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DRAFT ENVIRONMENTAL ASSESSMENT

STB FINANCE DOCKET NO. 34836

**Arizona Eastern Railway – Construction and Operation –
In Graham County, Arizona**

Volume I: Draft Environmental Assessment



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SURFACE TRANSPORTATION BOARD
Washington, DC 20423

Section of Environmental Analysis

February 25, 2008

Dear Reader:

The Surface Transportation Board's (Board) Section of Environmental Analysis (SEA) is pleased to provide you with the enclosed Draft Environmental Assessment (EA) for a proposed 12.1 mile rail line construction from Phelps Dodge's proposed San Juan mining operation to an existing Arizona Eastern Railway line operating between Miami and Bowie, AZ.

This proceeding is docketed at the Board as Finance Docket No. 34836, Arizona Eastern Railway (AZER) – Construction and Operation – In Graham County, Arizona. This Draft EA was prepared by SEA pursuant to the National Environmental Policy Act (NEPA) and other Federal laws including the National Historic Preservation Act (NHPA).

Copies of this Draft EA are being provided to all parties to the proceeding as well as to appropriate Federal, state, and local agencies, including potentially affected property owners, plus more than 40 Federal, state, and local agencies. As part of the cultural resources consultation under Section 106 of NHPA, all sovereign nations (Native American tribes) in the project vicinity have been consulted and those tribes expressing interest in participating in the environmental review process have received copies of this EA.

In its scoping process for this Draft EA, SEA solicited comments from Federal, state, and local agencies. These comments are summarized in Section 5.0, Agency Consultation and Coordination. Agency comments resulted in several significant changes to early plans for the Proposed Action, including relocation of the proposed rail alignment to outside of Dry Lake Park and Arizona State Trust Lands. The Arizona Department of Transportation requested that SEA require a grade-separated crossing funded in full by AZER where the proposed rail line would meet U.S. Highway 70. However, SEA's analysis to-date has found that the relatively low number of existing and projected future vehicle trips on U.S. Highway 70, along with low frequency and short duration of projected train trips on the proposed new rail line, did not appear to warrant grade-separation. Instead, SEA is recommending mitigation that includes consulting with the appropriate Federal, state, and local agencies to determine the final design of an at-grade road crossing and associated warning devices.

Based on the information provided from all sources to date and its independent analysis, SEA preliminarily concludes that construction and operation of the proposed rail line would have no significant environmental impacts if the Board imposes and AZER implements the mitigation recommended in the Draft EA.

SEA specifically invites comments on all aspects of this EA, including suggestions for additional mitigation measures. SEA will consider all comments received in response to the EA in making its final recommendation to the Board. The Board will consider the entire environmental record, SEA's final recommendations, including final recommended mitigation measures, and the environmental comments in making its final decision in this proceeding.

All faxed and electronic comments must be submitted by March 31, 2008; comments sent by mail must be post-marked by March 31, 2008. Please send written comments (an original and two copies) to:

Diana Wood
Section of Environmental Analysis
Surface Transportation Board
395 E Street SW
Washington, DC 20423

Please reference **STB Finance Docket No. 34836** in all correspondence. Written comments may also be filed electronically on the Board's website: www.stb.dot.gov/efilings.nsf. From this link, click on "Environmental Comments" to be directed to an electronic comment form. Questions may also be directed to Ms. Diana Wood at this address, by telephoning (202) 245-0302, or by email to woodd@stb.dot.gov.

Thank you for your interest and participation. We welcome your comments.

Sincerely,



Victoria Rutson
Chief
Section of Environmental Analysis

Enclosure

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- Appendix C Preliminary Hazardous Materials Study, Arizona Eastern Railway; Ninyo & Moore, October 2006.
- Appendix D Biological Assessment; WestLand Associates, December 2007.
- Appendix E Preliminary Jurisdictional Delineation; WestLand Associates, October 2006 (report and data sheets only); supplemental correspondence, January 2007.
- Appendix F Arizona Eastern Rail – Traffic Analysis; Wilbur Smith Associates, February 2007.
- Appendix G Arizona Eastern Rail – Draft Air Quality Analysis; Kleinfelder, Inc, November 2006, and memo update, October 2007.
- Appendix H Review of Surface Water and Groundwater Conditions, Arizona Eastern Railway, Graham County, Arizona; Ninyo and Moore, October 2006.
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Acronyms and Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
BTEX	benzene, toluene, ethylbenzene, and xylenes
°C	degree Celsius
CCR	California Code of Regulations
CFR	Code of Federal Regulations
COC	chain-of-custody
COPC	contaminants of potential concern
dB	decibels
dBA	A-weighted decibels
DTSC	Department of Toxic Substances Control
ERRG	Engineering/Remediation Resources Group, Inc.
FAR	federal acquisition regulation
GWSAP	groundwater sampling and analysis plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HSP	health and safety plan
IDLH	immediately dangerous to life or health
mg/kg	milligrams per kilogram
mg/m ³	milligrams per cubic meter
MS/MSD	matrix spike/matrix spike duplicates
MSDS	Material Safety Data Sheet
NFPA	National Fire Protection Agency
NIOSH	National Institute of Occupational Health

O&M	operations and maintenance
OSHA	Occupational Safety and Health Administration
PCBs	polychlorinated biphenyls
PEL	permissible exposure limit
PID	photoionization detector
PPE	personal protective equipment
ppm	parts per million
QA/QC	quality assurance/quality control
QC	quality control
RAP	remedial action plan
SVOC	semi-volatile organic compound
SWWF	Southwestern willow flycatcher
TCE	trichloroethene
TPHg	total petroleum hydrocarbons as gasoline
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound
µg/L	micrograms per liter
µg/m ³	microgram per cubic meter

EXECUTIVE SUMMARY

On August 4, 2006, the Arizona Eastern Railway (AZER) filed a petition with the Surface Transportation Board (Board) seeking an exemption under 49 United States Code (U.S.C.) 10502 from prior approval requirements of 49 U.S.C. 10901 for authority to construct and operate 12 miles of new rail line in Graham County, Arizona (AZ). The Board, pursuant to 49 U.S.C. 10901, is the Agency responsible for granting authority for the construction and operation of new rail line facilities. The Board, through the Section of Environmental Analysis (SEA), is the lead agency responsible for the preparation of this Environmental Assessment (EA). The Federal Railroad Administration (FRA) is a cooperating agency in this EA because AZER has indicated that it may seek Federal funds from FRA's Railroad Rehabilitation and Improvement Financing Program to construct the rail line.

The Proposed Action is the construction and operation of a new rail line to connect the Phelps Dodge Dos Pobres Mine (Mine) with the existing 133.5-mile AZER line that operates between Miami, AZ and Bowie, AZ. The proposed rail line would begin near Safford, AZ, at AZER milepost 1133.5, known as the "Lone Star Junction" and proceed northerly for 12.1 miles, terminating at the Mine. The proposed line would cross agricultural and undeveloped lands, the Gila River, and then would turn in a northeast direction toward the Safford Regional Airport (the Airport). The proposed rail line would cross U.S. Highway 70 west of the San Simon River and would also cross Solomon Road, Airport Road, Lone Star Mountain Road, San Juan Road, and Phelps Dodge Road. The crossing at U.S. Highway 70 would consist of a signalized at-grade crossing, including warning lights and automated gates. The other roadway crossings, where traffic volumes are generally low, would consist of signed at-grade crossings with warning lights. The proposed rail line would accommodate one round trip per day, seven days a week, each day of the year. Each trip would require 20 to 25 railcars, powered by two GP-35 locomotives from AZER's existing in-service fleet. Commodities transported would include sulfuric acid in tanker cars for use at the Mine, and copper cathodes in boxcars, transported from the Mine to the main AZER rail line.

PURPOSE AND NEED

The Proposed Action is needed to provide the Mine and Airport with an alternative to truck shipment of materials. Figure ES-1 illustrates the proposed rail alignment and the Project area.

The Mine, which is currently under construction and anticipated to open in 2008, proposes the shipment of sulfuric acid and copper cathodes via trucks, predominantly traveling on U.S. Highway 70. Under its current plan, the Mine would transport 60 to 80 truckloads of

sulfuric acid daily from its existing facility at Miami (approximately 90 miles to the west of the City of Safford) to the Mine, and about 15 loads of copper cathodes from the Mine back to its Miami plant or to the Union Pacific rail line at Bowie.

The Airport is proposing the development of a business park with light industrial uses on property owned by the Airport. The light industrial uses would most likely require the movement of raw materials and goods in and out of the Airport area. The proximity of the proposed rail line to the Airport would allow for potential future freight rail service; however, because business park development details are unknown at this time, this EA contemplates neither rail spurs nor separate rail trips associated with the potential business park area.

The Proposed Action would provide an efficient and cost effective alternative for the transport of commodities to and from both the Mine and the projected development associated with the Airport which could reduce or avoid the level of truck traffic on local and regional roadways.

PROJECT SCOPING AND ISSUES

The Board actively consulted with a number of Federal, state, and local agencies to inform them about the proposed construction and operation, to identify issues of concern, and to obtain information about environmental resources within the Project area.

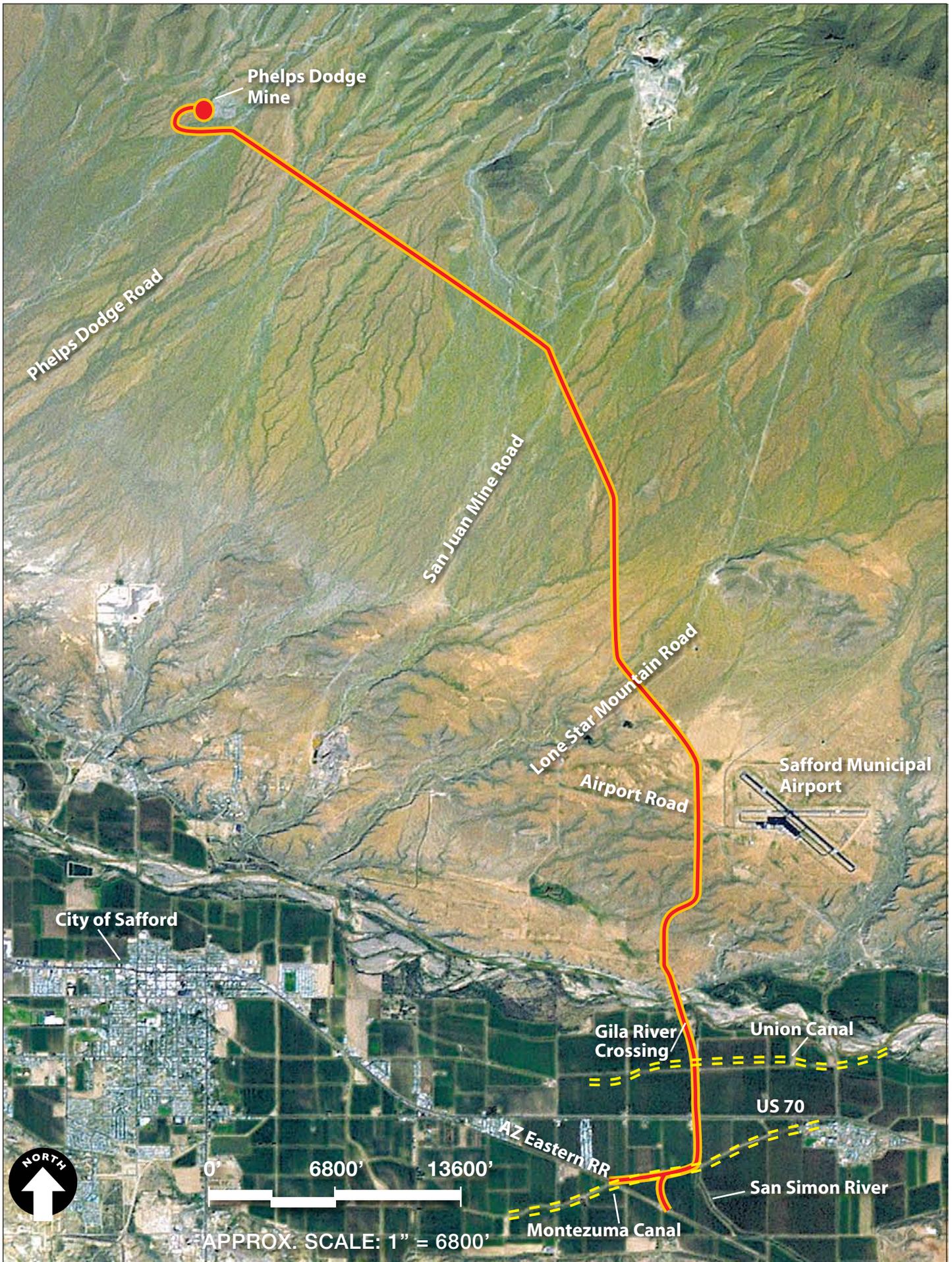
On June 13, 2006, SEA sent consultation letters to Federal, state, and local agencies describing the Proposed Action, showing the proposed rail alignment, and requesting that any concerns be identified. Early consultation was conducted to provide input as early as possible in the environmental review process, prior to preparation of the EA. SEA continued following up with a number of these agencies throughout the development of the EA in 2006 and 2007. A full list of agencies consulted is in Chapter 5.0, Agency Consultation and Coordination.

POTENTIALLY ADVERSE EFFECTS OF THE PROPOSED ACTION

SEA's analysis identified a number of potentially adverse effects of the Proposed Action. These effects are discussed in detail within Chapter 4.0, Environmental Consequences.

SEA has incorporated measures that would avoid, reduce, or otherwise mitigate all identified potentially adverse effects. All mitigation measures are provided in detail within Chapter 6.0, Mitigation Measures, Conclusion, and Request for Comments.

Potentially adverse effects are discussed below by environmental topic area.



TRAFFIC AND TRANSPORTATION

The Proposed Action would cross U.S. Highway 70 at grade. This proposed crossing could create potential traffic safety impacts during both construction and operational periods for vehicles traveling on U.S. Highway 70. SEA has incorporated measures to mitigate these potentially adverse effects, including raising the elevation of the crossing and requiring the installation and operation of warning lights. SEA has also incorporated measures during the construction period to ensure minimal disruption to traffic and travel along public roadways in the area.

CULTURAL RESOURCES

The Project area has been found to contain a number of historic resource sites, including several prehistoric resource “scatters” and a variety of structures related to the area’s historic agriculture use.

The Proposed Action would have the potential to reduce the integrity of three to four historic resources in the Project area, ultimately reducing the significance and National Register of Historic Places eligibility of such resources.

SEA has incorporated measures to mitigate these potential adverse effects. These include preparation of an Historic Properties Treatment Plan, evaluations of selected uncategorized resources in the area, and monitoring of construction activities in the event any undocumented resources are encountered.

HYDROLOGY AND WATER QUALITY

The Project area includes two rivers (the Gila River and the San Simon River), numerous ephemeral washes, and four irrigation canals. The Project area includes approximately 19 acres of wetlands as defined by the United States Army Corps of Engineers (ACOE).

The Proposed Action would have the potential to affect these waters and wetland features through grading, construction, and other topographic alterations needed to construct and operate the proposed rail line. SEA has incorporated a number of measures to mitigate these potentially adverse effects, including obtaining appropriate permits from Federal, state, and local agencies. These permits include a Section 404 permit, an Arizona Pollutant Discharge Elimination System permit, and a Graham County floodplain development permit. Other measures include the implementation of best management practices in project construction, the repair of impacted slopes, and revegetation of steep slopes.

GEOLOGY AND SOILS

The Project area contains soils that could potentially pose cave-in risks during trenching and excavation. Portions of the Project area are also at risk for landslides. In addition, abutments associated with the proposed Gila River bridge and other stream crossings would be at risk of experiencing adverse effects related to scouring action of watercourses. SEA has incorporated measures to address each of these potentially adverse effects, including

adherence of OSHA practices for safe trenching and prompt reclamation of any disturbed areas following construction.

HAZARDOUS MATERIALS

The Project area includes locations where there is the potential for contaminated soils and/or groundwater due to previous land uses. Project construction could disturb such areas, resulting in possible releases of potentially hazardous materials.

To avoid and/or minimize such risks, SEA has incorporated measures including the requirement for preparation of a spill prevention plan and specific guidance on containing potential issues related to the discovery of any abandoned trash/burn pits or septic pits in the construction area.

AIR QUALITY

Construction of the Proposed Action would have the potential to create dust emissions related to earth moving activities. SEA has incorporated standard measures that would mitigate these potentially adverse effects, including watering all active construction areas (including unpaved access roads and parking and storage areas) at least twice daily; covering all trucks hauling soil, sand, and other loose materials; and applying soil binders on unpaved roads and employee/ equipment parking areas.

BIOLOGICAL RESOURCES

The Project area includes about 19 acres of land identified as wetlands, as well as areas designated as riparian habitat. In addition, the project area includes habitat suitable for two protected species (razorback sucker and Southwestern willow flycatcher). To better understand the degree of potential impacts to habitat areas and protected species, SEA conducted a peer review of the biological assessment (BA) prepared for the Proposed Action.

SEA concluded that potential impact areas are relatively small and would not pose any significant threat to any protected plant or animal species in the Project area. SEA, in consultation with the U.S. Fish Wildlife Service and the ACOE, will recommend that the Board ensure that any potentially adverse biological resources impacts are adequately mitigated. SEA has included the use of best management practices and other measures in its mitigation, including restrictions on storage of construction materials or equipment in the bed of any watercourse, and coordination with the Arizona Department of Agriculture in the possible salvage of any native vegetation that is to be removed as part of project construction.

SEA's analysis identified no adverse impacts for the following environmental topic areas:

- Community and Socio-Economics
- Environmental Justice

- Utilities/Public Services
- Visual/Aesthetics
- Noise/Vibration
- Section 4(f) and Section 6(f) Resources¹

CONCLUSION

The Proposed Action would reduce the number of trucks using public roads transporting materials to and from the Mine. Materials to be transported include excavated copper cathodes from the Mine and sulfuric acid, which is used in mining activities. The proposed transport of sulfuric acid on a railroad represents a benefit of the Proposed Action in that rail transit has been found to have a lower accident rate in goods movement relative to truck transport on public roadways. Public roadways would also see incremental beneficial impacts from the Proposed Action in reduced air quality, noise, and vibration impacts associated with the proposed curtailment of truck transport of materials to and from the Mine.

The Proposed Action would have beneficial impact of providing needed infrastructure improvements to the area near the Airport. Local land use and airport plans have identified the potential viability of the Airport area for greater commercial/industrial development if improved transportation connections could be provided. At present, the Airport area is served only by an unpaved road.

The Proposed Action would have the short-term benefit of providing construction jobs in the greater Safford, Arizona, area during the one-year period of project construction.

In its scoping process, SEA solicited comments from Federal, state, and local agencies. These comments are summarized in Section 5.0, Agency Consultation and Coordination. Agency comments resulted in several significant changes to early plans for the Proposed Action, including relocation of the proposed rail alignment to outside of Dry Lake Park and Arizona State Trust Lands. The Arizona Department of Transportation requested that SEA require a grade-separated crossing where the proposed rail line would meet U.S. Highway 70. However, SEA's analysis found that the relatively low number of existing and projected future vehicle trips on U.S. Highway 70, along with low frequency and short duration of proposed train trips on the proposed rail line, did not warrant a grade-separated facility. Instead, SEA is recommending mitigation that includes consulting with the appropriate

¹ Section 4(f) is a federal transportation policy enacted by the Department of Transportation Act (DOT Act) of 1966 to preserve the integrity of publicly owned public parks and recreation areas, waterfowl and wildlife refuges, and historic sites considered to have national, state or local significance. The Surface Transportation Board is decisionally independent from DOT and therefore, is not subject to Section 4(f). The EA contains Section 4(f) analysis owing to the participation of FRA as a cooperating agency for the Proposed Action; FRA is an agency under DOT subject to Section 4(f).

Federal, state, and local agencies to determine the final design of an at-grade road crossing and associated warning devices.

The No Action Alternative would result in the transport of materials to and from the Mine via trucks only -- an estimated 80 round-trips per day between the Mine and Miami, Arizona. The Proposed Action would result in fewer truck trips to the Mine, and a concomitant reduction in potential air quality impacts. Similarly, the reduced number of truck trips to the Mine along public roadways would reduce noise and vibration along public roadways where truck trips to and from the Mine would occur.

Based on the information provided from all sources to date and its independent analysis, SEA preliminarily concludes that construction and operation of the proposed rail line would have no significant environmental impacts if the Board imposes and AZER implements the mitigation recommended above. Therefore, an EIS process is unnecessary in this proceeding.

REQUEST FOR COMMENTS

SEA specifically invites comments on all aspects of this EA, including suggestions for additional mitigation measures. SEA will consider all comments received in response to the EA in making its final recommendation to the Board. The Board will consider the entire environmental record, SEA's final recommendations, including final recommended mitigation measures, and the environmental comments in making its final decision in this proceeding.

Comments (an original and 2 copies) should be sent to:

Attention: Ms. Diana Wood
Section of Environmental Analysis
Surface Transportation Board
Case Control Unit
395 E Street S.W.
Washington, DC 20423

The lower left-hand corner of the envelope should be marked:

Finance Docket No. 34836

Questions may also be directed to Ms. Diana Wood at this address, by telephoning (202) 245-0302, or by email to Diana.Wood@stb.dot.gov. Written comments may also be filed electronically on the Board's website: www.stb.dot.gov/efilings.nsf. From this link, click on "Environmental Comments" to be directed to an electronic comment form.

