	NA	Solar facilities would be expected to create moderate to strong visual contrasts, with stronger contrast levels expected if multiple power tower receivers were visible above West Mesa. The Plaza is located within the town of Mesilla.
National Historic Trail	El Camino Real de Tierra Adentro	404 mi	Passes within 3.2 mi east of the SEZ	41.9 mi	10.4	Because of the open views of the SEZ along the rim of West Mesa, and the elevated position of the SEZ with respect to the trail, strong visual contrasts would be expected for some viewpoints on the trail. The distance to the SEZ ranges from the point of closest approach to 20 mi north of the northern boundary of the SEZ.

TABLE C.5.1-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi ^d of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi ^e	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes ^f
National Natural Landmark	Kilbourne Hole ^h	1,088 acres	9.3 mi south-southwest of the SEZ	NA ^g	NA	Solar facilities would occupy most of the horizontal field of view looking north and northeast. Depending on solar facility location, the types of solar facilities and their designs, and other visibility factors, moderate to strong visual contrasts would be expected at locations along the top of the ridge around the north side of Kilbourne Hole. Contrast at locations along the ridge on the east, west, and south sides of the crater would generally be lower, due in part to increased distance to the SEZ but primarily because of partial or full screening of the SEZ. Views of the SEZ from inside the Kilbourne Hole crater would be completely screened by the crater walls. There is a ridge around nearly the entire crater, and the SEZ would be visible from the ridgeline and north-facing slopes of most of the ridge; a trail runs along the top of the ridge.
Scenic Byway	El Camino Real	299 mi	Passes within 3.2 mi east of the SEZ	52.4 mi	17.5	Because of the open views of the SEZ along the rim of West Mesa and the elevated position of the SEZ with respect to the byway, strong visual contrasts would be expected for some viewpoints. The distance between the byway and SEZ ranges from the point of closest approach to more than 24 mi south of the southeastern boundary of the SEZ.

TABLE C.5.1-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi ^d of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi ^e	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes ^f
Other Areas of Interest (non-management areas)	I-25 ⁱ	1,063 mi	NA ^g	23 mi	2.2	Depending on the location, type, and height of solar facility components in the eastern part of the SEZ, visual contrast levels could be strong if multiple power towers were visible along the rim of West Mesa, with substantially lower levels of contrast expected if only lower height facilities were located along the eastern side of the SEZ. Solar facilities within the SEZ could be in view from I-25 for about 20 minutes driving time at highway speeds. Facilities could be in view from about 23 mi of the roadway, from beyond Radium Springs to I-25's southern terminus in Las Cruces. Southbound travelers would see very little at first, but as they approached Doña Ana, potential visibility of solar facilities in the SEZ would increase, reaching maximum levels of visual contrast at the I-25/I-10 interchange, where I-25 ends.
	I-10 ^j	2,460 mi	NA ^g	81 mi	3.3	Northbound travelers could first see solar facilities outside of El Paso, with a gradual increase in contrast levels as I-10 passes north up the Mesilla Valley, and reaching maximum levels of visual contrast near the Las Cruces Municipal Airport. At some viewpoints,

TABLE C.5.1-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi ^d of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi ^e	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes ^f
Other Areas of Interest (non-management areas) (Cont.)	I-10 ^j (Cont.)					depending on the location, type, and height of solar facility components, visual contrast levels could be strong. Solar facilities could be in view from I-10 for about 65 to 70 minutes driving time at highway speeds.
	U.S. 70 ^k	2,385 mi	NA	22 mi	0.9	Contrast levels would continue to slowly increase, but would likely remain at moderate levels until U.S. 70 began to climb the western slope of West Mesa. At that point, the slope in front of the vehicle would cut off views of solar facilities. Solar facilities would come back into view as U.S. 70 crested the slope of West Mesa, very near to the junction of U.S. 70 and I-10. At this location, with open and near-level views of the SEZ less than 2 mi away, expected visual contrasts would be moderate to strong.
	Las Cruces ^l	83 acres	7 mi	NA	NA	Moderate to strong visual contrast levels could be experienced in some portions.
	University Park ^l	1,005 acres	7 mi	NA ^g	NA	Moderate to strong visual contrast levels could be experienced.
	Mesilla ^l	3,430 acres	7 mi	NA	NA	Strong visual contrast levels could be experienced.

TABLE C.5.1-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi ^e	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes ^f
Other Areas of Interest (non-management areas) (Cont.)	Doña Ana ¹	467 acres	9.2 mi	NA	NA	Weak to moderate visual contrast levels could be experienced.
	San Miguel	NA	0.8 mi	NA	NA	Strong visual contrast levels could be experienced.
	La Mesa	NA	1.2 mi	NA	NA	Strong visual contrast levels could be experienced.
	Mesquite ¹	531 acres	3.1 mi	NA ^g	NA	Strong visual contrast levels could be experienced.
	Vado ¹	1,894 acres	3.4 mi	NA ^g	NA	Strong visual contrast levels could be experienced.
	Berino	NA	6.0 mi	NA	NA	Moderate to strong visual contrast levels could be experienced.

^a To convert mi to km, multiply by 1.609.

^b To convert acres to km², multiply by 0.004047.

^c Mileage (within all columns) is used only for trails or roads, unless otherwise specified.

^d Distances at the point of closest approach are based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries would result in changes to these calculations.

^e The total acreage/mileage visible within 25 mi (40 km) of the SEZ is based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries will result in changes to these acreages/mileages, as well as the percentage of total acreage/mileage visible within 25 mi (40 km) of the SEZ. The correct values will be given in the Final PEIS.

^f The assessment of impacts is based on the Draft Solar PEIS analysis dated December 2010. Subsequent alterations to the SEZ boundaries may result in reduced impacts in some of the SVRAs/SVLs due to the reduction in the overall footprint of the SEZ.

Footnotes continued on next page.

TABLE C.5.1-2 (Cont.)

- ^g NA = data not available.
- ^h Approximate acreage of Kilbourne: BLM (2011b).
- ⁱ Length of I-25: AARoads' Interstate Guide (2006a).
- ^j Length of I-10: AARoads' Interstate Guide (2006b).
- ^k Length of U.S. 70: US-Highways.com. (2010).
- ^l Acreage of New Mexico towns/cities: U.S. Bureau of the Census (2011b).

1 The following steps could be taken to better understand potential impacts on these
2 SVRAs and SVLs from solar development in the Afton SEZ:

- 3
- 4 • Identify key observation points (KOPs) within these areas through working
5 with the management agency or other local stakeholders.
- 6
- 7 • Conduct viewshed analyses from the KOPs to determine how much of the
8 SEZ would be in view from each KOP.
- 9
- 10 • As deemed necessary, based on viewshed analysis results, prepare wireframe
11 Google Earth™ visualizations of hypothetical solar facilities in the SEZ
12 depicting the 80% development scenario to better estimate potential impacts.
- 13

14 This additional analysis may help judge potential visual contrast more accurately for most
15 KOP. For KOPs of particularly high sensitivity, a site visit with photography and
16 superimposition of the wireframe models onto the photos might be required or desired.

17
18 Additional required mitigation measures to address potential visual resource impacts are
19 given in Section C.7.3 of this appendix.

20 21 22 **C.5.1.5.12 Acoustic Environment**

23
24 None.

25 26 27 **C.5.1.5.13 Paleontological Resources**

28
29 The Afton SEZ is located in an area with a Potential Fossil Yield Classification (PFYC)
30 that has been predominantly determined to be Class 4/5. Therefore, the potential for impacts on
31 paleontological resources is high. A paleontological survey should be conducted to determine
32 whether paleontological materials are present in the SEZ.

33
34 The BLM Regional Paleontologist will be contacted to determine whether additional
35 information is available regarding PFYC identifications in New Mexico.

36 37 38 **C.5.1.5.14 Cultural Resources and Native American Concerns**

39
40 Approximately 6% of the revised proposed Afton SEZ footprint has been surveyed
41 (approximately 1,840 acres [7.4 km²]). At least 58 sites have been recorded within the SEZ.
42 At least two of the sites are eligible for listing in the *National Register of Historic Places*, but
43 many are undetermined. The densest concentration of sites is in the southwestern portion of
44 the SEZ. Dune areas and areas near the Mesilla Valley are of potential concern for impacts on
45 cultural resources, as are a number of nearby ACECs designated to protect cultural values.
46 Approximately 330 sites have been recorded within 5 mi (8 km) of the SEZ, including several

1 sites with structural remains. The El Camino Real de Tierra Adentro National Historic Trail and
2 the Butterfield Trail are both relatively close to the SEZ and could be affected visually. There
3 may potentially be visual impacts on the Mesilla Plaza National Historic Landmark as well. The
4 destruction or degradation of important plant resources, and the destruction of habitat or
5 impediments to the movement of culturally important wildlife are also potential impacts of
6 concern within the SEZ.

7
8 The following additional data collection efforts would reduce the uncertainty about
9 potential impacts on cultural resources:

- 10 • Conduct a Class I literature file search to better understand (1) the site
11 distribution pattern in the vicinity of the SEZ, (2) trail networks through
12 existing ethnographic reports, and (3) overall cultural sensitivity of the
13 landscape.
- 14 • Conduct a Class II Stratified Random Sample Survey of the SEZ to obtain a
15 10% sample (approximately 3,071 acres [12.4 km²]). If the approximately
16 1,840 acres (7.4 km²) previously surveyed meets current survey standards,
17 then approximately 1,231 acres (5.0 km²) of survey could satisfy a 10%
18 sample. Areas of interest, as determined through a Class I review, should also
19 be identified prior to establishing the survey design and sampling strategy,
20 such as any dune areas in the SEZ. Subsurface testing of any dune areas
21 should be a component of the sampling strategy.
- 22 • Prepare a cultural sensitivity map based on results of the Class II survey and
23 Class I review.
- 24 • Identify any high potential segments of the El Camino Real de Tierra Adentro
25 National Historic Trail and conduct viewshed analyses from key points along
26 those portions of the trail.
- 27 • Conduct a viewshed analysis from Mesilla Plaza, a National Historic
28 Landmark.
- 29 • Identify key points within nearby ACECs (Los Tules, Organ/Franklin
30 Mountains, Robledo Mountain, Doña Ana Mountain, and San Diego
31 Mountain) and Special Management Areas (Butterfield Trail) and conduct
32 viewshed analyses to determine visual impacts on these resource areas
33 designated for cultural values.
- 34 • Continue with government-to-government consultation as described in
35 Section 2.4.3, including follow-up to recent ethnographic studies with Tribes
36 not included in the original studies to determine whether those Tribes have
37 similar concerns. The Afton SEZ falls in the traditional use area of primarily
38 the Chiricahua Apache, but also the Manso and the Piro Pueblo. Descendants
39 of the latter two groups are found among members of the Ysleta del Sur
40
41
42
43
44
45
46

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17

Pueblo and in the Tortuga Community in Las Cruces. Potential topics to be discussed during consultation include Potrillo and Florida Mountains, Salinas Peak, the above-mentioned ACECs, trail systems, mountain springs, habitation sites as places of cultural importance, burial sites, rock art, ceremonial areas, water resources, and plant and animal resources.

C.5.1.5.15 Socioeconomics and Environmental Justice

None.

C.5.1.5.16 Cumulative Impact Considerations

None.

1 **C.6 UTAH PROPOSED SOLAR ENERGY ZONES**

2
3
4 **C.6.1 Escalante Valley**

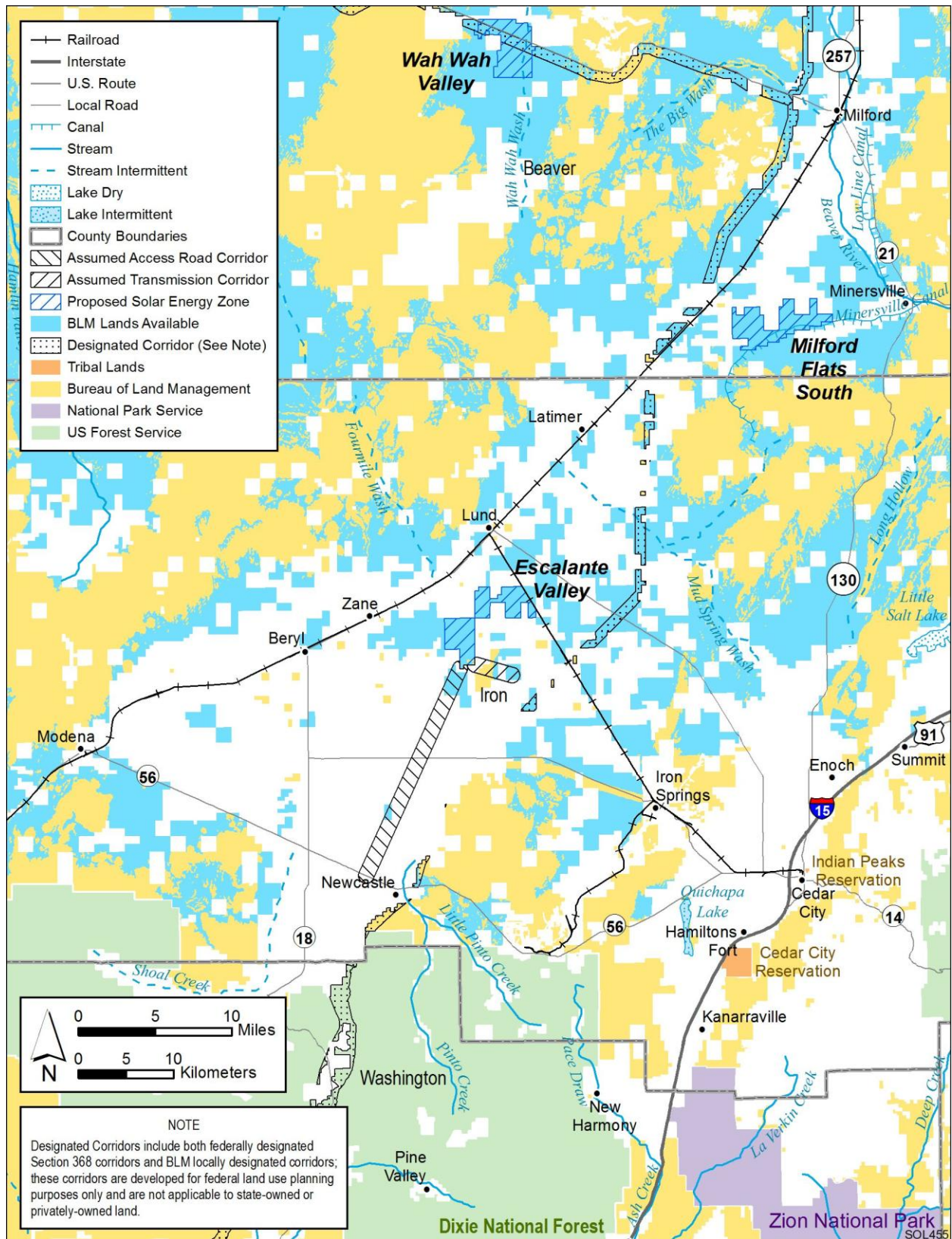
5
6
7 **C.6.1.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic**
8 **Environmental Impact Statement (PEIS)**
9

10 The proposed Escalante Valley solar energy zone (SEZ), as presented in the Draft Solar
11 PEIS, had a total area of 6,614 acres (27 km²). It is located in Iron County in southwestern Utah
12 (Figure C.6.1-1). The towns of Lund and Zane are about 4 mi (6 km) north of, and 5 mi (8 km)
13 west of, the SEZ, respectively.
14

15 The Draft Solar PEIS identified a 138-kV transmission line that ends about 3 mi (5 km)
16 from the southeastern area of the southernmost part of the SEZ as the nearest point of connection
17 of the SEZ to the grid. The location of new transmission that could be constructed for this SEZ in
18 the future may be different from that assumed in the Draft Solar PEIS. Details on the updated
19 transmission impact assessment to be included in the Final Solar PEIS are provided in
20 Section C.7.1 of this appendix. The Draft Solar PEIS also identified State Route 56, located
21 about 15 mi (24 km) to the southeast of the SEZ, as the nearest major road, and assumed that a
22 new access road would be constructed from the proposed SEZ to State Route 56 to support
23 development. As for a new transmission line, the location of a new access road that could be
24 constructed in the future may be different from that assumed in the Draft Solar PEIS. Analysis of
25 transmission lines and/or access roads will be completed, as necessary, as part of the project-
26 specific environmental reviews (see Section 2.2.2.2.2 of this Supplement).
27

28 Potential adverse impacts identified in the Draft Solar PEIS included the following:

- 29
- 30 • There could be a 20% reduction in the Butte grazing allotment that could have
31 potential adverse economic impacts on two permittees.
32
 - 33 • Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil
34 erosion by wind and runoff, sedimentation, and soil contamination) could
35 occur.
36
 - 37 • Existing oil and gas leases represent a prior existing right that could affect
38 solar energy development of the SEZ.
39
 - 40 • Groundwater use would deplete the aquifer to the extent that, at a minimum,
41 wet-cooling options would not be feasible.
42
 - 43 • Clearing of a large portion of the proposed SEZ could adversely affect dry
44 wash and dry lake habitats, and playa and sand dune and sand transport areas,
45 depending on the amount of habitat disturbed. The establishment of noxious
46 weeds could result in habitat degradation. Deposition of fugitive dust could
47 cause reduced productivity or changes in plant community structure.



1

2 **FIGURE C.6.1-1 Proposed Escalante Valley SEZ as Presented in the Draft Solar PEIS**

- 1 • Potentially suitable habitat for 18 special status species and more than
2 70 wildlife species occurs in the affected area of the proposed SEZ; less than
3 1.1% of the potentially suitable habitat for any of these species occurs in the
4 region that would be directly affected by development.
5
- 6 • If aquatic biota are present, they could be affected by the direct removal of
7 surface water features within the construction footprint. If present, aquatic
8 biota could also be affected by a decline in habitat quantity and quality due to
9 water withdrawals and changes in drainage patterns, as well as increased
10 sediment and contaminant inputs associated with ground disturbance and
11 construction activities.
12
- 13 • Temporary exceedances of ambient air quality standards for particulate matter
14 at the SEZ boundaries are possible during construction. These high
15 concentrations, however, would be limited to the immediate area surrounding
16 the SEZ boundary.
17
- 18 • Although the SEZ is in an area of low scenic quality, strong visual contrasts
19 could be observed by residents nearest to the SEZ.
20
- 21 • During operations, noise levels at the nearest residences could be about equal
22 to the Iron County regulation level if concentrating solar power facilities with
23 energy storage technologies (which could extend the daily operational time by
24 6 hours or more) were used at the SEZ.
25
- 26 • Few, if any, impacts on significant paleontological resources are likely to
27 occur. The proposed SEZ has a high potential for containing archaeological
28 sites in the dune area in the southwest portion of the SEZ.
29
- 30 • Low-income populations occur within a 50-mi (80-km) radius of the proposed
31 SEZ boundary; thus adverse impacts of solar development could
32 disproportionately affect low-income populations.
33
34

35 **C.6.1.2 Summary of Comments Received**

36
37 Most of the comments received on the proposed Escalante Valley SEZ were in favor of
38 identifying the area as an SEZ (HEAL Utah, The Wilderness Society et al.³⁰). The Wilderness
39 Society et al. proposed adjusting the boundary adjacent to the dry lakebed in the southwest
40 portion of the SEZ with a buffer to protect the area and using existing access roads rather than
41 constructing a new road from State Route 56.

³⁰ The Wilderness Society, Wild Utah Project, Southern Utah Wilderness Alliance, Grand Canyon Trust, Center for Native Ecosystems, Sierra Club, Natural Resources Defense Council, Soda Mountain Wilderness Council, and Sierra Trek submitted joint comments on the proposed Utah SEZs. Those comments are attributed to The Wilderness Society et al.

1 The Western Watersheds Project suggested that the U.S. Department of the Interior
2 Bureau of Land Management (BLM) include the retirement of grazing allotments as a mitigation
3 measure. There were concerns over vegetation removal and soil disturbance within the Escalante
4 Valley SEZ, and stringent guidelines and mitigation measures to preserve native vegetation and
5 soils were recommended to alleviate impacts (Wilderness Society et al.).
6

7 The Western Watersheds Project recommended that cumulative impact analysis include
8 an analysis of the proposed new road construction, and new transmission lines and upgrades,
9 particularly for species such as the greater sage-grouse, western burrowing owl, ferruginous
10 hawk, pygmy rabbit, bald eagle, and Utah prairie dog. The Western Watersheds Project also
11 recommended that the BLM perform cultural resource surveys and Native American consultation
12 prior to defining the SEZ, to ensure that the SEZ is an area with low resource conflicts.
13
14

15 **C.6.1.3 Changes to the SEZ**

16
17 No boundary revisions were identified for the proposed SEZ. However, areas specified
18 for non-development under SEZ-specific design features were mapped, where data were
19 available. For the proposed Escalante Valley SEZ, 12 acres (0.05 km²) of dry lake area and
20 69 acres (0.28 km²) of dune area were identified as non-development areas (see Figure C.6.1-2).
21 The remaining developable area within the SEZ is 6,533 acres (26.4 km²).
22
23

24 **C.6.1.4 Wilderness Character Status of SEZ**

25
26 A recently maintained inventory of wilderness characteristics was used to determine
27 whether public lands within the Escalante Valley SEZ have wilderness characteristics. The
28 finding of this inventory was that these lands do not contain wilderness characteristics
29
30

31 **C.6.1.5 Additional Data Collection Recommended**

32 33 34 **C.6.1.5.1 Lands and Realty**

35
36 None.
37
38

39 **C.6.1.5.2 Specially Designated Areas and Lands with Wilderness Characteristics**

40
41 None.
42

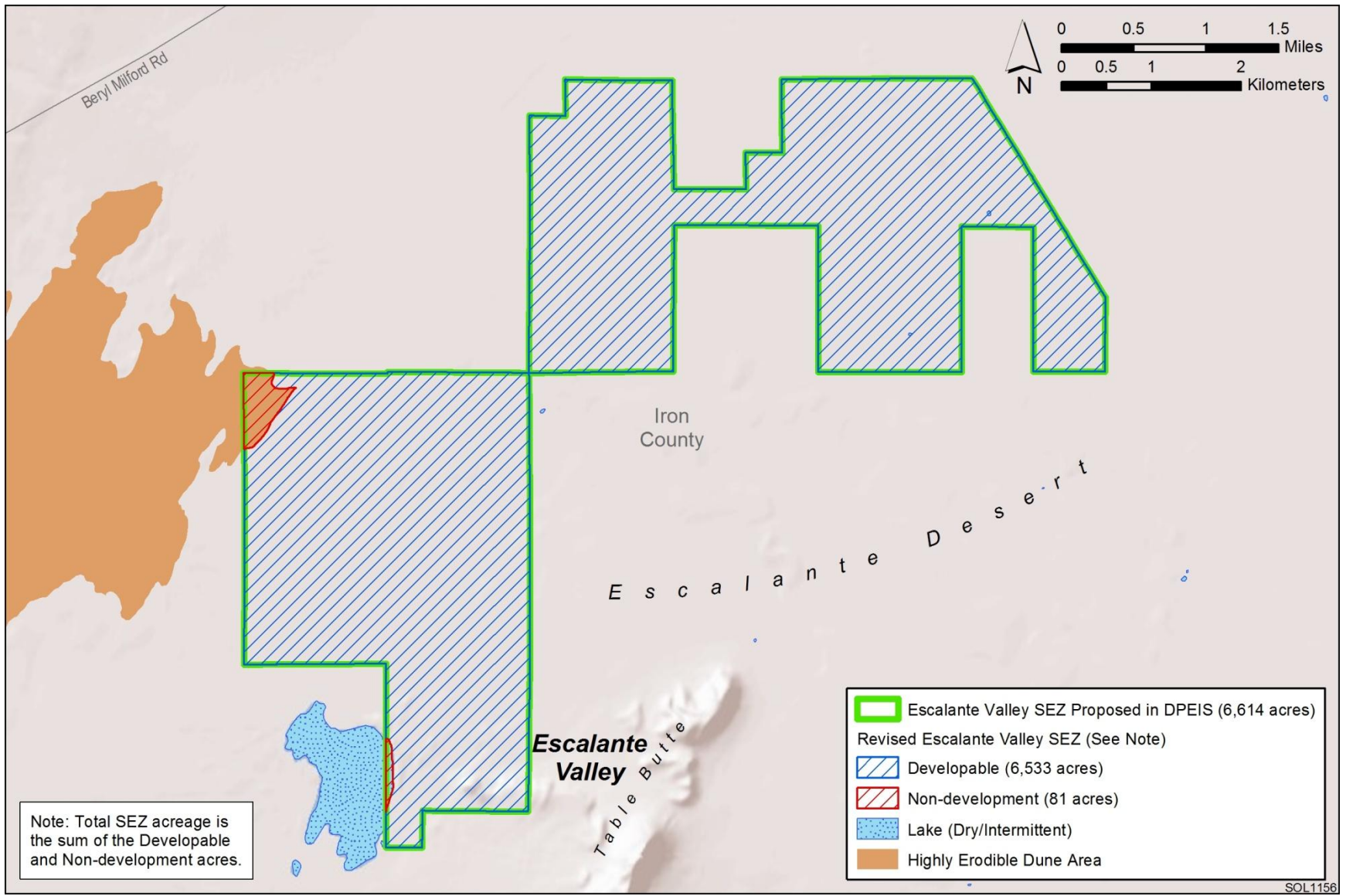


FIGURE C.6.1-2 Proposed Escalante Valley SEZ as Described in this Supplement

1 **C.6.1.5.3 Rangeland Resources**

2
3
4 *Livestock Grazing.* The potential impact on the Butte grazing allotment needs to be
5 reviewed with BLM field office staff.
6

7
8 *Wild Horses and Burros.* None.
9

10
11 **C.6.1.5.4 Recreation**

12
13 None.
14

15
16 **C.6.1.5.5 Military and Civilian Aviation**

17
18 None.
19

20
21 **C.6.1.5.6 Geologic Setting and Soil Resources**

22
23 None.
24

25
26 **C.6.1.5.7 Minerals**

27
28 Additional information on leasable and strategic minerals in the vicinity of the proposed
29 SEZ will be provided in the Final Solar PEIS to inform the Department of the Interior’s decision
30 on a proposed 20-year withdrawal of SEZ lands.
31

32
33 **C.6.1.5.8 Water Resources**

34
35 The following additional data and actions would help further characterize potential
36 impacts on water resources for the proposed Escalante Valley SEZ. A more detailed discussion
37 of each of these activities is included in the water resources action plan provided in Section C.7.2
38 of this appendix.
39

- 40 • Prepare a planning-level water resources inventory of the Beryl-Enterprise
41 Basin.
42
43 • Identify additional dry lakes, ephemeral stream channels, and alluvial
44 fan features for non-development areas through consultation with BLM
45 Utah, Utah Division of Water Resources, Utah Division of Water Rights,

1 U.S. Environmental Protection Agency, and U.S. Army Corps of Engineers
2 (USACE) with a focus on:

- 3 – Dick Palmer Wash,
- 4 – Unnamed washes in the southwestern portion of the SEZ, and
- 5 – The dry lakebed to the west of Table Butte.

