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TABLE OF CONTENTS

ACRONYMS ..... **XV**

1 PURPOSE AND NEED **1**

1.1 Introduction ***1***

1.2 Purpose and Need ***3***

1.3 Scoping, Public Involvement and Issues ***3***

1.3.1 Consultations with Cooperating Agencies/Organizations **5**

1.3.2 Public Meetings **5**

1.3.3 Project Location and Existing Land Use **5**

2 PROPOSED ACTION AND ALTERNATIVES **6**

2.1 The Proposed Action ***6***

2.1.1 Applicant and Agencies involved **7**

2.1.2 Action to be taken **7**

2.1.2.1 Location ***7***

2.1.2.2 Time frame for construction and operation ***10***

2.1.3 Construction **10**

2.1.3.1 Pre Construction Activities ***14***

2.1.3.1.1 Land Surveys 14

2.1.3.1.2 Aerial Surveys 14

2.1.3.1.3 Engineering Surveys 14

2.1.3.1.4 Cultural Resource Surveys 14

2.1.3.1.5 Biological Surveys 15

2.1.3.1.6 Interconnection Geotechnical Investigation 15

2.1.3.2 Construction Activities ***16***

2.1.3.2.1 Materials 22

2.1.3.2.2 Project Access Roads 22

2.1.3.2.3 Rail Line 23

2.1.3.2.4 Catenary Power Distribution Line 24

2.1.3.2.5 Building and Support Facilities 24

2.1.3.2.6 Transmission Line 25

2.1.3.2.7 Cleanup 25

2.1.4 Operations and Maintenance **27**

2.1.5 Design features and mitigation to reduce/eliminate potential impacts **28**

2.1.6 Connected actions **29**

2.1.7 Land Use Plan Conformance 29
2.2 The Alternative 30
2.2.1 Applicant and Agencies involved 30
2.2.2 Action to be taken 30
2.2.2.1 Location 30
2.2.2.2 Time frame for construction and operation 32
2.2.2.3 Construction 32
2.2.2.3.1 Pre Construction Activities 36
2.2.2.3.2 Construction Activities 36
2.2.2.3.3 Materials 40
2.2.2.3.4 Project Access Roads 40
2.2.2.3.5 Rail Line 40
2.2.2.3.6 Catenary Power Distribution Line 40
2.2.2.3.7 Building and Support Facilities 40
2.2.2.3.8 Transmission Line 40
2.2.2.3.9 Cleanup 40
2.2.2.4 Operations and Maintenance 40
2.2.2.5 Design features and mitigation to reduce/eliminate potential impacts 40
2.2.3 Connected actions 41
2.2.4 Conformance 41
2.2.4.1 Land Use Plan Conformance 41
2.3 No Action Alternative 41
2.4 Alternative Considered but Eliminated from Detailed Analysis 41
2.4.1 Wheeler Wash 41
2.5 Relationship to Statutes, Regulations, Policy, Plans or Other EAs 42
2.5.1 BLM Resource Management Plan 42
2.5.2 Statutes, Regulations, and Policies 43
3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES 44
3.1 Supplemental Authorities 44
3.2 Cumulative Scenario 50
3.2.1 Past and Present and Reasonably Foreseeable Future Actions (RFFAs) 53
3.2.2 Cumulative Effects Study Area 56
3.2.2.1 Proposed Action 57

3.2.2.2 Alternative ... 58
3.2.2.3 No Action Alternative ... 58
3.3 Air Quality ... 58
3.3.1 Affected Environment ... 58
3.3.2 Methodology ... 59
3.3.3 Environmental Consequences ... 59
3.3.3.1 Proposed Action ... 59
3.3.3.1.1 Direct and Indirect Effects ... 59
3.3.3.1.2 Mitigation Measures ... 59
3.3.3.1.3 Residual Impacts ... 60
3.3.3.1.4 Cumulative Impacts ... 60
3.3.3.2 Alternative ... 60
3.3.3.2.1 Direct and Indirect Effects ... 60
3.3.3.2.2 Mitigation Measures ... 60
3.3.3.2.3 Residual Impacts ... 60
3.3.3.2.4 Cumulative Impacts ... 60
3.3.3.3 No Action Alternative ... 61
3.3.3.3.1 Direct and Indirect Effects ... 61
3.3.3.3.2 Cumulative Impacts ... 61
3.4 Noxious Weed ... 61
3.4.1 Affected Environment ... 61
3.4.2 Methodology ... 61
3.4.3 Environmental Consequences ... 62
3.4.3.1 Proposed Action ... 62
3.4.3.1.1 Direct and Indirect Effects ... 62
3.4.3.1.2 Mitigation Measures ... 62
3.4.3.1.3 Residual Impacts ... 62
3.4.3.1.4 Cumulative Impacts ... 62
3.4.3.2 Alternative ... 63
3.4.3.2.1 Direct and Indirect Effects ... 63
3.4.3.2.2 Mitigation Measures ... 63
3.4.3.2.3 Residual Impacts ... 63
3.4.3.2.4 Cumulative Impacts ... 63
3.4.3.3 No Action Alternative ... 63

3.4.3.3.1 Direct and Indirect Effects 63
3.4.3.3.2 Cumulative Impacts 63
3.5 Floodplains 63
3.5.1 Affected Environment 63
3.5.2 Methodology 64
3.5.3 Environmental Consequences 64
3.5.3.1 Proposed Action 64
3.5.3.1.1 Direct and Indirect Effects 64
3.5.3.1.1 Mitigation Measures 65
3.5.3.1.2 Residual Impacts 67
3.5.3.1.3 Cumulative Impacts 67
3.5.3.2 Alternative 67
3.5.3.2.1 Direct and Indirect Effects 67
3.5.3.2.2 Mitigation Measures 67
3.5.3.2.3 Residual Impacts 67
3.5.3.2.4 Cumulative Impacts 68
3.5.3.3 No Action Alternative 68
3.5.3.3.1 Direct and Indirect Effects 68
3.5.3.3.2 Cumulative Impacts 68
3.6 Threatened and Endangered Species – Including Proposed and Candidate Species 69
3.6.1 Affected Environment 69
3.6.2 Methodology 70
3.6.3 Environmental Consequences 71
3.6.3.1 Proposed Action 71
3.6.3.1.1 Direct and Indirect Effects 71
3.6.3.1.2 Mitigation Measures 72
3.6.3.1.3 Residual Impacts 74
3.6.3.1.4 Cumulative Impacts 74
3.6.3.2 Alternative 75
3.6.3.2.1 Direct and Indirect Effects 75
3.6.3.2.2 Mitigation Measures 75
3.6.3.2.3 Residual Impacts 75
3.6.3.2.4 Cumulative Impacts 75

3.6.3.3 No Action Alternative ... 75
3.6.3.3.1 Direct and Indirect Effects ... 75
3.6.3.3.2 Cumulative Impacts ... 75
3.7 Migratory Birds ... 76
3.7.1 Affected Environment ... 76
3.7.2 Methodology ... 77
3.7.3 Environmental Consequences ... 77
3.7.3.1 Proposed Action ... 77
3.7.3.1.1 Direct and Indirect Effects ... 78
3.7.3.1.2 Mitigation Measures ... 79
3.7.3.1.3 Residual ... 79
3.7.3.1.4 Cumulative Impacts ... 79
3.7.3.2 Alternative ... 80
3.7.3.2.1 Direct and Indirect Effects ... 80
3.7.3.2.2 Mitigation Measures ... 80
3.7.3.2.3 Residual Impacts ... 80
3.7.3.2.4 Cumulative Impacts ... 80
3.7.3.3 No Action Alternative ... 80
3.7.3.3.1 Direct and Indirect Effects ... 80
3.7.3.3.2 Cumulative Impacts ... 80
3.8 Human Health and Safety ... 80
3.8.1 Affected Environment ... 80
3.8.2 Methodology ... 81
3.8.3 Environmental Consequences ... 81
3.8.3.1 Proposed Action ... 81
3.8.3.1.1 Direct and Indirect Effects ... 81
3.8.3.1.2 Mitigation Measures ... 85
3.8.3.1.3 Residual ... 86
3.8.3.1.4 Cumulative Impacts ... 86
3.8.3.2 Alternative ... 86
3.8.3.2.1 Direct and Indirect Effects ... 86
3.8.3.2.2 Mitigation Measures ... 86
3.8.3.2.3 Residual ... 86
3.8.3.2.4 Cumulative Impacts ... 86

3.8.3.3 No Action Alternative on Human Health and Safety..... 86
3.8.3.3.1 Direct and Indirect Effects 86
3.8.3.3.2 Cumulative Impacts 86
3.9 Hydrologic Conditions 87
3.9.1 Affected Environment 87
3.9.2 Methodology 87
3.9.3 Environmental Consequences..... 87
3.9.3.1 Proposed Action..... 87
3.9.3.1.1 Direct and Indirect Effects 87
3.9.3.1.2 Mitigation Measures 87
3.9.3.1.3 Residual Impacts 88
3.9.3.1.4 Cumulative Impacts 88
3.9.3.2 Alternative 88
3.9.3.2.1 Direct and Indirect Effects 88
3.9.3.2.2 Mitigation Measures 88
3.9.3.2.3 Residual Impacts 88
3.9.3.2.4 Cumulative Impacts 88
3.9.3.3 No Action Alternative 88
3.9.3.3.1 Direct and Indirect Effects 88
3.9.3.3.2 Cumulative Impacts 88
3.10 Land Use Authorizations 89
3.10.1 Affected Environment 89
3.10.2 Methodology 89
3.10.3 Environmental Consequences..... 89
3.10.3.1Proposed Action..... 89
3.10.3.1.1 Direct and Indirect Effects 89
3.10.3.1.2 Mitigation Measures 90
3.10.3.1.3 Residual Impacts 90
3.10.3.1.4 Cumulative Impacts 91
3.10.3.2Alternative 91
3.10.3.2.1 Direct and Indirect Effects 91
3.10.3.2.2 Residual Impacts 91
3.10.3.2.3 Cumulative Impacts 92
3.10.3.3No Action Alternative 92

3.10.3.3.1 Direct and Indirect Effects 92
3.10.3.3.2 Cumulative Impacts 92
3.11 Geology and Mineral Resources 92
3.11.1 Affected Environment 92
3.11.2 Methodology 93
3.11.3 Environmental Consequences 93
3.11.3.1Proposed Action 93
3.11.3.1.1 Direct and Indirect Effects 93
3.11.3.1.2 Mitigation Measures 93
3.11.3.1.3 Residual Impacts 94
3.11.3.1.4 Cumulative Impacts 94
3.11.3.2Alternative 94
3.11.3.2.1 Direct and Indirect Effects 94
3.11.3.2.2 Mitigation Measures 94
3.11.3.2.3 Residual Impacts 94
3.11.3.2.4 Cumulative Impacts 94
3.11.3.3No Action Alternative 94
3.11.3.3.1 Direct and Indirect Effects 94
3.11.3.3.2 Cumulative Impacts 94
3.12 Recreation 94
3.12.1 Affected Environment 95
3.12.2 Methodology 95
3.12.3 Environmental Consequences 95
3.12.3.1Proposed Action 95
3.12.3.1.1 Direct and Indirect Effects 95
3.12.3.1.2 Mitigation Measures 95
3.12.3.1.3 Residual Impacts 95
3.12.3.1.4 Cumulative Impacts 95
3.12.3.2Alternative 96
3.12.3.2.1 Direct and Indirect Effects 96
3.12.3.2.2 Mitigation Measures 96
3.12.3.2.3 Residual Impacts 96
3.12.3.2.4 Cumulative Impacts 96
3.12.3.3No Action Alternative 96

3.12.3.3.1 Direct and Indirect Effects 96
3.12.3.3.2 Cumulative Impacts 96
3.13 Socioeconomic Values 96
3.13.1 Affected Environment 96
3.13.2 Methodology 98
3.13.3 Environmental Consequences 98
3.13.3.1Proposed Action 98
3.13.3.1.1 Direct and Indirect Effects 98
3.13.3.1.2 Mitigation Measures 99
3.13.3.1.3 Residual Impacts 99
3.13.3.1.4 Cumulative Impacts 99
3.13.3.2Alternative 100
3.13.3.2.1 Direct and Indirect Effects 100
3.13.3.2.2 Mitigation Measures 100
3.13.3.2.3 Residual Impacts 100
3.13.3.2.4 Cumulative Impacts 100
3.13.4 No Action Alternative 100
3.13.4.1.1 Direct and Indirect Effects 100
3.13.4.1.2 Cumulative Impacts 100
3.14 Soils 100
3.14.1 Affected Environment 100
3.14.2 Methodology 101
3.14.3 Environmental Consequences 101
3.14.3.1Proposed Action 101
3.14.3.1.1 Direct and Indirect Effects 102
3.14.3.1.2 Mitigation Measures 102
3.14.3.1.3 Residual Impacts 102
3.14.3.1.4 Cumulative Impacts 102
3.14.3.2Alternative 102
3.14.3.2.1 Direct and Indirect Effects 102
3.14.3.2.2 Mitigation Measures 103
3.14.3.2.3 Residual Impacts 103
3.14.3.2.4 Cumulative Impacts 103
3.14.3.3No Action Alternative 103

3.14.3.3.1 Direct and Indirect Effects 103
3.14.3.3.2 Cumulative Impacts 103
3.15 Transportation 103
3.15.1 Affected Environment 103
3.15.2 Methodology 104
3.15.3 Environmental Consequences 104
3.15.3.1Proposed Action 104
3.15.3.1.1 Direct and Indirect Effects 104
3.15.3.1.2 Mitigation Measures 104
3.15.3.1.3 Residual Impacts 105
3.15.3.1.4 Cumulative Impacts 105
3.15.3.2Alternative 105
3.15.3.2.1 Direct and Indirect Effects 105
3.15.3.2.2 Mitigation Measures 105
3.15.3.2.3 Residual Impacts 106
3.15.3.2.4 Cumulative Impacts 106
3.15.3.3No Action Alternative 106
3.15.3.3.1 Direct and Indirect Effects 106
3.15.3.3.2 Cumulative Impacts 106
3.16 Vegetation Excluding Federally Listed Species 106
3.16.1 Affected Environment 106
3.16.1.1General Vegetation 106
3.16.1.1.1 North American Warm Desert Pavement 107
3.16.1.1.2 Inter-Mountain Basins Semi-Desert Shrub Steppe 107
3.16.1.1.3 Mojave Mid-Elevation Mixed Desert Scrub 108
3.16.1.2BLM Special Status Species 108
3.16.2 Methodology 110
3.16.3 Environmental Consequences 110
3.16.3.1Proposed Action 110
3.16.3.1.1 Direct and Indirect Effects 110
3.16.3.1.2 Mitigation Measures 111
3.16.3.1.3 Residual Impacts 112
3.16.3.1.4 Cumulative Impacts 112
3.16.3.2Alternative 112

3.16.3.2.1 Direct and Indirect Effects 112
3.16.3.2.2 Mitigation Measures 112
3.16.3.2.3 Residual Impacts 112
3.16.3.2.4 Cumulative Impacts 112
3.16.4 No Action Alternative 113
3.16.4.1.1 Direct and Indirect Effects 113
3.16.4.1.2 Cumulative Impacts 113
3.17 Forestry 113
3.17.1 Affected Environment 113
3.17.2 Methodology 113
3.17.3 Environmental Consequences 114
3.17.3.1Proposed Action 114
3.17.3.1.1 Direct and Indirect Effects 114
3.17.3.1.2 Mitigation Measures 114
3.17.3.1.3 Residual Impacts 114
3.17.3.1.4 Cumulative Impacts 114
3.17.3.2Alternative 115
3.17.3.2.1 Direct and Indirect Effects 115
3.17.3.2.2 Mitigation Measures 115
3.17.3.2.3 Residual Impacts 115
3.17.3.2.4 Cumulative Impacts 115
3.17.3.3No Action Alternative 115
3.17.3.3.1 Direct and Indirect Effects 115
3.17.3.3.2 Cumulative Impacts 115
3.18 Visual Resources 115
3.18.1 Affected Environment 115
3.18.2 Methodology 115
3.18.3 Environmental Consequences 116
3.18.3.1Proposed Action 116
3.18.3.1.1 Direct and Indirect Effects 116
3.18.3.1.2 Mitigation Measures 122
3.18.3.1.3 Residual Impacts 122
3.18.3.1.4 Cumulative Impacts 122
3.18.3.2Alternative 123

3.18.3.2.1 Direct and Indirect Effects 123
3.18.3.2.2 Mitigation Measures 123
3.18.3.2.3 Residual Impacts 123
3.18.3.2.4 Cumulative Impacts 123
3.18.3.3No Action Alternative 123
3.18.3.3.1 Direct and Indirect Effects 123
3.18.3.3.2 Cumulative Impacts 123
3.19 Wild Horses and Burros 123
3.19.1 Affected Environment 123
3.19.2 Methodology 124
3.19.3 Environmental Consequences 124
3.19.3.1Proposed Action 124
3.19.3.1.1 Direct and Indirect Effects 124
3.19.3.1.2 Mitigation Measures 124
3.19.3.1.3 Residual Impacts 124
3.19.3.1.4 Cumulative Impacts 124
3.19.3.2Alternative 124
3.19.3.2.1 Direct and Indirect Effects 124
3.19.3.2.2 Mitigation Measures 124
3.19.3.2.3 Residual Impacts 125
3.19.3.2.4 Cumulative Impacts 125
3.19.3.3No Action Alternative 125
3.19.3.3.1 Direct and Indirect Effects 125
3.19.3.3.2 Cumulative Impacts 125
3.20 Wildlife 125
3.20.1 Affected Environment 125
3.20.1.1General Wildlife 125
3.20.1.2BLM Sensitive Wildlife Species 125
3.20.1.3Nevada Wildlife Action Plan Conservation Priority 128
3.20.2 Methodology 128
3.20.3 Environmental Consequences 128
3.20.3.1Proposed Action 128
3.20.3.1.1 Direct and Indirect Effects 128
3.20.3.1.2 Mitigation Measures 129

3.20.3.1.3 Residual Impacts 129
3.20.3.1.4 Cumulative Impacts 130
3.20.3.2Alternative 130
3.20.3.2.1 Direct and Indirect Effects 130
3.20.3.2.2 Mitigation Measures 130
3.20.3.2.3 Residual Impacts 130
3.20.3.2.4 Cumulative Impacts 130
3.20.3.3No Action Alternative 130
3.20.3.3.1 Direct and Indirect Effects 130
3.20.3.3.2 Cumulative Impacts 130
4 LIST OF PREPARERS 131
REFERENCES 134

List of Figures

Figure 1. General vicinity map for the ARES REM project location. 1
Figure 2. Proposed Action project components and locations. 2
Figure 3. Gamebird Switch Station expansion and associated transmission components. 10
Figure 4. Rail Corridor for the Proposed Action. 11
Figure 5. Project Access Road within the transmission line alignment. 12
Figure 6. Operations, maintenance, and facilities area for the Proposed Action. 12
Figure 7. Layout overview of the Proposed Action. 17
Figure 8. Preliminary design detail for the track siding. 18
Figure 9. Yard Track Detail for the Proposed Action. 19
Figure 10. Elevation view of the shuttle car maintenance building. 20
Figure 11. Elevation view of a possible configuration for the control facilities and crew building. 20
Figure 12. ARES Substation design 21
Figure 13. Artistic rendering of the proposed shuttle train and overhead catenary line 24
Figure 14. Typical double-circuit transmission line support pole. 26
Figure 15. Typical single-circuit transmission pole 27
Figure 16. Rail Corridor for the Alternative. 33
Figure 17. Operations and Maintenance area and transmission interconnection for the Alternative. 33
Figure 18. Gamebird Switch Station and Transmission Components for the Alternative. 34
Figure 19. General site layout for the Alternative. 37
Figure 20. Elevation view of the shuttle car maintenance building. 38
Figure 21. Elevation view of a possible configuration for the control facilities and crew building. 39
Figure 22. Pahrump Regional Master Plan map of projects proposed, and BLM land requested for disposal status, in the vicinity of the Proposed Project (Pahrump Regional Planning Commission, 2014). 55
Figure 23. Proposed Pahrump beltway (red) and truck route (purple) passing the Proposed Project areas. 56
Figure 24. Cumulative Effects Study Area (CESA). 57
Figure 25. FEMA Flood Control Zone (Flood Insurance Rate) map for the Clark County portion of the Proposed Action. 64
Figure 26. Proposed culvert, road, and tortoise crossing locations within the rail corridor for the Proposed Action. 66
Figure 27. Proposed culvert, road, and tortoise crossing locations within the rail corridor for the Alternative. 68
Figure 28. Greater Trout Canyon Translocation Area in relation to southern Nevada (Averill-Murray, Field, Allison, & Germano, January 2013). 70
Figure 29. Preliminary design of the tortoise escape passage. 73
Figure 30. Proposed tortoise crossings under the rail alignment. 74
Figure 31. Locations of Carpenter Canyon Road and Loop Boundary Road within the Proposed Action Area. 82
Figure 32. Realignment of Loop Boundary Road to reduce the number of required rail crossings from three to two. 83
Figure 33. Location of the designated land transfer in relation to the existing VEA transmission line to be upgraded and Gamebird Switch Station. 90
Figure 34. Proposed Pahrump beltway (red) and truck route (purple) passing the Proposed Project areas. 105
Figure 35. Southwest Regional Gap Analysis Project mapped vegetation communities. 107
Figure 36. Visual resource analysis Key Observation Point locations. 116

List of Photos

Photo 1. View from Nevada State Highway 160, looking northwest. Rail corridor is approximately 6.5 miles distant, in the middle ground. 117
Photo 2. View of the Proposed Action Area, mid ground right side, from Nevada State Highway 160, looking northwest. The facilities area is approximately 2.5 miles distant. 117
Photo 3. Mid elevation, rail corridor centerline, of the Proposed Action, looking southwest toward the Pahrump Valley. 118
Photo 4. View from 2.25 miles upslope of the Proposed Action Area, looking southwest toward Pahrump Valley. 118
Photo 5. Proposed Action Area facilities location, looking northeast along the proposed alignment, with Mount Charleston in the background. 119
Photo 6. View of the Proposed facilities area, approximately 2.75 miles distant, looking east, with the rail corridor extending from center middle ground to the left of the picture. 119
Photo 7. The ARES Tehachapi Pilot Project (1/5th scale) in operation (note: the Proposed Action will utilize an overhead catenary line, not the trackside rail shown in the photo, and the proposed project does not include installation of wind energy turbines as shown in the background of this photograph). 120

List of Tables

Table 2-1: Proposed Rail Line Corridor Legal Land Description 8
Table 2-2: Proposed Operation, Control, and Maintenance Facilities Legal Land Description 8
Table 2-3: Transmission Interconnection Line Legal Land Description 8
Table 2-4. Summary of Permanent and Temporary Disturbance for the Proposed Action 13
Table 2-5: Proposed Rail Line Corridor Legal Land Description 31
Table 2-6: Proposed Operation, Control, and Maintenance Facilities Legal Land Description 31
Table 2-7: Transmission Interconnection Line Legal Land Description 31
Table 2-8. Summary of Permanent and Temporary Disturbance for the Alternative 35
Table 3-1. Supplemental Authorities Considered in the Analysis 44
Table 3-2. Other Resources Considered in the Analysis 47
Table 3-3 Past, Present and RFFAs in the vicinity of the Proposed Action 54
Table 3-4 BLM designated sensitive bird species. 76
Table 3-5 Demographics for the Town of Pahrump 97
Table 3-6 Town of Pahrump Employment Distribution as of 2013 97
Table 3-7. Sensitive species potentially occurring in or around the Project Area. 109
Table 3-8. Cactus and yucca species observed in the rail corridor and facilities area, including counts for each. 113
Table 3-9. Cactus and yucca species observed in the interconnection, existing transmission, and new transmission corridors, including counts for each. 114
Table 3-10. Visual Resources and Impacts Summary for the Proposed Action 120
Table 3-11. Bat Species with the Potential to Occur at the Proposed Action and Alternative Locations 127
Table 4-1 List of Tribes, Persons, Organizations, or Agencies Consulted 131
Table 4-2. List of Preparers - BLM 132
Table 4-3. List of Preparers - Other 133

ACRONYMS

AADT	Annual Average Daily Traffic
AAQS	Ambient Air Quality Standards
ACCC	Aluminum Conductor Composite Core
ACEC	Area of Critical Environmental Concern
AML	Appropriate Management Level
APLIC	Avian Power Line Interaction Committee
ArcGIS	Geographic Information System (ESRI GIS Program)
AREMA	American Railway Engineering & Maintenance-of-Way Association
ARES	Advanced Rail Energy Storage
ATV	All Terrain Vehicle
AUMs	Animal Unit Months
BAQP	Bureau of Air Quality Planning (Nevada)
BBCS	Bird and Bat Conservation Strategy
BCC	Birds of Conservation Concern
BLM	Bureau of Land Management
BMP	Best Management Practices
CAISO	California Independent System Operator
CEDS	Comprehensive Economic Development Strategy
CEQ	Council on Environmental Quality
CESA	Cumulative Effects Study Area
CFR	Code of Federal Regulations
DAQEM	Department of Air Quality & Environmental Management
EA	Environmental Assessment
ECN	Energy Communications Network
EIS	Environmental Impact Statement

EPA	Environmental Protection Agency (Federal)
ERMAs	Extensive Recreation Management Areas
ESA	Endangered Species Act – (16 U.S.C. 1536(c))
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FLPMA	Federal Land Policy and Management Act – (43 U.S.C. 1701 et. seq.)
FONSI	Finding of No Significant Impact
FRA	Federal Railroad Administration
GHG	Greenhouse Gas
GIS	Geographic Information System
GOED	Governor's Office of Economic Development
HMA	Herd Management Area
HUD	Housing and Urban Development
IEEE	Institute of Electrical and Electronic Engineers
IHHA	International Heavy Haul Association
IPaC	Information, Planning, and Conservation
KOPs	Key Observation Points
kV	Kilovolt
MBTA	Migratory Bird Treaty Act – (16 U.S.C. 703-711)
MOW	Maintenance of Way
mph	Miles per hour
MSDS	Material Safety Data Sheets
MW	Megawatt
MWH	Megawatt Hour
NAAQS	National Ambient Air Quality Standards
NAC	Nevada Administrative Code

NCREDA	Nye County Regional Economic Development Authority
NDA	Nevada Department of Agriculture
NDEP	Nevada Division of Environmental Protection
NDOT	Nevada Department of Transportation
NDOW	Nevada Department of Wildlife
NEPA	National Environmental Policy Act – (42 U.S.C. 4321 et seq.)
NESC	National Electrical Safety Code
NHPA	National Historic Preservation Act
NNHP	Nevada Natural Heritage Program
NNPS	Nevada Native Plant Society
NRA	National Recreation Area
NRCS	Natural Resource Conservation Service
NRS	Nevada Revised Statutes
OHV	Off –Highway Vehicle
OPGW	Optical Ground Wire
OSHA	Occupational Safety and Health Administration
PILT	Payment in Lieu of Taxes
PL	Public Law
$PM_{2.5}$	Particulate Matter, less than 2.5 microns
PM^{10}	Particulate Matter, less than 10 microns
POD	Plan of Development
PRPD	Pahrump Regional Planning District
RDAs	Regional Development Authorities
REM	Regulation Energy Management
RFFA	Reasonably Foreseeable Future Actions
RMP	Resource Management Plan

ROW	Right-of-Way
RUS	Rural Utility Service
SEZ	Solar Energy Zone
SRMAs	Special Recreation Management Areas
SWPPP	Stormwater Pollution Prevention Plan
UEPA	Utility Environmental Protection Act
USC	United States Code
USDOI	United States Department of Interior
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
VEA	Valley Electric Association
VRM	Visual Resource Management

1 PURPOSE AND NEED

1.1 Introduction

The Bureau of Land Management (BLM) received an SF 299 Application for Transportation and Utility Systems and Facilities on Federal Lands in January 2014, requesting approval for ARES Nevada, LLC (ARES) to construct an Advanced Rail Energy Storage Regulation Energy Management (REM) facility in Clark and Nye Counties, Nevada. Granting of the Right-of-Way (ROW) request is a federal action subject to analysis under the National Environmental Policy Act (NEPA) of 1969 (Public Law [PL] 1-91-190, as amended [42 United States Code (USC) 4321 *et seq*.]).

ARES is proposing to construct, operate and maintain a REM facility on BLM managed land in Clark and Nye Counties, Nevada, to assist in transmission system stability and reliability and electricity supply management on the regional electrical transmission grid. The Proposed Project is a 50 megawatt (MW) gravity based Energy Storage System that would be constructed on 72 acres of BLM managed land. The system utilizes multiple electric locomotives operating on a single steep grade railroad track to store or deliver electric energy into the regional electrical grid -- using electricity from the grid to power the locomotives uphill, returning that electricity to the grid as the locomotives descend with their motors operating as generators. The Proposed Project is designed to balance variable energy demands and renewable energy contributions across an electrical grid system. The Proposed Project does not produce more energy than is introduced into its system; therefore it is not an electrical generation facility.

ARES proposes to locate this project in the Carpenter Canyon area, east of Pahrump, in Nye and Clark Counties, Nevada (see Figure 1).

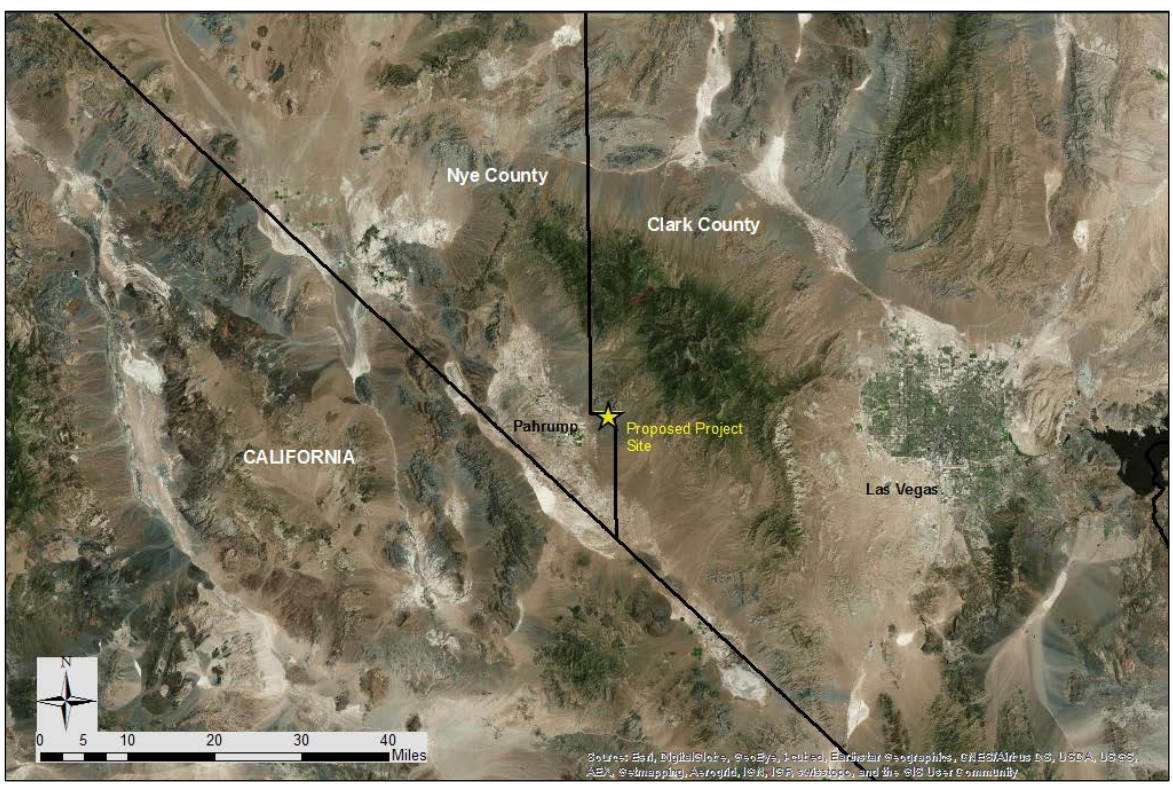

Figure 1. General vicinity map for the ARES REM project location.

The alignment of the Proposed Action, including the facilities and maintenance area and transmission, is contained within Township 21 South, Range 54 East, Sections 1, 2, 3, and 12; Township 21 South, Range 55 East, Sections 6 and 7; Township 20 South, Range 55 East, Sections 22, 27, 28, 31, 32 and 33; and Township 20 South, Range 54 East, Sections 34 and 35 (see Figure 2). The Proposed Action would include 72 acres of permanent and 98 acres of temporary disturbance on BLM lands.

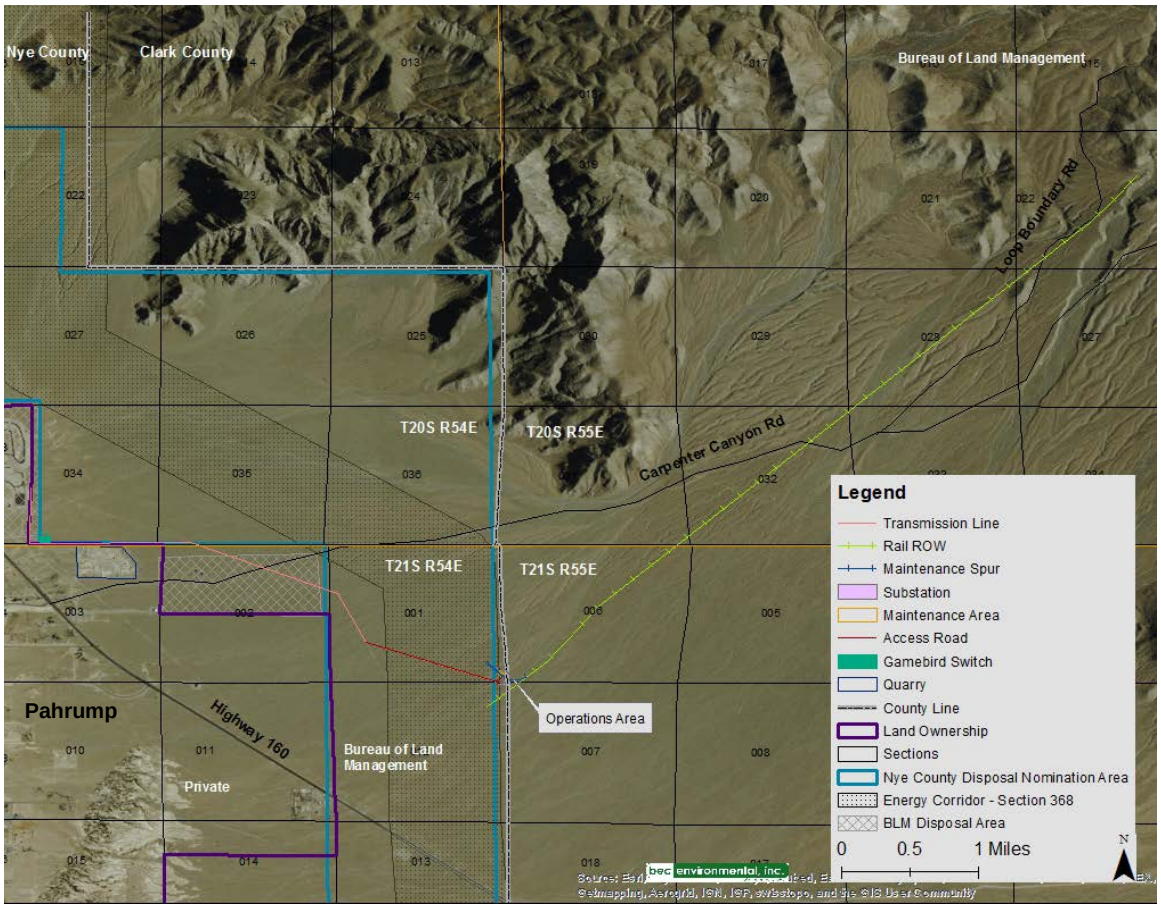

Figure 2. Proposed Action project components and locations.

This EA will analyze and disclose the direct, indirect, and cumulative impacts of the Proposed Action, an Alternative, and a No Action alternative. This EA also provides a basis for determining whether the Proposed Action, including associated mitigation measures, would result in impacts of sufficient scale to necessitate preparation of an Environmental Impact Statement (EIS) or would support a Finding of No Significant Impact (FONSI).

The proposed action would assist in electricity supply management and transmission system stability and reliability on the regional electrical transmission grid. The system accomplishes this by using electricity from the transmission grid when electricity is abundant (i.e. low energy usage times) to power locomotives uphill. Electricity is returned to the transmission grid when needed (i.e. high usage times) as the locomotives descend, the electric motors operating as generators.

The operation of the project will provide 12.5 megawatt hours (MWH) of fast-response energy storage necessary to assist in the balancing of electrical supply and demand to counter highly variable energy usage and unpredictably variable renewable energy supplies, while maintaining grid reliability.

The system, as proposed, would have an energy return efficiency of greater than 80% and could increase the amount of renewable energy resources added to the electric grid without compromising grid efficiency, reliability, or requiring additional impacts to the environment.

1.2 Purpose and Need

The BLM Southern Nevada District Office received a Right-of-Way application from ARES to construct a gravity based rail energy storage system on approximately 170 acres of BLM managed land in Clark and Nye Counties (BLM Standard Form 299, *Application for Transportation and Utility Systems and Facilities on Federal Lands*). ARES has identified a need to provide environmentally-friendly and sustainable energy storage system in support of promoting electrical grid stability and renewable energy consistency. The Valley Electric Association (VEA) transmission grid would support this project, allowing communities within southern Nye County as well as nearby California communities served through the California Independent System Operator (CAISO) network to benefit from enhanced grid stability and responsiveness to variable energy demands through consumer use and renewable energy sources.

The Proposed Action is to address current and future grid reliability and stability issues, in accordance with Federal Energy Regulatory Commission (FERC) objectives and in conformance with the objectives set forth in the Las Vegas Resource Management Plan (RMP) and Record of Decision approved in October 1998. Under Objective RW-1, the BLM is to "meet public demand and reduce impacts to sensitive resources by providing an orderly system of development for transportation, including legal access to private inholdings, communications, flood control, major utility transmission lines, and related facilities," with Management Direction RW-1-h stating, "All public land within the planning area, except as stated in RW-1-c through RW-1-g, are available at the discretion of the agency for rights-of-way under the authority of the Federal Land Policy Management Act" (FLPMA).

The BLM will review ARES's proposal and, in accordance with NEPA, FLPMA, and other applicable laws, it will issue a decision to grant the proposed ROW; grant the ROW with modifications; or deny the ROW (43 CFR 2805.10(a)(1)).

1.3 Scoping, Public Involvement and Issues

An initial kickoff meeting was held between the BLM and ARES on August 14, 2013, as a first step in identifying potential environmental issues to be addressed. The potential issues were also internally scoped by BLM specialists after the meeting with ARES. Several issues emerged during the scoping effort which included:

- Air Quality
  - Temporary exceedances of ambient air quality standards (AAQS) for 24-hour and annual concentrations levels of particulate matter 10 microns in diameter or smaller (PM_{10}) and 24-hour concentration levels of particulate matter 2.5 microns in diameter or smaller ($PM_{2.5}$) concentration levels along the proposed ROW and in the immediate surrounding areas during construction of the facilities.
- Flood Plains
  - Direct impacts to storm water flow runoff due to modification of existing drainage channels.
- Threatened and Endangered Species
  - Impacts to federally listed Mojave desert tortoise (*Gopherus agassizii*).
- Migratory Birds
  - Direct impacts to breeding, nesting, and wintering areas, as well as migration routes.

- Human Health and Safety
  - Safety issues related to construction and the operation of electric shuttle trains.
  - Potential impacts to recreational users.
- Hydrologic Conditions
  - Modifications to surface water run-off patterns.
  - Increases in sedimentation in run-off waters.
- Land Use Authorizations
  - Upgrades to existing transmission will require modifications to existing land use authorizations.
  - Direct impacts to an existing utility corridor.
- Minerals
  - Handling of excess mineral materials related to excavations.
- Recreation
  - Potential limitations to current levels of recreational use.
- Socio-Economic Values
  - Direct and indirect impacts to the local economy and work force.
- Soils
  - Direct loss and cumulative impacts to soils and the ecosystem services soils provide, including the loss of desert pavement.
- Transportation
  - Direct impacts to existing BLM travel routes.
  - Existing road improvements and repairs.
- Vegetation
  - The spread of noxious weeds in disturbed areas and colonization of adjacent undisturbed habitats.
  - The deposition of fugitive dust from large areas of disturbed soil onto habitats outside the project area.
  - Cumulative loss and fragmentation of habitat for BLM special status species.
  - Cumulative loss and fragmentation of native plant communities and the ecosystem services they provide.
- Forestry
  - Direct impacts to special forest products (cactus and yucca) from the project area.
  - Removal of cactus and yucca species from the project area.
  - Direct and cumulative impacts to BLM lands used for commercial seed collection.
- Visual Resources
  - The Proposed Action occurs on Visual Resource Management Class III lands.
- Wild Horses and Burros
  - Direct impacts to the free movement of Wild Horses and Burros.
- Wildlife (including BLM sensitive species)
  - Impacts to wildlife habitat and individuals, including BLM sensitive species.
  - Cumulative loss and fragmentation of wildlife habitat.
  - Cumulative loss and fragmentation of habitat for BLM sensitive species.

Section 101(d)(6)(B) of the National Historic Preservation Act of 1966 (NHPA) requires agency officials to consult with Indian tribes who may attach religious and cultural significance to historic properties which may be affected by the Proposed Action. Consulting party invitations were sent by certified letter on May 29, 2014, to:

- Chemehuevi Indian Tribe (Chairman Edward D. Smith and Ron Escobar)

- Las Vegas Paiute Tribe (Chairman Benny Tso and Cultural Coordinator Kenny Anderson)
- Moapa Band of Paiutes (Chairwoman Aletha Tom)
- Moapa Band of Paiutes Cultural Committee (Deanna Domingo)
- Pahrump Paiute Tribe (Chairman Eddie Jim)
- Timbisha Shoshone Tribe (Chairman George Gholson and THPO Barbara Durham)

1.3.1 Consultations with Cooperating Agencies/Organizations

As defined in 40 CFR 1508.5 (Council on Environmental Quality - CEQ), a cooperating agency is any federal agency other than a lead agency (BLM) which has jurisdiction by law or special expertise with respect to any environmental impact. A state or local agency of similar qualifications or, when the effects are on a reservation, an Indian Tribe may, by agreement with the lead agency, become a cooperating agency. No other agency has elected to become a cooperating agency.

The Proposed Action is located on BLM managed land, surrounded by BLM managed land; therefore, adjacent land owners were not consulted.

Section 106 of the NHPA requires Federal agencies to take into account the effects of their undertakings on historic properties, and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment. In January 2015, HDR Inc. submitted a "Cultural Resources Survey of the Proposed ARES Regulation Energy Management System Project, Clark and Nye Counties, Nevada" to the BLM detailing cultural findings which may be impacted by the Proposed Action. This report stated records reviews and pedestrian surveys failed to find any cultural materials which may be impacted physically, or any cultural sites which may be impacted visually. Additional Section 106 scoping will be performed with the Public Scoping procedures if needed.

Nye County (lower elevations of the proposed ROW, including the operations and maintenance facilities and transmission) has been actively working with ARES and the BLM on this project. The BLM and representatives from Nye County (Commissioners Frank Carbone and Dan Schinhofen, County Manager Pamela Webster, and County Planning Director Darrell Lacy) met on February 5, 2015, to discuss this project.

Users of the BLM managed land will have the opportunity to comment on the proposed action during the public comment period and during any public meetings (dates to be determined).

1.3.2 Public Meetings

The EA will be made available for a 30-day public review period.

Public meetings are anticipated to be held in Pahrump and Las Vegas, Nevada, after completion of the Draft EA. These meetings will be held to present information on the Proposed Project to communities that may be impacted by the Proposed Action, and provide copies of the Draft EA for public review.

1.3.3 Project Location and Existing Land Use

The Proposed Action is located entirely on BLM managed land in Clark and Nye County (see Figure 2).

Three components of the project are within the boundary of the designated West-wide Energy Corridor (Section 368 of the Energy Policy Act of 2005, 42 U.S.C. § 15926). The transmission interconnection from the project to the existing Valley Electric Association (VEA) transmission line would cross the corridor for approximately 3,793 feet. The southwestern end of the main rail alignment extends into the

corridor approximately 517 feet. The maintenance and spur rail line associated with the operation and maintenance facility extends beyond these structures 1,085 feet into the corridor. This Section 368 Energy Corridor has been designated for linear energy-based infrastructure development; the Corridor is not yet being utilized. ARES may shift the building location east, siting the building closer to the modular crew and facility control building, which would remain outside of the 368 Energy Corridor boundary.

Uses for the area include recreational off-road vehicle use and access to the Spring Mountains via Carpenter Canyon Road, and the Highway 160 Seed Collection Area. Adjacent uses include a BLM fire station (on Carpenter Canyon Road), a quarry (adjacent to proposed new transmission line and VEA Gamebird Switch Station Expansion, Township 21S, Range 54E, Section 3, Lots 1 and 2), and Pahrump Speedway (adjacent to proposed new transmission line and VEA Gamebird Switch Station Expansion).

BLM designated and Nye County proposed disposal lands exist within the transmission corridor for the project as well as on adjacent land, between the Proposed Project and the Town of Pahrump (see Figure 2).

2 PROPOSED ACTION AND ALTERNATIVES

2.1 The Proposed Action

ARES proposes to construct this project entirely on BLM managed land in the Carpenter Canyon area, east of Pahrump and Nevada State Highway 160, in Nye and Clark Counties, Nevada (see Figure 2).

The Proposed Action includes numerous components presented and discussed throughout this document as corridors or areas, including related or adjacent components in those corridors or areas (Figure 2). The corridors or areas are discussed briefly below and described in more detail throughout this document.

Rail line corridor: The corridor will include the main rail line, rail line overhead catenary power line, and trackside access and maintenance road. The main rail track will be 5.5 miles (29,036 feet) long, a mid-elevation spur track will be 0.19 miles (995 feet) long, and parallel facility area maintenance siding and maintenance storage spurs 0.22 miles (1,171 feet) and 0.33 miles (1,596 feet) long, respectively, for conducting maintenance on the locomotive components and storing the weighted cars. The rail line will not be lighted, though a lighted rail crossing sign will be active at Carpenter Canyon Road crossing when the train is in the area.

Operations, control and maintenance facilities: This area will be constructed on a concrete pad approximately 295 feet by 140 feet (0.8 acres). This area will include an operations building (two story, 48 feet by 28 feet), a maintenance building (125 feet by 42 feet), and an employee and visitor parking lot adjacent to the operations building. In this general a transmission interconnection substation (ARES substation - 170 feet by 140 feet) will be constructed. Outdoor lighting on these facilities will be minimal and shielded downward.