Date made available to the public: February 25, 2008

Comment due date: March 31, 2008

1.0 Purpose and Need

1.1 INTRODUCTION

On August 4, 2006, the Arizona Eastern Railway (AZER) filed a petition with the Surface Transportation Board (Board) seeking an exemption under 49 United States Code (U.S.C.) 10502 from prior approval requirements of 49 U.S.C. 10901 for authority to construct and operate 12 miles of new rail line in Graham County, Arizona (AZ).

The Board, pursuant to 49 U.S.C. 10901, is the agency responsible for granting authority for the construction and operation of new rail line facilities. The Board, through its Section of Environmental Analysis (SEA), is the lead agency responsible for the preparation of this Environmental Assessment (EA). This EA identifies and analyzes the potential environmental effects associated with the proposed action. SEA prepared this EA in accordance with the National Environmental Policy Act (NEPA),¹ the Council on Environmental Quality (CEQ) guidelines, and the Board's environmental regulations² to provide the Board, Federal, state, and local agencies, Native American Tribes, and the public with clear and concise information on the potential environmental effects of the proposed action alternative and the no build alternative.

SEA is issuing this EA for public review and comment. SEA will consider all comments received on this document in making its final recommendations to the Board. The Board will consider the entire environmental record, all public agency comments, and SEA's final environmental recommendations including final recommended mitigation measures in making its final decision in this proceeding. The Board will decide whether to approve, approve with conditions (which could include environmental conditions to mitigate impacts), or deny the proposed action.

¹ 42 U.S.C. 4321 et.seq.

² 49 C.F.R. Part 1105

1.2 BACKGROUND

ARIZONA EASTERN RAILWAY

AZER is an existing class III short line railroad. AZER currently owns and operates approximately 133 miles of railroad extending between Union Pacific's Sunset Route at milepost (MP) 1098.1 at Bowie, Arizona and the end of its line at MP 1231.3 at Miami, Arizona. AZER was chartered as the Gila Valley Globe and Northern Railway in 1885. Before completion to Globe in 1899, the Gila Valley Globe and Northern Railway came under the control of AZER. AZER was leased by the Southern Pacific Railroad in 1905 and merged into the Southern Pacific system in 1924. The Southern Pacific sold the Bowie – Miami line to Kyle Railroad in 1988. Kyle was purchased by the shortline holding company StatesRail in 1995. StatesRail was purchased by RailAmerica (RA) in 2001. RA sold AZER to Permian Basin Railways, a wholly-owned subsidiary of Iowa Pacific Holdings, on December 9, 2004.

The railroad serves the copper mining region of southeastern Arizona, the agricultural Gila River Valley and the east end of the Phoenix metropolitan area. Primary AZER commodities are copper concentrate, copper anode and cathode, and copper rod and other copper processing materials. AZER also handles minerals, chemicals, building supplies and lumber. AZER operates a transload center for lumber, building materials and other consumer commodities at Globe, AZ. AZER presently operates one round trip, seven days per week, employs 32 people, and handles approximately 7,300 cars per year.

PHELPS DODGE DOS POBRES/SAN JUAN MINE (MINE)

Phelps Dodge is currently developing the Dos Pobres/San Juan Mine (Mine) in the Gila Valley. The Mine, expected to begin operations in 2008, is located in the Safford Mining District in Graham County, Arizona, approximately seven to eight miles north of the City of Safford. The Mine is an integrated operation for the mining of copper and includes two open pit mines, a crushing and material handling system, a common Solution Extraction/Electrowinning processing facility and shared infrastructure and support facilities. Based upon the current Mining Plan of Operations, the Mine will produce approximately 2.9 billion pounds of copper over the Mine's estimated 16-year mine production life. Mining will occur on a 24-hour-per-day, 365-day-per-year schedule over the life of the Mine.

Mining operations will entail the importation of sulfuric acid. Sulfuric acid will be shipped to the Mine in 3,500-gallon capacity tanker trucks and stored on-site in carbon steel tanks. Once extracted, the copper will be plated onto sheets to create copper cathode for shipment off-site via trucks. Copper from the Mine will be delivered by truck from the Mine facilities to the Phelps Dodge copper rod mills in Miami, Arizona, and El Paso, Texas, or to other customers.

SAFFORD REGIONAL AIRPORT

The Safford Regional Airport (the Airport) is located approximately 6 miles northeast of Safford on Airport Road. Originally constructed as a training facility for the U. S. Army Air Force in 1941, and acquired by the City of Safford in 1946, the Airport has evolved into a full service facility with two paved runways, tie downs for transient aircraft, a heliport, twenty-four hour, seven day per week fuel service, and other amenities for business/private pilots. The Airport plans to develop additional light industrial uses on adjacent property.

1.3 PURPOSE OF THE PROPOSED ACTION

The purpose of the Proposed Action is to provide direct freight rail service to the Mine and to future light industrial development at the Airport.

1.4 NEED FOR THE PROPOSED ACTION

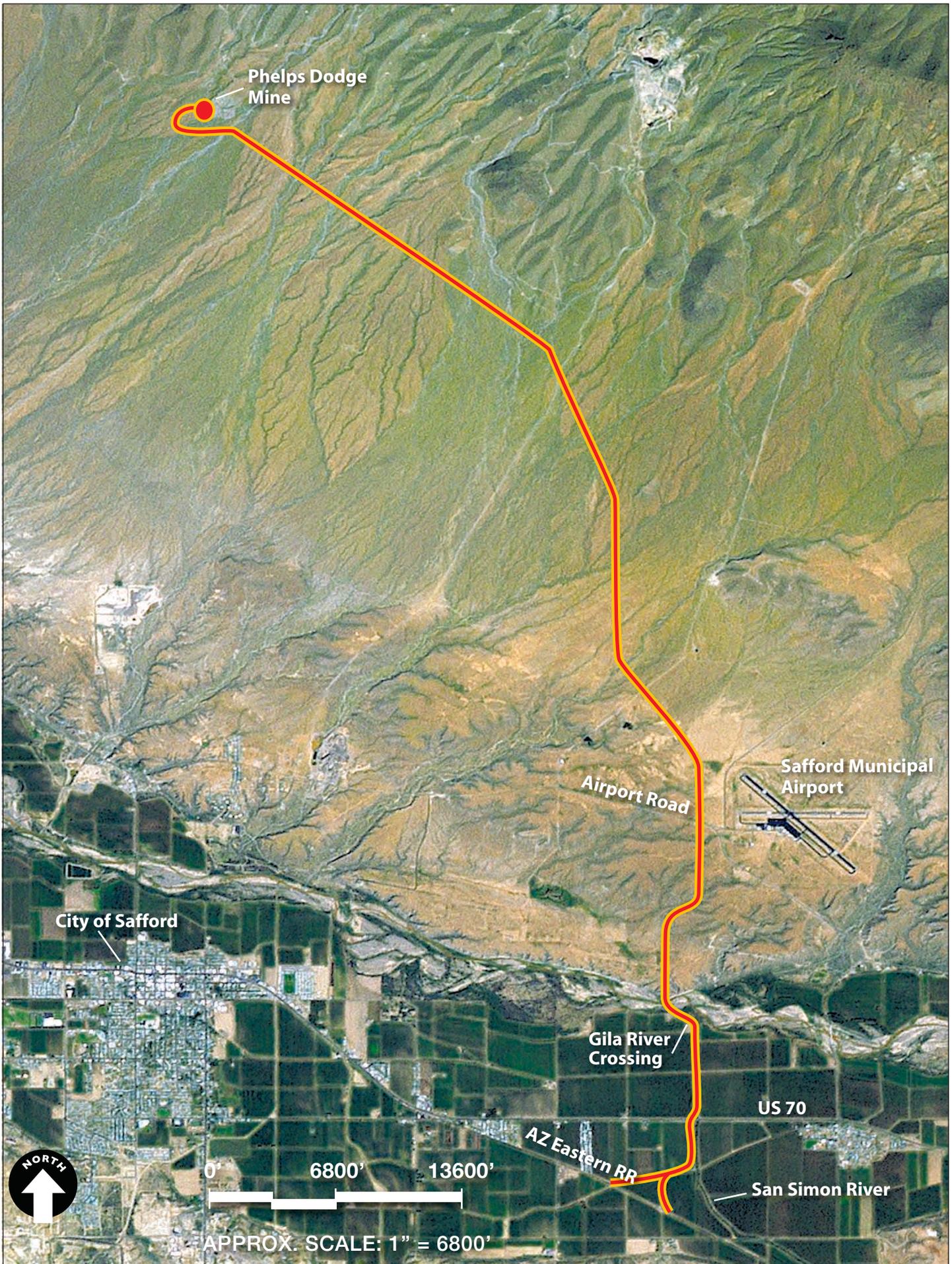
The Proposed Action is needed to provide the Mine and the Airport with an alternative to truck shipment of materials. The Mine, currently under construction and anticipated to open in 2008, proposes the shipment of sulfuric acid and copper cathodes via trucks, traveling mainly on U.S. Highway 70. Under the current plan, the Mine would transport 60 to 80 truckloads of sulfuric acid daily from its existing facility at Miami, AZ, to the Mine and about 15 loads of copper cathodes from the Mine back to Miami, AZ, or to the UP rail line at Bowie.

The Airport is proposing the development of light industrial uses on property owned by the Airport. The light industrial uses would most likely require the movement of raw materials and goods in and out of the Airport area.

The project would provide an efficient and cost effective alternative for the transport of commodities to and from both the Mine and the Airport which could reduce or avoid the level of truck traffic on local and regional roadways.

1.5 DESCRIPTION OF THE PROPOSED ACTION

The Proposed Action is located in Graham County, Arizona between the City of Safford and Town of Solomon in the Gila River Valley (see Figure 1-1, Project Regional Location). The proposed rail line alignment would begin at AZER's mainline near the City of Safford where it would leave AZER's existing line and proceed for approximately 12 miles to the Phelps Dodge mine. The proposed line would extend north and would cross paved and unpaved roadways including U.S. Highway 70 and Airport Road. The rail line would cross agricultural lands, the Gila River and undeveloped lands to the west of the Airport before continuing north/northwesterly to the Mine. The rail/road crossing at U.S. Highway 70 would include signals and automatic gates. The rail/road crossing at Airport Road would include appropriate warning signage. A bridge of approximately 800 feet would be constructed across the Gila River. Figure 1-2 depicts the proposed alignment being studied in this EA.



1.6 ROLE OF THE SURFACE TRANSPORTATION BOARD

The ICC Termination Act of 1995³ established the Board to assume certain regulatory activities that the Interstate Commerce Commission (ICC) had previously administered, particularly those related to the regulation of railroads. The Board has jurisdiction over certain transportation matters such as rail rates, financial transactions (including railroad acquisitions and rail construction), and abandonment of rail service.

SEA is responsible for conducting the environmental review of the proposed AZER project on behalf of the Board. In preparing this EA, SEA identified issues and areas of potential environmental impact, analyzed the potential environmental impacts of the proposed rail line construction project, reviewed agency and public comments, and developed mitigation measures to avoid or reduce anticipated impacts on the environment. SEA also considered pertinent Federal statutes, regulations, and Executive Orders.

To assist in conducting the NEPA environmental analysis and in preparing the EA, SEA approved CirclePoint to act as the Board's independent third-party consultant, in accordance with the Board's environmental regulations. The use of third party contractors is addressed at 49 CFR 1105.4 (j). Under the direction, supervision, and approval of SEA, the third party contractor develops the technical data required to conduct the environmental review of the proposed Project, and assists in the preparation of the EA.

In addition, SEA visited the proposed rail line construction site to document the existing conditions and assess the potential effects of the proposed action on the environment. SEA also initiated contact with the various Federal, state, and local agencies and jurisdictions that might have an interest or regulatory oversight role in the project, and their comments and concerns are reflected in this EA. After comments on the EA are received, SEA will prepare final environmental documentation. The Board will then issue a decision addressing the environmental aspects of the proposal and deciding whether to allow the exemption to become effective.

This EA is organized as follows:

- **Chapter 1** introduces the proposed action and describes its purpose and need;
- **Chapter 2** describes the proposed action and alternatives;
- **Chapter 3** describes the affected environment in the project area;
- **Chapter 4** identifies the potential environmental impacts of the proposed action;
- **Chapter 5** describes the agency consultation and coordination process;
- **Chapter 6** addresses mitigation, SEA's preliminary conclusion, and request for comments.

The Board has served the EA on the public, which has been invited to submit comments on the document.

³ ICC 1995. L, pp 104-88; p 109 no. 803

2.0 Proposed Action and Alternatives

This chapter outlines the alternatives considered for the proposed rail line, as well as the alternatives that were excluded from consideration. Two alternatives are analyzed in depth in this EA: the Proposed Action Alternative and the No-Action Alternative. This EA includes discussion of four other alternatives initially considered, but later rejected due to environmental impacts, discussed in Section 2.3 below.

2.1 PROPOSED ACTION ALTERNATIVE

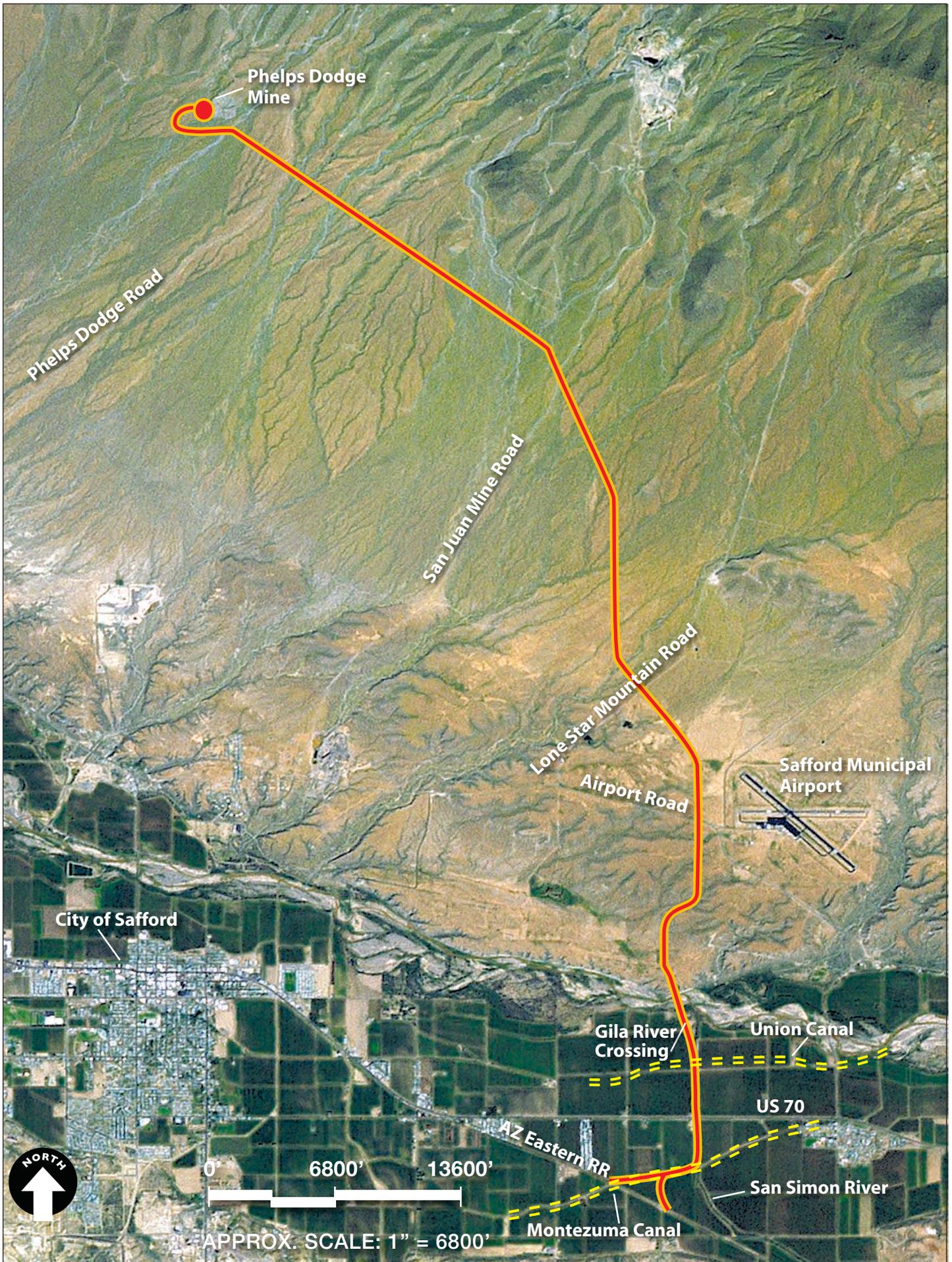
Proposed Action Alternative

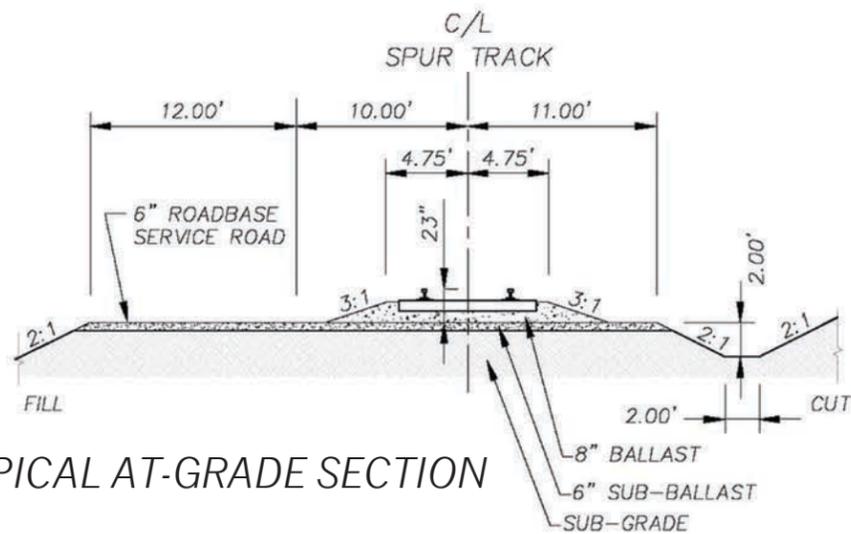
The Proposed Action is the construction and operation of a new rail line to connect the Mine with the existing 133.5-mile Arizona Eastern Railroad (AZER) line that operates between Miami, Arizona, and Bowie, Arizona. AZER connects with the Union Pacific (UP) railroad near Bowie. Figure 2.1 is a graphic of the proposed rail line. Appendix A contains a detailed plan and profile drawing of the proposed rail line.

The proposed rail line would begin near Safford, Arizona, at AZER milepost (MP) 1133.5, known as “Lone Star Junction.” From this point, the proposed rail line would proceed northerly for 12.1 miles, terminating at the Mine. The proposed rail line would cross U.S. Highway 70 west of the San Simon River and would also cross Solomon Road, Airport Road, Lone Star Mountain Road, San Juan Mine Road, and Phelps Dodge Road. The crossing at U.S. Highway 70 would consist of a signalized at-grade crossing, including warning lights and automated gates. The other roadway crossings, where traffic volumes are generally low, would consist of signed at-grade crossings, with warning lights.¹

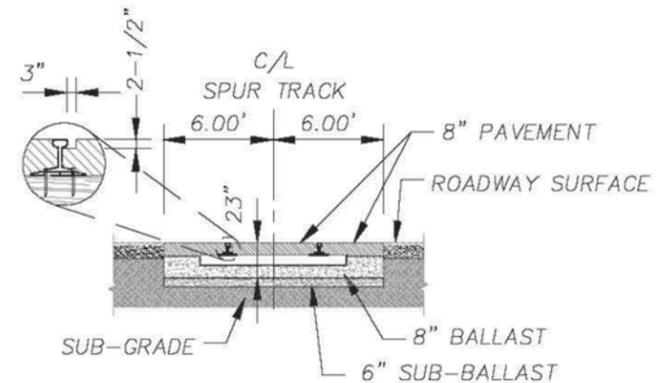
The right-of-way being considered for the proposed rail line would be 100 feet wide along the entire alignment. Within this right-of-way a single rail track, approximately 8.5 feet in width, would be constructed. This rail line would be located adjacent to a service road that would be approximately 12 feet in width, and bordered by a drainage ditch. Figure 2.2 contains typical track sections, including sections at proposed road crossings.

¹ A “signed crossing” is an at-grade rail crossing of a public road accompanied by a posted sign indicating the presence of railroad tracks. A “signalized crossing” is similar to the above, but includes a flashing light or signal that is activated by an approaching train.

