EXHIBIT E SCENIC AREAS, HISTORIC SITES AND STRUCTURES, AND ARCHAEOLOGICAL SITES

As stated in Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:

"Describe any existing scenic areas, historic sites and structures or archaeological sites in the vicinity of the proposed facilities and state the effects, if any, the proposed facilities will have thereon."

Exhibit E-1. Simulation 1
Exhibit E-2. Simulation 2
Exhibit E-3. Simulation 3
Exhibit E-4. Simulation 4
Exhibit E-5. Simulation 5
Exhibit E-6. Simulation 6

Exhibit E includes summaries of existing visual (scenic) and cultural resources, as well as the potential impacts the proposed project may have on each resource.

SCENIC AREAS

This section of Exhibit E addresses visual resources, including scenery, sensitive viewers, and agency visual resource management classifications. The text below provides a description of the visual resource environment (visual inventory) for the proposed project, followed by a description of the potential impacts to visual resources.

The USFS and BLM are the primary federal agencies with established visual management systems to which the proposed project must adhere. Using methods derived from the USFS's Visual Management System (VMS) and Scenery Management System (SMS), as well as the BLM's Visual Resource Management (VRM) System (VRM 8400 Series 1986), the following visual resource assessment addresses the inventory and potential impacts of the proposed project associated with scenery (scenic quality, variety class/scenic attractiveness) and sensitive viewers, and where applicable, conformance with agency visual management classifications.

INVENTORY METHODOLOGY

The methods used to conduct the inventory were consistent with, and adhered to, the USFS's VMS (U.S. Department of Agriculture, USFS, Agriculture Handbook Number 462, 1947), SMS (U.S. Department of Agriculture, USFS, Agriculture Handbook Number 701, 1995), and BLM's VRM Manual (BLM 1986). This inventory was conducted within the regional and project study area previously described in Exhibit B. The visual resources inventory was conducted on all land regardless of jurisdiction, including public, state, and private that may be affected by the project within the study area. Visual resource data collected within the project study area was based on aerial photographs, topographic maps, planning documents, consultation with participating

agencies, and field investigations. This data was reviewed and an inventory was conducted to determine the quality of scenery (scenic quality, variety class/scenic attractiveness), sensitive viewers and associated viewing conditions (including distance zones and viewer position), and agency visual management classifications (visual quality objectives [VQOs] scenic integrity objectives [SIOs], and VRM). The inventory results are presented below, including a description of the preferred and alternative routes.

INVENTORY RESULTS

Scenery

In the context of this Project, scenery is a measure of the inherent aesthetic value of the landscape (scenery) based on existing landscape features, including landform, rockform (USFS), vegetation, water, color, adjacent scenery, scarcity, and cultural modifications (1974 Forest Service Handbook 462, 1995 Forest Service Handbook 701, and 1986 BLM VRM 8400 Series). This definition of scenery was based on, and is consistent with, USFS scenic attractiveness/variety class and BLM scenic quality concepts. In determining scenery, discreet landscape units were inventoried using GIS for the project based on similarities of the landscape features. Generally, landscapes with a greater diversity of these features receive a higher rating. Variety class/scenic attractiveness ranking units are used by the USFS to describe specific landscape types found within the regional landscape. Variety class/scenic attractiveness rankings are categorized into three classes: A (distinctive/distinctive), B (common/typical), and C (minimal/indistinctive). Scenic quality rankings for BLM landscape units also include three categories: Class A (outstanding), B (above average), and C (common). The evaluation of scenery for the project is consistent with visual resource inventory procedures and existing agency data for ranking scenic quality, variety class, and scenic attractiveness.

The project study area is located within the Basin and Range physiographic province in southeast Arizona (Fenneman 1931). Developed areas in the western portion of the regional study area include the Town of Sahuarita and Green Valley. The topographic character within the project study area is generally flat, with areas of bajadas and foothills associated with the Santa Rita Mountains. The Santa Rita Mountains and Box Canyon are two areas of visual interest associated with the CNF. The predominant vegetation of the study area is characterized by the Arizona Uplands Subdivision of Sonoran Desertscrub, Semidesert Grassland, and Encinal Oak communities (Brown 1994). Generally, the northwest side of the study area is within the Arizona Upland Sonoran Desert, which gradually transitions into Semidesert Grassland as the study area rises in elevation to the southeast. Encinal Oak communities occur at higher elevations east of the Santa Rita Mountains, where terrain is steeper. Isolated woodland vegetation such as Juniper and Piñon Pine are present within the Encinal Oak community, but not common within the project study area.

Existing conditions adjacent to the centerline of the proposed alternatives range from natural to completely modified, based on the occurrences of transmission lines, substations, transportation routes, and other structural features that can modify the scenic quality of natural settings. Existing conditions were evaluated by means of aerial photography and field reconnaissance to determine the location where modifications have affected natural settings. The water pipeline

required for the Project would locally modify the landscape setting between the proposed Toro Switchyard and the Rosemont Substation. The water pipeline ROW would be 30 feet wide and include a 14 to 20-foot permanent access road for construction, operation, and maintenance. This underground linear utility and associated access road would require removal of all vegetation within the ROW and landscape recontouring. When co-located with the water pipeline, the transmission line ROW (100') would be centered to include the entire water pipeline ROW so that the access road could be shared which would reduce construction disturbance. The existing 46kV transmission line is a wooden monopole that is slightly smaller in scale than the proposed 138kV transmission line. Landscape modifications associated with the existing 46kV transmission line access road are minimal due to vegetation regrowth; however, some portions of the access road have been improved to allow maintenance of the line. Generally, these improved portions of the access road can be described as a primitive, 2-track, unpaved road.

A description of the scenery and existing conditions associated with the alternatives are described below.

Preferred Route – The Preferred Route would be co-located with the water pipeline route along Santa Rita Road to the Rosemont Substation, and would traverse Class A, B, and C scenery. The Preferred Route would traverse Class C scenery near the proposed Toro Switchyard and along Santa Rita Road where the landscape would be locally modified by the water pipeline required for Rosemont mining operations. In the northwest portion of the study area Class C scenery is characterized by flat topography occupied by creosote bush and species of cholla. The majority of the Preferred Route would cross Class B scenery, where the landscape would be locally modified by the water pipeline required for Rosemont mining operations. Class B scenery along the Preferred Route is primarily associated with the bajadas and foothills of the Santa Rita Mountains. In this area, the Arizona Uplands Subdivision vegetation community is associated with the bajadas west of the Santa Rita Mountains and Encinal Oak communities to the east, at higher elevations within the mountains. In addition to the water pipeline, other modifications associated with Class B scenery include residential development near the junction of Santa Rita and Helvetia roads and unpaved roads within the SRER and CNF. Class C scenery near the junction of Santa Rita and Helvetia roads is characterized by rounded foothills with Semidesert Grassland; however, historic mining activities have locally influenced the landscape setting. The Preferred Route would traverse an isolated area of Class A scenery when crossing the Santa Rita Mountains at Lopez Pass, before the route terminates at the Rosemont Substation. In this area, Class A scenery includes the unique formation of peaks and ridges associated with the Santa Rita Mountains, which would be modified by the water pipeline route.

Alternative Route 1 – Between the proposed Toro Switchyard and the Rosemont Substation, Alternative Route 1 would traverse the same area as the Preferred Route, with the exception of a small portion that starts near the junction of links 130 and 105. At this junction, Alternative Route 1 would depart the water pipeline route along Santa Rita Road, heading northeast in a new corridor to Link 140. This segment of the alternative would cross approximately 1 mile of Class B scenery and 1 mile of Class C scenery that would require new access for construction of the project.

Alternative Route 2 and Alternative Route 3 – Generally, Alternative Route 2 and Alternative Route 3 traverse the same Class A, B, and C scenery as previously described for the Preferred

Route and Alternative Route 1, between the proposed Toro Switchyard and the Rosemont Substation. Alternative Routes 2 and 3 would be consolidated with an existing 46kV transmission line that has modified this setting from the proposed Toro Switchyard to Helvetia Road. Alternative Route 2 and Alternative Route 3 would cross approximately 2 additional miles of Class B scenery while paralleling a portion of Helvetia Road, before connecting to Link 105 (Alternative Route 1) or Link 130 (Alternative Route 2). Both alternatives will require approximately 1 mile of new access along link 120.

Alternative Route 4 – Alternative Route 4 would be consolidated with an existing 46kV transmission line from the proposed Toro Switchyard to Link 160. Alternative Route 4 would traverse Class B and C scenery, which in addition to the existing 46kV line, has been minimally modified by primitive unpaved roads within the SRER and the CNF.

The majority of Alternative Route 4 would cross Class B scenery within the SRER and CNF, which is primarily associated with the bajadas and foothills of the Santa Rita Mountains in this area. Topography and vegetation communities associated with these landscapes exhibit greater diversity than adjacent Class C scenery. Class C scenery within the western portion of the study area, including lands adjacent to the proposed Toro Switchyard, is characterized by flat topography occupied by creosote bush and species of cholla. East of the Santa Rita Mountains, Class C scenery is characterized by flat to gently rolling topography occupied by Semidesert Grassland. Class A scenery would not be crossed by this alternative.