Transmission and access road corridor: The corridor will include a new transmission line connecting the ARES substation to the existing VEA transmission line (3,870 feet), and upgrades to a portion of the existing transmission line (7,200 feet). New transmission lines (6,260 feet) will also be constructed to reroute the existing line to connect to the existing Gamebird Switch Station; approximately 5,200 feet of the existing 230kV transmission line currently bypassing Gamebird Switch Station will be removed. The existing Valley Electric Association (VEA) Gamebird Switch Station (ROW N-59100) will be expanded by 2.4 acres, within the existing ROW boundary. Access/maintenance roads will be co-located with transmission lines.

2.1.1 Applicant and Agencies involved

ARES is proposing to construct, operate and maintain a REM facility on BLM managed land in Clark and Nye Counties, Nevada, in coordination with Valley Electric Association (VEA), and the support of Nye County.

ARES is coordinating with Clark and Nye Counties to identify required local permits, easements or dedications. Additional permits required by other local, state, and federal agencies are being investigated.

ARES has set up an Energy Planning and Conservation Fund (Assembly Bill 307) with the Nevada Department of Wildlife (NDOW).

2.1.2 Action to be taken

The Proposed project will provide up to 50 megawatts (MW) of gravity-based electrical energy regulation on 72 acres of BLM managed land, in order to balance variable energy demands and potential intermittent renewable energy contributions through energy storage. The system is a gravity-based energy storage system utilizing electric shuttle trains operating on a standard railroad track with an overhead catenary system to store electric energy in the form of gravitational potential energy. A maintenance road will be constructed adjacent to the rail line.

Additionally, upgrades will be required to the existing VEA transmission line in the immediate area to connect the ARES REM facility to the regional electric grid.

2.1.2.1 Location

ARES proposes to construct this project entirely on BLM managed land in the Carpenter Canyon area, east of Pahrump and Nevada State Highway 160, in Nye and Clark Counties, Nevada (see Figure 2).

The legal land descriptions for each component of the project are located in Tables 2-1, 2-2, and 2-3.

The upslope (northeast) end of the Proposed Action will begin in Township 20 South, Range 55 East, Section 22. The railroad corridor section of the ROW will run southwest (down-slope) to an operations and maintenance area (support facilities) which will include a new substation (ARES substation), a shuttle train maintenance building, and an operations control center. The operations and maintenance area and the ARES substation will be located within Nye County, outside the eastern border of the Section 368 Corridor. The maintenance and spur rail line passes through the maintenance building and extends about 1,085 feet into the Section 368 Corridor.

A new 230 kilovolts (kV) transmission line (interconnection) to be operated by VEA, will run approximately 3,870 feet (1,179 meters) northwest across the Section 368 corridor to connect with the existing VEA 230kV transmission line ROW (N-057100), with approximately 3,793 feet (1,156 meters) within the corridor. The existing VEA transmission line will then become the interconnection for approximately 7,200 feet (2,195 meters), at which point a new 4,400-foot (1,341-meter) double circuit transmission line will run due west from the existing transmission to connect with the existing VEA Gamebird Switch Station (N-059100), located in Township 20 South, Range 54 East, Section 34. This new east/west line will consist of typical double-circuit structures approximately 120 to 200 feet (36.6 to 61 meters) tall, spaced 425 feet (129.5 meters) apart, and will include a co-located maintenance road.

The Gamebird Switch Station will be expanded; the expansion and related construction will remain within the boundaries of the existing ROW (N-059100). A new single-circuit transmission line, approximately 1,860 feet (567 meters) long, will be constructed north from Gamebird Switch Station to reconnect with

the existing VEA (N-057100) 230kV transmission line. This new north/south line will consist of typical single-circuit structures approximately 120 to 200 feet (36.6 to 61 meters) tall, spaced 800 feet (244 meters) apart, and a co-located maintenance road. Both the new double-circuit and single-circuit transmission lines will be entirely on BLM managed land, and require ROWs consistent with the existing VEA ROW, which is 100 feet (30.5 meters) in width, containing the new transmission lines and a maintenance road.

Approximately 5,250 feet (1,600 meters) of the existing 230kV transmission line (N-57100) will be removed (see Figure 3).

Table 2-1: Proposed Rail Line Corridor Legal Land Description

Township and Range	Section	Aliquot Part
T. 20 South, R. 55 East	22	Begins in SW ¼ of the NE ¼, running southwest through the NW ¼ of the SE ¼, NE ¼ of the SW ¼, and SE ¼ of the SW ¼, to the SW ¼ of the SW ¼; then
T. 20 South, R. 55 East	27	NW ¼ of the NW ¼ of the NW ¼; then
T. 20 South, R. 55 East	28	NE ¼ of the NE ¼, running southwest through the SE ¼ of the NE ¼, SW ¼ of the NE ¼, NW ¼ of the NW ¼ of the SE ¼, NE ¼ of the SW ¼, and NW ¼ of the SE ¼ of the SW ¼, to the SW ¼ of the SW ¼, then
T. 20 South, R. 55 East	33	NW ¼ of the NW ¼ of the NW ¼; then
T. 20 South, R. 55 East	32	NE ¼ of the NE ¼, running southwest through the SW ¼ of the NE ¼, and NE ¼ of the SW ¼, SE ¼ of the NW ¼ of the SW ¼, to the SW ¼ of the SW ¼, then
T. 20 South, R. 55 East	31	SE ¼ of the SE ¼ of the SE ¼, then
T. 21 South, R. 55 East	06	NE ¼ of the NE ¼, running southwest through the SW ¼ of the NE ¼, and NE ¼ of the SW ¼, and NW ¼ of the SE ¼ of the SW ¼, to SW ¼ of the SW ¼, then
T. 21 South, R. 55 East	07	NW ¼ of the NW ¼ of the NW ¼, then
T. 21 South, R. 54 East	12	NE ¼ of the NE ¼ of the NE ¼.
T. 21 South, R. 54 East *-maintenance siding and spur line*	01	SE ¼ of the SE ¼.

Table 2-2: Proposed Operation, Control, and Maintenance Facilities Legal Land Description

Township and Range	Section	Aliquot Part
T. 21 South, R. 54 East *-maintenance and control buildings*	01	SE ¼ of the SE ¼, of the SE ¼.
T. 21 South, R. 54 East *-ARES substation*	12	NE ¼ of the NE ¼, of the NE ¼.

Table 2-3: Transmission Interconnection Line Legal Land Description

Township and Range	Section	Aliquot Part
Existing Transmission to be Upgraded		
T. 21 South, R. 54 East	01	NW ¼ of the SW ¼, running to the SW ¼ of the NW ¼

Township and Range	Section	Aliquot Part
T. 21 South, R. 54 East	02	NE ¼ of the S ½ of the NE ¼, through the N ½ of the NE ¼, running to the N ½ of the NW ¼
New Transmission Connection to Gamebird Switch Station		
T. 21 South, R. 54 East	02	N Section border of the NW ¼ of the NW ¼
T. 21 South, R. 54 East	03	N Section border of the NE ¼, and N Section border of the NE ¼ of the NW ¼
T. 20 South, R. 54 East	34	Running north/south in the E ½ of the W ½ of the SW ¼
Existing Transmission to be Removed		
T. 20 South, R. 54 East	34	SE ¼ running to the NE ¼ of the SW ¼
T. 20 South, R. 54 East	35	SW ¼ of the SW ¼
New Interconnection Connecting ARES Substation to Existing Line		
T. 21 South, R. 54 East	12	Running northwest from the NE ¼ of the NE ¼, of the NE ¼, through
T. 21 South, R. 54 East	01	S ½ of the SE ¼ of the SE ¼, SW ¼ of the SE ¼, N ½ of the SE ¼ of the SW ¼, to the SE ¼ of the NW ¼ of the SW ¼.

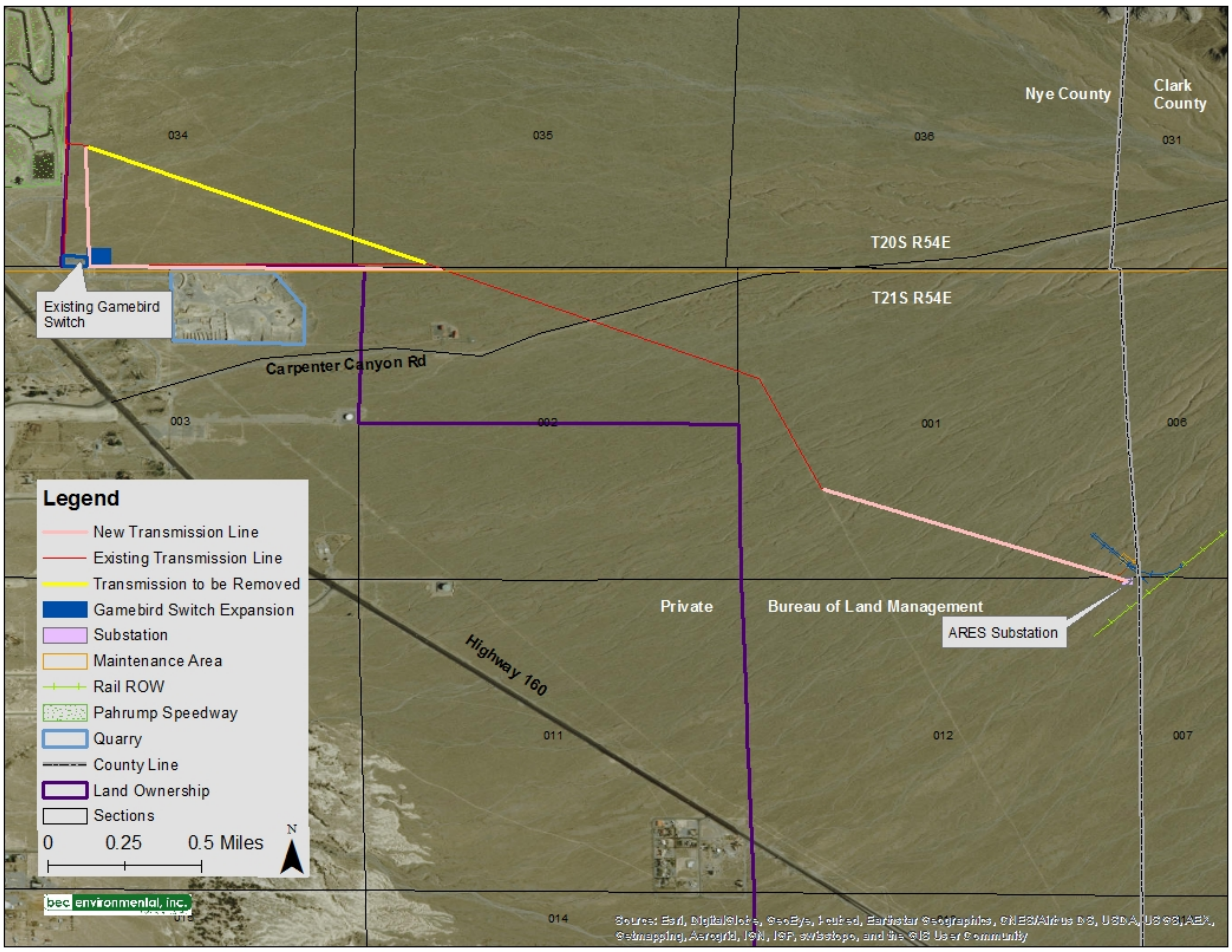

Figure 3. Gamebird Switch Station expansion and associated transmission components.

2.1.2.2 Time frame for construction and operation

Ideally, following the conclusion of required geotechnical and engineering surveys, ARES would begin construction of the project in the first quarter of 2017, with construction being completed mid 2017; operations would begin third quarter 2017. The system is designed to provide energy storage capabilities for 30 years.

2.1.3 Construction

The Proposed Project includes multiple temporary and permanent (long-term) components constructed and operated by ARES. Other components will be constructed and operated by VEA to directly support the project. Brief summaries of those components are provided below.

The Proposed Action includes four long-term disturbance areas and one short-term disturbance area (see Table 2-1, 2-2, and 2-3):

- A rail line corridor - 5.5 miles (8.9 kilometers) long averaging 75 feet (12.2 meters) wide (siding area will be wider, grading required to maintain a constant elevation change will vary)(see Figure 4).

- An operations, control and maintenance facilities area containing two to three buildings (offices and control center may be combined) and a small staff parking lot (graveled), for a total size of 0.8 acres (see Figure 5). These facilities would be constructed on a concrete pad.
- A transmission and access road corridor, which includes the new transmission interconnection as well as upgrades to the existing transmission - approximately 3,870 feet (1,179.6 meters) long by 100 feet (30.5 meters) in width (see Figures 4 and 5).
    - Removal of approximately 5,250 feet (1,600 meters) of existing transmission which will become obsolete with the upgrades required for the existing transmission to support the Proposed Action (see Figure 4).
- Construction related disturbance areas (cut and fill areas, equipment storage yards) will create a variable-width buffer along the rail corridor, and add 50 feet (15.2 meters) to all transmission corridors, for a short-term disturbance of 98 acres.

In total, 170 acres would be disturbed, 72 acres of which would be long-term infrastructure (see Table 2-4).

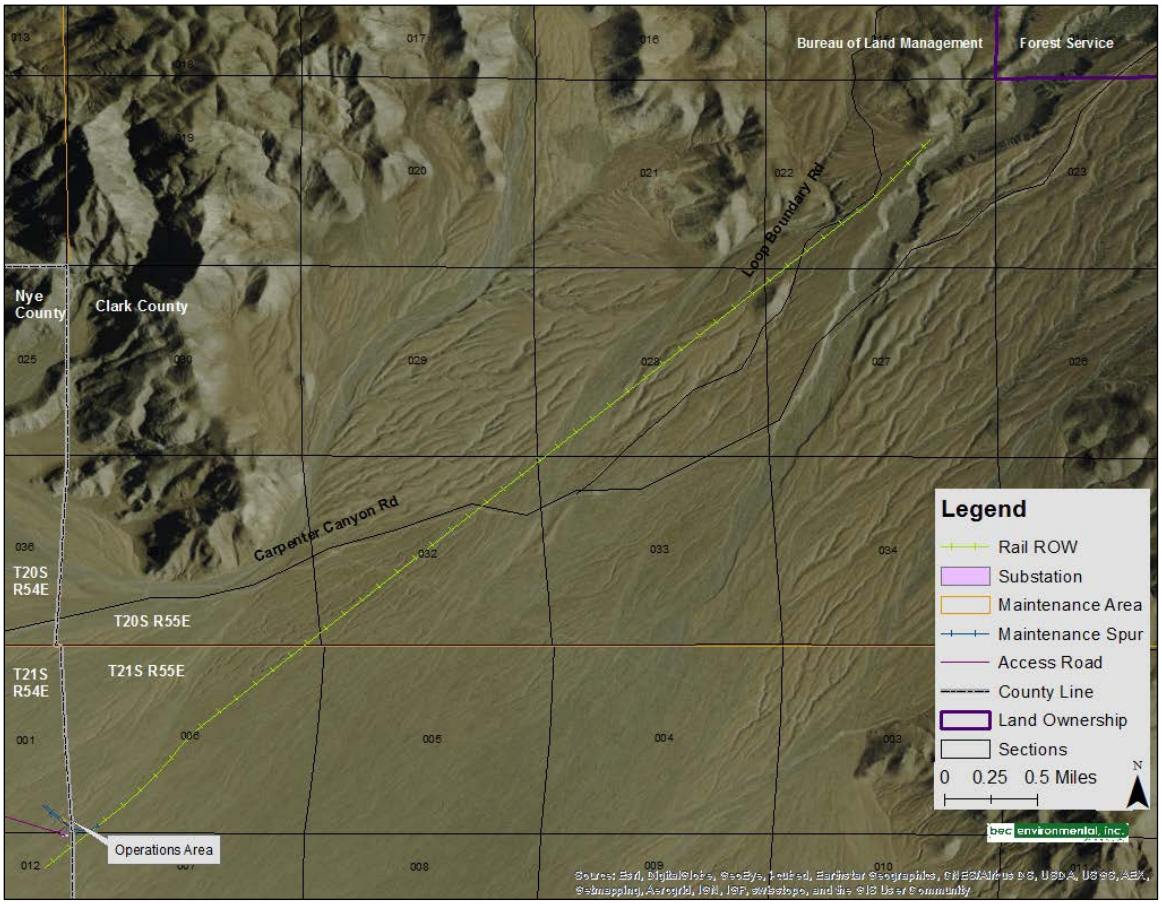

Figure 4. Rail Corridor for the Proposed Action.

Figure 5. Project Access Road within the transmission line alignment.

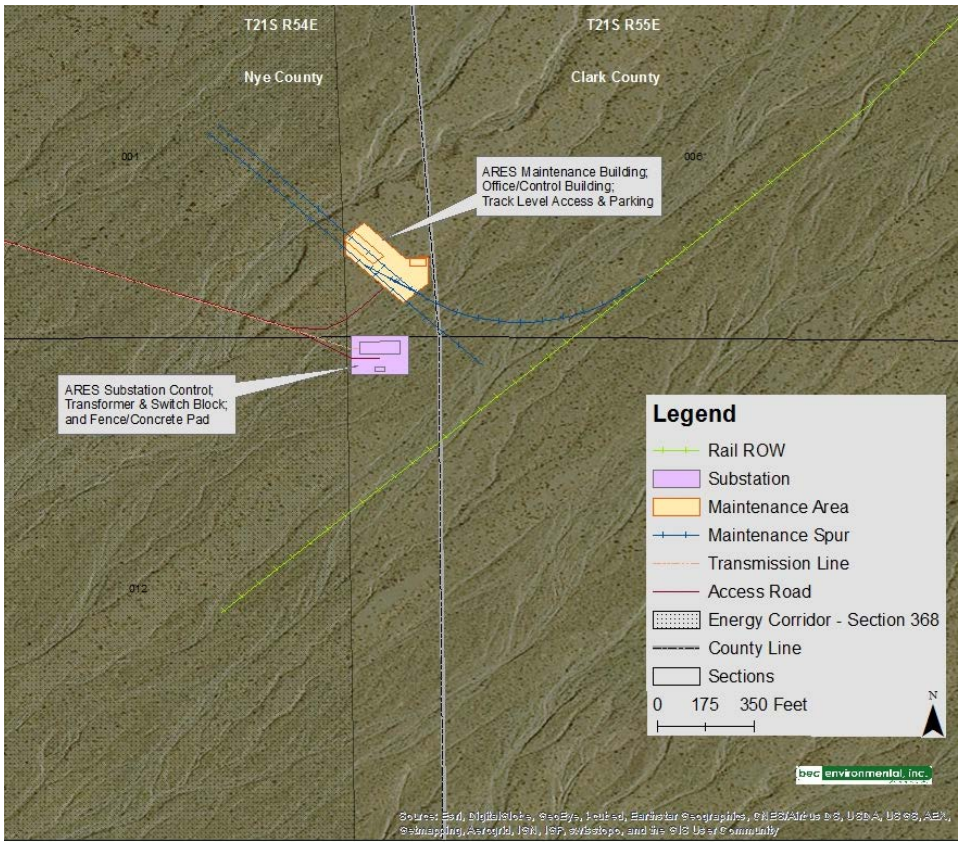

Figure 6. Operations, maintenance, and facilities area for the Proposed Action.

Table 2-4. Summary of Permanent and Temporary Disturbance for the Proposed Action

Disturbance Type	Acres of Disturbance	Notes
Long-Term Disturbance		
Rail Corridor	28.0	Rail corridor will include the rail line, overhead catenary line, and trackside access and maintenance road. The main rail track will be 5.5 miles (29,036 feet) long, the mid-elevation siding track will be 0.19 miles (995 feet) long, and the parallel facility area maintenance siding and maintenance storage spurs 0.22 miles (1,171 feet) and 0.33 miles (1,596 feet) long, respectively.
Operations Control and Maintenance Facilities	0.8	Operations and Maintenance Facilities area will be constructed on an approximate 260 foot by 140 foot concrete pad. Area will include an operations building (two story, 48 feet by 28 feet), a maintenance building (125 feet by 42 feet), and an employee and visitor parking lot adjacent to the operations building. (Rail lines are considered above, in the rail corridor summary.)
ARES Substation	0.5	A transmission interconnection substation (ARES substation) will be constructed on a separate fenced area in this location (170 feet by 140 feet).
Gamebird Switch Station Expansion	2.4	Located within existing VEA Gamebird Switch Station ROW N-59100.
Transmission Lines and Access Roads	39.8	Existing lines to be upgraded include 16.5 acres within an existing 100 foot wide ROW. New transmission consists of a 8.9 acre interconnection and 14.4 acres for the two new Gamebird Switch Station connections. Access roads will be co-located with transmission; acreage of disturbance for roads is included in the Transmission Lines acreage.
Total Long-Term	**71.5 (72)**	
Short-Term Disturbance		
Rail Corridor	51.5	Disturbance will occur on approximately 40 feet either side of the rail corridor infrastructure, for the length of the corridor.
Operations Control and Maintenance Facilities	6.0	Disturbance associated with the construction and installation of the operations building, maintenance building, ARES substation, parking lot, and laydown yard, materials storage, and vehicle parking.
Transmission Lines	40.6	Disturbance associated with the construction of the ARES substation interconnection (4.4 acres), upgrades to existing VEA transmission (8.3 acres), new VEA transmission lines (7.2 acres), removal of existing transmission (15.2 acres), Gamebird Switch Station expansion (0.6 acres), and five pulling stations (5 acres).
Total Short-term	**98.1 (98)**	
Total Disturbance	**169.6 (170)**	

2.1.3.1 Pre Construction Activities

2.1.3.1.1 Land Surveys

Multiple exploratory and environmental analysis surveys were conducted by ARES and their contractors during 2014. These surveys included botanical surveys, desert tortoise presence/absence surveys, preliminary alignment measurements, and a potential construction contractor on site meeting.

2.1.3.1.2 Aerial Surveys

In July 2014, an aerial survey of the proposed alignment was conducted in order to develop a more refined alignment and aid in the development of the initial engineering drawings.

2.1.3.1.3 Engineering Surveys

The BLM National Environmental Policy Act (NEPA) process will determine the preferred alignment for the project. Preliminary surveys and other investigations will be completed after a preferred alignment is selected by the BLM during the NEPA process, and on-the-ground investigations will be completed to precisely locate the centerline within the ROW. The exact centerline will be chosen to best implement design criteria, minimize environmental impacts, and satisfy the mitigation measures in the NEPA compliance document to be developed. Detailed surveying and final design drawings will be developed after the NEPA process has been completed. Required permits to conduct surveys on federal lands will be obtained. ARES is preparing to conduct engineering site surveys in consultation with rail design civil engineering consultants J.L. Patterson & Associates, Inc. and TRAMMCO, LLC, or other qualified entities. These more precise and detailed surveys conducted after the NEPA review will establish the exact project centerline, locations of drainage features, and address soil and geotechnical considerations of hydrology and hydraulics, critical drainage areas, climate induced track stability issues, and the anticipated Carpenter Canyon Road crossing.

Prior to construction, the ROW and temporary access roads for construction and maintenance of the 230 kV transmission lines and ARES Substation, will be surveyed to locate the centerlines accurately. Additional ground-based land surveys will be required including structure location (structure staking) surveying, and access road layout. On-ground investigations will be completed to accurately locate the centerline of the approved ROW for the 230 kV transmission lines and ARES Substation, and access roads for construction and maintenance. Construction survey work will consist of transmission line and access road centerline locations and ROW boundaries where necessary. Structure locations will be flagged and staked, and the proposed centerlines will be flagged and staked where needed.

2.1.3.1.4 Cultural Resource Surveys

A Class III cultural survey was conducted by HDR, Inc. during the period November 4 – 8, 2014. The purpose of the cultural resources survey was to locate, document, and evaluate archaeological resources located within the area of potential effects for both routes that could potentially be impacted by the proposed project.

Prior to conducting fieldwork, a Class I records search and review was conducted through the Southern Nevada Archaeological Archive of the Desert Research Institute. Sixteen cultural resources projects have been conducted within one mile of the proposed project area. Six previously recorded archaeological sites have been documented within one mile of the project area; however, none of the sites are located within the project’s area of potential effect.

The archaeological survey did not locate any cultural materials.

2.1.3.1.5 Biological Surveys

The Mojave desert tortoise will require special consideration in consultation with BLM, NDOW, and U.S. Fish and Wildlife Service (USFWS). Specific mitigation measures for biological resources will be developed as part of the environmental evaluation. If necessary, additional surveys or Section 7 consultation will be supported through the BLM during the NEPA process. Desert tortoise surveys were conducted along the entire proposed ROW in May, September, and October of 2014. One live tortoise was observed, and multiple burrows were identified.

As requested by the BLM, disturbance of special status plants (e.g. cacti, yucca, etc.) will be avoided during construction to the extent possible. If requested by the BLM, native plants requiring special protections will be flagged in areas of potential surface disturbance prior to construction. Native plant surveys were conducted for the entire proposed ROW during the period April 27 – May 25, 2014. Per Nevada Revised Statutes, potentially impacted yucca and cacti will be mitigated for according to current BLM and/or Nevada Division of Forestry requirements. All other vegetation removed during construction will be disposed of in accordance with BLM guidelines.

2.1.3.1.6 Interconnection Geotechnical Investigation

Geotechnical investigation will be completed for the 230 kV transmission lines, the ARES Substation and the expansion of Gamebird Switch Station. The purpose of the geotechnical investigation is to collect information regarding subsurface stability and soil resistivity, which will be used in the final design of each transmission tower structure and foundation, and used in design of the grounding system for both the transmission line and substations. The geotechnical investigation will consist of the drilling and sampling of soils to a typical depth of 25 to 50 feet below the existing ground surface. The boreholes will have a diameter of approximately 8 inches and will be backfilled with auger cuttings and on-site soils. Each location will be accessed using existing roads and the same access routes that will be used for construction of the 230 kV transmission line and ARES Substation. Surface disturbance will be limited to the actual tracks left by the drill rig and support vehicles within the work areas and access routes. All areas on BLM lands that are disturbed by geotechnical testing activities will be restored per BLM guidance after construction of the 230 kV transmission line and ARES Substation has been completed.

Detailed surveying, geotechnical investigations, and final design drawings will be developed after the NEPA process has been completed to precisely locate the rail line and transmission interconnection centerline within the approved ROW, and address soil and geotechnical considerations of hydrology and hydraulics, critical drainage areas, and climate induced track stability issues. Additional ground-based land surveys will be required including structure location (structure staking) surveying, and access road layout. Construction survey work will consist of transmission line and access road centerline locations and ROW boundaries where necessary. Structure locations will be flagged and staked, and the proposed centerlines will be flagged and staked as necessary.

Geotechnical investigation will be completed for the 230 kV transmission lines, the ARES Substation and the expansion of Gamebird Switch Station. The purpose of the geotechnical investigation is to collect information regarding subsurface stability and soil resistivity, which will be used in the final design of each transmission tower structure and foundation, and used in design of the grounding system for both the transmission line and substation. The geotechnical investigation will consist of the drilling and sampling of soils to a typical depth of 25 to 50 feet (7.6 to 15.2 meters) below the existing ground surface. The boreholes will have a diameter of approximately 8 inches and will be backfilled with auger cuttings and on-site soils. Each location will be within the newly granted or existing ROWs. Surface disturbance will be limited to the actual tracks left by the drill rig and support vehicles within the work areas and access routes. All areas on BLM lands that are disturbed by geotechnical testing activities will be restored per

BLM guidance after construction of the 230 kV transmission line and ARES Substation has been completed.

The rail system will consist of 136 pound rails mounted on steel tensioned concrete rail ties, supported by track ballast comprised of three inch crushed granite or equivalent wear resistant rock. An overhead catenary line, running above the shuttle trains, will be constructed per ARES final electrical design specification.

2.1.3.2 Construction Activities

Construction will involve earth moving, drainage provisions, and placement of materials typical of service roadway and railway alignment construction, and the construction of operations buildings, power transmission line, and rail line. The railway track roadbed, track, overhead catenary, and parallel service road will be built simultaneously. Detailed site plans have not yet been completed; therefore, figures are currently estimates based on initial preliminary site plans and project design. Detailed site plans will be developed after NEPA surveys and reviews have been completed.

In order to not impede stormwater flows from the Spring Mountains, six culverts will be installed where the proposed rail line would cross existing drainages (See Figure 7). The exact dimensions of the culverts will be determined during engineering, but will be of sufficient size to allow desert tortoises to see light on the other side and to use them for passage from one side of the rail line to the other.

A rail line siding, or spur line, to allow shuttle cars to be re-sequenced on the main rail line, will be included. The siding rail will be located adjacent to Carpenter Canyon Road, and be approximately 960 feet (292.6 meters) in length (see Figure 8).

Operations, control, and maintenance facilities will be constructed in an area perpendicular to the southwestern end of the rail corridor (Figure 9) to provide operational support, vehicle control, and shuttle train maintenance facilities (Township 21S, Range 54E, Section 1). This area will be approximately 295 feet by 140 feet (90 by 43 meters); approximately 0.8 acres (see Figure 9). Included in this area are:

- A shuttle car maintenance shop (see Figure 10).
- A modular building to house facilities controls and crew offices (see Figure 11).
- The ARES substation to connect the catenary distribution line and VEA transmission interconnection (see Figure 12).

Designated staff and visitor parking areas will be covered with gravel.

The control facilities will have the equipment necessary to respond to grid requirements by controlling the speed and number of shuttles in motion. Buildings will be standard modular type buildings and require normal foundation preparation, pouring of slab and footers. The maintenance shop will require erection of a pre-fabricated steel building, using lifts, cranes, and fork trucks.

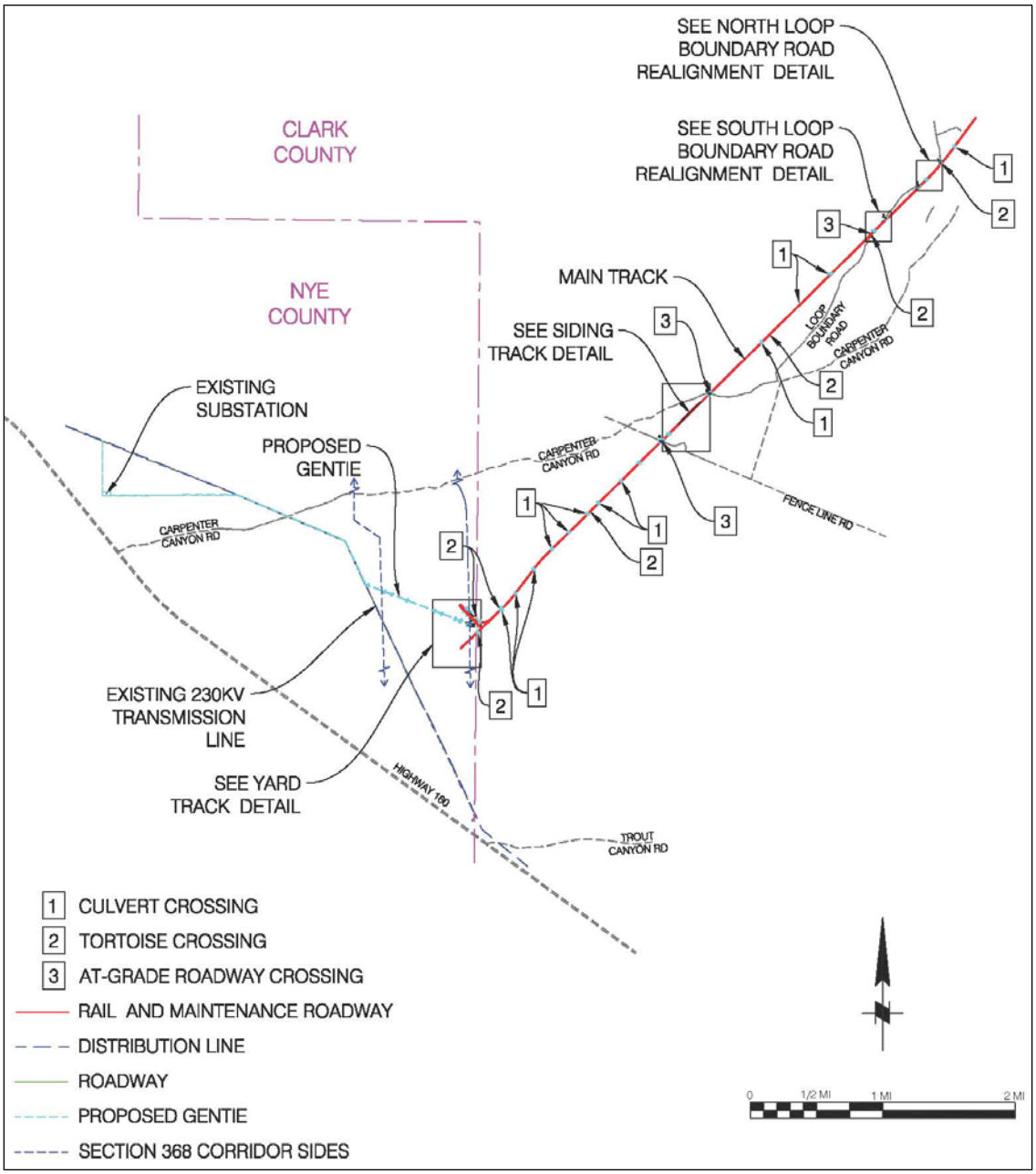

Figure 7. Layout overview of the Proposed Action.

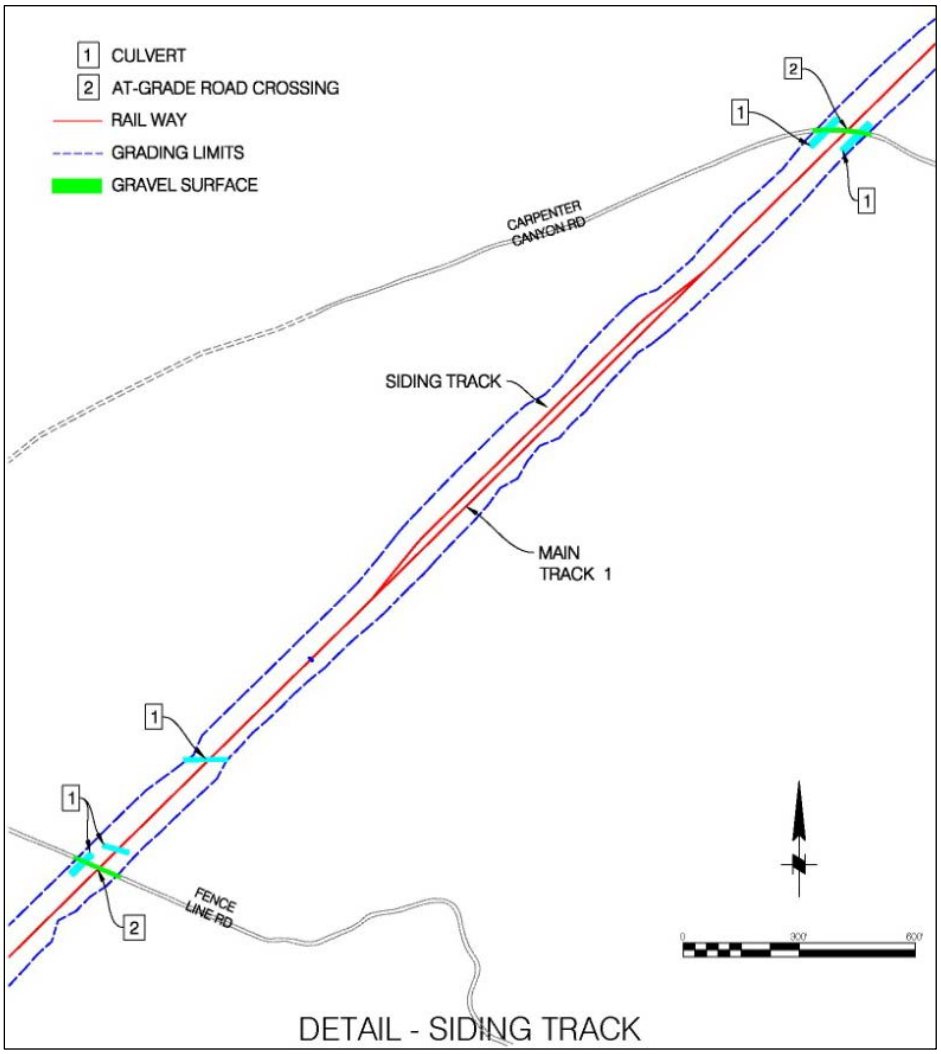

Figure 8. Preliminary design detail for the track siding.

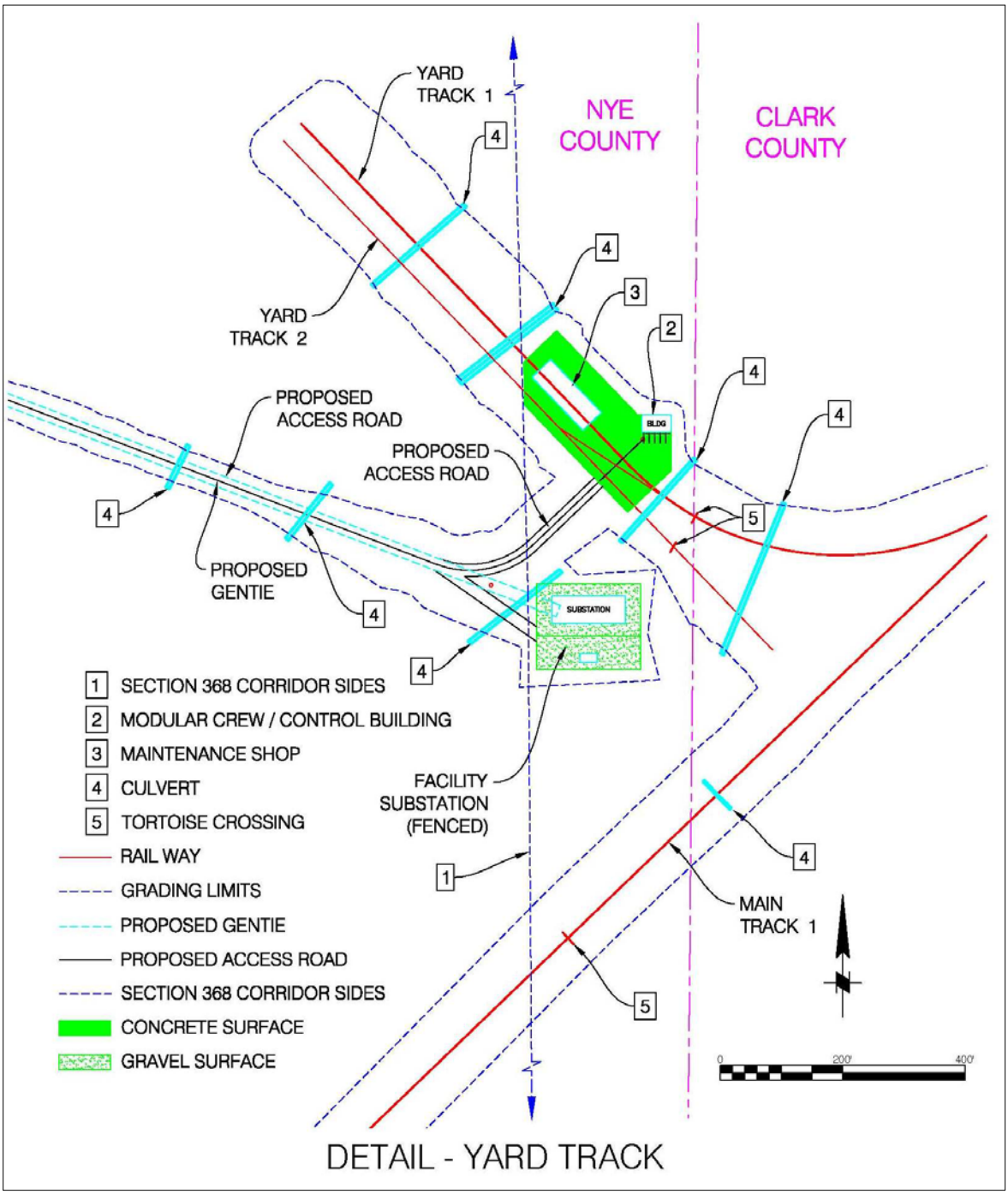

Figure 9. Yard Track Detail for the Proposed Action.

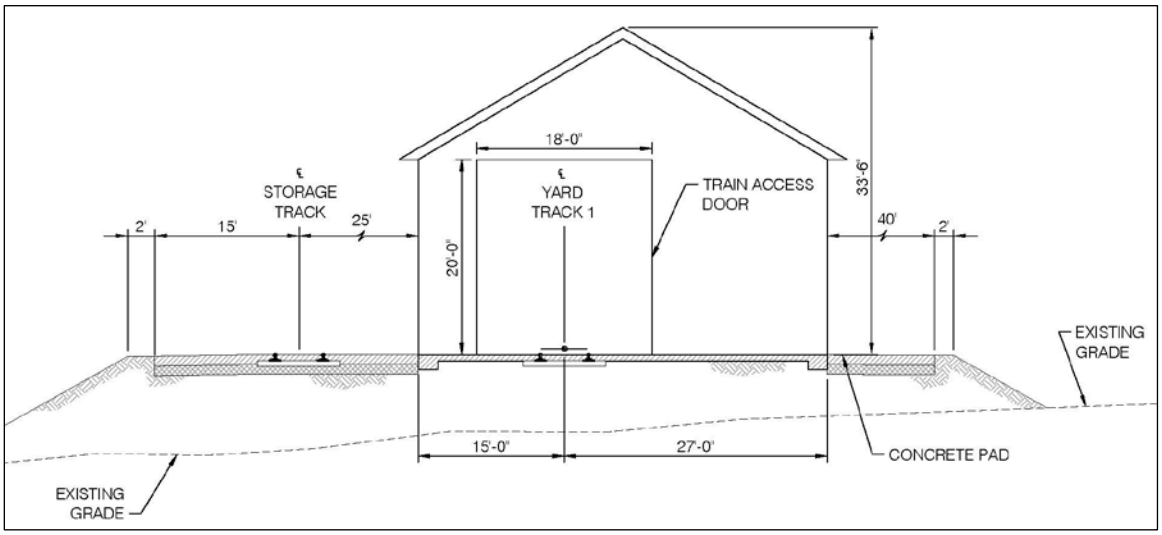

Figure 10. Elevation view of the shuttle car maintenance building.

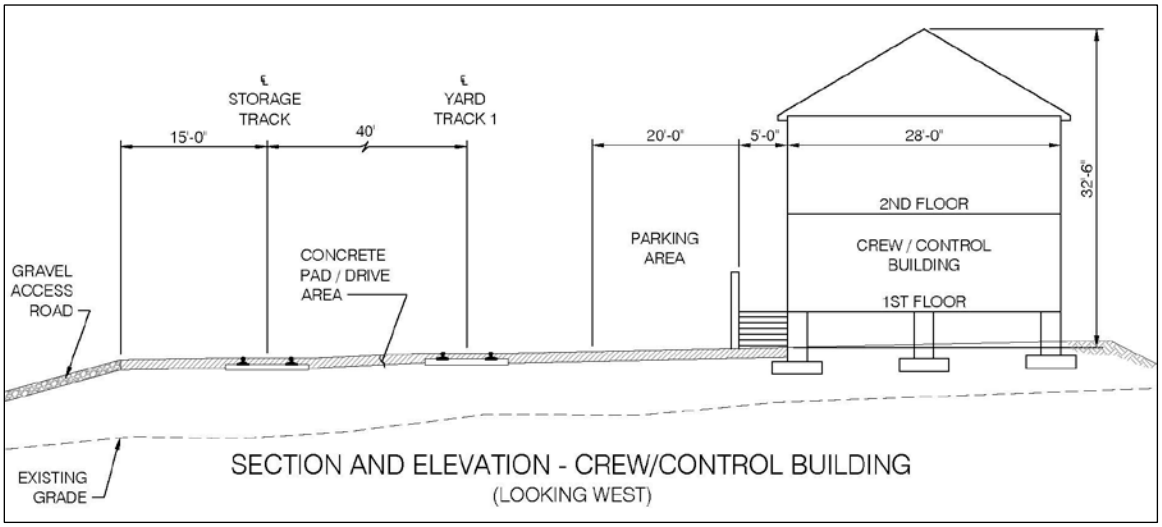

Figure 11. Elevation view of a possible configuration for the control facilities and crew building.

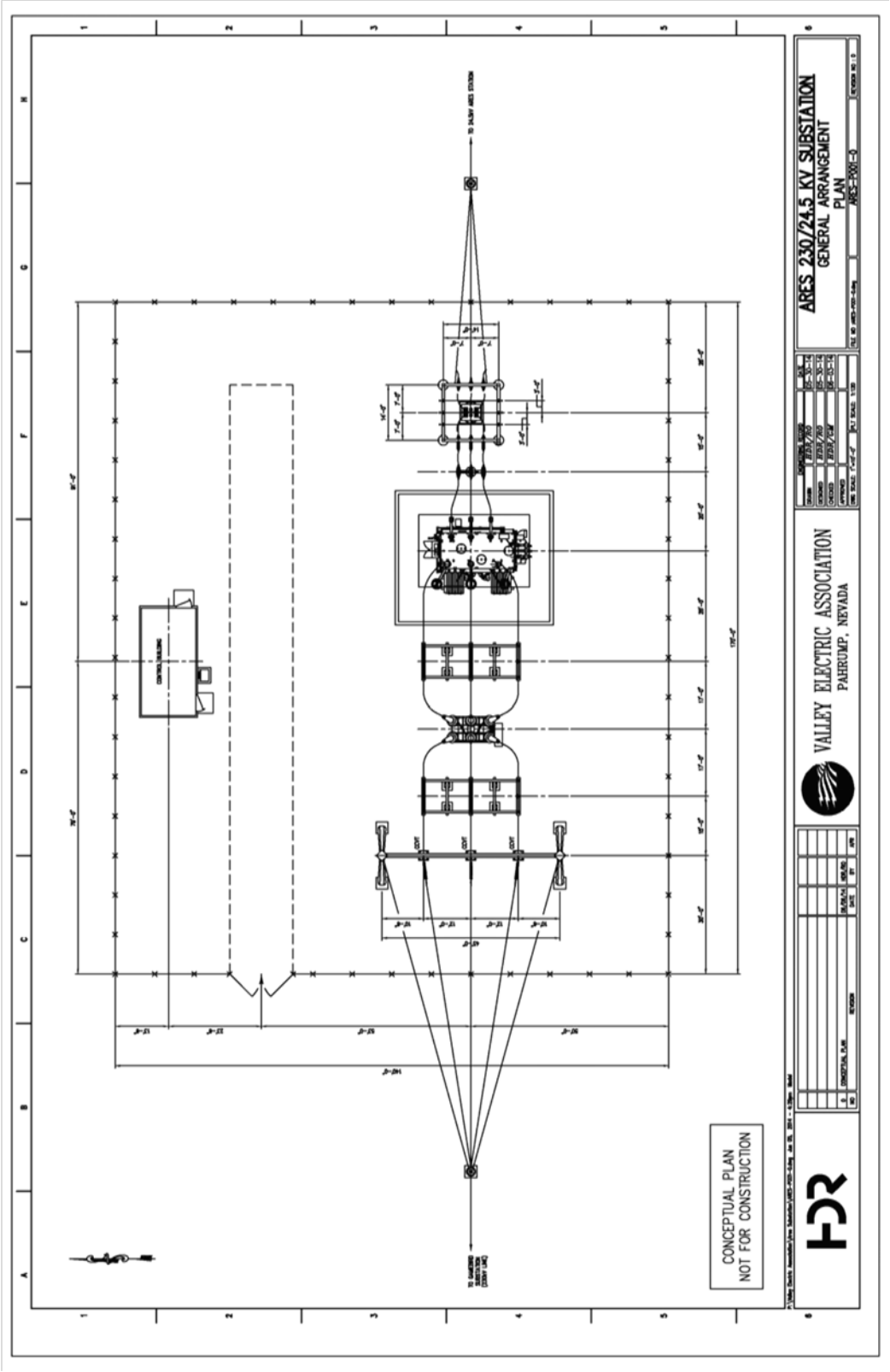

Figure 12. ARES Substation design

ARES will also provide additional administrative offices for project support staff off-site in Pahrump, Nevada. Office space would be leased from existing commercial office space in Pahrump. No other future components are envisioned either on or off public land.