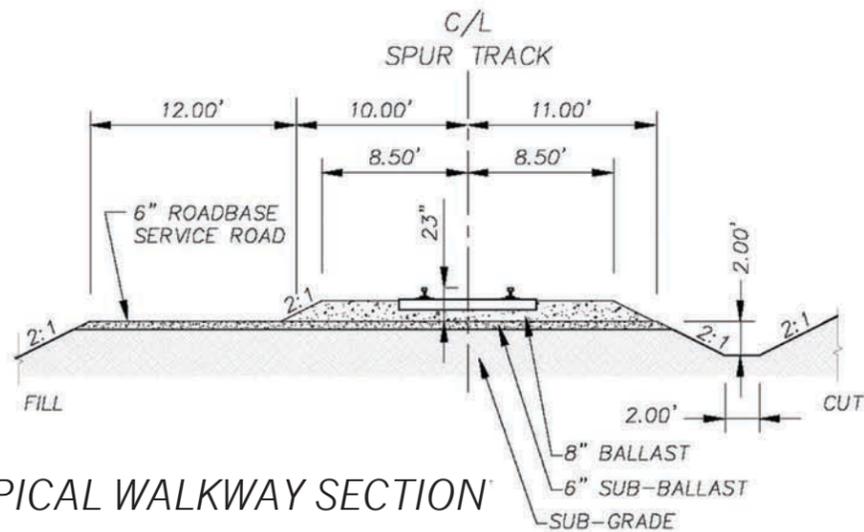




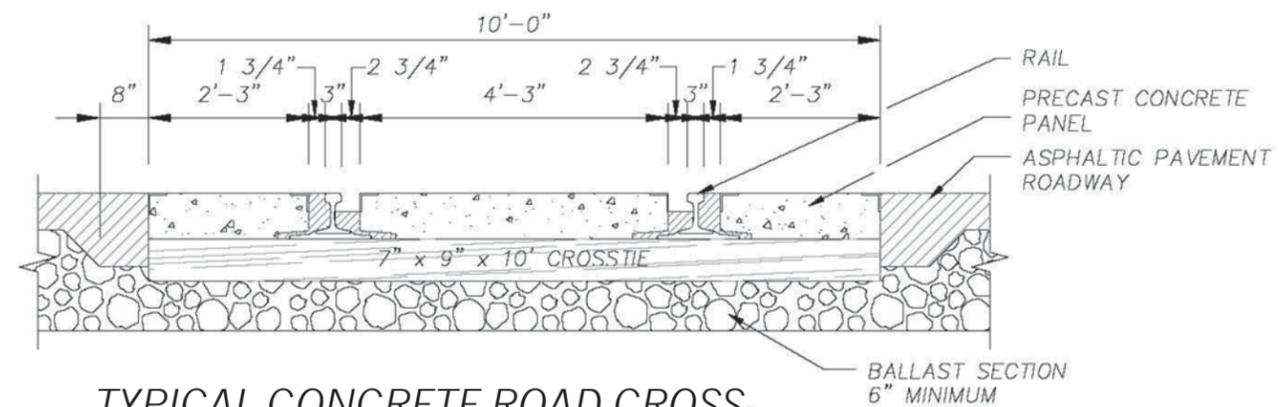
TYPICAL AT-GRADE SECTION



TYPICAL PAVED ROAD CROSSING SECTION



TYPICAL WALKWAY SECTION



TYPICAL CONCRETE ROAD CROSSING



NOT TO SCALE

South of the Gila River, the proposed rail line would also cross the Montezuma, Union, and Tidwell irrigation canals, as well as a currently unnamed irrigation canal. The proposed rail line would cross the Gila River on a new bridge approximately 1,600 feet in length. The bridge's length would provide 1,500 feet of opening between the north and south banks of the Gila River, to minimize bridge related flooding impacts.

The proposed Gila River bridge superstructure would be composed of precast, prestressed concrete I-girders with a composite concrete deck. Preliminary geotechnical recommendations indicate that deep foundations (composed of drilled shafts) are the most appropriate foundation system at both the bridge's piers and abutments. Known seismic and soil conditions in the area indicate that drilled shaft foundations should be socketed into the lower basin fills. The abutments would consist of a concrete beam supported by a single line of two drilled shafts. A 2:1 embankment slope would be constructed in front of each abutment. Preliminary geotechnical investigation indicates that approximately five to six drilled shafts would be required for each abutment, with embedment depths of 60 feet at the north abutment and 115 feet at the south abutment.

North of the Gila River bridge, the proposed rail line would turn in a northeast direction towards the Airport. The proximity of the proposed rail line to the Airport would allow for potential future freight rail service to a planned business park area adjacent to the Airport. Due to the uncertainty of the development of this business park area, this EA contemplates neither rail spurs nor separate rail trips associated with the potential business park.

The proposed rail line would handle one round trip per day at 20 to 25 carloads per trip, seven days a week. Commodities transported would include sulfuric acid in tanker cars for use at the Mine, and copper cathodes in boxcars, transported from the Mine to the main AZER rail line.

The proposed rail line would cross properties owned or controlled by private individuals, Phelps Dodge, the City of Safford, and the State of Arizona. Approximately 7.7 miles of the 12.1 miles of the proposed rail line are located north of the Gila River and on land owned by the Phelps Dodge Corporation, operator of the Mine.

Construction

Construction of the proposed rail line is anticipated to entail the temporary employment of up to 100 contractor and subcontractor employees, working at various locations along the right-of-way. AZER encourages its contractors to hire locally where feasible. It is anticipated that the construction workforce would be drawn from residents of the Arizona communities of Safford, Solomon, Thatcher, Willcox, and Globe.

All construction activities, including staging areas, would be located within a 200-foot wide corridor centered on the proposed rail line. AZER anticipates four equipment

staging areas would be used for constructing the proposed rail line, all of which would be located within this 200-foot wide corridor:

- 1) adjacent to the AZER mainline near Lone Star Junction;
- 2) at the south side of the proposed Gila River bridge;
- 3) at the north side of the proposed Gila River bridge; and
- 4) at the Mine site.

A construction and maintenance road, approximately 12 feet in width, would be constructed alongside the proposed railroad within the 100 foot wide right-of-way. This proposed road would be composed of high-density compacted earth material to limit runoff and erosion. The proposed road would be used for accessing the proposed rail line during both construction and operations, enabling maintenance access. Construction vehicles, including vehicles carrying materials from off-site sources, would access the proposed road via interstate highways, state highways, county, and local roads, pursuant to the posted weight limitations.

Construction of the proposed rail line is anticipated to require approximately one year to complete. Many construction tasks would occur simultaneously.

The first major task is acquisition of the right-of-way through a combination of purchases, leases, and easements. Next, work would begin to clear and grub the right-of-way. This would entail removal of vegetation and topsoils, to be temporarily stored on-site (within the right-of-way). Depending on the compaction characteristics of on-site soils, these soils would be used for building up the proposed roadbeds as construction proceeds (otherwise, fill materials would be imported from off-site locations). Next, the proposed road would be graded, followed by preparation of the proposed rail road beds. Grading would be conducted in several locations simultaneously. These initial preparation, grading, and roadbed building tasks would entail the use of scrapers, front-end loaders, power shovels, and bulldozers, working along the entire length of the right-of-way. It is not anticipated that these tasks would require the use of blasting. Cut material would not be cast outside the 200 foot construction corridor.

Next, culverts would be installed over ephemeral washes. Any required cattle crossings would also be built. Railbed construction would then occur over the next several months. Following construction of the railbed, track connectors would carry in the track materials, enabling track construction. As the proposed rail line would be built with jointed track, the use of large track laying machines is not anticipated.

Construction of the proposed Gila River bridge would take place at the same time as grading and railbed construction. Proposed bridge construction would require the use of additional specialized equipment, including drills, power shovels, and concrete trucks. Temporary pipe culverts would need to be installed to carry the normal flows of the Gila

River through the construction area. The pipe culverts would allow construction equipment to operate in and near the riverbed without impacting water quality. To the maximum extent feasible, pre-cast bridge sections would be fabricated off-site and trucked to the site to expedite the bridge construction process. It is anticipated that sixteen 100-foot pre-cast sections would be required.

Track construction, including the creation of grade crossings, along with bridge construction, are anticipated to occur over a ten month period. Table 2.1-1 provides general timeframes for construction activities.

Table 2.1-1: Construction Timeline

Activity	Timing
Acquisition of right-of-way	Prior to start of construction
Clear and grub right-of-way	Months 1-2
Grading/preparation of proposed roadbeds and drainage ditch	Month 2
Construction of rail bed	Months 2-5
Bridge construction (would occur at same time as other activities)	Months 1-11
Placement of tracks, grade crossings, and signaling	Months 2-11
Anticipated operation of proposed rail line	Month 12

Source: AZER, 2007

Railroad construction would follow generally accepted practices, including conformance to American Railway Engineering and Maintenance-of-Way Association² standards. With the exception of the Gila River crossing area, where extensive grading is anticipated, field conditions do not suggest a need to employ atypical construction methods.

Crossings of public highways, as shown in Figure 2.2, would be designed and constructed in consultation with the Arizona Department of Transportation (ADOT), the Arizona Corporation Commission, and/or Graham County, as appropriate.

Any required borrow pits would be outside the right-of-way from locations where clean fill is readily available. Construction off-haul would be disposed of at off-site locations. The selected contractor would be required to obtain all necessary permits for disposal of waste, including vegetation and other debris encountered during clearing, grading, and construction of the right-of-way. Table 2.1-2 describes the design specifications for the Proposed Action. Although most of the construction area has relatively gentle terrain and requires minimal grading, cut depth and fill height near the proposed bridge would be relatively high.

² Sometimes referred to as "AREMA standards."

Table 2.1-2: Design Specifications

Maximum and Minimum Width of right-of-way	100-ft
Maximum Grade	2.00%
Weight of Rail (loaded/unloaded)	90 # RE, minimum
Tie information:	
Length	8'-6"
Grade	New and relay 7"x9"x8'-6"
Top Ballast Depth	8"
Sub Ballast Depth	6"
Subgrade Width	22'-0"
Minimum Depth of Drainage Ditch	2'-0"
Minimum Width of Drainage Ditch Bottom	2'-0"
Minimum Distance Ditch Centerline to Track Centerline	16'-0"
Slope of Cuts and Fills	
Depth of Maximum Cut	48'
Height of Maximum Fill	44'

Source: AZER, 2007

Operations and Maintenance

The proposed rail line would accommodate one round trip per day, seven days a week, each day of the year. Each trip would entail 20 to 25 railcars, powered by two GP-35 locomotives from AZER's existing, in-service locomotive fleet.³ On an annual basis, a total of between 7,300 to 9,125 linked railcars would make roundtrips between the Mine and Phelps Dodge's processing facility in Miami, Arizona, utilizing AZER's mainline between Safford and Miami. Commodities to be handled would be sulfuric acid in tanker cars and copper cathodes in boxcars. About six to 12 permanent employees are anticipated to be hired to perform operations and maintenance tasks.

AZER expects to handle all interline traffic in its daily train departing from the UP interchange at Bowie, Arizona. Upon reaching Safford, Arizona, AZER would switch the

³ Early plans for the Proposed Action estimated that three locomotives would be required for each train. Several technical studies developed for this report utilized this estimate. However, subsequent engineering by the Project applicant determined that only two locomotives would be necessary. Project technical studies were largely not updated to reflect this change, insofar as the reduction in the number of locomotives would not introduce any new adverse environmental effects. In fact, the reduced number of locomotives would incrementally reduce the degree of several environmental effects, including noise and vibration and air quality.

interline traffic for the proposed rail line out of its regular train bound for Miami, Arizona. New traffic would be combined with inbound Mine traffic (tank cars originating at Miami, Arizona, and bound for the Mine) and the train would proceed to the end of the proposed rail line at the Mine. For the return trip, the train would leave the Mine with empty tank cars (which would return to the Miami, Arizona plant for refilling) and boxcars loaded with copper cathodes bound for either Miami, Arizona, or Bowie, Arizona (for interchange to the UP).

AZER would perform all maintenance and inspections in compliance with Federal Railroad Administration (FRA) Standards. Crews using “high-rail” vehicles traveling on the proposed rail line would perform daily inspection and maintenance activities.⁴ AZER would take necessary measures to ensure that appropriate vegetation control is conducted and that any herbicides applied are approved by the U.S. Environmental Protection Agency (USEPA). In areas where the proposed rail line crosses public highways, the maintenance requirements of ADOT and/or Graham County would be employed.

AZER has contingency plans for emergencies, such as derailments and natural disasters. AZER emergency crews are headquartered at Claypool, Arizona, proximate to the Phelps Dodge processing facility in Miami, Arizona.

2.2 NO-ACTION ALTERNATIVE

Under this alternative, AZER would not construct a proposed rail line from AZER’s mainline to the Mine and would therefore not provide the Mine with freight rail service. Approximately 60 to 80 truckloads of sulfuric acid would be transported round-trip each day along existing local roads from Phelps Dodge’s existing facility at Miami, Arizona, to the Mine, a distance of about 95 miles. Phelps Dodge would return about 15 truckloads of copper cathodes from the Mine to the Miami facility or to the UP rail line at Bowie, Arizona. Additionally, under this alternative there would be no potential for rail service to adjoin the proposed business park area just west of the Airport.

2.3 ALTERNATIVES CONSIDERED BUT REJECTED

A number of alignment alternatives for the Proposed Action were studied by the Applicant and rejected from further consideration using standardized technical and environmental criteria. The alternatives included several alignment options for the southern portion of the proposed rail line, from AZER’s main line to north of the Airport. The northern portion of the proposed rail line, on property owned by Phelps Dodge, was identical for all alternatives discussed below. Refer to Figure 2.1 to see a map of the full length of the proposed rail line. Figure 2.3 provides a map of the alternatives considered but rejected.

⁴ A “high rail vehicle” (also spelled “hi-rail”) is a vehicle used for track or train maintenance that has the ability to operate on the rails.

This section describes the process used to evaluate alignment alternatives and to make feasibility and practicability determinations. While alignment alternatives were similar in many technical and environmental factors, a number of factors (described below) differ between alternatives. These factors are shown in Table 2.3-1.

Table 2.3-1: Evaluation of Alignment Alternatives

Alternatives	Alternative A (Orange)	Alternative B (Aqua)	Alternative C (Green)	Alternative D (Red)	Action Alternative (Navy)
Distance (length) of line	13.8	11.9	11.7	11.6	12.1
Acres of land within the environmental study limit	836	721	709	703	733
Acres of agricultural lands within the environmental study limit	~165	~165	~165	~153	~165
Crossings of Perennial Streams	Gila River only. Would not cross San Simon River.	Gila River only. Would not cross San Simon River.	Gila River only. Would not cross San Simon River.	Gila River and San Simon River.	Gila River only. Would not cross San Simon River.
Number of ephemeral drainages crossed (excludes Gila River and San Simon River)	7	6	6	6	6
Serve the Airport development area with direct rail service to/from AZER mainline (includes distance to the Airport)	No (approximately 14,000 ft. west of the Airport)	No (approximately 8,800 ft. west of the Airport)	No (approximately 3,800 ft. west of the Airport)	Yes- on Airport land (approximately 1,500 ft west of the Airport)	Yes- on Airport land (approx. 1,500 ft west of the Airport)
Compatibility with existing surrounding/adjacent land uses	Yes – traverses mainly private property in agricultural use	No – Bisects Dry Lake Park, 4(f) resource.	No- Bisects State of Arizona Trust Land	Yes – traverses mainly private property in agricultural use	Yes – traverses mainly private property in agricultural use
Compatibility with planned surrounding/adjacent land uses	Yes–Avoids Dry Lake Park	No-Bisects Dry Lake Park, 4(f) resource.	No-Bisects State of Arizona Trust Land	Yes–Proposed Safford annexation area–com/industrial use	Yes–Proposed Safford annexation area–com/industrial use

Alternative Length, Size of Study Area

This is an important environmental consideration as it can minimize the potential impact area by providing the shortest distance between points. Alternative A is the longest route at 13.8 miles in length; the remaining Alternatives have comparable lengths, ranging from 11.6 miles (Alternative D) to 12.1 miles (Action Alternative). The differing lengths of the alternatives result in differing sizes of the study area. Alternative A has the largest study area and therefore would have the largest area of disturbance. With the exception of Alternative D, whose project area includes 153 acres of agricultural land, the study areas of the other alternatives include 165 acres of agricultural land.

Crossings of Perennial Streams and Ephemeral Drainages

Each of the alternatives would cross the Gila River on a newly constructed bridge. Bridge construction has the potential of disrupting aquatic and riparian habitat, including impacts to sediment load, water quality and bank stabilization. Alternative D would require crossings at both the Gila River and the San Simon River. This additional crossing at the San Simon River would increase the project's footprint and area of potential environmental disturbance.

All alternatives would cross several ephemeral drainages. Alternative A would cross seven ephemeral drainages; all other alternatives under consideration would cross six ephemeral drainages. A lower number of ephemeral drainage crossings is preferable as a means of reducing impacts to drainage areas.

Compatibility with existing/planned land uses

Alternatives must take into account what kinds of land uses would be compatible with the proposed rail line. Types of land use that should be avoided due to incompatibility include residential uses and parkland. A majority of the alignment areas in each of the alternatives is on privately held land. South of the Gila River, the majority of lands are in agricultural use; north of the Gila River, the majority of lands consist of lightly vegetated desert rangeland.

As discussed below, Alternative B would traverse Dry Lake Park, a 4(f) protected resource. This alternative would have a direct impact on Dry Lake Park.

Alternative C would cross through the center of State of Arizona Trust Land. The proposed rail line would not be compatible with the mission and goals of the Arizona State Land Department.

Minimize intrusions into State or City owned lands

Dry Lake Park is a Section 4(f) protected property and is held by the City of Safford, Arizona, under a Recreation and Public Purposes (R&PP) Patent.⁵ This Patent was issued to the City by the Bureau of Land Management (BLM) under the provision that the land would serve as a primary recreation facility unless otherwise authorized by BLM. In a letter dated July 12, 2006, the BLM recommended AZER evaluate alternatives that do not pass through the Dry Lake property, as BLM would not authorize the rail line due to incompatibility with the current uses under the R&PP Patent.

Modifications to Proposed Route

Following the identification of the Action Alternative routing, AZER conducted additional field reconnaissance in preparation for this EA, including evaluation of biological, cultural, and hydrological conditions all along the proposed rail line, but with particular emphasis at the proposed Gila River crossing. As a result of this reconnaissance, AZER made minor adjustments to the alignment at both the proposed Gila River crossing as well as at the proposed U.S. Highway 70 crossing. These changes do not materially affect any of the conclusions of the alternative evaluation as summarized in Table 2.3-1 above.

Summary

The technical and environmental criteria outlined above illustrate major differences between the alternatives, leading to the elimination of several alternatives from consideration.

Alternative A was withdrawn from consideration because it has the longest length and largest impact area. It also crosses the largest number of ephemeral drainages. Furthermore, Alternative A does not meet the objective of proximity to Safford Municipal Airport, such that the proposed rail line could someday serve a business park adjacent to the Airport.

Alternative B was withdrawn from consideration primarily because it would directly impact Dry Lake Park, a Section 4(f) protected parkland conveyed to the City of Safford, Arizona, by BLM. Alternative B therefore would be considered to have an incompatible land use. In addition, Alternative B is too distant from the Airport to be able to serve future business park development near the Airport site.

⁵ Section 4(f) is a federal transportation policy enacted by the Department of Transportation Act (DOT Act) of 1966 to preserve the integrity of publicly owned public parks and recreation areas, waterfowl and wildlife refuges, and historic sites considered to have national, state or local significance. The Surface Transportation Board is decisionally independent from DOT and therefore, is not subject to Section 4(f). The EA contains Section 4(f) analysis owing to the participation of FRA as a cooperating agency for the Proposed Action. FRA is an agency under DOT subject to Section 4(f).

Alternative C was withdrawn from consideration owing to its crossing of State of Arizona Trust Lands. Rail service is not within the uses contemplated for these Trust Lands, so the alternative would be considered to have an incompatible land use.

Alternative D avoids some of the environmental effects of Alternatives A, B, and C, in that it has a shorter alignment and avoids the land use incompatibility issues of Alternatives B and C. However, Alternative D would require construction of two bridges: one over the Gila River, a second over the San Simon River. Construction of a second bridge within a waterway would have potentially greater environmental effects than the other alternatives.

The Proposed Action Alternative was crafted to avoid the issues associated with Alternatives A, B, C, and D. The Proposed Action Alternative is not the shortest alignment, nor the one with the fewest environmental impacts. However, the Proposed Action Alternative crosses fewer ephemeral drainages than Alternative A and is proximate enough to the Airport to meet the applicant's objective of being able to provide future rail service to planned industrial development adjacent to the Airport. The Proposed Action Alternative also avoids a conflict with property protected under Section 4(f) (whereas Alternative B includes such a property). The Proposed Action Alternative does not bisect Arizona State Trust Land, as Alternative C would do. The Proposed Action Alternative would also avoid a crossing of the San Simon River, as would be required for Alternative D. Taking all of these environmental factors into account, Alternatives A, B, C, and D were eliminated from further consideration. The alternatives considered through the remainder of this document are the Proposed Action Alternative and the No Action Alternative.

3.0 Affected Environment

3.1 INTRODUCTION

Chapter 3 provides an overview of existing environmental conditions in the Project area and immediate vicinity of the Proposed Action, construction and operation of a new AZER rail line to serve the Mine, north of Safford, Arizona. Figure 2-1 provides a schematic illustration of the proposed rail line overlaid upon an aerial image of the vicinity. Appendix A includes a detailed plan and profile drawing of the proposed rail line.

The chapter discusses information provided by Federal, state and local agency contacts as well as data collected in the field.

Existing environmental conditions are described so that the potential environmental effects of the proposed action may be assessed (see Chapter 4, Environmental Consequences).

For the purposes of this analysis, the Project area is the new rail line that would be constructed and operated under the Proposed Action. While operations of the new rail would require transit over existing portions of AZER's mainline, the change in train traffic along this line would fall below the Board's threshold for analysis. This threshold is set forth in 49 CFR 1105.7 (e)(5)(i)(A), which requires analysis of any segment of a rail line affected by a new project which would see an increase of at least eight trains per day. The Proposed Action would create an increase of only two trains per day on existing segments of the AZER railway, therefore falling below the threshold established at 49 CFR 1105.7(e) above. For this reason, the Project area for this analysis is limited to the area immediately around the proposed new rail line.

3.2 LAND USE/FARMLANDS AND AGRICULTURE

The land use analysis examines and characterizes the physical area in terms of existing and proposed land uses.