- 6
- 7 • Perform field surveys and hydrologic analyses to support jurisdictional water
8 determinations and floodplain identifications. Tasks include:
 - 9 – Surveying Dick Palmer Wash and unnamed washes for surface elevations,
10 high water marks, and sediment conditions; and
 - 11 – Conducting hydrologic rainfall-runoff-routing analyses to identify
12 100-year floodplain areas.
- 13
- 14 • Coordinate with the USACE (Sacramento District) regarding jurisdictional
15 water determinations for the SEZ. Water features that need to be considered
16 include:
 - 17 – Dick Palmer Wash, and
 - 18 – The unnamed washes.
- 19
- 20 • Identify 100-year floodplain non-development areas (if they exist) for the dry
21 lake, Dick Palmer Wash, and unnamed washes identified during field survey.
22 This task would require coordination with the Federal Emergency
23 Management Agency and the following agencies:
 - 24 – Utah Department of Public Safety, and
 - 25 – Utah Geological Survey.
- 26
- 27 • Describe the formation of a stakeholder committee to conduct long-term
28 monitoring of water resources. This activity would entail:
 - 29 – Identifying key stakeholder agencies,
 - 30 – Discussing general features of a monitoring program, and
 - 31 – Working with the U.S. Geological Survey to develop groundwater
32 monitoring well design and numerical groundwater models.
- 33
- 34 • Develop a simple, numerical groundwater model for the Beryl-Enterprise
35 Basin to evaluate the potential impacts of full build-out. This activity would
36 entail:
 - 37 – Assessing the potential for drawdown impacts on the basin, which is
38 already in overdraft, including the potential for land subsidence.
- 39

40

41 **C.6.1.5.9 Ecological Resources**

42

43

44 ***Vegetation and Plant Communities.*** The following additional data-gathering actions
45 would help further characterize potential impacts on vegetation and plant communities for the
46 proposed Escalante Valley SEZ:

- 1 • Identify and map the location and areal extent of desert riparian, desert dry
2 wash, greasewood flat, dry lake, and playa habitats within the SEZ. Identify
3 and map the location and areal extent of these habitats outside the SEZ that
4 may be affected by hydrologic changes, including groundwater elevations,
5 and changes in water, sediment, and contaminant inputs associated with
6 runoff. Such efforts could determine habitat characteristics, including water
7 source, hydrologic regime, and dominant plant species.
8
- 9 • Identify and map the location and areal extent of sand dunes and sand
10 transport systems within the SEZ.
11

12
13 **Wildlife.** The following additional data-gathering actions would help further characterize
14 potential impacts on wildlife resources for the SEZ:
15

- 16 • Conduct pre-disturbance surveys within the SEZ to determine the use of the
17 SEZ as a movement/migratory corridor or as important habitat for mule deer
18 and pronghorn.
19
- 20 • Identify and map the location and areal extent of wash, playa, and sand dune
21 and sand transport habitat within the SEZ. These areas are important habitat
22 for a number of wildlife species.
23

24
25 **Aquatic Biota.** Investigations recommended under the water resources action plan
26 (Section C.6.1.5.8) would be useful in characterizing and protecting habitat available to aquatic
27 biota. Washes and dry lakes in the Escalante Valley SEZ are typically dry and are likely to
28 contain water only for brief periods following precipitation. They may or may not contain
29 aquatic biota; therefore, preliminary evaluations of these surface water features could be
30 conducted to determine the potential for aquatic communities to be present. Any aquatic biota
31 found in these features would likely be desiccation adapted aquatic invertebrates typical of the
32 region. The primary value of these features may be to nonaquatic animals that consume aquatic
33 biota within the SEZ.
34

35
36 **Special Status Species.** The following additional data-gathering actions would be useful
37 in further characterizing and protecting habitat available to special status species:
38

- 39 • Conduct pre-disturbance surveys within the SEZ to determine the presence
40 and abundance of those special status species that are (1) federally listed,
41 proposed for listing, or candidates for listing under the Endangered Species
42 Act (ESA); or (2) designated as sensitive by the Utah BLM State Office.
43 These species are listed in Table C.6.1-1. Surveys should focus on areas
44 identified as potentially suitable, and the suitability of these habitats to support
45 these special status species should be determined in the field. All field-
46 determined suitable habitats for special status species should be mapped.

1 **TABLE C.6.1-1 Special Status Species That May Occur in the Vicinity of the Proposed Escalante**
 2 **Valley SEZ^a**

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
Plants			
Compact cat's-eye	<i>Cryptantha compacta</i>	BLM-S	Salt desert shrub and mixed shrub communities at elevations between 5,000 and 8,400 ft. ^d Known from southwestern Millard County and northwestern Beaver County, Utah, and eastern Nevada. Nearest recorded occurrence is 50 mi ^e northwest of the SEZ. About 2,161,906 acres ^f of potentially suitable habitat occurs within the SEZ region.
Jone's globemallow	<i>Sphaeralcea caespitosa</i>	BLM-S	Known from at least four occurrences in western Utah and six occurrences in eastern Nevada on federal and state lands on dolomite calcareous soils in association with mixed shrub, pinyon-juniper, and grassland communities at elevations between 5,000 and 6,500 ft. Nearest recorded occurrence is 38 mi north of the SEZ. About 4,150,988 acres of potentially suitable habitat occurs within the SEZ region.
Long-calyx milkvetch	<i>Astragalus oophorus lonchocalyx</i>	BLM-S	Endemic to the Great Basin in western Utah and eastern Nevada in pinyon-juniper woodlands, sagebrush, and mixed shrub communities at elevations between 5,800 and 7,500 ft. Nearest recorded occurrences are 30 mi west of the SEZ. About 4,065,963 acres of potentially suitable habitat occurs within the SEZ region.
Money wild buckwheat	<i>Eriogonum nummulare</i>	BLM-S	Western Utah and eastern Nevada on gravelly washes, flats, and slopes in saltbush and sagebrush communities and pinyon-juniper woodlands. Nearest recorded occurrence is 30 mi west of the SEZ. About 3,659,646 acres of potentially suitable habitat occurs within the SEZ region.
Nevada willowherb	<i>Epilobium nevadense</i>	BLM-S	Known from western Utah in Iron, Millard, and Washington Counties, as well as Lincoln County, Nevada, in pinyon-juniper woodlands and oak/mountain mahogany communities, on talus slopes and rocky limestone outcrops. Elevation ranges between 5,000 and 8,800 ft. Nearest recorded occurrence is in the Dixie National Forest, approximately 30 mi southwest of the SEZ. About 2,058,301 acres of potentially suitable habitat occurs within the SEZ region.
Birds			
Bald eagle	<i>Haliaeetus leucocephalus</i>	BLM-S	Known as a winter resident throughout the SEZ region, most commonly along large bodies of water where fish and waterfowl prey are available. Wintering areas are associated with open water. May occasionally forage in arid shrubland habitats. Nearest recorded occurrences are from Fourmile and Mud Spring Washes 10 mi north and northeast of the SEZ. About 2,830,633 acres of potentially suitable habitat occurs within the SEZ region.
Ferruginous hawk ^g	<i>Buteo regalis</i>	BLM-S	Known as a winter resident throughout the SEZ region. Grasslands, shrublands, agricultural lands, and the periphery of pinyon-juniper forests throughout the SEZ region. Quad-level occurrences intersect the affected area. About 1,712,600 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.6.1-1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
Birds (Cont.)			
Greater sage-grouse	<i>Centrocercus urophasianus</i>	ESA-C	A year-round resident in the SEZ region. Plains, foothills, and mountain valleys dominated by sagebrush throughout the SEZ region. Lek sites are located in relatively open areas surrounded by sagebrush or in areas where sagebrush density is low. Nesting usually occurs on the ground where sagebrush density is higher. Quad-level occurrences intersect the affected area east of the SEZ. Crucial brooding habitat for the species exists within 10 mi east of the SEZ. About 1,591,858 acres of potentially suitable habitat occurs within the SEZ region.
Long-billed curlew	<i>Numenius americanus</i>	BLM-S	Summer resident and migrant throughout the SEZ region in short-grass grasslands near standing water. Species is likely to be transient only in the vicinity of the SEZ. Nearest recorded occurrences are from the Beaver River, approximately 30 mi northeast of the SEZ. About 237,630 acres of potentially suitable habitat occurs within the SEZ region.
Northern goshawk	<i>Accipiter gentilis</i>	BLM-S	A year-round resident in the SEZ region. Mature mountain forest and riparian zone habitats throughout the SEZ region. Nests in trees in mature deciduous, coniferous, and mixed forests. Forages in both heavily forested and relatively open shrubland habitats. Nearest recorded occurrences are approximately 25 mi southeast of the SEZ. About 591,239 acres of potentially suitable habitat occurs within the SEZ region.
Short-eared owl	<i>Asio flammeus</i>	BLM-S	A winter resident in the SEZ region. Grasslands, shrublands, and other open habitats throughout the SEZ region. Nearest recorded occurrences are within 10 mi northwest of the SEZ. About 3,990,928 acres of potentially suitable habitat occurs within the SEZ region.
Western burrowing owl	<i>Athene cunicularia hypugaea</i>	BLM-S	A year-round resident in the SEZ region. Open grasslands and prairies, as well as disturbed sites such as golf courses, cemeteries, and airports throughout the SEZ region. Nests in burrows constructed by mammals (prairie dog, badger, etc.). Nearest recorded occurrences are about 5 mi from the SEZ. About 2,108,869 acres of potentially suitable habitat occurs within the SEZ region.
Mammals			
Fringed myotis	<i>Myotis thysanodes</i>	BLM-S	Wide range of habitats, including lowland riparian, desert shrub, pinyon-juniper, and sagebrush habitats. Roost sites have been reported in buildings and caves. Nearest recorded occurrences are 30 mi south of the SEZ. About 4,742,697 acres of potentially suitable habitat occurs within the SEZ region.
Kit fox	<i>Vulpes macrotis</i>	BLM-S	Open prairie, plains, and desert habitats where it inhabits burrows and preys on rodents, rabbits, hares, and small birds. Nearest recorded occurrences are approximately 35 mi northwest of the SEZ. About 1,889,326 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.6.1-1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
<i>Mammals</i>			
<i>(Cont.)</i>			
Pygmy rabbit	<i>Brachylagus idahoensis</i>	BLM-S	Sagebrush-shrubland habitats throughout the SEZ region. Prefers loose soils to dig burrows. Nearest recorded occurrences are about 5 mi from the SEZ. About 1,016,858 acres of potentially suitable habitat occurs within the SEZ region.
Spotted bat	<i>Euderma maculatum</i>	BLM-S	Near forests and shrubland habitats throughout the SEZ region. Uses caves and rock crevices for day roosting and winter hibernation. Nearest recorded occurrences are 25 mi southeast of the SEZ. About 3,580,326 acres of potentially suitable habitat occurs within the SEZ region.
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	BLM-S	Near forests and shrubland habitats below 9,000-ft elevation throughout the SEZ region. The species may use caves, mines, and buildings for day roosting and winter hibernation. Nearest recorded occurrences are about 10 mi north of the SEZ. About 3,197,836 acres of potentially suitable habitat occurs within the SEZ region.
Utah prairie dog	<i>Cynomys parvidens</i>	ESA-T	Endemic to southwestern Utah in grasslands in level mountain valleys and areas with deep, well-drained soils. Colonies reside in underground burrow systems, which are dynamic in size and location. Nearest recorded occurrences are about 5 mi north of the SEZ. Potentially suitable habitat occurs along Fourmile Wash about 3 mi north of the SEZ. About 573,137 acres of potentially suitable habitat occurs within the SEZ region.

^a The listings for (1) federally listed, proposed for listing, or candidates for listing under the ESA, and (2) Utah BLM State Office sensitive species have been updated since the release of the Draft Solar PEIS.

^b BLM-S = listed as a sensitive species by the BLM; ESA-C = candidate for listing under the ESA; ESA-T = listed as threatened under the ESA.

^c For plant species, potentially suitable habitat was determined by using Southwest Regional Gap Analysis Project (SWReGAP) land cover types (USGS 2005). For terrestrial vertebrate species, potentially suitable habitat was determined by using SWReGAP habitat suitability and land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.

^d To convert ft to m, multiply by 0.3048.

^e To convert mi to km, multiply by 1.609.

^f To convert acres to km², multiply by 0.004047.

^g Species in bold text have been recorded or have designated critical habitat in the affected area.

1
2
3

1 Target species and survey protocols should be developed in coordination with
2 the U.S. Fish and Wildlife Service and Arizona Game and Fish Department.

3
4 The Draft Solar PEIS presents a table of special status species for which
5 potential impacts need to be evaluated prior to development in the proposed
6 Escalante SEZ. The list of species presented in Table 13.1.12.1-1 of the Draft
7 Solar PEIS also includes species listed by the State of Utah and species ranked
8 by the State of Utah as S1 or S2 or species of concern. On the basis of design
9 features presented in the Draft Solar PEIS, the potential for impacts on these
10 additional species will also need to be addressed before development could
11 occur in the SEZ.

- 12
- 13 • Identify and map the location and areal extent of woodland habitats within the
14 SEZ. Woodland habitats that may occur in the area of direct effects include
15 pinyon-juniper and oak/mahogany woodlands. The suitability of these
16 woodland habitats for special status species should be determined. Species
17 potentially associated with these habitats include the Nevada willowherb and
18 northern goshawk (nesting habitat).

19
20
21 **C.6.1.5.10 Air Quality and Climate**

22
23 None.

24
25
26 **C.6.1.5.11 Visual Resources**

27
28 As indicated in the Draft Solar PEIS, the Escalante Valley SEZ is located within
29 proximity of two sensitive visual resource areas (SVRAs), as well as several sensitive viewing
30 locations (SVLs), such as towns and roadways. The SVRAs include the Old Spanish National
31 Historic Trail and the Three Peaks Special Recreation Management Area (SRMA). Each of these
32 areas would be subject to weak levels of visual contrast; higher contrast levels may be
33 experienced in the peaks and northwest slopes of the Three Peaks SRMA.

34
35 The following steps could be taken to better understand potential impacts on these
36 SVRAs and SVLs from solar development in the Escalante Valley SEZ:

- 37
- 38 • Identify key observation points (KOPs) within these areas through working
39 with the management agency or other local stakeholders.
 - 40
 - 41 • Conduct viewshed analyses from the KOPs to determine how much of the
42 SEZ would be in view from each KOP.
 - 43
 - 44 • As deemed necessary, based on viewshed analysis results, prepare wireframe
45 Google Earth™ visualizations of hypothetical solar facilities in the SEZ
46 depicting the 80% development scenario to better estimate potential impacts.

1 This additional analysis may help judge potential visual contrast more accurately for
2 KOPs in these areas.

3
4
5 **C.6.1.5.12 Acoustic Environment**

6
7 None.

8
9
10 **C.6.1.5.13 Paleontological Resources**

11 The Escalante Valley SEZ is located in an area where the Potential Fossil Yield
12 Classification of the SEZ has been determined to be Class 2. Therefore, the potential for impacts
13 on paleontological resources is low. No additional data collection is needed at this time, although
14 verification of this classification is recommended at a project-specific level.
15

16
17
18 **C.6.1.5.14 Cultural Resources and Native American Concerns**

19
20 Less than 4% of the proposed Escalante Valley SEZ has been surveyed (approximately
21 256 acres [1.0 km²] out of 2 block survey projects and 8 linear surveys that cross into the
22 SEZ).³¹ At least five sites, possibly seven, have been recorded within the SEZ. Two of the sites
23 are eligible for listing in the *National Register of Historic Places*. Cultural resource impacts are
24 most likely in the southern and western portions of the SEZ, especially in the dune areas. No
25 sites have been recorded in the northern and eastern portions. Approximately 60 sites have been
26 recorded within 5 mi (8 km) of the SEZ. Significant prehistoric resources, including Paleoindian
27 sites, are likely to be located in dune areas and around margins of the playa within the Escalante
28 Valley SEZ. The Dominguez Escalante Trail and the Old Spanish National Historic Trail are
29 both relatively close to the SEZ, within 6 mi (9.7 km). The destruction or degradation of
30 important plant resources, and the destruction of habitat or impediments to the movement of
31 culturally important wildlife, are also potential impacts of concern within the SEZ.
32

33 The following additional data collection efforts could reduce the uncertainty about
34 potential impacts on cultural resources:

- 35
- 36 • Conduct a Class I literature file search to better understand (1) the site
37 distribution pattern in the vicinity of the SEZ, (2) trail networks through
38 existing ethnographic reports, and (3) overall cultural sensitivity of the
39 landscape. The Class I search will also help to resolve the discrepancy
40 between BLM and Utah State Historic Preservation Office data sets for this
41 SEZ.
 - 42
 - 43 • Conduct a Class II Stratified Random Sample Survey of SEZ to obtain a 10%
44 sample (roughly 661 acres [2.7 km²]). If the roughly 256 acres (1.0 km²)

³¹ New information not presented in the Draft Solar PEIS.

1 previously surveyed meets current survey standards, then approximately
2 405 acres (1.6 km²) of survey could satisfy a 10% sample. Areas of interest,
3 as determined through a Class I review, should also be identified prior to
4 establishing the survey design and sampling strategy, such as the dune areas
5 and playa margin in the southwest portion of the SEZ. Subsurface testing of
6 dune areas should be a component of the sampling strategy as well.

- 7
- 8 • Prepare a cultural sensitivity map based on results of the Class II survey and
9 Class I review.
- 10
- 11 • Identify high potential segments of the Old Spanish National Historic Trail
12 and viewshed analyses from key points along the trail. The closest point is
13 within 6 mi (9.7 km), but is obscured from view at that location by Table
14 Butte. Dominguez-Escalante Trail is not a National Historic Trail, but it is a
15 very important historic trail that should potentially be investigated further.
- 16
- 17 • Continue with government-to-government consultation as described in
18 Section 2.4.3, including follow-up to recent ethnographic studies with Tribes
19 not included in the original studies to determine whether those Tribes have
20 similar concerns. The Escalante Valley SEZ falls in the traditional use area of
21 primarily the Southern Paiute, but also the Western Shoshone and Ute.
22 Potential topics presented in the Draft Solar PEIS and/or in an ethnographic
23 study with the Paiute Indian Tribe of Utah, representing the Southern Paiute,
24 to be discussed during consultation include Table Butte, Parowan Gap, Doctor
25 Rock, spiritual trail systems, mountain springs and other water sources,
26 volcanic hot springs, habitation sites as places of cultural importance, clay and
27 rock resources, burial sites, rock art, ceremonial areas and healing places, and
28 plant and animal resources. The agencies value the information shared by the
29 Tribes during the ethnographic study and will consider their input in striving
30 to minimize the impacts of solar development in the SEZ. The completed
31 ethnographic study will be available in its entirety on the Solar PEIS Web site
32 (<http://solareis.anl.gov>). A summary of the contents of that report is also
33 provided in the following text box.
34
35

Tribal Perspectives on the Significance of Escalante Valley SEZ

The Escalante Valley SEZ region was traditionally occupied, used, aboriginally owned, and historically related to the Numic-speaking peoples of the Great Basin and western Colorado Plateau. The Paiute Indian Tribe of Utah (PITU) field consultations, summarized here, represent the cultural interests of the Southern Paiute peoples. These Numic-speaking peoples have gone on record in past projects and stipulate here again that they are the American Indian people responsible for the cultural resources (natural and man-made) in this study area. Their ancestors were placed here by the Creator and have subsequently lived in these lands, maintaining and protecting these places, plants, animals, water sources, and cultural signs of their occupation.

PITU has participated in this PEIS in order to explain the meaning and cultural centrality of the plants, animals, spiritual trails, healing places, and places of historic encounters that exist in these lands.

36

Tribal Perspectives on the Significance of Escalante Valley SEZ (Cont.)

The area under discussion extends beyond the boundaries of the SEZ because Southern Paiute Tribal representatives maintain that, in order to understand Southern Paiute connections to the SEZ, it must be placed in context with neighboring places and their associated cultural resources.

The SEZ region includes plant communities located directly in the SEZ boundary, geological features and water sources located just outside the SEZ boundaries, and trail systems that people used from neighboring or distance communities that pass through the SEZ study area to reach nearby medicine and ceremonial areas.

The Escalante Valley SEZ region is in an active geothermal and volcanic area. Places that contain the presence of volcanic activity are considered sacred and powerful. Southern Paiute people believe that volcanic events are moments when Puha (power or energy) deep inside the earth is brought to the surface as a way for the land to renew itself and to distribute Puha across the landscape. For millennia, Indian people have traveled places of volcanic activity like Thermo Hot Springs (32 mi [51 km] northeast) to engage in a variety of ceremonial activities. These activities include the curing of individuals using both the sulfuric muds and the mineralized, hot water. Other Indian peoples came to the hot spring to purify themselves before going to distant destinations where special activities such as vision quests or ceremonial balancing activities would occur. Trails from many directions came to the hot spring, bringing people on pilgrimage between the hot springs and distant destinations.

The Indian Tribal representatives interviewed at the Escalante SEZ study area indicated that this place is especially important because of Sulphur Spring (5 mi [8 km] north), the traditional spring near Lund that served as both a stopping place for people seeking healing in the nearby hills and a community location. Sulphur Spring was a central place for travelers going back and forth across the Escalante Desert. Because of its regional centrality and because it had a permanent Indian community before the arrival of non-native people, Sulphur Spring was a place of social and ceremonial gathering.

The Doctor Rock (28 mi [45 km] northwest) was identified by Tribal representatives as a key cultural feature in the Escalante Valley SEZ study area. They described this as a traditional area used by Southern Paiute *Puha'gants* (shaman) to tend to people who are ill and in need of rebalancing and healing. The *Puha'gants* would conduct complex healing ceremonies that could only be performed in a place of Puha, such as a doctor rock. Similar to the Shoshone Doctor Rock located near the Gold Point SEZ and the town of Lida, Nevada, the Southern Paiute Doctor Rock draws its power from the volcanic flows above and below ground. People traveling here from the east would pass through Parowan Gap (36 mi [58 km] east). A Southern Paiute Creation story explains the existence of the Parowan Gap in the middle of the volcanic ridge and the presence of thousands of rock peckings and rock paintings (called *tumpituxwinap* in Southern Paiute, meaning storied rocks).

Table Butte (4 mi [6 km] south) represents a major cultural feature the Escalante Valley SEZ region. Table Butte represents a powerful place in Southern Paiute epistemology because of its station in the Escalante Valley. It is a place of great contrast as a unique, isolated highpoint in the wide low valley. The butte gains additional power due to its hydrological role as a shedding point for water. Power is closely associated with water and its flow (Stoffle et al. 2001); thus, Table Butte represents an important element in shaping the movement of power in the immediate area.

Viewscapes are necessary for certain types of ceremonial activities. Viewscapes are essential for vision questing at the top of Mountain Spring Peak (16 mi [26 km] northwest) and Table Butte. The viewscape from the Doctor Rock has been a critical component of doctoring occurring in this area. From the Doctor Rock, a person has a view of Table Butte and the SEZ study area. Viewscapes such as this are important for ceremonial activity because they allow the *Puha'gant* to pray to nearby features and draw upon their power as he or she performs a given ceremony. These views need to be unobstructed; otherwise, there is a risk of disrupting the flow of Puha and the prayers and causing the ceremony to fail.

Tribal Perspectives on the Significance of Escalante Valley SEZ (Cont.)

During multiple field visits, Native American representatives identified 16 traditional use plants and 27 traditional use animals within the Escalante Valley SEZ study area. The presence of these plants and animals both physically and spiritually add to the study area’s overall cultural importance because they are associated with medicine, ceremony, and Creation. Animals play an important role in Creation and Origin stories and are viewed by Southern Paiute people as Creator beings. These animals include the coyote, cottontail rabbit, deer, red-tailed hawks, and rattlesnakes.

1
2
3
4
5
6
7
8
9
10
11

C.6.1.5.15 Socioeconomics and Environmental Justice

None.

C.6.1.5.16 Cumulative Impact Considerations

None.