Sensitive Viewers and Viewing Conditions

The term "sensitive viewers" refers to what the USFS considers VQO sensitivity levels or SMS constituent information and the BLM key observation points (KOPs). Potential sensitive viewers that may have views of the proposed project within the study area were identified in coordination with the CNF, field verified, and documented. Viewing locations, such as travel routes, recreation areas, and residences, are examples of locations where viewers have a concern, or sensitivity, to visual modifications of the landscape.

Viewer sensitivity was based on the following five criteria: (1) type of use (location); (2) volume of use; (3) view duration; (4) concern for aesthetics; and (5) scenic or historic status. The USFS uses "Constituent Analysis" to characterize viewer sensitivity. This analysis serves as a guide to perceptions of attractiveness, helps identify special places, and helps to define the meaning viewers give to the landscape. Constituent analysis assesses the relative importance of aesthetics to sensitive viewers, expressed as a Concern Level value of 1, 2, or 3, to reflect the relative High, Medium, or Low importance of aesthetics (or viewer sensitivity). Travel routes and trails that were assigned concern levels were identified by the CNF and considered in the inventory.

Viewers associated with locations, including residences, recreation, scenic, and/or USFS Concern Level 1 travel routes, are typically more sensitive to changes in the landscape, because viewing duration would be longer and the expectation for aesthetics would be greater for this type of user. Viewing conditions include consideration for distance from the project, visibility (e.g., skylined or backdropped), and viewer elevation.

The distance from the viewer to the project influences the project visibility. For this study project-specific influence zones were established based on visibility thresholds specific to 138kV transmission line facilities. Visibility is the perception of form, line, color, texture, and other visual elements in the landscape that changes with distance. These elements become less detailed and obvious as distance from a viewpoint increases.

Viewing conditions are also associated with the viewer's elevation to the project and could range from superior, where the viewer is looking down at the project, to level views and inferior views, where the viewer is looking up at the project. Potential views of the project could also be skylined or backdropped by adjacent terrain, vegetation, or structures. When the project is backdropped, the color, texture, and form of the proposed facilities can be more subdued, reducing visibility. When a project is skylined, portions of it will appear above the horizon line and would be seen in the context of typically blue sky.

Following are descriptions of inventoried sensitive viewing locations including viewer sensitivity, viewing conditions, and the influence zone in which the project would be viewed.

Preferred Route

Recreation and Travel Routes – Santa Rita Road was inventoried as having high sensitivity based on a formal scenic designation by Pima County (Pima County Major Streets and Scenic Routes Plan 2010). This designation, however, does not prohibit the construction of adjacent transmission lines of 46kV and above. Travelers on this route, a maintained unpaved route, are primarily associated with trucks going to Imerys Mine and residences near Helvetia. Recreation destination travel route viewers (associated with CNF) along this scenic route would have extended viewing duration of scenery, thus, concern for aesthetics is anticipated, whereas truckers hauling materials from Imerys marble mine (approximately 10-15 trips per day) would have less concern for aesthetics. The Preferred Route would be co-located with the water pipeline route, which would parallel Santa Rita Road on the north side. Views of the project within approximately ⅛ mile would be minimally screened for travel route viewers along Santa Rita Road. Helvetia Road is associated with moderate sensitivity and is one of the few access roads within the SRER that provides access to the CNF as well as private land. As a local destination and recreation access route, moderate use volume and viewing duration is anticipated, a moderate level of concern for changes in the landscape is anticipated. Viewers along Helvetia Road would have level views of the Preferred Route within approximately ⅛ to ½ mile, and these views would be minimally screened. At Link 140, the Preferred Route would continue to be co-located with the water pipeline before terminating at the Rosemont Substation. Viewers associated with a USFS Concern Level 1 road (FR 4051) near Link 140—a high sensitivity CNF travel route—would have inferior views of both alternatives within approximately ⅛ to ½ mile. Viewers associated with State Route 83 (Patagonia-Sonoita Scenic Road) may have views of Link 140, approximately 2 miles to the east from a scenic overlook/rest area, in context with Rosemont operations (also may be completely screened by tailings and waste rock piles depending on the alternative). There are no USFS Concern Level 2—or moderate sensitivity—travel routes associated with the Preferred Route. Dispersed recreation viewers are primarily associated with CNF and potential views of the Preferred Route may occur for portions of the route near Link 140 on forest land. It should be noted that Link 140

traverses approximately ½ miles of CNF lands while the remainder rests on Rosemont's private property.

Residences – Residential development associated with Sahuarita Highlands occur along Santa Rita Road northeast of the proposed Toro Switchyard and future residential viewers associated with the planned Quail Creek community in the southern portion of Sahuarita would have potential views of the Preferred Route and proposed Toro Switchyard within approximately ½ mile. These existing and future residences would have level views of the Preferred Route and the proposed Toro Switchyard within ½ mile (approximately) that would be partially screened by vegetation. The Preferred Route along Link 155 would have approximately 1 residence with superior views and 15 residences with level views of the project within approximately ⅛ to ½ mile. Depending upon local conditions, in general, views would be minimally screened from a superior viewing condition, whereas level views may be partially screened by vegetation.

Alternative Route 1

Recreation and Travel Routes – Recreation and travel route viewers would generally be the same as previously described for the Preferred Route between the proposed Toro Switchyard and the Rosemont Substation.

Residences – Residential viewers associated with Sahuarita Highlands and Quail Creek would generally be the same as previously described for the Preferred Route. Near Helvetia, Alternative Route 1 would utilize links 130, 135, and 95 which would have approximately 7 residences with level views and 1 residence with superior views of the project within approximately ⅛ to ½ mile. As mentioned previously, depending upon local conditions, in general views would be minimally screened from superior viewing locations, whereas level view locations may be partially screened by vegetation.

Alternative Route 2 and Alternative Route 3

Recreation and Travel Routes – Generally, the majority of Alternative Routes 2 and 3 would be consolidated with the existing 46kV transmission line until Helvetia Road, where both alternatives parallel a portion of the road until the junction of links 130 and 105. At this junction, viewers along Helvetia Road would have level views of both alternatives within ⅛ to ½ mile (approximately), with minimal to partial screening by vegetation. Alternative Route 2 would be located along the water pipeline route at Santa Rita Road, whereas, Alternative Route 3 would cross Santa Rita Road heading northeast to Link 140. Sensitive viewers on Santa Rita Road would have level views of both alternatives within approximately ⅛ mile with minimal screening. At Link 140, both routes would be co-located with the water pipeline before terminating at the Rosemont Substation. Viewers associated with a Concern Level 1 road (FR 4051) near Link 140—a high sensitivity CNF travel route— would have inferior views of both alternatives within ⅛ to ½ mile. Viewers associated with State Route 83 (Patagonia-Sonoita Scenic Road) may have views of Link 140, approximately 2 miles to the east from a scenic overlook/rest area, in context with Rosemont operations (also may be completely screened by tailings and waste rock piles depending on the alternative). There are no USFS Concern Level 2, or moderate sensitivity, travel routes near these alternatives. Dispersed recreation viewers are

primarily associated with CNF and potential views of both routes may occur for an isolated portion (link 140) on forest land.

Residences – There are existing residences near Helvetia (at the southeastern end of Santa Rita Road), Sahuarita Highlands, and future residences associated with the Quail Creek community. Alternative Route 2 would be co-located with the water pipeline route along Link 155, which would have 15 residences with level views and 1 residence with superior views of the project within approximately ⅛ to ½ mile. Alternative Route 3 would utilize links 130, 135, and 95 which would have 7 residences with level views and 1 residence with superior views of the route within ⅛ to ½ mile. Level views may be partially screened by vegetation, whereas, superior views would likely be minimally screened. Quail Creek future residences would have potential views of both alternatives and the proposed Toro Switchyard within approximately ½ mile. Views of both alternatives from Quail Creek may be partially to completely screened by vegetation and backdropped by terrain.

Alternative Route 4

Recreation and Travel Routes – Generally, the majority of Alternative Route 4 would be consolidated with the existing 46kV transmission line which traverses the Box Canyon area. Box Canyon Road is considered to have high sensitivity based on formal scenic designations by the CNF. In addition to this scenic designation, Box Canyon Road is identified by CNF as a Concern Level 1 road, which is associated with high sensitivity and concern for changes in the landscape. A portion of this alternative would be visible above the horizon line of the mountains (skylined) as the route crosses through the Box Canyon area. Alternative Route 4 would parallel Box Canyon Road within⅛ to ½ mile (approximately) for a short duration along Link 150. This alternative would also cross Box Canyon Road at Link 160; however, viewers would have partially to completely screened views of the project due to adjacent topography and vegetation. Other Concern Level 1 travel routes include the Arizona Trail—which is also formally designated as a National Scenic Trail—and Forest Roads (FRs) 231 and 229. Alternative Route 4 would generally parallel FR 231 for a short duration along Link 160, and the route would be minimally screened for sensitive viewers within⅛ mile (approximately). This alternative would not cross the Arizona Trail and FR 229; however, an isolated portion of the project would be visible to recreation viewers along the Arizona Trail, which occurs within ¼ mile of the route. Sections of the Arizona Trail, generally north of Box Canyon Road, would be relocated due to Rosemont operations; however, at this time the proposed trail realignments are conceptual. State Route 83 (Patagonia-Sonoita Scenic Road) viewers may have views of this alternative; however, modifications associated with Rosemont operations would be dominant and possibly screen portions of the route. Travel routes associated with moderate sensitivity include Helvetia Road, which crosses Alternative Route 4 at the junction of links 110, and 150. Views are anticipated to be minimally screened at the crossing; however, the majority of the route would be partially to completely screened by topography and/or vegetation. There is no USFS Concern Level 2—or moderate sensitivity—travel routes near this alternative. Dispersed recreation viewers are primarily associated with CNF and potential views of the project may occur for portions of the route (links 150, 160, 190, and 210) on forest land.