The following methods and sources of information were included in the land use analysis:

- A project site visit on July 20, 2006
- Review of recent and historical aerial photographs
- Graham County Comprehensive Plan and City of Safford General Plan

- United States Department of Agriculture Agricultural Statistics Service
- Safford Regional Airport Master Plan Update, 2000

Project Area Setting

The Project area is located entirely within Graham County, Arizona. A portion of the Project area traverses lands that are owned by but located outside the corporate limits of the City of Safford, Arizona.

Land uses in the Project area are regulated by Graham County and the City of Safford. Regulations governing land use are set forth in the Graham County Comprehensive Plan and the City of Safford General Plan.

Graham County is in the southeastern portion of Arizona. The County seat is located in Safford, which is also Graham County's largest city, encompassing 7.9 square miles. The County is 4,630 square miles in size.

The Project area is primarily located on privately owned land. Exceptions include U.S. Highway 70, a facility owned by ADOT, and parcels near the Airport, owned by the City of Safford.

Existing Land Uses

Existing land uses in the southern portion of the Project area are primarily agricultural. A mobile home park is located to the southwest of the Project area. Notably, these residential lands are currently adjacent to AZER's existing mainline tracks. Toward the Gila River, land uses are primarily irrigated farmland, including row crops of alfalfa and cotton fields adjacent to the San Simon River. The Project area crosses U.S. Highway 70, a 2-lane highway, and several irrigation ditches, including the Montezuma and Union Canals.

Moving north in the Project area, across the Gila River, the landscape changes from agricultural to desert scrub plateau. On the northern bank of the Gila River, alluvial fans are predominant, with numerous washes coming down from the Gila Mountains to the north. The Project area crosses Airport Road in addition to three private roads: Lone Star Mountain Road, San Juan Mine Road, and Phelps Dodge Road.

Land Use Regulatory Setting

With the exception of three parcels designated for residential use near AZER mainline tracks, all of the lands within the Project area are designated by the Graham County

Comprehensive Plan¹ for agricultural uses. The County's agricultural designation allows agricultural and grazing uses, as well as limited residential uses.

The City of Safford, Arizona, is located to the west and south of the Project area. While the Project area does not include any land within the corporate limits of the City, it does include portions of City owned parcels adjacent to the Airport, about 2 miles to the northeast of the City's central area. The City of Safford General Plan identifies these parcels near the Airport as within the Airport's master plan for non-aviation related light industrial development. The Safford General Plan states that "future development of these parcels, and the [A]irport in general, will be severely limited until adequate infrastructure is in place. At present there is only limited access to the parcels for non-aviation related development."²

Safford Regional Airport Master Plan

The Safford Regional Airport Master Plan, a collaborative effort of Graham County and the City of Safford, is intended to guide growth in the Airport's vicinity over the next two decades. The Plan allows for growth that will "satisfy aviation demand, support land use compatibility planning with community development plans, and minimize environmental impacts."³

The Airport comprises 630 acres located 4 miles northeast of the City of Safford, and provides general aviation services for the greater Safford area. The Airport has two paved runways (the longer is 6,015 feet), tie downs for transient aircraft, a heliport, and includes about 12 buildings on Airport property.

The compatibility of existing and planned land uses in the vicinity of an airport is generally associated with the level of noise impact related to the airport. The Federal Aviation Administration (FAA) has developed guidelines for land-use compatibility based on noise levels and the nature of the land use being impacted. Commercial, industrial, and most public uses are generally considered compatible with airport operations, provided such uses are consistent with the performance standards of Federal Aviation Regulation Part 77 relative to height and safety. The FAA has identified the 65 DNL noise level as the threshold of incompatibility with residential land uses.⁴

¹ It should be noted that Graham County does not maintain a public land use map to accompany its Comprehensive Plan. Determination of a parcel's Comprehensive Plan designation is made by providing the County with an assessor's parcel number. The County's APN database is consulted to determine the Comprehensive Plan designation.

² *ibid.*, p. 24.

³ Safford Regional Airport Master Plan Update 2000. Safford, Arizona.

⁴ DNL is typically defined as an average noise level, measured over a 24 hour period, in which nighttime noise events (those occurring between 10:00 p.m. and 7:00 a.m.) are more heavily weighted, reflecting the fact that noises occurring during these hours are typically considered more disruptive than noise during daytime hours.

The Project area is located within both the primary and secondary (buffer) airport influence area (AIA), an area which is exposed to noise and over flights. As defined in the Airport master plan, the AIA was developed to promote land use compatibility between the county, city, and Airport, in particular to deter residential encroachment that would threaten the viability of the Airport. As of 2007, no encroachment of incompatible land use has occurred near the Airport.

Agricultural Regulatory Setting

Included as part of the Agriculture and Food Act of 1981 and published in the Federal Register in 1994, the Farmland Protection Policy Act (FPPA) is intended to prevent the permanent conversion of prime or unique farmland to nonagricultural use. The Natural Resources Conservation Service (NRCS), an agency of the United States Department of Agriculture (USDA) classifies farmland by category:

“Prime farmland” is “land with the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimal inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion.”

“Unique farmland” is “farmland other than prime land that is used for production of specific high value foods.”

According to the Arizona office of NRCS, all land in the State of Arizona that is irrigated or actively used for agricultural purposes (even if not irrigated) is considered prime farmland.⁵

Existing Agricultural Conditions

The Project area is located within Graham County, Arizona. As of 2002, per the USDA, the County as a whole had 176 farms, most of them in the Gila River valley. The major crop raised in the County is cotton, accounting for the vast majority of County agricultural production.

The portion of the Project area south of the Gila River traverses predominately irrigated agricultural lands along the San Simon River. Table 3.2-1 shows current land uses for each parcel included in the Project area. In all cases, the Project area, a linear alignment, includes only a portion of the parcels identified in the table below.

⁵ Smarik, Steve. Environmental Specialist, Natural Resources Conservation Services (NRCS). Personal Communication, December, 2006.

Table 3.2-1 Project Area Parcels and Land Uses

Assessor's Parcel Number (APN)	Property Owner	Parcel Size (acres)	Land Use Status
102-01-004c	Anderson Farms	324	Vacant
102-01-004e	City of Safford	294	Vacant
102-01-005	City of Safford	2	Vacant
102-01-006	City of Safford	7	Vacant
102-02-001	Cluff Properties, Inc.	160	Agriculture
102-32-003b	VIP Farms	38	Vacant
102-33-002b	VIP Farms	317	Agriculture (cotton)
102-34-001	Claridge, Christopher Layton	320	Agriculture
103-17-002b	Phelps Dodge Corporation	144	Agriculture
103-17-002c	Phelps Dodge Corporation	6.23	Houses a Phelps Dodge lab
103-17-0022d	Phelps Dodge Corporation	137	Lease out by Phelps Dodge and farmed
103-17-003	Latter Day Saints	88	Agriculture
103-17-006	Kempton, Calvin Kent, Trustee/Calvin Kent & Patricia Ann Kempton	39	Agriculture
103-17-012b	Fringe Players AZ LCC	3	Vacant
103-17-012x	Lutz, Ryan F & Jessica L	1	Residential
103-17-012z	Mathews, Harold K	1	Vacant
103-17-029	Claridge, Christopher Layton	34	Agriculture
103-17-036	Fringe Players AZ LLC	19	Mobile Home
103-17-038	Rains, John W & Barbara J	1	Residential
107-08-006	Phelps Dodge Corporation	1675	Agriculture
107-08-007	Phelps Dodge Corporation	156	Agriculture

Sources: Jerold Smidt, Graham County Assessor's Office, personal communication, May 10, 2007. Ruth Barren, USDA Rural Development Department, personal communication, May 16 2007.

3.3 COMMUNITY/SOCIO-ECONOMIC CONDITIONS

The economic setting and demographics of the Project area and vicinity provide indicators of local and regional economic strength, population trends, and population characteristics. This information helps define the economic setting of the proposed action and understand how the construction and operation of the Project would affect the local economy.

The Project area includes three parcels known to be in residential use. These parcels are in the southwestern portion of the Project area and are part of a mobile home park adjacent to the existing AZER mainline tracks. There are no other parcels known to be in residential use within the Project area. Review of existing conditions suggests that the Project area includes three households, all of which are located near the southern terminus of the Project area; specifically, adjacent or near to AZER’s mainline tracks.

Detailed demographic data are not available at the Project area level. No single or aggregation of US Census block groups accurately represents the Project area, a linear alignment spanning approximately 12 miles. Project area demographic analysis is therefore infeasible. For the purposes of this analysis, community and socio-economic conditions are presented for Graham County, Arizona and Safford, Arizona, the nearest City. Section 3.4 below provides environmental justice analysis, examining Census tracts and block groups in the Project area.

Data used in this analysis was obtained from the U.S. Census Bureau (the 2000 US Census), as well as from the Arizona Department of Commerce, the Graham County Comprehensive Plan, and the City of Safford General Plan.

POPULATION

Table 3.3-1 presents population trends for Graham County, the City of Safford, and the State of Arizona.

Table 3.3-1 Population Trends

	1990 population	2000 population	Percent change	2003 population	Percent change
Graham County	26,554	33,498	+26.2	34,490	+3.0
City of Safford	7,359	9,232	+25.5	9,410	+2.3
State of Arizona	3,665,228	5,130,632	+40.0	5,629,870	+9.7

Source: Arizona Department of Commerce, 2003.

Graham County has experienced a population increase of 26.2 percent between 1990 and 2000, with an additional increase of 3.0 percent from 2000 to 2003. This represents an annual growth rate of approximately 2.5 percent. Safford experienced a 25.5 percent growth in population from 1990 to 2000, with an annual growth rate of just under 2.5 percent.

Despite these robust growth rates, both Graham County and Safford have grown more slowly than the State of Arizona as a whole. The state population increased 40 percent between 1990 and 2000, or 3.5 percent annually.

Economic Conditions

As shown in Table 3.3-2, the percentage of families and individuals below the poverty line in 2000 was higher in Graham County than Safford and the State average.

Table 3.3-2 2000 Income & Poverty Status for Graham County, Safford, and Arizona

	Graham County	City of Safford	State of Arizona
Per capita income	\$12,139	\$14,052	\$23,365
Percent of families below poverty level	17.7	13.9	10.9
Percent of individuals below poverty level	23.0	17.3	14.2

Source: US Census, 2000.

Median household income in Graham County rose 61 percent from 1990 to 2000, increasing from \$18,455 to \$29,668. The median income was 49.0 percent lower than the Arizona median household income of \$44,202 in 2000; the County ranks 13th out of the 15 counties in the State in terms of median household income. Per capita income in 2000 was 92.4 percent lower in Graham County than for the rest of the State; the City of Safford's median income was 15.8 percent higher than the County average.

Table 3.3-3 shows employment breakdown by work sector. The most significant employment sectors in Graham County are education and health services, agriculture/mining, and retail. For the past 50 years, the economic base for the county has been agriculture. Even today, the rate of Graham County jobs in agriculture and mining is more than 10 times that of the State of Arizona as a whole.

Within Safford, the County's largest city, major employers include city and county government, BLM, the U.S. Forest Service, and the Safford School District. Founded as an agricultural community, cattle ranching and cotton farming continue to play important roles in the local economy.

Table 3.3-3 Industrial Distribution in Graham County, Safford, and State of Arizona

Industry	Graham County	City of Safford	State of Arizona
Educational, health, and social services	24.9%	26.9%	18.8%
Agriculture, forestry, fishing and hunting, mining	13.4%	13.6%	1.2%
Retail Trade	12.4%	13.0%	12.1%
Public Administration	11.1%	10.6%	5.4%
Arts, entertainment, recreation, accommodation, and food services	9.0%	9.1%	10.1%
Construction	8.7%	7.7%	7.7%
Other Services (except public administration)	4.3%	4.0%	4.5%
Professional, scientific, management, administration, and waste management services	3.7%	2.6%	10.8%
Manufacturing	3.1%	3.1%	8.2%
Transportation and warehousing utilities	3.1%	2.5%	4.7%
Finance, insurance, real estate and rental and leasing	2.9%	3.7%	8.6%
Wholesale Trade	2.0%	1.5%	3.3%
Information	1.4%	1.7%	1.9%

Source: US Census Data, 2000.

Notes: State of Arizona percentages based on 2005 data

3.4 ENVIRONMENTAL JUSTICE COMMUNITIES

Environmental justice analysis is a requirement for all Federal agency actions, imposed by Executive Order No. 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*. This order directs Federal agencies to develop approaches that address environmental justice concerns in their programs, policies, and procedures. Although the Order does not require independent agencies such as the Board to conduct environmental justice analyses, SEA conducted an environmental justice analysis of the proposed AZER rail extension for the following reasons:

- The Executive Order requested that independent agencies comply with the Order, particularly during the NEPA process.
- The United States Department of Transportation (DOT), CEQ, and the United States Environmental Protection Agency (EPA) guidance on environmental justice emphasize addressing environmental justice concerns in the NEPA context.

- The Board is responsible for ensuring that the proposed AZER rail extension is consistent with the public interest.

Executive Order No. 12898 directs Federal agencies to identify and address, as appropriate, disproportionately high and adverse impacts to minority and low-income populations (environmental justice populations) with respect to human health and the environment. In summary, the Order directs Federal agencies to conform to existing laws to ensure that their actions:

- Do not discriminate on the basis of race, color, or national origin.
- Identify and address disproportionately high and adverse health or environmental effects of their actions on minority and low-income populations.
- Provide opportunities for community input in the NEPA process, including input on potential effects and mitigation measures.

SEA evaluated the potential effects of the construction and operation of the proposed line to ensure that potential environmental and health effects would not be borne disproportionately by minority and low income populations (environmental justice populations). To conduct the analysis, SEA identified environmental justice populations within a two-mile radius of the Project area. SEA then compared the occurrence of environmental effects between the identified environmental justice communities and other communities in the vicinity, to determine if the effects would be disproportionately borne by minority and low-income populations.

SEA defines an environmental justice population as one where the percentage of minority or low-income populations in a census block exceeds 50 percent, or is at least 10 percent greater than the percentage of minority or low-income population in the county as a whole. SEA examined all population groups within a two-mile radius of the Project area, using 2000 census data to identify block groups that meet or exceed the environmental justice thresholds.

According to the 2000 census, low income families comprise 23 percent of the County population, while 43.8 percent of the County is considered a minority population. As stated in Executive Order No. 12898, a local population that exceeds the County statistic by *10 percent* or more qualifies as an environmental justice community. Therefore, any block group population having at least 33 percent low-income or 53.8 percent minority composition would be considered an environmental justice community.

Of the four block groups within the 2.0-mile radius of the Project area, SEA identified one group where the population would be considered an environmental justice community (bolded in Table 3.4-1). Block Group 1 of Tract 9917 meets the environmental justice criteria on account of its having a population that comprised of greater than 53.8 percent minorities. Notably, none of the proposed rail line falls within the geographic boundaries of this block group, but it does include the Airport and stretches approximately 65 miles to

the east. The portion of this block group within 2 miles of the proposed rail line does not appear to have any residents.

Table 3.4-1 Racial and Poverty Characteristics by Block Group

Census Tract and Block Group	Total Population	Percent Minority Population	Percent Hispanic or Latino	Percent African American or Black	Percent Asian	Percent Native American /Alaskan Native	Percent Low-Income
9917, Block 1	1,799	55.9	45.2	8.2	0.1	2.4	31
9917, Block 2	700	44.1	39.1	2.5	0.1	0.7	17.3
9917, Block 3	2,161	35.3	33.1	1.2	0.5	0.6	20.3
9915, Block 1	2,124	35.1	33.9	0.4	0.05	0.1	17
Graham County	33,498	43.8	27	1.8	0.5	14.4	23

Source: US Census Data, 2000.

3.5 UTILITIES/PUBLIC SERVICES

This section describes and evaluates public services and utilities within the Project area and vicinity, including police and fire protection and emergency services, and gas and electric services. As part of this analysis, individual service providers were contacted and provided with information regarding the proposed Project.

POLICE SERVICES

No police facilities are located within the Project area. Police and public safety services in the Project area are provided by the Graham County Sheriff. The office is staffed with a sheriff, jail commander, patrol commander, and executive assistant and is located in the City of Safford.

The City of Safford also has its own police department, consisting of 21 full time police officers, one dog catcher, and three office personnel.

FIRE SERVICES

No fire department facilities are located within the Project area. Fire safety services in the Project area are provided by the City of Safford Fire Department, ⁶

⁶ According to Mike Rhodes at the City of Safford Fire Department, service on State owned property would be provided by the State's Wildland Fire Division, headed by the State Forester. The only State-owned property in the Project area is the U.S. Highway 70 right-of-way.

The City of Safford Fire Department responds to more than 200 calls per year and currently serves the City's five square miles as well as an area of 110 square miles outside the City.⁷ The department consists of one fire station staffed by 28 volunteer fire fighters; there are no fulltime-paid staff members.

UTILITIES

Telephone and electrical lines cross the Project area at U.S. Highway 70. Electric service in the area is provided by the Graham County Electrical Cooperative, Inc. Natural gas and propane services would be provided by Griffen Propane/Matlock Gas Company.

3.6 TRAFFIC AND TRANSPORTATION

This section documents the existing and predicted future conditions along two roadway segments which cross the Project area: U.S. Highway 70 and Airport Road.

EXISTING CONDITIONS

U.S. Highway 70

A one-mile segment along U.S. Highway 70 from milepost 343 to milepost 344 was studied. Within this one-mile stretch, U.S. Highway 70 is a two-lane highway with a posted speed limit of 55 mph. No signalized intersections exist within the study area. Both residential and commercial driveways directly access the highway. U.S. Highway 70 crosses the San Simon River within the study area. The roadway is generally flat. However, the road slopes slightly up to the San Simon River Bridge from as far away as 650 feet in either direction of the bridge.

Airport Road

A one half-mile segment of Airport Road from the intersection with Solomon Pass Road westward was studied. Within this area, Airport Road consists of two lanes with no intersections. Airport Road is predominantly surrounded by vacant land, with the exception of the Airport to the east. No speed limit was posted within this roadway segment, but is assumed to be 55 mph, based on the closest available posting.

Existing Traffic Volumes

Year 2005 average annual daily traffic (AADT) for U.S. Highway 70 from milepost 341.85 to milepost 344.37 was supplied by ADOT, while AADT for Airport Road was provided by

⁷ Mike Rhodes, City of Safford Fire Chief. Personal Communication, April 17, 2007.

the Graham County Office of Engineering.⁸ Seasonal and daily adjustment factors, as well as peak hour (K) and peak directional (D) factors were provided by ADOT or Graham County to arrive at a one-way afternoon peak hour volume for this analysis. Table 3.6-1 summarizes the findings for each study segment.

Table 3.6-1 Existing Traffic Volumes and Calculations

	2005	2005
	U.S. Highway 70	Airport Road
Raw count data ¹	N/A	464
Seasonal adjustment ²	N/A	0.917
Annual Average Daily Traffic ²	5,900	425
K Factor ²	10.10%	10.10%
Afternoon Peak Hour Traffic Volume	596	43
D Factor ¹	51.50%	51.50%
One Way PM Peak	307	22

Notes/Sources:

¹ Graham County Engineering Department. In this case, the D factor means that 51.5 percent of traffic is coming from one direction; 48.5 from the opposite direction.

² Arizona Department of Transportation (ADOT). In this instance, the K factor means that 10.1 percent of all daily trips are assumed to occur during the afternoon peak hour.

Existing Level of Service

There are no at-grade rail crossings along either study roadway segment that could restrict traffic flow. In terms of delay-based level of service (LOS) analysis, both study roadway segments are operating at free-flow conditions. Vehicles traveling on these roadway segments do not experience any congestion-related delay.

FUTURE CONDITIONS

Future conditions were projected into the year 2030. For U.S. Highway 70, both a two-lane and four-lane configuration was studied, consistent with ADOT intentions to widen this road.

Future Planned Development and 2030 Traffic Volumes

To better predict 2030 traffic levels, an annual growth rate of 1.85 percent was applied to 2005 AADT figures. This growth rate was provided by ADOT for traffic volumes along the study roadway segment. The growth rate was derived from the linear interpolation of

⁸ Year 2005 data is the most recent data available for Project area roadways.

previous growth in traffic volumes along U.S. Highway 70. Therefore, any previous development trends along U.S. Highway 70 are expected to be captured in the growth rate.

Table 3.6-2 summarizes the future traffic volumes for each location incorporated into each analyzed scenario. The resulting one-way PM peak hour volume was then incorporated into the subsequent intersection operational analyses to be outlined in Chapter 4, Environmental Consequences. The table shows that traffic is assumed to increase by 2030, but overall volumes are still low enough such that no congestion-related delay would occur. U.S. Highway 70 would see one vehicle approximately every 7.5 seconds during the evening peak hour, while during the same period, Airport Road would see one vehicle about every 2 minutes.

Table 3.6-2 2030 Traffic Volumes

	2005		2030	
	U.S. Highway 70	Airport Road	U.S. Highway 70	Airport Road
Raw count data ¹	N/A	464	N/A	464
Annual growth factor ²	N/A	N/A	1.85%	1.85%
Seasonal adjustment ²	N/A	0.917	N/A	0.917
Annual Average Daily Traffic ²	5,900	425	9,330	673
K Factor ²	10.10%	10.10%	10.10%	10.10%
Afternoon Peak Hour Traffic Volume	596	43	942	68
D Factor ¹	51.50%	52.00%	51.50%	52.00%
One way PM peak	307	22	485	35

Sources:

¹ Graham County Engineering Department.

² Arizona Department of Transportation (ADOT).