1 **C.6.2 Milford Flats South**
2
3

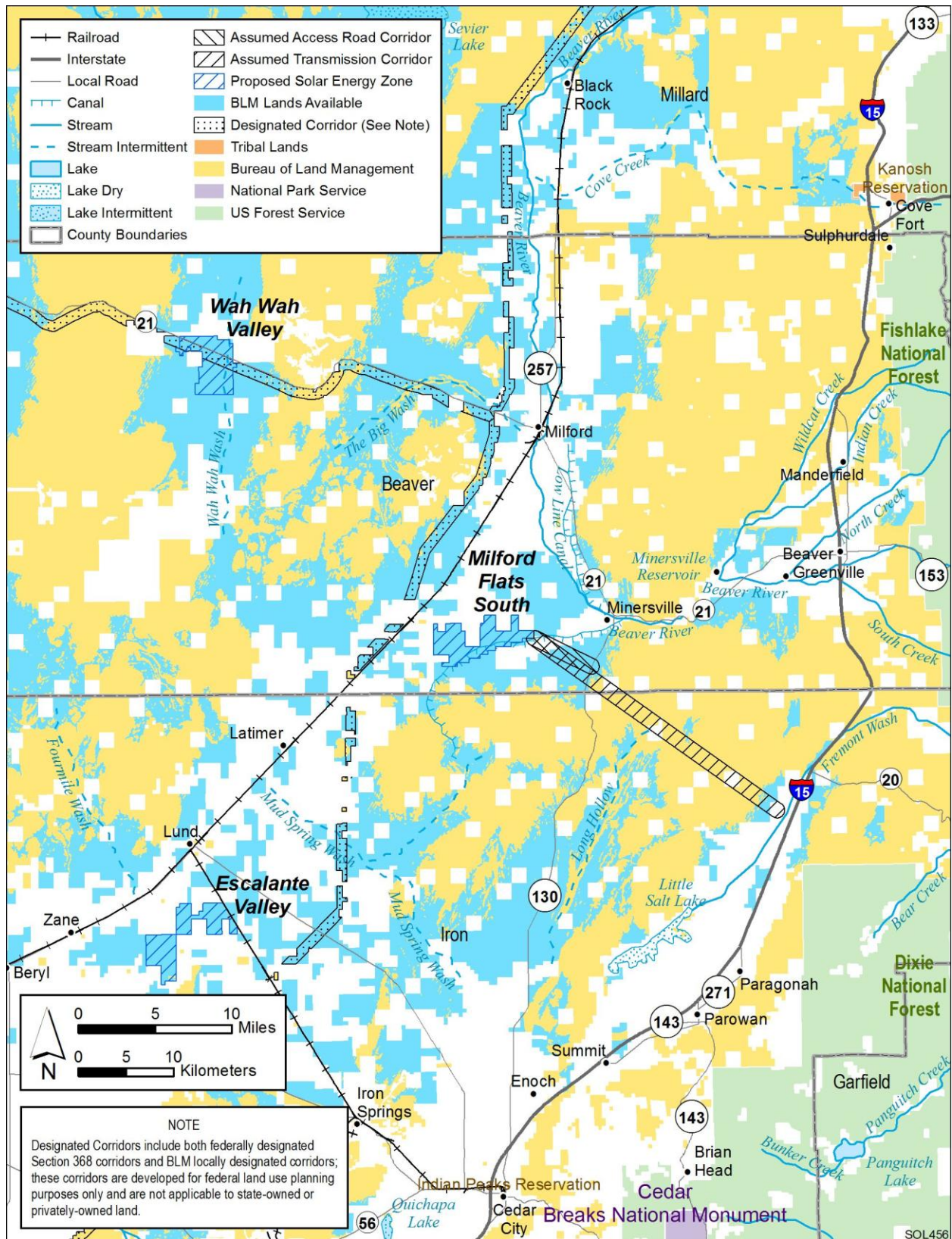
4 **C.6.2.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic**
5 **Environmental Impact Statement (PEIS)**
6

7 The proposed Milford Flats South solar energy zone (SEZ), as presented in the Draft
8 Solar PEIS, had a total area of 6,480 acres (26 km²). It is located in Beaver County in
9 southwestern Utah (Figure C.6.2-1). The towns of Minersville and Milford are about 5 mi (8 km)
10 east of, and 13 mi (21 km) north–northeast of, the SEZ respectively
11

12 The Draft Solar PEIS identified a 345-kV transmission line that runs north to south about
13 19 mi (31 km) southeast of the eastern boundary of the SEZ as the nearest point of connection of
14 the SEZ to the grid. The location of new transmission that could be constructed for this SEZ in
15 the future may be different from that assumed in the Draft Solar PEIS. Details on the updated
16 transmission impact assessment to be included in the Final Solar PEIS are provided in
17 Section C.7.1 of this appendix. The Draft Solar PEIS also identified State Route 21/130, located
18 about 5 mi (8 km) to the east of the SEZ, as the nearest major road, and assumed that a new
19 access road would be constructed from the proposed SEZ to State Route 21/130 to support
20 development. As for a new transmission line, the location of a new access road that could be
21 constructed in the future may be different from that assumed in the Draft Solar PEIS. Analysis of
22 transmission lines and/or access roads will be completed, as necessary, as part of the project-
23 specific environmental reviews (see Section 2.2.2.2.2 of this Supplement).
24

25 Potential adverse impacts identified in the Draft Solar PEIS included the following:
26

- 27 • Solar development would require coordination with existing rights-of way for
28 two energy pipelines, one power line, two roads, and one telecommunications
29 line crossing the SEZ.
30
- 31 • There could be a 10 to 13% reduction in two grazing allotments that could
32 have potential adverse economic impacts on six permittees.
33
- 34 • Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil
35 erosion and deposition by wind and runoff, sedimentation, and soil
36 contamination) could occur.
37
- 38 • Groundwater use would deplete the aquifer to the extent that, at a minimum,
39 wet-cooling options would not be feasible.
40
- 41 • Clearing of a large portion of the proposed SEZ could primarily affect salt
42 deserts scrub, big sagebrush shrubland, semidesert shrub steppe, and
43 greasewood flats and may adversely affect dry washes, depending on the
44 amount of available habitat disturbed. The establishment of noxious weeds
45 could result in habitat degradation. Deposition of fugitive dust could cause
46 reduced productivity or changes in plant community structure.
47



1

2 **FIGURE C.6.2-1 Proposed Milford Flats South SEZ as Presented in the Draft Solar PEIS**

- 1 • Potentially suitable habitat for 20 special status species and more than
2 70 wildlife species occurs in the affected area of the proposed SEZ; less than
3 1.0% of the potentially suitable habitat for any of these species occurs in the
4 region that would be directly affected by development. Development within
5 Minersville Canal could adversely affect amphibians, birds, and mammals.
6
- 7 • If aquatic biota are present, they could be affected by the direct removal of
8 surface water features within the construction footprint. If present, aquatic
9 biota could also be affected by a decline in habitat quantity and quality due to
10 water withdrawals, changes in drainage patterns, as well as increased sediment
11 and contaminant inputs associated with ground disturbance and construction
12 activities.
13
- 14 • Temporary exceedance of ambient air quality standards for particulate
15 matter at the SEZ boundaries is possible during construction. These high
16 concentrations, however, would be limited to the immediate area surrounding
17 the SEZ boundary.
18
- 19 • Although the SEZ is in an area of low scenic quality, strong visual contrasts
20 could be observed by residents nearest to the SEZ. Travelers on State
21 Routes 21 and 129 might observe moderate levels of visual contrast associated
22 with solar development within the SEZ.
23
- 24 • During operations, noise levels at the nearest residences could be about equal
25 to the Iron County regulation level if concentrating solar power facilities with
26 energy storage technologies (which could extend the daily operational time by
27 6 hours or more) were used at the SEZ.
28
- 29 • Few, if any, impacts on significant paleontological resources are likely to
30 occur.
31
- 32 • Low-income populations occur within a 50-mi (80-km) radius of the proposed
33 SEZ boundary; thus adverse impacts of solar development could
34 disproportionately affect low-income populations.
35
36

37 **C.6.2.2 Summary of Comments Received**

38

39 Most of the comments received on the proposed Milford Flats South SEZ were in favor
40 of identifying the area as an SEZ and cited that the region is already fragmented and has low
41 habitat value for many species (The Wilderness Society et al.,³² Sierra Club, Wild Utah, HEAL

³² The Wilderness Society, Wild Utah Project, Southern Utah Wilderness Alliance, Grand Canyon Trust, Center for Native Ecosystems, Sierra Club, Natural Resources Defense Council, Soda Mountain Wilderness Council, and Sierra Trek submitted joint comments on the proposed Utah SEZs. Those comments are attributed to The Wilderness Society et al.

1 Utah, and others). The National Park Service (NPS) was concerned that development of the SEZ
2 would have a 12% impact on Utah prairie dog habitat, which is a substantial portion of this
3 species' available and potentially suitable habitat in the Utah West Desert. The NPS recommends
4 that additional analysis of the impacts on the Utah prairie dog be provided in the Final Solar
5 PEIS for the proposed Utah SEZs, including cumulative impact analysis. The NPS also
6 recommended that additional analysis be provided in the Final Solar PEIS for impacts on the
7 greater sage-grouse for the proposed SEZs in Utah, and that analysis regarding effectiveness of
8 design features that avoid lek and nesting habitat should be conducted for each SEZ. The
9 U.S. Fish and Wildlife Service (USFWS) commented that the assumed transmission corridor
10 would cross greater sage-grouse brood-rearing habitat for the Black Mountains-Mineral East leks
11 and is also part of the Bald Hills Bird Habitat Conservation Area. The USFWS recommended
12 that the PEIS use the existing designated transmission corridor adjacent to and on the west side
13 of the SEZ.
14

15 The Wilderness Society et al. indicated that the Utah Division of Wildlife Resources
16 (UDWR) quad-level occurrences for greater sage-grouse intersect the SEZ itself, not just the
17 affected area. The Wilderness Society et al. suggested use of a different transmission line and
18 access road route than were assumed in the Draft Solar PEIS to minimize surface disturbance.
19 The Wilderness Society et al. is also concerned with the fragile soil and potential for fugitive
20 dust generation at the proposed Milford Flats South SEZ. The Western Watersheds Projects
21 requested that the cumulative impacts assessment include analysis of the impacts of expected
22 new road construction, and new transmission lines and upgrades on the greater sage-grouse,
23 western burrowing owl, ferruginous hawk, pygmy rabbit, bald eagle, and Utah prairie dog.
24
25

26 **C.6.2.3 Changes to the SEZ**

27

28 No boundary revisions were identified for the proposed SEZ. However, areas specified
29 for non-development under SEZ-specific design features were mapped, where data were
30 available. For the proposed Milford Flats South SEZ, 228 acres (0.9 km²) composing the
31 Minersville Canal were identified as a non-development area (see Figure C.6.2-2). The
32 remaining developable area within the SEZ is 6,252 acres (25.3 km²).
33
34

35 **C.6.2.4 Wilderness Character Status of SEZ**

36

37 A recently maintained inventory of wilderness characteristics was used to determine
38 whether public lands within the Milford Flats South SEZ have wilderness characteristics. The
39 finding of this inventory was that these lands do not contain wilderness characteristics.
40
41

42 **C.6.2.5 Additional Data Collection Recommended**

43
44

45 **C.6.2.5.1 Lands and Realty**

46

47 None.

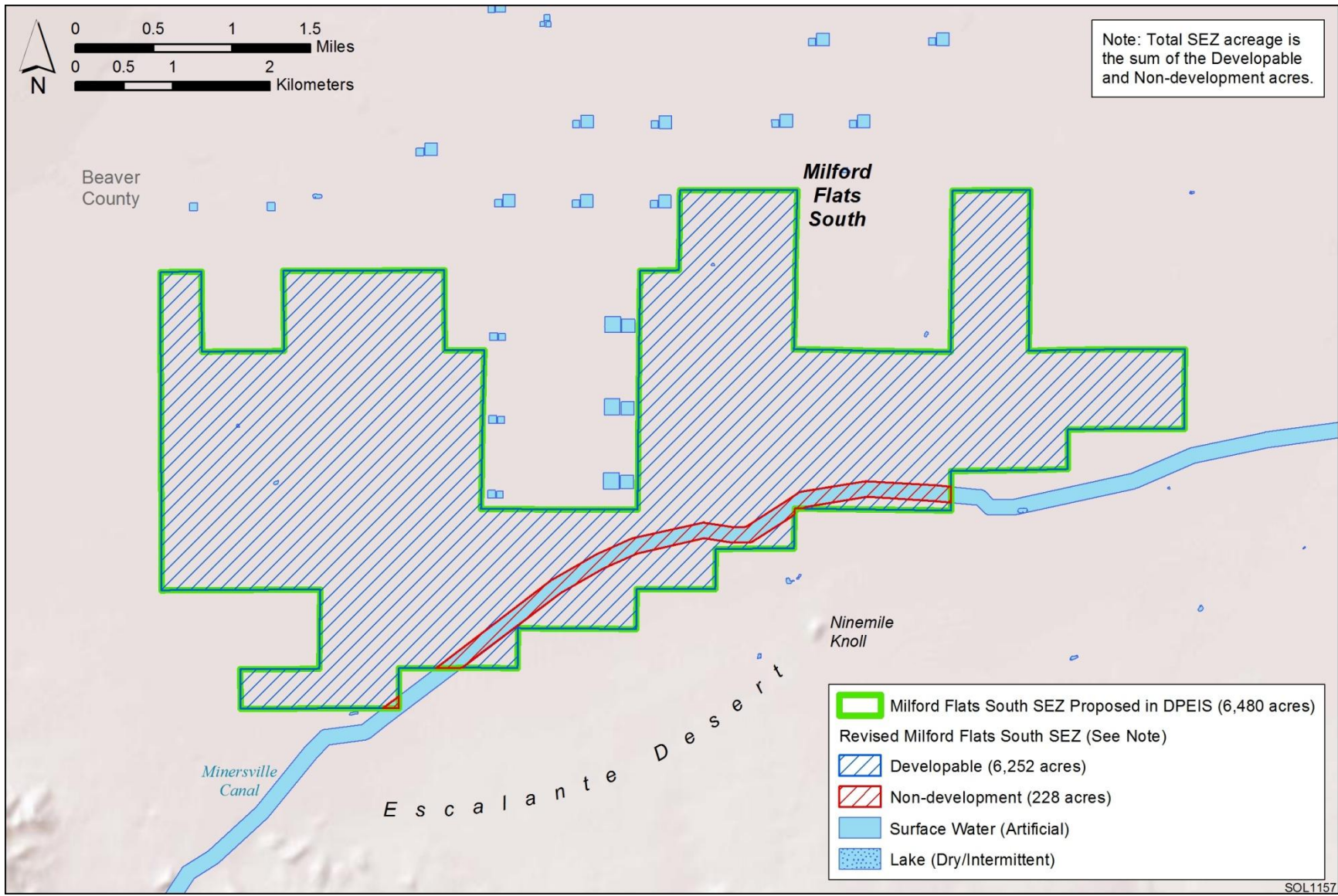


FIGURE C.6.2-2 Proposed Milford Flats South SEZ as Described in this Supplement

1 **C.6.2.5.2 Specially Designated Areas and Lands with Wilderness Characteristics**

2
3 None.

4
5
6 **C.6.2.5.3 Rangeland Resources**

7
8
9 *Livestock Grazing.* None.

10
11
12 *Wild Horses and Burros.* None.

13
14
15 **C.6.2.5.4 Recreation**

16
17 The status of off-highway vehicle use designations in the area will be reviewed with
18 U.S. Department of the Interior Bureau of Land Management (BLM) field office staff.

19
20
21 **C.6.2.5.5 Military and Civilian Aviation**

22
23 None.

24
25
26 **C.6.2.5.6 Geologic Setting and Soil Resources**

27
28 None.

29
30
31 **C.6.2.5.7 Minerals**

32
33
34 Additional information on leasable and strategic minerals in the vicinity of the proposed
35 SEZ will be provided in the Final PEIS to inform the Department of the Interior's decision on a
36 proposed 20-year withdrawal of SEZ lands.

37
38
39 **C.6.2.5.8 Water Resources**

40
41 The following additional data and actions would help further characterize potential
42 impacts on water resources for the proposed Milford Flats South SEZ. A more detailed
43 discussion of each of these activities is included in the water resources action plan provided
44 in Section C.7.2 of this appendix.

- 45
46
 - Prepare a planning-level water resources inventory of the Milford area basin.

- 1 • Identify additional dry lakes, ephemeral stream channels and alluvial fan
2 features for non-development areas through consultation with BLM Utah,
3 Utah Division of Water Resources, Utah Division of Water Rights Stream
4 Alteration Program, U.S. Environmental Protection Agency, and U.S. Army
5 Corps of Engineers (USACE) with a focus on:
6 – Unnamed washes throughout the SEZ draining north and northwest off of
7 the Black Mountains, and
8 – The agricultural ditches in the southern portion of the SEZ.
9
- 10 • Perform field surveys and hydrologic analyses to support jurisdictional water
11 determinations and floodplain identifications. Tasks include:
12 – Surveying unnamed washes for surface elevations, high water marks, and
13 sediment conditions, and
14 – Conducting hydrologic rainfall-runoff-routing analyses to identify
15 100-year floodplain areas.
16
- 17 • Coordinate with the USACE (Sacramento District) regarding jurisdictional
18 water determinations for the SEZ. Water features to be considered include:
19 – Unnamed washes.
20
- 21 • Identify 100-year floodplain non-development areas (if they exist) for
22 unnamed washes identified during the field survey. This task would require
23 coordination with the Federal Emergency Management Agency and the
24 following agencies:
25 – Utah Department of Public Safety, and
26 – Utah Geological Survey.
27
- 28 • Describe the formation of a stakeholder committee to conduct long-term
29 monitoring of water resources. This activity would entail:
30 – Identifying key stakeholder agencies,
31 – Discussing general features of a monitoring program, and
32 – Working with the U.S. Geological Survey to develop groundwater
33 monitoring well design and numerical groundwater models.
34
- 35 • Develop a simple, numerical groundwater model for the Milford area basin to
36 evaluate the potential impacts of full build-out. This activity would entail:
37 – Assessing the potential for drawdown impacts on the basin, which is
38 already in overdraft, including the potential for land subsidence.
39
40

41 **C.6.2.5.9 Ecological Resources**

42
43

44 ***Vegetation and Plant Communities.*** The following additional data-gathering action
45 would help further characterize potential impacts on wildlife resources for the SEZ:
46

- Identify and map the location and areal extent of dry wash and greasewood flat habitats within the SEZ. Identify and map the location and areal extent of these habitats, as well as playa and riparian habitats, outside the SEZ that may be affected by hydrologic changes, including groundwater elevations and changes in water, sediment, and contaminant inputs associated with runoff. Such efforts could help determine habitat characteristics, including water source, hydrologic regime, and dominant plant species.

Wildlife. The following additional data-gathering actions would help further characterize potential impacts on wildlife resources for the SEZ:

- Conduct pre-disturbance surveys within the SEZ to determine the use of the SEZ as a movement/migratory corridor or as important habitat for mule deer and pronghorn.
- Identify and map the location and areal extent of playa habitat within the SEZ. Wildlife surveys should be conducted along Minersville Canal in order to confirm that the non-development area identified for this feature is adequate to protect amphibian, bird, and mammal species. These areas provide important habitat for a number of wildlife species.

Aquatic Biota. Investigations recommended under the water resources action plan (Section C.6.2.5.8) would be useful in characterizing and protecting habitat available to aquatic biota. Washes in the Milford Flats South SEZ are typically dry. These surface water features may or may not contain aquatic biota; therefore, preliminary evaluations of these features could be conducted to determine the potential for aquatic communities to be present.

Special Status Species. The following additional data-gathering actions would be useful in further characterizing and protecting habitat available to special status species:

- Conduct pre-disturbance surveys within the SEZ to determine the presence and abundance of those special status species that are (1) federally listed, proposed for listing, or candidates for listing under the Endangered Species Act (ESA); or (2) designated as sensitive by the Utah BLM State Office. These species are listed in Table C.6.2-1. Surveys should focus on areas identified as potentially suitable, and the suitability of these habitats to support these special status species should be determined in the field. All field-determined suitable habitats for special status species should be mapped. Target species and survey protocols should be developed in coordination with the USFWS and UDWR.

The Draft Solar PEIS presents a table of special status species for which potential impacts need to be evaluated prior to development in the proposed

1 **TABLE C.6.2-1 Special Status Species That May Occur in the Vicinity of the Proposed Milford**
 2 **Flats South SEZ^a**

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
Plants			
Compact cat's-eye	<i>Cryptantha compacta</i>	BLM-S	Salt desert shrub and mixed shrub communities at elevations between 5,000 and 8,400 ft. ^d Known from southwestern Millard County and northwestern Beaver County, Utah, and eastern Nevada. Nearest recorded occurrence is 45 mi ^e northwest of the SEZ. About 2,430,377 acres ^f of potentially suitable habitat occurs within the SEZ region.
Jone's globemallow	<i>Sphaeralcea caespitosa</i>	BLM-S	Known from at least four occurrences in western Utah and six occurrences in eastern Nevada on federal and state lands on dolomite calcareous soils in association with mixed shrub, pinyon-juniper, and grassland communities at elevations between 5,000 and 6,500 ft. Nearest recorded occurrence is 27 mi northwest of the SEZ. About 4,077,164 acres of potentially suitable habitat occurs within the SEZ region.
Long-calyx milkvetch	<i>Astragalus oophorus lonchocalyx</i>	BLM-S	Endemic to the Great Basin in western Utah and eastern Nevada in pinyon-juniper woodlands, sagebrush, and mixed shrub communities at elevations between 5,800 and 7,500 ft. Nearest recorded occurrences are 12 mi east of the SEZ. About 3,961,336 acres of potentially suitable habitat occurs within the SEZ region.
Money wild buckwheat	<i>Eriogonum nummulare</i>	BLM-S	Western Utah and eastern Nevada on gravelly washes, flats, and slopes in saltbush and sagebrush communities and pinyon-juniper woodlands. Nearest recorded occurrence is 40 mi northwest of the SEZ. About 3,468,227 acres of potentially suitable habitat occurs within the SEZ region.
Birds			
American white pelican	<i>Pelecanus erythrorhynchos</i>	BLM-S	May occur as a summer resident and migrant in large reservoirs within the SEZ region. Species is likely to be a transient only in the vicinity of the SEZ. Nearest recorded occurrence is from the Minersville Reservoir, approximately 11 mi east of the SEZ. About 81,437 acres of potentially suitable habitat occurs within the SEZ region.
Bald eagle	<i>Haliaeetus leucocephalus</i>	BLM-S	Known as a winter resident throughout the SEZ region, most commonly along large bodies of water where fish and waterfowl prey are available. Wintering areas are associated with open water. May occasionally forage in arid shrubland habitats. Nearest recorded occurrences are from the Beaver River within 10 mi east of the SEZ. About 2,540,607 acres of potentially suitable habitat occurs within the SEZ region.
Ferruginous hawk^g	<i>Buteo regalis</i>	BLM-S	A year-round resident in the SEZ affected area. Grasslands, shrublands, agricultural lands, and the periphery of pinyon-juniper forests throughout the SEZ region. Quad-level occurrences intersect the SEZ and other portions of the affected area. About 1,761,837 acres of potentially suitable habitat occurs within the SEZ region.