Residences – Existing residences in the Sahuarita Highlands development and future residential viewers associated with the Quail Creek community would have potential views of Alternative

Route 4 and the proposed Toro Switchyard within approximately ½ mile. Views of the project from Quail Creek would be partially to completely screened by vegetation. Alternative Route 4 would be backdropped by terrain as the route crosses the SRER into the Box Canyon area. Three residences near the CNF boundary, located north of Box Canyon Road, would have inferior views of the project within approximately ⅛ to ½ mile. As Alternative Route 4 rises in elevation to cross the Santa Rita Mountains, a portion of this alternative would be skylined and, therefore, would be visible from this residence.

Agency Visual Resource Management Classifications

Both the USFS and the BLM utilize systems that establish guidelines for acceptable change on public lands. No formal guidelines for managing visual resources on state or private land were identified.

Currently, visual management classifications for the CNF are based on the VMS manual (1974, Forest Service Handbook 462); however, the CNF is in the process of adopting the newer Scenery Management System. Per direction of the CNF, conformance with agency management objectives was assessed for the project using both management systems. Current VQO designations are specified in the Coronado National Forest Land and Resource Management Plan (1986). Updated SIO classifications are outlined in the Draft Land and Resource Management Plan (March 2010).

Each objective describes the integration of aesthetics with other biological, physical, and cultural resources. There are five classifications for both VQO and SMS, described in Table E-1.

Table E-1. USFS Visual Resource Management Classifications

VQO Classification		SIO Classification	
Preservation	This visual quality objective allows for ecological changes only. Management activities, except for very low visual impact recreation facilities, are prohibited.	Very High	Refers to landscapes where the valued landscape character is intact with only minute, if any, deviations.
Retention	This visual quality objective provides for management activities that are not visually evident.	High	Refers to landscapes where the valued landscape character appears intact.
Partial Retention	Management activities remain visually subordinate to the characteristic landscape when managed according to the partial retention visual quality objective.	Moderate	Refers to landscapes where the valued landscape character appears slightly altered.
Modification	Under the modification, visual quality objective management activities may visually dominate the original characteristic landscape.	Low	Refers to landscapes where the valued landscape character appears moderately altered.
Maximum Modification	Management activities of vegetative and landform alterations may dominate the characteristic landscape.	Very Low	Refers to landscapes where the valued landscape character appears heavily altered.

The BLM has a similar approach, although management objective terminology differs from USFS. The BLM's VRM methodology to determine management classifications consists of an inventory of scenic values, which are classified into four management classifications as presented in Table E-2.

Table E-2. BLM Visual Resource Management Classifications	
Class I	To preserve the existing character of the landscape. The level of change to the characteristic landscape should be very low and must not attract attention.
Class II	To retain the existing character of the landscape. The level of change to the characteristic landscape should be low.
Class III	To partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate.
Class IV	To provide for management activities that require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high.

VRM class designations are typically determined by the scenic quality of the landscape, public concern for the maintenance of the scenic quality, sensitive viewers and associated visibility, and specific management prescriptions based on other resource concerns. BLM land in Pima County is currently specified within the Eastern Arizona Grazing Final EIS (1986).

Preferred Route and Alternative Route 1

Both routes would traverse approximately ½ mile of designated VQO partial retention. The Preferred Route and Alternative 1 would traverse ½ mile of high SIO. For these designated areas, the water pipeline route and Rosemont mining operations would modify the landscape setting.

The Preferred Route would not cross BLM land; however, Alternative Route 1 would traverse approximately 1.1 miles of VRM Class III land.

Alternative Route 2 and Alternative Route 3

Both alternatives would traverse approximately ½ mile of designated VQO of partial retention. Alternative Route 2 and Alternative Route 3 would traverse ½ mile of high SIO. For these designated areas, the water pipeline route and Rosemont mining operations would modify the landscape setting.

Alternative Route 2 would not cross BLM land; however, Alternative Route 3 would traverse approximately 1.1 miles of VRM Class III land.

Alternative Route 4

Alternative Route 4 would traverse approximately 1.6 miles of designated VQO of retention, which is associated with the Box Canyon area, 3.3 miles of partial retention, and 1.6 miles of modification designation. Areas of partial retention include FR 231 near Barrel Canyon. Approximately 6.5 miles of high SIO would be traversed by Alternative Route 4. For these designated areas, it is important to note that the existing 46kV transmission line and associated access road has modified the landscape setting

Alternative Route 4 would not cross BLM land.

VISUAL IMPACTS

The purpose of the visual impact assessment is to identify and characterize the level of visual change in the landscape and the perception of that change from public viewing locations that could result from the construction, operation, and maintenance of the proposed project. Modification of the landscape is described in levels of visual contrast, which affects compliance with visual agency management objectives (i.e., VQO/SIO and VRM Classes), and impacts to scenery and sensitive viewers. The potential contrasts resulting from the proposed project were assessed using a methodology consistent with the BLM's Contrast Rating System (BLM Manual 8431). Following is a description of how visual contrast is determined and the results of the visual impact assessment. Included in this discussion are the impacts to (1) scenery, (2) sensitive viewers, and (3) management objectives for the project alternatives.

Visual Contrast

The visual resource contrast rating focused on the evaluation and characterization of the level of visual change resulting from the construction, operation, and maintenance of the project. The measure of visual change is termed contrast and is consistent with USFS and BLM visual impact assessment procedures. Impacts on scenery and sensitive viewers are determined, in part, by evaluating the project contrast the proposed facilities would generate within existing landscapes. Specifically, visual contrast considers the project's effects on existing landscape features, including vegetation, landform (access roads, mines, etc.) and structures (i.e., transmission lines, and other facilities) in terms of form, line, color, and texture. Generally, project contrast is anticipated to be stronger when the project crosses steep terrain and requires new access for construction and new vertical features are introduced.

Visual contrast typically results from (1) landform modifications that are necessary to prepare a project site or ROW for access and transmission line construction, (2) the removal of vegetation to construct and maintain facilities including access roads, and (3) the introduction of new structures into the landscape. Introduction of project facilities, including the transmission line and access roads may result in visual contrast ranging from strong to strong/moderate, moderate, moderate/weak, or weak, as defined below:

- Strong – visual change demands attention and strongly dominates the landscape
- Strong/Moderate – visual change begins to demand attention and is still moderately dominant in the landscape
- Moderate – visual change attracts attention, but is co-dominant in the landscape
- Moderate/Weak – visual change begins to attract attention and is moderately subordinate in the landscape
- Weak – visual change can be seen, but is subordinate in the landscape

Visual Simulations

As a part of the evaluation of visual contrast, photographic simulations were prepared to evaluate the accuracy of the predicted visual effects and to determine the effectiveness of mitigation recommendations. During meetings with the CNF, potential simulation locations were selected and as a result, six locations for simulations were chosen to illustrate the range of potential project contrast (see Exhibit E-1 through E-6). These locations represent sensitive viewers (travel routes and residences) and typical viewing conditions (distance and visibility).

The following sections provide a general description of project contrast and potential impacts on scenery, sensitive viewers, and conformance with agency visual resource management classifications for the project.

POTENTIAL IMPACTS ASSOCIATED WITH ALTERNATIVES

Scenery

Preferred Route – The Preferred Route is anticipated to result in minimal impacts on Class C scenery and Class B scenery for portions of the route between the proposed Toro Switchyard to the Rosemont Substation. Co-location with the water pipeline would allow shared access for construction and operation that would effectively reduce landscape contrast for the entire route. Although structure contrast would be stronger because there are no existing similar vertical structures along the water pipeline route, shared access for construction would result in moderate project contrast. An isolated area along link 140 of the Preferred Route—which is associated with Class A scenery—would result in moderate/strong structure contrast resulting from the introduction of vertical features (i.e., transmission structures) and strong landscape contrast from the construction of access in steep, rocky terrain (landform contrast). The water pipeline would locally modify this portion of the preferred route; therefore, moderate/high impacts to Class A scenery are anticipated although a portion of this route would be modified by Rosemont mining operations.