Communication facilities needed to integrate the ARES REM system into the VEA transmission system and the California Independent System Operator (CAISO) grid will require access to a T1 Energy Communications Network (ECN – for Internet services) Circuit and dedicated telephone lines which will be co-located with an Optical Ground Wire (OPGW) on the transmission lines. Additional details of the communication system are currently being developed.

Construction of the ARES Substation and expansion of Gamebird Switch Station would include site grading, installation of a fence or block wall with access gates around the perimeter of the station, ground mat installation below grade, and application of gravel. The outdoor electrical equipment to be installed includes circuit breakers, switches, transformers and instrument transformers, electrical bus work, steel support structures, foundations, oil containment for the transformer, insulators, wiring and installation of a control building. Within the substation building protective relaying and control equipment, batteries, communication devices and fiber termination equipment would be installed. The construction equipment required may include similar equipment needed for construction of the 230 kV transmission line.

A single circuit 230 kV gen-tie will run directly from the new ARES Substation, to the existing VEA 230kV transmission line. This component will be 100 feet (30.5 meters) wide and 3,870 feet (1,180 meters) long. The interconnection would then connect with the existing VEA 230kV transmission line.

The total workforce is dependent on scheduling, but a reasonable estimate if all construction activities occur simultaneously is 100 to 125 workers present at the jobsite. Temporary parking required for construction workers will be identified within the ROW, with the assistance of the construction contractor.

The clearing and grading plan has not yet been developed as it will depend on the detailed site development plans to be prepared by J. L. Patterson & Associates, or other qualified entities, BLM approved mitigation measures (i.e. cactus and yucca disposition), and will follow the normal, approved BLM, Nye County, Clark County, and Nevada Division of Environmental Protection requirements regarding runoff, potential pollution issues, and disposal sites and methods. Engineering plans, as required by BLM, the Army Corps of Engineers, and others, will be developed by ARES. Grading will be minimized where possible to reduce mitigation requirements.

2.1.3.2.1 Materials

Typical materials include Type 2 road gravel, concrete, asphalt and crushed ballast stone, to be obtained from existing commercial permitted sources.

Sand, gravel and other materials generated from cut and fill activities within the project will be used for road construction to the extent possible. All necessary materials not collected from the site will be purchased from a permitted commercial source. Rail roadbed ballast and road material sourcing is still subject to engineering specification and procurement standards review.

2.1.3.2.2 Project Access Roads

Rail line and transmission line construction requires the movement of vehicles along the ROW. For the proposed project, existing access roads will be utilized whenever possible, although a new access road to connect to the facilities area will be necessary (see Figures 4 and 5). Upon completion of construction,

any access roads with the sole purpose of construction access, if created, will be reclaimed according to current BLM standards.

Site access and maintenance roads will be surfaced with Type 2 Gravel and constructed in accordance with Clark and Nye County requirements for Type 2 Gravel Road construction, dependent upon the type and number of anticipated construction vehicles necessary for completion of the project. Permitted commercial vendors will supply the materials for roadbeds. Mitigation measures to reduce impacts during construction and use will be implemented, as detailed Section 3. The maximum grade of the access road will be 8%. Requirements and final locations of drainage ditches and culverts will be determined during engineering site surveys. Subsequent design drawings will be developed after NEPA evaluation and detailed engineering surveys.

To the extent that on-site native soil and rock from cut activities is not acceptable for use as crushed three inch rail roadbed ballast or Type 2 gravel road building aggregates, this material will be trucked in from existing permitted vendors in Nye, Clark or San Bernardino County, dependent upon transportation routes road classifications.

2.1.3.2.3 Rail Line

The railway infrastructure will adhere to minimum standards per the Recommended Practices in the American Railway Engineering & Maintenance-of-Way Association (AREMA) Manual of Railway Engineering (latest); the maximum engineering standards will be based on those recommended in the publication "Guidelines to Best Practices for Heavy Haul Railway Operations - Infrastructure Construction and Maintenance Issues," published in 2009 by the International Heavy Haul Association (IHHA). ARES also expects to adopt promising new practices presently under test at the American Association of Railroad's Transportation Test Center, Inc., Pueblo, Colorado, related to rail and ballast/sub-grade life, once the practices are approved. These improved practices are not as yet codified in any of the current published standards and/or recommended practices.

The order of construction generally is:

- Prepare roadbed, spread base ballast (ballast spreader machine).
- Distribute and space ties (tie distributing).
- Weld and thread rail onto ties (rail threader, welding machine).
- Clip rail (clip applicator machines).
- Install turnouts (cranes).
- Spread additional ballast (special trailer and dump trucks).
- Raise transmission line and tamp the track (ballast tamping and dressing machines).
- Install overhead catenary lines, connect power wires.

Track construction uses common construction equipment such as boom trucks, low-bed trucks, high-lifts, rubber-tired loaders, rubber-tired hydraulic cranes, and dozers, plus specialized equipment such as tie distributing spreaders, rail threaders, a portable rail welding machine, and tamping and ballast handling/dressing equipment. Construction of the rail system will be coordinated to minimize blocking the Carpenter Canyon road crossing for extended periods.

The existing native topsoil will be moved and/or removed, primarily with scrapers and other heavy equipment such as bulldozers, loaders and excavators, and stored for future use in the restoration of disturbed areas and possibly as train ballast. Any remaining material will be recycled as road topping and

fill. Topsoil will be salvaged for reclamation activities occurring at a later date. Hot-mix asphalt may be required along any areas of the railway roadbed that are subject to groundwater seepage. Groundwater interactions are not expected due to the depth of the water table in this area, and will be confirmed through geotechnical surveys.

2.1.3.2.4 Catenary Power Distribution Line

Parallel to the rail line will be an overhead catenary power distribution line (see Figure 13). The catenary power distribution line will be designed in accordance with the published standards of the Rural Utility Services (RUS) as a Distribution System. The line will consist of wooden poles less than 50 feet (15.2 meters), spaced at approximately 325 foot (99 meters) intervals, carrying 4-wire 24.9kV circuits in a wishbone cross arm configuration supporting four - 954 Aluminum Conductor Composite Core (ACCC) wires as well as an optical ground wire (OPGW) for facilities communication requirements. Span lengths will vary in areas presenting terrain restrictions. The power distribution poles will be wood with brown fiberglass cross arms supporting ACCC wire. The design, construction, operation and maintenance of the interconnection line will meet or exceed the requirements of the National Electrical Safety Code (NESC), U.S. Department of Labor, Occupational Safety and Health Standards and ARES's requirements for safety.

Surveying and routing of the rail line and support structures for the overhead power distribution line will assist in identifying any areas of poor soil stability. If soil conditions are unsuitable for installation of poles at specified locations, ARES's contractor will notify the Project Engineer and the BLM of the conditions present. If possible, the issue will be remedied through relocations of the pole up-line or down-line from the previously specified location.

At each structure site, areas will be needed to stage and facilitate the operation of equipment. A temporary construction disturbance area will be necessary within the proposed ROW. Excavations for poles will be made with power equipment. Where the soil conditions permit, a vehicle-mounted power auger or backhoe will be used. If necessary, the foundation holes may be excavated by drilling. After the hole is augered, poles will be set, backfilled, and tamped using existing soils. Remaining soils and salvaged topsoil will be spread on the ground, and BLM approved reclamation activities will be conducted. Foundation materials will be determined based on final design specifications and geotechnical specifications. Materials will likely consist of gravel or concrete. Alternatively, depending on final design, no foundation may be necessary.

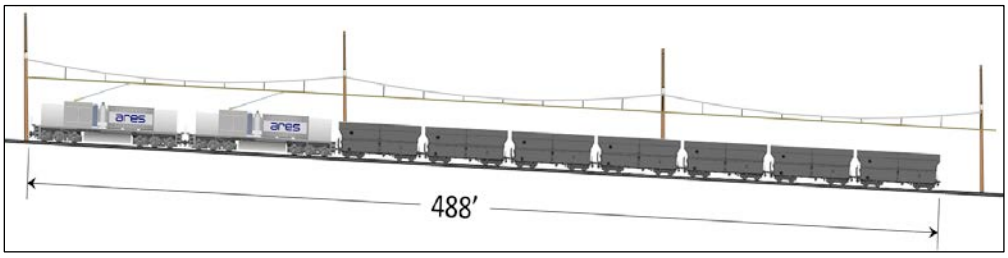

Figure 13. Artistic rendering of the proposed shuttle train and overhead catenary line

2.1.3.2.5 Building and Support Facilities

Structures will be pre-fabricated modular and steel frame buildings on reinforced concrete foundations, where necessary (see Figures 10 and 11). The clearing of natural vegetation will be required. Topsoil will be salvaged for future reclamation activities; unused topsoil will be disposed of as required by BLM. Selective clearing will be performed where necessary for electrical clearance, line reliability, and

construction and maintenance operations. The ROW will not be chemically treated, if possible. Any potential treatments will be reviewed and approved by the BLM prior to application.

A step-down substation (ARES substation) will be located in this component of the ROW (see Figure 12). Additional miscellaneous support service locations, including, outside lighting, emergency power, fire prevention measures, parking facilities, and fencing will be detailed in subsequent updates to the Preliminary Plan of Development (POD) and refined during the detailed site engineering survey stage. Outdoor lighting will be directed downwards to the extent possible to minimize the impact on dark skies while still meeting site safety requirements.

2.1.3.2.6 Transmission Line

Since the existing transmission support structures currently in place are unable to support an additional line, a 7,200 foot (2,194.5 meter) section of existing VEA 230kV transmission infrastructure will require tower upgrades to support the addition of the new line. A new double circuit 230 kV transmission line (see Figure 14) would turn west for 4,400 feet (1,341 meters) to connect the project to the expansion area within the existing Gamebird Switch Station. Upgrades necessary to accommodate terminating the new 230 kV line at the Gamebird Switch Station will be constructed within the existing Gamebird Switch Station ROW (N-059100); no new ROW is needed for the Switch Station upgrade. From the Switch Station a new single circuit line (see Figure 15) will run north for 1,860 feet (567 meters) to connect again with the existing VEA 230kV line. The current, existing 230 kV transmission line currently bypasses Gamebird Switch Station, which is why the new double-circuit and single-circuit lines are required. With the proposed configuration, approximately 5,000 feet (1,524 meters) of the existing 230kV line (currently bypassing the Gamebird Switch Station) will be removed. In addition to the above components, a transmission line maintenance road will be constructed along the ROW where existing roads do not already exist.

Construction of the power distribution and 230 kV transmission interconnection lines involve augering holes, pouring concrete or Type 2 foundations, erecting poles, installing insulators and hardware, stringing wire, installation of optical ground wire (OPGW), testing and commissioning; the construction equipment required may include pickup trucks, bucket trucks, pole trailers, wire trailers, all terrain vehicles (ATVs), concrete trucks, flat bed trucks, excavators, loaders, dozers, cranes, backhoe, wire-stringing trailers, water trucks and a helicopter.

2.1.3.2.7 Cleanup

Construction sites, material storage yards, and access roads will be kept in an orderly condition throughout the construction period. Refuse and trash, including stakes and flags, will be removed from the sites and disposed of in an approved manner. No construction equipment oil or fuel will be drained on the ground. Oils or chemicals will be hauled to an approved site for disposal. No burning of construction trash will occur on BLM managed lands.

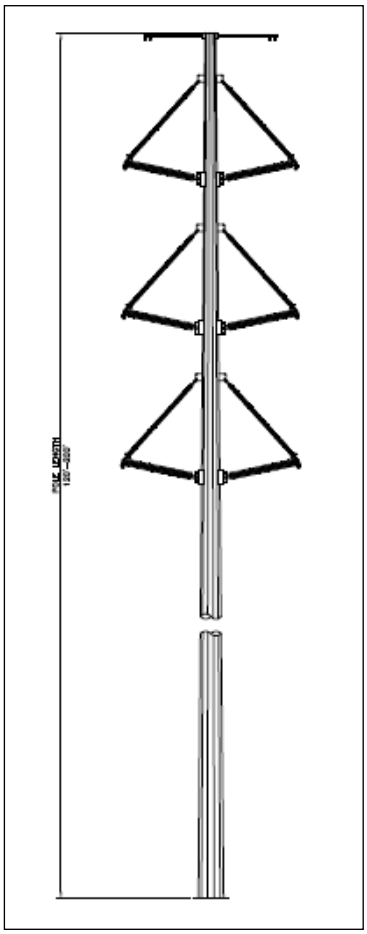

Figure 14. Typical double-circuit transmission line support pole.

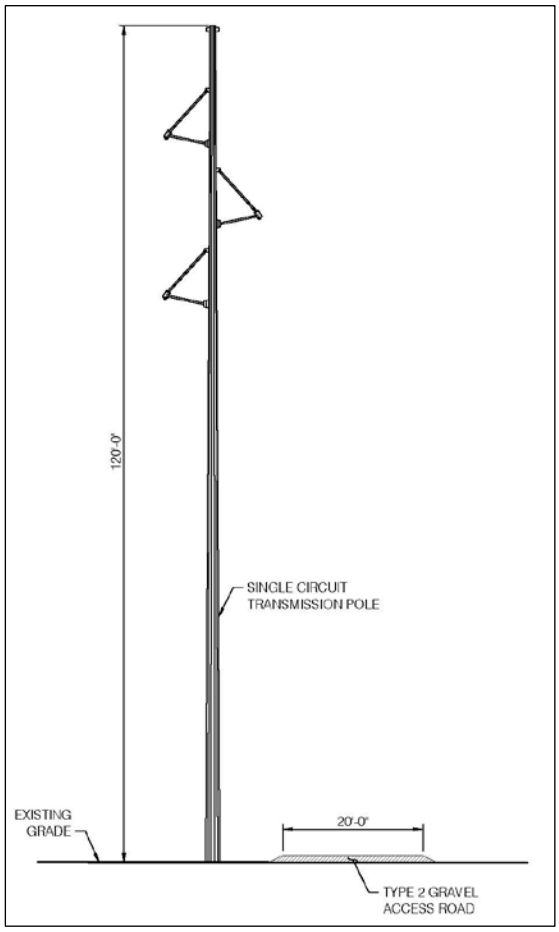

Figure 15. Typical single-circuit transmission pole.

2.1.4 Operations and Maintenance

The facility will be staffed seven days a week, 24 hours a day, for the duration of the project. Weekday day shifts would be staffed by five personnel including a control/operator, a security officer, a general manager, maintenance worker and administrative worker. During the night, graveyard, and weekends, shifts may be staffed by up to three personnel, which would at least include a control/operator and a security officer.

Inspection and maintenance schedules will be developed by the Maintenance Manager who, with staff, will develop the schedules necessary for the various elements of the operating system and on the recommendation of the various manufacturers and suppliers of the equipment, and best practices recommended by organizations such as the American Railway Engineering and Maintenance-of-Way Association, International Heavy Haul Association (IHHA), American Association of State Highway and Transportation Officials, Nevada Department of Transportation (NDOT), Electric Utility Distributers Association, Institute of Electrical and Electronics Engineers, etc.

Approximately 12 shuttle-trains will be located on the single track. Each shuttle-train will be comprised of two electric locomotives weighing approximately 220 tons each, and seven cars with a weighted load of salvaged soil or concrete, weighing approximately 150 tons each (see Figure 13). The shuttles are propelled by high-efficiency regenerative traction drive motors mounted on rail-car chassis. The facility

will be compliant with Institute of Electrical and Electronics Engineers (IEEE) 519 generation equipment standards.

Rapid detection and remediation of failures via redundant speed, location, thermal, visual, and vibration sensors, will operate on each shuttle for safety control. Each locomotive will have three redundant breaking systems. Although each shuttle has the potential to reach 25 miles per hour, the average speed for each will be 18.8 miles per hour.

The track and roadway will be inspected daily, possibly employing robotic equipment that can work 24 hours a day, seven days a week, without direct manual control. The inspection criteria will be, at a minimum, based on Title 49 CFR 213 Track Safety Standards as published in the Federal Register (latest), supplemented by recommendations of the IHHA and in-house developed criteria based on best practices from a world-wide network of specialized, heavy-haul railroad operations. There will be an internal process for automatic evaluation of inspection results data, tied into a system to generate work orders that will direct the Maintenance of Way (MOW) Department to repair or replace any defective guideway elements. The MOW Department will operate on a proactive basis to minimize the possibility of guideway components slipping below the State of Good Repair, by grinding rail, correcting surface anomalies, ultrasound testing of rail, etc., based on the inspection data and a planning forecast program that prevents any serious exceptions from developing.

Rail vehicle inspection processes and procedures will be provided by the shuttle vehicle component manufacturers.

2.1.5 Design features and mitigation to reduce/eliminate potential impacts

As part of standard operating procedures, standard mitigation measures will be implemented throughout the construction and operation of the project in order to reduce potential adverse environmental impacts. Most impacts are short term and generally occur during the construction period. Project design and implementation of site-specific or selectively recommended mitigation measures will minimize the effect of the project where the potential for long-term adverse impacts may occur.

Standard rail crossings will be installed where the rail line crosses dirt roads to maintain access to public lands. The Carpenter Canyon road crossing, which is frequently utilized based on the condition of the road, will include flashing lights as well as warning signs. Other minor crossings will include signage, but not lighting. To further improve public safety by minimizing track crossings, Loop Boundary Road, which, as currently aligned, would cross the rail corridor in multiple locations at the northeast end of the corridor, will be rerouted to reduce the necessary crossings from three to one, and still allow public access to the upper elevations of Carpenter Canyon. The rail system will be operated to minimize blocking the Carpenter Canyon road crossing for extended periods. Much of the rail line will be at or near grade level, but there will be areas where the embankment will be built up and a tortoise passage installed between the ties and under the two rails, to allow desert tortoise (and other smaller wildlife) to cross the rail line unimpeded by the rails. Tortoise escape passages[1] will be installed approximately every mile to allow the tortoise to exit from between the rails should one find itself in that position. Final spacing of the tortoise escape passages will be determined based on consultation with BLM resource specialists.

[1] Tortoise Escape Passages are areas between the construction crossings where the soil between the rail ties is removed to allow a tortoise to walk under the rail and down the embankment.

Remote monitoring of the rail corridor will be installed to protect and monitor the system for maintenance issues and from outside interference. ARES will install a remote monitoring system at the facility to monitor the rail line and potentially the tortoise crossings[2], as well as provide an on-site security officer to monitor the support facilities 24 hours a day, 365 days a year.

BLM approved weed control measures and best management practices will be used to avoid or mitigate any weed infestations, if necessary. The use of herbicides, if any, for potential future occurrences of weeds, will be in accordance to the BLM's 17 Western State EIS and only those which are in accordance with the US Fish and Wildlife Service (USFWS) biological opinion, or subsequent to further Section 7 consultation, to avoid possible harm to threatened or endangered species such as the desert tortoise. Only certified weed free straw bales will be used on site, if required. Revegetation areas and growth will be monitored for the presence of noxious weeds throughout the life of the project.

The operator or any contractor company working for the operator will be required by the Occupational Safety and Health Administration (OSHA) regulations to have Material Safety Data Sheets (MSDS) available for all chemicals, compounds, or substances that are used or anticipated to be encountered during the course of construction and operations. All chemicals would be handled in an appropriate manner to prevent leaks or spills in the environment. Because the project operations would comply with all applicable federal and state laws concerning hazardous materials and the operator's spill prevention and clean up procedures, and only limited amounts of hazardous materials will be on site, no impacts from hazardous or solid waste are anticipated. However, project mitigation plans will specifically address hazardous and solid waste handling, spill and leak prevention and handling procedures, and clean up processes and procedures for petroleum, oil, lubricants, and other materials that may be used on site.

Water for drinking, sanitary purposes, and dust mitigation during construction will be obtained off site and transported to the site.

2.1.6 Connected actions

The transmission interconnection line from the existing VEA transmission line to the ARES Substation will be constructed, owned, operated and maintained by VEA; therefore, it is anticipated this will be permitted as a BLM Connected Action as well as the VEA system upgrades and Gamebird Switch Station expansion. VEA would not be conducting the system upgrades and Gamebird Switch Station expansion but for supporting the ARES project.

2.1.7 Land Use Plan Conformance

The Proposed Action conforms to the Las Vegas RMP and Record of Decision approved in October 1998. Sections that specifically apply to this Project include:

- RW-1-h, Management Direction: "All public land within the planning area, except as stated in RW-1-c through RW-1-g area available at the discretion of the agency for rights-of-way under the Federal Land Management Policy Act."

In conjunction with FLPMA, the BLM's applicable authorities include the following:

[2] Tortoise Crossings are areas which allow a tortoise to cross the right-of-way without having to cross the train rails.

- Executive Order 13212, dated May 18, 2001, mandates that agencies act expediently and in a manner consistent with applicable laws to increase the production and transmission of energy in a safe and environmentally sound manner.
- Section 211 of the Energy Policy Act of 2005, establishes a goal for the Secretary of the Interior to approve 10,000 MW of non-hydropower renewable energy on public lands by 2015.
- Secretarial Order 3285A1, dated February 22, 2010, establishes the development of renewable energy as a priority for the Department of the Interior.

2.2 The Alternative

The Alternative includes the same project components outlined under the Proposed Action, but locates the operations, maintenance and control facilities and the ARES substation in a configuration that places the Maintenance building at the end of a relatively short rail spur, avoids the need for a secondary parallel rail spur and reduces the total area of impact slightly. This configuration and location also maintains a straight rail alignment within the southern portion of the main rail alignment. The Alternative locates the operations and control facilities and the ARES substation adjacent to the maintenance facility on a concrete pad that would be smaller than the area required for the Proposed Action. However, this alternative places these structures within the Congressionally-designated Section 368 West-wide Energy Corridor (Section 368 of the Energy Policy Act of 2005, 42 U.S.C. § 15926) boundary, which has been designated for linear energy-based infrastructure development.

The slight modification in the location of these facilities under the Alternative decreases the length of the interconnection between the ARES substation and existing VEA 230 kV transmission line by approximately 65 feet, and reduces the length of new road needed to access the facilities by approximately 450 feet. The maintenance building would be sited between 225 and 335 feet within the eastern boundary of the 368 Energy Corridor; the control building would be between 110 and 165 feet within the eastern boundary of the 368 Energy Corridor.

2.2.1 Applicant and Agencies involved

The agencies involved do not differ between the Proposed Action and Alternative.

2.2.2 Action to be taken

The Alternative will also provide up to 50 megawatts (MW) of gravity-based electrical energy regulation, but on 70 acres of BLM-managed land rather than 72 acres, in order to balance variable energy demands and potential intermittent renewable energy contributions through energy storage. The system components are the same for both the Proposed Action and Alternative.

The same upgrades to the existing VEA transmission line described in the Proposed Action will be required under the Alternative to connect the ARES REM facility to the regional electric grid.

2.2.2.1 Location

The locations of the Alternative are the same as those described for the Proposed Action with the exceptions discussed below.

The legal land descriptions for each component of the project are located in Tables 2-5, 2-6, and 2-7.

The upslope (northeast) end of the Proposed Action will begin in Township 20 South, Range 55 East, Section 22, as with the Proposed Action. For the Alternative, a single spur line off the railroad corridor will extend to the operations and maintenance area, whereas the Proposed Action includes two spurs for

vehicle storage. The support facilities, which will include the new substation (ARES substation), a shuttle train maintenance building, and an operations control center, will be located within Nye County. However, compared to the Proposed Action, these facilities will be within the eastern border of the Section 368 Energy Corridor.

As with the Proposed Action, the new 230 kilovolts (kV) transmission line (interconnection) to be operated by VEA, will run northwest across the Section 368 corridor to connect with the existing VEA 230kV transmission line ROW (N-057100). The remaining aspects of the transmission system would be the same as described for the Proposed Action.

Table 2-5: Proposed Rail Line Corridor Legal Land Description

Township and Range	Section	Aliquot Part
T. 20 South, R. 55 East	22	Begins in SW ¼ of the NE ¼, running southwest through the NW ¼ of the SE ¼, NE ¼ of the SW ¼, and SE ¼ of the SW ¼, to the SW ¼ of the SW ¼; then
T. 20 South, R. 55 East	27	NW ¼ of the NW ¼ of the NW ¼; then
T. 20 South, R. 55 East	28	NE ¼ of the NE ¼, running southwest through the SE ¼ of the NE ¼, SW ¼ of the NE ¼, NW ¼ of the NW ¼ of the SE ¼, NE ¼ of the SW ¼, and NW ¼ of the SE ¼ of the SW ¼, to the SW ¼ of the SW ¼, then
T. 20 South, R. 55 East	33	NW ¼ of the NW ¼ of the NW ¼; then
T. 20 South, R. 55 East	32	NE ¼ of the NE ¼, running southwest through the SW ¼ of the NE ¼, and NE ¼ of the SW ¼, to the SW ¼ of the SW ¼, then
T. 20 South, R. 55 East	31	SE ¼ of the SE ¼ of the SE ¼, then
T. 21 South, R. 55 East	06	NE ¼ of the NE ¼, running southwest through the SW ¼ of the NE ¼, and NE ¼ of the SW ¼, to the SW ¼ of the SW ¼, then
T. 21 South, R. 54 East	12	NE ¼ of the NE ¼ of the NE ¼, ending at the SW ¼ of the NE ¼ of the NE ¼.

Table 2-6: Proposed Operation, Control, and Maintenance Facilities Legal Land Description

Township and Range	Section	Aliquot Part
T. 21 South, R. 54 East	01	S ½ of the SE ¼, and E ½, of the SW ¼.

Table 2-7: Transmission Interconnection Line Legal Land Description

Township and Range	Section	Aliquot Part
Existing Transmission to be Upgraded		
T. 21 South, R. 54 East	01	NW ¼ of the SW ¼, running to the SW ¼ of the NW ¼
T. 21 South, R. 54 East	02	NE ¼ of the S ½ of the NE ¼, through the N ½ of the NE ¼, running to the N ½ of the NW ¼
New Transmission Connection to Gamebird Switch Station		
T. 21 South, R. 54 East	02	N Section border of the NW ¼ of the NW ¼
T. 21 South, R. 54 East	03	N Section border of the NE ¼, and N Section border of the NE ¼ of the NW ¼
T. 20 South, R. 54 East	34	Running north/south in the E ½ of the W ½ of the SW ¼

Existing Transmission to be Removed		
T. 20 South, R. 54 East	34	SE ¼ running to the NE ¼ of the SW ¼
T. 20 South, R. 54 East	35	SW ¼ of the SW ¼
New Interconnection Connecting ARES Substation to Existing Line		
T. 21 South, R. 54 East	01	S ½ of the SE ¼ of the SE ¼, running northwest through the NW ¼ of the SE ¼ of the SW ¼ of the SE ¼, N ½ of the SW ¼ of the SE ¼, NE ¼ of the SE ¼ of the SW ¼, and SW ¼ of the SW ¼ of the NE ¼ of the SW ¼, to connect with the existing VEA line in the SE ¼ of the NW ¼ of the SW ¼

2.2.2.2 Time frame for construction and operation

The time frame for construction for the Alternative would be the same as for the Proposed Action. Ideally, following engineering and geotechnical surveys, ARES would begin construction of the project in the first quarter of 2017, with construction being completed mid 2017; operations would begin third quarter 2017. The system is designed to provide energy storage capabilities for 30 years.

2.2.2.3 Construction

The construction process for the Alternative would be the same as for the Proposed Action, though the detailed location and amounts of disturbance vary. The Proposed Project includes multiple temporary and permanent (long-term) components constructed and operated by ARES. Other components will be constructed and operated by VEA to directly support the project. Brief summaries of those components are provided below.

As with the Proposed Action, the Alternative includes the same four long-term disturbance areas and one short-term disturbance area, though the sizes of these areas differ from the Proposed Action (see Table 2-5, 2-6, and 2-7):

- A rail line corridor - 5.5 miles (8.9 kilometers) long averaging 75 feet (22.9 meters) wide (siding area will be wider, grading required to maintain a constant elevation change will vary) (see Figure 16).
- An operations, control and maintenance facilities area on a concrete pad containing two to three buildings (offices and control center may be combined) and a small staff parking lot, for a total size of 0.3 acre (see Figure 17).
- A transmission and access road corridor, which includes the new transmission interconnection as well as upgrades to the existing transmission - approximately 3,700 feet (1,128 meters) long by 100 feet (30.5 meters) (see Figure 18).
    - Removal of approximately 5,250 feet (1,600 meters) of existing transmission which will become obsolete with the upgrades required for the existing transmission to support the Proposed Action (see Figure 18).
- Construction related disturbance areas (cut and fill areas, equipment storage yards) will create a variable width buffer along the rail corridor, and add 50 feet (15.2 meters) to all transmission corridors, for a short-term disturbance of 98 acres.

In total for the Alternative, 168 acres would be disturbed, 70 acres of which will be long-term infrastructure (see Table 2-8).

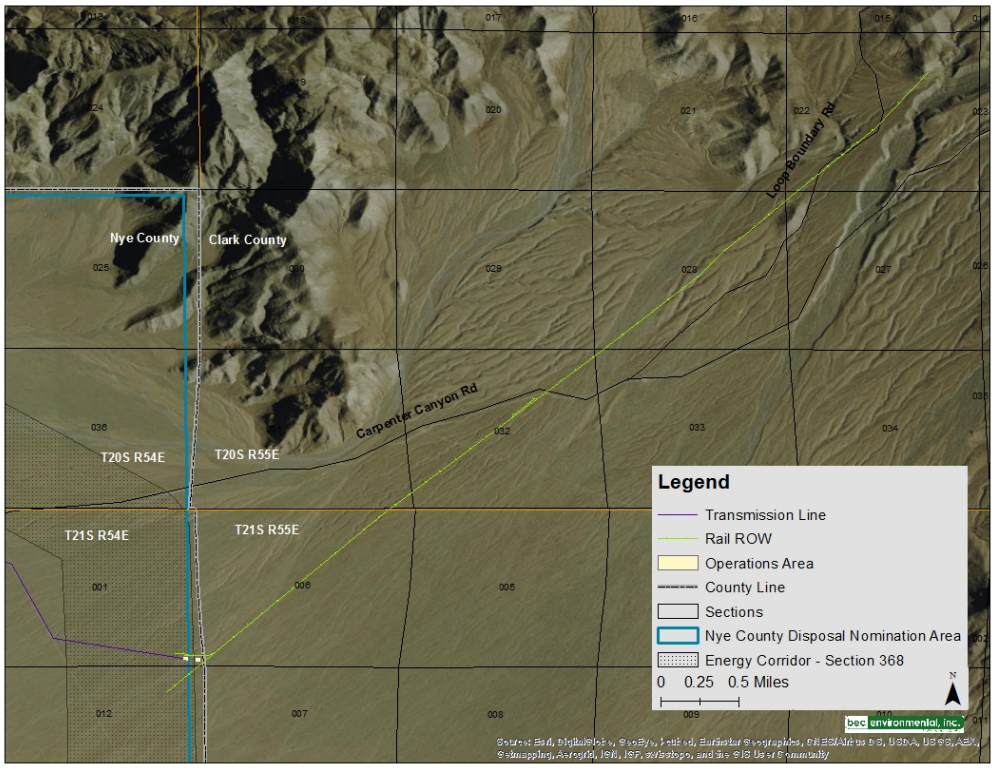

Figure 16. Rail Corridor for the Alternative.

Figure 17. Operations and Maintenance area and transmission interconnection for the Alternative.

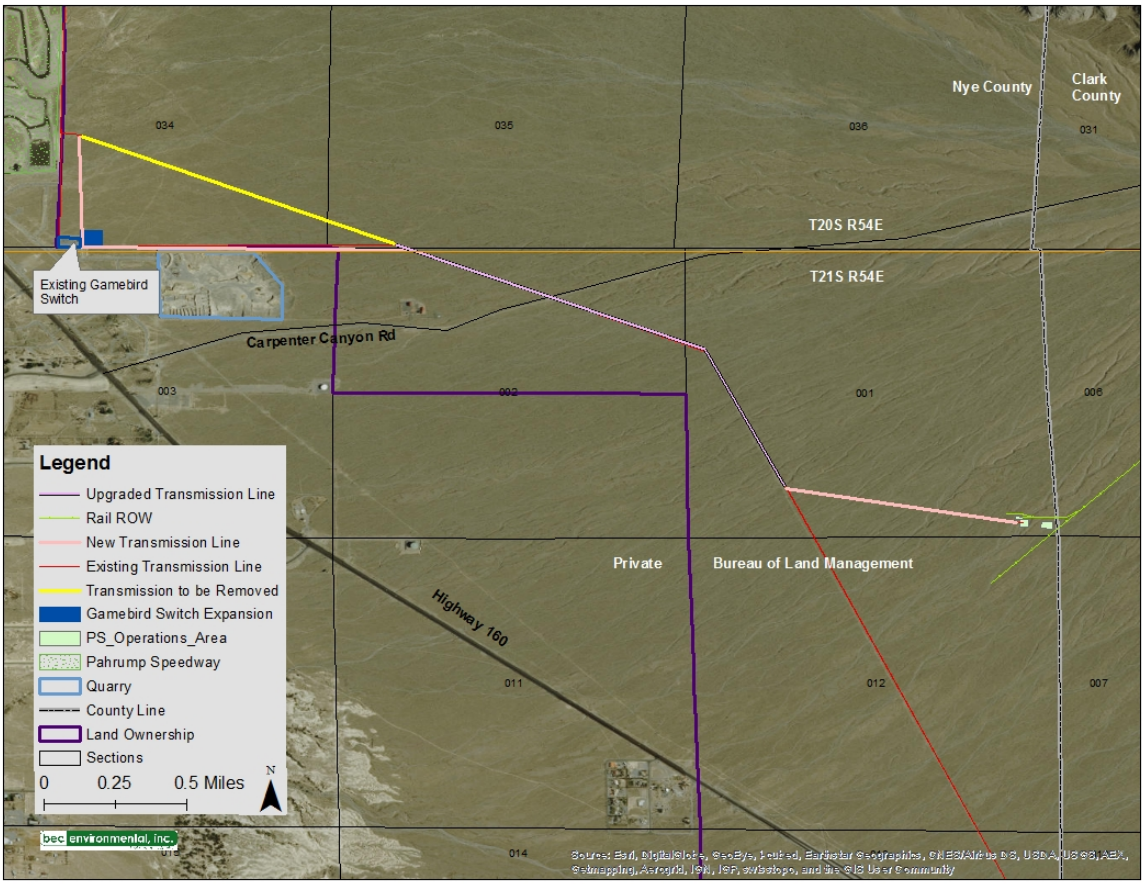

Figure 18. Gamebird Switch Station and Transmission Components for the Alternative.

Table 2-8. Summary of Permanent and Temporary Disturbance for the Alternative

Disturbance Type	Acres of Disturbance	Notes
Long-Term Disturbance		
Rail Corridor	27.2	The main rail track will be 5.5 miles (29,036 feet) long, the mid-elevation spur track will be 0.19 miles (995 feet) long, the facility area curve and storage track will be 0.23 miles (1,218 feet) long, and the maintenance building track will be 0.1 miles (284 feet) long. The facility area curve and storage track and maintenance building track may be shortened based on conversations with the BLM regarding the West-wide Energy Corridor.
Operations Control and Maintenance Facilities	0.3	Facilities will be placed on an area approximately 70 feet by 185 feet (0.3 acres) and will include an operations building (0.06 acres), a maintenance building (0.11 acres), and a gravel employee and visitor parking lot (0.07 acres). (Rail lines are considered above, in the rail corridor summary.)
ARES Substation	0.5	A transmission interconnection substation and control building (ARES substation)
Gamebird Switch Station Expansion	2.4	Located within existing VEA Gamebird Switch Station ROW N-59100.
Transmission Lines and Access Roads	39.4	Existing lines to be upgraded include 16.5 acres. New transmission consists of an 8.5 acre interconnection and 14.4 acres for the two new Gamebird Switch Station connections. Access roads will be co-located with transmission; acreage of disturbance for roads is included in the Transmission Lines acreage.
Total Long-Term	**69.8 (70)**	
Short-Term Disturbance		
Rail Corridor	51.5	Disturbance will occur on approximately 40 feet either side of the rail corridor infrastructure, for the length of the corridor.
Operations Control and Maintenance Facilities	6.0	Disturbance associated with the construction and installation of the operations building, maintenance building, ARES substation, parking lot, and laydown yard, materials storage, and vehicle parking.
Transmission Lines and Access Roads	40.4	Disturbance associated with the construction of the ARES substation interconnection (4.44 acres), upgrades to existing VEA transmission (8.26 acres), new VEA transmission lines (5.05 acres), removal of existing transmission (17.22 acres), Gamebird Switch Station expansion (0.60 acres), and five pulling stations (5 acres).
Total Short-Term	**97.9 (98)**	
Total Disturbance	**167.7 (168)**	

2.2.2.3.1 Pre Construction Activities

Land Surveys

Multiple exploratory and environmental analysis surveys were conducted by ARES and their contractors during 2014. These surveys included botanical surveys, desert tortoise presence/absence surveys, preliminary no impact initial alignment measurements, and a potential construction contractor on site meeting.

Aerial Surveys

In July 2014, an aerial survey of the proposed alignment was conducted in order to develop a more refined alignment and aid in the development of the initial engineering drawings.

Engineering Surveys

The BLM National Environmental Policy Act (NEPA) process will determine the preferred alignment for the project. As described for the Proposed Action, preliminary surveys and other investigations will be completed after a preferred alignment is selected by the BLM during the NEPA process, and on-the-ground investigations will be completed to precisely locate the centerline within the ROW. The details of these surveys and design efforts for the Alternative are the same as for the Proposed Action.

Cultural Resource Surveys

A Class III cultural survey was conducted by HDR, Inc. during the period November 4 – 8, 2014. The Alternative is within the areas surveyed and the description summarized for the Proposed Action is applicable to the Alternative. The archaeological survey did not locate any cultural materials.

Biological Surveys

As with the Proposed Action, the Mojave desert tortoise will require special consideration in consultation with BLM, NDOW, and USFWS for the Alternative. Specific mitigation measures for biological resources will be developed as part of the environmental evaluation. If necessary, additional surveys or Section 7 consultation will be supported through the BLM during the NEPA process. The area encompassing the Alternative was covered by desert tortoise surveys conducted in May, September, and October of 2014. One live tortoise was observed, and multiple burrows were identified.

As with the Proposed Action, special status plants (e.g. cacti, yucca, etc.) will be avoided during construction to the extent possible. The Alternative is within the area where native plant surveys were conducted during the period April 27 – May 25, 2014.

Interconnection Geotechnical Investigation

Geotechnical investigation will be completed for the 230 kV transmission lines, the ARES Substation and the expansion of Gamebird Switch Station for the Alternative as was described for the Proposed Action.

2.2.2.3.2 Construction Activities

Construction activities associated with the Alternative will be consistent the construction activities described for the Proposed Action. Detailed site plans for the Alternative have not yet been completed; therefore, figures are currently estimates based on initial preliminary site plans and project design. Detailed site plans will be developed after NEPA reviews have been completed and the Alternative is selected.

As with the Proposed Action, the Alternative will be installed where the proposed rail line would cross existing drainages in order to not impede stormwater flows from the Spring Mountains. The exact

dimensions of the culverts will be determined during engineering (see Figure 19), but will be of sufficient size to allow desert tortoises to see light from the other side and to pass back and forth through the culverts.

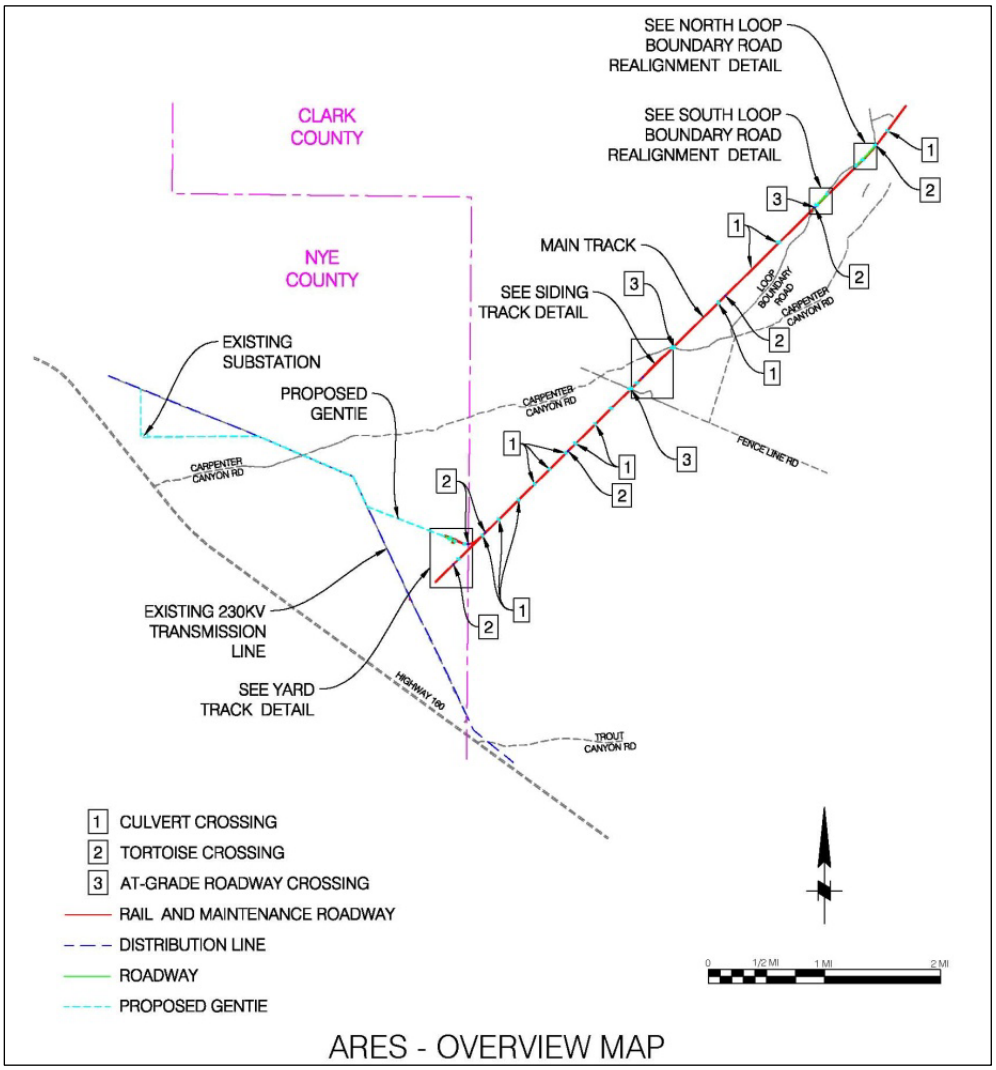

Figure 19. General site layout for the Alternative.

As described with the Proposed Action, a rail line siding, or spur line, to allow shuttle cars to be re-sequenced on the main rail line, will be included in the Alternative (see Figure 7).

The primary difference between the Proposed Action and the Alternative is the location and configuration of the operations, control, and maintenance facilities, as well as the ARES substation. These portions of the Alternative are within the boundary of the Section 168 west-wide energy corridor (Figure 17). The operations, control and maintenance facilities would be constructed on a concrete pad in an area perpendicular to the southwestern end of the rail corridor along a spur rail line that gradually curves from the primary rail alignment, providing a relatively level area to move and arrange the locomotives and the cars. The facilities would provide operational support, vehicle control, and shuttle train maintenance facilities (Township 21S, Range 54E, Section 1). This area will be approximately 70 feet by 185 feet (85 by 39 meters); approximately 0.3 acres (see Figure 17). Included in this area are:

- A shuttle car maintenance shop (see Figure 20).
- A modular building to house facilities controls and crew offices (see Figure 21).

Designated staff and visitor parking areas will be on the concrete pad to be constructed for the operations and maintenance facilities area.

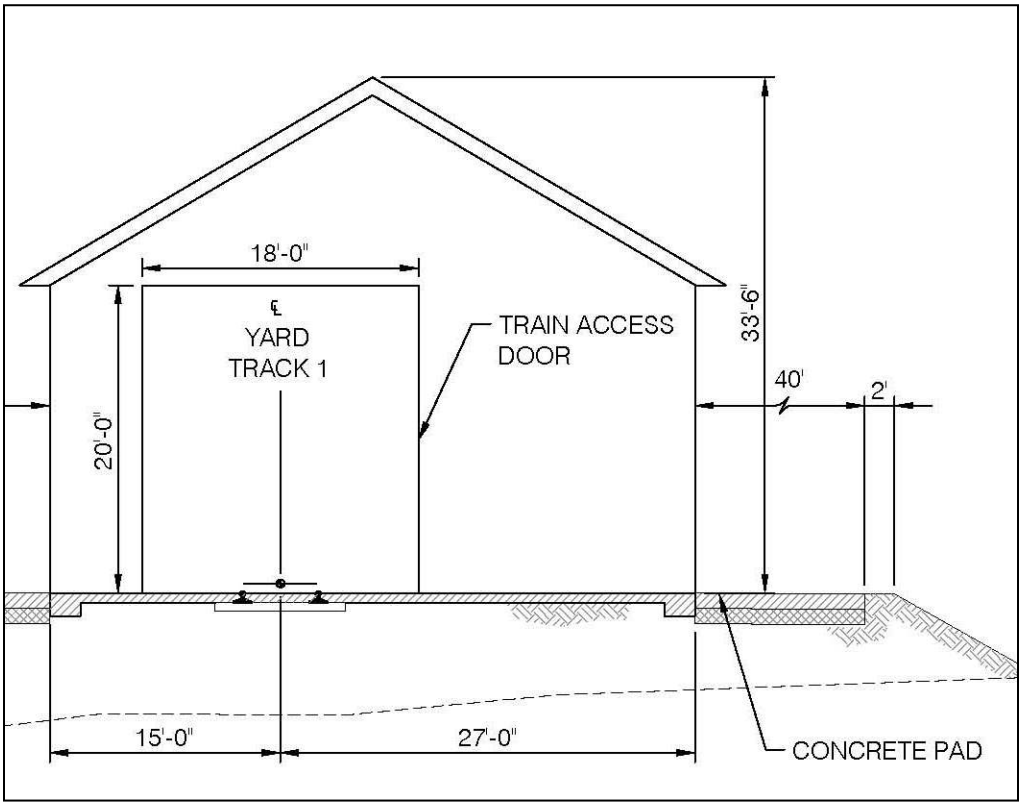

Figure 20. Elevation view of the shuttle car maintenance building.