3

TABLE C.6.2-1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
<i>Birds (Cont.)</i>			
Greater sage-grouse	<i>Centrocercus urophasianus</i>	ESA-C; BLM-S	A year-round resident in the SEZ region. Plains, foothills, and mountain valleys dominated by sagebrush throughout the SEZ region. Lek sites are located in relatively open areas surrounded by sagebrush or in areas where sagebrush density is low. Nesting usually occurs on the ground where sagebrush density is higher. Quad-level occurrences intersect the affected area east of the SEZ. Crucial brooding habitat for the species exists about 1 mi south of the SEZ and intersects the transmission corridor. About 1,646,504 acres of potentially suitable habitat occurs within the SEZ region.
Long-billed Curlew	<i>Numenius americanus</i>	BLM-S	Summer resident and migrant throughout the SEZ region in short-grass grasslands near standing water. Species is likely to be transient only in the vicinity of the SEZ. Nearest recorded occurrences are from the Beaver River, approximately 10 mi east of the SEZ. About 285,000 acres of potentially suitable habitat occurs within the SEZ region.
Northern Goshawk	<i>Accipiter gentilis</i>	BLM-S	A year-round resident in the SEZ region. Mature mountain forest and riparian zone habitats throughout the SEZ region. Nests in trees in mature deciduous, coniferous, and mixed forests. Forages in both heavily forested and relatively open shrubland habitats. Nearest recorded occurrences are approximately 18 mi southeast of the SEZ. About 704,300 acres of potentially suitable habitat occurs within the SEZ region.
Short-eared owl	<i>Asio flammeus</i>	BLM-S	A year-round resident in portions of the SEZ region, although only winter (nonbreeding) habitat is expected to occur in the affected area. Grasslands, shrublands, and other open habitats throughout the SEZ region. Quad-level occurrences intersect the SEZ and other portions of the affected area. About 3,938,700 acres of potentially suitable habitat occurs within the SEZ region.
Western burrowing owl	<i>Athene cunicularia hypugaea</i>	BLM-S	A year-round resident in the SEZ region. Open grasslands and prairies, as well as disturbed sites such as golf courses, cemeteries, and airports throughout the SEZ region. Nests in burrows constructed by mammals (prairie dog, badger, etc.). Quad-level occurrences intersect the SEZ and other portions of the affected area. About 2,432,600 acres of potentially suitable habitat occurs within the SEZ region.
<i>Mammals</i>			
Dark kangaroo mouse	<i>Microdiposops megacephalus</i>	BLM-S	Occurs in the Great Basin region in sagebrush-dominated areas with sandy soils. Nocturnally active during warm weather, the species remains in underground burrows during the day and cold winter months. Quad-level occurrences intersect the SEZ and other portions of the affected area. About 620,100 acres of potentially suitable habitat occurs within the SEZ region.
Fringed myotis	<i>Myotis thysanodes</i>	BLM-S	Wide range of habitats, including lowland riparian, desert shrub, pinyon-juniper, and sagebrush habitats. Roost sites have been reported in buildings and caves. Nearest recorded occurrences are 40 mi southeast of the SEZ. About 4,555,400 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.6.2-1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
<i>Mammals (Cont.)</i>			
Kit fox	<i>Vulpes macrotis</i>	BLM-S	Open prairie, plains, and desert habitats where it inhabits burrows and preys on rodents, rabbits, hares, and small birds. Quad-level occurrences intersect the affected area north of the SEZ. About 1,960,500 acres of potentially suitable habitat occurs within the SEZ region.
Pygmy rabbit	<i>Brachylagus idahoensis</i>	BLM-S	Sagebrush-shrubland habitats throughout the SEZ region. Prefers loose soils to dig burrows. Nearest recorded occurrences are about 10 mi southeast of the SEZ. About 967,900 acres of potentially suitable habitat occurs within the SEZ region.
Spotted bat	<i>Euderma maculatum</i>	BLM-S	Near forests and shrubland habitats throughout the SEZ region. Uses caves and rock crevices for day roosting and winter hibernation. Nearest recorded occurrences are 15 mi north of the SEZ. About 3,269,200 acres of potentially suitable habitat occurs within the SEZ region.
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	BLM-S	Near forests and shrubland habitats below 9,000-ft elevation throughout the SEZ region. The species may use caves, mines, and buildings for day roosting and winter hibernation. Quad-level occurrences intersect the affected area north of the SEZ. About 3,111,000 acres of potentially suitable habitat occurs within the SEZ region.
Utah prairie dog	<i>Cynomys parvidens</i>	ESA-T	Endemic to southwestern Utah in grasslands in level mountain valleys and areas with deep, well-drained soils. Colonies reside in underground burrow systems, which are dynamic in size and location. Quad-level occurrences intersect the affected area south of the SEZ. Colonies are known to occur outside of the affected area within 10 mi south of the SEZ. About 825,000 acres of potentially suitable habitat occurs within the SEZ region.

^a The listings for (1) federally listed, proposed for listing, or candidates for listing under the ESA, and (2) Utah BLM State Office sensitive species have been updated since the release of the Draft Solar PEIS.

^b BLM-S = listed as a sensitive species by the BLM; ESA-C = candidate for listing under the ESA; ESA-T = listed as threatened under the ESA.

^c For plant species, potentially suitable habitat was determined by using Southwest Regional Gap Analysis Project (SWReGAP) land cover types (USGS 2005). For terrestrial vertebrate species, potentially suitable habitat was determined by using SWReGAP habitat suitability and land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.

^d To convert ft to m, multiply by 0.3048.

^e To convert mi to km, multiply by 1.609.

^f To convert acres to km², multiply by 0.004047.

^g Species in bold text have been recorded or have designated critical habitat in the affected area.

1
2

1 Milford Flats South SEZ. The list of species presented in Table 13.2.12.1-1
2 of the Draft Solar PEIS also includes species listed by the State of Utah and
3 species ranked S1 or S2 or as species of concern by the State of Utah. Based
4 on the design features presented in the Draft Solar PEIS, the potential for
5 impacts on these additional species will also need to be addressed before
6 development could occur in the SEZ.

- 7
- 8 • Identify and map the location and areal extent of woodland habitats within the
9 SEZ. Woodland habitats that may occur in the area of direct effects include
10 pinyon-juniper and oak/mahogany woodlands. The suitability of these
11 woodland habitats for special status species should be determined. Species
12 potentially associated with these habitats include the ferruginous hawk
13 (nesting) and northern goshawk (nesting).
- 14
- 15 • Identify and map the location and areal extent of rocky cliffs and outcrops
16 within the area of direct effects (particularly within the assumed transmission
17 corridor). These habitats may be potential roost sites for special status bat
18 species, including the fringed myotis, spotted bat, and Townsend's big-eared
19 bat.
- 20

21

22 **C.6.2.5.10 Air Quality and Climate**

23 None.

24

25

26

27 **C.6.2.5.11 Visual Resources**

28 A summary of the Draft Solar PEIS visual contrast analysis for the proposed Milford
29 Flats South SEZ is provided in Table C.6.2-2. This table includes only the resources that would
30 be subject to moderate visual contrast. As indicated in the Draft Solar PEIS, solar development
31 within the Milford Flats South SEZ is unlikely to cause even moderate visual impacts on highly
32 sensitive visual resource areas (SVRAs), the closest of which is more than 25 mi (40 km) from
33 the SEZ. The closest community is about 5 mi (8 km) from the SEZ and is likely to experience
34 weak visual contrasts from solar development within the SEZ. The Milford Flats South SEZ is
35 located within proximity of sensitive viewing locations (SVLs) along State Routes 21 and 129.
36 Moderate levels of visual contrast associated with solar development within the SEZ may be
37 observed by travelers on these routes.

38

39

40 The following steps may be taken to better understand potential impacts on these SVLs
41 from solar development in the Milford Flats South SEZ:

- 42
- 43 • Identify key observation points (KOPs) within these areas through working
44 with the management agency or other local stakeholders.
- 45
- 46

TABLE C.6.2-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi (40-km) Viewshed of the Milford Flats South SEZ

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^a of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^c	Total Acreage/Mileage Visible within 25 mi	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes
Other Areas of Interest (non-management areas)	State Route 21	NA ^b	5 mi from the SEZ	NA	NA	Travelers on State Route 21 might observe moderate levels of visual contrast associated with solar development within the SEZ.
	State Route 129	NA	3.2 mi from the SEZ	NA	NA	Travelers on State Route 129 might observe moderate levels of visual contrast associated with solar development within the SEZ.

^a To convert mi to km, multiply by 1.609.

^b NA = data not available.

^c Distances are based on the Draft Solar PEIS analysis dated December 2010; any alterations to the SEZ boundaries may result in changes to the distance at the point of closest approach.

- 1 • Conduct viewshed analyses from the KOPs to determine how much of the
2 SEZ would be in view from each KOP.
3
4 • As deemed necessary, based on viewshed analysis results, prepare wireframe
5 Google Earth™ visualizations of hypothetical solar facilities in the SEZ
6 depicting the 80% development scenario to better estimate potential impacts.
7

8 This additional analysis may help judge potential visual contrast more accurately for
9 most KOPs. For KOPs of particularly high sensitivity, a site visit with photography and
10 superimposition of the wireframe models onto the photos might be required or desired.
11

12 13 **C.6.2.5.12 Acoustic Environment**

14 None.
15
16

17 18 **C.6.2.5.13 Paleontological Resources**

19
20 The Milford Flats South SEZ is located in an area where the Potential Fossil Yield
21 Classification of the SEZ has been determined to be Class 2. Therefore, the potential for impacts
22 on paleontological resources is low. No additional data collection is needed at this time, although
23 verification of this classification is recommended at a project-specific level.
24
25

26 **C.6.2.5.14 Cultural Resources and Native American Concerns**

27
28 Less than 2% of the proposed Milford Flats South SEZ has been surveyed (approximately
29 123 acres [0.5 km²] out of 9 linear surveys that cross into the SEZ³³). No sites have been
30 recorded within the SEZ. Although a 1935 Bell System Telephone Line is eligible for listing in
31 the *National Register of Historic Places* and may go through the SEZ, the line has been
32 previously mitigated through documentation. Approximately 100 sites have been recorded within
33 5 mi (8 km) of the SEZ, mostly in higher elevations or along long, linear survey corridors; the
34 sites recorded closest to the SEZ (on the valley floor within 2 mi [3 km]) have been determined
35 not eligible for listing in the NRHP. The low density of sites recorded in basin interiors in this
36 region suggests the potential for significant sites within the SEZ is low (Dalley 2009). The
37 destruction or degradation of important plant resources, and the destruction of habitat or
38 impediments to the movement of culturally important wildlife, are also potential impacts of
39 concern within the SEZ.
40

41 The following additional data collection efforts could reduce the uncertainty about
42 potential impacts on cultural resources:
43

³³ New information not provided in the Draft Solar PEIS.

- 1 • Conduct a Class I literature file search to better understand (1) the site
2 distribution pattern in the vicinity of the SEZ, (2) trail networks through
3 existing ethnographic reports, and (3) overall cultural sensitivity of the
4 landscape.
5
- 6 • Conduct a Class II Stratified Random Sample Survey of the SEZ to obtain a
7 10% sample (roughly 648 acres [2.6 km²]). If the roughly 123 acres (0.5 km²)
8 previously surveyed meets current survey standards, then approximately
9 525 acres (2.1 km²) of survey could satisfy a 10% sample. Areas of interest,
10 as determined through a Class I review, should also be identified prior to
11 establishing the survey design and sampling strategy.
12
- 13 • Prepare a cultural sensitivity map based on results of the Class II survey and
14 Class I review.
15
- 16 • Continue with government-to-government consultation as described in
17 Section 2.4.3, including follow-up to recent ethnographic studies with Tribes
18 not included in the original studies to determine whether those Tribes have
19 similar concerns. The Milford Flats South SEZ falls in the traditional use area
20 of primarily the Southern Paiute, but also the Western Shoshone and Ute.
21 Potential topics to be discussed during consultation include trail systems,
22 mountain springs, habitation sites as places of cultural importance, clay and
23 rock resources, burial sites, rock art, ceremonial areas, and plant and animal
24 resources. The agencies value the information shared by the Tribes during the
25 ethnographic study and will consider their input in striving to minimize the
26 impacts of solar development in the SEZ. The completed ethnographic study
27 will be available in its entirety on the Solar PEIS Web (<http://solareis.anl.gov>).
28 A summary of the contents of that report is also provided in the following text
29 box.
30
31

Tribal Perspectives on the Significance of Milford Flats South SEZ

The Milford Flats South SEZ region was traditionally occupied, used, aboriginally owned, and historically related to the Numic-speaking peoples of the Great Basin and western Colorado Plateau. The Paiute Indian Tribe of Utah (PITU) field consultations summarized here represent the cultural interests of the Southern Paiute peoples. Numic-speaking peoples have gone on record in past projects and stipulate here again that they are the American Indian people responsible for the cultural resources (natural and man-made) in this study area. Their ancestors were placed here by the Creator and they have subsequently lived in these lands, maintaining and protecting these places, plants, animals, water sources, and other cultural signs of their occupation. Southern Paiute people have a deeply rooted spiritual connection to the land that weaves stories and songs into the landscape, connecting all elements of the universe.

These Numic-speaking peoples further stipulate that because they have lived in these lands since the end of the Pleistocene and throughout the Holocene, a period of approximately 15,000 years, they deeply understand dramatic shifts in climate and ecology that have occurred over these millennia. Indian lifeways were dramatically

Tribal Perspectives on the Significance of Milford Flats South SEZ (Cont.)

influenced by these natural shifts, but certain religious and ceremonial practices continued unchanged. These traditional ecological understandings are carried from generation to generation through the recounting of origin stories occurring in mythic times and by strict cultural and natural resource conservation rules. The involved American Indian Tribal governments and their appointed cultural representatives have participated in this PEIS in order to explain the meaning and cultural centrality of the plants, animals, spiritual trails, healing places, and places of historic encounters that exist in these lands.

Southern Paiute Tribal representatives maintain that, in order to understand Southern Paiute connections to the SEZ, they must be placed in context with neighboring places and their associated cultural resources found in the larger SEZ region surrounding it. During the ethnographic field sessions, Tribal representatives identified the Milford Flats South SEZ study area as being part of a large regional ceremonial landscape that contains many traditional use features like hot springs, volcanic places, and important plants and animals.

The Milford Flats South SEZ region is in an active geothermal and volcanic area. Places that contain the presence of volcanic activity are considered sacred and powerful locations. Southern Paiute people believe that volcanic events are moments when *Puha* (power or energy) deep inside the Earth is brought to the surface as a way for the land to renew itself or be reborn. Volcanism is also a way for *Puha* to be distributed across a landscape.

According to interviews with Indian Tribal representatives, the outstanding feature of the Milford Flats South SEZ study area is the Thermo Hot Spring. These hot springs are located approximately 4 mi (6 km) west of the Milford Flats South SEZ boundary.

For millennia, Indian people have traveled to this special hot spring to engage in a variety of ceremonial activities. These activities include the curing of individuals using both the sulfuric muds and the mineralized, hot waters. Other Indian peoples came to the hot spring to purify themselves before going to distant destinations where special activities such as vision quests or ceremonial balancing activities would occur. The hot springs were also visited so Indian people could acquire songs *Puha* needed to help their communities when they returned. Trails from many directions come to the hot spring, bringing people on pilgrimage between the hot spring and distant destinations. Offerings would have been made to the hot spring and along the trails while the pilgrims were traveling. The trail system was so well developed that it led the first European travelers (those on the Dominguez-Escalante Expedition in 1776) to this special destination.

The viewscape at the Thermo Hot Springs provides a clear panorama of neighboring volcanic hills and the surrounding mountain ranges. Numic-speaking peoples believe that viewscales are critical components of ceremonial activity because they allow a person to send prayers to important cultural landmarks.

Traditional trails in the SEZ region connect ceremonial areas like Parowan Gap and Thermo Hot Springs. Parowan Gap is located some 32 mi (51 km) south of the SEZ boundary. Parowan Gap is associated with a Southern Paiute Creation story that explains the existence of the gap in the middle of the volcanic ridge and the presence of thousands of rock peckings and rock paintings (called *tumpituxwinap* in Southern Paiute, meaning storied rocks). This area has a clear viewscape of the Escalante Desert.

During PITU's field visit, representatives identified 19 traditional-use plants and 28 traditional-use animals within this SEZ study area. Identified plants include those used for ceremonial, medicine, food, and utilitarian functions. The presence of animals in an area contributes to the overall cultural importance of an area to Indian people. In Southern Paiute culture, animals factor significantly in songs, stories, and ceremonies. Animals were also important food sources, and their fur, bones, and feathers were used in the construction of various cultural items and tools. One animal that had specially meaning for this site was the mountain sheep. Mountain sheep are believed to be spiritual animals and are spirit helpers to shaman.

1
2
3
4
5
6
7
8
9
10

C.6.2.5.15 Socioeconomics and Environmental Justice

None.

C.6.2.5.16 Cumulative Impact Considerations

None.

1 **C.6.3 Wah Wah Valley**
2
3

4 **C.6.3.1 Summary of Potential Impacts Identified in the Draft Solar Programmatic**
5 **Environmental Impact Statement (PEIS)**
6

7 The proposed Wah Wah Valley solar energy zone (SEZ), as presented in the Draft Solar
8 PEIS, had a total area of 6,097 acres (25 km²). It is located in Beaver County in southwestern
9 Utah (Figure C.6.3-1). The town of Milford is located about 23 mi (37 km) east of the SEZ.
10

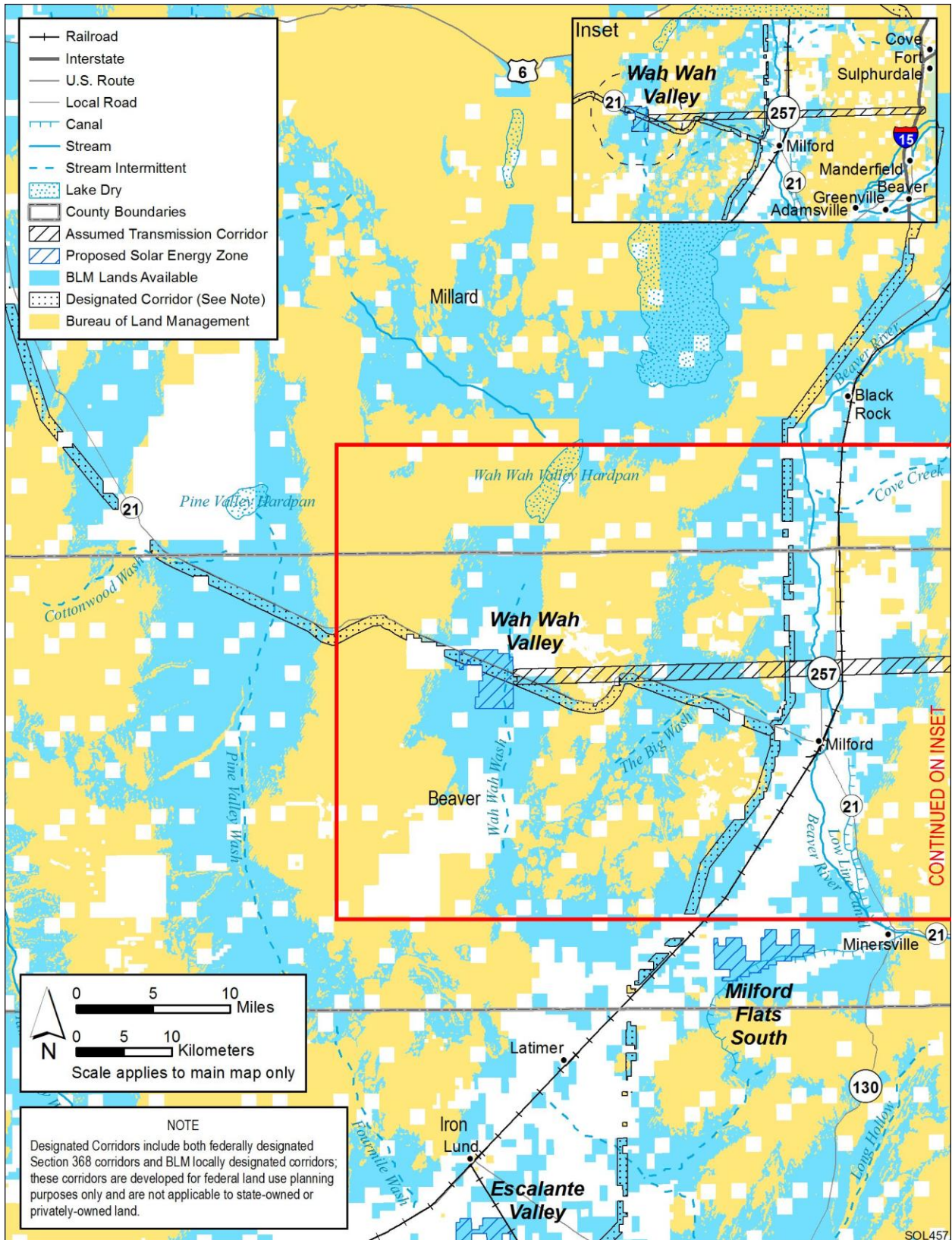
11 A designated Section 368 designated energy corridor on U.S. Department of the Interior
12 Bureau of Land Management (BLM) lands runs east–west through the site along State Route 21
13 and would limit development in the SEZ because solar facilities cannot be constructed under
14 transmission lines or over pipelines.³⁴ The Draft Solar PEIS discussion of impacts of solar
15 energy development in the SEZ acknowledged that solar facility development on both sides of
16 the corridor would limit the ability to add future corridor capacity.
17

18 The Draft Solar PEIS identified a 130-kV transmission line about 42 mi (68 km) east of
19 the SEZ as the nearest point of connection of the SEZ to the grid. The location of new
20 transmission that could be constructed for this SEZ in the future may be different from that
21 assumed in the Draft Solar PEIS. Details on the updated transmission impact assessment to be
22 included in the Final Solar PEIS are provided in Section C.7.1 of this appendix. Analysis of
23 transmission lines and/or access roads will be completed as necessary as part of the project-
24 specific environmental reviews (see Section 2.2.2.2.2 of this Supplement).
25

26 Potential adverse impacts identified in the Draft Solar PEIS included the following:
27

- 28 • There would be varying degrees of adverse impact on wilderness values in
29 one Wilderness Study Area (WSA) and two wilderness inventory units.
30
- 31 • Less than 3% of one grazing allotment could be removed from grazing with
32 small potential impact on one permittee.
33
- 34 • Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil
35 erosion and deposition by wind and runoff, sedimentation, and soil
36 contamination) could occur.
37

³⁴ Section 368 of the Energy Policy Act of 2005 (Public Law 109-58) required federal agencies to engage in transmission corridor planning (see Section 1.6.2.1 of the Draft Solar PEIS). As a result of this mandate, the BLM, U.S. Department of Energy (DOE), U.S. Forest Service (USFS), and U.S. Department of Defense (DoD) prepared a PEIS to evaluate the designation of energy corridors on federal lands in 11 western states, including the 6 states evaluated in this study (DOE and DOI 2008). The BLM and USFS issued Records of Decision to amend their respective land use plans to designate numerous corridors, often referred to as Section 368 corridors.



1

2 **FIGURE C.6.3-1 Proposed Wah Wah Valley SEZ as Presented in the Draft Solar PEIS**

- 1 • Groundwater use would deplete the aquifer to the extent that, at a minimum,
2 wet-cooling options would not be feasible.
3
- 4 • Clearing of a large portion of the proposed SEZ could primarily affect
5 semidesert shrub steppe and mixed salt desertscrub, and may adversely affect
6 dry wash, greasewood flat, and playa habitats, depending on the amount of
7 available habitat disturbed. The establishment of noxious weeds could result
8 in habitat degradation. Deposition of fugitive dust could cause reduced
9 productivity or changes in plant community structure.
10
- 11 • Potentially suitable habitat for 22 special status species and more than
12 70 wildlife species occurs in the affected area of the proposed SEZ; less than
13 1.0% of the potentially suitable habitat for any of these species occurs in the
14 region that would be directly affected by development.
15
- 16 • If aquatic biota are present, they could be affected by the direct removal of
17 surface water features within the construction footprint. If present, aquatic
18 biota could also be affected by a decline in habitat quantity and quality due
19 to water withdrawals, and changes in drainage patterns, as well as increased
20 sediment and contaminant inputs associated with ground disturbance and
21 construction activities. Several springs can be found in the vicinity of the
22 proposed SEZ that also may contain aquatic biota, and they may be affected,
23 primarily by water withdrawal.
24
- 25 • Temporary exceedance of ambient air quality standards for particulate matter
26 at the SEZ boundaries and the nearest residences is possible during
27 construction. These high concentrations, however, would be limited to the
28 immediate area surrounding the SEZ boundary.
29
- 30 • Although the SEZ is in an area of low scenic quality, strong visual contrasts
31 could be observed by residents nearest to the SEZ. Visitors to the Wah Wah
32 Mountains WSA would experience weak to moderate visual contrasts.
33 Travelers on State Route 21 could observe very strong levels of visual contrast
34 associated with solar development within the SEZ.
35
- 36 • During construction, noise levels at the nearest residence would be well above
37 the Iron County regulation levels and U.S. Environmental Protection Agency
38 (EPA) guideline levels. During operations, noise levels at the nearest
39 residence would be above both Iron County regulation levels and EPA
40 guideline levels if concentrating solar power facilities with energy storage
41 technologies (which could extend the daily operational time by 6 hours or
42 more) were used at the SEZ. If dish engine facilities were developed within
43 the SEZ, it was estimated that noise levels at the nearest residence would be
44 higher than the Iron County regulation levels and equivalent to the EPA
45 guideline levels.
46

- 1 • Few, if any, impacts on significant paleontological resources are likely to
2 occur.
- 3
- 4 • Low-income populations occur within a 50-mi (80-km) radius of the proposed
5 SEZ boundary; thus adverse impacts of solar development could
6 disproportionately affect low-income populations.
- 7
- 8

9 **C.6.3.2 Summary of Comments Received**

10
11 Many comments on the proposed Wah Wah Valley SEZ were opposed to identifying the
12 area as an SEZ in the applicable land use plan. Environmental groups cited the remoteness, lack
13 of water, impacts on special status species, including greater sage-grouse;, the need for long,
14 new transmission lines; and the lack of an underlying resource management plan framework
15 as reasons that the proposed SEZ should be eliminated or deprioritized (The Wilderness
16 Society et al.,³⁵ HEAL Utah, Western Watershed Project). The Wilderness Society et al.
17 recommended that the BLM not use the Section 368 corridor as the assumed location for
18 transmission to connect the SEZ to the grid. The Western Watersheds Project suggested that the
19 BLM perform cultural resource surveys and consultations prior to defining the SEZ.

20
21 The National Park Service (NPS) indicated that the SEZ contains a substantial portion of
22 the Utah prairie dog and greater-sage grouse habitat in the Utah West Desert and recommended
23 additional analysis and mitigation measures to be provided in the Final Solar PEIS. The Beaver
24 County Commission urged the BLM to look more closely into the impacts on grazing allotments
25 and strongly recommended appropriate and generous mediation standards to compensate the
26 animal unit month holder.