Alternative Route 1 – Impacts to scenery for the majority of Alternative Route 1 are anticipated to be the same as the Preferred Route which would be co-located with the water pipeline; however, approximately 2 miles of this alternative would not be co-located and, therefore, project contrast would be stronger. Specifically, this portion of Alternative Route 1 is anticipated to result in moderate/strong contrast, because both landscape and structure contrast would be moderate/strong where new structures and access are required in Class B scenery (approximately 1 mile). Therefore, moderate impacts to Class B scenery are anticipated for the portion of Alternative 1 (link 130) that would not be co-located with the water pipeline (approximately 1 mile). Moderate/low impacts are anticipated for Class C scenery where new structures and access would be required (approximately 1 mile).

Alternative Route 2 and Alternative Route 3 – Alternative Route 2 and Alternative Route 3 would traverse Class C and B scenery that is similar to the Preferred Route and Alternative Route 1; however, both routes would be consolidated with the existing 46kV transmission line from the proposed switchyard to the junction of Helvetia Road. Structure contrast is anticipated to be weak; however, the existing primitive access road would require upgrading for construction

and operation. Overall, impacts are anticipated to be minimal for Class C and B scenery when these alternatives would be consolidated with the 46kV transmission line, because project contrast would be greatly reduced. Both alternatives would require new access for construction along a portion of Link 120, which would result in moderate to moderate/strong landscape contrast in this area. In addition, new vertical structures would be introduced along Helvetia Road resulting in moderate/strong structure contrast and, therefore, moderate impacts on Class B scenery along Helvetia Road (approximately 2 miles) would occur. Alternative Route 2 and Alternative Route 3 impacts would be similar to impacts associated with the Preferred Route and Alternative Route 1, previously described, from the junction of Santa Rita Road to the Rosemont Substation.

Alternative Route 4 – The majority of Alternative Route 4 would traverse Class B scenery with some areas of Class C scenery, and no areas of Class A scenery would be crossed. Alternative Route 4 would be consolidated with the existing 46kV transmission line from the proposed Toro Switchyard to Link 160. Structure contrast is anticipated to be weak; however, the existing access road would require upgrading for construction and operation resulting in weak/moderate landform contrast in flat to rolling terrain; therefore, impacts are anticipated to be low in Class B and C scenery. Portions of Alternative Route 4 in steep terrain associated with the Box Canyon area would result in moderate landscape contrast where upgraded access would be required; therefore, impacts are anticipated to be low/moderate for an isolated portion of Alternative 4 in Class B scenery. The majority of the route occurs in flat to rolling terrain; therefore, impacts are anticipated to be low for Class B and C scenery when consolidated with the 46kV transmission line because project contrast would be minimized.

Portions of this alternative associated with the Rosemont mine operations (links 190 and 210) would result in weak project contrast, because the landscape setting would be associated with an industrial or modified landscape. Therefore, impacts to Class B scenery are anticipated to be minimal. A portion of the route (Link 160) would require new structures and new access in rolling terrain which would result in moderate/strong project contrast; therefore, moderate impacts are anticipated for this isolated portion of Alternative Route 4 on CNF land (approximately 1 mile).

Scenery Impact Summary

Overall, co-location with the water pipeline route would reduce landscape contrast resulting in low/moderate to moderate/high impacts to Class A, B, and C scenery for the Preferred Route. Moderate/high impacts to Class A scenery are anticipated for the Preferred Route, Alternative Route 1, Alternative Route 2, and Alternative Route 3; however, the water pipeline would locally modify this landscape setting. Isolated portions of Alternative Route 1, Alternative Route 2, Alternative Route 3, and Alternative Route 4 would require new access which would result in moderate impacts to Class B scenery. Portions of Alternative Route 2 and 3 would be consolidated with the existing 46kV transmission line, which would reduce both landscape and structure contrast resulting in low impacts to Class B and C scenery. Similar impacts are anticipated for Alternative Route 4 which would be consolidated with the existing 46kV transmission line for the majority of the route.

Sensitive Viewers

The following section summarizes the impacts to sensitive viewers resulting from the construction, operation, and maintenance of the project. Impacts to viewers along travel routes are anticipated to be greatest at crossings where moderate to moderate/strong project contrast would be visible to viewers, and when the travel route is immediately adjacent (within ⅛ mile) to the project. Recreation and residential viewers would have higher impacts when the project occurs within ⅛ mile or if there are superior views of the project.

Preferred Route

Recreation and Travel Routes – The Preferred Route would be located adjacent to the water pipeline from the proposed Toro Switchyard to the Rosemont Substation. Co-location with the water pipeline would result in moderate project contrast because access for construction would be shared between the project and the water pipeline. In addition, the presence of haul trucks associated with the Imerys Mine operations along Santa Rita Road would result in a moderate structure contrast. Therefore, structure and landscape contrast would be reduced. High sensitivity viewers associated with Santa Rita Road would have views of the Preferred Route with minimal screening of moderate project contrast (i.e., structures and access road) within⅛ mile. Moderate impacts are anticipated for high sensitivity viewers with views of the Preferred Route along Santa Rita Road for approximately 7 miles. An isolated portion of Helvetia Road—a moderate sensitivity travel route—near the junction of Santa Rita Road would have low/moderate impacts because the Preferred Route would be visible for viewers on Helvetia Road for a short duration, with minimal to partial screening within ⅛ mile. Viewers associated with a USFS Concern Level 1 road (FR 4051) near Link 140 would have moderate to moderate/high impacts because landscape contrast would be stronger in steep terrain associated with the crossing of Lopez Pass which would be viewed within ⅛ mile. Impacts are anticipated to be minimal for viewers associated with State Route 83 where the project would be backdropped by adjacent terrain and viewed in context with Rosemont operations at a distance of 2 miles and beyond. For dispersed recreation viewers associated with CNF, the Preferred Alternative would be viewed in the context of the Rosemont mine operations; therefore, impacts are anticipated to be minimal.

Residences – Impacts are anticipated for residences within ¼ to ½ mile with level views of the route; however, project contrast would be greater for residences with views of the project less than ¼ mile or with superior viewing conditions. Residences associated with Sahuarita Highlands and existing and future Quail Creek residences are anticipated to have low/moderate impacts, because the Preferred Route and proposed Toro Switchyard would be partially screened by vegetation within ½ mile (approximately) and viewed in the context of existing transmission lines. Residences near southeastern Santa Rita Road, approximately 15, would have level viewing conditions of the Preferred Route, which would be partially screened by vegetation or backdropped by surrounding terrain. One residence would have superior views of the project within approximately ½ mile with minimal screening, and approximately 10 residences would have views of the project within less than ¼ mile.

Alternative Route 1

Recreation and Travel Routes – Generally, recreation and travel route viewers would be the same as previously described for the Preferred Route, between the proposed Toro Switchyard and the Rosemont Substation.

Residences – This route would have 7 residential viewers with level views, and 1 with a superior view, of the project within ¼ to ½ mile (approximately) which would be minimally screened. Impacts are anticipated for residences within ¼ to ½ mile with level views of the route and project contrast would be greater from the residence with superior viewing conditions.

Alternative Route 2 and Alternative Route 3

Recreation and Travel Routes –A portion of Alternative Route 2 and 3 (approximately 7.6 miles) would have reduced structure and landscape contrast because it would be consolidated with the existing 46kV transmission line. Similarly, landscape contrast would be reduced for Alternative Route 2 and 3 when co-located with the water pipeline starting at links 105 and 140 respectively. Viewers along Santa Rita Road, a designated scenic road, may have views of these routes beyond 1 ½ miles and would be partially screened by vegetation resulting in low impacts. At the junction of Helvetia Road, Alternative Route 2 would co-locate with the water pipeline and would result in moderate impacts to viewers along Santa Rita Road within ⅛ mile. Alternative Route 3 would not parallel this scenic route but would cross the road perpendicularly near the junction of links 130 and 105. At this crossing, moderate impacts are anticipated for viewers along this scenic route; however, the viewing duration would be short. Moderate sensitivity viewers associated with Helvetia Road would have moderate impacts for an isolated portion of both routes where new access would be required and structures would be introduced (link 120). Impacts to recreation and travel route viewers would generally be the same as previously described for the Preferred Route and Alternative Route 1 at the junction of Link 120 and Santa Rita Road to the Rosemont Substation.

Residences – Existing and future residences near the Quail Creek community are anticipated to have low impacts because the routes and proposed Toro Switchyard would be partially to completely screened for future residences within ½ mile of both alternatives. Impacts to existing residential viewers along Santa Rita Road would be the same as previously described for the Preferred Route and Alternative Route 1 (links 155 and 130).