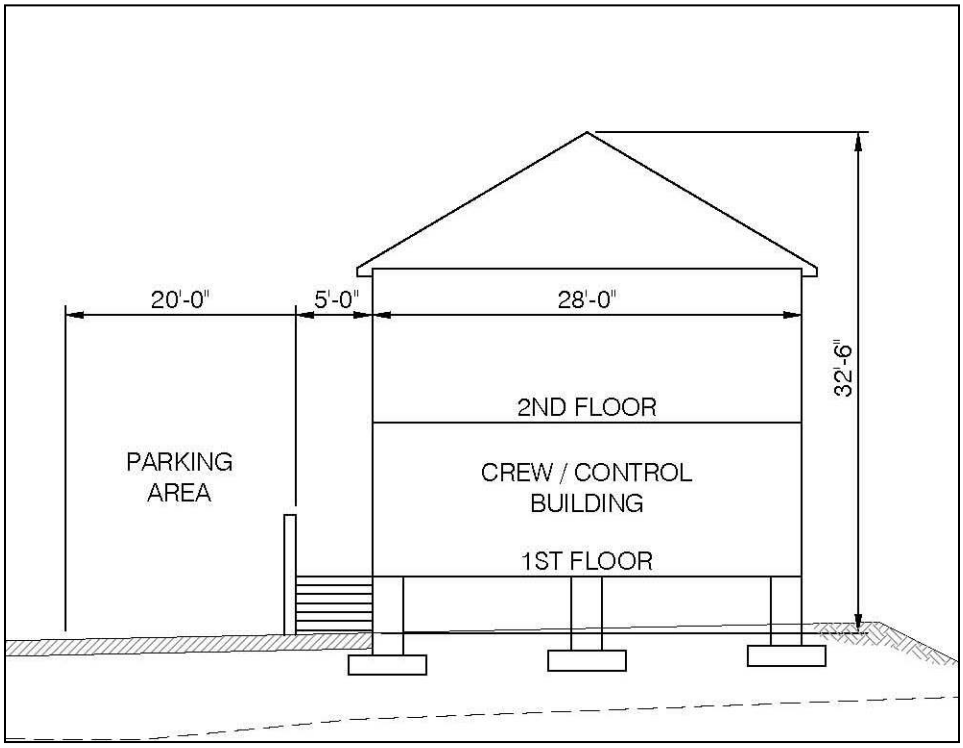

Figure 21. Elevation view of a possible configuration for the control facilities and crew building.

As with the Proposed Action, ARES will also provide additional administrative offices for project support staff off-site in Pahrump, Nevada, in office space that would be leased from existing commercial facilities. .

Communication facilities needed for the Alternative would be the same as described for the Proposed Action.

The location of the ARES Substation would be near the support facilities, adjacent to the rail line in close proximity to the overhead catenary system. This component of the project is within the Section 368 energy corridor (see Figure 17).

Construction of the ARES Substation and expansion of Gamebird Switch Station, as well as construction, upgrade or removal of the transmission lines for the Alternative would be the same as described for the Proposed Action and are not repeated here. The single circuit 230 kV gen-tie line that would run directly from the new ARES Substation, to the existing VEA 230kV transmission line for the Alternative will be similar to the line for the Proposed Action, with the exception that it is only 3,700 feet (1,180 meters) long, which is a result of the ARES substation being closer to the existing VEA 230kV transmission line, inside the Section 168 Corridor.

The total workforce is dependent on scheduling, but will be the same as the Proposed Action.

As with the Proposed Action, the clearing and grading plan has not yet been developed for the Alternative, as it will depend on the detailed site development plans to be prepared once the NEPA process has been completed.

2.2.2.3.3 Materials

Materials to be used for the Alternative would be consistent with those described for the Proposed Action.

2.2.2.3.4 Project Access Roads

Construction of the access roads for the Alternative would be the same as for the Proposed Action.

2.2.2.3.5 Rail Line

Detailed design and construction of the rail line for the Alternative will be consistent with the description provided for the Proposed Action. The slight adjustments to the alignment of the rail line at the southern end of the alignment will not alter construction processes or drainage components of the project. The same design and construction standards and guidelines will be used on the Alternative as with the Proposed Action.

2.2.2.3.6 Catenary Power Distribution Line

The overhead catenary power distribution line for the Alternative will be consistent with the line described for the Proposed Action.

2.2.2.3.7 Building and Support Facilities

The construction and design of the buildings and support facilities for the Alternative will be the same as those described for the Proposed Action.

Construction and design of the step-down substation (ARES substation) for the Alternative will be the same as for the Proposed Action.

2.2.2.3.8 Transmission Line

The construction, upgrade and removal of components of the transmission system for the Alternative will be the same as for the Proposed Action. The only difference with the Alternative is that the length of the gen-tie line from the ARES Substation to the existing VEA transmission line is approximately 130 feet shorter than for the Proposed Action due to the closer proximity of the ARES substation to the existing line.

2.2.2.3.9 Cleanup

As with the Proposed Action, construction sites, material storage yards, and access roads will be kept in an orderly condition throughout the construction period. Refuse and trash, including stakes and flags, will be removed from the sites and disposed of in an approved manner. No construction equipment oil or fuel will be drained on the ground. Oils or chemicals will be hauled to an approved site for disposal. No burning of construction trash will occur on BLM managed lands.

2.2.2.4 Operations and Maintenance

The Operations and Maintenance of the Alternative are consistent with those described for the Proposed Action, therefore they are not repeated here.

2.2.2.5 Design features and mitigation to reduce/eliminate potential impacts

All design features and mitigation measures identified and incorporated into the Proposed Action are included in the Alternative and are not repeated here.

2.2.3 Connected actions

As with the Proposed Action, the transmission interconnection line from the existing VEA transmission line to the ARES Substation will be constructed, owned, operated and maintained by VEA as part of the Alternative; therefore, it is anticipated this will be permitted as a BLM Connected Action as well as the VEA system upgrades and Gamebird Switch Station expansion. VEA would not be conducting the system upgrades and Gamebird Switch Station expansion but for supporting the ARES project.

2.2.4 Conformance

2.2.4.1 Land Use Plan Conformance

The Proposed Action conforms to the Las Vegas RMP and Record of Decision approved in October 1998. Sections that specifically apply to this Project include:

- RW-1-h, Management Direction: "All public land within the planning area, except as stated in RW-1-c through RW-1-g area available at the discretion of the agency for rights-of-way under the Federal Land Management Policy Act."

In conjunction with FLPMA, the BLM's applicable authorities include the following:

- Executive Order 13212, dated May 18, 2001, which mandates that agencies act expediently and in a manner consistent with applicable laws to increase the production and transmission of energy in a safe and environmentally sound manner.
- Section 211 of the Energy Policy Act of 2005, which establishes a goal for the Secretary of the Interior to approve 10,000 MW of non-hydropower renewable energy on public lands by 2015.
- Secretarial Order 3285A1, dated February 22, 2010, which establishes the development of renewable energy as a priority for the Department of the Interior.

Section 368 of the Clean Energy Act established west-wide energy corridors, within which linear energy transmission projects would be developed. That Act provides guidance to federal land management agencies that other activities that may interfere with or preclude such development would require a review and waiver from the U.S. Department of Energy prior to ROW grants. Given that several components of the Alternative would be constructed within the west-wide corridor, such waivers would be required for the Alternative.

2.3 No Action Alternative

Under the No Action alternative, the BLM would not grant the ROW request, transmission grid stability and reliability would not be enhanced, renewable energy variability balancing would not be available, and the Proposed Action ROW would remain unchanged.

2.4 Alternative Considered but Eliminated from Detailed Analysis

The following alternatives were eliminated from detailed analysis because they were not reasonable or feasible from technical and economical standpoints:

2.4.1 Wheeler Wash

ARES considered an alignment for the Proposed Project in the area of Wheeler Wash, northwest of the Proposed Action. During analysis, this site was determined to be infeasible for the following engineering and construction related issues:

Flood Control – Due to the topography of the area, extensive flood control measures would have been required to control and divert runoff from the Spring Mountains. Additional infrastructure and coordination with the Town of Pahrump and Nye County would have been required as well, due to the potentially modified runoff patterns which would drain into the Town of Pahrump. The negative economic impact on the Town and County could have been significant. This area is also adjacent to FEMA designated Zone AO: Areas subject to inundation by 1% annual chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between one and three feet. Average flood depths derived from detailed hydraulic analyses are shown in this zone. Some Zone AOs have been designated in areas with high flood velocities such as alluvial fans and washes.

Slope – The variability in the slope would have required extensive cut and fill actions to achieve the steady slope required for efficient operation of the rail energy management system. This variability in slope would have also required a longer rail corridor than the 5.5 miles proposed for the Pahrump South (Action) location.

Species of Concern – Approximately six miles of this project would lie within high value desert tortoise habitat. The site is also adjacent to the Nye County proposed Mojave Desert Tortoise Habitat Conservation Area (requested by the County as part of the BLM Resource Management Plan revision). If this area becomes established, there may be a higher density of desert tortoise in the area than in surrounding areas.

Transmission – The extent of transmission infrastructure upgrades required for the construction of the Wheeler Wash alternative would have been much greater and economically infeasible for both ARES and VEA.

2.5 Relationship to Statutes, Regulations, Policy, Plans or Other EAs

2.5.1 BLM Resource Management Plan

The Proposed Action is located on federal lands managed by the BLM Southern Nevada District Office under the October 1998 Las Vegas RMP (Bureau of Land Management, 1998).

The principles of multiple-use management for the BLM are established through FLPMA. The current BLM Las Vegas RMP is consistent with FLPMA and guides the decisions for the BLM. The Proposed Action is in conformance with the following management objectives and directions of the 1998 BLM Las Vegas RMP/EIS as amended:

Objective AR-1. "Ensure that actions occurring on BLM-administered lands do not violate local, state, tribal and Federal air quality laws, regulations, and standards."

Objective LD-2. "All public lands within the planning area, unless otherwise classified, segregated or withdrawn, and with the exception of Areas of Critical Environmental Concern and Wilderness Study Areas, are available at the discretion of the agency, for land use leases and permits under Section 302 of Federal Land Policy and Management Act."

Objective LG-1. "Provide for continued grazing of domestic livestock on public lands, consistent with law, regulation established standards and guidelines and policy on areas open to livestock grazing."

Objective RW-1. "Meet public demand and reduce impacts to sensitive resources by providing an orderly system of development of transportation, including legal access to private inholdings, communications, flood control, major utility transmission lines, and related facilities."

Management Direction RW-1-h. "All public land within the planning area, except as stated in RW-1-c through RW-1-g, are available at the discretion of the agency for rights-of-way under the authority of the FLPMA."

Objective WHB-1. "In Herd Management Areas not constrained by desert tortoise restrictions (see Maps 2-1 and 2-7), manage for healthy, genetically viable herds of wild horses and/or burros in a natural, thriving ecological balance with other rangeland uses."

Objective WHB-2. "Maintain the wild, free-roaming character of the wild horses and burros on the public lands.

2.5.2 Statutes, Regulations, and Policies

This EA has been prepared in accordance with the following statutes and implementing regulations, policies and procedures:

- The National Environmental Policy Act of 1969, as amended (PL 91-190, 42 USC 4321 (*et seq*.)
    - 40 Code of Federal Regulations (CFR) 1500 (et seq.). Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act
    - Considering Cumulative Effects under the National Environmental Policy Act [CEQ 1997]
    - U.S. Department of the Interior (USDOI) requirements (Departmental Manual 516, Environmental Quality [USDOI 2007])
    - BLM NEPA Handbook (H-1790 1) (BLM 2008)
- The Federal Land Policy and Management Act of 1976 (PL 94 579, 43 USC 1761 (*et seq*.)
    - 43 CFR 2800, Rights-of-Way, Principles and Procedures; Rights-of-Ways under the Federal Land Policy and Management Act and the Mineral Leasing Act; Final Rule, April 22, 2005
- The 2005 Energy Policy Act; The National Energy Policy, Executive Order 13212 - Actions To Expedite Energy-Related Projects
- The Endangered Species Act of 1973, as amended (ESA) (16 United States Code [USC] Section 1531)
    - The Migratory Bird Treaty Act of 1918, as amended (MBTA; 16 USC 703 *et seq*.):
    - Bald and golden Eagle Protection Act (16 USC 668 *et seq*.)
- National Historic Preservation Act (36 CFR 800)
    - Nevada State Historic Preservation Office, required consultation under 36 CFR 800
- Federal Water Pollution Control Act (Clean Water Act) Section 404, as amended (33 U.S.C. §1251 et seq. (1972)
- Utility Environmental Protection Act (UEPA Permit) (NRS 704.820 to 704.900)
- Avian Protection Plan Guidelines, 2005
- Federal Noxious Weed Act of 1974, as amended Public Law 93-629 (7 U.S.C. 2801 et seq.; 88 Stat. 2148)

3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section describes the current status of resources associated with the various supplemental authorities that may be affected by the Proposed Action, Alternative or No Action Alternative. The table is followed by a description of each resource, the current conditions, the environmental effects, mitigation measures and residual effects.

3.1 Supplemental Authorities

NEPA is only one of many authorities that contain procedural requirements pertaining to treatment of elements of the environment when the BLM is considering a federal action. To comply with NEPA and these supplemental authorities, the BLM mandates all EAs address specific elements of the environment subject to requirements specified in statute, regulation, or by Executive Order. Table 3-1 identifies the supplemental authorities that must be addressed in all EAs and whether or not the Proposed Action potentially affects those authorities. Only those supplemental elements that are "Present/May be Affected" will be analyzed.

Other resources that have been considered in this EA are listed in Table 3-2. Elements that may be affected are further described in the EA. Rationale for those elements that would not be affected by the Proposed Action are described in the table.

Table 3-1. Supplemental Authorities Considered in the Analysis

Supplemental Authority[3]	Not Present[4]	Present/Not Affected	Present/May be Affected[5]	Rationale
Air Quality			•	Carried forward for analysis. See Affected Environment, Environmental Consequences, and Cumulative Impacts in Section 3.3 Air Quality.
Area of Critical Environmental Concern (ACEC)	•			There are no ACECs within or near the Proposed Action area. Stump Springs ACEC, the closest to either proposed location, is more than ten miles south.

[3] See BLM National Environmental Policy Act Handbook H-1790-1 (January 2008) Appendix 1 Supplemental Authorities to be Considered.
[4] Supplemental Authorities determined to be Not Present or Present/Not Affected need not be carried forward for analysis or discussed further in the document.
[5] Supplemental Authorities determined to be present/May be Affected *must* be carried forward for analysis in the document.

Supplemental Authority[3]	Not Present[4]	Present/Not Affected	Present/May be Affected[5]	Rationale
Cultural/ Historical	•			A Class I records review was conducted through the Southern Nevada Archaeological Archive of the Desert Research Institute. Six previously recorded archaeological sites have been documented within one mile of the project area; however, none of the sites are located within the proposed alignment area of potential effect. Archaeological surveys of proposed routes, conducted on July 8 and November 4 and 8, 2014, failed to disclose any cultural materials.
Environmental Justice	•			The Proposed Action is located within Clark County Census Tract 75 and Nye County Census Tract 9604.01 (US Census Bureau, 2014). No minority or low-income populations would be disproportionately affected. The nearest qualified Housing and Urban Development (HUD) low income/minority census tract in Clark County is approximately 35 miles east, in Las Vegas, Nevada (U.S. Department of Housing and Urban Development, 2015). The nearest low income/minority census tract in Nye County is more than 17 miles northwest, in the Amargosa Valley, Nevada, area, on the California state border (U.S. Department of Housing and Urban Development, 2015).
Farmlands Prime or Unique	•			No prime or unique farmlands are located within the Proposed Action areas.
Noxious Weeds/ Invasive Non-native Species			•	Carried forward for analysis. See Affected Environment, Environmental Consequences, and Cumulative Impacts in Section 3.4 Noxious Weeds.
Native American Religious Concerns	•			The Proposed Action would not compromise the integrity of any traditional, spiritual, cultural or ceremonial use area, nor would it limit or prevent access to any traditional or ceremonial sites that may be currently in use based on no comment or negative responses received from the tribes to which letters of interest were sent by BLM.

Supplemental Authority[3]	Not Present[4]	Present/Not Affected	Present/May be Affected[5]	Rationale
Floodplains			•	Carried forward for analysis. See Affected Environment, Environmental Consequences, and Cumulative Impacts in Section 3.5 Floodplains.
Riparian/ Wetlands	•			The US Fish and Wildlife Service (USFWS) National Wetlands Inventory does not identify any wetlands or riparian areas along, or in the vicinity of, Proposed Action. No riparian dependent vegetation was observed during botanical surveys.
Threatened and Endangered Species			•	Carried forward for analysis. See Affected Environment, Environmental Consequences, and Cumulative Impacts in Section 3.6 Threatened & Endangered Species.
Migratory Birds - including BLM Sensitive Species			•	Carried forward for analysis. See Affected Environment, Environmental Consequences, and Cumulative Impacts in Section 3.7 Migratory Birds.
Waste – Hazardous or Solid		•		Hazardous material waste, solid, nonhazardous substances and wastes must be handled and disposed of in accordance with the applicable federal state, and local regulations and BLM Policy. Virtually all impacts can be mitigated onsite. The design features, which require development of an emergency response plan, will reduce the chances of a hazardous material release and provide a protocol for mitigating the site, should one occur.
Water Resources/ Quality		•		No surface water bodies are located in the Project Area. Groundwater (Central Region, Administrative Groundwater Basin 162) will not be used, encountered, or impacted. Water would be brought in from off-site for crew use only (drinking water and sanitary uses). The daily use of water for dust control during construction would not adversely affect water quality or quantity in the Pahrump Valley due to the limited amount (to be determined during project engineering) of water to be used and the high evaporation rate for the area.

Supplemental Authority[3]	Not Present[4]	Present/Not Affected	Present/May be Affected[5]	Rationale
Wild & Scenic Rivers	•			No wild and scenic rivers are located within the area of the Proposed Action.
Wilderness/ Wilderness Study Areas/ Lands with Wilderness Characteristics		•		The Action Area does not possess wilderness characteristics or lie within the boundaries of a Wilderness Area or Wilderness Study Area. However, the Proposed Action may be visible from high peaks and west facing ridgelines within the Mount Charleston Wilderness Area. The project would not notably stand out with the Town of Pahrump in the background and would look similar to existing roads (Carpenter Canyon) on the alluvial fans, and therefore would not affect or modify existing Wilderness Characteristics.
Forests and Rangelands (HFRA only)	•			This project and surrounding areas do not meet the requirements to qualify as a Healthy Forests Restoration Act project.
Human Health and Safety			•	Carried forward for analysis. See Affected Environment, Environmental Consequences, and Cumulative Impacts in Section 3.8 Human Health & Safety

Table 3-2. Other Resources Considered in the Analysis

Other Resources	Not Present[6]	Present/ Not Affected	Present/ May be Affected	Rationale
Fuels/Fire Management			•	Compliance with fire restrictions current at the time of project implementation will mitigate any risks introduced by the Proposed Project.

[6] Other Resources determined to be Not Present or Present/Not Affected need not be carried forward for analysis or discussed further in the document based on the rational provided.

Other Resources	Not Present[6]	Present/ Not Affected	Present/ May be Affected	Rationale
Greenhouse Gas Emissions and Climate Change		•		Greenhouse gas emission levels during construction and operation would be consistent with existing conditions and would not reach a level that would warrant additional analysis in this EA. Currently, there are no emission limits for suspected greenhouse gas (GHG) emissions, for this project, and no technically defensible method for predicting potential climate change contributions from GHG emissions during construction of the proposed action. However, there are, and would continue to be, several efforts to address GHG emissions from federal activities, including BLM authorized uses in future planning documents.
Grazing Management		•		The Proposed Action is located in the Wheeler Wash allotment (05431 – 64,701 acres). The Wheeler Wash allotment is inactive and does not have permittees. The BLM trend is toward a decrease in the number of active grazing allotments. This allotment has been designated to have the highest need and priority for intensive management by the BLM (BLM Southern Nevada District Office, 2014). Due to the linear nature and limited size of the Proposed Action, and the ability for cattle to cross the rail corridor at any location (other than wash crossings with culverts), the Proposed Action is not expected to reduce Animal Unit Months or produce other effects to Grazing Management.
Hydrologic Conditions			•	Carried forward for analysis. See Affected Environment, Environmental Consequences, and Cumulative Impacts in Section 3.9 Hydrologic Conditions.
Land Use Authorization			•	Carried forward for analysis. See Affected Environment, Environmental Consequences, and Cumulative Impacts in Section 3.10 Land Use Authorizations.

Other Resources	Not Present[6]	Present/ Not Affected	Present/ May be Affected	Rationale
Geology and Minerals			•	Carried forward for analysis. See Affected Environment, Environmental Consequences, and Cumulative Impacts in Section 3.11 Geology and Minerals.
Noise Impacts		•		Existing ambient noise levels will remain unchanged. Results of a study conducted for ARES by Dave Scott Consulting showed the rail cars in the Proposed Action would have a noise level of 57 decibels from a distance of 50 feet. This noise level is comparable to a rail transit train at a speed of 20 miles per hour (Federal Transit Administration, 2006). It is equivalent to the noise of an air-conditioning unit at a distance of 100 feet (see Appendix B). Sound will not be noticeable at Nevada State Highway 160, area neighborhoods, and will likely be drowned out by recreation vehicle noise on existing roads and at the Pahrump Speedway. At no distance will ear protection be needed by personnel. Wildlife in close proximity to the rail will notice the 'not natural' noise, but based on the operational parameters of the shuttle trains, the noise level will not be startling.
Paleontological Resources	•			Initial cultural surveys conducted at the site (HDR, 2015), found no evidence of artifacts. In the event of a discovery, the BLM archaeologist will be notified prior to continuing any work.
Recreation			•	Carried forward for analysis. See Affected Environment, Environmental Consequences, and Cumulative Impacts in Section 3.12 Recreation.
Socio-Economic Values			•	Carried forward for analysis. See Affected Environment, Environmental Consequences, and Cumulative Impacts in Section 3.13 Socio-Economic Values.
Soils			•	Carried forward for analysis. See Affected Environment, Environmental Consequences, and Cumulative Impacts in Section 3.14 Soils.

Other Resources	Not Present[6]	Present/ Not Affected	Present/ May be Affected	Rationale
Transportation			•	Carried forward for analysis. See Affected Environment, Environmental Consequences, and Cumulative Impacts in Section 3.15 Transportation.
Vegetation - including BLM Sensitive Species			•	Carried forward for analysis. See Affected Environment, Environmental Consequences, and Cumulative Impacts in Section 3.16 Vegetation.
Forestry			•	Carried forward for analysis. See Current Environment in See Affected Environment, Environmental Consequences, and Cumulative Impacts in Section 3.17 Forestry.
Visual Resources			•	Carried forward for analysis. See Current Environment in See Affected Environment, Environmental Consequences, and Cumulative Impacts in Section 3.18 Visual Resources.
Wild Horses and Burros			•	Carried forward for analysis. See Current Environment in See Affected Environment, Environmental Consequences, and Cumulative Impacts in Section 3.19 Wild Horses and Burros.
Wildlife - including BLM Sensitive Species			•	Carried forward for analysis. See Current Environment in See Affected Environment, Environmental Consequences, and Cumulative Impacts in Section 3.20 Wildlife.
Water Resources/ Quantity		•		The water will be brought in from offsite by a local provider. There will be no drawdown of groundwater from the local hydrographic basin by the Proposed Action.

3.2 Cumulative Scenario

The Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 CFR 1508.7) define cumulative impacts as:

> *". . . the impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."*

The BLM NEPA Handbook states that the purpose of the cumulative effects analysis is to ensure decision-makers consider the full range of the consequences of the Proposed Action, Alternative, and No Action Alternative. Those resources identified for detailed analysis that would be directly or indirectly affected by the Proposed Action are analyzed below. If the actions under the Proposed Action, Alternative, and No Action Alternative have no direct or indirect effect on a resource, then the cumulative impacts on that resource are not addressed below.

The geographic area of cumulative impacts analysis is generally based on the natural boundaries of the resource affected and is described below in each resource section. Past actions are considered those that have occurred within the past 50 years. Present actions are considered those occurring at the time of this evaluation. Future actions are those that are in planning stages with a reasonable expectation of occurring over the next 20 years.

As discussed in the Draft Resource Management Plan and Environmental Impacts Statement of the Las Vegas and Pahrump Field Offices, vegetation (native plant communities) in the Las Vegas Field Office and Mojave Ecoregion is experiencing severe declines in quality and quantity that affect the level of ecosystem services they provide to humans. In general, direct and indirect impacts to native plant communities are additive and cumulative over time, most Mojave Desert native plant communities will not fully recover from temporary disturbances within the lifetime of the average BLM resource management plan. Using a survey of 47 studies examining natural re-establishment after a variety of disturbances, such as fire, abandoned roads, power line corridors, and a linear regression, Scott Abella (Abella, 2010) estimates that without active restoration, it takes the Mojave Desert 76 years for re-establishment of perennial plant cover and 215 years for re-establishment of perennial and annual species cover. Almost all native vegetation in the Mojave ecoregion is being subjected to multiple environmental stressors that affect the quality of native plant communities. Summarized below are the trends in stressors and effects on vegetation from 1998 to 2013 in the Las Vegas and Pahrump Field Offices according to the draft RMP and EIS:

Non-native species – The trend is an increase in area occupied by non native species. Invasive non-native plants are a major threat to native plant communities because they thrive in disturbed areas and are better competitors for water, nutrients, and space than many native species (Billings, 1990) (D'Antonio & Vitousek, 1992) (DeFalco, Fernandez, & Nowak, 2007) (Mack, 1981) (Salo, 2005) (Vitousek, 1990). This competition slowly reduces the stability and resiliency of native plant communities because it gradually reduces the amount of seed produced by native species and, subsequently, the amount available for recovery. An estimated 2.9 million acres (or 94 percent) of Las Vegas and Pahrump Field Offices are moderately to heavily impacted by non native plants, primarily red brome and Mediterranean grass.

Fire – "Fire" in this case is wildfire. In the vicinity of the proposed project most wildfires have burned 0.1 acres or less however some fires have resulted larger areas burned such as the 2005 Carpenter 2 Fire which burned 45 acres, 2011 Carpenter Fire which burned 69 acres, and 2013 Carpenter 1 Fire which burned 27,881 acres. The 2013 Carpenter 1 Fire resulted in post-fire flooding and debris flows downstream of the burned area mostly in Trout and Kyle Canyons. Mass flows did reach HWYs 160 and 95 respectively. The trend is an increase in number of acres burned and higher frequency of repeat burning. In lower elevation vegetation, non-native annual grasses are now responsible for an annual grass/fire cycle that did not exist before (Brooks, 1999) (Brooks, et al., 2004). This is largely because the spaces between individual shrubs were bare, and acted as a fuel break. Now, non-native annual grasses create a nearly continuous fuel load that carries fire between shrubs (Brooks 1999). Following fire, non-native annual grasses are some of the first species to return. If fire returns too quickly, the surviving native plants do not have enough time to grow and

produce the seed needed for recovery. An estimated 1.3 million acres (or 42 percent) of Las Vegas and Pahrump Field Offices burned from 1998 to 2013.

Livestock Grazing – The trend is toward a decrease in the number of active grazing allotments, grazing use is constant in wild horse and burro herd management areas. Grazing affects the species composition and biomass production of native plant communities through selective foraging. It is generally agreed that present-day Mojave ecosystems did not evolve with significant selective pressure from large-bodied herbivores (Beever, Tausch, & Brussard, 2003) (Brown & McDonald, 1995) (Grayson, 1987) (Hall, 1946), and desert vegetation is very slow to recover if overgrazed or disturbed (Abella, A Systematic Review of Wild Burro Grazing Effects on Mojave Desert Vegetation, 2008) (Tueller, 1989) (Chambers, Brooks, Pendleton, & Raish, 2013). Currently 9.2 percent of the Las Vegas and Pahrump Field Offices are being grazed by domestic livestock, wild horses and burros.

Climate change – The trend is toward less stable atmospheric conditions leading to more extremes in temperature and precipitation, increase in the average low temperature, potential changes in seasonality, potential decrease in total precipitation. Changes in temperature and precipitation affect the ability of seeds to germinate, and plants to grow, which can affect the plant species are present and which species are dominant. The entire 3.1 million acres in Las Vegas and Pahrump Field Offices are affected. Evidence of changes in vegetation shifts over the last 30 years - including shifts in the distribution of Mojave yucca, pinyon pine and juniper trees.

Lands and minerals use authorizations – Trend is increasing number of authorizations issued that reflect trends in economic growth. BLM issued 2,917 lands and minerals authorizations directly and indirectly affecting 304,000 acres (roughly 9.8 percent) of the planning area between 1998 and 2013.

Development of desert tortoise habitat, habitat for BLM special status and habitat for wildlife – Trend is increasing development in desert tortoise habitat that reflects trends in economic growth. Based on desert tortoise Section 7 fees, an estimated 40,000 acres of creosote bursage scrub was impacted between 1998 and 2013.

Recreation use – Trend is increasing permitted and casual recreation on public lands. Since 2007, casual visitor use in the Las Vegas Field Office has increased by approximately 11 percent annually. Casual recreation is estimated to have directly impacted between 3,000 to 6,000 acres (0.12 percent to 0.25 percent) of native plant communities in the Las Vegas Field Office under the 1998 RMP. As of 2009, there is an estimated 11,151 miles (estimated 13,500 acres) of dirt roads and trails present in the Las Vegas Field Office. This represents 0.56 percent increase in the field office. Similar percentages are likely in the Pahrump Field Office. Impacts to vegetation from casual recreation are the highest in Special Recreation Management Areas. The number of acres of indirect impacts and cumulative impacts is unknown.

3.2.1 Past and Present and Reasonably Foreseeable Future Actions (RFFAs)

The approach to cumulative impacts of the proposed projects considers “past” projects to be those that have completed construction and are in operation. “Present” projects include those that are currently under construction or have been fully permitted such that they are likely to be part of the existing environment when the proposed projects would begin construction. “Reasonably foreseeable” future projects are those for which a formal permit application has been filed or the project has been detailed in an existing land use plan. Table 3-3 lists existing and proposed ROWs potentially impacted by the Proposed Action.

Table 3-3 Past, Present and RFFAs in the vicinity of the Proposed Action

Existing Public Land Use (Includes past and present Actions)			
Proponent	Project	Width/Size	Serial Register
BLM	Community gravel pits	variable	NA
BLM	Fire Station PLO-7636	15 acres	NVN-075850
NDOT	Highway 160	400 feet	NVN-016109
Nevada Bell	Buried fiber optic line (Pahrump to Sandy Valley)	20 feet	NVN-079653
Unknown	Unspecified (Non-energy FLPMA),	0.4 acres	NVN-062888
VEA	230kV transmission line	100 feet	NVN-057100
VEA	138kV transmission line	80 feet	NVN-059100
VEA	24.9kV transmission line	20 feet	NVN-066289
Reasonably Foreseeable Future Actions			
Proponent	Project	Size	Status
Multiple Federal Agencies	Proposed Section 368 multi-modal Energy Corridor (see Figure 2)	3,500 feet	Final EIS released
Board of Regents of Nevada System of Higher Education	Proposed Great Basin College campus (Tule Springs sale legislation, 2014 National Defense Authorization Bill)	approximately 280 acres	Pahrump Regional Planning District Master Plan
Nye County	Proposed Public Safety Center on Highway 160 at the County border (see Figure 22) Center is mapped in the Plan, but not discussed, therefore the Center may no longer be planned	Unknown	Pahrump Regional Planning District Master Plan
Nye County	Proposed Pahrump beltway and truck route (see Figure 23)	218 feet wide	Pahrump Regional Planning District Master Plan
Nye County	Proposed Wheeler Wash flood control dams	variable	Pahrump Regional Planning District Master Plan
Nye County	Proposed multiple flood control retention	variable	Pahrump Regional Planning District Master Plan
Western Area Power Administration	750kV transmission intertie - partially completed from Oregon to Mead Substation - construction halted in 1969 due to lack of funding	200 feet	NVN-065524

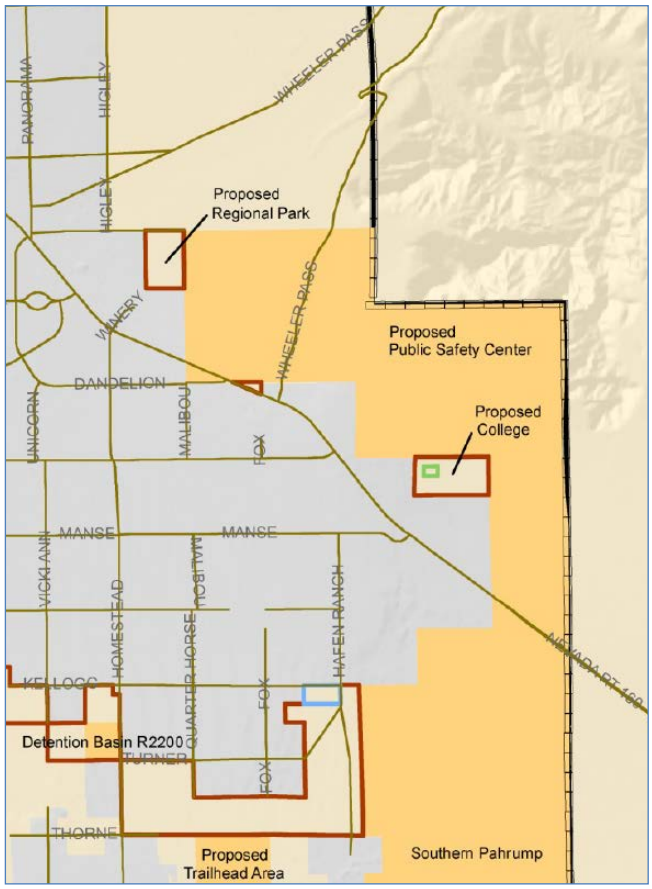

Figure 22. Pahrump Regional Master Plan map of projects proposed, and BLM land requested for disposal status, in the vicinity of the Proposed Project (Pahrump Regional Planning Commission, 2014).

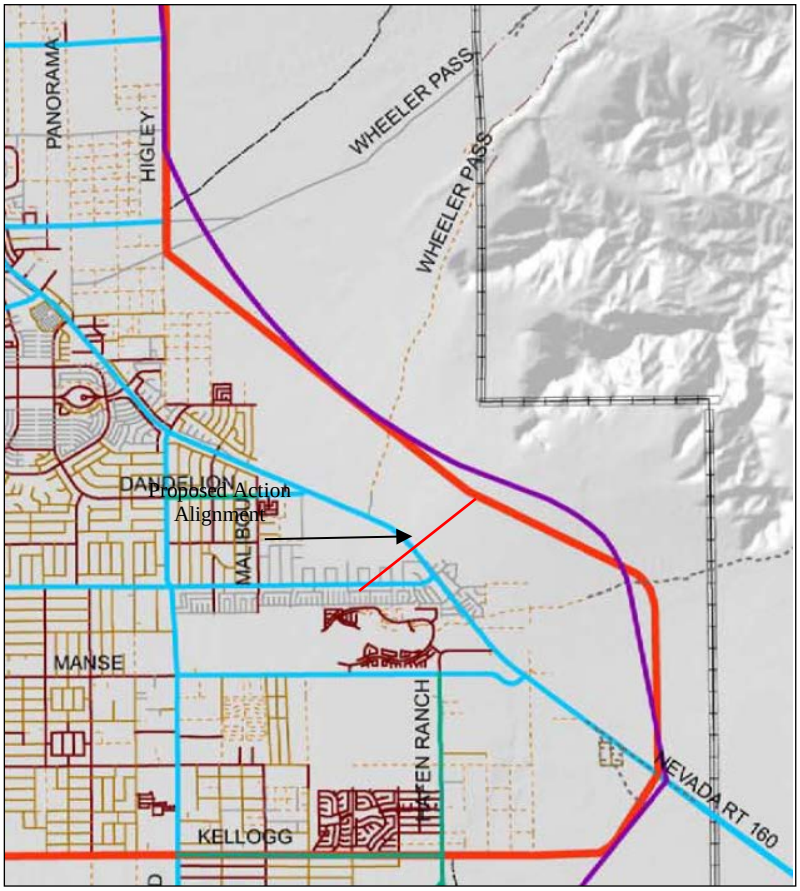

Figure 23. Proposed Pahrump beltway (red) and truck route (purple) passing the Proposed Project areas.

3.2.2 Cumulative Effects Study Area

The cumulative effects study area (CESA) encompasses approximately 142,830 acres (57,800 hectares) and is bounded by Nevada State Highway 160 to the west, Trout Canyon Road to the south, Spring Mountains ridgeline to the east, with the northern boundary running through Santa Cruz spring (see Figure 24).

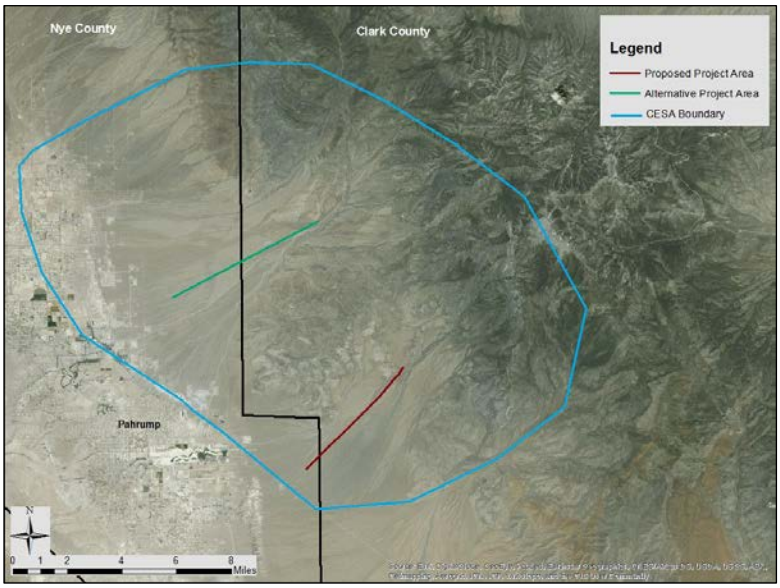

Figure 24. Cumulative Effects Study Area (CESA).

As discussed above, native plant communities in the Mojave Ecoregion are gradually declining and slow to recover. Contributing to this are: 1) wildfires that are increasing in frequency and intensity because non-native grasses are invading the natural plant communities and providing more fuel than is seen with native plants; 2) selective grazing by horses, burros and livestock; 3) recreational use that is increasing and can exacerbate erosion by breaking through desert pavement, crush plants, etc.; 4) increasing land and mineral use; and 5) climate change. In turn, these can adversely affect wildlife by reducing habitat/nesting areas and forage.

3.2.2.1 Proposed Action

The Proposed Action would contribute marginally to the decline of native plant communities and animals in the area through the long-term removal of 72 acres and short-term removal of 98 acres of habitat (the 98 acres will be restored following construction). Construction will contribute to a slight increase in dust and noise in the area. The dust will be controlled with water or a BLM approved palliative) and noise will be mitigated by operating only during daylight hours when most people are active, but will have almost no dust or noise impact during operations. It should have minimal impact to recreation and recreational access, since the land will remain largely open, the roads will be provided with rail crossing signs, and Loop Boundary Road will be straightened to only cross the railbed once, rather than the three times it would if it remained unchanged. The Proposed Action could increase human caused fires and the facility and infrastructure could be threatened by wildfire, however the rail line and cars could act as a fire break. In the realm of climate change, it will contribute engine exhaust products during construction, almost none (mainly from employee travel) during operations phase, and will produce no emissions while storing and releasing energy. It will provide a significant positive impact to the community.

Approximately 100 to 125 personnel (mostly local) will be employed during construction, providing increased business (e.g., restaurants, gas stations, food and clothing stores, entertainment and housing). Additionally, supplies and equipment will be sourced locally whenever possible. During the operations period (approximately 30 years) 15 to 16 employees will operate, maintain, and provide security for the site on a 24-hour basis. Most of the 16 will likely purchase homes in the area for their families, and put their children in local schools. Increased business will lead to a badly needed increase in the tax base for local government.

To avoid disrupting habitat connectivity, the 5.5 mile rail bed will be constructed at grade level with a catenary power line to allow easy and safe passage by wild horses, burros and other large animals. A series of culverts and safe passage ways will allow tortoises and small animals passage from one side of the railbed to the other. The success of this approach to reducing impacts to desert tortoise connectivity and habitat fragmentation will be unknown until the project has been constructed and monitoring data has been collected. The presence of the Proposed Action, its personnel, and their contribution to local business and taxes may help to jumpstart or lend credence to other projects, such as the Great Basin College, or the Public Safety Center, and could create a synergistic effect to help growth in other areas such as a park, or the Pahrump truck bypass route. It may provide an outstanding example of sustainable development and possibly convince other developers to build sustainably. However, it would continue to contribute very slightly to habitat fragmentation and gradual deterioration if those projects were constructed.

3.2.2.2 Alternative

Cumulative impacts and contributions to the existing and foreseeable future actions from the Alternative would not differ noticeably from those discussed in the Proposed Action. As with the Proposed Project, the Alternative would contribute marginally to the decline of native plant communities and animals in the area through the long-term removal of 70 acres and short-term removal of 98 acres of habitat (the 98 acres will be restored following construction), which is slightly lower than for the Proposed Project.

3.2.2.3 No Action Alternative

Under the No Action Alternative the Project ROW would be denied and no energy storage or site disturbance would take place. There would be no increase in jobs, so local businesses (gas stations, restaurants, grocery stores, etc.) would see no increase and there would be no change in the tax base to support state and local government. Vegetation and habitat would continue to gradually decline and be affected by wildfires. Invasive plants and weeds may crowd native plant communities when fire or other disturbance provides access to the area for them.

3.3 Air Quality

The principal ambient air pollutants, based on public health concerns, have been identified by the U.S. Environmental Protection Agency (EPA) as "criteria" pollutants. The EPA established National Ambient Air Quality Standards (NAAQS) for these criteria pollutants. The standards of quality for ambient air in Nevada differ from EPA's.

3.3.1 Affected Environment

The unincorporated township of Pahrump and Pahrump Valley currently meet attainment standards for all criteria pollutants as set forth in the NAAQS (BLM Southern Nevada District Office, 2014).

Nevada Bureau of Air Quality Planning (BAQP) has identified fugitive dust as a significant concern in the Pahrump Regional Planning District (PRPD) and Pahrump Valley. Fast population growth in the ‘90s through mid-2006 created intensive development. Large parcels of land were cleared of vegetation, subdivided and prepared for housing construction. Dirt and gravel roads were constructed. Many of the planned housing developments never materialized and the lots are now disturbed, vacant areas.

As a result of the disturbed, vacant land and the number of dirt and gravel roads, fugitive dust (particulate matter less than 10 microns, or PM^{10}) became a problem. The Pahrump valley is subject to high winds and these winds often create dust storms. Even the slightest wind can pick up dust from the disturbed areas, allowing it to become a health hazard.

The BAQP has been monitoring for PM^{10} in the Town of Pahrump since January 2001. Monitors record ambient air data continuously, which is downloaded to the BAQP office in Carson City. Based on a 2001 inventory, fugitive emissions from unpaved roads and disturbed vacant land were found to be the biggest sources of PM^{10} emissions, accounting for 92% of PM^{10} emissions in the Valley. As of fall 2010, monitors are located and operating at Linda Street, Manse Elementary School, Glenoaks Street and the church on Gamebird Road (Nevada Division of Environmental Protection, 2010).

The PRPD Dust Control Regulations (Nye County Ordinance 289) were adopted by the Nye County Board of Commissioners on August 17, 2004, and became effective on January 1, 2005. The Nye County Air Quality Department enforces the dust control regulations for the PRPD.

3.3.2 Methodology

In evaluating potential impacts, the acres of potential surface disturbances were compared with known and potential emissions from construction and operation of the facility. The potential air quality impacts were then compared with existing conditions, including current issues and trends.

3.3.3 Environmental Consequences

3.3.3.1 Proposed Action

The Proposed Action includes the construction of 5.5 miles of rail line and associated catenary line, 7 miles of new road, 3 miles of existing road improvements, 5,000 feet of transmission line removal, 7,200 feet of transmission line upgrades, and grading of 0.8 acres for a facilities and maintenance area (see Tables 2-1, 2-2, and 2-3).

3.3.3.1.1 Direct and Indirect Effects

Air quality would decrease during construction activities. Pollutants generated during these activities would include combustion emissions and fugitive dust associated with construction equipment and vehicles. Construction activity is planned to occur between 7:00 am and 7:00 pm daily for approximately six to eight months. Dust control activities utilizing water will be conducted during all construction activities as indicated in project mitigation plans.

There will be a one month period during the construction phase when a majority of the rail line ballast will be delivered, potentially further increasing fugitive dust levels and vehicle emissions at that time due to the increased heavy truck traffic. Additional mitigation for dust may be required during that time.

Once construction is complete, air quality impacts associated with these activities would cease. Emissions anticipated during operation will be nominal. The electric trains operate without emissions. Fugitive dust from travel on the track-side maintenance road would be due mainly to recreational vehicles; maintenance vehicles are not anticipated to make more than two trips each day along the length of the road. Recreational vehicle use is not expected to rise above current use levels due to the development of this project.

3.3.3.1.2 Mitigation Measures

Limiting dust during construction and operation activities will be an adopted design feature. The fugitive dust control measures, including the application of water to disturbed surfaces, would keep off-site particulate matter levels reduced. In addition, dust control permits from the Clark County Department of Air Quality for all soil-disturbing activities within Clark County, and Nye County Planning for all soil-disturbing activities within Nye County, would be required for the Project. Clark and/or Nye County may

defer management and oversight of the dust control permit to the Nevada Division of Environmental Protection, Air Quality Bureau.