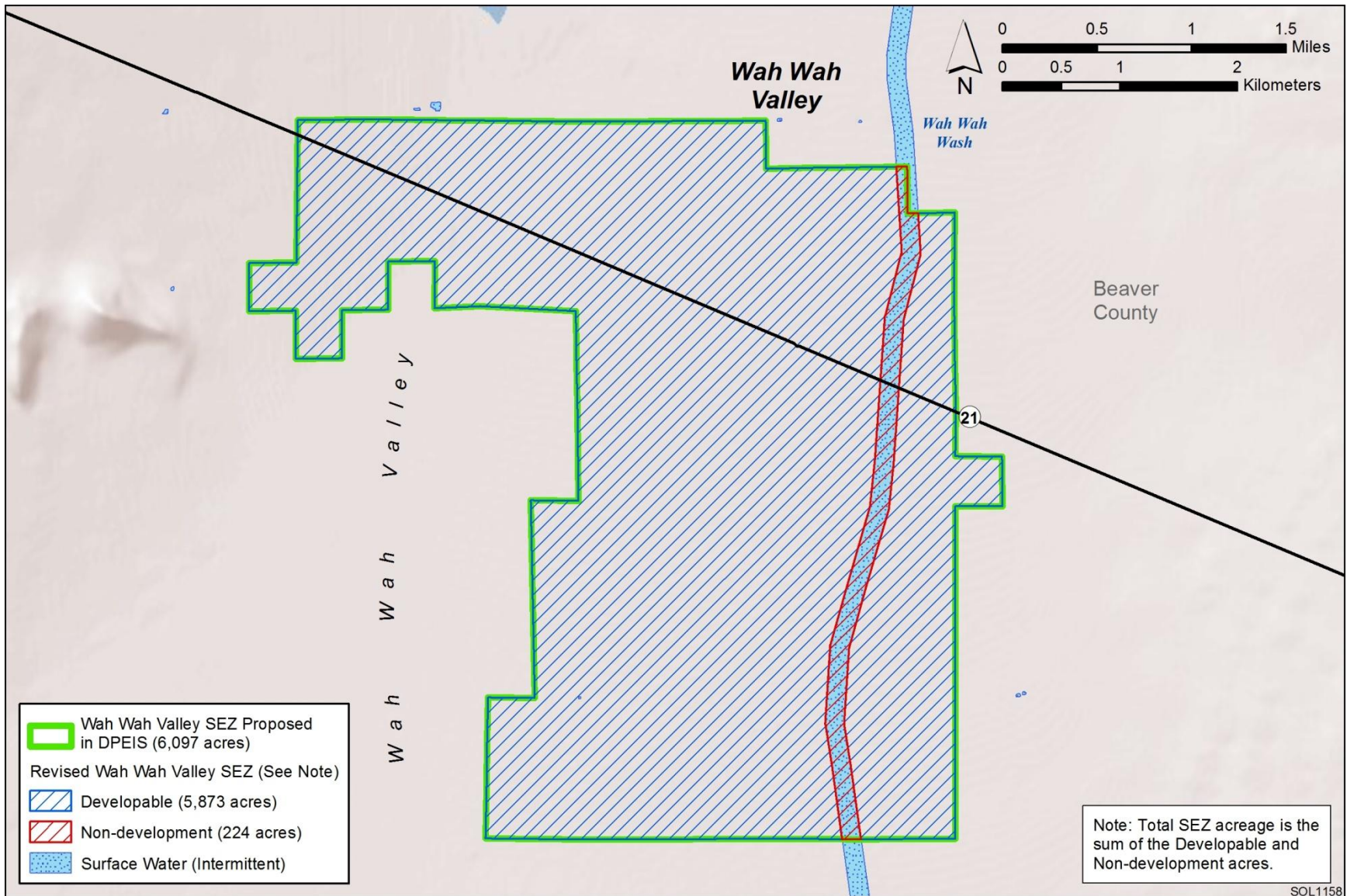
27 28 29 **C.6.3.3 Changes to the SEZ**

30
31 No boundary revisions were identified for the proposed SEZ. However, areas specified
32 for non-development under SEZ-specific design features were mapped, where data were
33 available. For the proposed Wah Wah Valley SEZ, 224 acres (0.91 km²) of the Wah Wah Wash
34 were identified as non-development areas (see Figure C.6.3-2). The remaining developable area
35 within the SEZ is 5,873 acres (23.8 km²).

36 37 38 **C.6.3.4 Wilderness Character Status of SEZ**

39
40 A recently maintained inventory of wilderness characteristics was used to determine
41 whether public lands within the Wah Wah Valley SEZ have wilderness characteristics. The
42 finding of this inventory was that these lands do not contain wilderness characteristics.

³⁵ The Wilderness Society, Wild Utah Project, Southern Utah Wilderness Alliance, Grand Canyon Trust, Center for Native Ecosystems, Sierra Club, Natural Resources Defense Council, Soda Mountain Wilderness Council, and Sierra Trek submitted joint comments on the proposed Utah SEZs. Those comments are attributed to The Wilderness Society et al.



SOL1158

FIGURE C.6.3-2 Proposed Wah Wah Valley SEZ as Described in this Supplement

1 **C.6.3.5 Additional Data Collection Recommended**

2
3
4 **C.6.3.5.1 Lands and Realty**

5
6 None.

7
8
9 **C.6.3.5.2 Specially Designated Areas and Lands with Wilderness Characteristics**

10
11 None.

12
13
14 **C.6.3.5.3 Rangeland Resources**

15
16
17 *Livestock Grazing.* None.

18
19
20 *Wild Horses and Burros.* None.

21
22
23 **C.6.3.5.4 Recreation**

24
25 None.

26
27
28 **C.6.3.5.5 Military and Civilian Aviation**

29
30 None.

31
32
33 **C.6.3.5.6 Geologic Setting and Soil Resources**

34
35 None.

36
37
38 **C.6.3.5.7 Minerals**

39
40 Additional information on leasable and strategic minerals in the vicinity of the proposed
41 SEZ will be provided in the Final Solar PEIS to inform the Department of the Interior's decision
42 on a proposed 20-year withdrawal of SEZ lands.

1 **C.6.3.5.8 Water Resources**
2

3 The following additional data and actions would help further characterize potential
4 impacts on water resources for the proposed Wah Wah Valley SEZ. A more detailed discussion
5 of each of these activities is included in the water resources action plan provided in Section C.7.2
6 of this appendix.
7

- 8 • Prepare a planning-level water resources inventory of the Wah Wah Valley
9 Basin.
- 10
- 11 • Identify additional dry lakes, ephemeral stream channels, and alluvial fan
12 features for non-development areas through consultation with BLM Utah,
13 Utah Division of Water Resources, Utah Division of Water Rights Stream
14 Alteration Program, EPA, and U.S. Army Corps of Engineers (USACE) with
15 a focus on:
 - 16 – Wah Wah Wash, and
 - 17 – Other ephemeral washes that cross the SEZ from south to north.
- 18
- 19 • Perform field surveys and hydrologic analyses to support jurisdictional water
20 determinations and floodplain identifications. Tasks include:
 - 21 – Surveying Wah Wah Wash and tributaries for surface elevations, high
22 water marks, and sediment conditions, and
 - 23 – Conducting hydrologic rainfall-runoff-routing analyses to identify
24 100-year floodplain areas.
- 25
- 26 • Coordinate with the USACE (Sacramento District) regarding jurisdictional
27 water determinations for the SEZ. Water features to be considered include:
 - 28 – Wah Wah Wash, and
 - 29 – Other ephemeral washes that cross the SEZ from south to north.
- 30
- 31 • Identify 100-year floodplain non-development areas (if they exist) for Wah
32 Wah Wash. This task would require coordination with the Federal Emergency
33 Management Agency and the following agencies:
 - 34 – Utah Department of Public Safety, and
 - 35 – Utah Geological Survey.
- 36
- 37 • Describe the formation of a stakeholder committee to conduct long-term
38 monitoring of water resources. This activity would entail:
 - 39 – Identifying key stakeholder agencies,
 - 40 – Discussing general features of a monitoring program, and
 - 41 – Working with the U.S. Geological Survey to develop groundwater
42 monitoring well design and numerical groundwater models.
- 43
- 44
- 45

1 **C.6.3.5.9 Ecological Resources**
2
3

4 **Vegetation and Plant Communities.** The following additional data-gathering action
5 would help further characterize potential impacts on wildlife resources for the Wah Wah Valley
6 SEZ:
7

- 8 • Identify and map the location and areal extent of dry wash, playa, and
9 greasewood flat habitats within the SEZ. Identify and map the location and
10 areal extent of these habitats outside the SEZ that may be affected by
11 hydrologic changes, including groundwater elevations, and changes in water,
12 sediment, and contaminant inputs associated with runoff. Such efforts could
13 help determine habitat characteristics, including water source, hydrologic
14 regime, and dominant plant species.
15
16

17 **Wildlife.** The following additional data-gathering actions would help further characterize
18 potential impacts on wildlife resources for the SEZ:
19

- 20 • Conduct pre-disturbance surveys within the SEZ to determine the use of the
21 SEZ as a movement/migratory corridor or as important habitat for mule deer
22 and pronghorn.
23
24 • Identify and map the location and areal extent of wash and shrubland habitat
25 within the SEZ. These areas are important habitat for a number of wildlife
26 species.
27
28

29 **Aquatic Biota.** Investigations recommended under the water resources action plan
30 (Section C.6.3.5.8) would be useful in characterizing and protecting habitat available to aquatic
31 biota. Ephemeral surface water features within the Wah Wah Valley SEZ may or may not
32 contain aquatic biota; therefore, preliminary evaluations of these surface water features could be
33 conducted to determine the potential for aquatic communities to be present.
34
35

36 **Special Status Species.** The following additional data-gathering actions would be useful
37 in further characterizing and protecting habitat available to special status species.
38

- 39 • Conduct pre-disturbance surveys within the SEZ to determine the presence
40 and abundance of those special status species that are (1) federally listed,
41 proposed for listing, candidates for listing, or under review for listing under
42 the Endangered Species Act (ESA); or (2) designated as sensitive by the Utah
43 BLM State Office. These species are listed in Table C.6.3-1. Surveys should
44 focus on areas identified as potentially suitable, and the suitability of these
45 habitats to support these special status species should be determined in the
46 field. All field-determined suitable habitats for special status species should be
47 mapped. Target species and survey protocols should be developed in
48 coordination with the U.S. Fish and Wildlife Service (USFWS) and Utah
49 Department of Wildlife Resources (UDWR).

1 **TABLE C.6.3-1 Special Status Species That May Occur in the Vicinity of the Proposed Wah Wah**
 2 **Valley SEZ^a**

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
Plants			
Compact cat's-eye	<i>Cryptantha compacta</i>	BLM-S	Salt desert shrub and mixed shrub communities at elevations between 5,000 and 8,400 ft. ^d Known from southwestern Millard County and northwestern Beaver County, Utah, and eastern Nevada. Nearest recorded occurrence is 25 mi ^e northwest of the SEZ. About 2,866,813 acres ^f of potentially suitable habitat occurs within the SEZ region.
Frisco buckwheat	<i>Eriogonum soredium</i>	ESA-UR; BLM-S	Endemic to a small area in the San Francisco Mountains in Beaver County, Utah, on white limestone outcrops associated with pinyon-juniper communities. Elevation ranges between 6,600 and 7,300 ft. Known to occur in the San Francisco Mountains approximately 7 mi northeast of the SEZ. About 37,100 acres of potentially suitable habitat occurs within the SEZ region.
Frisco clover	<i>Trifolium friscanum</i>	ESA-UR; BLM-S	Endemic to four mountain ranges in Beaver and Millard Counties, Utah, on volcanic gravels and limestone substrates in association with pinyon-juniper woodlands at elevations between 6,900 and 7,300 ft. Nearest recorded occurrence is 8 mi northeast of the SEZ. About 1,505,400 acres of potentially suitable habitat occurs within the SEZ region.
Jone's globemallow	<i>Sphaeralcea caespitosa</i>	BLM-S	Known from at least four occurrences in western Utah and six occurrences in eastern Nevada on federal and state lands on dolomite calcareous soils in association with mixed shrub, pinyon-juniper, and grassland communities at elevations between 5,000 and 6,500 ft. Nearest recorded occurrence is 7 mi west of the SEZ. About 4,471,200 acres of potentially suitable habitat occurs within the SEZ region.
Long-calyx milkvetch	<i>Astragalus oophorus lonchocalyx</i>	BLM-S	Endemic to the Great Basin in western Utah and eastern Nevada in pinyon-juniper woodlands, sagebrush, and mixed shrub communities at elevations between 5,800 and 7,500 ft. Nearest recorded occurrence is 12 mi northeast of the SEZ. About 4,351,100 acres of potentially suitable habitat occurs within the SEZ region.
Money wild buckwheat	<i>Eriogonum nummulare</i>	BLM-S	Western Utah and eastern Nevada on gravelly washes, flats, and slopes in saltbush and sagebrush communities and pinyon-juniper woodlands. Nearest recorded occurrence is 20 mi north of the SEZ. About 3,760,200 acres of potentially suitable habitat occurs within the SEZ region.
Ostler's ivesia	<i>Ivesia shockleyi ostleri</i>	BLM-S	Endemic to the Wah Wah Mountains and Needle Range of western Beaver County, Utah, in pinyon-juniper and ponderosa pine forests in crevices of quartzite outcrops at elevations between 6,500 and 8,000 ft. Nearest recorded occurrence is 15 mi southwest of the SEZ. About 1,507,100 acres of potentially suitable habitat occurs within the SEZ region.
Ostler's pepper-grass	<i>Lepidium ostleri</i>	ESA-UR; BLM-S	Endemic to a small area in the San Francisco Mountains in Beaver County, Utah, on limestone outcrops within pinyon-juniper communities at elevations between 5,800 and 6,800 ft. Nearest recorded occurrence is within 7 mi northeast of the SEZ.

TABLE C.6.3-1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
<i>Birds</i>			
Bald eagle^g	<i>Haliaeetus leucocephalus</i>	BLM-S	A winter resident throughout the SEZ region, most commonly along large bodies of water where fish and waterfowl prey are available. Wintering areas are associated with open water. May occasionally forage in arid shrubland habitats. Quad-level occurrences intersect the SEZ and other portions of the affected area. About 2,666,800 acres of potentially suitable habitat occurs within the SEZ region.
Ferruginous hawk	<i>Buteo regalis</i>	BLM-S	A year-round resident in the SEZ region. Grasslands, shrublands, agricultural lands, and the periphery of pinyon-juniper forests throughout the SEZ region. Nests are generally constructed in trees and exposed rock outcrops along cliffs, buttes, and creek banks. Quad-level occurrences intersect the SEZ and other portions of the affected area. About 1,749,900 acres of potentially suitable habitat occurs within the SEZ region.
Greater sage-grouse	<i>Centrocercus urophasianus</i>	ESA-C; BLM-S	A year-round resident in the SEZ region. Plains, foothills, and mountain valleys dominated by sagebrush throughout the SEZ region. Lek sites are located in relatively open areas surrounded by sagebrush or in areas where sagebrush density is low. Nesting usually occurs on the ground where sagebrush density is higher. Quad-level occurrences intersect the affected area south of the SEZ. Crucial brooding habitat for the species exists about 22 mi east of the SEZ and intersects the transmission corridor. About 1,608,000 acres of potentially suitable habitat occurs within the SEZ region.
Long-billed curlew	<i>Numenius americanus</i>	BLM-S	Summer resident and migrant throughout the SEZ region in short-grass grasslands near standing water. Species is likely to be transient only in the vicinity of the SEZ. Quad-level occurrences intersect the affected area within the transmission corridor approximately 20 mi east of the SEZ. About 331,700 acres of potentially suitable habitat occurs within the SEZ region.
Northern goshawk	<i>Accipiter gentilis</i>	BLM-S	A year-round resident in the SEZ region. Mature mountain forest and riparian zone habitats throughout the SEZ region. Nests in trees in mature deciduous, coniferous, and mixed forests. Forages in both heavily forested and relatively open shrubland habitats. Quad-level occurrences intersect the affected area north of the SEZ. About 245,300 acres of potentially suitable habitat occurs within the SEZ region.
Short-eared owl	<i>Asio flammeus</i>	BLM-S	Year-round resident within the SEZ region. Inhabits grasslands, shrublands, and other open habitats throughout the SEZ region. Nomadic, often selecting unique breeding sites each year, depending on local rodent densities. Nests on the ground near shrubs. Quad-level occurrences intersect the affected area east and west of the SEZ. About 4,138,850 acres of potentially suitable habitat occurs within the SEZ region.
Western burrowing owl	<i>Athene cunicularia hypugaea</i>	BLM-S	A year-round resident in the SEZ region. Open grasslands and prairies, as well as disturbed sites such as golf courses, cemeteries, and airports throughout the SEZ region. Nests in burrows constructed by mammals (prairie dog, badger, etc.). Quad-level occurrences intersect the SEZ and other portions of the affected area. About 3,037,300 acres of potentially suitable habitat occurs within the SEZ region.

TABLE C.6.3-1 (Cont.)

Common Name	Scientific Name	Listing Status ^b	Habitat ^c
<i>Mammals</i>			
Dark kangaroo mouse	<i>Microdiposops megacephalus</i>	BLM-S	Sagebrush-dominated areas with sandy soils in Great Basin region. Nocturnally active during warm weather, the species remains in underground burrows during the day and cold winter months. Quad-level occurrences intersect the SEZ and other portions of the affected area. About 1,060,500 acres of potentially suitable habitat occurs within the SEZ region.
Fringed myotis	<i>Myotis thysanodes</i>	BLM-S	Wide range of habitats, including lowland riparian, desert shrub, pinyon-juniper, and sagebrush habitats. Roost sites have been reported in buildings and caves. Quad-level occurrences intersect the affected area within the transmission corridor approximately 40 mi east of the SEZ. About 4,433,300 acres of potentially suitable habitat occurs within the SEZ region.
Kit fox	<i>Vulpes macrotis</i>	BLM-S	Open prairie, plains, and desert habitats where it inhabits burrows and preys on rodents, rabbits, hares, and small birds. Quad-level occurrences intersect the SEZ and other portions of the affected area. About 2,641,200 acres of potentially suitable habitat occurs within the SEZ region.
Pygmy rabbit	<i>Brachylagus idahoensis</i>	BLM-S	Sagebrush-shrubland habitats throughout the SEZ region. Prefers loose soils to dig burrows. Quad-level occurrences intersect the affected area within the transmission corridor approximately 10 mi east of the SEZ. About 930,850 acres of potentially suitable habitat occurs within the SEZ region.
Spotted bat	<i>Euderma maculatum</i>	BLM-S	Near forests and shrubland habitats throughout the SEZ region. Uses caves and rock crevices for day roosting and winter hibernation. Quad-level occurrences intersect the affected area within the transmission corridor approximately 10 mi east of the SEZ. About 3,404,900 acres of potentially suitable habitat occurs within the SEZ region.
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	BLM-S	Near forests and shrubland habitats below 9,000-ft elevation throughout the SEZ region. The species may use caves, mines, and buildings for day roosting and winter hibernation. Quad-level occurrences intersect the affected area east of the SEZ. About 3,283,500 acres of potentially suitable habitat occurs within the SEZ region.
Utah prairie dog	<i>Cynomys parvidens</i>	ESA-T	Endemic to southwestern Utah in grasslands in level mountain valleys and areas with deep, well-drained soils. Colonies reside in underground burrow systems, which are dynamic in size and location. Nearest quad-level occurrences are 20 mi south of the SEZ; colonies are known to occur outside of the affected area within 18 mi south of the SEZ. About 641,400 acres of potentially suitable habitat occurs within the SEZ region.

^a The listings for (1) federally listed, proposed for listing, or candidates for listing under the ESA, and (2) Utah BLM State Office sensitive species have been updated since the release of the Draft Solar PEIS.

^b BLM-S = listed as a sensitive species by the BLM; ESA-C = candidate for listing under the ESA; ESA-T = listed as threatened under the ESA; ESA-UR = under review for listing under the ESA.

Footnotes continued on next page.

TABLE C.6.3-1 (Cont.)

- ^c For plant species, potentially suitable habitat was determined by using Southwest Regional Gap Analysis Project (SWReGAP) land cover types (USGS 2005). For terrestrial vertebrate species, potentially suitable habitat was determined by using SWReGAP habitat suitability and land cover models. Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.
- ^d To convert ft to m, multiply by 0.3048.
- ^e To convert mi to km, multiply by 1.609.
- ^f To convert acres to km², multiply by 0.004047.
- ^g Species in bold text have been recorded or have designated critical habitat in the affected area.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35

The Draft Solar PEIS presents a table of special status species for which potential impacts need to be evaluated prior to development in the proposed Wah Wah Valley SEZ. The list of species presented in Table 13.3.12.1-1 of the Draft also includes species listed by the State of Utah and species ranked by the State of Utah as S1 or S2 or as species of concern. On the basis of design features presented in the Draft Solar PEIS, the potential for impacts on these additional species will also need to be addressed before development could occur in the SEZ.

- Identify and map the location and areal extent of rocky cliffs and outcrops within the SEZ. The suitability of these habitats for special status species should be determined. Species potentially associated with these habitats include Frisco buckwheat, Ostler’s pepper-grass, ferruginous hawk (nesting), fringed myotis (roosting), spotted bat (roosting), and Townsend’s big-eared bat (roosting).
- Identify and map the location and areal extent of woodland habitats within the SEZ. Woodland habitats that may occur in the area of direct effects include pinyon-juniper and oak/mahogany woodlands. The suitability of these woodland habitats for special status species should be determined. Species potentially associated with these habitats include Frisco clover, Ostler’s ivesia, ferruginous hawk (nesting), and northern goshawk (nesting).

C.6.3.5.10 Air Quality and Climate

None.

C.6.3.5.11 Visual Resources

A summary of the Draft Solar PEIS visual contrast analysis for the Wah Wah Valley SEZ is provided in Table C.6.3-2. This table includes only the resources that would be subject to

TABLE C.6.3-2 Summary of Potential Visual Impacts on SVRAs and SVLs within the 25-mi (40-km) Viewshed of the Proposed Wah Wah Valley SEZ

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes
WSA	Wah Wah Mountains	49,406 acres	5 mi northwest of the SEZ	3,777 acres	7.6	Potential visual contrast expected would be highly dependent on viewer locations, as well as on the numbers, types, sizes, and locations of solar facilities and other project- and site-specific factors. Solar facilities would be expected to create weak to moderate visual contrasts; the highest levels of visual contrast would be expected for viewing locations at higher elevations in the far southern portion of the WSA, with less visibility and lower contrast levels expected at the more distant locations in the SEZ viewshed farther north and at lower elevations: The visible area of the WSA extends from the point of closest approach to approximately 10.3 mi.

TABLE C.6.3-2 (Cont.)

Management Area Category	SVRA/SVL within 25 mi ^a of SEZ	Total Acreage/Mileage ^{a,b,c} of SVRA/SVL	Distance from SEZ at Point of Closest Approach ^d	Total Acreage/Mileage Visible within 25 mi	Percentage of Total Acreage/Mileage Visible within 25 mi	Notes
Other Areas of Interest (non-management areas)	State Route 21 ^e	107 mi	3.8 mi of the route passes through the northern half of the SEZ from east-southeast to west-northwest	16 mi	15.0	Very strong visual contrasts could be observed within and near the SEZ by travelers as they approached and passed through the SEZ on State Route 21. Contrast levels would gradually rise, and strong levels of visual contrast would be expected. Travelers would have a brief exposure of the proposed solar facilities.

^a To convert mi to km, multiply by 1.609.

^b To convert acres to km², multiply by 0.004047.

^c Mileage (within all columns) is used only for trails or roads, unless otherwise specified.

^d Distances are based on the Draft Solar PEIS analysis dated December 2010; any alterations to the SEZ boundaries may result in changes to the distance at the point of closest approach.

^e Length of State Route 21: Utah DOT (2008).

1 moderate or strong visual contrast. The Draft Solar PEIS visual impact analysis predicted these
2 levels of visual contrast from solar energy development in the Wah Wah Valley SEZ for the
3 following sensitive visual resource areas (SVRAs) and sensitive viewing locations (SVLs):
4

- 5 • Wah Wah Mountains Wilderness Study Area (WSA)
- 6
- 7 • State Route 21.
- 8

9 A very small portion of the King Top WSA is within the viewshed of the SEZ, but it is
10 too far away for strong visual contrasts to be noted from solar development within the SEZ. The
11 closest community is more than 25 mi (40 km) from the SEZ, and, therefore is likely to have
12 minimal to no visual contrast within the landscape resulting from solar development within the
13 SEZ.
14

15 The following steps could be taken to better understand potential impacts on these
16 SVRAs and SVLs from solar development in the Wah Wah Valley SEZ:
17

- 18 • Identify key observation points (KOPs) within these areas through working
19 with the management agency or other local stakeholders.
- 20
- 21 • Conduct viewshed analyses from the KOPs to determine how much of the
22 SEZ would be in view from each KOP.
- 23
- 24 • As deemed necessary, based on viewshed analysis results, prepare wireframe
25 Google Earth™ visualizations of hypothetical solar facilities in the SEZ
26 depicting the 80% development scenario to better estimate potential impacts.
27

28 This additional analysis may help to judge potential visual contrast more accurately
29 for most KOPs. For KOPs of particularly high sensitivity, a site visit with photography and
30 superimposition of the wireframe models onto the photos might be required or desired.
31

32 **C.6.3.5.12 Acoustic Environment**

33
34 None.
35
36
37

38 **C.6.3.5.13 Paleontological Resources**

39
40 The Wah Wah Valley SEZ is located in an area where the Potential Fossil Yield
41 Classification (PFYC) of the SEZ has been determined to be Class 2. Therefore, the potential for
42 impacts on paleontological resources is low. No additional data collection is needed at this time,
43 although verification of this classification is recommended at a project-specific level.
44
45
46

1 **C.6.3.5.14 Cultural Resources and Native American Concerns**
2

3 Less than 1% of the proposed Wah Wah Valley SEZ has been surveyed (approximately
4 11 acres [0.04 km²]³⁶). One site has been recorded in the SEZ, and only four sites have been
5 recorded within 5 mi (8 km) of the SEZ. The low density of sites recorded in basin interiors in
6 this region suggests the potential for significant sites within the SEZ is low (Dalley 2009). One
7 potential cultural resource of interest that runs through the SEZ is a former power line that ran
8 from Milford to the Rocky Mountain Research Station Desert Experimental Range; the line was
9 noted in an initial site visit of the SEZ but has not been formally recorded. The destruction or
10 degradation of important plant resources and the destruction of habitat or impediments to the
11 movement of culturally important wildlife are also potential impacts of concern within the SEZ.
12

13 The following additional data collection efforts could reduce the uncertainty about
14 potential impacts:
15

- 16 • Conduct a Class I literature file search to better understand (1) the site
17 distribution pattern in the vicinity of the SEZ, (2) trail networks through
18 existing ethnographic reports, (3) overall cultural sensitivity of the landscape,
19 and (4) the historical background of the former power line and associated
20 research station.
21
- 22 • Conduct a Class II Stratified Random Sample Survey of SEZ to obtain a 10%
23 sample (roughly 610 acres [2.5 km²]). Areas of interest, as determined
24 through a Class I review, should also be identified prior to establishing the
25 survey design and sampling strategy.
26
- 27 • Prepare a cultural sensitivity map based on results of the Class II survey and
28 Class I review.
29
- 30 • Continue with government-to- government consultation as described in
31 Section 2.4.3, including follow-up to recent ethnographic studies with Tribes
32 not included in the original studies to determine whether those Tribes have
33 similar concerns, or if they would want to participate in a similar ethnographic
34 study (the Pahrump Paiute have indicated they would like to be included).
35 The Wah Wah Valley SEZ falls in the traditional use area of primarily the
36 Southern Paiute, but also the Western Shoshone and Ute. Potential topics to
37 be discussed during consultation include the Wah Wah Springs, Lake Sevier,
38 Lake Bonneville, Wallace’s Peak, the Wasatch Mountains, trail systems,
39 mountain springs, habitation sites as places of cultural importance, clay and
40 rock resources, burial sites, rock art, ceremonial areas, and plant and animal
41 resources. The agencies value the information shared by the Tribes during
42 the ethnographic study and will consider their input in striving to minimize
43 the impacts of solar development in the SEZ. The completed ethnographic

³⁶ New information not provided in the Draft Solar PEIS.