Alternative Route 4

Recreation and Travel Routes – The majority of Alternative Route 4 is anticipated to result in reduced project contrast, because the route would be consolidated with the existing 46kV transmission line from the proposed Toro Switchyard to Link 160 which would lower impacts to viewers. Alternative Route 4 would be visible for moderate sensitivity travelers along Helvetia Road for a short duration within ⅛ mile of the proposed facilities. Although the project would be minimally screened, reduced project contrast is anticipated because the project would be consolidated with an existing transmission line; therefore, impacts are anticipated to be minimal. Alternative Route 4 would parallel Box Canyon Road (Link 150) for a short duration within ⅛ to ¼ mile with minimal screening. High sensitivity viewers with views of the route paralleling the

road are anticipated to have moderate impacts because the Project would be viewed within ⅛ mile where existing modifications associated with the 46kV transmission line are evident. The portion of the route that crosses Box Canyon Road (Link 160) would require new access and some areas of upgraded access along FR 231. Contrast is anticipated to be moderate/strong for portions of this alternative that would require new access for construction in moderate to steep terrain. Due to partial screening and short viewing duration, moderate impacts are anticipated; however, in steep terrain where new access and facilities would be visible at the crossing of Box Canyon Road, limited occurrences of moderate-high impacts are anticipated. Alternative Route 4 would not cross the Arizona Trail and FR 229. Views of the project from FR 229 would be screened by topography; therefore, impacts are not anticipated. Impacts to the Arizona Trail are anticipated to be low because a portion of Alternative 4 would be consolidated with an existing 46kV transmission line which would reduce project contrast. Portions of Alternative Route 4 would be viewed in the context of the Rosemont mine operations or existing 46kV transmission line for dispersed recreation viewers associated with CNF and, therefore, impacts are anticipated to be low. Recreation viewers along the re-routed portions of the Arizona Trail are anticipated to have low impacts because Alternative Route 4, if visible, would be viewed in context with the Rosemont operations; thus, contrast would be greatly reduced. Views of the project from State Route 83 may be partially to completely screened by Rosemont operations and viewed at a distance of 2 miles and beyond; therefore, impacts are anticipated to be low.

Residences – Existing residences associated with Sahuarita Highlands and existing and future residences near the Quail Creek community are anticipated to have low/moderate impacts, because Alternative Route 4 and the proposed Toro Switchyard would be partially to completely screened within approximately ½ mile of the project. Views of Alternative Route 4 from three residences near the CNF boundary would be minimally screened within ½ mile; however, project contrast would be reduced because it would be consolidated with an existing 46kV transmission line. Impacts for this residence near Box Canyon Road are anticipated to be low/moderate, due to weak project contrast.

Sensitive Viewers Impact Summary

Overall, co-location with the water pipeline route would reduce project contrast resulting in low to moderate/high impacts to residences, scenic travel routes, and a USFS Concern Level 1 road for the Preferred Route. Moderate/high impacts to residences near Helvetia with views of the Preferred Route and Alternative Route 2 within 1/8 mile are anticipated; however, the transmission line would be viewed in context with the water pipeline. Alternative Route 1 and Alternative Route 3 would reduce impacts for 7 residences because link 130 would be partially to completely screened by vegetation and topography; however, 8 residences would have impacts similar to the Preferred Route. Residences associated with the Quail Creek community would have distant views of Alternative Route 2, Alternative Route 3, and Alternative Route 4, which would result in weak/moderate project contrast based on consolidation opportunities with the 46kV transmission line. In addition, each of the routes (link 30) would be partially screened by vegetation and backdropped by adjacent terrain which would result in minimal impacts. Portions of all alternative routes would be viewed by residences associated with Sahuarita Highlands, approximately ½ mile from the proposed Toro Switchyard, although the project would be viewed in context with existing transmission lines which would reduce project contrast.

In addition, the preferred and alternative routes and the switchyard would be partially screened by vegetation resulting in low/moderate impacts.

Agency Visual Resource Management Classifications

Following is a description of compliance with agency management classifications.

Preferred Route and Alternative Route 1 –The Preferred Route and Alternative Route 1 would not be initially compliant with VQO classification of partial retention or SIO classification of high. The removal of vegetation on steep visible slopes and the introduction of a new structure would result in moderate/strong project contrast, and therefore, portions of the Preferred Route and Alternative Route 1 would not be consistent with VQO classifications partial retention or proposed SIO classification of high. The Preferred Route would be compliant with visual resource objectives based on (1) the forest land use plan being amended due to the Rosemont EIS or (2) the CNF plan revision would identify a new management area for Rosemont operations.

The Preferred Route does not cross BLM land. Alternative Route 1 is compliant and consistent with the VRM classification for VRM Class III, because the portions of the project would only occur on Class III, which allows management activities that partially retain the existing character of the landscape.

Alternative Route 2 and Alternative Route 3 – Both alternative routes would not be initially compliant with VQO classifications partial retention or SIO classification of high. The removal of vegetation on steep visible slopes and the introduction of a new structure would result in moderate/strong visual contrast, thus, non-compliance. Both alternative routes would be compliant with visual resource objectives based on (1) the forest land use plan being amended due to the Rosemont EIS, or (2) the CNF plan revision would identify a new management area for Rosemont operations.

Alternative Route 2 does not cross BLM land; however, Alternative Route 3 is compliant and consistent with the VRM classification for VRM Class III. Portions of Alternative Route 3 would only occur on Class III land for less than ½ mile, approximately. Class III allows management activities that partially retain the existing character of the landscape.

Alternative Route 4 – Alternative Route 4 would not be initially compliant with VQO classifications retention and partial retention or SIO classification of high. The removal of vegetation on steep visible slopes and the introduction of a new structure would result in moderate/strong visual contrast, thus non-compliance. Compliance is anticipated for portions of Alternative Route 4 within VQO modification, because management activities may visually dominate the original characteristic landscape. Alternative Route 4 would be compliant with visual resource objectives based on (1) the forest land use plan being amended due to the Rosemont EIS, or (2) the CNF plan revision would identify a new management area for Rosemont operations. Alternative Route 4 would not cross BLM land.

REFERENCES

Brown, David E. Biotic Communities Southwestern United States and Northwestern Mexico. University of Utah Press, Salt Lake City. 1994.

Fenneman, N.M. 1931. Physiography of the Western United States. McGraw Hill, Book Company Inc. New York and London.

U.S. Department of the Interior. Bureau of Land Management. 1986. BLM Manual H-8410-1, Visual Resource Inventory. Available at http://www.blm.gov/nstc/VRM/8410.html

Bureau of Land Management (BLM). Proposed Phoenix Resource Management Plan and Final Environmental Impact Statement. Adopted December 1988.

_____. 1986. Eastern Arizona Grazing FEIS. September 1986

U.S. Department of Agriculture. Forest Service.

_____. 1995. Agriculture Handbook Number 701, Landscape Aesthetics – A Handbook for Scenery Management.

_____. 1974. Agriculture Handbook Number 462, National Forest Landscape Management.

_____. 1986. Coronado National Forest Land and Resource Management Plan. Adopted August 4, 1986. Washington, D.C.: Forest Service.

_____. 2010. Coronado National Forest Working Draft Land and Resource Management Plan. March 2010.

HISTORIC SITES, STRUCTURES, AND ARCHAEOLOGICAL SITES

This section of Exhibit E describes "historic sites and structures or archaeological sites," commonly referred to as "cultural resources," for the proposed project alternatives and the potential effects to resources associated with each of the alternatives.

A detailed description of cultural resources in the project study area that were recorded during pedestrian surveys of proposed project alternatives have been documented in separate reports and submitted for review to the CNF. The results in those reports are summarized in this exhibit. The assessment was prepared, in part, to identify impacts to historic properties that may be eligible or are eligible for listing on the National Register of Historic Places (NRHP), in accordance with the National Historic Preservation Act of 1966, as amended. The assessment also was prepared to support the ACC's compliance with the State Historic Preservation Act (Arizona Revised Statutes 41-861 through 41-864), which requires state agencies to consider impacts of their programs on historic properties listed in, or eligible for, the Arizona Register of Historic Places (Arizona Register), and to provide the State Historic Preservation Office (SHPO) an opportunity to review and comment on the ACC's actions that affect properties listed on, or eligible for listing on, the Arizona Register.

To be eligible for the NRHP and the Arizona Register, properties must be at least 50 years old (unless they have special significance) and have national, state, or local significance in American history, architecture, archaeology, engineering, or culture. They also must possess integrity of location, design, setting, materials, workmanship, feeling, and association, and meet at least one of four criteria (Arizona Administrative Code, Title 12, Chapter 8, Article 3, R12-8-302):

- Criterion A: be associated with significant historical events or trends
- Criterion B: be associated with historically significant people
- Criterion C: have distinctive characteristics of a style or type, or have artistic value, or represent a significant entity whose components may lack individual distinction
- Criterion D: have yielded or have potential to yield important information concerning history or prehistory

Inventory Methods

Class III pedestrian surveys were conducted for the preferred and alternative routes by EPG in November and December 2009 (Sheehan et al. 2010) and in June and July 2010 (Swanson et al. 2010); and by SWCA between May and August of 2008 (Ezzo et al. 2009). Survey methods followed ASM and SHPO guidelines for 100 percent survey coverage, with a spacing of 15 meters between surveyors. ASM and SHPO guidelines were used to determine whether a property was classified as a historic property (site) or as an isolated historic item (such as an isolated artifact or feature). The Helvetia Cemetery is located within the corridor surveyed for the Preferred Route and Alternative Route 1. In accordance with ASM and SHPO guidelines, this cemetery does not qualify as a historic property since it is still in use. The project will avoid the Helvetia Cemetery.

Inventory Results

As a result of these surveys, 13 historic properties recommended eligible for listing on the NRHP were recorded along the various alternative routes. These include simple artifact scatters and resource processing sites, complex artifact scatters with extensive processing features such as hearths and roasting pits, prehistoric habitation sites, historic roads, historic mines and habitation sites, and two historic mining towns (Table E-3).