The construction contractor will cover construction materials and stockpiled soils if these are sources of fugitive dust. To minimize fugitive dust generation, land surfaces will be watered before and during surface clearing or excavation activities.

Mitigation plans will provide a speed limit for project access roads to help reduce dust emissions.

3.3.3.1.3 Residual Impacts

After mitigation measures are applied, limited residual impacts are anticipated. These would mainly occur during the construction phase, due to vehicle and heavy equipment emissions. Decommissioning operations would be similar to construction, with fewer vehicle emissions.

Residual impacts during operation will be minimal due to the limited number of full time employees needing to commute to the site each day.

3.3.3.1.4 Cumulative Impacts

The Proposed Action would result in new disturbance of up to 170 acres. The project, in combination with other past, present, and reasonably foreseeable future actions in Hydrographic Basin 162 would contribute to cumulative increases in particulate levels and other criteria pollutants in the Basin.

Other reasonably foreseeable future actions in the basin that would result in soil-disturbing activities of greater than 0.25 acre would be required to obtain a dust permit from the Clark County Department of Air Quality and/or Nye County Air Quality Department, and to comply with the all permit stipulations.

3.3.3.2 Alternative

The Alternative includes the construction of generally the same facilities and similar amount of land disturbance as described for the Proposed Action (see Tables 2-5, 2-6, and 2-7 for the acreages of disturbance).

3.3.3.2.1 Direct and Indirect Effects

The direct and indirect effects of the Alternative on air quality would be the same as described for the Proposed Action because the same construction procedures would be use and a similar level of ground disturbance would occur and the same construction methods and best management practices would be implemented.

3.3.3.2.2 Mitigation Measures

Mitigation measures described for the Proposed Action would be adopted and implemented for the Alternative.

3.3.3.2.3 Residual Impacts

As with the Proposed Project, limited residual impacts are anticipated, and would be the same as those described for the Proposed Action.

3.3.3.2.4 Cumulative Impacts

The Cumulative Impacts from the Alternative would be minimal and similar to those described for the Proposed Project.

3.3.3.3 No Action Alternative

3.3.3.3.1 Direct and Indirect Effects

Under the No Action Alternative, the Proposed Project would not be built and the area would continue to be subject to existing conditions. The land would remain available for future development. Any future developments within this area could result in impacts to air quality of a similar or greater degree.

3.3.3.3.2 Cumulative Impacts

Because the No Action Alternative would result in no direct or indirect impacts related to air quality, there would be no cumulative impacts associated with the No Action Alternative.

3.4 Noxious Weed

3.4.1 Affected Environment

Invasive plants and noxious weeds are managed on public lands by the BLM under the direction of the National Invasive Species Council (NISC) established in 1999 (Executive Order [EO] 13112). This statute defines invasive species as " …an alien (non-native) species whose introduction does, or is likely to cause, economic or environmental harm or harm to human health" (NISC 2008). In addition, much of the management of invasive plants and the listing of noxious weeds are regulated by the USDA under the Federal Noxious Weed Act (7 U.S.C. 2801 et seq. 1974).

Executive Order 13112 outlines the federal responsibility to "prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause..."Additionally, Nevada Revised Statutes, Chapter 555.05 defines "noxious weeds" and mandates the extent that land owners and land management agencies must control specific noxious weed species on lands under their jurisdiction.

Southern Nevada lands are impacted by the presence of noxious and invasive, non-native vegetation. The Las Vegas Field Office (LVFO) has prepared the LVFO Weed Plan that provides guidance for an active integrated weed management program using Best Management Practices (BMP).

The proposed project area has not been previously inventoried for the presence of invasive, non-native species. However, the site may be impacted by various noxious and/or invasive weeds that are known to occur within the Southern Nevada District. A list of some of the weed species that are a concern includes; Sahara mustard (*Brassica tournefortii*), camelthorn (*Alhagi maurorum*), perennial pepper weed (*Lepidium latifolium*), several knapweeds, malta starthistle (*Centaurea melitensis*), and yellow starthistle (*Centaurea solstitialis*), Johnson grass (*Sorghum halepense*), Scotch thistle (Onopordum acanthium), Canada thistle (Cirsium arvense), fountain grass (Pennisetum setaceum), puncture vine (Tribulus terrestris), Russian thistle (Salsola tragus) and tamarisk *(Tamarix ramosissima).*

3.4.2 Methodology

The analysis makes use of the best available data, and the professional judgment and field observations of BLM specialists. The analysis also compares elements of the Proposed Action and the project area boundary with the habitat and describes the risk of spread and introduction of new weeds in those disturbed areas.

3.4.3 Environmental Consequences

3.4.3.1 Proposed Action

3.4.3.1.1 Direct and Indirect Effects

The Proposed Action has the potential to impact 72 acres in the long-term and impact 98 acres in the short-term through ground-disturbing activities which could introduce noxious weed populations. Construction associated with the Proposed Action would involve clearing and grubbing which would result in a decrease in native plant cover and increased soil disturbance. Vegetation removal provides an opportunity for non-native weeds species to colonize the project area. Noxious weeds effectively compete with native species for sunlight, soil, water, nutrients, and space, reducing forage productivity. Additionally, soil disturbance could reduce the native seed bank associated with the site.

Increased vehicle traffic during all phases of the Proposed Action would also contribute to the potential spread of noxious weeds. Vehicles are effective at introducing and/or spreading weeds by dispersing seeds along roadways.

Increased vehicle activity also has the potential to spread non-native invasive annual grasses. Although the non-native annual grasses are not legally designated as noxious by the State of Nevada, their role within the Mojave Desert ecosystem is increasingly important with respect to their relationship to fire and future disturbance. The increase of fine fuels may result in ignitions and ultimately increase the number of wildfires in the area. Aggressively managing invasive or noxious species would limit residual effects to manageable levels. This is made possible by maintaining discontinuous, dispersed native vegetation, nonflammable native species, propagation and planting of native species, or complete removal of all vegetation. In addition, for the life of the project, fires originating outside of the project area on adjacent lands could impact the project area. These areas have had increased wildfire risk over time due to invasive annual grasses.

3.4.3.1.2 Mitigation Measures

Implementation of standard BMPs and project stipulations would help identify, prevent, and treat the spread of noxious and/or invasive species. An Integrated Weed Management Plan would be prepared in coordination with the BLM. ARES proposes to reduce and control invasive plants within the project area by manual methods, and if necessary and approved by the BLM with an authorized Pesticide Use Proposal, herbicides, to lessen the potential for the dispersal or increased abundance of any new noxious weeds. A Fire Protection Plan would be prepared to minimize the occurrence of unwanted human-caused and naturally caused fires. The plan would describe an emergency notification procedure, site evacuation process, and fire prevention procedures.

3.4.3.1.3 Residual Impacts

If not monitored and/or actions not taken to mitigate or eradicate noxious weeds which may find their way onto the Proposed ROW, noxious weeds could spread to areas not currently inhabited, degrading not only the lands within the Proposed ROW, but adjacent lands as well.

3.4.3.1.4 Cumulative Impacts

The Proposed Action would contribute to the cumulative impacts from noxious weeds, and in conjunction with other projects, would result in cumulative impacts on native vegetation communities, including the potential spread of noxious and/or invasive weeds. The combined effects of the reasonably foreseeable future actions have the potential to increase the rate at which the noxious weeds colonize lands with the cumulative impacts area.

It is assumed that all reasonable foreseeable future development on BLM lands would be subject to the same design features and mitigation measures which reduce the potential cumulative increases in noxious weeds and invasive species. In addition, other reasonably foreseeable future actions that would result in ground-disturbing activities would be required to comply with the Las Vegas Field Office Noxious Weed Plan.

3.4.3.2 Alternative

3.4.3.2.1 Direct and Indirect Effects

The potential direct and indirect effects of the Alternative would be the same as the effects from the Proposed Project except that a slightly smaller amount of habitat would be affected.

3.4.3.2.2 Mitigation Measures

As described for the Proposed Action, implementation of standard BMPs and project stipulations would help identify, prevent, and treat the spread of noxious and/or invasive species.

3.4.3.2.3 Residual Impacts

Residual impacts from implementing the Alternative would be the same as described for the Proposed Project.

3.4.3.2.4 Cumulative Impacts

The potential cumulative impacts of implementing the Alternative are the same as described for the Proposed Action.

3.4.3.3 No Action Alternative

3.4.3.3.1 Direct and Indirect Effects

Under the No Action Alternative, the Project ROW would be denied and noxious weeds would continue to grow and spread under current conditions. The land would remain available for future development; future development could result in impacts of a similar or greater degree.

3.4.3.3.2 Cumulative Impacts

Because the No Action Alternative would result in no direct or indirect impacts related to invasive species and noxious weeds there would be no cumulative impacts associated with the No Action Alternative.

3.5 Floodplains

3.5.1 Affected Environment

There are no perennial streams within the project area; there are a number of ephemeral washes. Flow in the ephemeral washes can be substantial during rainfall events or spring snow melt, and may result in flash flooding in the washes and floodplains.

The Proposed Action is located on an alluvial fan originating from the Spring Mountains. Alluvial fans are triangular or fan-shaped, gently-sloping landforms found along the base of mountain fronts in western states. Carpenter Canyon exhibits characteristics of an active fan, such as braided channels and deeper flow paths.

Flooding can occur on the surface of an alluvial fan, originating at the apex, and is characterized by high-velocity flows; active processes of erosion, sediment transport, and deposition; and unpredictable flow-paths.

3.5.2 Methodology

This analysis makes use of the best available data. FEMA flood insurance rate maps and letters of map revision were reviewed to determine flood potential along the proposed alignment for the project. Field observations and professional judgment (project design engineers' site visit on June 11 and 12, 2014) were incorporated to determine culvert use.

3.5.3 Environmental Consequences

3.5.3.1 Proposed Action

The Proposed Action lies within FEMA designated Zone A (designated as Peak Springs alluvial fan in Figure 25) and Zone X (unshaded). Zone A is defined by FEMA as areas subject to inundation by the one-percent-annual-chance flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations or flood depths are shown. Zone X is defined by FEMA as an area of minimal flood hazard, i.e. areas outside the Special Flood Hazard Areas and higher than the elevation of the 0.2-percent-annual-chance flood.

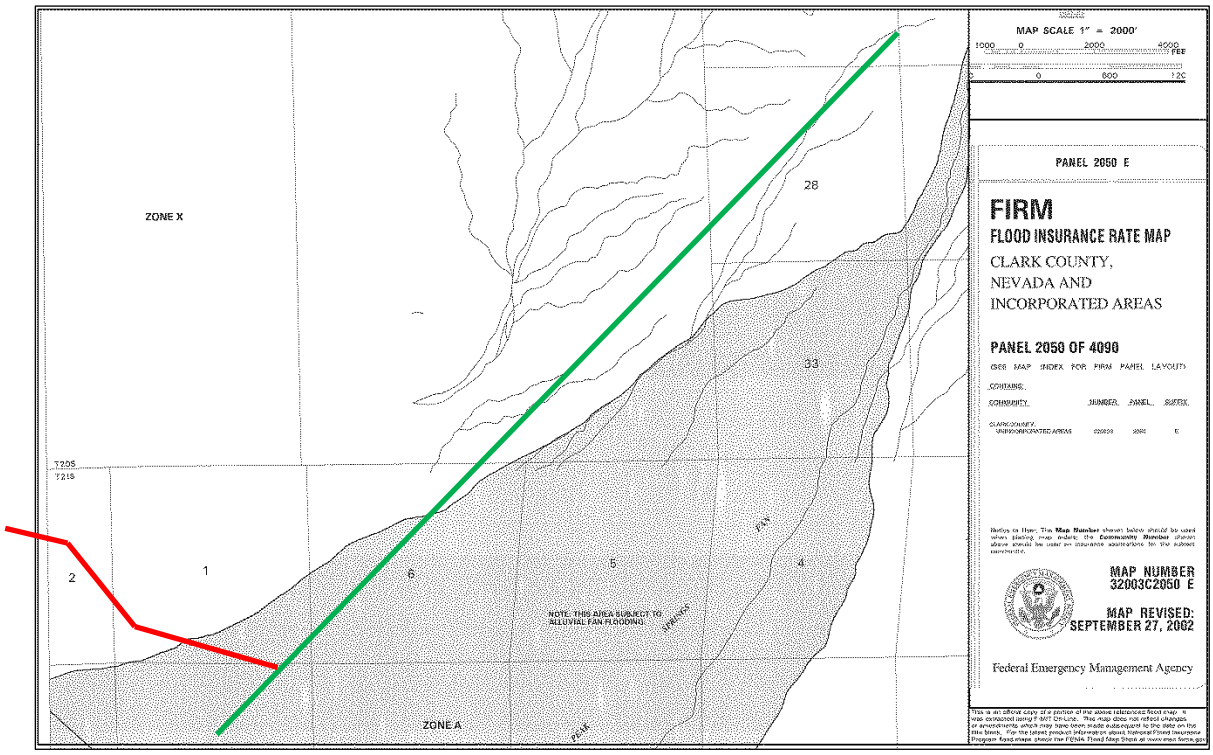

Figure 25. FEMA Flood Control Zone (Flood Insurance Rate) map for the Clark County portion of the Proposed Action.

3.5.3.1.1 Direct and Indirect Effects

The Proposed Action would utilize culverts (see Figure 26) to allow the train to travel along a constant elevation and avoid changing drainage patterns, or impede or redirect flows outside of existing flow channels, to the extent possible. Sediment levels would not be increased to any measurable degree during runoff events by abiding to the NDEP required Stormwater Pollution Prevention Plan best management practices.

All runoff from the Proposed Project would encounter the established drainage features installed by Nevada Department of Transportation (Highway 160), therefore, drainage patterns and flows in inhabited areas, such as the Town of Pahrump, should not be impacted.

3.5.3.1.1 Mitigation Measures

Application of proposed design features would reduce floodplain impacts. Surface water protection measures will be taken for runoff and storm events. US Army Corps of Engineers Nationwide Permit 43 applies to stormwater management facilities.

ARES would also prepare a Site Drainage Plan and Stormwater Pollution Prevention Plan (SWPPP).

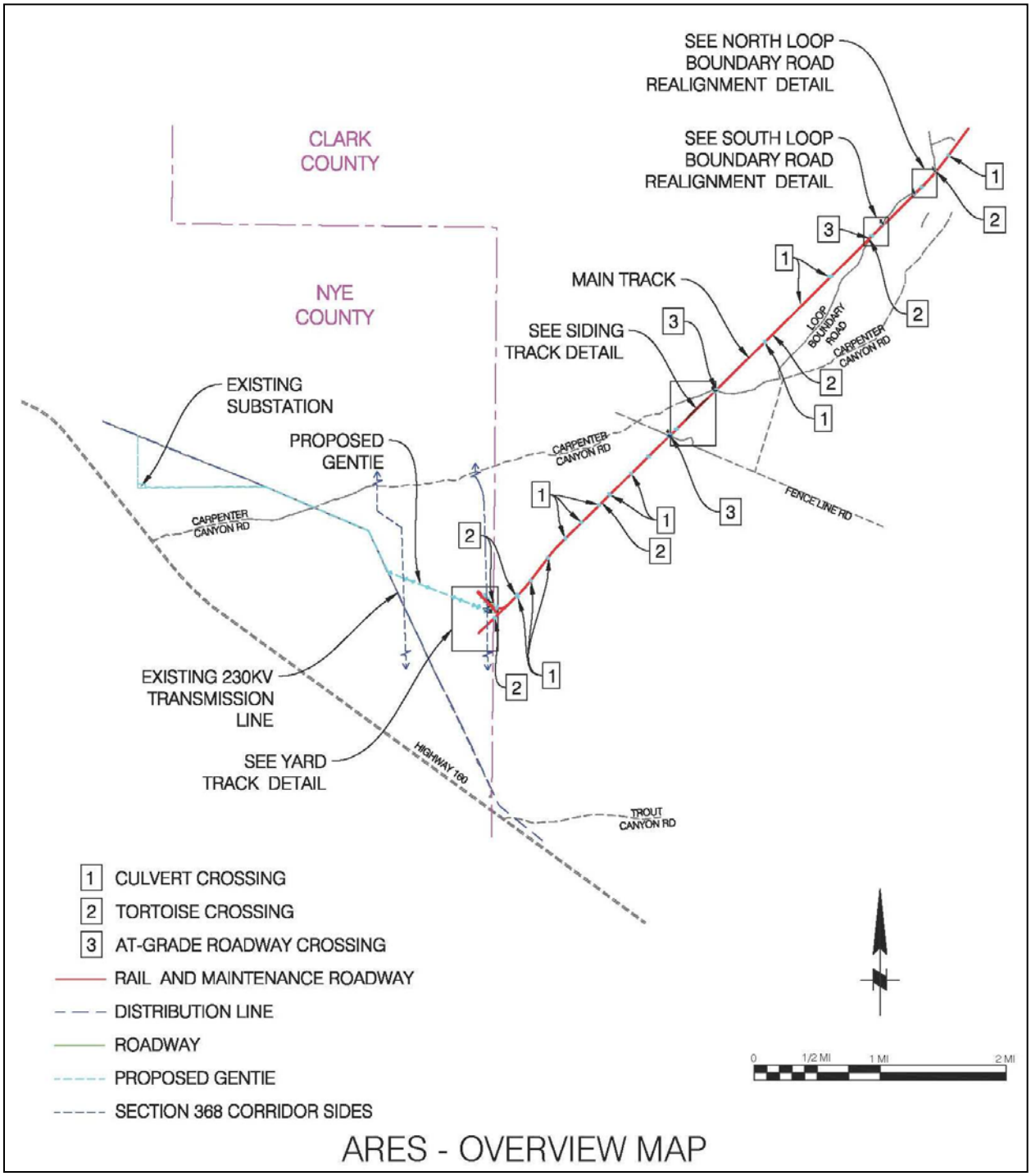

Figure 26. Proposed culvert, road, and tortoise crossing locations within the rail corridor for the Proposed Action.

3.5.3.1.2 Residual Impacts

After mitigation measures are applied, limited residual impacts are anticipated, particularly to the down-slope areas, which are across Highway 160.

Residual impacts during operation would be negligible assuming rehabilitation of temporary disturbance areas is successful. Stormwater Pollution Prevention best management practices will be utilized to limit storm water runoff from the facilities area.

3.5.3.1.3 Cumulative Impacts

The Proposed Action would result in new disturbance of up to 170 acres. The project, in combination with other past, present, and reasonably foreseeable future actions in Hydrographic Basin 162 would contribute to cumulative increases in erosion and sedimentation.

3.5.3.2 Alternative

As with the Proposed Action, the Alternative lies within FEMA designated Zone A (designated as Peak Springs alluvial fan in Figure 25) and Zone X (unshaded). Zone A is defined by FEMA as areas subject to inundation by the one-percent-annual-chance flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations or flood depths are shown. Zone X is defined by FEMA as an area of minimal flood hazard, i.e. areas outside the Special Flood Hazard Areas and higher than the elevation of the 0.2-percent-annual-chance flood.

3.5.3.2.1 Direct and Indirect Effects

As with the Proposed Action, the Alternative would utilize culverts (see Figure 27) to allow the train to travel along a constant elevation and avoid changing drainage patterns, or impede or redirect flows outside of existing flow channels, to the extent possible. Sediment levels would not be increased to any measurable degree during runoff events by abiding to the NDEP required Stormwater Pollution Prevention Plan best management practices.

All runoff from the Proposed Project would encounter the established drainage features installed by Nevada Department of Transportation (Highway 160), therefore, drainage patterns and flows in inhabited areas, such as the Town of Pahrump, should not be impacted.

3.5.3.2.2 Mitigation Measures

Application of proposed design features would reduce floodplain impacts. Surface water protection measures will be taken for runoff and storm events. US Army Corps of Engineers Nationwide Permit 43 applies to stormwater management facilities.

ARES would also prepare a Site Drainage Plan and Stormwater Pollution Prevention Plan (SWPPP).

3.5.3.2.3 Residual Impacts

After mitigation measures are applied, limited residual impacts are anticipated, particularly to the down-slope areas, which are across Highway 160.

Residual impacts during operation would be negligible assuming rehabilitation of temporary disturbance areas is successful. Stormwater Pollution Prevention best management practices will be utilized to limit storm water runoff from the facilities area.

3.5.3.2.4 Cumulative Impacts

The Proposed Project would result in new disturbance of up to 170 acres. The project, in combination with other past, present, and reasonably foreseeable future actions in Hydrographic Basin 162 would contribute to cumulative increases in erosion and sedimentation.

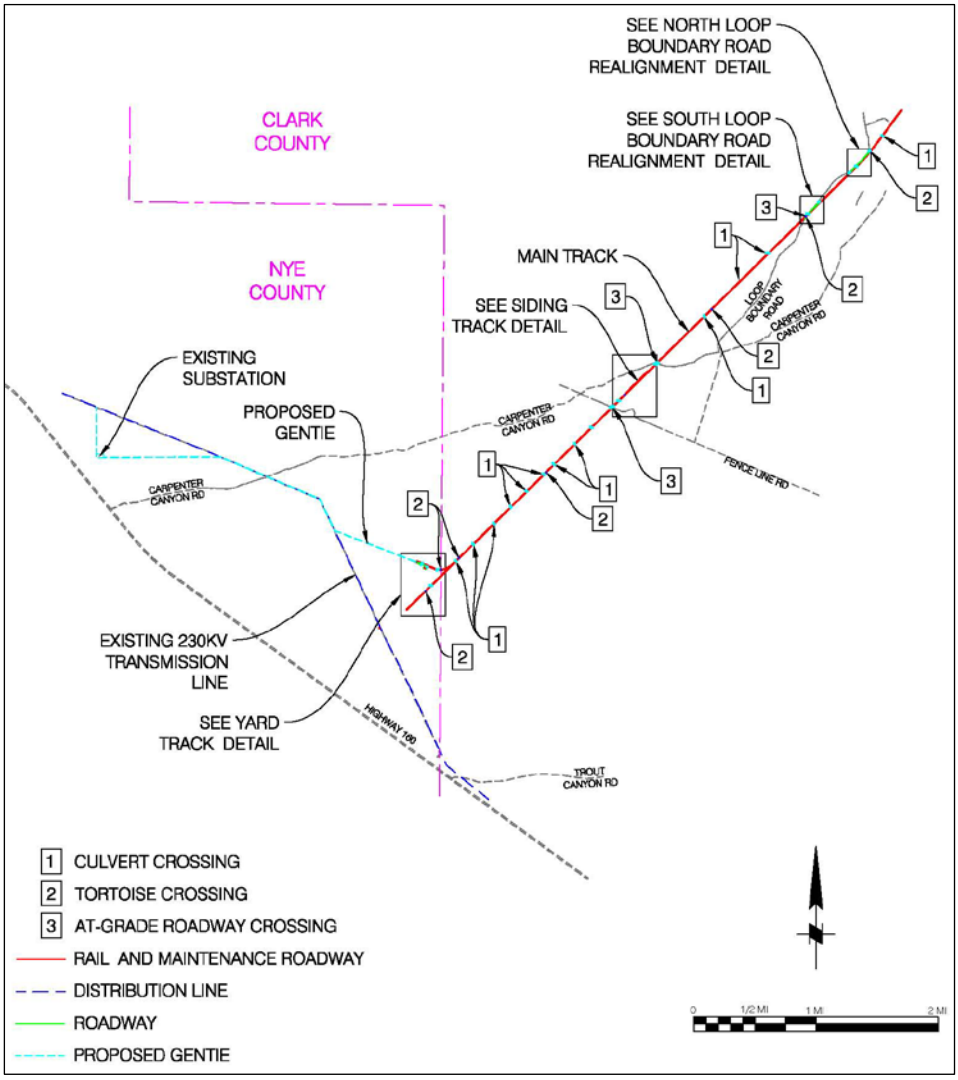

Figure 27. Proposed culvert, road, and tortoise crossing locations within the rail corridor for the Alternative.

3.5.3.3 No Action Alternative

3.5.3.3.1 Direct and Indirect Effects

Under the No Action Alternative, the Proposed Project would not be built and no impact to the existing flood regime would occur. Intermittent flooding would continue to occur along the FEMA designated Peak Spring Alluvial Fan

3.5.3.3.2 Cumulative Impacts

Because the No Action Alternative would result in no direct or indirect impacts on the Peak Spring Alluvial Fan, there would be no cumulative impacts associated with the No Action Alternative.

3.6 Threatened and Endangered Species – Including Proposed and Candidate Species

Special status species include animals and plants that require specific management attention as a result of population or habitat concerns. The categories of these species include federally listed threatened and endangered species and their respective designated critical habitats, federally proposed species and proposed critical habitats, federal candidate species, and Nevada BLM sensitive species.

3.6.1 Affected Environment

Threatened and endangered species are placed on a Federal list by the USFWS and receive protection under the Endangered Species Act of 1973, as amended.

According to the Information, Planning and Conservation (IPaC) support tool created by the USFWS (ESA Section 7(c) compliant species list), three federal threatened and endangered species have potential to occur in the vicinity of the project area: the endangered southwestern willow flycatcher, the threatened yellow-billed cuckoo, and the threatened Mojave desert tortoise. The southwestern willow flycatcher and the yellow-billed cuckoo are riparian birds requiring surface water, and no riparian habitat occurs in or near the project area. The project area is not within a path that would connect any aquatic features.

The only USFWS noted endangered, threatened, proposed, or candidate species known to occur in the vicinity of the project area is the state and federally threatened Desert Tortoise (*Gopherus agassizii*). The Proposed Action is within desert tortoise habitat. The Action Area lies within the desert tortoise's geographic range, within the Eastern Mojave Recovery Unit. The Project site is not located in designated critical habitat. Based on the existing habitat and location, the project will have no impacts to any other federally protected species and/or habitats. No further analysis required.

The Mojave desert tortoise occurs primarily on flats and bajadas with soils ranging from sand to sandy-gravel. They are also found on rocky terrain and slopes. Tortoises occur in saltbush scrub, creosote scrub, and blackbrush scrub habitat types. Within these vegetation types, desert tortoises can potentially survive and reproduce provided their basic habitat requirements are met. These requirements include a sufficient amount and quality of forage species; shelter sites for protection from predators and environmental extremes; suitable substrates for burrowing, nesting, and overwintering; various plants for shelter; and adequate area for movement, dispersal, and gene flow.

Biologists from BEC Environmental, Inc. surveyed the project area for desert tortoise in May, September, and October, 2014. Pre-project surveys followed USFWS guidance. One live juvenile tortoise (approximately 75 millimeters) was observed on bare ground within the proposed project boundary in the southeast ¼ of Section 32, Township 20 South, Range 55 East, on September 30, 2014. No other live tortoises were observed within the proposed project boundary. Desert tortoise sign was observed in all Sections comprising the proposed project site with the exception of Township 20 South, Range 55 East, Section 22. All categories of tortoise sign were observed (burrows, pallets, scat, carcasses, and footprints). Evidence of nesting from a previous year was observed with the presence of small eggshell fragments on one Class 3 burrow apron.

Historical survey data indicate that the area surrounding the project site ranges from very low to very high density tortoise habitat. Desert tortoise survey data show live tortoise and tortoise sign within and in close proximity to the Proposed Project.

Desert tortoises were translocated east of the Project to the Trout Canyon Large Scale Translocation Site in 2013 and 2104. The translocation site encompasses approximately 59,000 acres of public lands

managed by the BLM and 1,144 acres of the Spring Mountain National Recreation Area (part of the Humboldt-Toiyabe National Forest) managed by the U.S. Forest Service within Clark County, Nevada (Averill-Murray, Field, Allison, & Germano, January 2013). The translocation site occurs outside of designated critical habitat, but it does lie within a block of contiguous desert tortoise habitat that may be valuable for population connectivity. The site is bordered on the south by Nevada State Highway 160, and extends to the 1,250 meter elevation line in the Spring Mountains to the north. The remaining boundaries are open to adjacent land, and include a western boundary which runs North-South along the current Clark and Nye County line and an eastern boundary which follows the west bank of Lovell Wash (see Figure 28). This places the rail corridor within the boundary of the Trout Canyon Large Scale Translocation Site.

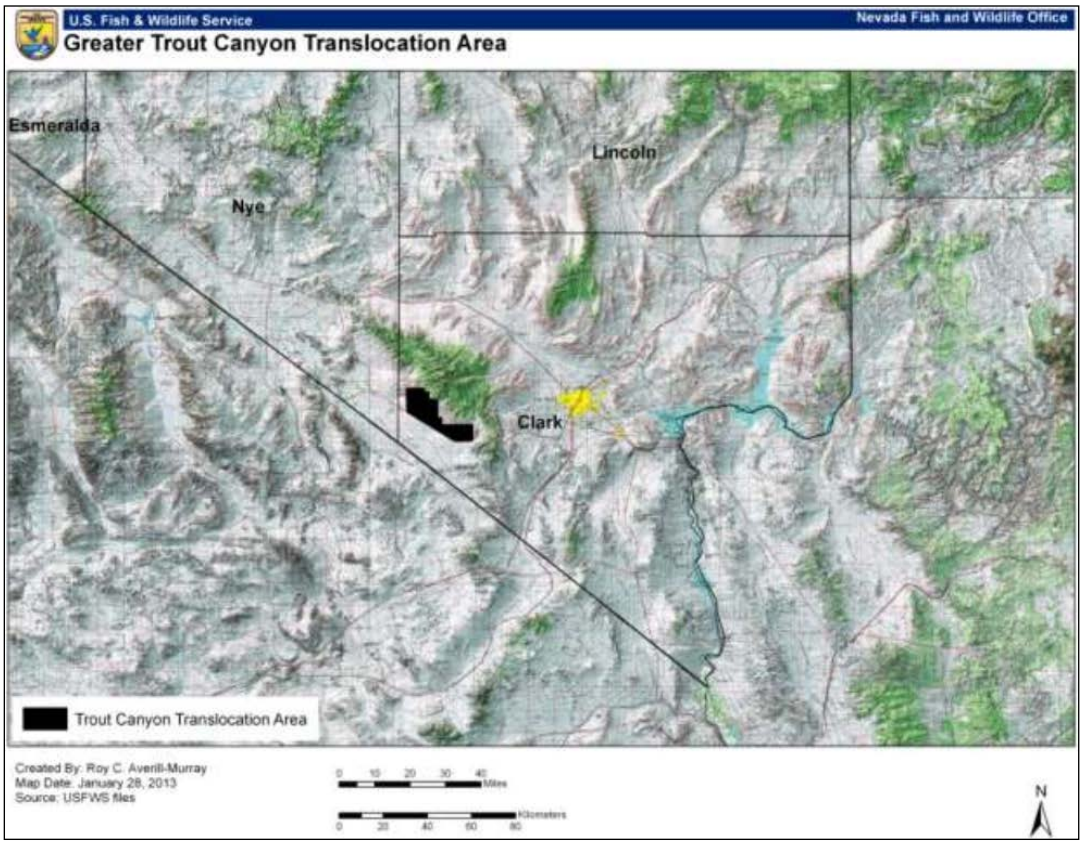

Figure 28. Greater Trout Canyon Translocation Area in relation to southern Nevada (Averill-Murray, Field, Allison, & Germano, January 2013).

Impacts to potential habitat could result from noxious weed invasion following soil disturbing activities proposed for the Action Area. Noxious weeds are aggressive and can develop dense stands that tend to out-competed native plants. Mitigation measures developed with the BLM will address potential adverse impacts.

No caves or other suitable roosting sites for bats occur in the project vicinity. Loss of feeding habitat would also be minimal, and disturbance due to construction activities would not occur at night when the bats are feeding. During operation of the facility, minimal security lighting will be used which may draw insects, and thus bats, to the area.

3.6.2 Methodology

Nevada Department of Wildlife and Nevada Natural Heritage Program were contacted to provide potentially impacted species lists. Additionally, maps of tortoise habitat and connectivity were reviewed. Database information from NNHP, Nevada Native Plant Society (NNPS), BLM, and USFS, USFWS were used to determine special status plant species with the potential to occur within the Project area.

3.6.3 Environmental Consequences

3.6.3.1 Proposed Action

Threats to the desert tortoise include loss of habitat from construction projects such as roads, housing, and energy developments. Grazing and off-highway vehicle activities not only degrade tortoise habitat, but could also collapse burrows, killing any tortoises present. Also threatening the desert tortoise's continuing existence is illegal collection by humans for pets or consumption, predation on juvenile desert tortoises by common ravens (*Corvus corax*) and kit foxes (*Vulpes macrotis*), and collisions with vehicles on paved and unpaved roads. Fire is an increasingly important threat to desert tortoise habitat, mainly due to introduction of non-native annual grasses. Introduction of non-native plants can also impact tortoises by reducing the quantity and quality of forage that may stress tortoises and make them more susceptible to drought-and disease-related mortality. Anthropogenic changes to habitat or natural factors such as drought may enhance the effects of naturally occurring diseases in the desert tortoise.

Potential impacts to threatened and endangered species may result from the construction, operations, maintenance, and decommissioning of the Proposed Project. Overall impacts to desert tortoise habitat are expected to be small (a loss of ≤1% of desert tortoise habitat in the region. There are dangers to tortoise associated with handling and removal from harm's way. Development of the area may fragment tortoise populations by creating impediments to natural migration patterns.

3.6.3.1.1 Direct and Indirect Effects

The Proposed Project has a may affect, likely to adversely affect determination for the federally threatened desert tortoise, and a no effect determination for its designated critical habitat, as the project is outside of this range. The Proposed Action has the potential to permanently impact 72 acres and temporarily impact 98 acres of desert tortoise habitat.

The proposed Project would have both direct and indirect impacts on desert tortoises on the site and tortoises in the area. Since tortoises are known to occur on the site, direct impacts would occur through loss and fragmentation of 72 acres of habitat. Direct impacts could occur during construction if a tortoise is within the site and is either injured or killed. If not noticed and avoided during construction, operation, or maintenance activities, desert tortoises could be either injured or killed (by crushing) or harassed (by being moved out of harm's way) during construction, operation, and/or maintenance activities. The project may contribute to displacement of individuals, and increased potential for harassment of federally protected species, increased human presence leading to death or harm to individuals or collection, increased weeds and increased access to area by general public.

In addition to loss of habitat, any tortoise located onsite prior to construction would have to be moved to an appropriate adjacent area out of harm's way. In doing so, both the moved tortoises as well as the tortoises located on the recipient site may be affected. This effect could be minimized by moving tortoises within the current home range of tortoises cleared from the developed areas on-site. Tortoises might also be harmed by the maintenance and operation of the train, employee vehicles, and possibly private off road vehicles utilizing the maintenance road. The addition of transmission poles less than 50 feet in height may also increase predation by birds on juvenile tortoises.

Unique to this area is also the Large Scale Tortoise Translocation area located in Trout Canyon and to the north and east of the Proposed ROW, encompassing a majority of the rail corridor. The use of this Translocation area could introduce a higher number of desert tortoises to the Project Area than would otherwise normally be encountered, thus increasing the chances for an encounter.

Indirect effects from noise and vibration associated with construction activities could cause some tortoise to abandon their burrows and seek other existing cover sites. This would temporarily expose them to an increased risk of predation as they seek other burrows within their home range. In addition, desert tortoise mortality may result from increased human presence and construction-related traffic.

The Proposed Action may not result in adverse impacts to local or regional genetic connectivity of the desert tortoise population. A modeled connectivity area (least cost corridor) is located northwestern of the project area (Averill-Murray, Darst, Strout, & Wong, 2013). However, according to the same Averill-Murray study, approximately 123 acres of the Proposed Action could be considered a least cost corridor.

3.6.3.1.2 Mitigation Measures

Mitigation for desert tortoise would be addressed through measures outlined in the Biological Opinion and would be supported by the desert tortoise fees paid to the BLM.

The following plans would be prepared and implemented that would further reduce impacts to listed species:

- Worker Environmental Awareness Plan
- Raven Management Plan
- Integrated Weed Management Plan

In order to minimize habitat fragmentation impacts and address the possibility of a tortoise becoming trapped between the track rails, special tortoise crossings and escape passages are being incorporated into the project design (see Figure 29), as well as culverts (see Figure 30) approved by the Fish and Wildlife Service and developed in coordination with the BLM resource specialists. The desert tortoise escape passages, will be areas between the constructed crossings where the soil between the rail ties is removed to allow a tortoise to walk under the rail and down the embankment. Spacing of the crossing areas and escape passages will be finalized based on discussions with the Fish and Wildlife Service and BLM.

Anti-perch devices will be utilized. The transmission lines will be Avian Power Line Interaction Committee (APLIC) compliant and a raven management plan will be developed.

Proposed Project actions will be minimized by following the BLM Programmatic Biological Opinion and is discussed in the Biological Assessment, Section 2.2 (BEC Environmental, Inc., July 2015). Mitigation for birds would be addressed by the development and implementation of a Project-specific Bird and Bat Conservation Strategy.

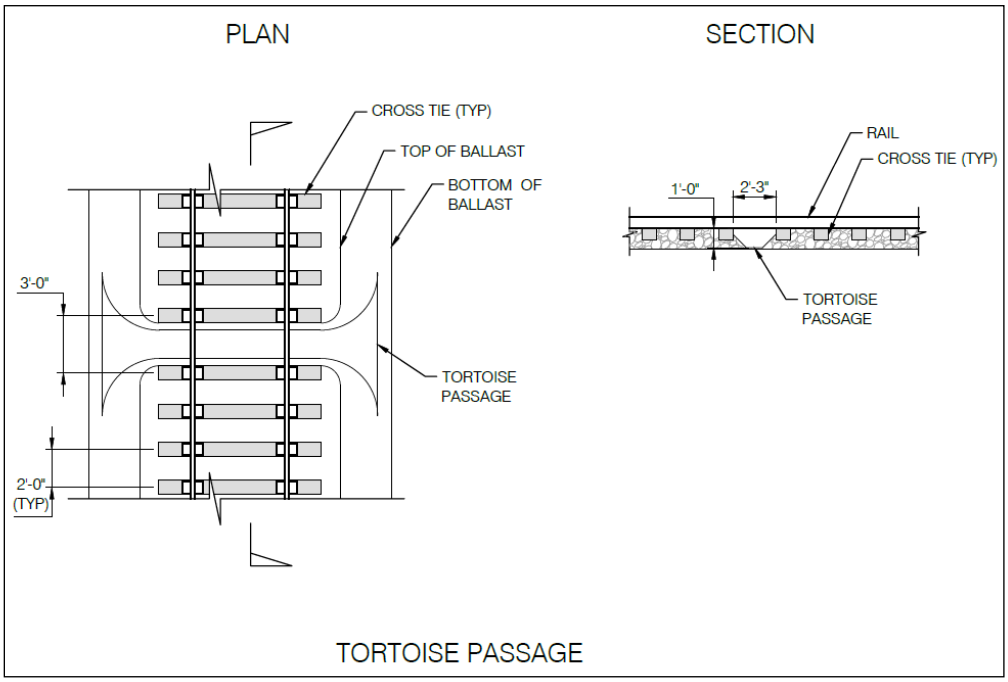

Figure 29. Preliminary design of the tortoise escape passage.

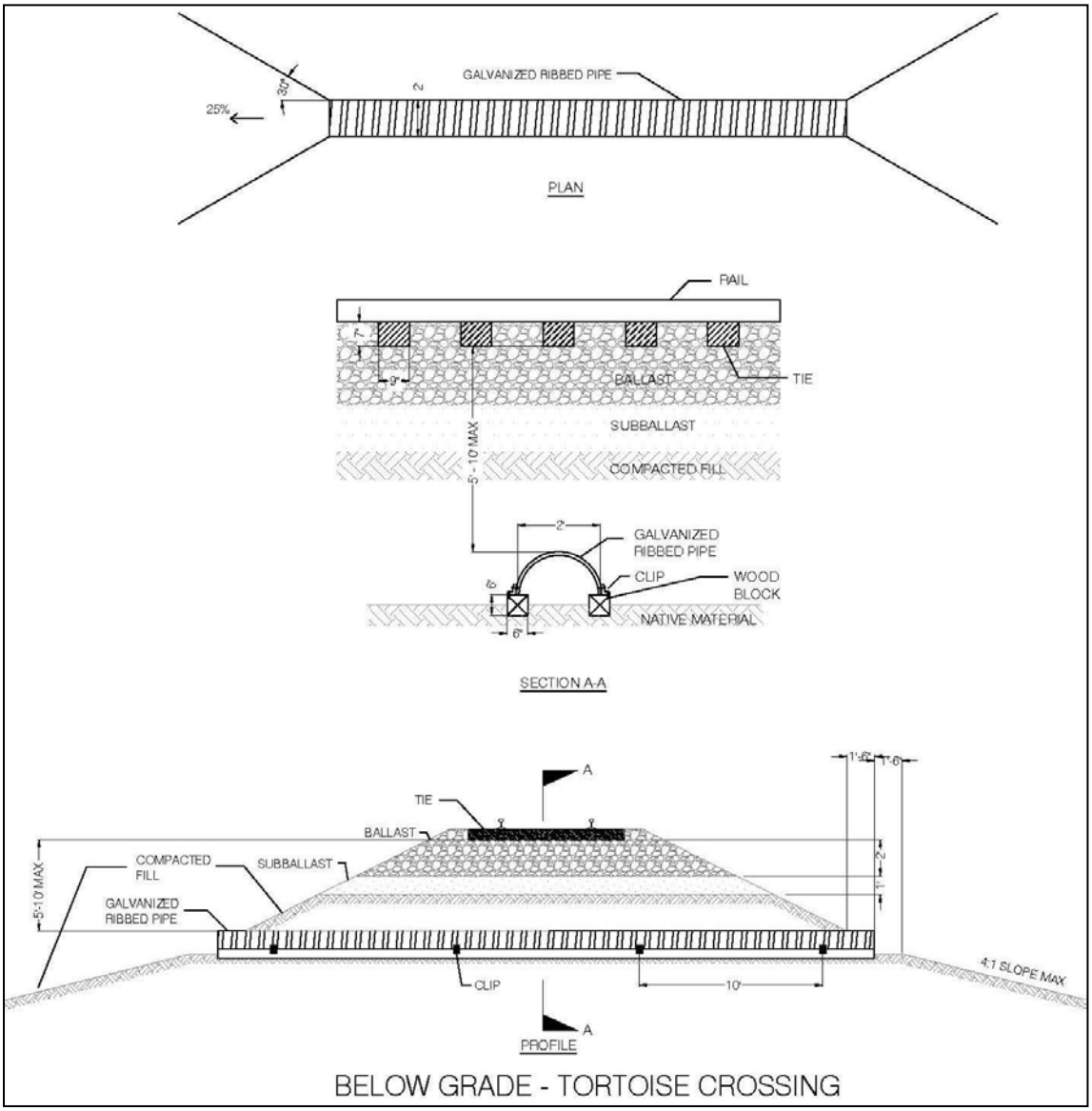

Figure 30. Proposed tortoise crossings under the rail alignment.

3.6.3.1.3 Residual Impacts

As proposed, the Proposed Action would disturb 170 acres of desert tortoise habitat; therefore, remuneration fees of $143,310 are required as described below (BLM Southern Nevada District Office, 2014).

BLM shall collect remuneration fees to offset residual impacts to desert tortoises from project-related disturbance to desert tortoise habitat. The current rate is $843 per acre of disturbance, as indexed for inflation, effective March 1, 2015. The next adjustment will become effective March 1, 2016.

3.6.3.1.4 Cumulative Impacts

The Proposed Action would have a long term impact on 72 acres of desert tortoise habitat. Additionally, the Project has the potential to impact translocated tortoises which have dispersed throughout and beyond the borders of the Trout Canyon Large Scale Translocation area. Desert tortoises found in the Project

ROW would not be translocated to other locations; tortoises encountered during construction would be moved out of harm's way in adjacent habitat by an Authorized Biologist.

Because habitat for the southwestern willow flycatcher and the yellow-billed cuckoo does not occur within or near the project area, the Proposed Action, in conjunction with other projects, would not contribute to cumulative impacts on habitat for these listed bird species.

The combined effects of the reasonably foreseeable future actions do have the potential to increase risk of mortality of individual animals within the cumulative impacts area.

3.6.3.2 Alternative

The Alternative differs from the Proposed Action in the specific location and configuration of the Operations and Support Facilities, and a slight lateral adjustment in the location of the southern end of the rail alignment. The amount of habitat potentially disturbed by the Alternative would be slightly smaller than for the Proposed Action. Surveys conducted in these areas for desert tortoises indicate the presence and relative abundance of tortoises in those areas are the same as those for the Proposed Action.

3.6.3.2.1 Direct and Indirect Effects

The direct and indirect effects of the Alternative on desert tortoises are expected to be the same as have been described for the Proposed Action, although a slightly smaller area would be affected by the Alternative.

3.6.3.2.2 Mitigation Measures

The same mitigation measures described for the Proposed Action would be implemented for the Alternative.

3.6.3.2.3 Residual Impacts

The potential residual impacts from the Alternative on desert tortoises after implementation of the mitigation measures would be the same as the impacts described for the Proposed Action.

3.6.3.2.4 Cumulative Impacts

The cumulative impacts that would result from implementing the Alternative would be similar to the cumulative impacts described for the Proposed Action.

3.6.3.3 No Action Alternative

3.6.3.3.1 Direct and Indirect Effects

Under the No Action Alternative, the Project ROW would be denied and the current conditions of the desert tortoises and tortoise habitat would continue unchanged. The land would remain available for future development or recreational use.

3.6.3.3.2 Cumulative Impacts

Because the No Action Alternative would result in no new direct or indirect impacts related to listed species, there would be no project-related cumulative impacts associated with the No Action Alternative.

3.7 Migratory Birds

3.7.1 Affected Environment

For the purpose of this EA, the term "migratory birds" applies generally to native bird species protected by the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703-711). A list of the protected bird species can be found in 50 C.F.R. 10.13. Under the MBTA it is unlawful to take, kill, or possess migratory birds. Executive Order 13186 issued January 11, 2001, further defines the responsibilities of federal agencies to protect migratory birds. Additionally, bald eagles (*Haliaeetus leucocephalus*) and golden eagles are protected under both the MBTA and the Bald and Golden Eagle Protection Act. In addition to the MBTA Executive Order 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds, signed in January 2001) requires the BLM to evaluate the effects of federal actions on migratory birds. In addition, there is a Memorandum of Understanding between the BLM and USFWS to promote the conservation of migratory birds. The purpose of the Memorandum of Understanding is to strengthen migratory bird conservation by identifying and implementing strategies that promote conservation and avoid or minimize adverse impacts on migratory birds through enhanced collaboration between the two agencies, in coordination with state, tribal, and local governments.