1
2
3
4
5

study will be available in its entirety on the Solar PEIS Web site (<http://solareis.anl.gov>). A summary of the contents of that report is also provided in the following text box.

Wah Wah Valley SEZ Study Area Summary

The Wah Wah Valley SEZ study area and its surrounding landscape were traditionally occupied and used, aboriginality owned, and historically related to the Numic-speaking peoples of the Great Basin and western Colorado Plateau. The field consultations summarized here are from members of the Paiute Indian Tribe of Utah and members of the Confederated Tribes of the Goshute Reservation. These Numic-speaking peoples have stated on record in past projects and stipulate here again, that they are the American Indian people responsible for the cultural resources in this SEZ study area because their ancestors were placed here by the Creator. They have continued to live in these lands, maintaining and protecting these places, associated natural resources, and cultural signs of their occupation.

These Numic-speaking peoples further stipulate that because they have lived in these lands since the end of the Pleistocene and throughout the Holocene; they deeply understand the dramatic shifts in climate and ecology that have occurred over these millennia. Indian lifeways were dramatically influenced by these natural shifts, but certain religious and ceremonial practices continued unchanged. These traditional ecological understandings are carried from generation to generation through the recounting of origin stories and by strict cultural and natural resource conservation rules. The involved American Indian Tribal governments and their appointed representatives have participated in this PEIS in order to explain the meaning and cultural centrality of the natural and culture resources that exist in these lands.

During the ethnographic field sessions, Tribal representatives identified the Wah Wah Valley SEZ study area as being part of a large ceremonial landscape that contains many traditional use features such as the Wah Wah Springs, volcanic places, and important plants and animals, as detailed below:

- Sources for water—Wah Wah Springs, Lake Sevier, and Lake Bonneville
- Evidence of previous Indian use—extensive Indian ricegrass (waii) field remnants of farming and lithics at Wah Wah Springs
- Sources for plants—ceremonial, medicinal, and utilitarian plants, food staples (waii)
- Sources for animals—birds of prey, game birds, migratory birds, predatory and game mammals, small mammals, lizards, snakes, spiritual animals, and pronghorn antelope
- Geologic features—Wah Wah Mountains and Wallace’s Peak used for vision questing
- Indian history—Lake Sevier farming, travelers along the Old Spanish Trail 1829–1849, Mormon expansion 1850s, cattle and sheep ranching 1870s, mining and boom towns 1871–1910, railroads 1880.

Tribal representatives noted that the Wah Wah Valley SEZ study area has always been a part of the greater Lake Sevier region. Lake Sevier (located about 20 mi [32 km] northeast of the SEZ) receives most of its replenishing water today from Sevier River. The river begins in a meadow high in the Wasatch Mountains. The Sevier River flows from its headwaters and then drains into Lake Sevier. For thousands of years, Lake Sevier also was filled with water from the south that largely emanated from the high mountain ranges that topographically define Wah Wah Valley.

Tribal representatives identified the Wah Wah Springs Complex (located 2 mi [3 km] west of the SEZ) as an important water source in the SEZ study area. Their importance has increased with the depletion of Lake Sevier and the Wah Wah Valley Playa. Because of this, the springs are currently the primary water sources in the valley. These springs are seen as both a culturally important life force and a spiritual place.

6

Wah Wah Valley SEZ Study Area Summary (Cont.)

Since the end of the Pleistocene, Indian people have lived and thrived in the abundant lake, river, and riparian habitats of the Wah Wah Valley SEZ study area. Prior to the arrival of Euro-Americans, the area was a shared borderland between Southern Paiutes and Goshutes. Southern Paiutes and Goshutes shared farming areas and social relations along both sides of the Sevier River.

Indian people noted that the SEZ study area contains a wide variety of traditional use plants. In the mountains, areas were identified as rich pine nut harvesting areas. The lowland areas contained expansive fields of Indian ricegrass (*Achnatherum hymenoides*), also known as *waii*, which is a culturally central food. The term field is used by Indian representatives to indicate that they perceive these types of plants like traditional crops, in that Indian people actively managed and cared for these wild resources.

The abundant plant communities in the Wah Wah Valley SEZ study area support extensive herds of antelope, which were the focus of large-scale communal hunts that involved different Indian communities. Antelope shamans were important in these organized hunts because they were specialized in spiritually and physically interacting with the antelope to draw upon the antelope's Puha (power or energy) and to select ones for the communal hunts. The purpose of these interactions was to assure that the animals were treated with respect and protected.

Volcanic places, such as Wallace's Peak (located about 2.5 mi [4 km] west of the SEZ), are considered sacred locations used for vision questing and power acquisition. Numic-speaking people believe that volcanic events are moments when Puha deep inside the Earth is brought to the surface as a way for the land to renew itself as it moves across the landscape. Underground, Puha follows the flow of magma and distributes itself and connects volcanic places over vast distances.

Indian people continued to use these areas in traditional ways until Euro-Americans began settling along the front range of the Wasatch Mountains in about the mid-1800s. Soon the Indian irrigated farms along the Sevier River were lost, and eventually most major water sources would be taken by the non-Indian settlers. The encroachment period continued until the late 1800s when most aspects of traditional life were impossible to sustain. At this time, Indian people shifted to wage labor. They worked in many of the region's mines, built and operated the railroads, and were ranch laborers. This shift is positively discussed and remembered today with a cultural interest in how previous generations adapted to new social, economic, and ecological conditions. The celebration of survival is offset by the sadness of having a well-adapted independent traditional lifeway replaced by wage labor in resource extraction activities.

1
2
3
4
5
6
7
8
9
10
11

C.6.3.5.15 Socioeconomics and Environmental Justice

None.

C.6.3.5.16 Cumulative Impact Considerations

None.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

This page intentionally left blank.

1 **C.7 GENERAL ADDITIONAL ANALYSIS REQUIREMENTS FOR SEZS**

2
3
4 **C.7.1 Revised Transmission Analysis**

5
6
7 **C.7.1.1 General Information**

8
9 The Draft Solar Programmatic Environmental Impact Statement (Solar PEIS) included a
10 generic analysis of the environmental impacts of construction and operation of transmission lines
11 and substations (Section 5 of the Draft Solar PEIS); proposed design features to reduce or
12 eliminate impacts (Appendix A of the Draft Solar PEIS); a transmission constraints analysis to
13 determine whether additional corridor designation on U.S. Department of the Interior Bureau of
14 Land Management (BLM) lands would be needed to facilitate solar development (Appendix G of
15 the Draft Solar PEIS); and an analysis of the impacts of constructing transmission from the
16 individual proposed solar energy zones (SEZs) to the nearest existing transmission line based on
17 the assumption that existing lines could be upgraded (contained in individual SEZ sections in
18 Chapters 8 through 13 of the Draft Solar PEIS).

19
20 Commentors, including the U.S. Environmental Protection Agency, disagreed with the
21 simplifying assumptions used for the SEZs and stated that impacts from transmission were likely
22 to be substantially greater than those portrayed in the Draft Solar PEIS. Comments from industry
23 and environmental organizations noted that BLM policies should address cooperative
24 development, sharing of generation tie-lines, and transmission incentives that could facilitate
25 development within SEZs, and should be integrated with ongoing regional and state-level
26 transmission planning efforts. Some commentors also asked for a much more comprehensive
27 transmission analysis such as available capacity, costs associated with building or upgrading
28 infrastructure, and timing of new transmission.

29
30 Although the lead agencies (BLM and DOE) recognize that there are limitations in terms
31 of the accuracy of predicting whether new transmission will be needed to support development
32 within the proposed SEZs and where and when it will be built, they propose to conduct
33 additional analysis of transmission needs for inclusion in the Final Solar PEIS for those SEZs
34 being carried forward in the analysis (see Sections C.1 through C.6). This analysis is intended to
35 provide additional information to the agencies and their stakeholders regarding the nature of
36 transmission access issues associated with proposed SEZs and the extent of new transmission
37 development that might be needed to support solar energy generation within the SEZs.
38 Section C.7.1.2 of this appendix discusses the factors that can limit accurate prediction of
39 transmission needs for the SEZs. Section C.7.1.3 presents the proposed methods to be used for
40 additional SEZ-specific transmission analysis for the Final Solar PEIS. Section C.7.1.4 presents a
41 test case analysis for the proposed Brenda SEZ to demonstrate the types of additional
42 information that would be included in the Final Solar PEIS.

1 **C.7.1.2 Factors Limiting Predictability of Future Transmission Needs for the SEZs**
2 **Assessed in the Solar PEIS**
3

4 Due largely to federal government deregulation of the utility industry and the greater
5 roles regional transmission organizations (RTOs) and independent system operators (ISOs) play
6 in apportioning transmission capacity, there has been great uncertainty in the power generation
7 industry about how to finance new transmission infrastructure. It became unclear what benefits a
8 utility would derive from bankrolling transmission system upgrades, or how they would be
9 repaid for their investment. Consequently, there has been little investment in transmission over
10 the past 20 years. This situation has very slowly been resolved, with utilities increasingly gaining
11 the confidence to make investments in infrastructure.
12

13 Renewable energy developers, both wind and solar, have shown a strong preference to
14 locating their generation projects near existing transmission lines, especially lines with existing
15 capacity, and preferably very near an existing substation on a line with capacity. This strategy
16 minimizes the cost of connecting their projects to the transmission grid and avoids the need to
17 finance transmission system upgrades to create the needed capacity. However, this is not an
18 option for transmission projects in the SEZs that are not located near existing transmission lines
19 or near lines with existing capacity. The proposed additional transmission analysis that will be
20 conducted for SEZs, which is described in Section C.7.1.3, will assess the available capacity on
21 existing transmission lines near the proposed SEZs and estimate the costs and impacts of
22 upgrading existing lines and/or constructing completely new lines.
23

24 On the basis of approved solar projects to date, establishing transmission (either through
25 use and/or upgrade of existing lines or construction of new lines) generally precedes solar
26 development projects. Solar developers likely need to have signed Power Purchase Agreements
27 (PPAs) and a demonstrated ability to reach the potential purchasers in order to acquire financing.
28 However, arranging for the new and/or upgraded transmission line capacity needed and
29 financing it is an area in which solar developers may not be knowledgeable. If transmission
30 planning is not adequately factored into project planning, solar projects may be greatly delayed
31 or become infeasible.
32

33 The following factors limit the ability to identify specific transmission construction needs
34 to allow solar development in the proposed SEZs, and should be considered when interpreting
35 the results of the proposed transmission impact assessment (detailed further in Sections C.7.1.2
36 and C.7.1.3):
37

- 38 • Available transmission capacity in the six-state study area is limited. It is
39 likely that much of the solar generation produced in SEZs would need new or
40 upgraded transmission lines to move power to market. Determining exactly
41 where new transmission lines would be located is problematic, as discussed
42 below.
43
- 44 • By law, requests for capacity on the transmission system are analyzed on a
45 first-come, first-serve basis. The applicant who first encounters a shortage of
46 capacity to meet the planned project's needs must finance whatever system

1 upgrades are necessary in order to create the additional capacity needed.
2 Utilities maintain queues to keep track of who applied first; thus there is
3 incentive to make a request regardless of how viable a project might be.
4 Therefore, most utility queues include a number of unlikely projects, and there
5 is no easy way to separate out the truly viable projects from the placeholders.
6 The queues are thus a poor source of information about what projects might
7 be built and when.
8

- 9 • Some transmission projects are viewed as proprietary information by their
10 proponents for several reasons, including but certainly not limited to concerns
11 about competition for favorable rights-of-way (ROWs) or routes, cost or
12 funding considerations, or a desire to preserve a competitive advantage. If
13 such projects are not publicly known, that information cannot be used to help
14 efficiently plan transmission for the SEZs.
15
- 16 • The order in which projects proceed, and their relative timing, can have a
17 large impact on how the transmission system develops. A simple example
18 would be solar project development in a given SEZ. If many solar generation
19 projects were developed at the same time or close in time, it is reasonable to
20 assume that one or a few large transmission lines would be constructed to
21 carry the generation to market. If the same projects were developed singly
22 over a longer period of time, then one would predict that several smaller
23 transmission lines could result, since there is generally no financing
24 available for overbuilding a transmission line for potential (and uncertain)
25 future projects. In the proposed method for assessing new transmission
26 needs for SEZs, it has been assumed that all the SEZs would be built out to
27 capacity over a relatively short time period of 5 to 10 years, because
28 available data on the transmission system do not extend past the year 2020
29 (see Section C.7.1.3). However, it should be noted that larger lines are more
30 expensive, and if SEZs are not built out to capacity over the next 10 years or
31 so, construction of smaller transmission lines or upgrades of existing lines
32 may be more likely.
33
- 34 • The same list of projects will result in far different transmission development
35 depending on which project gets under way first. The first project may
36 partially negate the need for follow-on projects, or divert some customers.
37 Competing projects may continue up to the time that one goes forward: at that
38 time, the second project may be discontinued or may be combined with the
39 first project. The corresponding need for power flow on the transmission
40 system would also change, depending on the generation level of the first
41 project and where it would interconnect to the power system. This could cause
42 other proposed projects to become nonviable because of capacity changes on
43 the system. With all of the placeholder projects in utility queues and the
44 multitude of reasons project schedules either lag or accelerate, it is extremely
45 difficult to predict the capacity of new transmission development and where
46 and when it will occur.

- 1 • Solar developers will need to market the output of their projects to potential
2 purchasers. The PPAs would generally need to be in place in order to
3 determine to which load areas (i.e., population centers that could
4 accommodate the solar-generated electricity) the power would be transported.
5 The proposed SEZ-specific transmission analyses to be included in the Final
6 Solar PEIS may help developers initially identify the most likely load areas
7 for each SEZ and begin PPA negotiations with appropriate power companies.
8
- 9 • Several extremely long transmission line projects are proposed in the six-state
10 study area. Routing of these lines may or may not take into consideration the
11 locations of the proposed SEZs, and new transmission lines may be located
12 without regard for where the SEZs are located, as developers will want to
13 minimize the costs of constructing new or upgraded transmission systems.
14 However, such projects may be constructed within designated transmission
15 corridors, particularly corridors designated under Section 368 of the Energy
16 Policy Act of 2005,³⁷ because designated corridors have been through initial
17 environmental review to minimize siting issues. Many of the proposed SEZs
18 are located near Section 368 corridors. In addition, under the BLM’s preferred
19 alternative, applications for solar projects in variance areas outside of SEZs
20 may be accepted, thus allowing some projects outside of SEZs to take
21 advantage of new transmission that may become available over the 20-year
22 study period.
23
24

25 **C.7.1.3 Proposed Methodology for SEZ-Specific Transmission Analyses for the** 26 **Final Solar PEIS** 27

28 To better quantify potential upper bound and mid-range impacts of bringing transmission
29 to the SEZs being carried forward for the Final Solar PEIS, a revised transmission analysis is
30 proposed. The overall scope and approach for this additional analysis has been guided by review
31 comments and programmatic oversight by the BLM, DOE, National Renewable Energy
32 Laboratory (NREL), Western Area Power Administration, and the Western Electricity
33 Coordinating Council (WECC), with a goal of developing reasonable estimates for transmission
34 requirements and impacts, while recognizing that full-scale engineering analyses are beyond the
35 scope of the Solar PEIS effort. The information generated by this analysis would include:
36

- 37 1. Identification and characterization of potential load areas to be served by the
38 SEZ under consideration.
39

³⁷ Section 368 of the Energy Policy Act of 2005 (Public Law 109-58) required federal agencies to engage in transmission corridor planning (see Section 1.6.2.1 of the Draft Solar PEIS). As a result of this mandate, the BLM, DOE, U.S. Forest Service (USFS), and U.S. Department of Defense prepared a PEIS to evaluate the designation of energy corridors on federal lands in 11 western states, including the 6 states evaluated in this study (DOE and DOI 2008). The BLM and USFS issued Records of Decision to amend their respective land use plans to designate numerous corridors, often referred to as Section 368 corridors.

- 1 2. Characterization of transmission options for delivering power from the SEZ to
2 the potential load areas under both an upper bound analysis and a mid-range
3 analysis, and an estimation of the associated requirements in terms of
4 transmission line length, number of substations, total land use requirement,
5 voltage levels, wire sizes, and bundling configurations.
6
- 7 3. Identification of favorable and less-favorable transmission configurations in
8 terms of potential impacts, including land use requirements and cost.
9

10 To identify the potential load areas to be served by SEZs, a simple mathematical
11 algorithm will be applied to identify which load areas would be the most favorable in terms of
12 load requirements and distance from specific SEZs (see Section C.7.1.3.1 for a detailed
13 description of the methodology for load area identification). Because of the variable nature of
14 solar generation, the identified load areas will need to represent significantly greater load than is
15 expected to be delivered from a given SEZ (because no load area would depend entirely on solar
16 generation to meet its peak loads).
17

18 Using the information on potential load centers for an SEZ, an upper bound assessment
19 of transmission impacts for the SEZs will be conducted, assuming that new transmission lines
20 will be needed for all SEZ-generated electricity (this will be termed the “dedicated-line
21 transmission” analysis, or DLT analysis). The estimated generation capacity of SEZs will be
22 conservatively based on an assumed full build-out of each SEZ (i.e., 80% of acreage developed)
23 to be delivered to one or more load areas. It is projected that one to four favorable load areas for
24 each SEZ will be identified.
25

26 In addition to the upper bound analysis, an additional mid-range analysis will be
27 conducted for some of the SEZs being carried forward to provide a semi-quantitative analysis of
28 transmission needs using information about available capacity on existing lines and proposed
29 new lines as the basis for impact estimates (this will be termed the shared-line transmission
30 analysis, or SLT analysis). The SLT analysis will be conducted for all proposed SEZs in
31 Arizona, California, and Nevada that are being carried forward in the Final Solar PEIS (see
32 Sections C.1 through C.6). These analyses will support responses to specific comments about
33 opportunities to use existing and proposed new lines that were received on the Draft Solar PEIS.
34

- 35 • Specifically, the upper bound DLT analysis will estimate the number and size
36 of additional lines and substations required to move SEZ-generated electricity
37 to load center(s) in order to estimate the acres of land that would be disturbed.
38 The mid-range SLT analysis will estimate the number of line upgrades, new
39 transmission lines, and substations needed, assuming tie-in to the existing grid
40 where data indicate this would be likely. For both analyses, in order to
41 calculate the number of miles of new transmission construction and acres
42 disturbed, it will be assumed that new transmission construction will occur
43 parallel to existing ROWs and/or within or along designated corridors.
44
- 45 • The revised transmission analysis will also identify the transmission
46 stakeholders (e.g., regulators, planning groups, and councils) and transmission

1 planning process for each SEZ, and outline coordination policies that DOE
2 and the BLM may adopt to help bring transmission to SEZs. It will
3 acknowledge the requirements contained in the Memorandum of
4 Understanding regarding coordination in federal agency review of
5 transmission facilities on federal land (USDA et al. 2009).
6

- 7 • Transmission considerations will be an early and integral component of the
8 BLM’s SEZ identification protocol (see Appendix D of this Supplement),
9 focusing on near-term transmission projects and coordination with
10 transmission analytical and planning efforts ongoing through other
11 organizations. Examples of such efforts include those being carried out by
12 WECC’s Transmission Expansion Planning Policy Committee (TEPPC),
13 WECC’s Technical Studies Subcommittee, the Western Governors’
14 Association State/Provincial Steering Committee transmission planning
15 groups, regional and subregional planning groups, utility-level planning
16 initiatives, and investigations by many other stakeholders.
17
18

19 **C.7.1.3.1 Methodology for Identifying Likely Load Areas**

20
21 The methodology for identifying likely load centers is designed to provide a logical
22 foundation and reproducible basis for associating SEZs with appropriate load areas. The goal is
23 to develop SEZ/Load-Area assignments for each SEZ. This task represents the first step in an
24 enhanced assessment of transmission requirements for SEZs. The SEZ/Load-Area assignments
25 will provide the basis for examining the transmission needs and impacts for all SEZs, including
26 those that can potentially take advantage of nearby transmission lines and/or substations with
27 available capacity, those existing lines that could be upgraded to carry more capacity, and those
28 that are likely to require new transmission capabilities.
29
30

31 **Background.** The approach is designed to provide realistic approximations but should
32 not be interpreted as predictive or definitive, in part, because the transmission development
33 process is complex and dynamic, and also because of limitations in scope. Many commercial
34 entities (utilities, independent transmission developers, etc.), public entities, and governmental
35 entities are involved in planning, financing, permitting, and constructing new transmission lines,
36 and this analysis is not intended to capture those multi-entity dynamics. Likewise, this analysis
37 does not represent a technically rigorous treatment of the load associations, as it does not employ
38 load flow analysis or optimization techniques that are used by industry to simulate grid flows and
39 optimize cost/pricing issues. Such rigorous analysis requires extensive modeling that is beyond
40 the scope of the Solar PEIS. Instead, the logic outlined in this algorithm represents an effort to
41 capture some of the important physical factors that determine logical load areas for prospective
42 generation sources. By including considerations for the factors discussed below, the algorithm
43 described is intended to produce realistic assessments of transmission requirements and
44 associated impacts. This information may provide insight and data for supplying study requests
45 to WECC for additional analysis by WECC’s TEPPC Regional Transmission Expansion
46 Planning 10-year planning process, and for WECC’s Technical Studies Subcommittee reliability

1 studies. In addition, this information may be used to augment the Western Renewable Energy
2 Zone initiative.

3
4
5 ***Basic Considerations and Overview.*** The following objectives and factors are
6 incorporated into the SEZ/Load-Area algorithm:

- 7
- 8 • Minimizing distances between each SEZ generation source and selected
9 load(s);
- 10
- 11 • Identifying existing transmission lines where available capacity may exist;
- 12
- 13 • Taking advantage of existing ROWs or planned corridors, even where little or
14 no excess capacity exists, and recognizing existing grid topology as it might
15 lead to shorter transmission distances (to provide a realistic estimate of the
16 routes that would likely be followed in constructing new transmission lines or
17 upgrading existing lines);
- 18
- 19 • Identifying adequate loads to absorb planned SEZ generating capacities;
- 20
- 21 • Limiting solar-generated assignments for any given load area to a reasonable
22 percentage of the total load for that area; and
- 23
- 24 • Allowing SEZs to serve out-of-state load areas.
- 25

26 These factors will be integrated into the algorithm for identifying load areas for each
27 SEZ. Collectively, they are intended to mimic some of the basic considerations that drive
28 transmission development, without requiring the rigor of detailed load flow analysis. These items
29 are discussed in greater detail in the following descriptions.

30
31 *Minimizing Distances between Generation Source and Designated Load(s).* Distance
32 minimization recognizes that transmission distance is one of the strongest factors affecting
33 transmission costs and line losses. Minimizing distance represents a fundamental objective in
34 most transmission planning efforts, although in some cases a power generator can afford to move
35 power greater distances if the sales price in the more-distant market is higher than that in closer
36 markets. However, in the methods used for SEZ transmission analyses, total incremental
37 transmission distance will be treated as a basic parameter to be minimized, subject to the
38 requirements for assembling a collection of loads that satisfy the other requirements.