Table E-3. NRHP Eligible Historic Properties along Preferred and Alternative Routes

No.	Site Number	Description	CL Length through Site	Route[1]
1	AZ EE:1:80(ASM)	Historic mining town of Helvetia	1830'/560m (P, 2) 2823'/860m (1, 3)	P, 1, 2, 3
2	AZ EE:1:99(ASM)	Prehistoric artifact scatter with thermal features and tools	817'/249m (P, 1) 846'/258m (2, 3, 4)	P, 1, 2, 3, 4
3	AZ EE:1:242(ASM)	Prehistoric artifact scatter with thermal features and tools	512'/156m	2, 3, 4
4	AZ EE:1:245(ASM)	Prehistoric artifact scatter with thermal features and tools	545'/166m	2, 3, 4

Table E-3. NRHP Eligible Historic Properties along Preferred and Alternative Routes				
No.	**Site Number**	**Description**	**CL Length through Site**	**Route**[1]
5	AZ EE:1:392(ASM)	Prehistoric artifact scatter with thermal features and tools	700'/213m	P, 1
6	AZ EE:1:446(ASM)	Prehistoric habitation site (multiple room blocks)	262'/80m	P, 2
7	AZ EE:1:450(ASM)	Historic CCC-constructed Box Canyon Road	50'/15m (P, 1) 107'/31m (4)	4
8	AZ EE:1:452(ASM)	Prehistoric resource processing	184'/56m	2, 3
9	AZ EE:1:454(ASM)	Prehistoric artifact scatter	604'/184m	4
10	AZ EE:1:455(ASM)	Prehistoric artifact scatter with features	358'/109m	2, 3, 4
11	AZ EE:1:423(ASM)	Historic mine and road	1207'/368m (spannable to north of centerline)	P, 1, 2, 3
12	AZ EE:1:431(ASM)	Historic road	Parallels CL for approximately 1654'/504m.	P, 1, 2, 3
13	AZ EE:2:149(ASM)	Historic mining town of New Rosemont	891'/272m (spannable west of centerline)	P, 1, 2, 3
1 "P" indicates Preferred route; numbers indicate Alternative routes 1 through 4.				

Five of the properties are artifact scatters with features and potential for intact, subsurface cultural materials that are recommended eligible for listing on the NRHP under Criterion D for their potential to provide important information on the subsistence and settlement strategies of prehistoric inhabitants of the southern Tucson Basin area: AZ EE:1:99(ASM), AZ EE:1:242(ASM), AZ EE:1:245(ASM), AZ EE:1:392(ASM), and AZ EE:1:455(ASM).

One property is a prehistoric habitation site that is recommended eligible for listing on the NRHP under Criterion D, for its potential to provide significant information on settlement, subsistence, and social interaction during the Classic (AZ EE:1:446[ASM]) period in the southern Tucson Basin.

One property is a historic mining and transportation site that is recommended eligible for listing on the NRHP under Criterion D, for its potential to provide important information on historic mining practices in the Rosemont area (AZ EE:1:423[ASM]).

Two of the properties are historic roads. One is recommended eligible for listing on the NRHP under Criterion D, for its potential to provide important information on historic mining practices and transportation in the Rosemont area (AZ EE:1:431[ASM]); the other historic road is recommended eligible for listing on the NRHP under Criteria A and C (AZ EE:1:450[ASM]). Criterion A is relevant because this Civilian Conservation Corps (CCC)-constructed road is associated with events that have made a significant contribution to the broad patterns of American history, namely the efforts and results of the "New Deal" legislation during the Great Depression. The property is also significant under Criterion C, because the features along the road (mostly of hand-laid, rough, native stone) embody distinctive characteristics of a type, period, and/or method of construction.

The historic mining towns of Helvetia (AZ EE:1:80[ASM]) and New Rosemont (AZ EE:2:149[ASM]) are recommended eligible for listing on the NRHP under Criterion D, for their potential to provide important information on historic mining practices and habitation during the historic period in the Rosemont area. Helvetia (AZ EE:1:80[ASM]) was also recommended eligible for listing on the NRHP under Criterion A for its association with the historic theme of mining.

The remaining two properties (AZ EE:1:452[ASM] and AZ EE:1:454[ASM]) are artifact scatters/processing areas recommended eligible for listing on the NRHP under Criterion D for their potential to provide important information on the subsistence and settlement strategies of prehistoric inhabitants of the southern Tucson Basin area.

Preferred Route

Seven NRHP eligible properties are located along the Preferred Route (Table E-3). Two sites likely cannot be spanned by transmission line structures under the current project design; these are the historic mining town of Helvetia (AZ EE:1:80[ASM]) and an Archaic site (AZ EE:1:99[ASM]). Five sites likely can be spanned by transmission line structures under the current project design; these are the historic mining town of New Rosemont (AZ EE:2:149[ASM]), a prehistoric artifact scatter with thermal features (AZ EE:1:392[ASM]), a prehistoric habitation site (AZ EE:1:446[ASM]), a historic road and mine (AZ EE:1:423[ASM]), and a historic road (AZ EE:1:431[ASM]).

There are no sites associated with the proposed Toro Switchyard that is common to all alternatives.

Alternative Route 1

Six NRHP eligible properties are located along Alternative Route 1 (Table E-3). Two sites likely cannot be spanned by transmission line structures under the current project design; these are the historic mining town of Helvetia (AZ EE:1:80[ASM]) and an Archaic site (AZ EE:1:99[ASM]). Four sites likely can be spanned by transmission line structures under the current project design; these are the historic mining town of New Rosemont (AZ EE:2:149[ASM]), a prehistoric artifact scatter with thermal features (AZ EE:1:392[ASM]), a historic road and mine (AZ EE:1:423[ASM]), and a historic road (AZ EE:1:431[ASM]).

Alternative Route 2

Ten NRHP eligible properties are located along Alternative Route 2 (Table E-3). Two sites likely cannot be spanned by transmission line structures under the current project design; these are the historic mining town of Helvetia (AZ EE: 1:80[ASM]) and an Archaic site (AZ EE:1:99[ASM]). Eight sites likely can be spanned by transmission line structures under the current project design; these are the historic mining town of New Rosemont (AZ EE:2:149[ASM]), two artifact scatters with thermal features (AZ EE:1:242[ASM] and AZ EE:1:245[ASM]), a prehistoric habitation site (AZ EE:1:446[ASM]), two prehistoric artifact scatters with features (AZ EE:1:452[ASM] and AZ EE:1:455[ASM]), a historic road and mine (AZ EE:1:423[ASM]), and a historic road (AZ EE:1:431[ASM]).

Alternative Route 3

Nine NRHP eligible properties are located along Alternative Route 3 (Table E-3). Two sites likely cannot be spanned by transmission line structures under the current project design; these are the historic mining town of Helvetia (AZ EE: 1:80[ASM]) and an Archaic site (AZ EE:1:99[ASM]). Seven sites likely can be spanned by transmission line structures under the current project design; these are the historic mining town of New Rosemont (AZ EE:2:149[ASM]), two prehistoric artifact scatters with thermal features (AZ EE:1:242[ASM] and AZ EE:1:245[ASM]), two prehistoric artifact scatters with features (AZ EE:1:452[ASM] and AZ EE:1:455[ASM]), a historic road and mine (AZ EE:1:423[ASM]), a historic road (AZ EE:1:431[ASM]).

Alternative Route 4

Six NRHP eligible properties are located along Alternative Route 4 (Table E-3). One site likely cannot be spanned by transmission line structures under the current project design: Archaic site AZ EE:1:99(ASM). Five sites likely can be spanned by transmission line structures under the current project design; these are two artifact scatters with thermal features (AZ EE:1:242[ASM] and AZ EE:1:245[ASM]), the historic CCC-constructed Box Canyon Road (AZ EE:1:450[ASM]), a prehistoric artifact scatter (AZ EE:1:454[ASM]), and a prehistoric artifact scatter with features (AZ EE:1:455[ASM]).

POTENTIAL IMPACTS ASSOCIATED WITH ALTERNATIVES

An undertaking can have an impact on historic sites and structures and archaeological sites, when it alters the characteristics of the property that qualify it for inclusion on the NRHP or Arizona Register. Impacts are adverse when they diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse impacts on historic properties include, but are not limited to:

- physical destruction of, or damage to, all or part of the property
- removal of the property from its historic location
- change of the character of the property's use, or of physical features within the property's setting that contribute to its historic significance
- introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic characteristics
- neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to a Native American tribe
- transfer, lease, or sale of property out of government ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance

The area of potential effects (APE) for direct impacts would include the areas that would be disturbed by construction and operation of the proposed project.