3.7 VISUAL/AESTHETICS

Visual resources are the natural and human-made features of a landscape that characterize its form, line, texture, and color. This section describes the existing visual landscape within the Project area and vicinity.

SOUTHERN PORTION: FROM EXISTING ARIZONA EASTERN RAILROAD TO GILA RIVER CROSSING

This portion of the Project area consists of agricultural fields with views to distant mountains in all directions. Viewpoints for the analysis are shown on Figure 3.7-1; photos from the viewpoints are depicted on Figure 3.7-2. Existing views (from Viewpoints A and B) are of cultivated fields, the San Simon River, distant mountains, and minor structures (silos, sheds, etc.) associated with agricultural usage. From a point about 1 mile north of the existing Arizona Eastern mainline railroad and the Gila River, the Project area parallels the San Simon River. North of U.S. Highway 70, the Project area would cross agricultural fields and the Union Irrigation Canal en route to the proposed Gila River Crossing.

NORTHERN PORTION: FROM GILA RIVER CROSSING TO MINE

Whereas the southern portion of the Project area travels through a primarily flat agricultural area, the area north of the Gila River is an open desert landscape without significant tall vegetation that allows for expansive views to distant mountains in all directions. Photos of existing views from viewpoints in this area (Viewpoints C and D) are included in Figure 3.7-2.





A Looking West from US 70
At San Simon River



B Typical view from US 70 near
San Simon River



C Gila River at proposed crossing



D Lone Star Mountain Road

3.8 CULTURAL AND PALEONTOLOGICAL RESOURCES

BACKGROUND

Cultural resources are properties that reflect the heritage of local communities, states, and nations. Properties judged to be significant in American history, architecture, archeology, and culture, to possess integrity, and to have achieved significance within the past 50 years are termed "historic properties," and are afforded certain considerations in accordance with state and Federal legislation.

The National Historic Preservation Act (NHPA) of 1966⁹ defines historic properties as sites, buildings, structures, districts (including landscapes), and objects included in, or eligible for inclusion in, the National Register of Historic Places (NRHP), as well as the artifacts, records, and remains related to such properties. Section 106 of the NHPA requires Federal agencies to take into account the effects of their activities and programs on NRHP-eligible properties.

For the purposes of evaluating potential impacts to cultural resources, the Project area was determined to be a 500-foot wide band centered on the centerline of the proposed rail line, running the entire length of the proposed rail line. The proposed rail corridor would be approximately 25 feet in width for the majority of its length, inclusive of tracks, access road, and drainage ditch.

WestLand Resources, Inc. prepared two Class III cultural resource inventories of the Project area.¹⁰ A second, supplemental report was prepared in 2007 to reflect changes to the Project description and area. SEA engaged a qualified peer reviewer, William Self Associates (WSA) of Tucson to review and verify Westland's reports and develop the discussion in this section.

EXISTING CONDITIONS

There are three previously recorded and nine newly recorded cultural resources within the Project area. The previously recorded resources consist of: the Arizona Eastern Railroad

⁹ Public Law 89-665, as amended.

¹⁰ The two reports prepared were: 1) *Class III Cultural Resources Inventory of the Arizona Eastern Railroad Extension of Service Right-of-Way Near Solomonville, Graham County, Arizona*, Cultural Resources Report No. 2006-64 and 2) *Class III Cultural Resources Inventory of the Arizona Eastern Railroad Extension of Service Right-of-Way Near Solomonville, Graham County, Arizona; Supplemental Archaeological Survey*, Cultural Resources Report No. 2006-64

(AZ CC:1:76(ASM); the historic Union Canal (AZ CC:2:172(ASM); and US Highway 666/191 (AZ CC:3:91(ASM)).¹¹

The nine newly recorded resources consist of:

- two Archaic/Formative artifact scatters (AZ CC:2:358(ASM) and AZ CC:2:359(ASM));
- the historic San Simon River diversion canal (AZ CC:2:360(ASM));
- a historic site identified as a possible “piggery” (a waste management site; AZ CC:2:361(ASM));
- the Montezuma Canal (AZ CC:2:362(ASM));
- a historic habitation site (AZ CC:2:363(ASM));
- a sub-surface historic aqueduct (AZ CC:2:364(ASM));
- two prehistoric artifact scatters with rock features (AZ CC:2:369 (ASM) and AZ CC:2:370 (ASM)).

Table 3.8-1 below summarizes the cultural resources present within the Project area and provides a recommendation of eligibility for inclusion in the NRHP for each. Of the documented cultural resources, four have been recommended eligible for inclusion in the NRHP. Those recommended for inclusion are AZ CC:2:172 (ASM), the Union Canal, AZ CC:2:358(ASM), a prehistoric artifact scatter, AZ CC:2:362 (ASM), the Montezuma Canal, and AZ CC:2:364 (ASM), a buried aqueduct.¹²

Two resources have been recommended eligible for inclusion in the NRHP, although the segments located within the Project area have been recommended as non-contributing portions of larger eligible sites. These are: the Arizona Eastern Railroad (AZ CC:1:76(ASM)) and US Highway 66/191 (AZ CC:3:91(ASM)).

Three resources have been recommended not eligible for inclusion in the NRHP. These are AZ CC:2:359(ASM), a pre historic artifact scatter, AZ CC:2:369 (ASM) and AZ CC:2:370 (ASM). Both AZ CC:2:369 (ASM) and AZ CC:2:370 (ASM) are prehistoric artifact scatters with rock features. Although AZ CC:2:370 (ASM) is recommended ineligible to the NRHP, one feature was identified as a possible grave, in which case the provisions of Arizona Revised Statute §41-865 would pertain.

Three resources have been recommended as unevaluated pending additional archival research and eligibility testing; these are AZ CC:2:360(ASM), the San Simon River diversion; AZ CC:2:361(ASM), a historic “piggery”; and AZ CC:2:363 (ASM), a farmhouse.

¹¹ Within the number of each resource, “ASM” refers to the Arizona State Museum.

¹² The existence of AZ CC:2:364 (ASM) is inferred from archival research; no physical traces have been observed in fieldwork.

Table 3.8-1 Cultural Resources Recorded within the Project Area

ASM Site Number	Land Status	Site Type	Age and Cultural Affiliation	NRHP Eligibility	SHPO concurrence	Recommended Treatment
AZ CC:1:76 (ASM) Arizona Eastern Railroad	Private (AZER)	Railroad	Historic: Euroamerican	Eligible: Non-Contributing	SHPO has determined other portions of this linear site to be eligible but has not previously evaluated this segment.	None
AZ CC:2:172 (ASM) Union Canal	Private	Irrigation Canal	Historic: Euroamerican	Eligible	SHPO has determined other portions of this linear site to be eligible but has not previously evaluated this segment.	Data recovery, if necessary; monitor
AZ CC:2:358 (ASM)	Private	Artifact Scatter	Prehistoric: Archaic/ Formative	Eligible	Newly identified site.	None: Project will avoid this site (See Chapter 4.0, Environmental Consequences)
AZ CC:2:359 (ASM)	Private	Artifact Scatter	Prehistoric: Archaic/ Formative	Ineligible	Newly identified site.	None
AZ CC:2:360 (ASM) San Simon River Diversion	Private	Earthen Levee and Channel	Historic: Euroamerican	Unevaluated	Newly identified site.	Additional archival research to determine eligibility; Data recovery, if necessary; monitor
AZ CC:2:361 (ASM)	Private	Piggery	Historic: Euroamerican	Unevaluated	Newly identified site.	Archival research
AZ CC:2:362 (ASM) Montezuma Canal	Private	Irrigation Canal	Historic: Euroamerican	Eligible	Newly identified site.	Data recovery, if necessary; monitor
AZ CC:2:363 (ASM)	Private	Farm-house	Historic: Euroamerican	Unevaluated	Newly identified site.	Eligibility testing, if necessary; data recovery, if necessary; monitor

ASM Site Number	Land Status	Site Type	Age and Cultural Affiliation	NRHP Eligibility	SHPO concurrence	Recommended Treatment
AZ CC:2:364 (ASM)	Private	Aqueduct	Historic: Euroamerican	Eligible	SHPO has determined other portions of this linear site to be eligible but has not previously evaluated this segment.	None
AZ CC:2:369 (ASM)	Private	Artifact scatter with rock features	Prehistoric Native American	Ineligible	Newly identified site.	None
AZ CC:2:370 (ASM)	Private	Artifact scatter with rock features	Prehistoric Native American	Ineligible	Newly identified site.	Archaeological testing of possible grave.
AZ CC:3:91 (ASM) US Hy 666/191	State (ADOT)	Road	Historic: Euroamerican	Eligible: Non-Contributing	SHPO has determined other portions of this linear site to be eligible but has not previously evaluated this segment.	None

Source: Westland, 2006.

3.9 HYDROLOGY AND WATER QUALITY

This section describes the hydrologic setting of the Project area and vicinity, including a review of surface water and groundwater conditions. This section is based on a Hydrology Study prepared for SEA by Ninyo and Moore in October 2006, included as Appendix H.

EXISTING CONDITIONS

The local hydrologic system is influenced by a semiarid climate. Annual average precipitation in the Project area and vicinity ranges between 9 and 15 inches; average evaporation rates are high. Hydrologic surface features within the Project area include drainages, a dry lake, river-beds, and intermittent rivers. The groundwater system is comprised of recharge zones, discharge points, unsaturated and saturated zones, and aquifers.

The surface elevations within the Project area range from a high point of approximately 3,480 feet above mean sea level (AMSL) near the proposed mining operations at the northwestern limits of the Project area to a low of about 2,970 feet AMSL near the confluence of the San Simon and Gila Rivers at the southern limits of the Project area. The topography of the Project area generally slopes downward from the northeast to southwest toward the Gila River.¹³ Interpretation of topographic contours indicates that the average surface gradient over the entire distance of the Project area is approximately 0.010 feet per foot or approximately 50 feet per mile.

The Gila River, which flows from the southeast to the northwest in this region, crosses the Project area approximately one mile north of U.S. Highway 70. A channelized section of the San Simon River parallels the Project area between AZER's mainline tracks and the Gila River. North of the Gila River, the Project area consists of undeveloped desert land dissected by multiple natural drainages on southwest-sloping alluvial fans, with several graded and unimproved roadways. Other hydrological features located in and adjacent to the Project area include the Montezuma and Union irrigation canals, several aqueducts, and groundwater production wells.

Based on a review of historic photographs, land uses and geomorphic expression of drainages in and adjacent to the Project area have changed very little since 1935. It should be noted, however, that fluvial responses can change dramatically in response to relatively short-term climatic changes.¹⁴ Agricultural structures observed in historical photographs

¹³ According to the Safford, Graham County, Arizona 7.5-Minute United States Geological Survey (USGS) Topographic Map (1985), and the Weber Peak, Graham County, Arizona 7.5-Minute USGS Topographic Map (1985).

¹⁴ Based on a 1935 Soil Conservation Service (Fairchild) aerial photograph, a 1964 Arizona State highway Department aerial photograph, a 1980 Rupp's aerial photograph, a 1998 Terraserver photograph, and a 2006 Google™ Earth photograph.

near the proposed southern terminus of the Project area may have housed hazardous substances such as agricultural chemicals and/or petroleum products. As such, residual concentrations of agricultural chemicals and petroleum products may have impacted soil and/or shallow groundwater within the Project area. Additionally, hazardous substances and petroleum products associated with wildcat dumping areas and the recreational shooting range observed in the vicinity of the Project area north of the Gila River may have also impacted soil and/or groundwater conditions.

Surface Water Conditions

The Project area lies within the upper Gila Watershed, which extends from southwest New Mexico through southeast Arizona to the Coolidge Dam at the San Carlos Reservoir, about 25 miles southeast of the City of Globe. The Upper Gila Watershed drains approximately 7,430 square miles in Arizona and is located partially or wholly within the Morenci, Duncan Valley, Bonita Creek, and Safford groundwater basins boundaries.¹⁵ The watershed consists of variety of physiographic terrains ranging from rugged mountain ranges to gentle valleys. Elevations range from 2,600 feet to 11,000 feet AMSL, with annual precipitation varying from approximately 9 to 20 inches. About 17 percent of the land within the watershed is privately owned; the remainder is under the direction of state, Federal, or tribal governments. Mining, ranching, and agriculture are the principal industries in the upper Gila Watershed.

The Gila River flows intermittently through the watershed, although it maintains scattered stretches of perennial flow in the Project area. Upgradient of the Safford area, the Gila River is fed by several important tributaries, including the San Francisco River, Eagle Creek, Bonita Creek, and scattered springs. Through the Safford area, the intermittently flowing San Simon River, as well as numerous ephemeral washes and creeks feed the Gila River. Heavy pumping of groundwater for agricultural uses in the watershed has also affected the flow of the Gila River along some of its stretches, causing it to flow intermittently.

Natural drainages that cross the Project area north of the Gila River are oriented northeast to southwest and include, from south to north, the Lone Star Wash, Wilson Wash, Peterson Wash, Cottonwood Wash, Watson Wash, and the Talley Wash. The Coyote Wash is located approximately 0.40 miles north of the northern terminus of the Project area. Each of these drainages is tributary to the Gila River.

Flood Potential

Flood conditions occur infrequently across Arizona, although strong thunderstorms during the summer months are characteristic of the region. These storms can cause flash floods capable of considerable damage. Most water from summer storms is lost to

¹⁵ Arizona Department of Water Resources (ADWR), 2005a and 2006.

evapotranspiration; however, an intense storm or successive storms may result in runoff in washes.

The USGS-Real Time Water Data for Arizona web interface indicates that as of 2006, there is no available stream gauge information associated with the referenced washes. According to information included in the Dos Pobres/San Juan EIS¹⁶, annual average discharge of the Gila River through the Safford area has been measured at approximately 500 cubic feet per second (cfs) with historical lows and highs ranging from approximately 100 to 2,200 cfs, respectively.¹⁷ However, based on historical peak streamflow data obtained from the USGS, streamflows at the head of the Safford Valley near Solomon have exceeded 100,000 cfs. On October 2, 1983, a flow of 132,000 cfs was recorded at this gauge. This flow rate was the highest recorded over the 91 year period of record (1914 to 2005).

The Project area crosses 100-year flood zones, as identified on Flood Insurance Rate Maps (FIRMs) published by the Federal Emergency Management Agency (FEMA), at five locations. Specifically, the Project area traverses an approximately 1.5 mile section of designated Zone A floodplain associated with the confluence of the San Simon and Gila Rivers¹⁸ and would also cross the Lone Star, Wilson, Peterson, and Watson Washes; each of which is a FEMA designated Zone A 100-year flood zone. The approximate width of designated Zone A areas associated with each wash ranges from 440 feet at the Lone Star Wash to approximately 180 feet at the Watson Wash.

Surface Water Quality

In general, the quality of the Gila River changes considerably from its upstream source in New Mexico to the San Carlos Reservoir. Water at the source area is low in mineral content, containing primarily calcium and bicarbonate. However, along the watercourse, multiple tributaries, irrigation-return flows, and springs/seeps that have their sources in the underlying evaporite beds, significantly increase the river's concentration of dissolved solids. In a study conducted over a five year period during the 1950s the concentration of dissolved solids in the Gila River at the Arizona-New Mexico border averaged 305 milligrams per liter (mg/L), while in the Bylas area northwest of Safford, the average concentration of dissolved solids was 1,397 mg/L.¹⁹

A review of Arizona Department of Environmental Quality's (ADEQ's) List of Impaired Waters indicates that the reach of the Gila River between its confluence with the San Simon River and the outfall of Coyote Wash (the portion which the Project area would

¹⁶ Environmental Impact Statement Dos Pobres/San Juan Project, June 2004.

¹⁷ BLM, 2003.

¹⁸ According to the explanation provided with the FEMA Flood Insurance Rate Maps, Zone A areas are areas of 100-year flood; base flood elevations and flood hazard factors are not determined.

¹⁹ ADWR, 2005a and 2006.

cross) is not included on the Department's final 2004 Integrated 305(b) Assessment and 303(d) Listing Report. According to ADEQ's online web-based Arizona Unified Repository for Informational Tracking of the Environment (AZURITE) system, there have been no Arizona Pollution Discharge Elimination System (AZPDES) permits issued in the Project area and immediate vicinity as of November 2007.²⁰ Under the AZPDES Permit Program, facilities that discharge pollutants from any point source into waters of the United States (navigable waters) are required to obtain or seek coverage under an AZPDES permit. Pollutants can enter waters of the United States from a variety of pathways, including agricultural, domestic and industrial sources. For regulatory purposes these sources are generally categorized as either point source or non-point sources.

Drainages Crossed

The Project area crosses several natural drainages that are tributary to numerous washes: the Lone Star, Wilson, Peterson, Cottonwood, Watson, Tulley, and Coyote washes. In addition, the Project area would cross the Montezuma and Union irrigation canals, as well as an unnamed aqueduct north of the Gila River.

Groundwater Conditions

The Project area lies within the Safford groundwater basin in southeastern Arizona. Covering approximately 5,000 square miles, the Safford basin forms an elongated valley extending northwest to southeast through the Basin and Range and Central Highlands physiographic provinces. The Chiricahua, Dos Cabezas, Pinaleño, and Santa Teresa Mountains are located to the southwest, and the Peloncillo and Gila Mountains are located to the northeast. In general, groundwater flows northwestward from the southeastern end of the basin toward the San Carlos reservoir.

The Safford basin is divided into three sub-basins: the San Simon Valley, the Gila Valley, and the San Carlos Valley.²¹ The Project area is located in the Gila Valley sub-basin. The Gila Valley sub-basin is located in the central portion of the Safford groundwater basin and encompasses approximately 1,600 square miles. In general, groundwater in the Gila Valley sub-basin flows southeast to northwest from the Gila and Pinaleño mountains, toward the Gila River.

According to drilling-log data obtained through ADWR database (55-Well Inventory) and a 1987 ADWR hydrologic report, the depth of groundwater decreases from north to south in the Project area as follows:

²⁰ A December 2007 review of the AZURITE database indicated that the City of Safford applied in November 2007 for an AZPDES permit for a wastewater reclamation plant. This reclamation plant is located within the City of Safford and is outside of the Project area.

²¹ ADWR, 2005b.

- The northern portion near the proposed mining operations ranges from approximately 390 to 450 feet;
- The central portion ranges from approximately 95 to 265 feet, and;
- The southern portion adjacent to the Gila and San Simon Rivers ranges from approximately 15 to 50 feet.

Groundwater Use and Quality

Groundwater in the Project area and vicinity is used primarily for irrigation purposes. However, according to ADWR records, groundwater is also withdrawn for domestic and industrial use.

In general, the groundwater quality of the Gila Valley sub-basin is poor. Although high concentrations of dissolved solids and fluoride make the groundwater non-potable unless first treated, the groundwater is suitable for irrigation.²²

An unusual characteristic of groundwater in the Safford basin is elevated water temperatures. Low to medium temperature geothermal springs and wells are prevalent in this portion of Arizona.²³ These low- to moderate-temperature geothermal systems in the area are believed to derive their heat from deep circulation of surface-derived water.

3.10 GEOLOGY AND SOILS

This section describes existing geological and soil conditions, including geological hazards found in the area. This section is based on a Geotechnical Study and Geologic Hazards Evaluation prepared by Ninyo and Moore in October 2006, included as Appendix B.

Aerial photography from five different years ranging between 1935 and 2005 were reviewed to evaluate historical changes and potential geologic hazards in the Project area.²⁴ Aerials from 1935 and 1964 depict the Project area as agricultural land south of the Gila River, and undeveloped desert land north of the river. Aerial photographs from 1980, 1998, and 2005 show increased development within the City of Safford but continued agricultural uses in the Project area south of the Gila River.

GEOLOGIC SETTING

The Project area is located within the Mexican Highlands Section of the Basin and Range physiographic province, also known as the Arizona Transition Zone, which is typified by

²² ADWR, 1987.

²³ Witcher, 1982.

²⁴ Aerial photograph sources by date: 1935: Fairchild Aerial Surveys; 1964: ADOT; 1980 Rupp Aerial; 1998: USDA; 2005: GlobeXplore.

broad, hydrologically closed, alluvial valleys or basins separated by steep, northwest trending mountain ranges.²⁵ The basins and surrounding mountains were formed approximately 10 to 13 million years ago during the mid-to late-Tertiary period.

Extensional tectonics (the movement and stretching of the earth's crust) resulted in the formation of horsts (mountains) and grabens (basins) with vertical displacement along high-angle normal faults. Intermittent volcanic activity also occurred during this time. The surrounding basins filled with alluvium from the erosion of the surrounding mountains as well as from deposition from rivers. Coarser-grained alluvial material was deposited at the margins of the basins near the mountains and near rivers.

Surficial Geology

According to the 1958 Geologic Map of Graham and Greenlee Counties, Arizona, the surficial geology in the Project area consists of three separate alluvial deposits with ages ranging from the Late Tertiary period (about 2 million years ago) to the Holocene period (about the last 10,000 years). These deposits are generally composed of gravel, sand, silt, cobbles, and boulders. The younger alluvial deposits (Qal) are situated along the Gila River, and along the southern base of the Natanes Mountains (Qs). Depth to bedrock may be shallow within the alluvial unit denoted as Qs, due to the adjacent mountain range. Late Tertiary to Early Quaternary period (within the last 1.8 to 2 million years) alluvial deposits are generally found in the middle of the slope between the Natanese Mountains and the Gila River (Qts). A map and description of the geologic units can be found in the Ninyo and Moore report included as Appendix B.