39
40 *Recognizing Existing Transmission Lines Where/If Available Capacity Exists.* For
41 locations where reliable data sources (e.g., FERC 2011; WECC 2010, 2011a) indicate that load
42 carrying capacity might be available on existing transmission lines, the algorithm will treat that
43 resource as top priority. While excess capacity may be relatively rare for many pathways around
44 SEZs, in cases where it does exist and the capacity is in the direction of the load area where
45 power is needed, it represents the least-cost and least-impact alternative for delivering power
46 from SEZs to load areas. As such, it would be the first option chosen relative to other options for

1 expanding or constructing new lines and/or ROWs. It is important to recognize that proper
2 location of a solar resource has the potential to actually reduce congestion by locating the
3 resource between the point of congestion and load and/or sending power in the opposite direction
4 of existing congestion.
5

6 *Taking Advantage of Existing ROWs or Planned Corridors Even Where Little or No*
7 *Excess Capacity Exists.* The identification of load areas for each SEZ will also recognize that
8 existing lines provide favorable pathways even when excess capacity is limited. The incremental
9 costs and impacts for expanding existing lines/ROWs are typically much lower than developing
10 entirely new pathways. There are numerous alternatives for adding capacity along existing
11 transmission pathways: adding new circuits/conductors to spare positions on existing structures;
12 reconducting the lines with high-temperature, low-sag conductors; making voltage upgrades;
13 and/or widening the ROW to accommodate new circuits/structures. These options, along with the
14 associated cost estimates, will be addressed in steps that follow after the initial sets of load areas
15 are identified for each SEZ.
16

17 *Recognizing Grid Topology as It Might Lead to Shorter Transmission Distances.*
18 “Incremental,” or new, transmission distances will be recognized in the analysis for
19 interconnected load areas. For example, if two load areas are reachable at different points along a
20 single transmission line, the selection logic will recognize that if both loads are to be connected,
21 the more-distant load area only incurs an incremental transmission enhancement distance to link
22 between the nearer load area and the more-distant load area. Recognizing interconnection
23 dependencies can alter the selection of the most favorable load areas to be served by a given
24 SEZ.
25

26 *Identifying Loads: (a) Identifying Adequate Loads To Absorb Planned SEZ Generating*
27 *Capacities.* For each SEZ, an adequate collection of load areas will need to be selected to absorb
28 the estimated solar-generating capacity at full build-out. In cases where surrounding load areas
29 represent small loads, this consideration will mean that multiple load areas will be identified
30 for a given SEZ. Limits that operators of individual load areas would place on the use of
31 renewable/solar power (see item (b) below) will also affect the number of load areas needed to
32 accommodate generation from each SEZ. With respect to the SEZ transmission analysis, a
33 simplifying assumption that no more than 20% of a load area’s power requirements could be
34 supplied from solar resources is made. In reality, the amount of solar power from an SEZ that
35 individual load areas will accept will vary based on the amount already supplied by other
36 renewable sources, and state and federal regulations and policies mandating the use of solar
37 power. *(b) Limiting Solar-Generated Load Assignments for any Given Load Area To Represent a*
38 *Reasonable Percentage of the Total Load for That Area.* For a given load area, only a portion of
39 total peak load will be “eligible” to be served from an SEZ. This consideration recognizes that
40 each load area would limit its exposure to variable loads as derived from solar generation
41 sources. Initially, the proposed fraction to be applied to each load area would equal the
42 Renewable Portfolio Standard (RPS) requirement (i.e., the fraction of electricity required to be
43 generated from renewable sources for the state where the load area is located). Peak load
44 estimates for load areas are expected to be approximated from a simple scalar based on
45 population.
46

1 *Allowing SEZs To Serve Out-of-State Load Areas.* The initial assumption in this analysis
2 will treat SEZs as able to serve both in-state and out-of-state loads. If interests or questions are
3 raised regarding sensitivities to this assumption, they can be addressed relatively easily with
4 additional case studies.
5
6

7 **Implementation.** The SEZ/Load-Area assignment algorithm will be solved by using a
8 simple mixed-integer linear programming (MILP) formulation. By defining the factors outlined
9 above, the MILP will identify the most effective collection of load areas for each SEZ. The
10 formulation will be flexible in terms of potential modifications or enhancements once initial test
11 cases are prepared and reviewed. In general, the algorithm will be formulated as a distance
12 minimization problem, subject to constraints to ensure that adequate loads are designated to
13 consume the solar-derived generation from a given SEZ.
14

15 Objective function: Minimize the sum of incremental transmission distances to all
16 designated load areas, subject to the following constraints:
17

- 18 • Sum of “eligible” load from all selected load areas must be \geq total SEZ
19 generating capacity.
- 20 • SEZ-eligible load for each load area = load area peak load \times RPS fraction
21 (for state of load area).
- 22 • Follow existing/planned ROWs/corridors to in-state and out-of-state load
23 areas.
- 24 • Use existing available capacity as possible (i.e., lowest incremental
25 distance/impact).
- 26 • For congested pathways, assume new capacity would need to be added.
- 27 • Use “incremental” distances to load areas located along ROWs/corridors that
28 serve other load areas.
29
- 30 • Use “incremental” distances to load areas located along ROWs/corridors that
31 serve other load areas.
32 • Use “incremental” distances to load areas located along ROWs/corridors that
33 serve other load areas.
34

35 In some cases, particularly for the smaller SEZs, the SEZ/Load-Area assignments may be
36 obvious upon initial inspection of the grid topography and magnitudes of capacity involved. In
37 such cases, it may not be necessary to actually construct or solve the MILP.
38

39 The end product of this process will be a list of logical load areas for each SEZ. These
40 lists will be used to assess the distances, upgrade requirements, and costs for:
41

- 42 • Transmission tie-lines to connect with the existing grid (and potential
43 transmission capacity on existing lines), and
44
- 45 • New transmission capabilities (on, or parallel to, existing/planned ROWs).
46

1 **C.7.1.3.2 Transmission Analysis Methodologies**
2

3 Subsequent to the identification of potential load areas as described in Section C.7.1.3.1,
4 the following additional assumptions, methods, and data sources are proposed for use in
5 identifying upgraded and/or new transmission facilities that would be needed for individual
6 SEZs, and for estimating the environmental impacts and costs of these upgraded or new
7 facilities.
8

9 The total load, in megawatts (MW) for each load area, will be roughly estimated by
10 assuming a population-to-power density (P-P-D) of 400 people per MW. Since population is the
11 most common parameter associated with a market area, the use of P-P-D is a convenient means
12 of calculating the equivalent MW load given the population. The resulting MW load usually
13 reflects the high side of the MW load estimate and, thus, supports analysis of upper bound
14 impacts.
15

16 The DLT analysis (see Section C.7.1.3 for definition) will assume that all SEZ-generated
17 power would require entirely new transmission lines. Where existing transmission lines are
18 present, it is assumed that the new dedicated lines would be constructed parallel to the existing
19 lines leading to the identified potential load areas and that they would require additional land for
20 ROWs. The new transmission lines are assumed to traverse the identified potential load areas in
21 sequence according to their linear distance from the center of the SEZ until the maximum
22 allowable MW output for the SEZ is fully distributed. The purpose of the DLT analysis is to
23 establish an approximate upper bound of potential impacts of transmission development
24 associated with solar development in the SEZ in terms of land disturbance and cost.
25

26 The SLT analysis will examine existing transmission lines with potential spare capacity
27 over a 10-year planning horizon, assuming that these lines could be used in transmitting
28 electricity generated at the SEZ to various load areas. To accomplish this, the analysis will
29 evaluate alternating current (AC) load flow data for the base year of 2011 through the tenth year
30 of the assumed planning horizon. The difference between the line rating (in MW) and the base
31 load flow (also in MW) is the allowable electrical capacity that could be used to transmit SEZ-
32 generated power. If there is insufficient capacity on the existing line, the analysis will examine
33 possible enhancements to existing transmission lines, as needed, to accommodate the full SEZ
34 output. Added investment is also required for a tie-line or tie-lines that would run from the SEZ
35 to the connecting point on the existing transmission line (note that larger SEZs may require more
36 than one tie-line).
37

38 Within each methodology (i.e., DLT and SLT analyses), the goal is to identify
39 transmission configurations that make efficient use of land and equipment investments, and
40 provide other qualitative advantages (e.g., transmission system flexibility and long-term
41 sustainability). Thus, the DLT analysis attempts to identify the best configuration for new
42 dedicated lines, and the SLT analysis attempts to identify the most favorable option that
43 recognizes the availability of existing transmission line capacity.
44

45 The planned data sources for the analyses include:
46

- 1 • Information about the proposed SEZs and potential generation levels as
2 presented in the Draft PEIS, associated spatial data (available at
3 <http://solareis.anl.gov/maps/index.cfm>), and revisions to the proposed SEZs
4 described in Sections C.1 through C.6.
5
- 6 • WECC systems map and load flow data from FERC for the years 2010, 2015,
7 and 2020 under peak summer demand (FERC 2011).
8
- 9 • WECC pathway reports for calibration adjustments to line capacity estimates:
10 for example, *10-Year Regional Transmission Plan, WECC Path Reports,*
11 *September 2011* (WECC 2011b).
12
- 13 • POWERmap data (Platts 2011): for load area identification and population
14 estimates.
15
- 16 • The Electric Power Research Institute (EPRI) *Transmission Line Reference*
17 *Book* (EPRI 2005).
18
- 19 • Various technical publications from the Institute of Electrical and Electronics
20 Engineers, EPRI, WECC, and other organizations.
21

22 Major assumptions to be employed in the analyses are as follows:

- 23
- 24 1. The study horizon will be assumed to be 10 years and cover the period 2011
25 to 2020. This assumption is constrained mainly by the available load flow data
26 and facility expansion information from FERC. FERC can provide load flow
27 data only extending up to 2020. Load growth and transmission line loadings
28 over this period of time will thus be included in the analysis.
29
- 30 2. Transmission lines that require new construction will be assumed to run
31 parallel to existing transmission routes.
32
- 33 3. A ROW requirement of 200 ft (61 m) for 500-kV transmission corridors and a
34 land requirement of 950 ft² (88.3 m²) per megavolt-ampere (MVA) for the
35 electric substations are assumed (Western 2009). These assumptions will be
36 further reviewed and revised as needed prior to the Final Solar PEIS.
37
- 38 4. The Brenda SEZ will have a maximum output of 770 MW, which will remain
39 constant over the planning horizon. (This is the assumption for the test case
40 presented in Section C.7.1.4; however, a revised assumption on the amount of
41 potential solar development at the Brenda SEZ now projects about 609 MW of
42 generation. While some of the results will change, the basic steps and general
43 findings are expected to remain the same as reported here.)
44
- 45 5. Other details: A present-worth method based on an opportunity cost of 3%
46 will be employed. Projections for annual load growth will be assumed to be

1 directly proportional to population growth. Cost of electric energy will be
2 assumed to be constant at about \$100/MWh. Only investment costs for the
3 transmission lines will be considered in this study. Maintenance cost will be
4 neglected for the time being to simplify the illustration of the analysis
5 procedure. These assumptions will be further reviewed and revised as needed
6 prior to the Final Solar PEIS.

- 7
- 8 6. As a simplifying approach to recognizing the variability characteristics of
9 solar generation, load areas are assumed to have a maximum supply of 20%
10 that is eligible to be served by solar power. Thus a load area with a total load
11 of 100 MW is assumed to represent only 20 MW of potential load for new
12 solar power generated in the SEZs. This consideration recognizes that each
13 load area would limit its exposure to variable generation as derived from solar
14 sources. As stated in Section C.7.1.3.1, the amount of solar power from an
15 SEZ that individual load areas will accept will vary based on the amount
16 already supplied by other renewable sources and on state and federal
17 regulations and policies mandating the use of solar power.
- 18
- 19 7. Transmission line expansion and reinforcements for 2011, 2015, and 2020 are
20 based on the “Planned Facilities Map” provided by WECC via FERC 715
21 filings.
- 22
- 23 8. Peak baseline power flows will be derived from the proportional relationship
24 between real power flows and the voltage angles. Power flow through a line
25 can be estimated by taking the difference between the voltage angle for the
26 sending and receiving terminals, and dividing by the line reactance (also
27 requires applying appropriate unit-conversion factors).
- 28
- 29 9. The thermal ratings of the lines as contained in FERC Form 715 for WECC
30 will be used to estimate spare capacity.
- 31
- 32

33 **C.7.1.4 Test Case Transmission Analysis for the Proposed Brenda SEZ**

34

35 The purpose of this test case is to demonstrate the effectiveness and usefulness of the
36 planned approach for conducting enhanced transmission assessments as described in
37 Section C.7.1.3 for proposed SEZs being carried forward to the Final Solar PEIS. The Brenda
38 SEZ, located in Arizona, was selected for this test case because it represents a nontrivial
39 combination of grid connection and delivery-to-load options that test the planned approach
40 (e.g., proximity to existing transmission lines and alternative loads). A paper containing the
41 details of the methods and assumptions used to conduct this test case analysis is available at the
42 Solar PEIS project Web site (<http://www.solareis.anl.gov>).

43

44 It is important to point out that the results presented in this test case are preliminary and
45 subject to refinement and validation via:

46

- 1 1. Utilizing WECC data sources and consulting with WECC, the California
2 Independent System Operator (CAL ISO), and other pertinent utilities on the
3 subjects of planned expansion facilities and spare transmission line capacities
4 over the study horizon;
- 5
- 6 2. Re-affirming the method used for quantifying the magnitude of “solar-
7 eligible” loads at identified load areas; and
8
- 9 3. Augmenting the transmission design assumptions using additional
10 transmission design reference materials (e.g., from EPRI, North American
11 Electric Reliability Corporation, and power engineering companies).
12

13 As stated in Section C.7.1.3, the assumed maximum output from the proposed Brenda
14 SEZ for the purposes of this test case analysis is 770 MW. For both the DLT analysis and the
15 SLT analysis, it is assumed that a 10-mi (16-km) tie-line from the proposed SEZ to a connection
16 point at the Salome Substation would need to be constructed. The primary candidates for Brenda
17 SEZ load areas are the major surrounding cities. The dispersal pattern of the load areas partly
18 determines the number of logical transmission schemes for the Brenda SEZ. The most likely
19 load area groupings for the SEZ are (1) Phoenix/Tucson; (2) Yuma, El Centro, San Diego;
20 (3) Las Vegas; and (4) Indio Coachella, Palm Springs, Hernet-San Jacinto, Riverside, and
21 Los Angeles. These groupings provide for linking loads along alternative routes from the Brenda
22 SEZ so that the SEZ’s output of 770 MW can be fully allocated.
23
24

25 ***Dedicated-Line Transmission Analysis.*** The DLT analysis approach assumes that the
26 Brenda SEZ will require all new construction for transmission lines (i.e., dedicated lines) and
27 substations. The new transmission lines(s) would directly convey the 770-MW output of the
28 Brenda SEZ to the prospective load areas for each possible transmission scheme. It also
29 assumes that all existing transmission lines in the WECC region are saturated and have little
30 or no available capacity to accommodate Brenda’s 770-MW output throughout the entire
31 10-year study horizon.
32

33 Table C.7-1 summarizes the distances to the various load areas over which new
34 transmission lines would need to be constructed by leg, as well as the assumed number of
35 substations that would be required. Table C.7-2 shows the net present value (NPV) of the various
36 transmission configurations and takes into account the cost of constructing the lines and the
37 projected revenue stream over the 10-year horizon. A positive NPV indicates that revenue more
38 than offsets investments. The estimated land use requirement for the various transmission
39 configurations is presented in Table C.7-3.
40

41 The results of this preliminary test case DLT analysis indicate that the most economically
42 attractive configuration (i.e., the configuration with the highest positive NPV) would be
43 Transmission Scheme 1, which treats Phoenix and Tucson as the primary markets. The second
44 most economic option is Scheme 2 which would primarily serve the San Diego Area. The
45 transmission scheme that identifies Las Vegas as the primary market falls short of fully
46

TABLE C.7-1 Potential Transmission Schemes, Estimated Solar Markets, and Distances to Load Areas for the Brenda SEZ

Transmission Scheme	City	Estimated MW for Solar Market ^a (based on population size)	Total Solar Market (MW)	Sequential Distance (mi) ^b	Total Distance (mi)	Line Voltage (MW)	Number of Substations
1	Phoenix	652	906	108	224	500	3
	Tucson	254		116			
2	Yuma	75	878	79	226	500	4
	El Centro	38		56			
	San Diego	765		91			
3	Las Vegas	467	467	188	188	500	2
4	Indio Coachella	26	2,934	131	262	500	2
	Palm Springs	22		18			
	Hemet-San Jacinto	65		27			
	Riverside	121		27			
	Los Angeles	2,699		59			

^a The estimated MW for solar market in each city is based on the 2010 population; 20% of the total estimated MW value is assumed as the maximum solar market.

^b To convert mi to km, multiply by 1.609.

TABLE C.7-2 Comparison of Potential Transmission Lines with Respect to Net Present Value

Transmission Scheme	City	Present Value Transmission Line Cost (million \$) ^a	Annual Sales Revenue (million \$) ^b	Present Worth Revenue (million \$) ^c	Net Present Value Revenue (million \$)
1	Phoenix, Tucson	784	134.9	1,152	368
2	Yuma, El Centro, San Diego	791	134.9	1,152	361
3	Las Vegas	658	81.8	699	41
4	Indio Coachella, Palm Springs, Hernet-San Jacinto, Riverside, Los Angeles	917	134.9	1,152	235

^a Assumes construction cost spike is at beginning of year 1; assumes a discount rate of 3%.

^b Assumes a revenue spike occurs at the end of each year; assumes a discount rate of 3%.

^c Assumes a discount rate of 3%.

TABLE C.7-3 Comparison of the Various Transmission Line Configurations with Respect to Land Use Requirements

Transmission Scheme	City	Total Distance (mi) ^a	Number of Substations	Land Use (mi ²) ^b		
				Transmission Line ^c	Substation ^d	Total
1	Phoenix, Tucson	224	3	8.4848	0.0289	8.51
2	Yuma, El Centro, San Diego	226	4	8.5606	0.0289	8.59
3	Las Vegas	188	2	7.1212	0.0175	7.14
4	Indio Coachella, Palm Springs, Hernet-San Jacinto, Riverside, Los Angeles	262	6	9.9242	0.0289	9.95

^a To convert mi to km, multiply by 1.609.

^b To convert mi² to km², multiply by 2.590.

^c Assumes a ROW width of 200 ft (61 m) for a 500-kV line.

^d Assumes a generic land use requirement for substations of about 950 ft/MVA (290 m/MVA). The size of each substation per scheme varies but has a sum total capacity limit of 770 MW × 1.1 (or about 847 MVA, assuming 1 MW = 1.1 MVA).

1 accommodating the maximum potential of the Brenda SEZ, and thus appears as the least
2 attractive configuration in terms of NPV. However, the Las Vegas transmission scheme has the
3 smallest impact in terms of amount of land disturbance. The worst transmission configuration in
4 terms of the amount of land disturbed and NPV is Scheme 4, which would deliver solar power
5 from the Brenda SEZ to Los Angeles.
6
7

8 ***Shared-Line Transmission Analysis.*** The SLT analysis provides a more detailed
9 analysis of transmission requirements by assessing the available capacity of existing lines
10 between the SEZ and the load centers and the need for new dedicated lines. This approach:
11

- 12 1. Takes into account the configuration and performance of the existing
13 transmission system and explores the possibility of using the existing spare
14 capacity (if there is any) to facilitate the conveyance of power from the SEZ to
15 the prospective load areas;
- 16 2. Maximizes the utilization of common resources (e.g., spinning reserves and
17 ancillary power reserves) within the context of a wider grid;
- 18 3. Accounts for the effects of future expansion plans of relevant utilities in the
19 WECC region; and
- 20 4. Takes advantage of connectivity between load areas and recognizes
21 cumulative solar-eligible demand requirements.
22

23
24
25
26 The SLT analysis makes use of AC load flow data to establish normal flow patterns
27 (i.e., magnitude and direction of power flows) on existing high-voltage lines surrounding the
28 SEZ. It then calculates the spare capacity of the existing high-voltage lines under peak load
29 conditions for 2011, 2015, and 2020. For the 10-year planning horizon, electrical growth for the
30 load areas is recognized, including its effects on the loading levels of the transmission lines.
31

32 Using this approach for the Brenda SEZ, only two transmission configurations emerged
33 as favorable; other configurations are possible but are clearly not optimal relative to the top two
34 configurations. The first transmission scheme analyzed Phoenix and San Diego as the primary
35 markets; the second analyzed Los Angeles as the primary market. Tables C.7-4 and C.7-5 show
36 the estimated spare capacity on existing lines for 2011, 2015, and 2020 for both of these
37 transmission schemes. For both transmission schemes and all three years, the estimated spare
38 capacity exceeds the 760 MW that could be generated from the proposed Brenda SEZ; thus,
39 there is enough spare capacity through 2020 to accommodate the SEZ outputs.
40

41 Note that the current scope of analysis will treat each SEZ independently. Conducting
42 coordinated transmission development studies that consider multiple SEZs contributing power to
43 the same load center or centers is considered beyond the scope of the additional SEZ-specific
44 transmission analysis planned for the Final Solar PEIS. However, discussion of the likelihood of
45 potential impacts from multiple SEZs will be included in the Final Solar PEIS, based on the
46 likely load centers identified for the SEZs.

1
2

TABLE C.7-4 Estimated Spare Capacity on Existing Lines from the Proposed Brenda SEZ to Phoenix and San Diego^a

Transmission Line Start/End Locations	Transmission Line Description	Spare MW		
		2011	2015	2020
Devers to Palo Verde	1 circuit 500 kV	4,693	4,488	4,582
Palo Verde to Rudd	1 circuit 500 kV	1,322	1,795	1,270
Hassayam to N. Gila	1 circuit 500 kV	2,923	1,144	2,385

^a Details of the calculation of spare MW using a calculated sending angle and receiving angle are provided in the full report for this test case (see the Solar PEIS project Web site [<http://solareis.anl.gov>]).

3
4
5
6

TABLE C.7-5 Estimated Spare Capacity on Existing Lines from the Proposed Brenda SEZ to the Los Angeles Area^a

Transmission Line Start/End Locations	Transmission Line Description	Spare MW		
		2011	2015	2020
Palo Verde to Devers	2 circuit 500 kV ^b	1,637	NA	NA
Devers to ValleySC	1 circuit 500 kV	1,615	NA	NA
Palo Verde to Colorado River	1 circuit 500 kV	NA ^c	1,158	958
Colorado River to Devers	2 circuit 500 kV	NA	5,738	5,636
Devers to ValleySC	2 circuit 500 kV	NA	4,001	3,482
ValleySC to Serrano	1 circuit 500 kV	2,434	1,979	2,532

^a Details of the calculation of spare MW using a calculated sending angle and receiving angle are provided in the full report for this test case (see the Solar PEIS project Web site [<http://solareis.anl.gov>]).

^b Conflicting sources: single circuit per Powermap; double circuit per WECC diagram.

^c NA = not applicable.

7
8
9
10
11
12

Discussion and Caveats to the Analyses. Although the DLT analyses may be useful in determining higher cost/higher impact estimates for the Solar PEIS, these analyses do have shortcomings. The approach ignores the systems approach, whereby common reserves and spares are shared within a system to maximize the use of available resources. Also, because the

1 transmission lines are assumed to be dedicated to SEZ operation, their utilization factor over the
2 planning horizon would remain essentially constant at about 20% (based on the estimated
3 average capacity factor of solar facilities), which is low and would not likely justify the huge
4 investments required. It also holds the SEZ owners captive to being the only probable investor on
5 the transmission lines. Because of fundamental limitations for the DLT analysis as discussed
6 above, the transmission configurations resulting from this approach should be considered
7 hypothetical.
8

9 An important finding from the SLT analysis is that there appears to be spare capacity
10 available in the existing 500-kV network linking the proposed Brenda SEZ to major load areas
11 and potential solar energy markets. The 10-year projection of the loading levels for existing and
12 planned 500-kV transmission lines also predicts the availability of spare capacity to
13 accommodate the SEZ output. However, a limitation of this analysis is that it does not
14 investigate potential queues of customers who might be waiting to occupy such excess capacity.
15 Nonetheless, this finding of potential spare capacity would indicate that the transmission
16 investment cost for this SEZ could be minimal, consisting mainly of approximately \$35 million
17 to construct the tie-line to existing transmission (assuming a cost of \$3.5 million per mile. This
18 finding needs to be confirmed through further peer review with transmission planning agencies,
19 particularly the WECC.
20
21

22 **C.7.2 Water Resources Action Plan**

23
24 There are seven main action plan items relating to water resources that apply to all SEZs
25 being carried forward. The following sections explain each action plan item and provide some
26 additional consideration for consultation with other federal, state, and local agencies and feasible
27 timelines for the additional work.
28
29

30 **C.7.2.1 Planning-Level Inventory of Water Resources**

31
32 The Draft Solar PEIS summarized surface water and groundwater resources for
33 individual SEZs at the programmatic level, but a more in depth or planning-level inventory
34 would provide a common resource for developers of individual SEZs, as well as address
35 comments on the Draft Solar PEIS.
36

37 The planning-level inventory of water resources will be presented in the Final Solar
38 PEIS. Products of the planning-level inventory will include (sources in parentheses):
39

- 40 • Maps of basin valley and surrounding mountain ranges
- 41 – All canals and perennial, intermittent, ephemeral streams (U.S. Geological
42 Survey [USGS] National Hydrography Dataset [NHD])
- 43 – HUC8 (8-digit, 4th-level hydrologic unit code) watersheds (USGS NHD)
- 44 – Groundwater wells (USGS National Water Information System [NWIS]
45 and Water Science Centers, National Resources Conservation Service
46 [NRCS])

- 1 – Springs (USGS NWIS)
- 2 – Groundwater basin(s) (state water agency)
- 3 – Wetlands (USFWS National Wetlands Inventory [NWI] or state agency)
- 4 – Playas and dry lakes (USGS NHD or state agency)
- 5 – Meteorological station locations (USGS NWIS, Western Regional Climate
- 6 Center [WRCC], state agency climate stations, e.g., California Irrigation
- 7 Management Information System [CIMIS] in California)
- 8
- 9 • Tabular information
- 10 – Canals and perennial and intermittent streams (USGS NHD)
- 11 – Total length of ephemeral stream channels (USGS NHD)
- 12 – Total length of stream channels by stream order (USGS NHD)
- 13 – Annual, seasonal, peak discharge values (USGS NWIS and Water Science
- 14 Centers)
- 15 – HUC8 watershed areas (USGS NHD)
- 16 – Groundwater basins—area, generic properties (state water agency, PEIS,
- 17 USGS NWIS and Water Science Centers, NRCS)
- 18 – Wetlands—areas, types (USFWS NWI or state agency)
- 19 – Springs—names, elevations, flows (USGS NWIS or state agency)
- 20 – Climate—precipitation, snowfall, evapotranspiration (USGS NWIS,
- 21 WRCC, state agencies)
- 22
- 23 • Google Earth™/geographic information system (GIS) data files, providing
- 24 links to datasets (USGS NWIS)
- 25 – Stream gages—flows and water quality
- 26 – Groundwater wells—depth to groundwater and water quality
- 27 – Meteorological stations—temperatures, precipitation, snowfall, etc.
- 28
- 29

30 **C.7.2.2 Floodplain Determinations**

31

32 In May 27, 1977, the President signed Executive Order 11988 “Floodplain Management,”

33 which states that federal agencies should avoid surface disturbance activities within identified

34 100-year floodplains (*Federal Register*, Volume 42, page 117, May 27, 1977). Only a few SEZs

35 being carried forward (Afton, Dry Lake, Imperial East, and Gillespie) have prior floodplain

36 analyses available to map exclusion floodplain areas. Identifying 100-year floodplain areas must

37 be performed in order to define non-development areas within SEZs. Given the episodic and

38 sometimes catastrophic nature of rainfall-runoff events in the desert southwest, floodplain

39 analyses could extend beyond the 100-year floodplain to regions susceptible to extreme flooding

40 events (e.g. alluvial fans, high gradient areas).