Indirect effects to cultural resources may also result from the construction and operation of the proposed project. Indirect effects are particularly relevant to traditionally sacred sites, historic towns, and historic roads where visual and auditory conditions are considered elements of a historic property's NRHP eligibility. Indirect effects include, but are not limited to:

- increased looting and surface collection of cultural resources through improved access to site areas
- increased off-road recreation and subsequent destruction/erosion of cultural resources through improved access to site areas
- introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic characteristics
- wild-land fires generated by increased public utilization of an area through improved access

Impacts to sites eligible for listing on the NRHP under Criterion D can be mitigated through avoidance, monitoring, and data recovery. Two methods of avoidance that can be utilized for this project are short reroutes and spanning. Typical spans between structures will be 750 feet, thereby avoiding the majority of potential impacts to surface and subsurface components. Therefore, all NRHP eligible sites less than 750 feet in length can be avoided through careful transmission line structure placement and spanning. All of the sites in Table E-4 can be spanned, with the exception of two sites: the historic mining town of Helvetia (AZ EE:1:80[ASM]) and an Archaic site (AZ EE:1:99[ASM]).

Impacts to sites eligible under Criteria A, B, or C cannot be avoided by spanning. This is because visual impacts may diminish the integrity of the property's significant historic characteristics. However, the consolidation of a transmission line with existing utility structures, upgrading existing utility structures for new line, or placing the Project adjacent to an existing line would reduce indirect visual impacts to these kinds of sites.

Table E-4. Potential Impacts to NRHP Eligible Sites by Route

Route	Eligible Sites	Sites that Can be Avoided	Sites that Cannot be Avoided
Preferred	7	5	2
Alternative Route 1	6	4	2
Alternative Route 2	10	8	2
Alternative Route 3	9	7	2
Alternative Route 4	6	5	2[1]

[1] Includes site AZ EE:1:450(ASM) eligible under Criteria A, C and D, that can be spanned, but would experience indirect visual impacts.

Construction activities will potentially impact two sites that are recommended eligible, and may require mitigation (AZ EE:1:80[ASM] by the Preferred Route and Alternatives 1, 2, and 3, and AZ EE:1:99[ASM] by all routes).

Seven other eligible prehistoric artifact scatters and habitation sites with potential for subsurface features could potentially be impacted by the proposed project: AZ EE:1:242(ASM) by

Alternatives 2, 3, and 4, AZ EE:1:245(ASM) by Alternatives 2, 3, and 4, AZ EE:1:392(ASM) by the Preferred Route and Alternative 1, AZ EE:1:446(ASM) by the Preferred Route and Alternative Route 4, AZ EE:1:452(ASM) by Alternative Routes2 and 3, AZ EE:1:454(ASM) by Alternative Route 4, and AZ EE:1:455(ASM) by Alternative Routes 2, 3, and 4. These sites can be spanned with careful transmission line structure placement.

Two eligible historic sites related to mining and transportation could potentially be impacted by the proposed project: AZ EE:1:423(ASM) by all routes and AZ EE:1:431(ASM) by the Preferred Route and Alternative Routes 1, 2, and 3. These sites can be spanned with careful transmission line structure placement.

Direct impacts to the CCC-constructed Box Canyon Road (AZ EE:1:450[ASM]), eligible under Criteria A, C and D, may be avoided through spanning. The integrity of the property's historic, visual setting that contributes to the property's NRHP eligibility, could be indirectly affected. However, if the transmission line were consolidated onto new structures placed in the same corridor as existing structures, impacts to this property's visual setting would be reduced.

Proposed construction activities will potentially affect different sites, depending upon which route is chosen (see Table E-3 and Table E-4). If the Preferred Route is chosen, 7 sites will potentially be affected, 4 of which can likely be spanned, and impacts to another avoided by placing a transmission structure in a non-contributing area of the site; Alternative Route 1 will potentially affect 6 sites, 4 of which can likely be spanned; Alternative Route 2 will potentially affect 9 sites, 7 of which can likely be spanned; Alternative Route 3 will potentially affect 9 sites, 7 of which can likely be spanned; and Alternative Route 4 will potentially affect 6 sites, 4 of which can likely be spanned, and another that can be spanned but may have indirect visual impacts.

To summarize, all routes have potential impacts to cultural resources (see Table E-4). The Preferred Route and Alternative Routes 1, 2 and 3 will directly impact two sites. Alternative Route 4 will have direct impacts to one site, and indirect impacts to another site. Each route thus has the potential to impact an equal number of historic properties.

If avoidance is not possible for register-eligible sites, impacts to these sites may be mitigated by the development and implementation of a Historic Properties Treatment Plan, in consultation with the CNF, Arizona State Lands, interested tribes, and the Arizona SHPO prior to construction. Possible mitigation measures that could be proposed in the Historic Properties Treatment Plan include archival research, data recovery, and construction monitoring.

In the event human remains or funerary objects are discovered during construction of the proposed project, all work in the area should cease and the finding be reported to the director of the ASM or designee, in accordance with Statutes 41-844 and 41-865.

REFERENCES

Ezzo, Joseph, Eric S. Petersen II, Stephanie M. Whittlesey, and Dennis Gilpin
2009 *Archaeological Survey for the Proposed Rosemont Copper Mine, Pima County, Arizona.* SWCA Cultural Resources Report No. 0-35.

Sheehan, Michael S., Steve Swanson, and Steven Shelley
2010 *A Cultural Resource Survey for the Rosemont Project utility Corridor Pima County, Arizona.* EPG Cultural Resource Service Technical Paper No 2010-001. EPG, Inc., Phoenix, Arizona.

Swanson, Steve, Dustin Sunderman, Benjamin Snow, and Cara Lonardo
2010 *A Cultural Resource Survey of the 46kV Alternative and Additional Area for the Rosemont Project 138kV Line Pima County, Arizona*. EPG Cultural Resource Service Technical Paper No 2010-0017. EPG, Inc., Phoenix, Arizona.

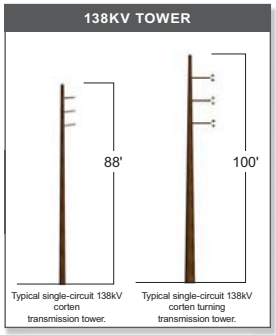
Existing Condition – Santa Rita Road within the Santa Rita Experimental Range

Simulated Condition – Proposed 138kV corten steel single-circuit transmission line and water pipeline with shared access road

Simulated Condition – Proposed 138kV galvanized steel single-circuit transmission line and water pipeline with shared access road

---

Photograph Location: Santa Rita Road Route facing southeast on Santa Rita Road.



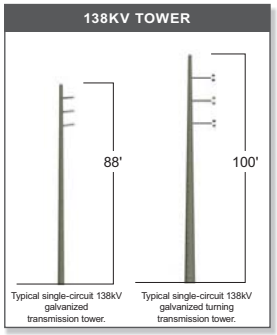


Photo Date and Time: 11-11-09, 2:14 p.m. Focal Length: 50mm

Structure models that were used in the simulations were created using diagrams provided by TEP. Pipeline information provided by Rosemont Copper.

This simulation represents a schematic concept design that will be refined and finalized. Actual final structure sizes, heights, materials, and conductor sag will vary on a case-by-case basis.

Typical structures would range between 75 to 150 feet above ground and up to 199 feet for special clearance issues, with a span of 750 feet. Typical conductor sag would be 34 to 46 feet above ground.

Rosemont 138kV Transmission Line Project
Exhibit E1: Simulation 1 - Preferred Route

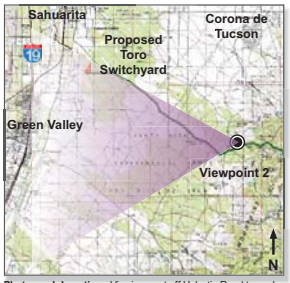
November 2011

THIS PAGE INTENTIONALLY LEFT BLANK

Existing Condition – Existing distribution lines and residences along Helvetia Road

Simulated Condition – Proposed 138kV corten steel double-circuit transmission line and water pipeline with shared access road

Simulated Condition – Proposed 138kV galvanized steel double-circuit transmission line and water pipeline with shared access road



Photograph Location: Viewing west off Helvetia Road toward Green Valley, Arizona.
Photo point is approximately 0.3 mile from nearest transmission line.

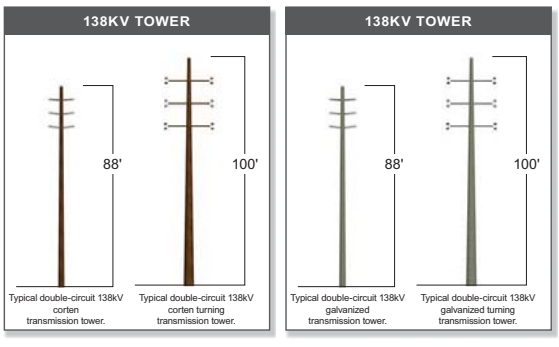


Photo Date and Time: 1-25-10, 10:50 a.m. Focal Length: 50mm

Structure models that were used in the simulations were created using diagrams provided by TEP. Pipeline information provided by Rosemont Copper.

This simulation represents a schematic concept design that will be refined and finalized. Actual final structure sizes, heights, materials, and conductor sag will vary on a case-by-case basis.

Typical structures would range between 75 to 150 feet above ground and up to 199 feet for special clearance issues, with a span of 750 feet. Typical conductor sag would be 34 to 46 feet above ground.