Surficial soils in the Project area are generally well- to very-well drained; water is removed from soil rapidly, generally medium-grained material. However, these soils also have a relatively high potential to corrode materials containing a high iron content. These same soils have a relatively low potential to corrode concrete. Soils in the area of the proposed Gila River bridge abutments (Arizo Loam, Arizo Gravelly Loam, and Grabe Loam) are consistent with these characteristics. Limited portions of the Project area (namely, near U.S. Highway 70 and San Juan Mine Road, where only tracks would be constructed) contain soils with a high clay content and high potential for expansiveness.²⁶

A common characteristic of these types of desert soils include the development of calcium carbonate and caliche horizons.²⁷ Soils containing such layers are generally more difficult to excavate and may necessitate more aggressive excavation techniques. Stages of calcium carbonate and caliche cementation range from Stage I (partial grain coating of

²⁵ USGS, 1985.

²⁶ Soil Survey Staff, NRCS, USDA. Web Soil Survey. Available online at <http://websoilsurvey.nrcs.usda.gov/> accessed October 2006.

²⁷ Caliche is a hardened deposit of calcium carbonate that cements together other materials such as gravel, sand, clay, and silt.

cementation) to Stage VI (complete cementation of former soil).²⁸ In general, soils with Stage II or higher number carbonate development or calcification can mean increasingly higher potential for encountering difficult excavation and rippability conditions as the Stage number increases.

Calcium carbonate cemented soils and caliche horizons were not identified in the geologic map nor the soil survey of the Project area. However, soils in the desert southwestern United States will typically contain caliche layers, even if not expressly identified on geologic and soils maps.

Geological Hazards

Potential geological hazards in the Project area and vicinity include land subsidence and earth fissures, giant desiccation cracks, landslides, faulting and seismicity, and liquefaction.

Land Subsidence and Earth Fissures

Groundwater depletion, due to groundwater pumping, has caused land subsidence and earth fissures in numerous alluvial basins in southern Arizona. It has been estimated that subsidence has affected more than 3,000 square miles and has caused damage to a variety of engineered structures and agricultural land.²⁹ From 1948 to 1983, excessive groundwater withdrawal has been documented in several alluvial valleys where groundwater levels have been reportedly lowered by up to 500 feet. With such large depletions of groundwater, the alluvium has undergone consolidation resulting in large areas of land subsidence.

In Arizona, earth fissures are generally associated with land subsidence and pose an ongoing geologic hazard. Earth fissures generally associated with land subsidence form near the margins of geomorphic basins where significant amounts of groundwater depletion have occurred. Reportedly, earth fissures have also formed due to tensional stress caused by differential subsidence of the unconsolidated alluvial materials over buried bedrock ridges and irregular bedrock surfaces. Facies changes within the unconsolidated alluvial materials may also cause differential subsidence resulting in tensional stress.³⁰

However, within the Project area, there are no known Earth fissures present. The closest documented earth fissure to the Project area is located approximately 33 miles to the

²⁸ Lerner et al, 2003.

²⁹ Schumann and Genualdi, 1986

³⁰ *ibid.*

southeast, in a location where groundwater levels have declined approximately 100 to 300 feet bgs.³¹

Continued groundwater withdrawal within the Safford area has the potential to result in subsidence near the Gila River valley with the possible formation of new fissures or the extension of existing fissures.

Giant Desiccation Cracks

Giant desiccation cracks are common in the southwestern United States where clayey soils have become desiccated. Several of these large-scale cracks have been reported in playas in Arizona. Desiccation cracks are soil or mud cracks, formed in a polygonal-type shape, that range in size from less than a millimeter up to several feet wide and several feet deep, and can extend to 1,000 feet in length. These cracks generally form beneath the surface and commonly extend up toward the surface by the collapse of the roof cavity. Large desiccation cracks are commonly mistaken for earth fissures.³²

Giant desiccation cracks generally form in clay-rich layers deposited in lakes or playas within drained basins. In Arizona, these clay-rich layers generally undergo shrink-swell cycles due to fluctuations in moisture content.³³

There are no known giant desiccation cracks underlying the Project area. The closest giant desiccation crack is located approximately 8.3 miles to the southeast of the Project area.³⁴

Landslides

Landslides are downslope movements of soil and rock driven by gravity. Landslides generally occur along steep slopes, and rates of movement can range from rapid to a slow creep. Landslides and other mass movements occur in every part of the United States, and on average, result in 1 to 2 billion dollars in damage across the United States each year.³⁵

Landslides in Arizona generally occur during heavy rainfall events. In colder regions of the state, landslides can also occur in response to the freezing of water in fractures and soils. Other factors that can contribute to landslides in Arizona are unvegetated and/or steep slopes, rock fractures, thickness of underlying soil, and sources of vibrations (such as earthquakes, construction, etc.).³⁶

³¹ *ibid.*

³² Harris, 2004.

³³ *Ibid.*

³⁴ *Ibid.*

³⁵ Harris, 2002.

³⁶ *Ibid.*

Landslides in Arizona will generally occur where layers of rock or soil overlie clay-rich units. Once saturated, the clay-rich units lose their cohesion, resulting in downslope transport of overlying material.

Landslides are not expected to be a constraint to the design of the Project. Landslides are not expected south of the Gila River, where topography is essentially flat. North of the Gila River, landslides may occur along steeper slopes, but none are seen to impede construction or operation of the Project area.

Faulting and Seismicity

The Project area lies within the Mexican Highland Zone, which geologists consider a relatively stable tectonic region.³⁷ The Mexican Highland Zone is characterized by sparse seismicity and few Quaternary faults.

Based on field observations and a review of readily available published geological maps and literature, there are no known active faults underlying the Project area. As shown in Table 3.10-1, the closest Quaternary faults are at least three miles from the Project area.

Table 3.10-1 Quaternary Faults in Vicinity of Project Area

Fault Name	Location	Fault Type and Trends*	Surface Displacement
Cactus Flats Faults	Approximately 4.2 miles south of Safford along the US-191	Normal fault Trends northeast and crosses US-191	Displacement occurs along the middle Pleistocene (<750,000 years) units along the fault is approximately 2 meters. Late Pleistocene (<250,000 years) to Holocene (<10,000 years) deposits have not been displaced.
Buena Vista Fault	Approximately 3 miles east of the Project corridor near the Town of Solomon	Normal fault Trends northeast	The surface displacement along the middle Pleistocene units along the fault is approximately 2 meters. Late Pleistocene to Holocene deposits have not been displaced.
Safford Fault Zone	Approximately 16 miles south of the Town of Safford, and crosses US-191	Normal faults Consists of a series of northwest trending faults	Latest Pleistocene (<15,000 years) have been displaced along the fault; however Holocene deposits have not been displaced

Source: Ninyo and Moore, 2006. Information from Pearthree, 1998.

Notes: * A normal fault is defined as a fault in which blocks of rock slip straight down.

³⁷ Euge et al., 1992.

USGS data indicates that the Project area is within a zone where low to moderately low ground shaking could occur. Maximum anticipated ground shaking (also known as peak ground acceleration) in the Project area would range from 0.05 to 0.12 g, where g is a measurement of ground acceleration due to gravity. Data consulted indicates a relatively low probability, ranging from 2 to 10 percent, of this intensity of ground shaking occurring in the Project area.³⁸

³⁸ USGS, Probabilistic Seismic Hazard Assessment for the Western United States, 2002. Ground motion values within this assessment are calculated for "firm rock" sites, which correspond to a shear-wave velocity of approximately 2,500 feet per second in approximately the top 100 feet bgs. Different soil sites may amplify or de-amplify these values.

3.11 HAZARDOUS MATERIALS

APPROACH AND METHODOLOGY

This section describes potential hazardous materials in the Project area, based on a preliminary hazardous materials study conducted for SEA by Ninyo and Moore, which is included as Appendix C.

Preliminary environmental assessment studies, including this one, typically consist of the following general steps:

- A computerized database search of readily available government environmental lists and databases for properties located within the Project area and vicinity
- Review of historic aerial photographs
- Field visit, to follow up on any sites noted in database searches and review of aerial photographs
- Contact with regulatory agency representatives, as appropriate, to discuss the current status of selected hazardous waste sites within the Project area that appear on the government agency database search
- Review of any hazardous material issues associated with the Proposed Action and alternatives, in this case the operation of the rail line
- Assessment of adjoining sites with that may pose issues of potential environmental concern to the Proposed Action and/or alternatives

This study also included a review of information obtained from Ninyo & Moore's research into the Project area's hydrological conditions (Appendix C).

The preliminary study included a review of the electronic databases of 24 Federal, state, and local agencies who compile data on the potential presence of hazardous materials of environmental concern.³⁹ The review examined properties located within a 0.125-mile radius around the full length of the Project.

Of all the databases reviewed, no sites of environmental concerns were identified.

Review of aerial photographs and a field visit in July 2006 identified three generalized areas where previous and/or ongoing land uses may have stored, used, or disposed of materials that could be of potential environmental concern.

³⁹ Appendix C provides a list and discussion of each database consulted.

One of these areas contains sites with agricultural related structures. The area is located along U.S. Highway 70 near its bridge over the San Simon River, extending northward to the Gila River. Aerial photographs dating to 1935, and as recent as 2005, reveal the presence of agricultural structures in the general vicinity. The presence of older agricultural structures can indicate a potential for environmental concern if such structures or surrounding areas were used to store and/or dispose of pesticides and/or herbicides. These areas could also contain relic trash and/or burn pits, as well as water wells and septic systems.

The second area of potential environmental concern was noted immediately north of the Gila River, in the vicinity of the proposed bridge touchdown area. Aerial photographs from 1998 indicate the presence of residential trailers, wildcat dumping, as well as the potential for trash and/or burn pits to exist. The nature of such land use in this area suggests the possibility that septic and/or other waste pits may also be located in the vicinity.

The third area of potential environmental concern is located northwest of the Project area in the shooting range portion of Dry Lake Park. Soils in this area could contain lead residues from spent ammunition. While no portion of Dry Lake Park is within the Project area, gunfire activities in the vicinity of Dry Lake Park's shooting range may have led to bullet-borne contaminants affecting the immediate vicinity of the Project area.

3.12 AIR QUALITY

CLIMATOLOGY AND METEOROLOGY

The Safford area is temperate and semi-arid. The mean daily maximum and minimum temperatures are 80.0 °F and 46.3 °F, respectively.⁴⁰ The mean annual precipitation ranges between nine and fifteen inches, with the months of July to October being the only months with more than one inch of precipitation on average. Average annual snowfall is one inch.

Safford is located within a valley at an elevation of approximately 2,950 feet, between the Pinaleno Mountains to the southwest, and the Gila Mountains to the northeast. Winds are funneled through the valley, predominantly from the northwest and southeast. Stronger winds occur during summer monsoon thunderstorms.

AIR QUALITY STANDARDS AND POLLUTANTS OF CONCERN

USEPA has established National Ambient Air Quality Standards (NAAQS) for six criteria air pollutants: carbon monoxide (CO), nitrogen oxides (NOx), sulfur dioxide (SOx), ozone

⁴⁰ 1948-2005 Climate Summary for Safford Agricultural Center, Western Regional Climate Center.

(O₃), particulate matter (PM₁₀ and PM_{2.5}) and lead. If a geographic area (typically an air basin) meets the NAAQS, it is considered to be in attainment of the standards for each pollutant. If an area exceeds the NAAQS for any criteria pollutant, it is considered to be in nonattainment of the standard for that specific pollutant. States in which NAAQS are exceeded must prepare State Implementation Plans (SIP) describing how attainment will be achieved. Projects undertaken in such areas must demonstrate that they are in general conformity with SIPs and will not contribute to or cause further violation of NAAQS.

The State of Arizona has established Arizona Ambient Air Quality Guidelines (AAAQGs) for hazardous air pollutants (HAPs). HAPs are defined as those pollutants that are known or suspected to cause serious health problems. These guidelines are based on conservative risk assessments to protect public health. Many of the AAAQG compounds are also Federal HAPs under the Section 112 of the Clean Air Act.

Existing Conditions

The Project area and its immediate surroundings are in an area determined by ADEQ to be in attainment for all criteria pollutants. Notably, ADEQ maintains a monitor for PM₁₀ in the Safford area; this monitor has never exceeded the NAAQS, and the trend over the last 20 years shows decreasing concentrations.⁴¹

As such, the Proposed Action does not require a General Conformity Determination.⁴²

The Project area is approximately 70 miles distant from two Federal wilderness areas (the Galiuro Wilderness, located within a portion of the Coronado National Forest in southwestern Graham County, Arizona and the Gila Wilderness, located within Catron, Grant, and Hildago Counties, in the state of New Mexico). Under 40 C.F.R. 51, the USEPA has implemented a Regional Haze Program, under which these wilderness areas, plus 154 other national parks, monuments, and wilderness areas are designated “Class I” airsheds.⁴³

Sensitive Receptors

The term “sensitive receptor” refers to a facility where sensitive populations (e.g. children, the elderly, acutely or chronically ill persons) are likely to be located. This may include schools, day-care centers, hospitals, and retirement homes. The Project area traverses agricultural fields, the Gila River, and open desert areas, all of which are unpopulated and do not include any facilities housing sensitive populations. In sum, there are no sensitive receptors within the Project area or vicinity. Three properties in residential use are located about 1,000 feet from the southernmost portion of the Project area, along the

⁴¹ ADEQ 2005 Air Quality Annual Report A.R.S. 49-424.10.

⁴² ADEQ determination, 7/20/2006.

⁴³ Under the Clean Air Act, Class I airsheds are afforded the highest degree of air quality protection.

existing AZER mainline, but these are not considered to be locations of sensitive receptors.

3.13 NOISE AND VIBRATION

The Project area is primarily agricultural or undeveloped desert scrub. The only areas with noise sensitive land are the communities of Safford, Solomon, and Lone Star, all of which are located several thousand feet from the southern end of the Project area, as well as a trailer park approximately 1,000 feet from the Project area.

3.14 BIOLOGICAL RESOURCES

As the basis for material in this section, SEA independently reviewed a study of biological resources within the Project area. WestLand Resources, Inc. prepared the study and Biological Assessment of the Project area. CH2M Hill Inc., independently reviewed and verified WestLand Resources's work on behalf of SEA.

SEA determined that the width of the Project corridor, and thus the area under consideration in the biological resources assessment, would be 250 feet on either side of the proposed rail line. For the purposes of this analysis, the biological resources have been separated into southern and northern sections of the Project area based on differences in the biotic communities. The southern portion extends from AZER's mainline to the Gila River; the northern portion extends from the Gila River to the Mine.

VEGETATION AND WILDLIFE HABITATS

The southern portion of the Project area is situated within the Arizona Upland subdivision of the Sonoran desert scrub biotic community. The northern portion is within the Semi desert grassland biotic community.⁴⁴

Vegetation varies along the length of the Project area as described below. Appendix D, the draft Biological Assessment, includes a list of plants associated with the different habitats of the southern and northern portions of the Project area.

Southern Portion

The Project area crosses irrigated agricultural fields from AZER's mainline to the Gila River.

The vegetation along the nearby San Simon River is strongly influenced by the surrounding agricultural fields, with numerous non-native species present. The dominant

⁴⁴ Brown, 1994.

species present include desert broom (*Baccharis sarothroides*), velvet mesquite (*Prosopis velutina*), tamarisk (*Tamarix* sp.), and Goodding willow (*Salix gooddingii*).

The Gila River is classified as perennial within the Project area and supports mesoriparian vegetation.⁴⁵ Saturated soils extend about two feet up the river bank and are also present in proximity to pools within the river created by flow blockages associated with beavers (*Castor canadensis*). The southern bank of the Gila River within the Project area is relatively level, while the north is bounded by an approximately 100-foot-high cliff.

The dominant plant along the Gila River is coyote willow (*Salix exigua*), which creates a hedge of habitat approximately 10 to 13 feet in width and 10 to 40 feet in height at the waters edge. Vegetation across the wide floodplain of the Gila River tends to be open with scattered patches of trees and dense willow strands adjacent to the river. Beavers have created numerous breaks in vegetation adjacent to the channel. Numerous Fremont cottonwood (*Populus fremontii*) and tamarisk patches, which are present throughout the floodplain, are adapted to periods of drought and do not require constant surface flows. The cottonwood trees tend to be older, more mature plants. The tamarisk tends to occur in scattered mono-typical patches across the floodplain, and throughout the Project area comprises only a small fraction (approximately ten percent) of the overall vegetation biomass. Other plants noted along the Project area include nut sedge (*Cyperus rotundus*), spike rush (*Eleocharis* sp.), sweet clover (*Melilotus alba*), rabbitfoot grass (*Polypogon monspeliensis*), bull rush (*Schoenoplectus americanus*), seepwillow (*Baccharis salicifolia*), cockle bur (*Xanthium strumarium*), and sunflower (*Helianthus annuus*). Other tree and shrub species found in this portion of the Project area include Goodding's willow and desert broom.

Northern Portion

The northern portion of the Project area crosses largely undeveloped lands, which are in turn crossed by a number of unpaved public and private roads. There are several ephemeral drainages in this area, ranging from large named drainages with multiple braided channels to smaller unnamed channels. The upland plant community is typical of Sonoran desert scrub and is sparsely vegetated throughout the area. Xeroriparian vegetation⁴⁶ is found along the ephemeral drainages is typified by velvet mesquite, desert broom, seep-willow, and desert hackberry (*Celtis spinosa*).

⁴⁵ "Mesoriparian vegetation" is vegetation typical of areas around creeks and washes where water flows are generally perennial, but can experience occasional prolonged drought periods.

⁴⁶ "Xeroriparian" vegetation refers to vegetation likely to grow within desert washes, which tend to be dry except immediately following a rainfall.

WILDLIFE

Appendix D includes a list of wildlife species that have been observed or are likely to occur in or adjacent to the Project area. This list was compiled based on field surveys conducted by biologists or on habitat characteristics or other indicators such as tracks or scat that were observed in the field.

Agricultural fields, in general, support fewer wildlife species than undeveloped, natural habitats. Typical species in agricultural fields include mourning dove (*Zenaida macroura*), white-winged dove (*Zenaida asiatica*), northern mockingbird (*Mimus polyglottos*), brown-headed cow birds (*Molothrus ater*), desert cottontail (*Sylvilagus auduboni*), and a variety of rodents.

The xeroriparian vegetation of the washes is an important habitat feature for many species of wildlife in that the denser vegetation provides relatively more food, escape cover, and water than the inter-wash areas. In addition, the washes provide shade and cover where wildlife can escape temperature extremes.

Riparian habitats in the Sonoran Desert, such as the Gila River floodplain, have the potential to support a diverse assemblage of wildlife. Amphibians include the Couch's spadefoot (*Scaphiopus couchii*), green toad (*Bufo debilis*), red-spotted toad (*Bufo punctatus*), Sonora desert toad (*Bufo alvarius*), and American bullfrog (*Rana catesbeiana*). Riparian areas also provide important habitat and can serve as movement corridors for larger mammals such as beavers, coyotes (*Canis latrans*), collared peccary (*Pecari tajacu*), and mule deer (*Odocoileus hemionus*).

Due to the extreme aridity, amphibians are unlikely to occur in upland desert scrub communities outside of the Gila River floodplain. However, these areas do support a wide variety of reptiles. Common reptiles include the western diamondback rattlesnake (*Crotalus atrox*), gopher snake (*Pituophus melanoleucus*), western whiptail, desert iguana (*Dipsosaurus dorsalis*), zebra-tailed lizard (*Callisaurus draconoides*), and common side-blotched lizard (*Uta stansburiana*). Most mammals, particularly rodents, have adapted to high temperatures by living underground in burrows.

WETLANDS

A preliminary Jurisdictional Delineation (JD) of waters within the Project area was conducted and submitted to the ACOE for approval in September 2006. It is currently under review and is included as Appendix E. Potentially jurisdictional waters within the Project area include the Gila and San Simon Rivers and numerous ephemeral washes.

The estimated total area of delineated jurisdictional waters associated with ephemeral drainages is approximately 0.52 acres north of the Gila River and 9.68 acres south and inclusive of the Gila River. Within the Project area there are approximately 9.7 acres of perennial waters associated with the Gila River crossing.

SPECIAL STATUS SPECIES

The U.S. Fish and Wildlife Service (USFWS) lists 19 species for Graham County as threatened or endangered (T&E) under the Endangered Species Act (ESA).⁴⁷ SEA reviewed published and unpublished literature on the flora and fauna of the Sonoran Desert, focusing on the presence or likely presence of threatened or endangered species in Graham County and, in particular, on those most likely to occur on or in the vicinity of the proposed alignment. The evaluation for each of the 19 species is summarized in Appendix D. The results of the evaluation indicate that there is very low to no potential for occurrence of 17 Federally listed species within the Project area; consequently, these were not further evaluated. The determinations are based on habitat analysis, review of the best available information regarding the biology of these species, comparisons of this information with habitat within the Project area, and known ranges of the species. These seventeen species have been eliminated from further review because their known ranges are outside the Project area, or they are found in habitats dissimilar to those within the Project area.

The Project area crosses designated Critical Habitat for two listed endangered species: the Southwestern willow flycatcher (*Empidonax extimus traillii*) and the razorback sucker (*Xyrauchen texanus*). Designated critical habitat for both the Southwestern willow flycatcher and the razorback sucker is present within the Project area portion of the Gila River. Additionally, a list of recorded occurrences of special status species was provided by the Arizona Game and Fish Department (AGFD), August 24, 2006 from the Heritage Data Management System (HDMS). The review indicated that the Southwestern willow flycatcher and razorback sucker were the only listed species considered to occur or potentially occur within the Project area.