41

42 Floodplain determinations require field surveys, consultations with the Federal

43 Emergency Management Agency (FEMA) and state/local flood control agencies, and hydrologic

44 analyses. The primary steps to identifying floodplain areas include the following:

- 45
- 46 • Identifying of main surface drainage pathways within and adjacent to SEZs

- 1 • Consulting with FEMA and state/local flood control agencies regarding
2 floodplain mapping protocols
3
- 4 • Conducting field surveys
 - 5 – Channel geometries
 - 6 – High-water-mark indicator maps
 - 7 – Ground-truthing NHD channel networks
8
- 9 • Performing hydrologic analyses
 - 10 – Analysis of flood frequency
 - 11 – Hydraulic modeling of runoff routing
 - 12 – Determination of inundation areas
13
- 14 • Obtaining approvals (BLM-coordinated)
 - 15 – FEMA/agency for floodplains
16
17

18 **C.7.2.3 Jurisdictional Waters Determinations**

19
20 Section 404 of the Clean Water Act (CWA) requires a permitting process for dredging
21 and filling activities affecting “jurisdictional waters” of the United States. The U.S. Army Corps
22 of Engineers (USACE) and EPA oversee the permitting process and make determinations on
23 what constitutes jurisdictional water on a case-by-case basis. Jurisdictional water determinations
24 can be made by using a variety of techniques, including topographic maps and aerial
25 photographs, field surveys, and hydrologic analyses. The appropriate method for jurisdictional
26 water determinations must be coordinated with the appropriate offices of the USACE and EPA.
27 If field surveys are required, coordination with field surveys for floodplain determinations should
28 be made. Jurisdictional water determinations will not define non-developmental areas within
29 SEZs but will determine where CWA Section 404 permitting will be required.
30
31

32 **C.7.2.4 Significant Ephemeral Waters Determinations**

33
34 In addition to floodplains and jurisdictional waters, several commentors and cooperators
35 had concerns regarding the loss of ephemeral stream networks because of their importance to
36 hydrology, geomorphology, and habitat. The Draft Solar PEIS identified significant washes to be
37 excluded from development that showed physical evidence of conveying substantial flood flows
38 (these areas will likely overlap with 100-year floodplain mapping). Further analyses should be
39 performed to identify dense ephemeral stream networks that overlap with critical habitat, provide
40 significant groundwater connectivity, or constitute critical geomorphic features necessary for
41 maintaining connected features (e.g., dunes, eolian transport corridors, and active alluvial fans).
42 These additional analyses should include consultation with local BLM offices, cooperating
43 federal agencies, and state agencies regarding critical ephemeral stream networks for habitat,
44 hydrologic, and geomorphic value.
45
46

1 **C.7.2.5 Long-Term Monitoring Programs**
2

3 Careful siting and planning of solar facilities can reduce adverse impacts on surface water
4 and groundwater resources, but there are many unknowns regarding both surface water and
5 groundwater processes. Establishing a robust monitoring program and analysis tools for SEZs
6 would gain important information on whether surface water or groundwater resources are being
7 affected by solar facilities. Monitoring programs would need to incorporate stakeholder
8 involvement including appropriate federal/state/local agencies (e.g., local BLM offices, USGS
9 Water Science Centers, USFWS, National Park Service [NPS], state water resources agencies)
10 that conduct water resources monitoring. The Final Solar PEIS will recommend a process and
11 methods and tools for developing SEZ monitoring programs for water resources.
12

13
14 **C.7.2.5.1 Stakeholder Monitoring Committee**
15

16 Stakeholder agencies involved with water rights and water resources for each SEZ could
17 be identified to oversee the development and implementation of a monitoring program. The Final
18 Solar PEIS will describe the generic functions of stakeholder committees that could carry out
19 long-term monitoring at SEZs.
20

21
22 **C.7.2.5.2 Surface Water and Groundwater Monitoring**
23

24 The basic components for a long-term monitoring program of surface water and
25 groundwater resources will be described in the Final Solar PEIS. Examples of the basic
26 components at an individual SEZ include recommendations on monitoring parameters,
27 measuring frequency, and stakeholder involvement.
28

29
30 **C.7.2.6 Modification of Design Features**
31

32 Public and cooperator comments on the Draft Solar PEIS provided additional information
33 on water resources and new information that could be obtained from further analyses described
34 in the action plans. New information obtained from comments and work done for proposed
35 action plans will be used to modify design features for the Final Solar PEIS. Examples include
36 the following:
37

- 38 • Describing long-term monitoring programs that can be implemented for SEZs;
- 39
- 40 • Requiring water flow meters on groundwater pumps to accurately measure
41 extractions (to be used in groundwater models and analyses to support long,
42 term monitoring programs); and
43
- 44

- Requiring varying levels of groundwater analyses from developers depending on proposed water use (e.g., less detailed analyses required for photovoltaic [PV] facilities and more detailed analyses for higher water use parabolic trough facilities)

C.7.2.7 Groundwater Analyses

Utility-scale solar energy facilities have the potential to affect groundwater. The Draft Solar PEIS analysis of groundwater impacts was done qualitatively by summarizing available information relative to groundwater processes and comparing that information to estimates of potential groundwater extractions for the four main solar energy technologies evaluated. Seven of the SEZs being carried forward that would benefit from a more quantitative analysis have been identified: Afton, Amargosa Valley, Brenda, Dry Lake, Dry Lake Valley North, Imperial East, and Riverside East. At these seven SEZs, numerical groundwater modeling analyses will be presented in the Final Solar PEIS to better address two major concerns: potential drawdown impacts on surface water features (e.g., loss of springs, change in river discharge) and drawdown impacts on other groundwater users and groundwater processes. Where there are existing groundwater models, the following will be added:

- Groundwater model refinements for SEZ analysis, and
- Analyses of full build-out pumping scenarios.

Where there are not existing groundwater models, the following will be provided:

- Simplified, superposition-based, groundwater modeling; and
- Analyses of full build-out pumping scenarios.

C.7.3 Visual Resource Design Features for Select SEZs

The Draft Solar PEIS identified design features to lessen the adverse impacts of solar development on visual resources that would be applicable to all projects located on BLM-administered lands (see Section A.2.2.13 of the Draft). Additionally, the Draft Solar PEIS identified the need for SEZ-specific design features to reduce impacts on visual resources for eight of the proposed SEZs being carried forward for the Final Solar PEIS: Afton, Amargosa Valley, Antonito Southeast, De Tilla Gulch, Fourmile East, Gillespie, Los Mogotes East, and Riverside East. For three of these proposed SEZs (De Tilla Gulch, Fourmile East, and Gillespie), the recommended mitigation was to prohibit power tower facilities within the SEZ. For the other SEZs, the mitigation proposed in the Draft Solar PEIS was that development within certain portions of the SEZ be restricted to meet visual resource management (VRM) Class II- or Class III-consistent objectives (see Section 5.12 of the Draft PEIS for definitions of VRM classes). For the proposed Afton, Amargosa, Fourmile East, and Riverside East SEZs, some or all of the area

1 proposed for VRM Class II- or Class III-consistent management objectives has been eliminated
2 from the SEZ, so that the potential for large impacts on visual resources has been reduced.
3

4 The BLM has proposed revised SEZ-specific design features for visual resources for all
5 eight SEZs listed above, except De Tilla Gulch; these design features are listed in the SEZ
6 Action Plans (Sections C.1 through C.6). In addition to the SEZ-specific design features, the
7 BLM has determined that proposed development within these SEZs shall abide by the Draft
8 Solar PEIS visual resource design features, with the addition of the following requirements
9 pertaining to areas previously listed for meeting VRM Class II- and III-consistent management
10 objectives:

- 11 • No vertical development over 100 ft (30.5 m), including transmission towers
12 and other structures.
- 13 • Color-treat all facilities using color selection from the BLM Environment
14 Color Chart CC-001 to reduce visual color contrast with surrounding
15 landscape (including, but not limited to, buildings, storage facilities,
16 substation equipment, solar panel frames and electrical storage boxes).
- 17 • Color-treat surfaces cleared and stabilized with gravel paving to reduce color
18 contrast.
- 19 • Bury all transmission lines routed through the areas within the SEZs that are
20 listed for meeting VRM Class II-consistent management objectives.
- 21 • Color-treat solar panel backs to reduce visual contrast with landscape setting.
- 22 • Coat security fencing with black polyvinyl or other visual contrast-reducing
23 color.
- 24 • Shield glint and glare emitted from the surfaces of concentrated solar mirrors
25 and heliostats, solar engine mirrors, and other ancillary facilities shall be
26 shielded from sensitive observation areas including, but not limited to,
27 National Scenic and Historic Trails; National Parks and Wildlife Refuges;
28 Wilderness Areas and Wilderness Study Areas; Special Recreation
29 Management Areas; and National State and Back Country Byways. If
30 shielding of the glare and glint is impossible in these areas, then the default
31 is the use of PV technology.

C.8 REFERENCES

- 1
2
3
4 AARoads' Interstate Guide, 2006a, *Interstate 25*. Available at <http://www.interstate-guide.com/i-025.html>.
5
6
7 AARoads' Interstate Guide, 2006b, *Interstate 10*. Available at <http://www.interstate-guide.com/i-010.html>.
8
9
10 AARoads' Interstate Guide, 2007, *Interstate 15*. Available at <http://www.interstate-guide.com/i-015.html>.
11
12
13 America's Byways, 2011a, *Los Caminos Antiguos*. Available at <http://www.byways.org/explore/byways/2111/>.
14
15
16 America's Byways, 2011b, *Route 78—Anza-Borrego Desert State Park Road*. Available at
17 <http://www.byways.org/explore/byways/2171/>.
18
19 BLM (Bureau of Land Management), 2010, *National Landscape Conservation System*. Available
20 at http://www.blm.gov/pgdata/etc/medialib/blm/wo/Law_Enforcement/nlcs/online_electronic.Par.90025.File.dat/NHSTrails%20detail%20table%20December2010.pdf.
21
22
23 BLM, 2011a, *Old Spanish National Historic Trail*. Available at http://www.blm.gov/az/st/en/prog/blm_special_areas/hist_trails/old_span_tr.html.
24
25
26 BLM 2011b, *Kilbourne Hole Volcanic Center*. Available at http://www.blm.gov/nm/st/en/prog/recreation/las_cruces/kilbourne_hole.html.
27
28
29 BLM California, 2011, *The Bradshaw Trail*. Available at <http://www.blm.gov/ca/st/en/fo/palmsprings/bradshaw.html>.
30
31
32 Dalley, G., 2009, personal communication from Dalley (Bureau of Land Management, Cedar
33 City Field Office, Cedar City, Utah) to B. Verhaaren (Argonne National Laboratory, Argonne,
34 Ill.), May 26.
35
36 DOE and DOI (U.S. Department of Energy and U.S. Department of the Interior), 2008,
37 *Programmatic Environmental Impact Statement, Designation of Energy Corridors on Federal*
38 *Land in the 11 Western States*, DOE/EIS-0386, Final, Nov. Available at <http://corridoreis.anl.gov/eis/guide/index.cfm>.
39
40
41 DOT (U.S. Department of Transportation), 2011a, *Highway History: U.S. 93 Reaching*
42 *for the Border*. Available at <http://www.fhwa.dot.gov/infrastructure/us93.cfm>.
43
44 DOT, 2011b, *Highway History: U.S. 6—The Grand Army of the Republic Highway*. Available at
45 <http://www.fhwa.dot.gov/infrastructure/us6.cfm>.
46

1 EPRI (Electric Power Research Institute, 2005, *AC Transmission Line Reference Book—200 kV*
2 *and Above*, 3rd ed., 1011974, Final Report, Palo Alto, Calif.
3
4 FERC (Federal Energy Regulatory Commission), 2011, *FERC Form 715: Load Flow*
5 *Data Set for Western Electricity Coordinating Council*, transmitted by D. Burnham to
6 Argonne National Laboratory, July 2011
7
8 Leake, S.A., et al., 2008, *Use of Superposition Models to Simulate Possible Depletion of*
9 *Colorado River Water by Ground-Water Withdrawal*, U.S. Geological Survey Scientific
10 Investigations Report 2008-5189.
11
12 Nevada Commission on Tourism, 2011, *Silver State OHV Trail*. Available at
13 <http://travelnevada.com/tourist-attractions/info/must-see-silver-state-ohv-trail.aspx>.
14
15 Platts, 2011, POWERmap, Strategic Desktop Mapping System, The McGraw Hill Companies.
16 Available at <http://www.platts.com/Products/powermap>.
17
18 Steward, J.H., 1938, *Basin-Plateau Aboriginal Sociopolitical Groups*, *Bureau of American*
19 *Ethnology Bulletin 120*, Smithsonian Institution, Washington, D.C.
20
21 Stoffle, R.W., and H.F. Dobyns, 1983, *Nuvagantu: Nevada Indians Comment on the*
22 *Intermountain Power Project*, prepared by the Applied Urban Field School, University of
23 Wisconsin–Parkside, Kenosha, Wis., for the Bureau of Land Management, Nevada.
24
25 Stoffle, R.W., et al., 1997, “Cultural Landscapes and Traditional Cultural Properties: A
26 Southern Paiute View of the Grand Canyon and Colorado River,” *American Indian*
27 *Quarterly* 21(2):229–250.
28
29 Stoffle, R.W., et al., 2000a, *Ha’tata (The Backbone of the River): American Indian Ethnographic*
30 *Studies Regarding the Hoover Dam Bypass Project*, prepared by the Bureau of Applied Research
31 in Anthropology, University of Arizona, Tucson, Ariz., for the Federal Highway Administration.
32
33 Stoffle, R.W., et al., 2000b, *From Place to Object: Native American Graves Protection and*
34 *Repatriation Act Consultation for the Hot Creek Valley Collection, Central Nevada Test Area*,
35 prepared by the Bureau of Applied Research in Anthropology, University of Arizona, Tucson,
36 Ariz., for the U.S. Department of Energy Nevada Operations Office.
37
38 Stoffle, R.W., et al., editors, 2001, *American Indians and the Nevada Test Site: A Model of*
39 *Research and Consultation*, Government Printing Office, Washington, D.C.
40
41 U.S. Bureau of the Census, 2011a, *Colorado—Place GCT-PH1. Population, Housing Units,*
42 *Area, and Density: 2000 Data Set: Census 2000 Summary File 1 (SF 1) 100-Percent Data.*
43 Available at http://factfinder.census.gov/servlet/GCTTable?_bm=y&-geo_id=04000US08&-_box_head_nbr=GCT-PH1&-ds_name=DEC_2000_SF1_U&-format=ST-7.
44
45

1 U.S. Bureau of the Census, 2011b, *New Mexico—Place GCT-PH1. Population, Housing Units,*
2 *Area, and Density: 2000 Data Set: Census 2000 Summary File 1 (SF 1) 100-Percent Data.*
3 Available at http://factfinder.census.gov/servlet/GCTTable?_bm=y&-context=gct&-ds_name=DEC_2000_SF1_U&-mt_name=DEC_2000_SF1_U_GCTPH1_ST7&-tree_id=4001&-redoLog=false&-_caller=geoselect&-geo_id=04000US35&-format=ST-7|ST-7S&-_lang=en.
4
5
6
7 U.S. Bureau of the Census, 2011c, *California—Place GCT-PH1. Population, Housing Units,*
8 *Area, and Density: 2000 Data Set: Census 2000 Summary File 1 (SF 1) 100-Percent Data.*
9 Available at http://factfinder.census.gov/servlet/GCTTable?_bm=y&-geo_id=04000US06&-box_head_nbr=GCT-PH1&-context=gct&-ds_name=DEC_2000_SF1_U&-tree_id=4001&-redoLog=false&-mt_name=DEC_2000_SF1_U_GCTPH1_ST7&-format=ST-7.
10
11
12
13 U.S. Bureau of the Census, 2011d, *Arizona—Place GCT-PH1. Population, Housing Units, Area,*
14 *and Density: 2000 Data Set: Census 2000 Summary File 1 (SF 1) 100-Percent Data.* Available
15 at http://factfinder.census.gov/servlet/GCTTable?_bm=y&-context=gct&-ds_name=DEC_2000_SF1_U&-mt_name=DEC_2000_SF1_U_GCTPH1_ST7&-tree_id=4001&-redoLog=true&-_caller=geoselect&-geo_id=04000US04&-format=ST-7|ST-7S&-_lang=en.
16
17
18
19 USDA (U.S. Department of Agricultural), et al., 2009, *Memorandum of Understanding among*
20 *the U.S. Department of Agriculture, Department of Commerce, Department of Defense,*
21 *Department of Energy, Environmental Protection Agency, the Council on Environmental*
22 *Quality, the Federal Energy Regulatory Commission, the Advisory Council on Historic*
23 *Preservation, and Department of the Interior Regarding Coordination in Federal Agency Review*
24 *of Electric Transmission Facilities on Federal Land*, BLM MOU WO-350-2010-05, Oct. 23.
25 Available at [http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_](http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/im_attachments/2010.Par.65839.File.dat/IM201-169_att1.pdf)
26 [Management/policy/im_attachments/2010.Par.65839.File.dat/IM201-169_att1.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/im_attachments/2010.Par.65839.File.dat/IM201-169_att1.pdf).
27
28 USGS (U.S. Geological Survey), 2005, *National Gap Analysis Program, Southwest Regional*
29 *GAP Analysis Project—Land Cover Descriptions*, RS/GIS Laboratory, College of Natural
30 Resources, Utah State University. Available at http://earth.gis.usu.edu/swgap/legend_desc.html.
31 Accessed March 15, 2010.
32
33 USGS, 2010, *Gap Analysis Program Land Cover Viewer*. Available at <http://lc.gapanalysisprogram.com/landcoverviewer/Downloads.aspx>. Accessed Aug. 23, 2011.
34
35
36 USGS, 2011, *Monitoring Network of the Ground-Water Flow System and Stream-Aquifer*
37 *Relations in the Mesilla Basin, Doña Ana County, New Mexico and El Paso County, Texas.*
38 Available at <http://nm.water.usgs.gov/projects/mesilla/>.
39
40 US-Highways.com, 2007, *U.S. Highways: From US 1 to (US 830)*. Available at [http://www.us-](http://www.us-highways.com/usbt.htm)
41 [highways.com/usbt.htm](http://www.us-highways.com/usbt.htm).
42
43 US-Highways.com, 2010, *Sequential List with Termini and Lengths in Miles*. Available at
44 <http://www.us-highways.com/us1830.htm>.
45

1 Utah DOT (Utah Department of Transportation), 2008, *Highway Reference: 0021*. Available at
2 <http://www.dot.utah.gov/main/uconowner.gf?n=7207725046907213>.
3

4 WECC (Western Electricity Coordinating Council), 2010. *2009 Western Interconnection*
5 *Transmission Path Utilization Study, Path Flows, Schedules, and OASIS ATC Offerings WECC*
6 *Transmission System 2008 and 2009, Including 10-year History*, June 24. Available at
7 [http://www.wecc.biz/committees/BOD/TEPPC/Shared%20Documents/TEPPC%20Annual%](http://www.wecc.biz/committees/BOD/TEPPC/Shared%20Documents/TEPPC%20Annual%20Reports/2009/2009%20Western%20Interconnection%20Transmission%20Path%20Utilization%20Study.pdf)
8 [20Reports/2009/2009%20Western%20Interconnection%20Trasnmission%20Path%20](http://www.wecc.biz/committees/BOD/TEPPC/Shared%20Documents/TEPPC%20Annual%20Reports/2009/2009%20Western%20Interconnection%20Transmission%20Path%20Utilization%20Study.pdf)
9 [Utilization%20Study.pdf](http://www.wecc.biz/committees/BOD/TEPPC/Shared%20Documents/TEPPC%20Annual%20Reports/2009/2009%20Western%20Interconnection%20Trasnmission%20Path%20Utilization%20Study.pdf).
10

11 WECC, 2011a, *Draft WECC 10-Year Regional Transmission Plan—for Public Comment,*
12 *Western Electricity Coordinating Council*, Aug. Available at [http://www.wecc.biz/](http://www.wecc.biz/committees/BOD/TEPPC/Shared%20Documents/Forms/AllItems.aspx?RootFolder=%2fcommittees%2fBOD%2fTEPPC%2fShared%20Documents%2fDRAFT%20WECC%2010-Year%20Regional%20Transmission%20Plan%20-%20for%20public%20comment%2fWECC%20Path%20Reports%20-%20for%20public%20comment&FolderCTID=&View={3FECCB9E-172C-41C1-9880-A1CF02C537B7})
13 [committees/BOD/TEPPC/Shared%20Documents/Forms/AllItems.aspx?RootFolder=](http://www.wecc.biz/committees/BOD/TEPPC/Shared%20Documents/Forms/AllItems.aspx?RootFolder=%2fcommittees%2fBOD%2fTEPPC%2fShared%20Documents%2fDRAFT%20WECC%2010-Year%20Regional%20Transmission%20Plan%20-%20for%20public%20comment%2fWECC%20Path%20Reports%20-%20for%20public%20comment&FolderCTID=&View={3FECCB9E-172C-41C1-9880-A1CF02C537B7})
14 [%2fcommittees%2fBOD%2fTEPPC%2fShared%20Documents%2fDRAFT%20WECC](http://www.wecc.biz/committees/BOD/TEPPC/Shared%20Documents/Forms/AllItems.aspx?RootFolder=%2fcommittees%2fBOD%2fTEPPC%2fShared%20Documents%2fDRAFT%20WECC%2010-Year%20Regional%20Transmission%20Plan%20-%20for%20public%20comment%2fWECC%20Path%20Reports%20-%20for%20public%20comment&FolderCTID=&View={3FECCB9E-172C-41C1-9880-A1CF02C537B7})
15 [%2010-Year%20Regional%20Transmission%20Plan%20-%20for%20public%20](http://www.wecc.biz/committees/BOD/TEPPC/Shared%20Documents/Forms/AllItems.aspx?RootFolder=%2fcommittees%2fBOD%2fTEPPC%2fShared%20Documents%2fDRAFT%20WECC%2010-Year%20Regional%20Transmission%20Plan%20-%20for%20public%20comment%2fWECC%20Path%20Reports%20-%20for%20public%20comment&FolderCTID=&View={3FECCB9E-172C-41C1-9880-A1CF02C537B7})
16 [comment%2fWECC%20Path%20Reports%20-%20for%20public%20comment&](http://www.wecc.biz/committees/BOD/TEPPC/Shared%20Documents/Forms/AllItems.aspx?RootFolder=%2fcommittees%2fBOD%2fTEPPC%2fShared%20Documents%2fDRAFT%20WECC%2010-Year%20Regional%20Transmission%20Plan%20-%20for%20public%20comment%2fWECC%20Path%20Reports%20-%20for%20public%20comment&FolderCTID=&View={3FECCB9E-172C-41C1-9880-A1CF02C537B7})
17 [FolderCTID=&View={3FECCB9E-172C-41C1-9880-A1CF02C537B7}](http://www.wecc.biz/committees/BOD/TEPPC/Shared%20Documents/Forms/AllItems.aspx?RootFolder=%2fcommittees%2fBOD%2fTEPPC%2fShared%20Documents%2fDRAFT%20WECC%2010-Year%20Regional%20Transmission%20Plan%20-%20for%20public%20comment%2fWECC%20Path%20Reports%20-%20for%20public%20comment&FolderCTID=&View={3FECCB9E-172C-41C1-9880-A1CF02C537B7}).
18

19 WECC 2011b, *10-Year Regional Transmission Plan, WECC Path Reports, September 2011,*
20 *Sept. 22.*
21

22 Western (Western Area Power Administration), 2009, *Transmission Line Electrical Design:*
23 *Right-of-Way, Section IX*, Aug.
24
25