Rosemont 138kV Transmission Line Project
Exhibit E2: Simulation 2 - Preferred Route

November 2011

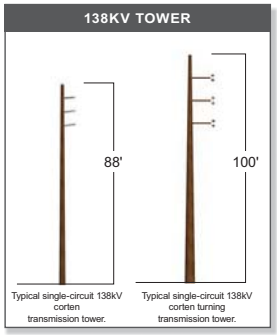
THIS PAGE INTENTIONALLY LEFT BLANK

Existing Condition – Box Canyon Road within the Santa Rita Mountains

Simulated Condition – Proposed 138kV corten steel single-circuit transmission line

Simulated Condition – Proposed 138kV galvanized steel single-circuit transmission line

Photograph Location: Box Canyon facing east down Box Canyon Road. Photo point is approximately 0.14 mile from nearest transmission line. Simulation location and viewpoint selected by Coronado National Forest landscape architect.



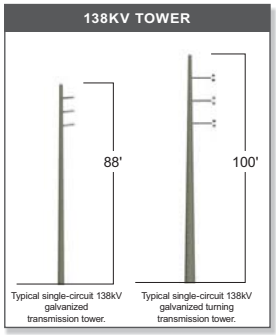


Photo Date and Time: 1-25-10, 12:59 p.m. Focal Length: 50mm

Structure models that were used in the simulations were created using diagrams provided by TEP.

This simulation represents a schematic concept design that will be refined and finalized. Actual final structure sizes, heights, materials, and conductor sag will vary on a case-by-case basis.

Typical structures would range between 75 to 150 feet above ground and up to 199 feet for special clearance issues, with a span of 750 feet. Typical conductor sag would be 34 to 46 feet above ground.

Rosemont 138kV Transmission Line Project
Exhibit E3: Simulation 3 - Alternative 4

November 2011

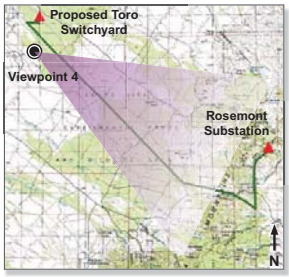
THIS PAGE INTENTIONALLY LEFT BLANK

Existing Condition – Quail Creek Community Golf Course and existing 46kV transmission line

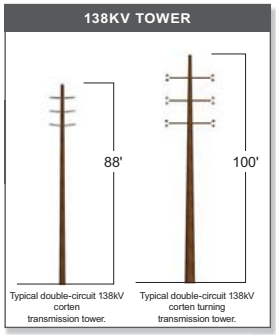
Simulated Condition – Proposed consolidated 138kV corten steel double-circuit transmission line

Simulated Condition – Proposed consolidated 138kV galvanized steel double-circuit transmission line

---



Photograph Location: Viewing southeast off Quail Creek Community Golf Course.
Photo point is approximately 0.9 mile from nearest transmission line.



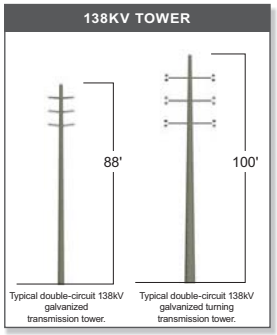


Photo Date and Time: 2-18-10, 2:37 p.m. Focal Length: 50mm

Structure models that were used in the simulations were created using diagrams provided by TEP.

This simulation represents a schematic concept design that will be refined and finalized. Actual final structure sizes, heights, materials, and conductor sag will vary on a case-by-case basis.

Typical structures would range between 75 to 150 feet above ground and up to 199 feet for special clearance issues, with a span of 750 feet. Typical conductor sag would be 34 to 46 feet above ground.

Rosemont 138kV Transmission Line Project
Exhibit E4: Simulation 4 - Alternative 4

November 2011

THIS PAGE INTENTIONALLY LEFT BLANK

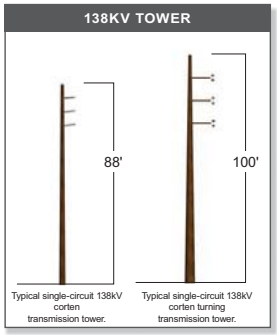
Existing Condition – Sahuarita Highlands residences along East Broadwater Way, Santa Rita Road, and Santa Rita Mountains

Simulated Condition – Proposed 138kV corten steel single-circuit transmission line

Simulated Condition – Proposed 138kV galvanized steel single-circuit transmission line

---

Photograph Location: Viewing south from Sahuarita Highlands, on East Broadwater Way, toward Santa Rita Road. Photo point is approximately 0.50 mile from nearest transmission line.



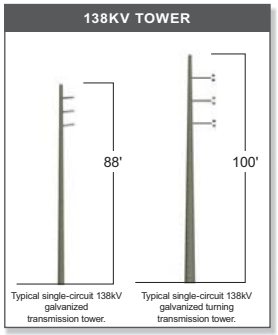


Photo Date and Time: 1-26-10, 11:45 a.m. Focal Length: 50mm

Structure models that were used in the simulations were created using diagrams provided by TEP.

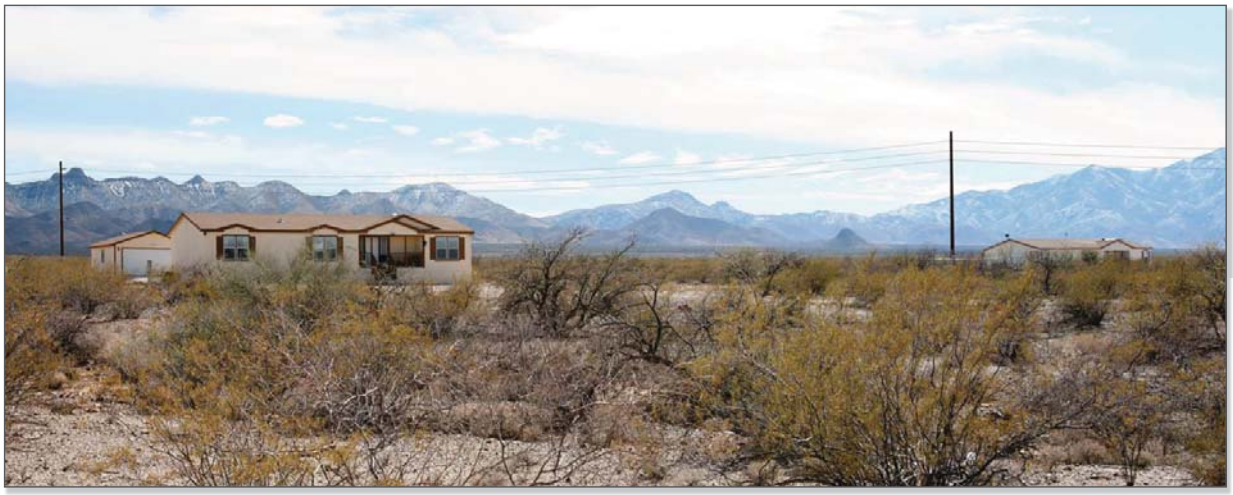
This simulation represents a schematic concept design that will be refined and finalized. Actual final structure sizes, heights, materials, and conductor sag will vary on a case-by-case basis.

Typical structures would range between 75 to 150 feet above ground and up to 199 feet for special clearance issues, with a span of 750 feet. Typical conductor sag would be 34 to 46 feet above ground.

Rosemont 138kV Transmission Line Project
Exhibit E5: Simulation 5 - Preferred Route Alternative 1
November 2011

THIS PAGE INTENTIONALLY LEFT BLANK

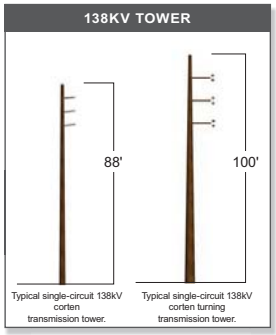
Existing Condition – Residences near Corona de Tucson, north of S. Kolb Road, with views of the Santa Rita Experimental Range and Santa Rita Mountains



Simulated Condition – Proposed 138kV corten steel single-circuit transmission line

Simulated Condition – Proposed 138kV galvanized steel single-circuit transmission line

Photograph Location: Viewing southeast from residences, north of S. Kolb Road, toward the Santa Rita Mountains. Photo point is approximately 0.2 mile from nearest transmission line.



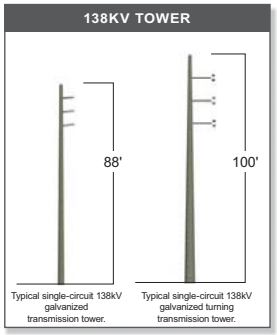


Photo Date and Time: 1-26-10, 1:19 p.m. Focal Length: 50mm

Structure models that were used in the simulations were created using diagrams provided by TEP.

This simulation represents a schematic concept design that will be refined and finalized. Actual final structure sizes, heights, materials, and conductor sag will vary on a case-by-case basis.

Typical structures would range between 75 to 150 feet above ground and up to 199 feet for special clearance issues, with a span of 750 feet. Typical conductor sag would be 34 to 46 feet above ground.

Rosemont 138kV Transmission Line Project
Exhibit E6: Simulation 6 - Northern Route Option 3 (Eliminated)
November 2011

THIS PAGE INTENTIONALLY LEFT BLANK