Use of the Action Area by most raptors is expected to be transitory during hunting rather than for nesting. For this reason, and because the same type of habitat is very extensive throughout the area, the Proposed Action is not expected to affect any species adversely. The exception may be use by burrowing owls. No signs of burrowing owls were observed during the desert tortoise presence/absence surveys, but the Proposed Action is within suitable burrowing owl habitat.

Despite the data supporting a majority of avian deaths due to transmission towers are passerines, raptor mortality historically has received the most attention. The Proposed Action is located on an alluvial fan, which does not provide suitable nesting habitat for raptors; however, the area can be considered foraging habitat for raptors as the area contains small mammals and reptiles, and contains existing transmissions lines and fences which can be used to perch.

To minimize unintentional take as defined by Executive Order 13186, the BLM has issued Washington Office Instruction Memo (IM) No. 2008-050, *Migratory Bird Treaty Act–Interim Management Guidance* (BLM 2008b) to provide interim guidance to meet the BLM responsibilities under the MBTA, and IM 2010-156 for the Bald and Golden Eagle Protection Act. This provides the BLM with a consistent approach for addressing migratory bird populations and habitats.

Table 3-4 BLM designated sensitive bird species.

Common Name	*Species name*	Nevada Status
Bald eagle	*Haliaeetus leucocephalus*	Endangered
Bendire's thrasher	*Toxostoma bendirei*	Protected
Brewer's sparrow	*Spizella breweri*	Sensitive
Ferruginous hawk	*Buteo regalis*	Protected
Golden eagle	*Aquila chrysaetos*	Protected
LeConte's thrasher	*Toxostoma lecontei*	Protected
Lewis's woodpecker	*Melanerpes lewis*	Protected
Loggerhead shrike	*Lanius ludovicianus*	Sensitive
Peregrine falcon	*Falco peregrines*	Endangered
Pinyon jay	*Gymnorhinus cyanocephalus*	Protected
Swainson's hawk	*Buteo swainsoni*	Protected
Western burrowing owl	*Athene cunicularia*	Protected

Common Name	*Species name*	Nevada Status
Western snowy plover	*Charadrius alexandrinus nivosus*	Protected

3.7.2 Methodology

The analysis makes use of the best available data, and professional judgment. Correspondence with NDOW and NNHP for species potentially occurring in the area was reviewed. The analysis also compares elements and timing of the Proposed Action and the project area boundary with suitable habitat.

3.7.3 Environmental Consequences

3.7.3.1 Proposed Action

Migratory birds could be found in the Action Area as either seasonal residents or as migrants. Among the wide variety of species protected by the MBTA, special concern is usually given to the following groups:

- Species that migrate across long distances, particularly Neotropical migrant passerines that winter in tropical or Southern Hemisphere temperate zones.
- Birds of prey, which require large areas of suitable habitat for finding sufficient prey.
- Species that have narrow habitat tolerances and hence are vulnerable to extirpation from an area as a result of a relatively minor habitat loss.
- Species that nest colonially and hence are vulnerable to extirpation from an area and hence are vulnerable to extirpation from an area as a result of minor habitat loss.

The Proposed Action site is expected to exhibit species typical to the Mojave Desert, populations within which typically exhibit little variation seasonally. Songbirds, gamebirds, and pigeons/doves are likely to use the project area most frequently. It is unlikely the Action Area is located in a major passerine migratory route due to the harsh desert conditions. Thus, migratory species making stopovers in the area are unlikely to concentrate within the Action Area due to similar habitat being readily available throughout the region and more favorable habitat existing within the Ash Meadows National Wildlife Refuge, at Lake Mead National Recreation Area on the Colorado River, and even within the Town of Pahrump.

Common bird species that may be present in the vicinity of the proposed project site may include the Black-throated Sparrow, Turkey Vulture (*Cathartes aura*), Common Raven (*Corvus corax*), and Red-tailed Hawk (*Buteo jamaicensis*). Raptors have been observed in the area during botanical and tortoise field surveys; no raptor nests were observed during these surveys. No bird specific surveys were conducted.

NDOW reported various species of raptors may reside in the vicinity of the Proposed Action Area (September 5, 2013, letter). American kestrel (*Falco sparverius*), bald eagle (*Haliaeetus leucocephalus*), barn owl (*Tyto alba*), burrowing owl (*Athene cunicularia hypugaea*), Cooper's hawk (*Accipiter cooperi)*, ferruginous hawk (*Buteo regalis*), flammulated owl (*Otus flammeolus*), golden eagle (*Aquila chrysaetos*), great horned owl (*Bubo virginianus*), long-eared owl (*Asio otus*), merlin (*Falco columbarius*), northern goshawk (*Accipiter gentilis*), northern harrier (*Circus cyaneus*), northern saw-whet owl (*Aegolius acadicus*), osprey (*Pandion haliaetus*), peregrine falcon (*Falco peregrinus*), red-tailed hawk (*Buteo jamaicensis*), rough-legged hawk (*Buteo lagopus*), sharp-shinned hawk (*Accipiter striatus*), short-eared owl (*Asio flammeus*), Swainson's hawk (*Buteo swainsoni*), and turkey vulture (*Cathartes aura*) have distribution ranges that include the Project Area and four-mile buffer area.

The ferruginous hawk is a BLM designated sensitive species in Nevada. The Proposed Action encompasses foraging habitat, but does not contain nesting habitat for ferruginous hawks.

A Nevada Department of Wildlife (NDOW) database query retuned one result for a raptor nest, likely falcon, identified within ten miles of the Action Area; Section 24 of Township 20 South, Range 54 East, last recorded active in March 1975.

The following BLM sensitive bird species could potentially be impacted by the proposed action.

Western burrowing owl (Athene cunicularia hypugaea)
The Western burrowing owl is a diurnal bird of prey specialized for shrub-steppe habitats. Burrowing owl habitat in the Mojave Desert typically consists of open, dry, treeless areas on the desert floor. Burrowing owls most frequently use mammal burrows created by other animals such as ground squirrels (*Spermophilus* spp.), coyotes (*Canis latrans*), or desert tortoises (*Gopherus agassizii*). The burrows are used for nesting, roosting, cover, and caching prey. In recent decades, the range and species count have been declining primarily due to agricultural, industrial, and urban development that reduce burrow availability.

Bendire's thrasher (Toxostoma bendirei)
In Southern Nevada, Bendire's thrashers occur mostly in Joshua tree woodlands with dense grass, but they can also occur in desert scrub habitats with cholla or mesquite or in sagebrush with scattered junipers. They normally avoid dense woodlands and areas with very sparse vegetation. They typically nest in mesquite, cholla, juniper, Joshua trees, and other yucca species. Their population trend in Southern Nevada is unknown, but they are declining in other parts of their range.

LeConte's thrasher (Toxostoma lecontei)
LeConte's thrasher is a year-round resident in the Mojave Desert of Southern Nevada. In Nevada, they are associated with saltbush flats and wash systems and nest in cholla cactus, sagebrush, small trees, or shrubs. This thrasher prefers open habitats for foraging with sparse vegetation for cover and is a good indicator of habitat quality. Their population trend in Southern Nevada is unknown.

Loggerhead shrike (Lanius ludovicianus)
This species prefers open country with nesting habitat preference toward scattered trees and shrubs. They are commonly found in shrub habitat types comprising savanna, desert scrub, and occasionally, open woodland. Perches are an important habitat component used for hunting. If natural perches are unavailable, they will perch on poles, wires or fence posts. Population trend data in Nevada has shown an unexplained 5 percent decline per year since 1966.

3.7.3.1.1 Direct and Indirect Effects

Migratory birds in the project area may be disturbed and/or displaced through 98 acres of short term (construction) and 72 acres of long term (operations) habitat removal. Noise levels from construction equipment may impact migratory birds during the construction phase of the project. However, noise levels during operations will not increase existing noise levels for the area. Depending on the time of year for construction, operation, or maintenance, there is the potential to disturb nesting birds within or immediately adjacent to the proposed action. ARES must comply with the MBTA and avoid potential impacts to protected birds within the project area. Migratory birds within the vicinity of the Action Area would likely move into adjacent habitat due to disturbance, potentially competing with other individuals or individuals of other species, for foraging and nesting habitat. However, considering the size of the proposed disturbance (170 acres short-term), the presence of existing and nearby disturbance, location (as

it relates to soils, vegetation and topography) of the project area, and abundance of adjacent habitat, impacts to migratory birds would be negligible.

Utility scale transmission lines have been hypothesized to negatively affect migratory bird populations both directly and indirectly. Direct effects can include actual bird strikes with the wires or habitat disturbance from tower placement. Specifically, warblers and vireos, family Parulidae and Vireonidae, respectively, were found to have the highest risk of collision with towers (Arnold & Zink, 2011). Most passerines (e.g. perching birds such as warblers and vireos) are short-lived and have high reproductive output, and their population growth rates are more sensitive to reproductive failure than to adult survival (Arnold & Zink, 2011).Therefore, collision mortality for most passerine species is expected to have negligible effects on population dynamics.

The direct impacts of the proposed action on the identified bird species would be loss of nesting habitat and forage, mortality and harassment of individual animals, and decrease in habitat value of adjacent remaining "wildland" areas due to increased human activity and noise disturbance in the area. The species is protected by the Migratory Bird Treaty Act and the proponent will be required to adhere to mitigation measures for migratory birds.

3.7.3.1.2 Mitigation Measures

Habitat-altering projects or portions of projects should be scheduled outside of the bird breeding season which generally occurs between February 15th and August 31st. If a project has to occur during the breeding season, then a qualified biologist must survey the area for nests immediately prior to commencement of construction activities. This shall include burrowing and ground nesting species in addition to those nesting in vegetation. If any active nests are found, an appropriately-sized buffer area must be established and maintained until the young birds fledge. The buffer area must connect to suitable, undisturbed habitat. As the above dates are a general guideline, if active nest are observed outside this range they are to be avoided as described above.

Due to potential for electrocution, collision and nesting/perching by migratory birds on overhead power lines, the Proposed Project must follow Avian Power Line Interaction Committee (APLIC) guidelines (Suggested Practices for Avian Protection on Power Lines [2006] and Reducing Avian Collisions with Power Lines [2012]) to reduce this risk through facility design and comply with MBTA and other federal wildlife laws.

Guy wires should not be used if practicable. If not practicable, all guy wires must be marked in sections over the entire line (flight diverters or markers) so they are visible to prevent injury/mortality to birds through collision.

Any lighting for on-ground facilities and equipment would be down-shielded to keep light within the boundaries of the site.

3.7.3.1.3 Residual

The Proposed Action could result in minor impacts on migratory birds, including the potential loss of habitat and increased risk of injury and mortality.

3.7.3.1.4 Cumulative Impacts

The Proposed Action, in conjunction with other projects, would result in cumulative impacts on migratory birds, including the potential loss of habitat and increased risk of injury and mortality. The combined

effects of the reasonably foreseeable future actions have the potential to remove suitable migratory bird habitat and to increase risk of mortality of individual animals within the cumulative impacts area.

It is assumed that all reasonable foreseeable future development on BLM lands would be subject to the same design features and mitigation measures, which reduce the potential cumulative impacts to migratory birds. In addition, other reasonably foreseeable future actions may be required to prepare and implement a BBCS with monitoring and adaptive management in addition to complying with suggested APLIC BMPs.

3.7.3.2 Alternative

The specific location of Operations and Maintenance facilities for the Alternative varies slightly from the Proposed Action, and the alignment of the southern end of the rail line shifted a short distance, but the habitat in these areas is the same as described for the Proposed Action, including the list of bird species potentially encountered.

3.7.3.2.1 Direct and Indirect Effects

The potential effects of implementing the Alternative are the same as those described for the Proposed Action. The only difference is that the Alternative would impact a smaller amount of desert habitat, therefore potentially impacting fewer birds with the loss of that habitat.

3.7.3.2.2 Mitigation Measures

The mitigation measures to be implemented for the Proposed Action would be implemented for the Alternative.

3.7.3.2.3 Residual Impacts

The potential residual impacts on migratory birds from the Alternative would be essentially the same as those described for the Propose Action.

3.7.3.2.4 Cumulative Impacts

The potential cumulative impacts of the Alternative would be similar to those described for the Proposed Action.

3.7.3.3 No Action Alternative

3.7.3.3.1 Direct and Indirect Effects

Under the No Action Alternative, the Project ROW would be denied and migratory birds would continue to be subject to existing conditions. The land would remain available for future development and ROW requests.

3.7.3.3.2 Cumulative Impacts

Because the No Action Alternative would result in no new direct or indirect impacts related to listed species, there would be no cumulative impacts other than the current impacts associated with the No Action Alternative.

3.8 Human Health and Safety

3.8.1 Affected Environment

The Project Area is located in an uninhabited, undeveloped region within Clark and Nye Counties, Nevada. The area is utilized for recreational purposes including dirt bike and four-wheeler riders, hikers,

bikers, and horseback riders. The southernmost portion of the project is located within the Pahrump Regional Planning District (PRPD).

3.8.2 Methodology

The analysis makes use of the best available data, professional judgment, field observations, and review of operations and safety manuals.

3.8.3 Environmental Consequences

3.8.3.1 Proposed Action

There may be potential health and safety risks associated with this project. These risks can be mitigated with proper training and on site safety protocols.

The rail corridor discussed includes the rail line, an access road, an electricity regulation system (parallel overhead catenary transmission line), a mid-slope spur rail to be used as a turnout, and drainage management features.

The facilities area will include the ARES substation, a rail car maintenance building, and a modular-type crew and control building. It is anticipated potable water will be provided for staff as a standalone water dispenser (five gallon jug type). Sanitary water and waste facilities will be contained in holding tanks built into the modular buildings and supplied and serviced by commercial vendors. The facility would not include a buried septic system.

3.8.3.1.1 Direct and Indirect Effects

Descriptions of potential Human Health and Safety concerns are detailed below by category.

Construction Safety

There are potential health and safety risks commonly associated with construction activities. An emergency response and health and safety plan to cover various safety issues will be developed to meet or exceed the requirements of the U.S. Department of Labor and Occupational Safety and Health Administration (OSHA) standards.

For the safety of construction crews, drinking water will be imported and distributed daily. Portable toilets would be provided on site, likely in the planned facilities area. For worker safety, outdoor lighting would be installed around occupied buildings and within the ARES substation, and be designed to provide the minimum illumination needed to achieve safety and security objectives, and be directed downward and shielded to focus illumination on the desired areas.

At times during construction, public access must be controlled where particular hazards exist. Temporary fencing will be installed in these areas. Standard construction noise will be generated during the short period of construction.

Rail Corridor and Electric Shuttle Trains

The Carpenter Canyon Road crossing (see Figure 31) will include standard railway signage and flashing lights, while other less used established crossings will contain only warning signage. Loop Boundary road, at the northeast end of the rail corridor, will be rerouted for a short section (approximately 0.7 miles) to merge with the proposed trackside maintenance road to eliminate two rail crossings without impeding existing public land travel routes (see Figure 32), with only one remaining crossing. This will limit public rail crossings.

ARES will install a remote monitoring system at the facility to monitor the rail line as well as provide an on-site security officer to monitor the support facilities 24 hours a day, 365 days a year.

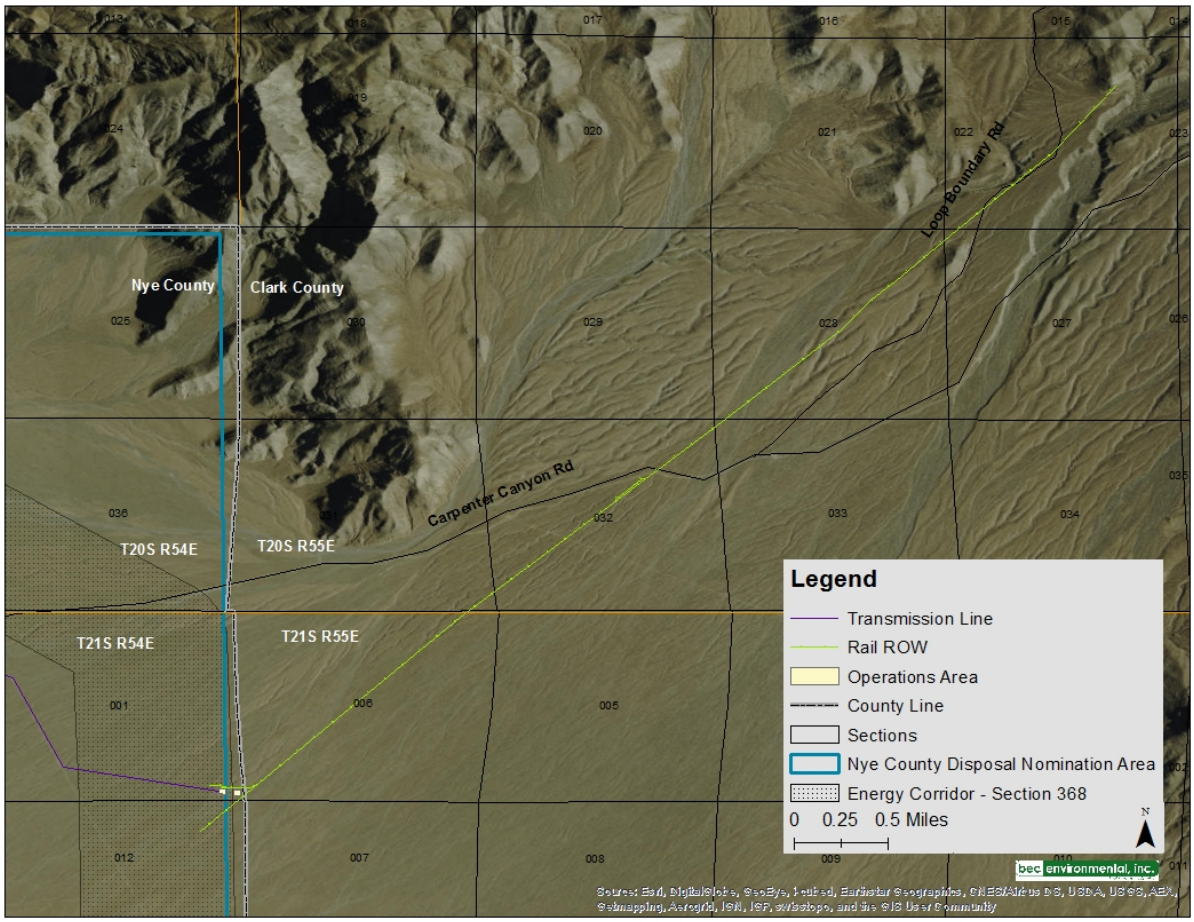

Figure 31. Locations of Carpenter Canyon Road and Loop Boundary Road within the Proposed Action Area.

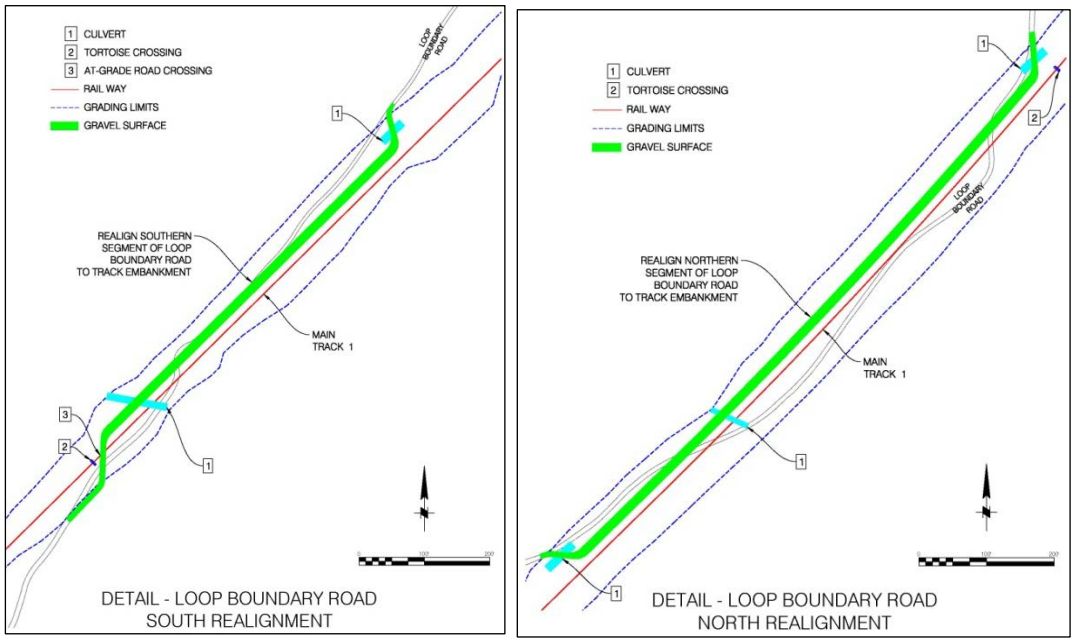

Figure 32. Realignment of Loop Boundary Road to reduce the number of required rail crossings from three to two.

Shuttle trains, each comprised of two electric locomotives and seven ballast cars, will ascend and descend the rail line at slow speeds. The shuttle trains travel an average speed of 18.8 mph (30.3 kilometers per hour), but not more than 25 mph (40 kilometers per hour), which is the speed limit in most residential neighborhoods and the recreational roads in the area. In comparison, a cantering horse lopes at a speed of 10 to 17 mph (16.1 to 27.4 kilometers per hour) (Horse Speed in MPH, 2005) and could outpace one of the proposed shuttle trains should it desire to do so.

Results of a study conducted by Dave Scott Consulting show that the Proposed Action will have noise levels comparable to a restaurant conversation, background music or an air conditioner. At no distance will ear protection be needed by personnel during the operation of the train cars and at a distance of 1,000 feet, the sound level is about that of a library, meaning sound will not be noticeable at Nevada State Highway 160, area neighborhoods, and will likely be drowned out by recreation vehicle noise on existing roads. During field surveys conducted of the area in April, May, September and October 2014, vehicle noise from the Pahrump Speedway was very evident.

The Federal Railroad Administration (FRA) implements federal environmental laws and policies related to the nation's railroads (FRA Environment).

Cheech Smialek, Chief Inspector, FRA Region 7, Sacramento, advised ARES in an email dated October 21, 2013, the Proposed Action would not conform to the basic definition of a “railroad,” as defined by 49 CFR Part 209.

> Railroad means any form of nonhighway ground transportation that runs on rails or electro-magnetic guideways, including (i) commuter or other short-haul railroad passenger service in a metropolitan or suburban area and commuter railroad service that was operated by the Consolidated Rail Corporation on January 1, 1979; and (ii) high speed ground transportation systems that connect metropolitan areas, without regard to whether those systems use new

technologies not associated with traditional railroads; but does not include rapid transit operations in an urban area that are not connected to the general railroad system of transportation.

Smialek stated, "The prevailing regulation that would exempt your operation from our jurisdiction is found in 49 CFR Part 209… the operative phrase being, "general railroad system of transportation," which means that a candidate railroad must have access outside its operating area to other destinations. Secondly, the function is not "ground transportation," in that no goods or services are being moved.

While the Proposed Action may be exempt from FRA regulation, FRA Environmental Procedures provide some guidance relevant to safety measures which have been considered in preparing the projects Plan of Development (Federal Railroad Administration, 1999). Because the FRA health and safety regulations focus on the transportation of hazardous waste and actions to take in the event of a spill, they will not apply to the Proposed Action because no hazardous materials will be transported by the shuttle trains.

Operations, Control, and Maintenance Facilities

Buildings utilized for the operations, control, and maintenance facilities will meet or exceed the minimum requirements of codes adopted by Nye County and the PRPD. Codes effective within the PRPD include:

- 2006 International Building Code
- 2006 International Energy Conservation Code
- 2006 Uniform Plumbing Code
- 2006 Uniform Mechanical Code
- 2006 International Property maintenance Code
- 2005 National Electric Code
- 2006 International Fire Code

Sanitary water and waste facilities will be provided for operations personnel. Water and wastewater will be contained in holding tanks built into the modular buildings and supplied and serviced by commercial vendors. The facility would not include a buried septic system. Potable water would be provided through a commercial bottled water service. Fire suppression capabilities within the operations and maintenance buildings will be constructed in accordance with the 2006 International Fire Code. The nature of that suppression system has not yet been determined. The Pahrump Valley Fire and Rescue Department (Department) provides fire protection, rescue and ambulance services to the Pahrump Valley. The Operations, Control, and Maintenance Facilities lie within the jurisdiction served by the Department. The BLM fire station located on Carpenter Canyon Road, 21S 54E, Section 2, NW Quarter, may be able to provide support in cooperation with the Department, in the event of a structure wildfire. ARES will confer with these agencies to develop a comprehensive emergency response plan.

230 kV Transmission Line

A new 230 kilovolt (kV) transmission line will be constructed and operated by VEA to connect the Proposed Project to the regional electrical grid. The interconnection will include a substation, a gen-tie connecting the substation to the existing VEA 230kV transmission line, upgrading of the existing VEA 230kV transmission line to support the facility, two new transmission lines to connect the existing VEA 230kV transmission line to the Gamebird Switch Station, removal of the section of VEA transmission line currently bypassing the Gamebird Switch Station, and construction of a new switch yard at the existing VEA Gamebird Switch Station.

3.8.3.1.2 Mitigation Measures

All applicable safety and management plans for the operation, control, and maintenance of all components will be developed and followed. A health and safety program will be developed to protect both workers and the general public during construction, operation, and decommissioning. The program should identify all applicable Federal and state occupational safety standards, establish safe work practices for each task (e.g., requirements for personal protective equipment and safety harnesses, Occupational Safety and Health Administration [OSHA] standard practices, measures for reducing occupational electromagnetic field [EMF] exposures), and define safety performance standards (e.g., electrical system standards). The program will include a training program to identify hazard training requirements for workers for each task and establish procedures for providing required training to all workers. Documentation of training and a mechanism for reporting serious accidents to appropriate agencies should be established.

ARES will develop a comprehensive emergency plan that considers the vulnerabilities of the Proposed Project to credible events initiated by natural causes (earthquakes, avalanches, floods, high winds, violent storms, wildfires, etc.), human error, mechanical failure, cyber attack, or sabotage, and the potential for and possible consequences of those events.

The track and roadway will be inspected daily, possibly employing robotic equipment that can work 24 hours a day, seven days a week, without direct manual control. The inspection criteria will be, at a minimum, based on Title 49 CRF 213 Track Safety Standards as published in the Federal Register (latest), supplemented by recommendations of the International Heavy Haul Association (IHHA) and in-house developed criteria based on best practices from a world-wide network of specialized, heavy-haul railroad operations. There will be an internal process for automatic evaluation of inspection results data, tied into a system to generate work orders that will direct the Maintenance of Way (MOW) Department to repair or replace any defective guideway elements. The MOW Department will operate on a proactive basis to minimize the possibility of guideway components slipping below the State of Good Repair, by grinding rail, correcting surface anomalies, ultrasound testing of rail, etc., based on the inspection data and a planning forecast program that prevents any serious exceptions from developing.

The design, construction, operation, and maintenance of the 230 kV transmission line would meet or exceed the requirements of the National Electrical Safety Code (NESC), U.S. Department of Labor, OSHA, California Independent System Operator, Federal Energy Regulatory Commission, and VEA's requirements for safety and protection of landowners and their property.

The Proposed Project will comply with FAA regulations, including lighting regulations.

ARES will develop a fire management strategy to implement measures to minimize the potential for a human-caused fire during project construction, operation, and decommissioning. The strategy should clarify who has responsibility for fire suppression and hazardous fuels reduction, if necessary. The BLM responds to all wildfires on BLM managed public lands. The proponent, ARES, would be responsible for costs and implementation hazardous fuels reduction, including all related environmental compliance and coordination with the BLM.

Any wastewater generated on site in association with temporary, portable sanitary facilities will be periodically removed on a schedule approved by the BLM, by a licensed hauler, and introduced into an existing municipal sewage treatment facility.

Construction activity is planned to limit noisy activities to the least noise-sensitive times of day (i.e., daytime only between 7 a.m. and 7 p.m. week days).

3.8.3.1.3 Residual

Impacts caused by the Proposed Action would not result in an adverse residual health or human safety impacts in part because the Proposed Project would be required to adhere to the robust body of regulations that govern worker health and safety. These laws and other requirements have been adopted with cumulative safety considerations in mind and to be sufficiently protective of human health and safety.

3.8.3.1.4 Cumulative Impacts

Impacts caused by the projects in the cumulative scenario, combined with the Proposed Action, would not result in adverse cumulative impacts even if all of the projects were to be constructed simultaneously, in part because all projects would be required to adhere to federal, state, county, and local regulations. These laws and other requirements have been adopted with cumulative safety considerations in mind and to be sufficiently protective of human health and safety under cumulative conditions.

Cumulative impact could occur if there were a significant increase in recreational vehicle traffic on the area dirt roads, which would increase the number of public encounters with the train.

3.8.3.2 Alternative

The Alternative is designed and would be constructed using the same guidelines and processes described for the Proposed Action, despite slight variations in the location of the facilities and the southern end of the alignment. None of these changes alter how the project will interface with the public or public facilities such as roads

3.8.3.2.1 Direct and Indirect Effects

The potential direct and indirect effects of construction and operation of the Alternative would be the same as those identified and described for the Proposed Action.

3.8.3.2.2 Mitigation Measures

The mitigation measures to be implemented for the Alternative are the same as those that would be implemented for the Proposed Action.

3.8.3.2.3 Residual

The residual impacts of the Alternative would be the same as those described for the Proposed Action.

3.8.3.2.4 Cumulative Impacts

The cumulative impacts from implementing the Alternative would be the same as those described for the Proposed Action.

3.8.3.3 No Action Alternative on Human Health and Safety

3.8.3.3.1 Direct and Indirect Effects

Under the No Action Alternative, the Project Areas would remain unchanged, although VEA has long term plans to modify the existing 230kV transmission line connection to Gamebird Switch Station in the manner described under the Proposed Action.

3.8.3.3.2 Cumulative Impacts

Because the No Action Alternative would result in no direct or indirect impacts related to human health and safety, there would be no cumulative impacts associated with the No Action Alternative.

3.9 Hydrologic Conditions

3.9.1 Affected Environment

The project area is located in the Pahrump Valley area, in Hydrographic Basin 162 (504,960 acres). There are no perennial streams within the project area; there are a number of ephemeral washes (see Figure 26). Flow in the ephemeral washes can be substantial during rainfall events or spring snow melt, and may result in flash flooding in the washes and floodplains. Water resources within the project area are managed under the authority of the Federal Clean Water Act, as amended (33 USC 1251 et seq.) and Chapter 445A of the NRS.

3.9.2 Methodology

The analysis makes use of the best available data, professional judgment and field observations.

3.9.3 Environmental Consequences

3.9.3.1 Proposed Action

3.9.3.1.1 Direct and Indirect Effects

The Proposed Action has the potential to permanently impact 72 acres and temporarily impact 98 acres through ground disturbing activities. Development of the project area may alter groundwater recharge, ecological habitats, and ephemeral stream channels that can impact flooding and debris flow during storms.

The Proposed Action would utilize culverts (see Figure 26) to avoid changing drainage patterns or impeding or redirecting flood flows outside of existing flow channels. Sediment levels would not be increased to any measurable degree during runoff events due to this. All runoff from this area currently drains into Nevada Department of Transportation drainage features installed on Nevada State Highway 160.

3.9.3.1.2 Mitigation Measures

A Site Drainage Plan, a Stomwater Pollution Prevention Plan (SWPPP), and best management practices (BMPs) will be developed and utilized. Implementation of measures identified in a SWPPP would reduce impacts to hydrologic conditions. Culverts will allow current flow patterns to remain while allowing the train to travel as necessary to achieve the energy storage goal. Runoff from the facilities area will be minimize through best management practices, such as the use of gravel for vehicle areas and allowing natural vegetation to grow where is does not interfere with operations.

ARES will implement erosion controls complying with county, state, and Federal standards, such as jute netting, silt fences, and check dams, and will secure all necessary stormwater pollution prevention plan permits.

ARES will minimize ephemeral wash crossings by access roads and rail tracks to the extent practicable. All structures crossing intermittent streams will be located and constructed so the structures do not decrease channel stability, or increase water velocity.

ARES will not alter existing drainage systems and will give particular care to sensitive areas such as erodible soils or steep slopes. Soil erosion shall be reduced at culvert outlets by appropriate structures. Catch basins, roadway ditches, and culverts will be cleaned and maintained.

3.9.3.1.3 Residual Impacts

Through the use of the Site Drainage Plan, the SWPPP, and the BMPs, no increases in sediment load are anticipated in the runoff from the alluvial fan. Redirecting of existing flow patterns will be avoided to the extent possible. Since the project will not increase the amount of runoff in this area, any impacts to runoff will be negligible before flows encounter the established drainage features at Nevada State Highway 160. Due to these features, no impacts to populated areas of the Town of Pahrump are expected.

3.9.3.1.4 Cumulative Impacts

The Proposed Project would result in new disturbance of up to 170 acres. The project, in combination with other past, present, and reasonably foreseeable future actions in Hydrographic Basin 162 could contribute to cumulative increases in erosion and sedimentation.

3.9.3.2 Alternative

3.9.3.2.1 Direct and Indirect Effects

The location and configuration of the majority of the Alternative are similar to the Proposed Action, generally crossing the same washes and resulting in the same impacts to the drainage patterns in the area (See Figure 27). The location of the Operations and Maintenance facilities would require different size and location of culverts compared to the Proposed Action, but like the Proposed Action, the exact dimensions and location of those culverts would be established during the detailed design. However, the potential impacts of the project on hydrological resources in the area would be essentially the same as those described for the Proposed Action

3.9.3.2.2 Mitigation Measures

The mitigation measures for hydrologic resources described for the Proposed Action would be the same as those implemented for the Alternative.

3.9.3.2.3 Residual Impacts

The residual impacts of implementing the Alternative would be the same as those described for the Proposed Action.

3.9.3.2.4 Cumulative Impacts

The potential cumulative impacts from implementing the Alternative would be the same as those described for the Proposed Action.

3.9.3.3 No Action Alternative

3.9.3.3.1 Direct and Indirect Effects

Under the No Action Alternative, the Project ROW would be denied and hydrologic conditions would be unchanged. The Land would remain available for future development. Hydrologic conditions would continue to be impacted only by current water uses and conditions.

3.9.3.3.2 Cumulative Impacts

Because the No Action Alternative would result in no direct or indirect impacts to hydrologic conditions in the area, the existing cumulative impacts would remain unchanged.

3.10 Land Use Authorizations

3.10.1 Affected Environment

Land uses throughout the project area consist of undeveloped land, transmission lines, and recreational and U.S. Forest Service access roads. Surrounding land uses include a BLM fire station, a future Nevada System of Higher Education development site, transmission, Section 368 Energy Corridor (Section 368 of the Energy Policy Act of 2005, 42 U.S.C. § 15926), Nevada State Highway 160 Seed Collection Area, the Pahrump Speedway, and an approximately 54 acre sand and gravel quarry.

3.10.2 Methodology

The analysis makes use of the best available data, including information available in the BLM LR2000 Database, review of existing regulatory documents, maps and satellite imagery, professional judgment and field observations.

3.10.3 Environmental Consequences

3.10.3.1 Proposed Action

3.10.3.1.1 Direct and Indirect Effects

Approximately 57.5 acres of Project ROW would no longer be available for other public land uses (the 14.5 acres of trackside access and maintenance roads would be open to public use) if the Proposed Action is implemented. The existing Loop Boundary Road will be modified (merged with the trackside maintenance road for approximately 0.7 miles to reduce the required public rail crossings from three to one, without impeding existing public land travel routes), but all other existing roads in the area will be left as-is, with the exception of Carpenter Canyon Road, which will have a rail safety crossing installed, and existing transmission maintenance roads which will be upgraded to accommodate construction traffic.

The Proposed Action includes the construction of approximately 3,793 feet of new transmission interconnection, approximately 517 feet of main rail line, 1,085 feet of maintenance and spur rail line, and 3,955 feet of access road within the designated Section 368 Energy Corridor.

The Section 368 Energy Corridors may be used for siting linear facilities such as electricity transmission and distribution projects. Proposed projects should be compatible with identified energy transport modes and avoid conflicts with other land uses within a corridor. Any proposed development within Section 368 Energy Corridors must be consistent with the 2009 West-wide Energy Corridor Programmatic Environmental Impact Statement Record of Decision (2009), Settlement Agreement (Wilderness Society, et al. v. U.S. Department of Interior, No. 3:09-cv-03048 JW, filed July 03, 2012), and BLM's policy on Section 368 Energy Corridors provided under Instructional Memorandum 2014-080.

The Proposed Action is located within the Highway 160 Seed Collection Area.

A 2014 National Defense Authorization Bill designated parcel of land to be sold to the Nevada System of Higher Education is located along the transmission upgrade corridor (see Figure 33). This Congressionally designated land transfer already includes a portion of Carpenter Canyon Road and existing VEA transmission; the land is adjacent to a BLM fire station.

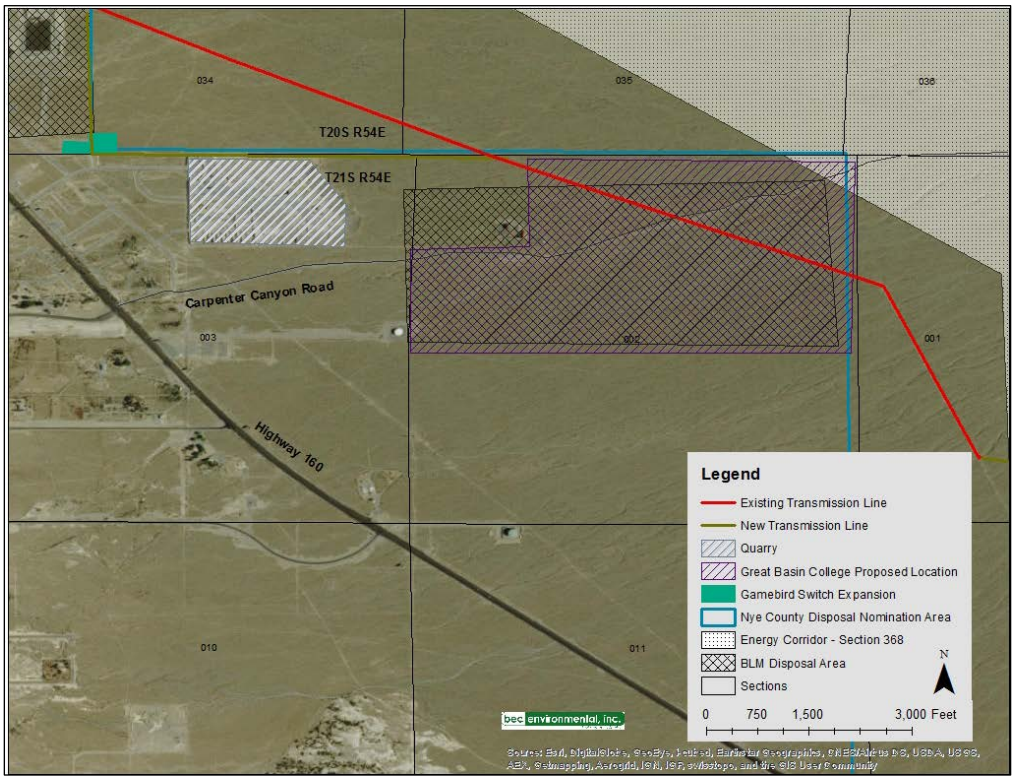

Figure 33. Location of the designated land transfer in relation to the existing VEA transmission line to be upgraded and Gamebird Switch Station.

3.10.3.1.2 Mitigation Measures

Interagency Operating Procedures state corridors are to be efficiently used. The applicant, assisted by the appropriate agency, shall consolidate the proposed infrastructure, such as access roads, wherever possible and utilize existing roads to the maximum extent feasible, minimizing the number, lengths, and widths of roads, construction support areas, and borrow areas.

The Proposed Action may require coordination with the BLM to modify infrastructure to ensure it is compatible with the purpose of the corridor. Where design modifications are insufficient to reduce conflicts of the proposed transmission line and rail line with future uses of the Section 368 Energy Corridor (if required), ARES will work further with BLM to find an acceptable compromise without violating federal statutes.

3.10.3.1.3 Residual Impacts

The Proposed Action will result in the Highway 160 Seed Collection Area being reduced by 72 acres.

Infrastructure would be constructed within the Section 368 Energy Corridor. Coordination with other agencies and companies may be required in the future if energy related infrastructure development is planned for the corridor.

ARES will work with the Nevada System of Higher Education and VEA early in the process of any proposed development for the land parcel to ensure Nevada System of Higher Education, VEA, and ARES planning objectives are met.

3.10.3.1.4 Cumulative Impacts

The Proposed Project would remove 72 acres of land from future uses and designations.

There may be some interactions with nearby planned projects, such as the Great Basin College, proposed beltway and truck route, and the proposed Public Safety Center if and when they developed. Those impacts will vary depending on the speed and order with which they are developed.

3.10.3.2 Alternative

3.10.3.2.1 Direct and Indirect Effects

For the Alternative, 55.5 acres of land no longer available for other public land uses (the 14.5 acres of trackside access and maintenance roads would be open to public use). As with the Proposed Action, existing Loop Boundary Road will be modified (merged with the trackside maintenance road for approximately 0.7 miles to reduce the required public rail crossings from three to one, without impeding existing public land travel routes), but all other existing roads in the area will be left as-is, with the exception of Carpenter Canyon Road, which will have a rail safety crossing installed, and existing transmission maintenance roads which will be upgraded to accommodate construction traffic.

As with the Proposed Action, the Alternative includes the construction of approximately 3,712 feet of new transmission interconnection, approximately 910 feet of main rail line, 605 feet of maintenance and spur rail line, and 3,720 feet of access road, within or adjacent to the designated Section 368 Energy Corridor. Unlike the Proposed Action, for the Alternative, the ARES substation, the shuttle car maintenance building, and the operations buildings would be constructed within the Section 368 Energy Corridor.

Section 368 Energy Corridors may be used for siting linear facilities such as electricity transmission and distribution projects. Proposed projects should be compatible with identified energy transport modes and avoid conflicts with other land uses within a corridor. Any proposed development within Section 368 Energy Corridors must be consistent with the 2009 West-wide Energy Corridor Programmatic Environmental Impact Statement Record of Decision (2009), Settlement Agreement (Wilderness Society, et al. v. U.S. Department of Interior, No. 3:09-cv-03048 JW, filed July 03, 2012), and BLM's policy on Section 368 Energy Corridors provided under Instructional Memorandum 2014-080.

All other Land Use impacts from the implementation of the Alternative would be the same as described for the Proposed Action. Mitigation Measures

Interagency Operating Procedures state corridors are to be efficiently used. The applicant, assisted by the appropriate agency, shall consolidate the proposed infrastructure, such as access roads, wherever possible and utilize existing roads to the maximum extent feasible, minimizing the number, lengths, and widths of roads, construction support areas, and borrow areas.

The Proposed Action may require coordination with the BLM to modify infrastructure to ensure it is compatible with the purpose of the corridor. Where design modifications are insufficient to move infrastructure outside the Section 368 Energy Corridor boundary (if required), ARES will work with BLM to find an acceptable compromise without violating federal statutes.

3.10.3.2.2 Residual Impacts

The Proposed Action will result in the Highway 160 Seed Collection Area being reduced by 70 acres.

Infrastructure would be constructed within the Section 368 Energy Corridor. Coordination with other agencies and companies may be required in the future if energy related infrastructure development is planned for the corridor.

ARES will work with the Nevada System of Higher Education and VEA early in the process of any proposed development for the land parcel to ensure Nevada System of Higher Education, VEA, and ARES planning objectives are met.

3.10.3.2.3 Cumulative Impacts

Cumulate impacts from implementation of the Alternative would be the same as those described for the Proposed Action.

3.10.3.3 No Action Alternative

3.10.3.3.1 Direct and Indirect Effects

Under the No Action Alternative, BLM would deny the Project ROW and the land would remain available for other uses. There would be no residual impacts to any roads or other projects that may be built on or near the Project site.

3.10.3.3.2 Cumulative Impacts

Because the No Action Alternative would result in no direct or indirect impacts related to human health and safety, there would be no cumulative impacts associated with the No Action Alternative. No additional jobs or tax base would be created.

3.11 Geology and Mineral Resources

This section provides an overview of the geologic conditions that occur within the proposed project area to assist in identifying the possible effects of the Proposed Action.

3.11.1 Affected Environment

The site is located in the Pahrump Valley, which lies in the southwestern portion of the Great Basin, within the Basin and Range physiographic province. The Pahrump Valley is a horst and graben system, typical of the Basin and Range Physiographic Province. The valley was formed as extensional forces in the Tertiary Period pulled apart the existing carbonate bedrock. As the bounding mountains were pulled away from each other, the central block was forced down, eventually forming a deep linear depression. As sediments eroded off the surrounding mountains, they filled this depression to several thousand feet, burying the ancient carbonates and creating the modern alluvial fan and valley floor.

Deposits in the Pahrump Valley are mainly Tertiary age (from 67 million to 2 million years old) and Quaternary Age (from 2 million years old to present). These deposits are comprised of unconsolidated sediments derived from the surrounding uplifted mountain ranges, which, in the vicinity of Carpenter Canyon area, are mainly Cambrian rock formations (comprised of dolomite and limestone) and late Precambrian formations (comprised of quartzitic sandstone, siltstone, micaceous shale, and marble).

Minerals found on BLM-managed lands, or that are under BLM management, fall within three categories: Leasable minerals, locatable minerals, and saleable minerals (also referred to as mineral materials). Leasable minerals are divided into fluid and solid. Fluid leasables include oil, gas, and geothermal resources. Solid leasables include coal, phosphate, potash, and sodium. Locatable minerals include hard-rock minerals such as gold, silver, and other minerals found in specific deposit locations. Saleable

minerals include materials commonly used in building and construction projects. These include sand, gravel, stone, clay, etc (BLM Southern Nevada District Office, 2014).

The General Mining Law of 1872, as amended, opened public lands of the United States to mineral acquisition by the location and maintenance of mining claims. Mineral deposits subject to acquisition in this manner are generally referred to as "locatable minerals." The BLM LR2000 database indicates there are no mining claims, mineral claims, or mineral leases in the project area.

Mineral materials within the project area are public property and administered by the BLM under the regulations at 43 CFR 3600 (Mineral Materials Disposal) and the Federal Aid to Highway Act. Mineral materials are authorized for disposal by the Las Vegas RMP and Final Environmental Impact Statement (October, 1998). The regulations at 43 CFR 3600 establish procedures for the exploration, development, and disposal of mineral material resources on the public lands, and for the protection of the resources and the environment. The regulations apply to free use permits and contracts for sale of mineral materials. The sale, free use or issuance of a material site right-of-way for mineral materials must be in conformance with the RMP, Minerals Management Section (Code MN), the Federal Aid to Highway Act and the regulations found at 43 CFR 3600. Any mineral materials extracted, severed or removed from public lands without a contract, free use permit or material site right-of-way constitutes unauthorized use. Unauthorized users are liable for damages to the United States, and are subject to prosecution for such unlawful acts (BLM Southern Nevada District Office, 2014).