Surveys for the Southwestern willow flycatcher were conducted within the Project area in 2006. One individual was detected during the first survey in 2006, but is considered to be a migrant bird because no Southwestern willow flycatchers were detected during the next four surveys that year. WestLand does not have any other historical records of Southwestern willow flycatcher surveys or activity for the Project area. The Gila River portion of the Project area is within Critical Habitat for the Southwestern willow flycatcher, although habitat characteristics at the Project area river crossing create marginal habitat for this species.

No surveys were conducted for the razorback sucker. According to AGFD, the closest known occupied razorback sucker habitat is located near the Salt and Verde Rivers, neither within 50 miles of the Project area.⁴⁸

⁴⁷ USFWS web site, accessed August 22, 2006.

⁴⁸ AGFD, review of Heritage Data Management System (HDMS), August 24, 2006.

3.15 SECTION 4(F) AND 6(F)

SECTION 4(F)

Section 4(f) of the Department of Transportation Act of 1966, codified in Federal law at 49 USC §303, declares that “[i]t is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites.”

Section 4(f) specifies that “[t]he Secretary [of Transportation] may approve a transportation program or project . . . requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance, or land of an historic site of national, State, or local significance (as determined by the Federal, State, or local officials having jurisdiction over the park area, refuge, or site) only if:

- there is no prudent and feasible alternative to using that land; and
- the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.”

Section 4(f) further requires consultation with the Department of the Interior and, as appropriate, the involved offices of the Departments of Agriculture and Housing and Urban Development in developing transportation projects and programs which use lands protected by Section 4(f).

In general, a Section 4(f) “use” occurs with a Department of Transportation-approved project or program when 1) Section 4(f) land is permanently incorporated into a transportation facility (direct use); 2) when there is a temporary occupancy of Section 4(f) land that is adverse in terms of the Section 4(f) preservationist purposes as determined by specific criteria (temporary use) (23 CFR §771.135[p][7]; and 3) when Section 4(f) land is not incorporated into the transportation project; but the project’s proximity impacts are so severe that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) are substantially impaired (constructive use). (23 CFR §771.135[p][1] and [2].

Consultation with the USDA should occur whenever a project uses Section 4(f) land from the National Forest System. Consultation with the Department of Housing and Urban Development (HUD) should occur whenever a project uses Section 4(f) land for/on which certain HUD funding has been utilized. Neither of these conditions applies to the proposed project. Consultation with USDA and HUD will therefore not be pursued.

4(f) Resources in the Project Vicinity

Dry Lake Park

Although located outside the corporate boundaries of Safford, the City owns and operates Dry Lake Park. As described in the City of Safford General Plan, Dry Lake Park is a 640 acre partially developed desert park located approximately 5.5 miles northwest of the City. Facilities on site include a model aircraft range, an archery course, rifle, pistol and skeet ranges, RV campsites and restroom facilities, and an ATV Course. The Project area is approximately 0.5 miles to the east of Dry Lake Park.

SECTION 6(F)

Section 6(f) of the Land and Water Conservation Fund Act (LWCFA) concerns transportation projects that propose impacts, or the permanent conversion, of outdoor recreation property that was acquired or developed with LWCA grant assistance.

Passed in Congress in 1965, the LWCFA provides grants which pay half the acquisition and development cost of outdoor recreation sites and facilities. Section 6(f) of the act states that property acquired through this grant money cannot be taken out of recreational use without approval of the Department of Interior's National Park Service (NPS). Section 6(f) also holds the NPS "to assure that replacement lands of equal value, location and usefulness are provided as conditions of approval of land conversions."

Dry Lake Park is the only recreational facility in the vicinity of the Project area. BLM conveyed Dry Lake Park to the City of Safford through a Recreation and Public Purposes patent in 1970. As the Park was neither acquired nor developed with the use of LWCA grant assistance, the park is not considered a resource protected under Section 6(f). As such, no further discussion of Section 6(f) resources is necessary in this EA.

4.0 Potential Environmental Impacts

4.1 INTRODUCTION

This chapter provides an overview of the potential environmental impacts from the Proposed Action, construction and operation of a proposed rail line near Safford, Arizona.

An identification of agencies consulted in the preparation of this EA, along with their specific comments are provided in Chapter 5.0. As appropriate, comments from the consultation process were considered by SEA in this EA, from the formulation and evaluation of alternatives to the assessment of impacts. SEA's recommended mitigation measures are presented in Chapter 6.0.

4.2 LAND USE

The potential for land use impacts from construction of any rail line generally arises from acquisition of land for the right-of-way and associated uses, as well as impacts on properties adjacent to the right-of-way due to such things as restriction of access. The extent to which such impacts actually occur depends on the circumstances of the particular case. SEA considered the following criteria to assess the potential for the Proposed Action to have adverse land use impacts:

- Interference with the normal functioning of adjacent land uses.
- Consistency and/or compatibility with local land use plans and policies.
- Permanent loss of Prime Agricultural Land.

For analytical purposes, the Project area for land use impacts was identified as the proposed 100 foot wide right-of-way.

LAND USE IMPACTS

Proposed Action

Construction and operation of the proposed rail line would be expected to result in minimal impacts to land uses within the Project area. Below the Gila River, land uses within the Project area are almost entirely agricultural. Acquisition of the right-of-way would require the permanent use/conversion of agricultural land, but rail operations

would not conflict with ongoing agricultural uses in the immediate vicinity. (See below for a more specific discussion of potential impacts to agricultural lands).

North of the Gila River, the City of Safford plans to develop two large parcels adjacent to the Airport for non-aviation related, light industrial uses. Currently, access to the northern parcel is limited to a dirt road. The City of Safford's General Plan acknowledges that development on these two parcels cannot take place until the area is served by adequate infrastructure, such as improved roads and/or available rail transportation.¹ The Proposed Action would potentially allow for development on these two parcels by opening the area to improved transportation infrastructure.

Between the Airport and the Mine, the proposed rail line would traverse an unpopulated high desert environment on land in unincorporated Graham County. Much of this land is owned by the Phelps Dodge Corporation, operator of the Mine.

SEA has determined that the Proposed Action would facilitate local land use plans by bringing rail service to the parcels adjacent to the Airport.

Based on this analysis, SEA has determined that the Proposed Action would not cause significant adverse impacts with regard to land use and no mitigation measures would be necessary.

No Action Alternative

Under the No Action Alternative, transportation of materials to and from the Mine would take place on existing local and state roads. This would not require the use of any other public or private property. Therefore, SEA has determined that the No Project Alternative would pose no impact to land use.

FARMLAND AND AGRICULTURAL IMPACTS

SEA has examined the Proposed Action's potential for adverse impacts to farmland and agricultural areas. Pursuant to regulations of the NRCS, federal sponsoring agencies should identify and take into account any adverse effects on farmland arising from a project and develop alternative actions that would avoid or mitigate such adverse effects. If, after consideration of the adverse effects and suggested alternatives, the landowners want to proceed with conversion of farmland to non-agricultural purposes, the Federal agency may provide or deny the requested assistance.² In order to assess the total acreage of farmland potentially converted by a project, an agency may complete and file a

¹ Safford General Plan, 2004, p. 24.

² 7 C.F.R. § 658.3

Farmland Conversion Impact Rating Form (NRCS-CPA-106 form) with the NRCS.³ The NRCS can then assess the extent to which prime farmland would be impacted within a project area.

Proposed Action

All irrigated farm and agricultural land in Arizona is considered prime farmland by the State of Arizona Office of the NRCS. The majority of land south of the Gila River is irrigated and used for agricultural purposes, planted with cotton and alfalfa.

In its reach between AZER's existing mainline and the Gila River, the proposed rail line would pass through prime farmland. The Proposed Action would therefore result in the irreversible conversion of farmland to nonagricultural uses.

In accordance with the NRCS and the FPPA, and as described in 7 CFR Section 658.1:

As required by section 1541(b) of the Act, 7 U.S.C. 4202(b), Federal agencies are (a) to use the criteria to identify and take into account the adverse effects of their programs on the preservation of farmland, (b) to consider alternative actions, as appropriate, that could lessen adverse effects, and (c) to ensure that their programs, to the extent practicable, are compatible with State and units of local government and private programs and policies to protect farmland.

Direct impacts are based upon an assumed 100 foot right-of-way for the proposed rail line. The indirect impact area is assumed to be an additional 50 feet on either side of the direct impact area. Temporary construction impacts would be expected to take place within the 200 foot wide indirect impact area.

Approximately 13,058 feet (approximately 2.5 miles) of the Project area would cross six parcels designated for and currently in agricultural use that would be considered prime farmland. As shown in detail within Table 4.2-1, the Proposed Action would directly impact and permanently convert a total of approximately 1,072,900 square feet (24.63 acres) of prime farmland to a non-agricultural use. It is estimated that an additional 24.63 acres of prime farmland would be indirectly affected. This acreage is entirely within the 200 foot wide corridor centered on the proposed rail line.

³ 7 C.F.R. § 658.4

Table 4.2-1 Estimated Areas of Farmland Impacts

Assessor's Parcel Number (APN)	Owner	Length of Line	Estimated Direct Impact Area	Estimated Indirect Impact Area
103-17-036	Fringe Players Az LLC	286 ft.	14,300 sq. ft. (0.33 acres)	14,300 sq. ft. (0.33 acres)
103-17-006	Kempton Calvin Kent Trustee/Calvin Kent & Patricia Ann Kempton	629 ft.	62,900 sq. ft. (1.44 acres)	62,900 sq. ft. (1.44 acres)
103-17-029	Claridge Christopher Layton	1,443 ft.	0 sq. ft. (0 acres)	72,150 sq. ft. (1.66 acres)
103-17-002b	Phelps Dodge Corporation	5,186 ft.	518,600 sq. ft. (11.91 acres)	409,300 sq. ft. (9.40 acres)
103-17-003	Latter Day Saints	743 ft.	0 sq. ft. (0 acres)	37,150 sq. ft. (0.85 acres)
102-34-001	Claridge, Christopher Layton	4,771 ft.	477,100 sq. ft. (10.95 acres)	477,100 sq. ft. (10.95 acres)
Total		13,058 ft.	1,072,900 sq. ft. (24.63 acres)	1,072,900 sq. ft. (24.63 acres)

Sources: Jerold Smidt, Graham County Assessor's Office, personal communication, May 10, 2007. Ruth Barren, USDA Rural Development Department, personal communication, May 16, 2007.

According to USDA's 2002 Census of Agriculture, Graham County had a total of 34,509 acres of irrigated farmland. The Proposed Action would directly convert 24.63 acres or 0.07% of all irrigated farmland in Graham County. The Proposed Action would indirectly impact an additional 24.63 acres of farmland (an additional 0.07% of all farmland in Graham County). All together, the Proposed Action would directly and indirectly impact 49.26 acres or 0.14% of all irrigated farmland in Graham County. SEA has concluded that these impacts are minor and that no mitigation measures are required. SEA completed and submitted USDA NRCS Form CPA-106. In its review, the Arizona office of the NRCS concluded that the Proposed Action would be exempt from the FPPA due to the amount and relative quality of the farmland directly affected.

Although SEA concurs with the NRCS conclusion of no permanent effect to farmland, construction would have the potential for short-term disruption of farming activities in and around the proposed rail alignment. As a result, SEA has incorporated mitigations to minimize potentially adverse direct and indirect effects to farmland.

No Action Alternative

Under the No Action Alternative, there would be no construction of a rail line on agricultural lands; no conversion of agricultural lands would occur. Therefore, SEA has determined that the No Project Alternative would have no adverse impacts to farmlands.

4.3 COMMUNITY/SOCIO-ECONOMIC IMPACTS

Proposed Action

SEA analyzed the community and socioeconomic effects of the Proposed Action. Community and socioeconomic impacts would be considered adverse if the Proposed Action would result in significant alteration to economic growth or inconsistency with adopted growth plans; cause displacement of a significant number of local residents; disrupt or sever community interactions and public services; or create negative effects to the local or regional economy.

Potential socioeconomic effects to the local community arising from the Proposed Action are expected to be minimal. Project construction would potentially create up to 100 temporary jobs for residents of Safford and nearby communities. Upon completion of construction, ongoing operation of the rail line is anticipated to create 6-12 permanent jobs in rail maintenance and operations.

According to the 2000 U.S. Census, the Safford area labor force is comprised of 3,454 people; the unemployment rate in the area at that time was 4.1 percent. The addition of up to 100 temporary jobs and 6-12 permanent jobs represents a less than one percent increase in the number of people permanently employed in the Safford area and an approximate four percent decrease in the local unemployment rate, at the height of construction. As a result, SEA has determined that the addition of these jobs associated with the Proposed Action would have a small but positive effect on the local economy.

SEA has also determined that the Proposed Action would both further local land use planning and foster beneficial economic effects through the potential for the proposed rail line to serve the future business park area adjacent to the Airport. The City of Safford General Plan acknowledges that development on these two parcels cannot take place until the area is served by adequate infrastructure.⁴ The Proposed Action would potentially allow for development on these two parcels by providing freight rail service. Development of industrial uses in the Airport area could lead to additional local jobs.

The vast majority of the Project area is located within an undeveloped area; the primary land use in the area is agricultural, which is limited to lands south of the Gila River. The

⁴ Safford General Plan, 2004, p. 24.

proposed rail line would not traverse any densely populated area nor displace any residences. From the point where the proposed rail line would originate from AZER's existing mainline, three adjacent parcels are known to be in residential use, including two one acre residential parcels, and a 19 acre parcel designated for mobile home use. However, the residential uses on these parcels are located more than 1,000 feet from the proposed rail line.

In sum, SEA has determined that the Proposed Action would not disrupt local populations nor sever interactions within the surrounding community. No adverse socioeconomic or community impacts are anticipated. The Proposed Action would have a beneficial socioeconomic impact by creating infrastructure to serve the future business park area adjacent to the Airport.

No Action Alternative

Under the No Action Alternative, no temporary construction or permanent rail operation jobs would be created by construction and operation of a rail line in the Project area. However, the No Action Alternative would not result in the beneficial impact of providing needed infrastructure to the future business park area near the Airport.

4.4 ENVIRONMENTAL JUSTICE COMMUNITIES

Proposed Action

SEA analyzed the effects of the proposed rail line on low-income and minority populations in accordance with procedures established in Executive Order 12898— "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." SEA conducted an analysis to (1) determine the presence or absence of environmental justice communities of concern in proximity to the proposed project, and (2) if such a community is present, determine the presence or absence of disproportionately high and adverse human health or environmental effects on the citizens of that community.

As part of the analysis, SEA reviewed the demographic and income data from the 2000 Census to compare the population of the project area with that of Graham County. SEA used the following criteria established by USEPA for identifying communities of concern:

- At least one-half of the census block being analyzed is minority status, or
- At least one-half of the census block being analyzed is low-income status, or
- The percentage minority of the census block being analyzed is more than 10 percentage points higher than the percentage minority for the entire county in which the block is located, or

- An adverse environmental justice effect would occur if any significant adverse effect of the proposed construction or operation were to fall disproportionately on low-income or minority populations.

As described in Chapter 3, SEA's review of the demographic characteristics of block groups within 2 miles of the Project area identified a single block group (Block Group 1 of Tract 9917) whose population meets the criteria for an environmental justice community. Approximately 52.8 percent of the population of this block group is in racial/ethnic groups that are considered minority.

Notably, the proposed rail line would not fall within this block group. The block group extends as far west as the Airport, and then extends approximately 65 miles to the east. The portion of the Project area within this block group does not appear to include any populated areas. The closest populated area within the block group is a portion of the Town of Solomon, no closer than 1 mile east of the Project area.

Although the block group meets the criteria for an environmental justice community, the fact that the proposed rail line traverses a portion of the block group that is at least one mile from any populated area, SEA has determined that the Proposed Action would have no disproportionately adverse temporary or permanent affect on the health of the population in the block group in question.

No Action Alternative

The No Action Alternative would not entail the construction or operation of the proposed rail line and would therefore not result in environmental justice impacts.

4.5 UTILITIES/PUBLIC SERVICES

Proposed Action

SEA analyzed the effects of the Proposed Action on utilities and public services in the Project area. Impacts would be considered adverse if the Proposed Action would significantly affect local or regional energy supply, public services, or result in the generation of significant amounts of solid waste.

Land within the Project area is primarily used for agriculture with minimal utility demands. While telephone and electrical lines cross the Project area at U.S. Highway 70, there are no electric or gas lines within the Project area that would obstruct construction or operation of the proposed rail line.⁵

⁵ Angela, Griffen Propane/Matlock Gas staff. Personal Communication, November 2, 2006.

Dick Berryhill, Graham County Electric Cooperative, Inc. Personal Communication, April 16, 2007.

Construction activities associated with the Proposed Action would entail the use of diesel and gasoline powered equipment; however, no tie-in to local utilities is anticipated.

Rail operations are proposed to be powered by diesel locomotive engines. Operation of the Proposed Action would require tie-ins to local utilities for a crossing gate and signal activation at the proposed crossing of U.S. Highway 70, as well as crossing signal activation at other road crossings. These are minimal uses that would pose no significant demand on local utilities.

Law enforcement issues relative to freight rail lines would include trespass and vandalism of railroad equipment, including automated warning devices and railcars. According to the FRA, there were a total of 42 recorded incidents of trespass onto railroad property in the State of Arizona in 2006. These incidents primarily occurred on major freight and passenger rail lines within or between metropolitan areas. As the Proposed Action includes a relatively short spur line in a rural area, SEA has determined that the potential for trespass or vandalism is minimal.

Fires involving trains are generally caused by the ignition of flammable freight due to accidents. The proposed rail line would generally carry copper cathodes and sulfuric acid. Neither of these substances is considered flammable and the likelihood of fire erupting as a result of their transport is minimal. Therefore, SEA has determined that the demand on local firefighting services would be minimal.

No Action Alternative

The No Action Alternative would not entail the construction or operation of a rail line and therefore would not increase the demand on existing utilities. The additional truck traffic associated with the No Action Alternative could result in an increase in demand for police and firefighting services, but this demand is likely to be minimal.

4.6 TRAFFIC AND TRANSPORTATION

SEA evaluated the effects of construction and operation of the Proposed Action on traffic delay and safety conditions at the proposed at-grade crossings at U.S. Highway 70 and Airport Road. SEA commissioned a traffic analysis study which was completed by Wilbur Smith Associates in February 2007 and is included as Appendix F.

Traffic/transportation impacts would be considered significant if the Proposed Action resulted in excessive delay as characterized by an exceedance of LOS standards established in the Highway Capacity Manual and adopted by the ADOT or if vehicular delay at a railroad crossing resulted in a significant degradation of roadway safety conditions as determined by the American Association of State Highway and Transportation Officials (AASHTO).

TRAFFIC DELAY IMPACTS

Proposed Action

Traffic delays were calculated for U.S. Highway 70 and Airport Road, based on the predicted potential maximum delay resulting from train crossings combined with the available AADT volumes for each roadway segment. The analysis evaluated operational impacts for the afternoon (PM) peak hour and included an assessment of two possible configurations for U.S. Highway 70: the existing two-lane configuration as well as a four-lane configuration (a planned but heretofore unfunded improvement). The analysis, summarized in Table 4.6-1 below, assumed a thirty car trains with three locomotives. ⁶

Table 4.6-1 Results of Afternoon Peak Hour Intersection Operational Analysis

	2005 + Proposed Action			2030 + Proposed Action		
	U.S. Highway 70	U.S. Highway 70	Airport Road	U.S. Highway 70	U.S. Highway 70	Airport Road
	2 lanes	4 lanes		2 lanes	4 lanes	
Volume (vehicles per hour [vph])	596	NA	43	942	942	68
Peak Hour Flow	0.9	NA	0.8	0.9	0.85	0.8
Adjusted Flow (vph)	662	NA	54	1047	1109	85
Average delay per vehicle (sec)	19	NA	32.1	17.5	18.3	30.5
Intersection LOS	B	NA	C	B	B	C
Max Queue (ft)	848	NA	61	1371	608	87
Max Queue (number of vehicles) ¹	48	NA	3	78	34	5
Vehicles Affected per PM peak hour crossing	96	NA	6	156	68	10

Source: Wilbur Smith Associates, 2006.

Notes:

NA= Not Applicable

¹ Based on AASHTO standard length of 17 feet 8 inches for cars and light trucks.

⁶ The Proposed Action was revised subsequent to the completion of the traffic analysis to entail the operation of somewhat shorter trains of twenty to twenty-five railcars powered by two locomotives. The proposed use of shorter trains than those analyzed does not materially affect the findings of the traffic analysis. In fact, the assumption of longer trains in the traffic analysis provides a more conservative estimate of traffic delays related to the two major proposed at-grade crossings.

The analysis examined current year (2005) plus Proposed Action conditions, along with year 2030 plus Proposed Action conditions. Traffic volume and rate projections for this scenario were provided by ADOT and include increases in ambient traffic due to anticipated population growth in Graham County during this time period. Notably, ADOT is considering a possible expansion of U.S. Highway 70 from its present two-lane configuration to a four-lane configuration.⁷

The analysis indicates that the proposed at-grade crossings of U.S. Highway 70 and Airport Road would each cause average afternoon peak hour delays of about 17 to 30 seconds, assuming a train would cross during the afternoon peak hour.⁸

This would be an increase in delay over existing conditions, which are free flowing and classified by ADOT as operating at Level of Service (LOS) A. Under Proposed Action conditions, traffic would operate at LOS B along U.S. Highway 70 in either a two-lane or four-lane roadway configuration. At the proposed crossing of Airport Road, traffic would operate at LOS C with the Proposed Action.

Pursuant to ADOT guidelines, both LOS B and LOS C are considered acceptable levels of service for roads of this type. SEA has determined that no mitigation would be required.