There are no active, pending, or expired mining Plans of Operation or Notices, or active or pending sodium, potassium prospecting, or mineral material permits in the area of the Proposed Action.

3.11.2 Methodology

The analysis makes use of the best available data (the BLM LR2000), and the professional judgment of geology specialists. The analysis also compared an overlay of the project area with active mining claims and leases.

3.11.3 Environmental Consequences

3.11.3.1 Proposed Action

3.11.3.1.1 Direct and Indirect Effects

No active mining claims are present within the Proposed Action area.

Excavation in the project area may result in the production of mineral materials, such as sand and gravel for railbed construction. These mineral materials will be used within the right-of-way or stockpiled within the right-of-way for future use at this or another location. If mineral materials are to be stockpiled within the right-of-way for future use, they must be obtained in accordance with the regulations found at 43 CFR 3600 or under the Federal Aid to Highways Act in the form of a contract, free use permit or material site right-of-way before they can be removed from the right-of-way.

If a contract, free use permit or material site right-of-way is necessary for the export of excess mineral materials, the BLM will issue the required contract, free use permit or material site right-of-way so long as it falls within the analyzed area.

3.11.3.1.2 Mitigation Measures

Mitigation measures will be developed in coordination with the BLM as necessary.

3.11.3.1.3 Residual Impacts

Because the Proposed Action is not expected to result in impacts to geology and mineral resources, there would be no residual impacts.

3.11.3.1.4 Cumulative Impacts

Contributions to cumulative impacts would be limited to future plans for mineral development; there are no pending claims within the Action Area.

Because the Proposed Action would not result in impacts to geology and mineral resources, there would be no contribution to cumulative impacts.

3.11.3.2 Alternative

3.11.3.2.1 Direct and Indirect Effects

No active mining claims are present within the Alternative area. The potential effects on geology and mineral resources from implementing the Alternative are the same as were described for the Proposed Action.

3.11.3.2.2 Mitigation Measures

Mitigation measures to be implemented for the Proposed Action would be implemented for the Alternative.

3.11.3.2.3 Residual Impacts

Because the Proposed Action would not result in impacts to geology and mineral resources, there would be no residual impacts.

3.11.3.2.4 Cumulative Impacts

The potential cumulative impacts of the Alternative would be the same as described for the Proposed Action.

3.11.3.3 No Action Alternative

Under the No Action Alternative, the Project ROW would be denied and the Proposed Action would not take place. The area would remain open to future claims and leases.

3.11.3.3.1 Direct and Indirect Effects

Under the No Action Alternative, the Project ROW would be denied, the Project would not take place, and geology and minerals at the site would not be either directly or indirectly impacted. The project area would remain available for future minerals claims requests or development.

3.11.3.3.2 Cumulative Impacts

Because the No Action Alternative would result in no direct or indirect impacts related to geology or minerals, there would be no new cumulative impacts associated with the No Action Alternative.

3.12 Recreation

The BLM manages recreation on public lands by identifying Special Recreation Management Areas (SRMAs). SRMAs have a distinct recreation market and corresponding management strategy. BLM managed public lands not delineated as SRMAs are managed as Extensive Recreation Management Areas (ERMAs) and do not require a specific management strategy or activity-level planning, but emphasize dispersed and diverse recreation opportunities.

3.12.1 Affected Environment

The Project Area offers limited potential for recreation opportunities. Although there are no developed recreation sites within the Project Area, roads and trails are used for dispersed recreation on a limited basis. The predominant recreation activities would be hunting access to the Spring Mountains and casual OHV use.

3.12.2 Methodology

Recreation use data were not collected for the area, or for this portion of the Southern Nevada ERMA. The analysis makes use of the best available data, professional judgment and field observations to identify specific recreational trends and opportunities in the project area and on nearby lands. The analysis also compares the project area boundary with known routes accessing the Spring Mountains.

3.12.3 Environmental Consequences

3.12.3.1 Proposed Action

3.12.3.1.1 Direct and Indirect Effects

Only the facilities area would be fenced and closed to public use. This would result in the long term loss of approximately 0.8 acres of public land currently available for dispersed recreation activities. Based on the acreage of this area, and the available surrounding land, this would be a negligible impact.

Access to the Spring Mountains via Carpenter Canyon Road may be impacted during construction; equipment deliveries and movement could create delays for public users. The road will remain open to the public once construction is complete. One rail crossing will be added, which will include flashing lights and standard railroad signs. All other crossings will have standard signage only. During operation, the train may pause at this crossing, causing public travel to be delayed.

Loop Boundary road, at the northeast end of the rail corridor, will be rerouted for a short section (approximately 0.7 miles) to merge with the proposed trackside maintenance road to eliminate two rail crossings without impeding existing public land travel routes (see Figure 32 in Section 3.8.3.1.1). This will limit public rail crossings and potential issues. As with Carpenter Canyon Road, the train may pause at this crossing, causing public travel to be delayed.

3.12.3.1.2 Mitigation Measures

Delays to public travel would be limited in frequency and duration. The exact impact has not yet been determined but will be described in future Plan of Development updates submitted to the BLM for approval.

All existing recreation routes impacted by the proposed project would be maintained for public use. Travel routes shall be maintained by providing crossing either over or under the proposed project.

3.12.3.1.3 Residual Impacts

The Project Area has limited opportunities for dispersed recreation, and development would not result in the displacement of recreation.

3.12.3.1.4 Cumulative Impacts

Other developments on free use public lands, such as the proposed Nevada System of Higher Education Great Basin College Campus development, would contribute to the loss of currently available public lands for dispersed recreation through land closures and route access restrictions. However, the Action

Area has limited opportunities for dispersed recreation, and development would not result in the displacement of recreation. Other reasonably foreseeable future actions would have similar impacts, since they would also be located in areas providing limited opportunities for recreation.

3.12.3.2 Alternative

3.12.3.2.1 Direct and Indirect Effects

The effects of the Alternative on recreation would be the same as those described for the Proposed Action.

3.12.3.2.2 Mitigation Measures

Mitigation measures developed and implemented for the Proposed Action would be implemented for the Alternative.

3.12.3.2.3 Residual Impacts

Residual impacts from implementing the Alternative would be the same as described for the Proposed Action.

3.12.3.2.4 Cumulative Impacts

The cumulative impacts from implementing the Alternative would be the same as described for the Proposed Action.

3.12.3.3 No Action Alternative

3.12.3.3.1 Direct and Indirect Effects

Under the No Action Alternative, the Project ROW would be denied and recreation opportunities and access would continue to be managed consistent with the objectives of the Southern Nevada ERMA, in the BLM Las Vegas RMP. The land would remain available for future development.

3.12.3.3.2 Cumulative Impacts

Because the No Action Alternative would result in no direct or indirect impacts related to human health and safety, there would be no cumulative impacts associated with the No Action Alternative.

3.13 Socioeconomic Values

"Management of BLM lands within the planning area has and will continue to have important social implications for many individuals and groups. This includes local residents that depend on development activities on BLM lands as a source of employment, income, or subsistence" (BLM Southern Nevada District Office, 2014). This socioeconomic analysis provides an overview of the human environment and resources in the vicinity of the project area, including the population and demographics, economic characteristics, and social infrastructure (housing, schools, and other facilities) that could be affected by the construction and operation of the Proposed Project.

3.13.1 Affected Environment

Although the project is located in both Nye and Clark Counties, the socioeconomic impacts are anticipated mainly in the Town of Pahrump. The project is geographically isolated from the population of Clark County by the Spring Mountains and an approximate 26 mile drive along Nevada State Highway 160 from the project site to the one of the nearest population centers in Clark County, Mountain Springs, Nevada.

The Town of Pahrump is the population center of Nye County, located at the southernmost tip of the County, situated between the City of Las Vegas, approximately 60 miles away, and the California border. Demographics for the Town are included in Table 3-5.

Table 3-5 Demographics for the Town of Pahrump

Sector	Pahrump	Nye County	Nevada	United States
Population[1]	36,583	43,946	2,700,551	308,745,538
Unemployment[2]	22.1%	18.0%	13.7%	9.6%
Poverty Rate[3]	21.9%	21.5%	13.0%	14.3%
Percent Minority[1]	13.8%	14.1%	33.8%	26.7%
Per Capita Income[3]	21,262	21,340	26,520	26,530

[1]Data is from the 2010 U.S. Census data and is available at www.census.gov.

[2]Data for Nye County, Nevada, and the United States is for the 2010 average unemployment rate from the Bureau of Labor Statistics and is available at www.bls.gov. Data for Pahrump was not available from the Bureau of Labor Statistics and instead is reported from the 2010 American Community Survey 3-year Estimates and is available at www.census.gov.

[3]Data for the United States is from the 2009 American Community Survey and is available at http://www.census.gov/newsroom/releases/archives/income_wealth/cb10-144.html. Data for Pahrump, Nye County, and Nevada is from the 2010 American Community Survey 3-year Estimates and is available at www.uscensusbureau.gov. The 2010 American Community Survey 3-year Estimates report the poverty rate nationally as 14.4% and the per capita income as $26,942.

Almost half of Pahrump's residents are employed in industries most impacted by the recession, including entertainment, construction, and retail. A list of the employment distribution as of 2013 is provided in Table 3-6. Since the economic downturn, the unemployment rate in the community has become one of the highest in the nation, resulting in more residents below poverty and lower per capita incomes.

Table 3-6 Town of Pahrump Employment Distribution as of 2013

Employment Industry	Number of Workers	Percentage of Total
Agriculture, forestry, fishing, hunting, and mining	1,083	7.8
Construction	1,489	10.8
Manufacturing	445	3.2
Wholesale trade	234	1.7
Retail trade	1,491	10.8
Transportation, warehousing, and utilities	740	5.3
Information	223	1.6
Finance, insurance, real estate, rental, and leasing	374	2.7
Professional, scientific, management, administrative, and waste management services	1,168	8.4
Educational services, health care, and social assistance	2,101	15.2
Arts, entertainment, recreation, accommodation, and food services	2,684	19.4
Other services, except public administration	849	6.1
Public Administration	965	7.0
Total for all Sectors	**13,846**	**100**

Between 2007 and 2013, the median household income in Pahrump fell from $42,601 to $41,653. By way of comparison, the 2013 U.S. median household income was $52,250. As the median household income fell, the population of Nye County decreased by approximately 3.8% from 2010 to 2013, resulting in a decrease from 43,946 residents to 42,297 residents. Conversely, the population of Clark County increased during that time by approximately 3.9%, from 1,951,269 in 2010, to 2,027,868 in 2013 (US Census Bureau, 2014).

In 2013, the total number of housing units listed was 21,957, of these, 18,046 were occupied and 3,911 (more than 18%) were reported as vacant.

In 2012, Nye County, in conjunction with key stakeholders throughout its jurisdictional boundaries, including the Town of Pahrump, partnered to form the Nye County Regional Economic Development Authority (NCREDA) to work throughout the County to improve economic conditions. NCREDA was developed as the economic support structure critical to the region's economic welfare. NCREDA's vision, mission, objectives, and strategic initiatives were aligned with the Governor's Office of Economic Development (GOED) Strategy, "Moving Nevada Forward: A Plan for Excellence in Economic Development, 2012 – 2014".

NCREDA works closely with GOED to coordinate economic development efforts, learn from the successes and challenges of other Regional Development Authorities (RDAs), and proactively engage in coordination and cooperation among RDAs, consistent with Nye County's Comprehensive Economic Development Strategy. These efforts included the pursuit of four key Target Sectors for pursuit within the Region, including: aerospace and defense; mining, materials and manufacturing; tourism, gaming, and entertainment; and clean energy.

The ARES project was initially approached by NCREDA members and subsequently received support from the Nye County Board of Commissioners to construct their project in the Town of Pahrump.

3.13.2 Methodology

The analysis makes use of the best available data and professional judgment to identify specific socio-economic trends and opportunities in the project area and on nearby lands.

3.13.3 Environmental Consequences

3.13.3.1 Proposed Action

3.13.3.1.1 Direct and Indirect Effects

The direct economic impacts of the construction phase will depend on the dollar value and quantity of materials available for purchase locally, as well as personal income and employment. The majority of construction materials, much of which is highly technical, with the exception of natural resources, such as sand, gravel, stone, and concrete products (those with little value-added), will likely be imported and have minimal impact on the local economy. Labor accounts for a significant portion of total construction costs. As more construction workers spend their wages and salaries for household consumption in the local area, the positive impacts associated with these jobs increases. As many as 100 to 125 full time construction workers are expected to be on site during construction, which is expected to last up to six months. ARES anticipates hiring a Pahrump, Nevada, based construction company with locally-based employees. Thus the personal income, jobs, increased sales by local suppliers of construction goods and services, and other direct economic benefits associated with the project are likely to stay within the Town of Pahrump. Similarly, indirect benefits, including local secondary consumer and supply-chain goods and services

would be expected. Also, the hiring of a local, established company, will limit the negative impacts on community services and local government an in-migration of new workers may affect.

During the operation of the facility 15 to 16 full time workers are expected to be on site during the facility's 24 hour, seven days per week operation. Anticipated benefits associated with these long-term jobs include personal income, new jobs, and business expenditures. Indirect benefits would include expansion of the local supply chain providing goods and services in support of direct suppliers to the project. Additionally, the new project would amount to a diversification of the local economy in the energy industry that would be consistent with one of the four target industry sectors identified in both the County's Comprehensive Economic Development Strategy (CEDS) document and with the Governor's Office of Economic Development Strategy.

The local government would experience an increase in property tax revenues. Materials will be sourced locally to the extent possible (technical equipment may have limited distributors), to reduce shipping costs and impacts.

Economic benefit associated with the project in Clark County is likely to be minor, primarily comprised of fees associated with Clark County air quality and land use planning permits, and property taxes.

On both a local and a regional scale, socio-economics stands to benefit from the ultimate purpose for the project – energy regulation management, which promotes a secure and reliable electrical power service for residents, business, and industry

The Proposed Action may result in some negative social and economic impacts during construction including: (1) reduced scenic quality (see Visual Resources, Section 3.18); (2) increased dust levels during the six month construction period (see Air Quality, Section 3.3); and (3) increased traffic during construction (see Transportation, Section 3.15), possibly affecting tourism. These would be offset by the increase in short-term construction jobs and long-term operations and maintenance jobs, resulting in a possible increase in local businesses such as housing, restaurants, gas stations, grocery stores, entertainment and supply related businesses. The presence of the Proposed Action and its associated jobs would also lead to a much needed increased tax base for local and state governments.

3.13.3.1.2 Mitigation Measures

As described above, it is not anticipated the Project would result in the need for new or expanded local government or community services; therefore, mitigation measures are not anticipated to be needed.

3.13.3.1.3 Residual Impacts

It is anticipated that the Project would result in minimal in-migration, and as a result, not increase the service populations of local government and community services to an extent which would cause social change or disruption in local communities. During operation, the Proposed Action is expected to create approximately 15 to 16 long-term positions. No noticeable additional in-migration is expected to occur as a result of these long-term jobs being created.

3.13.3.1.4 Cumulative Impacts

Because the Project would not result in impacts that could be experienced disproportionately within the identified low-income areas, it would not contribute to cumulative environmental justice impacts.

As indicated above, it is anticipated that the Project would result in minimal in-migration, and as a result, would not increase the service populations of local government and community services or cause social

change or disruption in local communities. Projects in the cumulative scenario can be expected to create additional long-term positions, the number of which would be based on their sizes and employment sector. The potential cumulative impacts of the Proposed Action in combination with other reasonably foreseeable projects would not be significant.

3.13.3.2 Alternative

3.13.3.2.1 Direct and Indirect Effects

The direct and indirect economic impacts of implementation of the Alternative would be the same as those described for the Proposed Action.

3.13.3.2.2 Mitigation Measures

As described for the Proposed Action, no economic impacts from implementation of the Propsoed Alternative, therefore, mitigation measures are not anticipated to be needed.

3.13.3.2.3 Residual Impacts

The potential residual impacts of implementation of the proposed project are the same as those described for the Proposed Action.

3.13.3.2.4 Cumulative Impacts

The potential cumulative impacts of implementation of the Alternative are the same as those described for the Proposed Action.

3.13.4 No Action Alternative

3.13.4.1.1 Direct and Indirect Effects

Under the No Action alternative the Project ROW would be denied and the project would not be built. The socioeconomic conditions within and around the Project Area would not be enhanced by either short-term construction or long-term job opportunities, perpetuating the economic recession in Pahrump. Similarly, the initiatives promoted to expand and diversify the local economy through both a Comprehensive Economic Strategy and direct efforts to attract new and innovative companies like ARES would be negated and the social and economic efforts already spent in pursuing the project would be lost. Finally, the electrical grid system would remain without a local facility for energy regulation and management, thereby maintaining existing levels of electrical transmission stability and reliability.

3.13.4.1.2 Cumulative Impacts

Because the No Action Alternative would result in no direct or indirect impacts related to socio economics, there would be no cumulative impacts associated with the No Action Alternative.

3.14 Soils

3.14.1 Affected Environment

Soils within the project area are managed under the authority of the Federal Clean Water Act, as amended (33 USC 1251 et seq.) and Chapter 445A of the NRS.

The Project Area predominantly includes the Commski-Lastchance and Irongold-Weiser associations (Natural Resources Conservation Service, 2014). Lesser percentages of Irongold, Commski-Oldspan-Lastchance and Lastchance-Commski associations also exist in the area. The soils are alluvium derived from limestone and dolomite. The predominant soil characteristics consist mostly of a surface covered in

cobbles or stones, with a profile of extremely gravelly sandy loam (below five inches) and very gravelly fine sandy loam (above five inches) to extremely and very gravelly loam.

The following information is excerpted from the *Final Report, Landscape Analysis, Chapter 1: Characterization of the Spring Mountains National Recreation Area* (Entrix, Inc., 2008):

> *The biological soil crust is found at the surface in the open spaces between plants in most arid ecosystems (Belnap et al. 2001). Biological soil crusts are a mosaic of cyanobacteria, green algae, lichens, mosses, microfungi, and other bacteria (Belnap et al. 2001). The cyanobacterial and microfungal filaments hold soil particles in place, reducing soil loss from wind and water erosion (Belnap and Gillette 1998). Additionally, biological soil crusts function as living mulch by retaining soil moisture and discouraging annual weed growth (Belnap et al. 2001). Certain species of cyanobacteria and lichens fix atmospheric nitrogen, and are often the primary nitrogen source for higher plants (Evans and Ehleringer 1993; Belnap 2002). In the Spring Mountains NRA, biological soil crusts primarily occur at the lower elevations ranging from desert scrub up through pinyon-juniper vegetation communities.*

Biological soil crusts were observed on higher elevation areas of the project site during a BLM field visit in March 2015.

Desert pavement does exist in the Action Area. Once desert pavement has been disrupted, the underlying soil is subject to wind and water erosion and there is a greater possibility of non-native plants being able to take root, as explained in the quote from Haff (March 2001).

> "*Desert pavement surfaces are typically mechanically weak. Most surface clasts on well-developed pavements lie in edge-to-edge contact with their neighbors, somewhat like the mosaic on a tiled floor. Clasts are seated in the underlying fine-grained matrix, but they are not strongly cemented to each other or to the matrix. Pavement stones are often easily dislodged by a footstep. Long-term pavement stability is a function of isolation from disruptive forces, not of strength of the pavement itself. This type of stability may be termed "environmental stability" to distinguish it from a stability gained from inherent mechanical resistance to physical disruption such as characterizes duricrusts. The importance of recognizing environmentally stable systems lies in their potential role as detectors of environmental change, since the longevity of their present state is due to relative stability of the local environment*. (Haff, March 2001)"

3.14.2 Methodology

Soil data were obtained from the United States Department of Agriculture's Natural Resource Conservation Service (NRCS) Soil Survey Geographic Database, and from survey NV755 (Clark County Area).The analysis of the data makes use of the best available data, professional judgment, and field survey observations. The analysis also compared an overlay of the U.S. Department of Agriculture, Natural Resources Conservation Service soil map of the project area to identify soil types, runoff and erosion potential.

3.14.3 Environmental Consequences

3.14.3.1 Proposed Action

Construction will involve grading of the surface within the project area. Cut and fill sections will also be needed to maintain an even grade for the rail of approximately 8%.

3.14.3.1.1 Direct and Indirect Effects

Activities in the Project Area have the potential to directly impact 170 acres of soil resources through compaction and wind and storm water-related erosion. Commski-Lastchance, Irongold-Weiser, Irongold, Commski-Oldspan-Lastchance, Lastchance-Commski, Purob-Irongold, and Lastchance-Ferrogold-Commdki associations are common soil associations in the area of the Proposed Project; construction and operation of the REM facility will impact a small portion of the each soil association. Soil loss may occur through sediment transport, particularly in areas where the desert pavement is disturbed.

Biological soil crusts were observed on higher elevation areas of the project site during a BLM field visit in March 2015.

As much of 170 acres of desert pavement may be lost, this will contribute incrementally to existing declines.

3.14.3.1.2 Mitigation Measures

Although application of the proposed design features would reduce impacts to soils, disturbance of 170 acres of soils as a result of the Proposed Action would remain in the short term, and disturbance of 72 acres of soils as a result of the Proposed Action would remain in the long term. The use of water or an alternative BLM-approved dust palliative on disturbed area will preserve soil by reducing wind erosion resulting from the destruction of desert pavement in disturbed areas. Culverts will be installed in the rail bed to maintain the normal passage of rainwater and reduce erosion. Weed free straw bales or waddles may also be utilized as necessary to reduce erosion from storm water runoff during construction. The reseeding of temporary disturbance areas after construction activities have been completed will also control erosion and reduce any potential remaining impacts.

3.14.3.1.3 Residual Impacts

Residual impacts to soil resources in the Project Area would include the loss of 170 acres of desert pavement. The 72 acres of long term disturbance may be subject to mitigation through the use of a dust palliative, but at least minor wind and water erosion can be anticipated.

3.14.3.1.4 Cumulative Impacts

The Proposed Action would contribute to the cumulative impacts on soil resources in the basin. The cumulative loss of soils for the Proposed Project and other RFFA could be large, but due to the nature and type of the variables cannot be adequately quantified (level of development within the Planning District or a designated corridor, for example).

3.14.3.2 Alternative

The location of the Alternative is the same as for the Proposed Action, except for the small modifications in the location of the Operation and Maintenance facilities and the adjusted alignment of the southern end of the rail corridor. However, these changes do not alter the soil associations affected by the project as described for the Proposed Action.

3.14.3.2.1 Direct and Indirect Effects

The potential direct and indirect effects of the Alternative on soil resources, and the effects of the soil on construction considerations are the same as described for the Proposed Action.

3.14.3.2.2 Mitigation Measures

The mitigation measures to be implemented for the Alternative are the same as those described for the Proposed Action.

3.14.3.2.3 Residual Impacts

The potential residual impacts impact on soil resources from the Project Alternative are the same as those described for the Proposed Action.

3.14.3.2.4 Cumulative Impacts

The potential cumulative impacts from implementation of the Alternative are the same as those described for the Proposed Action

3.14.3.3 No Action Alternative

3.14.3.3.1 Direct and Indirect Effects

Under the No Action Alternative, the Project ROW would be denied and the Actions Area would remain unchanged. Current activities in the area, such as off road vehicle use, grazing, etc., would continue.

No additional direct or indirect soil resources would be impacted. The land would remain available for future development and ROW requests.

3.14.3.3.2 Cumulative Impacts

Because the No Action Alternative would result in no direct or indirect impacts related to soils, there would be no new cumulative impacts associated with the No Action Alternative.

3.15 Transportation

3.15.1 Affected Environment

Access to the Project Area is provided by a combination of state highways and county and BLM roads. Local traffic on federal lands is served by improved and unimproved BLM roads. The Nevada Department of Transportation (NDOT) measures annual average daily traffic (AADT) on federal and state highways. Two major transportation corridors pass through downtown Pahrump: Nevada State Highway 160 running north to south, and Nevada State Highway 372 running from the Nevada-California state line east to Highway 160. The portion of Highway 160 passing the access to the Action Areas, from 0.1 miles north of Highway 327 to 15.6 miles north of Nevada State Highway 159 in Clark County, had a combined AADT of 58,000 for 2013. Nevada State Highway 372 from 0.1 miles east of the Nevada/California state line (California State Highway 178) to 0.8 miles west of Highway 160 had a combined AADT of 11,300 for 2013. Nevada State Highway 160 from 0.1 miles south of US-95 (north of Pahrump) to 0.1 miles north of SR-372 had a combined AADT of 22,900 for 2013.

In addition to monitoring AADT, NDOT also produces a report providing information on the number and types of accidents that occur on Nevada roads. This report is prepared with cooperation from other Nevada agencies, including Department of Motor Vehicles, Nevada Department of Public Safety, and local law enforcement agencies. In 2010, Nye County reported motor vehicle accidents total of 419 in 2008, 467 in 2009, and 494 in 2010 (Nevada Department of Transportation Safety Engineering Division, 2010). In 2010, 6 of the 15 reported fatality accidents in Nye County occurred in Pahrump.

3.15.2 Methodology

The analysis of potential traffic congestion and travel delays on US Route 95 and Nevada State Highway 160 during peak construction was used as an impact indicator of the change in traffic density by road (i.e., percent of carrying capacity). A comparison of the existing traffic density with expected densities during construction and operation was evaluated to determine the potential effect on local traffic.

3.15.3 Environmental Consequences

3.15.3.1 Proposed Action

3.15.3.1.1 Direct and Indirect Effects

Traffic in the Pahrump area will have a noticeable increase during the construction phase of the project. There will be a one month period during the six month construction phase when a majority of the rail line ballast will be delivered to the Project Area. The Proposed Action would generate increases in traffic volumes on highways providing access to the project area and on county and operator-maintained roads within the Action Area. Heavy haul traffic would not carry deliveries from southern California, as California State Highway 178 would not support the heavy vehicles. ARES does not anticipate receiving heavy haul deliveries from the Las Vegas area, either. It is anticipated a majority of heavy haul traffic will access the site from the north, utilizing U.S. Route 95 and Nevada State Highway 160. In addition, the increase in traffic may potentially increase fugitive dust levels and vehicle emissions (see Air Quality, Section 3.3).

Existing dirt roads used to access the Project Area will require upgrades including the installation of culverts in existing drainages to level the road surface, and the application of standard Type 2 gravel, obtained from a local source (yet to be determined). These roads will then be maintained during the life of the project, as they will also act as site access.

The mean travel time to work for Nye County residents in 2012 surveys was 28.7 minutes (US Census Bureau, 2014). The increase in construction traffic may negatively impact travel time to work for Pahrump residents during the construction phase and increase congestion in the Town of Pahrump and on roads and highways providing access to the project site. Rerouting traffic through residential areas and roadways other than Nevada State Highway 160, would further slow traffic in town, and would increase the level of danger from accidents for motorists and residents.

Operation of the Project would require a workforce of up to 16 full-time-equivalent positions. This workforce would include administrative and management personnel, operators, security and maintenance personnel. Employees would be based at the on-site Operations and Control building. Operation and maintenance would require the use of vehicles and equipment such as pickup trucks. Because operation and maintenance of the Project would generate substantially less traffic than construction activities, no adverse impacts are expected to occur due to the traffic generated during the operation and maintenance phase of the Proposed Action.

3.15.3.1.2 Mitigation Measures

ARES will consult with Nye County Planning authorities, the Sheriff's Office, and other agencies, regarding increased traffic during the construction phase, including an assessment of the number of vehicles per day, their size, and type. Specific issues of concern (e.g., location of school bus routes and stops) will be identified and addressed in the traffic management plan.

3.15.3.1.3 Residual Impacts

Once construction is completed, any variance in traffic levels due to the Proposed Action will be negligible, as the project anticipates no more than five employees on site at one time.

3.15.3.1.4 Cumulative Impacts

In addition, the proposed beltway and truck route for the Town of Pahrump are still in the planning stages and are not expected to begin construction prior to the completion of the Proposed Action (see Figure 34). If these bypass routes are completed, any impacts to community residence due to modifications in traffic levels due to the Proposed Action, would likely be eliminated.

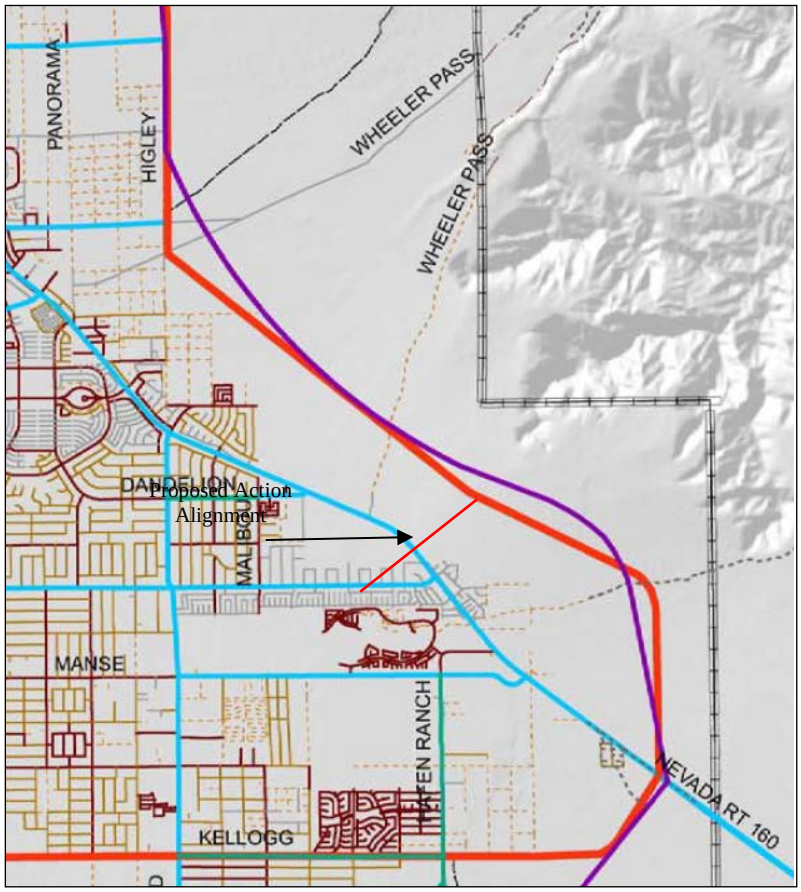

Figure 34. Proposed Pahrump beltway (red) and truck route (purple) passing the Proposed Project areas.

3.15.3.2 Alternative

3.15.3.2.1 Direct and Indirect Effects

The potential direct and indirect effects of the Alternative on transportation are the same as for the Proposed Action.

3.15.3.2.2 Mitigation Measures

Mitigation measures developed and implemented for the Proposed Action would be implemented for the Alternative.

3.15.3.2.3 Residual Impacts

The potential residual impacts of the Alternative would be the same as described for the Proposed Action.

3.15.3.2.4 Cumulative Impacts

The potential cumulative impacts of the Alternative are the same as those described for the Proposed Action.

3.15.3.3 No Action Alternative

3.15.3.3.1 Direct and Indirect Effects

Under the No Action Alternative, the Project ROW would be denied and transportation in the area would continue to be subject to existing conditions.

3.15.3.3.2 Cumulative Impacts

Because the No Action Alternative would result in no new direct or indirect impacts related to transportation, there would be no cumulative impacts associated with the No Action Alternative.

3.16 Vegetation Excluding Federally Listed Species

3.16.1 Affected Environment

3.16.1.1 General Vegetation

Vegetation cover types described and mapped under the Southwest Regional Gap Analysis Project (US Geological Survey, 2004) were used to evaluate plant communities in the proposed project area. Land cover types occurring within the potentially affected area of the proposed project area are shown in Figure 35. North American Warm Desert Pavement, Inter-Mountain Basins Semi-Desert Shrub Steppe, and Mojave Mid-Elevation Mixed Desert Scrub communities that occur within the project area are generally widespread and present throughout the Mojave Ecoregion. These vegetation communities provide a variety of ecosystem services with direct and indirect economic benefits to humans such as wildlife habitat, soil, water, and air protection, and a setting for recreation, and are an important component of the viewshed. The vegetation communities that occur within the project area are generally widespread and present throughout the Mojave Ecoregion, but can also be considered a limited and finite resource.

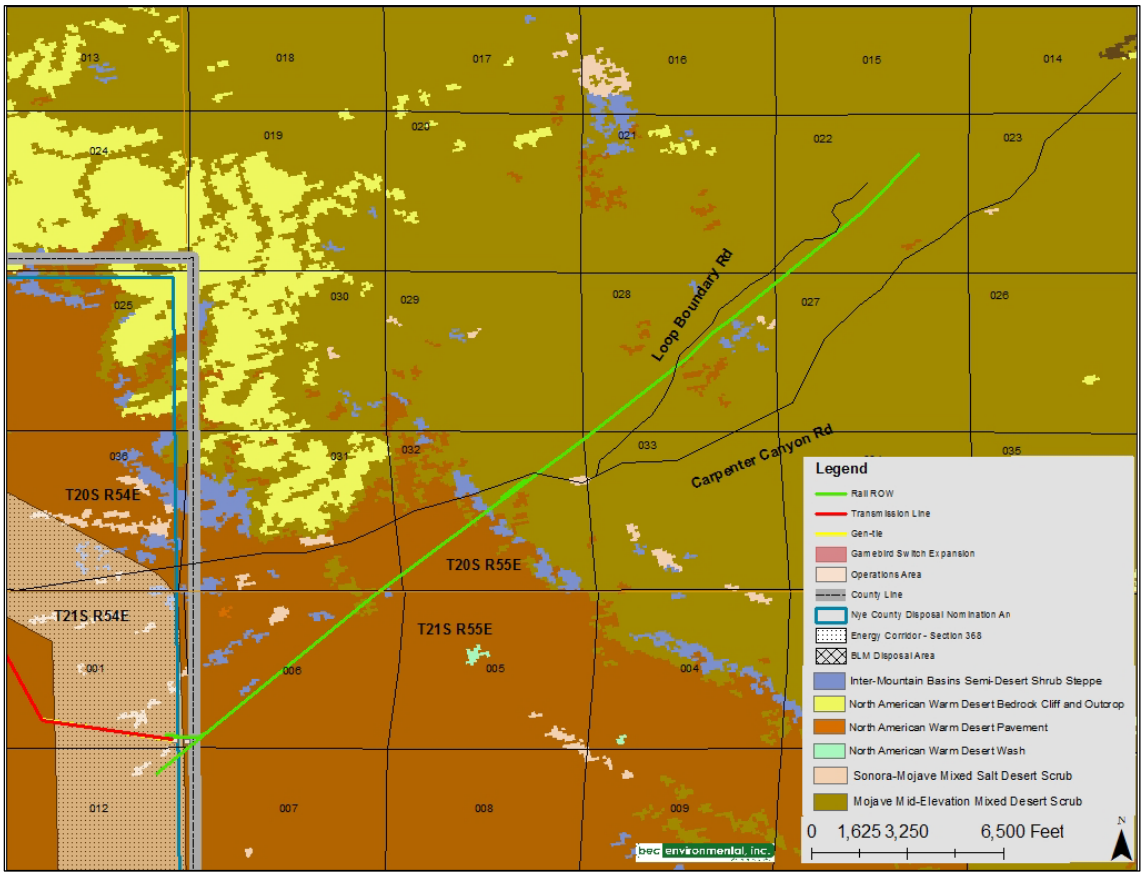

Figure 35. Southwest Regional Gap Analysis Project mapped vegetation communities.

3.16.1.1.1 North American Warm Desert Pavement

This vegetative community comprises 13,105 acres in the BLM Southern Nevada District.

The Southwest Regional Gap Analysis Project describes this community as an ecological system occurring throughout much of the warm deserts of North America, "and is composed of unvegetated to very sparsely vegetated (<2% plant cover) landscapes, typically flat basins where extreme temperature and wind develop ground surfaces of fine to medium gravel coated with "desert Varnish." Very low cover of desert scrub species such as *Larrea tridentata* or *Eriogonum fasciculatum* is usually present. However, ephemeral herbaceous species may have high cover in response to seasonal precipitation, including *Chorizanthe rigida*, *Eriogonum inflatum*, and *Geraea canescens*."

3.16.1.1.2 Inter-Mountain Basins Semi-Desert Shrub Steppe

This vegetative community comprises 4,092 acres in the BLM Southern Nevada District.

The Southwest Regional Gap Analysis Project describes this community as an, "ecological system occurs throughout the Intermountain western U.S., typically at lower elevations on alluvial fans and flats with moderate to deep soils. This semi-arid shrub-steppe is typically dominated by graminoids (>25% cover) with an open shrub layer, but includes sparse mixed shrublands without a strong graminoid layer. Characteristic grasses include *Achnatherum hymenoides*, *Bouteloua gracilis*, *Distichlis spicata*, *Hesperostipa comata*, *Pleuraphis jamesii*, *Poa secunda*, and *Sporobolus airoides*. The woody layer is often a mixture of shrubs and dwarf-shrubs. Characteristic species include *Atriplex canescens*, *Artemisia*

filifolia, *Chrysothamnus greenei*, *Chrysothamnus viscidiflorus*, *Ephedra* spp., *Ericameria nauseosa*, *Gutierrezia sarothrae*, and *Krascheninnikovia lanata*. Scattered *Artemisia tridentata* may be present but does not dominate. The general aspect of occurrences may be either open Shrubland with patchy grasses or patchy open herbaceous layer. Disturbance may be important in maintaining the woody component. Microphytic crust is very important in some occurrences."

3.16.1.1.3 Mojave Mid-Elevation Mixed Desert Scrub

This vegetative community comprises 532,079 acres in the BLM Southern Nevada District.

Described by the Southwest Regional Gap Analysis Project as an, "ecological system represents the extensive desert scrub in the transition zone above *Larrea tridentata-Ambrosia dumosa* desert scrub and below the lower montane woodlands (700-1800 m elevations) that occurs in the eastern and central Mojave Desert. It is also common on lower piedmont slopes in the transition zone into the southern Great Basin. The vegetation in the ecological systems is quite variable. Codominants and diagnostic species include *Coleogyne ramosissima, Eriogonum fasciculatum, Ephedra nevadensis, Grayia spinosa, Menodora spinescens, Nolina* spp., *Opuntia acanthocarpa, Salazaria mexicana, Viguiera parishii, Yucca brevifolia*, or *Yucca schidigera*. Desert grasses include *Achnatherum hymenoides, Achnatherum speciosum, Muhlenbergia porter, Pleuraphis jamesii, Pleuraphis rigida*, or *Poa secunda*, may form an herbaceous layer. Scattered *Juniperus osteosperma* or desert scrub species may also be present.

The presence of noxious weeds can result in the loss of desert scrub through increased fire probabilities, or outcompeting the native species. The treatment and handling of noxious weeds are regulated by NRS 555.130-201 and NAC Chapter 555. Lists of weed species reviewed in connection with the Proposed Action included the Nevada Department of Agriculture (NDA) Noxious Weed List (Nevada Department of Agriculture, 2014) and the Federal Noxious Weed List (US Department of Agriculture, December 2010). No noxious weeds were observed during the field surveys conducted for this project.

3.16.1.2 BLM Special Status Species

This section includes BLM Sensitive plant species and plants protected in the State of Nevada under NRS 527 (except cactus and yucca, which are discussed in Section 3.16 Forestry). The BLM manages special-status plant species according to BLM Manual 6840. Protection of Nevada special-status plant species is provided under NRS 527.050 and NRS 527.260–527.300.

The area occupied by rare plant habitats in the BLM Southern Nevada District management area is finite. In general, the acreage of rare plant habitat has been steadily decreasing due to BLM realty actions, congressionally mandated land transfers, mining, wildfire, and unlawful and/or trespass actions. This decrease has been predominantly on multiple-use lands within designated disposal boundaries and utility corridors. In general, rare plant habitats are slow to recover following disturbance, such as casual use recreation and grazing, which can also promote colonization by non-native invasive species.

In an August 23, 2013, letter the Nevada Natural Heritage Program (NNHP) stated habitat for the ivory-spined agave (*Agave utahensis* var. *eborispina*), an NNHP vulnerable species, and Mojave milkvetch (*Astragalus mohavensis* var. *mohavensis*), an NNHP imperiled species, may occur in the area of the Proposed Action. NNHP information noted occurrences of halfring milkvetch (*Astragalus mohavensis* var. *hemigyrus*), a BLM sensitive species, were recorded in the vicinity of the Action Area in April 1999, the closest of which was identified 0.5 miles west of the Project Area.

BLM designated sensitive species with the potential include the halfring milkvetch (noted above), yellow two-toned penstemon (*Penstemon bicolor* ssp. *bicolor*), rosey two toned penstemon (*Penstemon bicolor*

ssp. *roseus*), white bearpoppy (*Arctomecon merriamii*), Pahrump Valley buckwheat (*Eriogonum bifurcatum*), and Death Valley beardtongue (*Penstemon fruticiformis* ssp. *amargosae*).

Additional USFS (Spring Mountains National Recreation Area) special status plant species with the potential to occur within the upper elevations of the Project area and special status plant species that may occur in the vicinity of the Project area are listed in Table 3-7.

Table 3-7. Sensitive species potentially occurring in or around the Project Area.

Special Status Species	Common Name	ESA Status	BLM Status	Nevada Status	NNHP	NNPS	Habitat Present/ Species Observed
Arctomecon merriamii	white bearpoppy	Not Listed	Sensitive	N/A	Watch List	Watch List	No/No
Agave utahensis var. *eborispina*	ivory-spined agave	Not Listed	N/A	Vulnerable	Watch List	No Concern	No/No
Astragalus mohavensis var. *hemigyrus*	halfring milkvetch	Not Listed	Sensitive	Imperiled	At Risk	Watch List	Yes/No
Eriogonum bifurcatum	Pahrump Valley buckwheat	Not Listed	Sensitive	N/A	Sensitive	Threatened	No/No
Eriogonum heermannii var. *clokeyi*	Clokey buckwheat	Not Listed	Sensitive	Imperiled	At Risk	Watch List	No/No
Penstemon bicolor ssp. *bicolor*	yellow two-tone beardtongue	Not Listed	Sensitive	Imperiled	At Risk	Watch List	Yes/No
Penstemon bicolor ssp. *roseus*	rosey two-tone beardtongue	Not Listed	Sensitive	Vulnerable	At Risk	Watch List	Yes/No
Penstemon fruticiformis ssp. *amargosae*	Death Valley beardtongue	Not Listed	Sensitive	N/A	At Risk	Threatened	No/No

White bearpoppy (*Arctomecon merriamii*)
Known to occur in Mohave desert scrub habitat, on barren, gravelly places up to rocky slopes; some populations have been observed on limestone. This bearpoppy typically occurs around 3,937 feet (1,200 meters), but can occur as low as 1,968 feet (600 meters) and up to 5,906 feet (1,800 meters) (NatureServe, 2015).

Ivory-spined agave (*Agave utahensis* var. *eborispina)*
Known to occur in the Mojave Desert in desert scrub to conifer woodland, on calcareous outcrops between 3,609 feet (1,100 meters) and 3,937 feet (1,200 meters) (University of California, Berkeley, 2013).

Halfring milkvetch (*Astragalus mohavensis* var. *hemigyrus*)
Known to occur on rocky ledges and arid gravelly hillsides in the Creosote Bush Scrub community, Joshua tree "woodland," in carbonate soil, at elevations around 4,232 feet (1,290 meters) (NatureServe, 2015).

Pahrump Valley buckwheat (*Eriogonum bifurcatum)*
Known to occur in Chenopod scrub communities, on saline, clay or silt hardpan soils on and near dry playa margins, and on adjacent shore terraces, stabilized sand dunes, and sandy slopes. This buckwheat typically occurs between 984 feet (300 meters) and 2,786 feet (850 meters) in elevation (NatureServe, 2015).

Clokey buckwheat (*Eriogonum heermannii* var. *clokeyi*)
Known to occur in Nevada on limestone gravelly to rocky flats, slopes, and washes, saltbush, blackbrush, or sagebrush communities, pinyon-juniper and montane conifer woodlands between 3,937 feet (1,200 meters) and 6,234 feet (1,900 meters). Variety *clokeyi* is restricted to scattered locations mainly in the Spring (Charleston) Mountains and Sheep Range of Clark County, with outlying populations in limestone mountains around Mercury and just entering Lincoln County in the Hiko Range (Flora of North America Association, 2008).

Yellow two-toned beardtongue (*Penstemon bicolor* ssp. *bicolor*)
Known to occur on calcareous or carbonate soils in washes, roadsides, rock crevices, outcrops, or similar places receiving enhanced runoff, between 2,500 feet (762 meters) and 5,480 feet (1,670 meters) elevation (NatureServe, 2015).

Rosey two-toned beardtongue (*Penstemon bicolor* ssp. *roseus*)
Known to occur on rocky calcareous, granitic, or volcanic soils in washes, roadsides, scree at outcrop bases, rock crevices, or similar places receiving enhanced runoff, in the creosote-bursage, blackbrush, and mixed-shrub zones. Elevation profile is between 1,800 feet (762 meters) and 4,839 feet (1,670 meters) elevation (Bureau of Land Management, 2010).

Death Valley beardtongue (*Penstemon fruticiformis* ssp. *amargosae*)
Known to occur in creosote brush scrub, in gravely washes, canyon floors and juniper/pine woodlands in Nevada (Wetherwax, 2002). Occurs at elevations between 3,281 feet (1,000 meters) and 3,937 feet (1,200 meters).

3.16.2 Methodology

An ArcGIS overlay of project components (short-term and long-term disturbance areas) was compared with mapped vegetation communities downloaded from the Southwest Regional Gap Analysis website. Habitat descriptions and known occurrences for special status species were reviewed prior to field surveys; and plant identification keys were utilized during the field surveys for special status species potentially occurring in or near the Action Area.

3.16.3 Environmental Consequences

3.16.3.1 Proposed Action

3.16.3.1.1 Direct and Indirect Effects

General Vegetation

The Proposed Action has the potential to impact 72 acres in the long term and another 98 acres in the short term (170 acres in total) through ground disturbing activities.

Construction activities associated with the Proposed Action would include clearing and grubbing which would result in a decrease in native plant cover and increased soil disturbance. Vegetation removal also provides an opportunity for non-native weeds species to colonize the project area. Noxious and/or invasive weeds compete with native species for sunlight, soil, water, nutrients, and space, reducing forage productivity. Additionally, soil disturbance could reduce the native seed bank associated with the site.

Indirect effects include increased vehicle traffic during all phases of the Proposed Action, but primarily during the construction phase, which would also contribute to the potential spread of noxious and/or invasive weeds (see full discussion of Noxious Weeds in Section 3.4). Vehicles are effective pathways of introduction for weeds by dispersing seeds along roadways. (See Section 3.20 Wildlife for additional potential impact discussion.)

Special Status Species

Although no special status species were observed during field surveys, the potential for occurrences within the Action Area still exists. Because of this, the Proposed Project may result in the direct loss of individual plants and suitable habitat. Nearby populations of other BLM sensitive plant species including halfring milkvetch may also be indirectly impacted if the Proposed Action leads to the introduction and spread of invasive species. However, the disturbance of habitat is also known to increase populations of some special status species, such as the yellow and rosey two-toned beardtongues.

3.16.3.1.2 Mitigation Measures

During construction, impacts would be limited to as small a footprint as possible through the use of flags to delineate boundaries. Temporary disturbance areas will be restored in accordance with BLM guidelines in order to reduce short and long-term impacts. Upon final closure of the site at the end of the project life, vegetation will be restored to comply with current BLM guidelines.

ARES will develop an integrated vegetation management plan consistent with applicable regulations and agency policies for the control of unwanted vegetation, noxious weeds, and invasive species (E.O. 13112). The plan will address monitoring; ROW vegetation management; the use of certified weed-seed-free hay, straw, and/or mulch; the cleaning of vehicles to avoid the introduction of invasive weeds; education of personnel on weed identification, the manner in which weeds spread, and the methods for treating infestations.

To restore disturbed habitats, ARES will prepare a habitat restoration plan to identify the approach and methods to be used to restore habitats disturbed during project construction activities. The plan will be designed to expedite the recovery to natural habitats supporting native vegetation, and require restoration to be completed as soon as practicable after completion of construction, minimizing the habitat converted at any one time. To ensure rapid and successful restoration efforts, the plan will include restoration success criteria, including time frames, which will be developed in coordination with the BLM.

In addition, the following plans would be prepared and implemented that would further reduce impacts to vegetation:

- Fire Protection Plan
- Noxious Weed Management Plan
- Decommissioning and Site Reclamation Plan

3.16.3.1.3 Residual Impacts

Although application of proposed design features would reduce impacts to vegetation, disturbance of 72 acres of vegetation as a result of the Proposed Action would remain in the long term. These impacts will be unavoidable. However, these impacts will contribute incrementally to existing declines in the quantity and quality of these vegetation communities in the BLM Southern Nevada District.

3.16.3.1.4 Cumulative Impacts

During development cumulative impacts to native vegetation and the ecosystem services they provide would occur on 170 acres. The North American Warm Desert Pavement, Inter-Mountain Basins Semi-Desert Shrub Steppe, and Mojave Mid-Elevation Mixed Desert Scrub communities within the project area are generally widespread and present throughout the Mojave Ecoregion. These vegetation communities provide a variety of ecosystem services with direct and indirect economic benefits to humans such as wildlife habitat, soil, water, and air protection, and a setting for recreation, and are an important component of the viewshed. For cumulative impacts the area of analysis is the lands administered by the Las Vegas and Pahrump Field Offices. These vegetation communities are widespread within this area; however, both are a limited and finite resource. When combined with other reasonably foreseeable actions and the cumulative scenario described in Section 3.2, the Proposed Action would result in an incremental addition to current declines in the quantity and quality of native vegetation in the analysis area. As described in Section 3.2, a major reason impacts to vegetation in the Mojave Desert are cumulative is because of the extremely slow rate of natural recovery. Restoration (seeding and soil decompaction) does not replace natural recovery, but it can speed the rate of recovery. Increased resource protection is beneficial because native vegetation and soils in the Mojave can be fragile. As little as one pass from a vehicle can create a new road, unless steps are taken to prevent additional disturbance.

3.16.3.2 Alternative

3.16.3.2.1 Direct and Indirect Effects

General Vegetation

The Alternative has the potential to impact 70 acres in the long term and another 98 acres in the short term (168 acres in total) through ground disturbing activities, an area slightly smaller than that for the Proposed Action. The potential effects of the project on these vegetation within the Alternative area are the same as those described for the Proposed Action.

Special Status Species

The potential effects of the Alternative on Special Status Species are the same as those described for the Proposed Action.

3.16.3.2.2 Mitigation Measures

The mitigation measures that would be implemented for the Alternative are the same as those developed and described for the Proposed Action.

3.16.3.2.3 Residual Impacts

The potential residual impacts of the Alternative are the same as those described for the Proposed Action.

3.16.3.2.4 Cumulative Impacts

The potential cumulative impacts of the Alternative are the same as those described for the Proposed Action.

3.16.4 No Action Alternative

3.16.4.1.1 Direct and Indirect Effects

Under the No Action Alternative, the Project ROW would be denied and vegetation would continue to be managed consistent with the objectives of the BLM Las Vegas RMP. The land would remain available for future development.

3.16.4.1.2 Cumulative Impacts

Because the No Action Alternative would result in no direct or indirect impacts related to vegetation, there would be no cumulative impacts associated with the No Action Alternative.

3.17 Forestry

3.17.1 Affected Environment

Two different forestry program vegetative resources are present in the Proposed Area and are affected by the proposed action, native seed and cactus and yucca plants. Native seed, collected by commercial vendors under a BLM issued permit, is important for revegetation, mine reclamation, habitat restoration, and fire rehabilitation of private and public lands. The Proposed Project is part of the State Highway 160 Seed Collection Area. Individual cactus and yucca plants, sold to the public under a permit, are considered wildings and are in demand for drought tolerant and native plant landscaping as well as habitat restoration and reclamation projects on public lands.

BLM administers the sale of forest products and other vegetative resources under 43 CFR 5400. In Nevada IM-NV-2010-055 and draft IM-NV-2014-013 clarify and provide guidance to the disposal, sale and pricing of forest products on BLM lands in the state.

3.17.2 Methodology

A density estimate of the number of cactus and yucca plants present within the project areas was completed and used to evaluate impacts to Forestry Program concerns. Surveys were conducted on April 27, May 25, and September 25, 2014. Seven species of cacti and three species of yucca observed during the surveys. Species counts for the rail corridor and facilities area are listed in Table 3-8. Species counts for each of the transmission corridors (interconnection with ARES substation, existing transmission to be upgraded, and new transmission) are listed in Table 3-9.

Table 3-8. Cactus and yucca species observed in the rail corridor and facilities area, including counts for each.

Common Name (*Species*)	Totals
silver cholla (*Cylindropuntia echinocarpa*)	1,010
hedgehog cactus (*Echinocereus engelmannii*)	955
cottontop cactus (*Echinocactus polycephalus*)	181
desert spinystar (*Escobaria vivipara* var. *deserti*)	19
barrel cactus (*Ferocactus cylindraceus*)	17
fishhook cactus (*Mammillaria tetrancistra*)	1
beavertail cactus (*Opuntia basilaris*)	484
banana yucca (*Yucca baccata*)	75
Joshua tree (*Yucca brevifolia*)	4,800
Mojave yucca (*Yucca schidigera*)	5,351
Totals	**12,893**

Table 3-9. Cactus and yucca species observed in the interconnection, existing transmission, and new transmission corridors, including counts for each.

Common Name (*Species*)	Totals
silver cholla (*Cylindropuntia echinocarpa*)	565
hedgehog cactus (*Echinocereus engelmannii*)	131
cottontop cactus (*Echinocactus polycephalus*)	209
desert spinystar (*Escobaria vivipara* var. *deserti*)	2
barrel cactus (*Ferocactus cylindraceus*)	0
fishhook cactus (*Mammillaria tetrancistra*)	6
beavertail cactus (*Opuntia basilaris*)	251
banana yucca (*Yucca baccata*)	0
Joshua tree (*Yucca brevifolia*)	83
Mojave yucca (*Yucca schidigera*)	2,228
Totals	**3,475**

3.17.3 Environmental Consequences

3.17.3.1 Proposed Action

3.17.3.1.1 Direct and Indirect Effects

The Proposed Action would result in the loss of approximately 72 acres within the Highway 160 Collection Area. Opportunities for commercial contractors to collect native seed on public lands are limited by stand location and the density of target species. On average Las Vegas Field office has issued one commercial collection permit for the area every two to three years. The proposed action would directly affect area of land that BLM can use to issue future seed collection contracts to native seed collectors in the area. Because many of the target species occur elsewhere, the reduction in seed collection area would be negligible.

An estimate of the density of cacti and yucca present was calculated based on surveying 175 acres. It is estimated 16,368 cactus and yucca plants are present within the Proposed Project Area and would be impacted by the Proposed Action through removal or habitat loss.

3.17.3.1.2 Mitigation Measures

The proponent has requested BLM allow them to purchase cactus and yucca in the impact area at salvage sale pricing set by the BLM Nevada State Office.

3.17.3.1.3 Residual Impacts

Residual impacts would include the long term loss of potentially 72 acres of Highway 160 Collection Area and cactus and yucca habitat.

3.17.3.1.4 Cumulative Impacts

It is assumed that all reasonably foreseeable future development on BLM lands would be subject to the same design features and mitigation measures which reduce the potential cumulative impacts to forestry program concerns.

3.17.3.2 Alternative

3.17.3.2.1 Direct and Indirect Effects

The potential direct and indirect effects of the Alternative are the same as those described for the Proposed Action, but in a slightly smaller area.

3.17.3.2.2 Mitigation Measures

The mitigation measures developed and described for the Proposed Action would be implemented for the Alternative.

3.17.3.2.3 Residual Impacts

The potential residual impacts from the Alternative would be the essentially same as those described for the Proposed Action.

3.17.3.2.4 Cumulative Impacts

The potential cumulative impacts from the Alternative would be essentially the same as those described for the Proposed Action.

3.17.3.3 No Action Alternative

3.17.3.3.1 Direct and Indirect Effects

Under the No Action Alternative, the Project ROW would be denied and forestry resources would continue under current conditions. The land would remain available for other development requests.

3.17.3.3.2 Cumulative Impacts

Because the No Action Alternative would result in no direct or indirect impacts related to forestry resources, there would be no new cumulative impacts associated with the No Action Alternative.

3.18 Visual Resources

All lands administered by the BLM are managed to achieve some level of visual or scenic quality. The BLM uses a visual resource management (VRM) system to identify and manage scenic values on federal lands administered by that agency. The VRM system includes a visual resource inventory, which classifies visual resources on BLM land into one of four categories (Class I, II, III, or IV), and sets management objectives through the RMP process. The manner in which the four visual resource inventory classifications are determined is explained in BLM Handbook H-8410-1, *Visual Resource Inventory* and Handbook H-8431-1, *Visual Resource Contrast Rating*.

3.18.1 Affected Environment

The Las Vegas Southern Nevada District Office has classified the Proposed Action Area as VRM Class III (BLM Southern Nevada District Office, 2014). The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. New projects can be approved that are not large scale, dominating features (i.e., geothermal power plant or major mining operation would not be approved).

3.18.2 Methodology

A contrast rating was done from critical viewpoints, known as Key Observation Points (KOPs), located along Nevada State Highway 160 (a commonly traveled route) and within and above the ROW.

Six KOPs were selected to determine the potential impacts of the proposed project on visual resources within the project area (see Figure 36 and Photos 1 - 6). The primary public views of the proposed project would be from Nevada State Highway 160; less frequent public views would occur along the ROW itself, from recreational users. KOPs were selected to represent effects of the Project as seen from public areas that permit a high degree of visibility to the project area.

The degree of visual contrasts was rated at each KOP, based on the form, line, color, and texture changes between the existing landscapes and how the landscapes would look after implementation of the potential project (see Table 3-10).

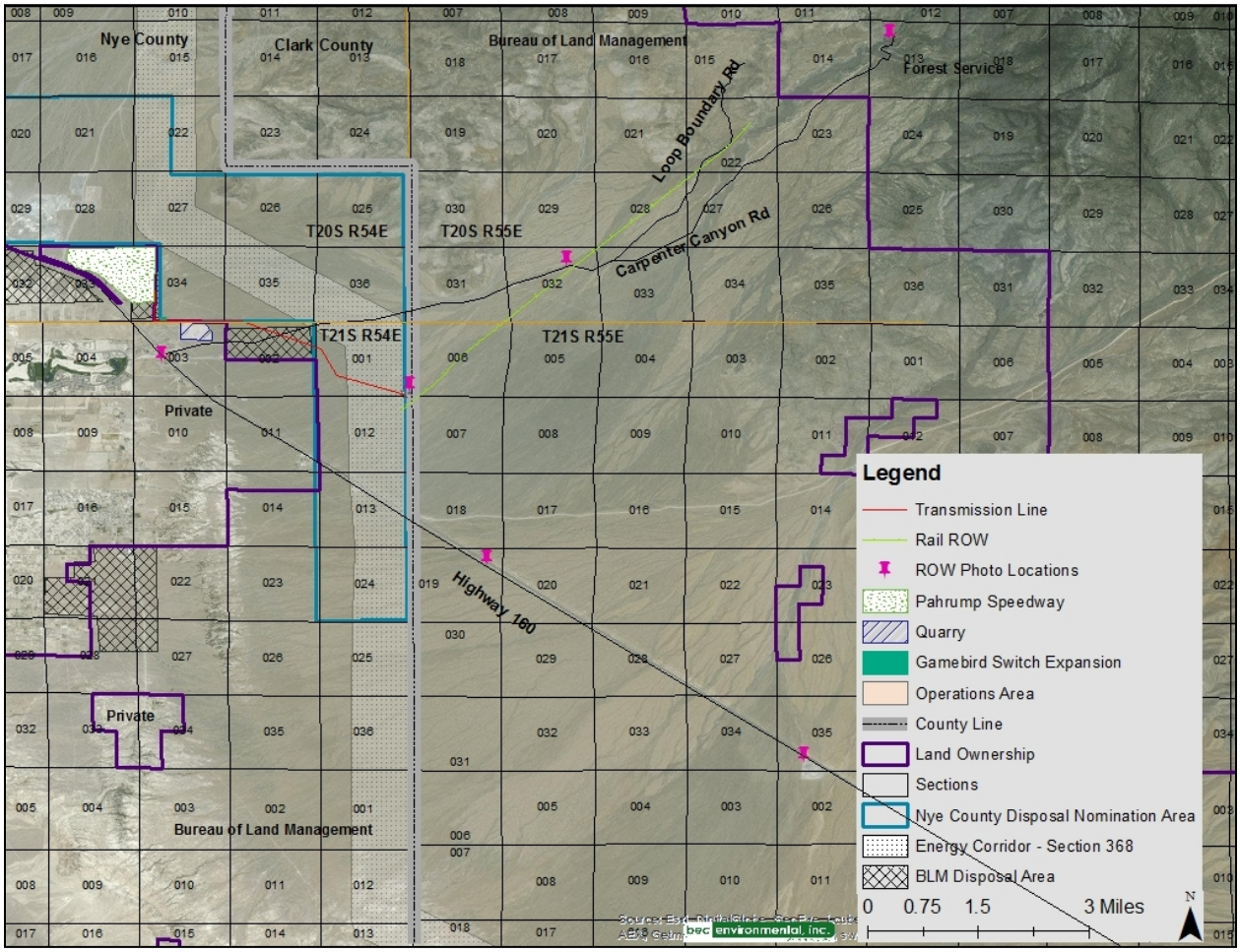

Figure 36. Visual resource analysis Key Observation Point locations.

3.18.3 Environmental Consequences

3.18.3.1 Proposed Action

3.18.3.1.1 Direct and Indirect Effects

In the general vicinity of the Proposed Action, the natural and undisturbed visual environment is dominant, but utility lines, fence lines, dirt roads, billboards, and highway signage are also highly visible elements of the landscape. Once completed, the REM facility would be consistent with VRM Class III; since most viewers would be traveling by car along Nevada State Highway 160. The Proposed Action is

an acceptable modification in VRM Class III and is not anticipated to dominate the visual landscape of the casual observer.

Photographs were taken of the Proposed Project Area at Key Observation Points (KOP), distances ranging from more than six miles distant to adjacent to the Proposed ROW. Each KOP was chosen based on the likelihood of public observation of the surrounding area and potentially the Project Area. The photographs were taken on June 11, 2014.

Photo 1. View from Nevada State Highway 160, looking northwest. Rail corridor is approximately 6.5 miles distant, in the middle ground.

Photo 2. View of the Proposed Action Area, mid ground right side, from Nevada State Highway 160, looking northwest. The facilities area is approximately 2.5 miles distant.

Photo 3. Mid elevation, rail corridor centerline, of the Proposed Action, looking southwest toward the Pahrump Valley.

Photo 4. View from 2.25 miles upslope of the Proposed Action Area, looking southwest toward Pahrump Valley.

Photo 5. Proposed Action Area facilities location, looking northeast along the proposed alignment, with Mount Charleston in the background.

Photo 6. View of the Proposed facilities area, approximately 2.75 miles distant, looking east, with the rail corridor extending from center middle ground to the left of the picture.

Photo 7. The ARES Tehachapi Pilot Project (1/5th scale) in operation (note: the Proposed Action will utilize an overhead catenary line, not the trackside rail shown in the photo, and the proposed project does not include installation of wind energy turbines as shown in the background of this photograph).

Table 3-10. Visual Resources and Impacts Summary for the Proposed Action

	Land	Water	Vegetation	Structures	Impacts
Form	Mostly flat, gently rising toward the Spring Mountains. Mountains dominate in the distance. Transmission lines, fences, and billboards dominate in the near distance in multiple directions.	None.	Low to moderate in height, dispersed and distant.	Eye is drawn to roadside signs and structures, including transmission lines and billboards, which dominate the near ground view.	**Weak to Moderate**: The Proposed Action would impact the existing populated area's far view form with a dominant line running upslope, perpendicular to most near view linear structures, very similar to how existing unimproved roads appear. The Proposed Action becomes dominant for viewers traveling the dirt roads crossing the alluvial fan.
Line	Near distance dominated by horizontal lines formed by	None.	Jagged in the foreground, but mainly horizontal	Distinct vertical and horizontal lines are created from the	**Weak to Moderate**: The Proposed Action would add an additional linear feature to the

	Land	Water	Vegetation	Structures	Impacts
	transmission lines, fences, billboards, and the highway blacktop; jagged hill and mountain profiles more distant surround the area. The transmission lines and highway features create unnatural straight lines. After construction of the Proposed Action, the additional line may not be apparent until focus shifts to the far ground.		lines created by subtle changes in density and variations in vegetation cover which is predominantly creosote at lower elevations, Joshua tree at higher elevations.	transmission lines, support poles, signage and sections of fence. Blacktop creates distinct lines. Structures become less dominant for a viewer along the dirt roads crossing the alluvial fan.	area. The modification would not likely be noticed as inconsistent with the near ground, but may seem inconsistent if viewed from one of the dirt roads on the alluvial fan.
Color	Vegetative greens and browns in the soil. Some rocks exhibit shades of gray. Colors darken during rain events and snow adds a white contrast to the mountains and hills.	None.	Ranges from green to brown to black, depending on the weather, season, and distance of viewer. Areas of yellow dominate during blooming.	Most noticeable during the day is the blacktop of the highways, buildings, and transmission lines for lower elevation viewers. The dark brown of the transmission poles blends with the topography, unless viewed with a blue sky background. Yellow to light brown clouds of dust are produced from OHV traffic on the existing dirt roads. Night lighting would produce a contrast due to the lack of other light sources in the Action Areas direction.	**Weak to Moderate**: The Proposed Action would not appreciably modify the color of the area, with the exception of vehicles on site and night lighting. The contrasting color of the vehicles would only be noticeable in the near ground. Lighting used for night operations will be visible from a greater distance at night than other impacts. However, such lighting will be shielded to direct light where needed and minimize other impacts.

	Land	Water	Vegetation	Structures	Impacts
Texture	Broken/clumpy in the foreground from vegetation. Pahrump Valley exhibits a smooth texture broken with buildings and roads.	None.	Coarse and clumpy in the immediate foreground. Texture changes to smooth as vegetation blends in the distance. Hills and mountains in the far distance create a jagged texture.	Highways and transmission lines create a visible linear feature. Occasional views of recreational vehicles interrupt the naturally flowing lines of the area.	**Weak to Moderate**: The Proposed Action is expected to minimally modify the texture of the area, as structures will be painted to blend with the surrounding area. Contrast will not be readily apparent from lower elevations. Area texture will be more noticeably modified for closer viewers.

3.18.3.1.2 Mitigation Measures

All lighting would be designed to provide the minimum illumination needed to achieve safety and security objectives, and be directed downward and shielded to focus illumination on the desired areas. Lighting is planned to be installed at the exterior of the buildings and within the on-site substation.

Standard rail safety lighting will be installed at the Carpenter Canyon Road crossing. This lighting will only be activated when the train is approaching the crossing. The train shuttle cars will have lights identifying the head and tail of the train, and possibly the sides of each shuttle car (this may just be reflective items).

Structures within the facilities area, as well as the train shuttle cars, will be colored to conform to the current BLM Standard Environmental Colors chart (Standard Environmental Color Chart CC-001: June 2013), selecting the most appropriate color to as closely as possible match the predominant background colors of the immediate area. Color selection will be a shade or two darker than the surrounding landscape to account for natural shadows, normal fading, and weathering, and be approved by the BLM.

3.18.3.1.3 Residual Impacts

Although application of the proposed design features would reduce impacts to visual resources, moderate levels of visual contrasts from the Proposed Action would remain in the long term.

3.18.3.1.4 Cumulative Impacts

The development of other reasonably foreseeable future actions would result in the modification of undeveloped public land managed as VRM Class III. The level of change to the characteristic landscape from the cumulative impacts of all development would be low. Other reasonably foreseeable future actions would have similar impacts, also in areas with existing modifications, and would need to abide by BLM visual impact standards.

3.18.3.2 Alternative

3.18.3.2.1 Direct and Indirect Effects

The potential effects of the Alternative on the visual resources in the area will be the same as described for the Proposed Action.

3.18.3.2.2 Mitigation Measures

The mitigation measures developed for the Proposed Action would be implemented for the Alternative.

3.18.3.2.3 Residual Impacts

The potential residual impacts of the Alternative are essentially the same as those described for the Proposed Action.

3.18.3.2.4 Cumulative Impacts

The potential cumulative impacts of the Alternative are essentially the same as those described for the Proposed Action.

3.18.3.3 No Action Alternative

3.18.3.3.1 Direct and Indirect Effects

Under the No Action Alternative, the Project ROW would be denied and visual resources in the project area would continue to be influenced by the existing modifications to the landscape and land uses, and managed consistent with the objectives of the BLM Las Vegas RMP. The land would remain available for future development and it is possible that some form of development could occur in this location if the Proposed Action were not authorized.

3.18.3.3.2 Cumulative Impacts

Because the No Action Alternative would result in no direct or indirect impacts related to visual resources, there would be no new cumulative impacts associated with the No Action Alternative.

3.19 Wild Horses and Burros

3.19.1 Affected Environment

There are five wild horse herd management areas (HMA) managed by the Southern Nevada BLM District Office. Of those HMAs, the Proposed Action is located within the Wheeler Pass HMA

Under the direction of the 1971 Wild Free-Roaming Horses and Burros Act, the BLM evaluates and monitors the Wheeler Pass Herd Management Area and determines how many wild horses and burros can live there along with a variety of wildlife and recreational users. The Wheeler Pass HMA is divided into two separate sections by the Spring Mountain Recreation Area. The HMA covers approximately 273,000 acres. The Wheeler Pass HMA is part of the Spring Mountains Complex and was determined to have a carrying capacity of 933 Animal Unit Months (AUMs) that can be supported by the available forage; based on this calculation, the Appropriate Management Level (AML) was set at 47 to 66 wild horses and 20 to 35 wild burros. This AML is based on the coordinated management between the BLM and the U.S. Forest Service. Populations within the HMA were estimated to be 335-443 horses and 109-164 burros in 2014; BLM estimates wild horse and burro populations generally increase by 20 percent annually.

During the hot summer months, burros tend to occupy shaded areas such as ravines, while wild horses tend to remain in open country. During cooler months, both horses and burros roam the entire HMA. Cold Creek (east side of the Spring Mountains, approximately 15 miles north of the Proposed Project) contains

several springs, creeks, and ponds that supply water for the wild horses and burros, as well as other wildlife.

3.19.2 Methodology

Maps of existing HMAs were reviewed and BLM statistics on HMA utilization were incorporated.

3.19.3 Environmental Consequences

3.19.3.1 Proposed Action

3.19.3.1.1 Direct and Indirect Effects

Increased activity in the area, especially during construction could result in disruption and displacement of wild horses and burros utilizing the area. Construction of fences around the proposed action facilities could result in minor disruption of movement of free roaming wild horses and burros.

Very little evidence of use by horses or burros was observed during the desert tortoise and botanical field surveys (April, May, September and October 2014).

3.19.3.1.2 Mitigation Measures

No fences are anticipated, except those required for safety and security purposes around the facilities area, to avoid disrupting horse and burro free roaming to the extent possible.

The rail line will be constructed at-grade, transmission associated with shuttle train car operation will be an overhead catenary, and the rail corridor will not be fenced; current rail corridor design will minimize impacts to the free-roaming nature of wild horses and burros.

Current wild horse and burro mitigation measures would remain in effect unless/until BLM made changes or another use was found for the land.

3.19.3.1.3 Residual Impacts

During long-term operations, it is expected horses and burros will quickly become accustomed to operational activities and resume normal residence in the area.

3.19.3.1.4 Cumulative Impacts

Managing wildlife habitats to provide sufficient forage and cover, and limiting habitat fragmentation, is beneficial to wild horses and burros because it limits the opportunity for disturbance and the potential for habitat degradation. Any actions, such as fencing or restricting wild horse and burro access could be detrimental by restricting access to forage and/or water or by limiting their free-roaming nature. However, due to the dispersed quality, nature, and locations of all reasonably foreseeable future actions, the cumulative impact is expected to be low.

3.19.3.2 Alternative

3.19.3.2.1 Direct and Indirect Effects

The potential direct and indirect effects on horses from the Alternative would be the same as those described for the Proposed Action.

3.19.3.2.2 Mitigation Measures

The mitigation measures developed for the Alternative would be the same as those developed for the Proposed Action.

3.19.3.2.3 Residual Impacts

Potential residual impacts of the Alternative are essentially the same as those described for the Proposed Action.

3.19.3.2.4 Cumulative Impacts

Potential cumulative impacts of the Alternative are essentially the same as those described for the Proposed Action.

3.19.3.3 No Action Alternative

3.19.3.3.1 Direct and Indirect Effects

Under the No Action Alternative, there would be no change to the existing habitat for wild horses and burros.

3.19.3.3.2 Cumulative Impacts

Because the No Action Alternative would result in no direct or indirect impacts related to visual resources, there would be no new cumulative impacts associated with the No Action Alternative.

3.20 Wildlife

3.20.1 Affected Environment

3.20.1.1 General Wildlife

The Project Area supports, and is adjacent to lands that support, wildlife characteristic of the Mojave Desert. Biological diversity varies according to topography, plant community, and proximity to water, soil type, and season. For a comprehensive discussion of potential wildlife species that may be present, refer to the most recent Resource Management Plan for the BLM Southern Nevada District.

Wildlife species in the general area include mammals, birds, reptiles, and invertebrates. Additionally, the BLM is directed to conserve special status species through BLM Special Status Species Manual 6840. The BLM maintains a comprehensive list of species that have risks associated with a downward population trend and/or have specialized habitats that may be at risk. Wildlife, including BLM sensitive species, may be displaced as 170 acres of land are disturbed within the Project Area.

The upper elevations of the Proposed Action Area does enter known elk distribution habitat. Any impacts to elk populations are anticipated to be minor as the impact would occur in a very small portion of the distribution area and construction for that portion of the rail corridor will be short in duration. If requested as part of the mitigation measures, construction within the elk habitat can be scheduled to reduce potential impacts.

3.20.1.2 BLM Sensitive Wildlife Species

BLM sensitive species are species that require special management consideration to avoid potential future listing under ESA and that have been identified in accordance with procedures set forth in BLM Manual 6840 – Special Status Species. A complete list of BLM sensitive species within the area can be found in the Resource Management Plan. Many of these species as well as other wildlife species of concern are also discussed in the Nevada State Wildlife Action Plan (NDOW 2012) and the Clark County Multiple Species Habitat Conservation Plan. Sensitive bird species are also provided protection by the Migratory Bird Treaty Act and thus are discussed in the Migratory Bird Section (see Section 3.7).

Wildlife specific surveys were not conducted of the Project Area. However, one Mojave Desert sidewinder (*Crotalus cerastes cerastes*) was observed along the existing transmission route, and three years-old mule deer (*Odocoileus hemionus*) antler sheds were observed in washes, during botanical, desert tortoise, and general alignment site surveys.

Both NDOW and NNHP provided information regarding historical occurrences of endangered, threatened, candidate, and at risk plant and animal species (September 5, 2013 and August 23, 2013, respectively). NDOW noted approximately 1.5 miles of upper elevation rail occurred within occupied elk distribution area, and identified mule deer distribution area occurred just beyond the upper boundary of the proposed rail corridor. The only wildlife of concern noted by NNHP was the desert tortoise, which is discussed in Section 3.6 Threatened and Endangered Species.

The following BLM sensitive species could potentially be impacted by the proposed action.

Chuckwalla (*Sauromalus obesus*)
Chuckwalla occur in rocky desert, lava flows, hillsides, talus slopes, and rock outcrops mostly below 5,000 feet, where creosote bush is typically the dominant plant species. Chuckwalla will seek shelter in rock crevices and bask on rocks during the day. They are herbivorous, preferring annuals, but they will also eat perennial vegetation. Chuckwallas are relatively common throughout their Nevada range and likely occur within the project area, but would be localized on rock outcroppings.

Banded Gila monster (*Heloderma suspectum*)
Gila monsters occur in desert washes and rocky upland desert scrub at elevations below 5,000 feet. Banded Gila monsters frequently utilize lower slopes of mountains and nearby plains. They will use and are occasionally encountered out in gentler terrain of alluvial fans. Hence, Gila monster habitat overlaps habitats of both the desert tortoise and chuckwalla. Threats to this reptile include illegal collection, traffic fatalities, and habitat destruction from urban and agricultural development.

Mojave shovel-nosed snake (*Chionactis occipitalis occipitalis*)
The Mojave shovel-nosed snake is a burrowing, nocturnal snake frequenting washes, dunes, sandy flats, loose soil, and rocky hillsides in sandy gullies or pockets among the rocks throughout the Mojave Desert.

Desert glossy snake (*Arizona elegans*)
The desert glossy snake is a burrowing, nocturnal snake that occurs in a variety of habitat throughout the Mojave Desert including light shrubby to barren desert, grasslands and woodlands. The desert glossy snake generally prefers open areas where the ground is sandy to loamy.

Nevada shovel-nosed snake (*Chionactis occipitalis talpina*)
The Nevada shovel-nosed snake is a nocturnal burrowing snake that typically stays underground in the daytime and occurs in washes, dunes, sandy flats, loose soil and rocky hillsides with sandy gullies of pockets of sand. Their habitat consists of sparse vegetation including creosote bush, desert grasses, cactus and mesquite.

Mojave Desert sidewinder (*Crotalus cerastes cerastes*)
The Mojave Desert sidewinder is a nocturnal snake hiding in the day in animal burrows or coiled camouflaged in a shallow self-made pit at the base of a shrub. This species is most common where there are sand hummocks topped with creosote bushes, mesquite, or other desert plants but may also occur on flats, barren dunes, hardpan, and rocky hillsides.

Desert bighorn sheep (*Ovis canadensis nesloni*)
Bighorn sheep habitat preference includes open, usually treeless vegetation types with plant communities containing grasses, sedges, and forbs for foraging, typically in close proximity to steep, rocky terrain for predator escape where they exhibit remarkable agility. Moisture is primarily derived through their diet of a variety of desert plants; however, surface waters are a vital component of their survival and important to population health. Desert bighorns have a lengthy lambing season that can begin in December and end in June.

Bats
Twenty BLM sensitive bat species are known to occur within the general area of the Proposed Project. Day roosts can include caves, trees, mines, buildings, and bridges. Little population information is known for most bat species within the area; therefore, most trends are unknown with the exception of six species (cave myotis, Townsend's big-eared bat, western pipistrelle, fringed myotis, long-eared myotis, and long-legged myotis) experiencing downward trends.

Discussions with NDOW staff (Hardenbrook, personal communication) indicated they believe bats currently use the Project Area primarily for foraging, and expect bats to be attracted to lights. Potential species of bats that may be found in the area are listed in Table 3-11. Many of the listed species are expected to roost beyond areas of impact.

Table 3-11. Bat Species with the Potential to Occur at the Proposed Action and Alternative Locations

Species	Status	Roost Habitat Features
Allen's big-eared bat (*Idionycteris phyllotis*)	State Protected; BLM Sensitive	Generally roosts in trees, but may also use mines and caves
big brown bat (*Eptesicus fuscus*)	State Unprotected;	Selects a variety: caves, mines trees, mines buildings, and bridges
Brazilian free-tailed bat (*Tadarida brasiliensis*)	State Protected; BLM Sensitive	Cliff faces, mines, caves, bridges, buildings and hollow trees
California leaf-nosed bat (*Macrotus californicus*)	State Protected/ Sensitive; BLM Sensitive	Abandoned mines in desert scrub
California myotis (*Myotis californicus*)	State Unprotected	Rock crevices, mines, caves, buildings, tree hollows and exfoliating bark
canyon bat (aka western pipistrelle) (*Parastrellus hesperus*)	State Protected; BLM Sensitive	Rock crevices are common day roosts; mines, caves, occasionally in buildings and vegetation
fringed myotis (*Myotis thysanodes*)	State Protected; BLM Sensitive	Caves, mines in desert scrub
long-legged myotis (*Myotis volans*)	State Unprotected	Day roosts primarily in hollows of larger diameter trees, but also caves, mines, buildings, and rock crevices
pallid bat (*Antrozous pallidus*)	State Protected; BLM Sensitive	Caves, mines, cliffs, canyons
spotted bat (*Euderma maculatum*)	State Protected/Threatened; BLM Sensitive	Crevices in rocky cliffs and canyons
Townsend's big eared bat (*Corynorhinus townsendii*)	State Protected/Sensitive; BLM Sensitive	Caves in desert scrub, Pinyon/Juniper woodlands

3.20.1.3 Nevada Wildlife Action Plan Conservation Priority

Mule deer consideration is given in the Nevada Wildlife Action Plan because of significant population declines in conjunction with large-scale habitat degradation and loss.

3.20.2 Methodology

GIS overlays of wildlife habitat were compared to project components (temporary and permanent, or long-term, disturbance areas) locations. Lists of NDOW, NNHP, and BLM species were reviewed for potential impacts.

3.20.3 Environmental Consequences

3.20.3.1 Proposed Action

3.20.3.1.1 Direct and Indirect Effects

General Wildlife

Wildlife species would be displaced as 170 acres of habitat are disturbed within the project area. The primary direct impacts of the proposed action on wildlife would be killing or maiming of ground dwelling animals, noise and displacement of individuals, the permanent loss and fragmentation of habitat, and increased potential for harassment of wildlife. Indirect impacts could include increased noise, introduction and spread of weeds, and increased erosion potential. Wildlife species in the general area are common and widely distributed throughout the area and the loss of some individuals and/or their habitat should have a negligible impact on populations of the species throughout the region.

Construction of the project would force small mammals and reptiles to migrate to adjacent undisturbed areas. Although the linear nature of the project should limit the overall disruption of the habitat, it may result in increased pressure on resources and on animals already residing in the adjacent areas, and may result in mortality of some individual animals. Mortality rates may rise due to loss of cover for small mammals, allowing for increased predation by birds, coyotes, and other predators. Increased vehicular traffic may also result in higher mortality rates among small animal populations. Scavengers may be attracted to the construction site in search of trash and litter, and raptors will be provided additional perching locations on fences and transmission poles.

BLM Sensitive Wildlife Species

Impacts to BLM sensitive species are not anticipated to lead to further decline of the species range-wide.

<u>Chuckwalla, Mojave shovel-nosed snake</u>, <u>desert glossy snake, Nevada shovel-nosed snake, and desert Sidewinder</u>
Potential impacts to these species from the proposed action would be similar to those discussed above for general wildlife.

<u>Banded Gila monster</u>
Potential impacts to the banded Gila monster from the proposed action would be similar to those discussed above for general wildlife but these can be minimized by implementing measures such as clearance surveys, avoidance, and removal from the project area to adjacent areas as needed.

<u>Desert bighorn sheep</u>
In addition to the long-term loss of 72 acres of foraging habitat, desert bighorn sheep may be disturbed by vehicles operating in their habitat. Animals may seek cover on steep slopes and ridges to avoid vehicular activity and associated noise pollution. Because of this, disruption of migration corridors may also occur;

however, incorporating fencing for only the facilities area should not impact or block any free movement of bighorn sheep or other big-game species. Increased impacts may occur if activities occur during lambing season. Solitude dependent species, such as the Desert bighorn sheep, may abandon the area if human activities reduce the quality of their habitat.

Bats

The general area around the Proposed Project supports a large diversity of bats, which are on the BLM sensitive species list. The proposed action should not have any direct impacts on bats; however, installation of lighting may indirectly affect their behavior and use of the project area for foraging. Many of the listed species are expected to roost beyond areas of impact. To reduce impacts to bats lighting should be kept to the absolute minimum and should be down lighting only.

In general, the long-term persistence of North American bat species is threatened by the loss of clean, open water; modification or destruction of roosting and foraging habitat; and, for hibernating species, disturbance or destruction of hibernacula. Chemicals in the environment that affect bats or their prey are also threats.

3.20.3.1.2 Mitigation Measures

Although application of the proposed design features would reduce impacts to general wildlife, disturbance of 72 acres of habitat as a result of the Proposed Action would remain in the long term. During development of the Proposed Project, cumulative impacts to wildlife and sensitive wildlife were identified as an unavoidable impact all of which cannot be mitigated. Wildlife habitat is an ecosystem service provided by native vegetation. Impacts and mitigation for vegetation will also benefit general wildlife and sensitive wildlife.

Any impacts to sensitive species would be avoided and/or minimized through the special stipulations provided below:

- Litter pickup will be specifically addressed in mitigation measures for project construction and operation.
- Anti-perching devices may be installed on track side catenary poles, where practical.
- Observations by project staff of potential wildlife problems, including wildlife mortality, will be immediately reported to the applicable BLM authorized officer.
- All NDOW protocols will be followed for any NDOW protected species found during pre-construction surveys and any necessary permits would be obtained.
- Any Gila monster (state sensitive) encounters during project construction will be reported immediately to NDOW at (702) 486-5127.
- There is currently no surface water in the immediate area around the Action Area and the nearest man-made water source is more than one-quarter mile away. No standing water or ponds will be developed as part of the Proposed Project.
- Fencing will only be installed around the facilities area, for safety and security purposes, and should not impact or block any free movement of bighorn sheep or other big-game species
- To reduce impacts to bats lighting should be kept to the absolute minimum and be down lighting only.

3.20.3.1.3 Residual Impacts

The Proposed Action would result in impacts to general wildlife, including the loss of habitat. These impacts would be above what is currently experienced in the area from recreational travel on the existing roads, and unlawful off established road travel. When combined with existing declines in the quality and

quantity of native vegetation in the Las Vegas and Pahrump Field Offices management areas, the Proposed Action would result in an incremental addition to current declines in the quantity and quality of habitat available for general wildlife and BLM special status wildlife habitat. In addition, the Proposed Action may result in an incremental addition to habitat fragmentation.

3.20.3.1.4 Cumulative Impacts

The Proposed Action, in conjunction with other projects, would result in cumulative impacts to general wildlife, including the potential loss of habitat. When combined with other reasonably foreseeable actions, and existing declines in the quantity and quantity of native vegetation (which is a fundamental component of habitat) in the Las Vegas and Pahrump Field Offices, the Proposed Action would result in an incremental addition to current declines in the quantity and quality of habitat available for general wildlife and BLM special status wildlife habitat. In addition the Proposed Action would result in an incremental addition to habitat fragmentation.

3.20.3.2 Alternative

3.20.3.2.1 Direct and Indirect Effects

The potential direct and indirect effects on general wildlife species and BLM sensitive wildlife species from implementation of the Alternative would be the same as those described for the Proposed Action.

3.20.3.2.2 Mitigation Measures

Mitigation measures developed and to be implemented for the Alternative would be the same as those described for the Proposed Action.

3.20.3.2.3 Residual Impacts

The potential residual impacts of the Alternative would be essentially the same as those described for the Proposed Action, but in a slightly smaller area.

3.20.3.2.4 Cumulative Impacts

The potential cumulative impacts of the Alternative would be essentially the same as those described for the Proposed Action.

3.20.3.3 No Action Alternative

3.20.3.3.1 Direct and Indirect Effects

Under the No Action Alternative, the Project ROW would be denied and wildlife individuals and habitat would not be directly or indirectly impacted by the Project. Current impacts due to recreational travel on the existing roads and unlawful off-established-road-travel would remain at the existing level. The land would remain available for future development.

3.20.3.3.2 Cumulative Impacts

Because the No Action Alternative would result in no direct or indirect impacts, there would be no cumulative impacts associated with the No Action Alternative.

4 LIST OF PREPARERS

Table 4-1 List of Tribes, Persons, Organizations, or Agencies Consulted

Name	Purpose & Authorities for Consultation or Coordination	Findings & Conclusions
Clark County		
Kenneth Gullett	Department of Comprehensive Planning	Clark County permitting requirements.
Jared Tasko	Department of Comprehensive Planning	Clark County permitting requirements.
Federal Railroad Administration		
Cheech Smialek	Chief Inspector, Federal Railroad Administration, Region 7	ARES REM Project does not fall under FRA management.
Nevada Department of Wildlife		
Brad Hardenbrook	Supervisory Habitat Biologist	NDOW species of concern for the Action Area. Low potential for impact on bats.
Anthony Miller	Habitat Biologist	
Chet Van Dellen	GIS Coordinator	GIS analysis.
Nevada Natural Heritage Program		
Erik Miskow	Data Manager, Nevada Natural Heritage Program	
Nevada State Historic Preservation Office	Consultation for undertakings, as required by the NHPA (16 USC 470)	Nevada SHPO has concurred with the findings in the Cultural Survey Summary Report (HDR, January 2015).
Nye County		
Tim Dahl	Public Works	
Darrell Lacy	Director, Nye County Planning	
Jaynee Reeves	Nye County Administration	
Pam Webster,	County Manager	
Tribal Entities	Consultation as required by the American Indian Religious Freedom Act of 1978 (42 USC 1531) and NHPA Section 106 (16 USC 1531)	
Edward D. Smith	Chairman, Chemehuevi Indian Tribe	BLM will complete this
Ron Escobar	Chemehuevi Indian Tribe	BLM will complete this
Benny Tso	Chairman, Las Vegas Paiute Tribe	BLM will complete this
Kenny Anderson	Cultural Coordinator, Las Vegas Paiute Tribe	BLM will complete this
Aletha Tom	Chairwoman, Moapa Band of Paiutes	BLM will complete this
Deanna Domingo	Cultural Committee, Moapa Band of Paiutes	BLM will complete this
Eddie Jim	Chairman, Pahrump Paiute Tribe	BLM will complete this

Name	Purpose & Authorities for Consultation or Coordination	Findings & Conclusions
George Gholson	Chairman, Timbisha Shoshone Tribe	BLM will complete this
Barbara Durham	THPO, Timbisha Shoshone Tribe	BLM will complete this
US Fish and Wildlife Service	Consultation as required by the Endangered Species Act of 1973 (16 USC 1531)	The BLM and USFWS are currently proceeding with Section 7 consultation under the ESA.
Michael Burroughs	Wildlife Biologist	Obtained species list for use during biological surveys of project site

Table 4-2. List of Preparers - BLM

Name	Title	Responsible for the Following Section(s) of this Document
Evan Allen,	Geologist. Las Vegas Field Office	Geology
Mark Boatwright	Archaeologist	Cultural
Aleta Nafus	Weed Management Specialist, Southern Nevada District Office	Weeds/Fire/Fuels
Mark Chandler,	Realty Specialist, Renewable Energy Coordination Office	Lands and Realty
Nancy Christ,	Planning and Environmental Coordinator, Renewable Energy Coordination Office	NEPA
Lisa Christianson	Air Resources Specialist, Southern Nevada District Office	Air Quality
Melanie Cota,	Wildlife Biologist, Pahrump Field Office	ACEC, Wildlife, Migratory Birds, Threatened and Endangered Animals
Fred Edwards,	Botanist/Range and Forestry Program Lead, Southern Nevada District Office	Botany
Dave Fanning	Geologist. Pahrump Field Office	Geology
Susan Farkas	Planning and Environmental Coordinator, Pahrump Field Office	NEPA
Kathryn Foster,	Realty Specialist, Renewable Energy Coordination Office	Lands and Realty
Nicollee Gaddis,	Planning and Environmental Coordinator, Renewable Energy Coordination Office	NEPA
Matt Hamilton	Wildlife Biologist, Southern Nevada District Office	Wilderness/LWC/WSA
Greg Helseth,	Project Manager, Renewable Energy Coordination Office	Project Management/ Reviewer
Vanessa Hice,	Assistant Field Manager – Lands Division, Las Vegas Field Office	Reviewer
Krystal Johnson	Wild Horse and Burro Specialist, Pahrump Field Office	Wild Horse and Burro
Chris Linehan	Recreation Specialist, Las Vegas Field Office	Recreation
Sean McEldery	Fuels Program Manager, Southern Nevada District Office	Fire/Fuels

Name	Title	Responsible for the Following Section(s) of this Document
Erica Pionke	Realty Specialist, Pahrump Field Office	Realty Specialist
Stan Plum	Archaeologist	Cultural
Boris Poff, Ph.D.,	Hydrologist, Southern Nevada District Office	Floodplains, Hydrologic Conditions, Soils
Marc Sanchez	Recreation Specialist, Pahrump Field Office	Recreation
Mark Slaughter,	Supervisor of Natural Resources, Las Vegas Field Office	Reviewer
Kerri-Anne Thorpe,	Realty Specialist, Las Vegas Field Office	Lands and Realty
Lorri Dee Dukes	Geologist, Southern Nevada District Office	Minerals

Table 4-3. List of Preparers - Other

Name	Title	Responsible for the Following Section(s) of this Document
Erika Balderson	BEC Environmental, Inc.	Document Oversight, Affected Resources
Eileen Christensen	BEC Environmental, Inc.	Geology, Soils, Socioeconomics
Chris Dye	BEC Environmental, Inc	Proposed Action
Brenda Gilbert	BEC Environmental, Inc.	Introduction, Proposed Action
Jennifer Hill	BEC Environmental, Inc.	GIS, Threatened and Endangered Species, Transportation
Elizabeth Nelson	BEC Environmental, Inc.	QA/QC
Richard Nelson	BEC Environmental, Inc.	Proposed Action, Cumulative Effects, Technical Review
Danny Rakestraw	BEC Environmental, Inc.	Natural Resources
Kurt Rautenstrauch	HDR, Inc.	Transmission
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