No Action Alternative

Under the No Action Alternative, there would be no introduction of rail service and no associated impact to traffic resulting from at-grade crossings at U.S. Highway 70 and Airport Road. Traffic would operate at levels of service anticipated in local projections. However, public roadways in the vicinity of the Project Area would be used by the operator of the Mine for approximately 80 round-trip truck trips per day to carry materials to and from the Mine. The Mine EIS concluded no significant impact to traffic in the area would result from such truck traffic on local roadways. Therefore, no impacts related to traffic delay would be anticipated under the No Action Alternative.

Construction Traffic Impacts

Proposed Action

Construction activities would consist of clearing and grubbing, laying down the roadbed, laying track, and constructing a bridge over the Gila River. The assumption for construction time is 8 hours a day, 5 days a week, for approximately 9 to 12 months.

⁷ This expansion would not increase traffic volume at the proposed at-grade crossing in that traffic volume projections are contingent on area population and job growth, rather than the width of U.S. Highway 70.

⁸ Actual traffic delays would only occur during the live crossing of a train. When no train is passing an at-grade crossing, passing vehicles would experience no delay.

A typical track construction vehicle list was assumed to be the following:

- Trucks (5 pickups and 1 flat bed truck)
- Skid Steer Loaders (4)
- Front-end Loaders (4)
- Air Compressors (2)
- Spiker (1)
- Ballast Regulator (1)
- Tampers (2)

A key component of the Proposed Action is the construction of an access road to run alongside the proposed rail bed. Once construction activities commence, construction equipment would travel primarily along this access road with minimal incursions onto local roads and highways. Local roads and highways would be used primarily as a means to bring construction equipment to the Project area and to remove it from the Project area upon completion of construction. The relatively low number of construction equipment vehicles would pose a minimal impact on local roadways during the short durations where local roadways are anticipated to be in use. However, mitigation measures have been included to help ensure a negligible impact to traffic in the Project area.

No Action Alternative

Under the No Action Alternative, there would be no construction of a rail line and therefore no construction related traffic within the Project area.

Traffic Safety Impacts

Proposed Action

As a result of the proposed at-grade crossings, vehicles traveling along each of the study roadway segments would be required to come to a complete stop when a train is crossing the roadway. SEA examined the potential within the Project area for any impacts related to limited stopping sight distance (SSD). SSD is the sum of two distances: the distance traversed by a vehicle from the instant the driver sights an object necessitating a stop to the instant the brakes are applied and the distance required to stop the vehicle from the instant brake application begins.⁹

⁹ AASHTO, *A Policy on Geometric Design of Highways and Streets*, pp. 117-118 (1994).

Field observations conducted along U.S. Highway 70 and Airport Road revealed no horizontal sight distance concerns as both roads are essentially straight between intersections. Similarly, no relevant substantial vertical sight distance issues were observed along Airport Road.

However, up-grades in roadway slope were observed leading to the existing U.S. Highway 70 bridge over the San Simon River at a length of approximately 650 feet on either side. An at-grade rail crossing west of the San Simon River would thus be at a slightly lower elevation than the bridge itself, creating a potential obstruction to the visibility of the crossing as well as the cars queued at the crossing.

Table 4.6-4 shows the zone to the west of the San Simon River in which the placement of an at-grade crossing would necessitate either additional warning signals, or the elevation of the crossing to be level with the San Simon River Bridge.

Table 4.6-4 Stopping Site Distances at U.S. Highway 70 At-Grade Crossing

	2005		2030	
	U.S. Highway 70	U.S. Highway 70	U.S. Highway 70	U.S. Highway 70
	2 lanes	4 lanes	2 lanes	4 lanes
Max Queue (feet)	848	333	1,371	608
Stopping Site Distance (feet)	590	590	590	590
Hazard Zone (feet west of San Simon River Bridge)	1,438	923	1,961	1,198

Source: Wilbur Smith Associates, 2006.

At the distances shown in Table 4.6-4, vehicle queues related to a train crossing during the afternoon peak hour would remain outside the allotted SSD, thus allowing an approaching vehicle the necessary distance to stop before reaching the queue.¹⁰

SEA has determined that this potential impact can be mitigated by ensuring that the at-grade crossing of U.S. Highway 70 is raised to the same elevation as the U.S. Highway 70 crossing of the San Simon River.

SSD was also calculated for vehicles traveling westbound over the river crossing. Given that the railroad is proposed to cross U.S. Highway 70 to the west of the San Simon River, only vehicles traveling westbound over the river crossing could possibly be affected by

¹⁰ Additional information on SSD calculations are within the traffic study, included as Appendix F.

limited sight distance of an at-grade crossing here. Therefore, SEA has determined that no additional mitigation would be necessary.

No Action Alternative

Under the No Action Alternative, no at-grade rail crossing would be constructed; there would be no potential visibility obstruction nor any vehicle queuing.

4.7 VISUAL/AESTHETICS

This section evaluates the impacts of the Proposed Action on the surrounding visual and aesthetic environment. Although there are no specific Federal criteria for evaluating visual or aesthetic impacts under NEPA, Federal agencies are required to consider the impacts to these resources that may result from any proposed action. CEQ regulations also require evaluation of impacts on visual and aesthetic resources arising from Federal projects.

As neither FRA nor the Board have set forth detailed guidelines for assessing impacts to aesthetic and visual resources, this analysis uses a methodology based upon guidelines established by the Federal Highway Administration (FHWA). For a discussion of potential visual impacts related to haze, please see Section 4.12, Air Quality.

Determination of visual impacts begins by assessing existing visual resources and predicting viewer response to changes to the landscape resulting from implementation of the Proposed Action. For purposes of this analysis, the viewer is considered a typical user of the area being analyzed. Changes to visual resources are determined by assessing the compatibility of the Proposed Action with the visual character of the existing landscape. In addition, changes to visual resources include comparison of the existing visual quality with projected visual quality after implementation of the project. Visual quality is evaluated by identifying the following three factors:

- Vividness is the memorability of the visual impression received from contrasting landscape elements as they combine to form a striking and distinctive visual pattern.
- Intactness is the integrity of visual order in the natural and man-built landscape and the extent to which the landscape is free from visual encroachment.
- Unity is the degree to which the visual resources of the landscape join together to form a coherent, harmonious visual pattern. Unity refers to the compositional harmony or inter-compatibility between landscape elements.

The resulting level of visual impact is determined by combining the severity of resource change with the degree to which people are likely to oppose the change. For this analysis,

construction period and operational impacts are considered to be similar in potential for visual impacts.

This analysis evaluated impacts of the Proposed Action on the four key viewpoints as identified in Chapter 3.0, Existing Conditions (see Figure 3.7-2). The Project area is composed of two distinct landscape areas; the southern and northern portion.

The southern portion extends from AZER's existing mainline north across the proposed bridge crossing of the Gila River to the Airport. The landscape in this area is dominated by agricultural fields with views of distant mountains in all directions. The two viewpoints in this area are designated as Viewpoints A and B (See Figure 3.7-2).

The northern portion extends from the Airport area and terminates at the Mine. This area is characterized by an open desert landscape without significant tall vegetation, enabling expansive views to distant mountains in all directions. The two viewpoints in this area are designated as Viewpoints C and D (See Figure 3.7-2).

The following section discusses potential visual impacts of the Proposed Action upon all four viewpoints.

Proposed Action

Viewpoint A

Viewpoint A is situated west of the proposed alignment alongside U.S. Highway 70 near the San Simon River. The view from this perspective includes the U.S. Highway 70 roadway, utility wires, and mountains in the distance. The typical viewer from this viewpoint would be surrounding property owners and motorists driving westward on U.S. Highway 70.

The Proposed Action would introduce a permanent visual presence into the Project area in the form of railroad tracks which would be traversed by two daily trains. However, the view from this viewpoint is relatively undistinguished and does not include any characteristics that would render it a memorable or striking landscape within its context. Furthermore, the existing visual environment of the area currently includes utility wires, a paved roadway, and concrete and metal roadway barriers. Existing infrastructure in this vicinity acts to interrupt the integrity of the natural landscape by introducing man-made elements that encroach on an otherwise rural area. In addition, the presence of overhead utility lines, roadway, and roadway infrastructure interfere with the unity of westward views.

As the view already includes several incongruous elements, SEA has determined that the addition of the Proposed Action to this area would only slightly detract from the overall visual character in the area and that no adverse effects to the visual environment would be anticipated. No mitigation would be required.

Viewpoint B

Viewpoint B is situated adjacent to U.S. Highway 70 alongside the San Simon River. This viewpoint perspective is directed towards the east with views of U.S. Highway 70, utility lines, farm fields, agricultural infrastructure, and mountains in the distance. People most likely to look from this viewpoint would be surrounding property owners and motorists driving eastward on U.S. Highway 70 from Safford to Solomon.

The introduction of the Proposed Action to Viewpoint B would result in the addition of a permanent visual presence in the form of railroad tracks and two daily trains. While the current view from this perspective includes agricultural fields and mountains to the north, the presence of existing utility lines, pipes, sheds, and roadway disturb the integrity of the view. Furthermore, overhead utility lines interrupt the unity of the landscape. The addition of the Proposed Action to this viewpoint would add to the already substantial presence of manmade elements present in this viewpoint. Therefore, SEA has determined that there would be minimal adverse effects to the visual character of this area; no mitigation would be required.

Viewpoint C

Viewpoint C is situated along the southerly bank of the Gila River near the proposed crossing location. This viewpoint's perspective is directed toward the north, overlooking the river bed with mesas in the forefront and mountains in the far distance. The surrounding environment has a typical desert landscape with sparse vegetation outside the river channel. As this is privately owned property, the typical viewer would be the property owner. The site is not visible from the closest public property, Dry Lake Park.

The introduction of the Proposed Action to Viewpoint C would result in a permanent visual presence to the area in the form of a bridge and railroad tracks. Twice daily trains would also represent a visual presence, albeit limited to time they pass through the area. This infrastructure would alter the visual character of the surrounding environment. Under existing conditions, the aesthetic of this viewpoint reflects a relatively untouched landscape, although agricultural fields visible to the south reflect manmade changes to the landscape. The Proposed Action would infringe upon both the integrity and unity of this view by introducing railroad tracks and passing trains to an area currently lacking any evidence of human presence.

However, passing trains, while representing a visual presence, would not result in a permanent blockage of distant views and any disruption would be minimal. Furthermore, as this is privately owned land with viewpoints not readily accessible to members of the public, any impact to visual resources would be borne primarily by the private property owner. Therefore, SEA has determined that there would be minimal adverse effects to the visual character of this area; no mitigation would be required.

Viewpoint D

Viewpoint D is situated alongside Lone Star Mountain Road in the northeastern part of the Project area. The viewpoint perspective is directed toward the northwest with views of the road and mountains in the distance. The surrounding environment has a typical high desert landscape with minimal amounts of vegetation. As this is privately owned land, the typical viewer would be the property owner or person in a vehicle traveling along Lone Star Mountain Road. As a dirt road that traverses mountainous, largely uninhabited terrain, Lone Star Mountain Road sees very little daily traffic.

The introduction of the Proposed Action to Viewpoint D would result in a permanent visual presence in the area in the form of railroad tracks. Frequent passing trains would also represent a visual presence, albeit limited to time they pass through the area. This infrastructure would alter the visual character of the surrounding environment. Under existing conditions, the aesthetic of this viewpoint reflects high desert landscape with the only man made element being an unpaved gravel roadway. The presence of the road does not visually encroach upon the integrity of the landscape as the roadway surface is consistent with the surrounding environment. However, the Proposed Action would infringe upon both the integrity and unity of this view by introducing railroad tracks and frequent trains to an area that appears relatively untouched by human presence. Regardless, passing trains, while representing a visual presence, would not result in a permanent blockage of distant views and any disruption would be minimal. Furthermore, this is privately owned land with viewpoints not readily accessible to members of the public. SEA has thus determined that there would be minimal adverse effects to the visual character of this area; no mitigation would be required.

No Action Alternative

Under the No Action Alternative, there would not be construction or operation of a rail line within the Project area. There would therefore be no impact to visual or aesthetic resources within the Project area.

4.8 CULTURAL AND PALEONTOLOGICAL RESOURCES

Proposed Action

The Project area contains 12 historic properties. The significance of these evaluated varies in terms of their eligibility to be placed on the NRHP. Four of the resources have been determined eligible, two are non-contributing (ineligible) segments of eligible linear sites, three are not eligible, and three resources require further research before their significance can be adequately evaluated.

Impacts from construction activity and operation of the railroad have the potential to reduce the integrity of historic resources, ultimately reducing their significance and NRHP eligibility.

Significant paleontological resources have been identified within Graham County, notably at 111 Ranch and in the Bear Springs Badlands. However, no paleontological resources have been identified within the Project area.

Both construction and operational activities would have the potential to affect cultural resources in the Project area. The most common impact to sites would arise from earthmoving activity during construction of the railroad bed and associated access road. Intact surface and subsurface cultural deposits would be disturbed by this work; demolition of standing structures, some of historic value, would also be entailed.

Operation of the railroad would involve changes to the viewshed and environment of historic properties. In some instances this may reduce the ability of a resource to convey a historic sense of the property, and therefore its integrity.

The relative impacts upon individual sites depend upon the type and constituent elements of each site. These impacts are discussed below in detail. Mitigation relative to the identified adverse effects are included in Chapter 6.0.

AZ CC:1:76(ASM) This historic linear site is the Arizona Eastern Railroad. The segment within the Project area has been recommended a non-contributing (ineligible) element of the site. The Proposed Action would result in no adverse effect to this site.

AZ CC:2:172 (ASM) This historic linear site is the Union Canal. The segment within the Project area has been recommended eligible to the NRHP. The canal has been abandoned, and filled, but it is thought likely the channel remains intact beneath the modern ground surface. The Proposed Action would result in an adverse impact to this site.

AZ CC:2:358(ASM) This site is a prehistoric artifact scatter. It has been recommended eligible to the NRHP. The Proposed Action would avoid this site, resulting in no adverse effect to the resource.

AZ CC:2:359(ASM) This site is a prehistoric artifact scatter. It has been recommended ineligible to the NRHP. The Proposed Action would have no adverse effect on this site.

AZ CC:2:360(ASM) This site is the San Simon River diversion; an earthen levee and channel. The NRHP eligibility of the site has not been determined. Evaluation of the Proposed Action's potential consequences on this resource is contingent upon determination of the site's NRHP eligibility.

AZ CC:2:361(ASM) This site is the historic "piggery;" a complex of agricultural structures, installations, machines, artifacts and debris. The NRHP eligibility of the site

has not been determined. Evaluation of the Proposed Action's potential consequences on this resource is contingent upon determination of the site's NRHP eligibility.

AZ CC:2:362 (ASM) This historic linear site is the Montezuma Canal, an irrigation facility which remains in use. It has been recommended eligible to the NRHP. The Proposed Action would have an adverse effect on this site.

AZ CC:2:363 (ASM) This historic site is an abandoned farmhouse. The NRHP eligibility of the site has not been determined. Evaluation of the Proposed Action's potential consequences on this resource is contingent upon determination of the site's NRHP eligibility.

AZ CC:2:364 (ASM) This site is a buried aqueduct. The existence of this site is inferred from archival research; the aqueduct cannot be observed within the Project area. The site has been recommended eligible to the NRHP. The Proposed Action would have no adverse affect on this site.

AZ CC:2:369 (ASM) This site is a prehistoric artifact scatter with rock features. It has been recommended ineligible to the NRHP. The Proposed Action would have no adverse affect on this site.

AZ CC:2:370 (ASM) This site is a prehistoric artifact scatter with rock features. It has been recommended ineligible to the NRHP. The Proposed Action would have no adverse affect on this site.

AZ CC:3:91 (ASM) This historic linear site is US Highway 666/191. The segment within the Project area has been recommended a non-contributing (ineligible) element of the site. The Proposed Action would have no adverse affect on this site.

No Action Alternative

Under the No Action Alternative, there would not be construction or operation of a rail line within the Project area. The No Action Alternative would therefore result in no adverse effect to cultural and paleontological resources within the Project area.

4.9 HYDROLOGY AND WATER QUALITY

SEA evaluated the effects of the Proposed Action on hydrology and water quality, including potential effects on floodplains, surface waters, groundwater, and wetlands. Impacts would arise if the Proposed Action would result in:

- Degradation of groundwater quality.
- Alteration of creek embankments with rip-rap, concrete and other bank stabilization measures.

- Temporary or permanent loss of surface water area associated with the incidental deposition of fill.
- Downstream sediment deposition or water turbidity due to fill activities, dredging, and/or soil erosion from upland construction site areas.
- Degradation of water quality through sediment loading or chemical spills.
- Alteration of water flow that could increase bank erosion or flooding, uproot or destroy vegetation, or adversely affect fish and wildlife habitats.

The following sections evaluate impacts arising from the Proposed Actions and No Action Alternative to floodplains, surface water, groundwater, and wetlands.

FLOODPLAIN IMPACTS

Proposed Action

The proposed rail line would cross the 100 year flood zone in five separate locations. The most prominent crossing occurs on an approximate 1.5 mile wide section of designated Zone A floodplain located near the confluence of the Gila and San Simon Rivers. The proposed alignment also crosses FEMA designated Zone A flood zones at the Lone Star, Wilson, Peterson, and Watson Washes. The approximate crossing width of these washes ranges from 180 feet at the Watson Wash to 440 feet at the Lone Star Wash.

Project construction may lead to an alteration of natural drainage patterns and possible changes in locations where erosion and sedimentation normally take place. This may result in a reduction in area through which floodwaters would typically flow with a corresponding shift in sedimentation and erosion patterns. To ensure the proposed rail line is compatible with local floodplain management activities, AZER shall obtain a floodplain development permit from Graham County, Arizona. This process involves County review of the construction documents to ensure that construction activities would not divert or otherwise alter surface flows in floodplains and floodways in a manner that would harm public health and safety.

With the incorporation of mitigation, SEA has determined that the Proposed Action would have a minimal impact in terms of alterations to natural drainage, sedimentation, and erosion patterns. The minimal alteration of natural drainage patterns is not anticipated to result in significant increase in the size of the floodplain.

No Action Alternative

Under the No Action Alternative, no construction on existing floodplains would take place. Therefore, no impacts would be anticipated.

SURFACE WATERS IMPACTS

Proposed Action

The proposed rail line would cross the Gila River (which is perennial through the Project area, but intermittent elsewhere) and several ephemeral washes that flow into the Gila and San Simon Rivers. Construction of the Gila River Bridge would require placing temporary pipe culverts in the riverbed to enable construction of the bridge. While river flows would be temporarily diverted through the construction area, the culverting is intended to avoid undue amounts of construction related sediment from entering the watercourse.

However, SEA has determined that the Proposed Action would not result in the long-term alteration of any watercourse beds or cause a loss of aquatic and riparian habitats through the enclosure of waterways.

In the southern portion of the Project area, the San Simon River would be within the 200-foot indirect impact area of the Proposed Action. The proposed rail line would be located along the outer banks of the San Simon River. However, the Proposed Action would have no direct impact on the river because no crossing nor any construction activity proposed within the watercourse. Therefore, SEA has determined that the Proposed Action would have no impacts to watercourse beds, aquatic, or riparian habitats.

In addition, the Proposed Action does not include nor necessitate maintenance facilities or yards that include storage tanks or pipes that could potentially leak hazardous materials into nearby washes or streams. As these facilities are not included as part of the Proposed Action, no impacts are anticipated. However, as the trains that would operate over the proposed rail line would be carrying sulfuric acid, the Proposed Action could potentially impact surface waters in the event of an accident and chemical spill. This is further discussed in Section 4.11, Hazardous Materials, below.

No Action Alternative

Under the No Action Alternative, there would be no construction of a rail line that would encroach upon surface waters. However, the potential for contamination of surface waters due to chemical spills would remain. Under the No Action Alternative, chemicals associated with the Mine would be transported by truck over local and state roads, including the bridges crossing the Gila River to the west of Safford at North Reay Lane and North 8th Avenue. Therefore, the No Action Alternative would also have the potential to cause contamination of surface waters related to accidental chemical spills in the event of a vehicle overturn.

GROUNDWATER IMPACTS

Proposed Action

The Proposed Action would result in the creation of approximately 75 acres of impervious surface, consisting of the proposed railbed and access road. Impervious surfaces have the potential to negatively affect recharge to groundwater aquifers by blocking water from ground surfaces. However, the creation of impervious surface area associated with the Proposed Action is not expected to impede groundwater recharge. Recharge of aquifers within the Project area is primarily attributed to the Gila River with some contribution from seepage from irrigation water and mountain-front groundwater flow.

As the Project would not result in any significant long term alteration to the Gila River, (notwithstanding the temporary construction period diversion), the primary source of groundwater recharge within the Project area would not be affected. Due to the linear nature of the proposed rail line, the amount of actual impervious surface created within areas where irrigation water recharge occurs would be minimal, particularly in comparison to irrigated areas south of the Gila River.

In addition, the aquifers within most of the Project area are not anticipated to be disturbed due to excavation activities. Based on well data from ADWR gathered in 1987 and 2002, depth to groundwater varies throughout the Project area, increasing from south to north along the proposed alignment. In general, depth in the northern portion of the alignment ranges from between 95 to 450 feet. In the southern portion of the alignment, depth to the groundwater is 15 to 50 feet. However, adjacent to the proposed Gila River crossing, groundwater may be encountered relatively close to the surface due to the proximity of the recharge source. The presence or absence of groundwater is generally not expected to be a constraint to this project, except in the general vicinity of the Gila River, where higher groundwater elevations may influence structural considerations for the proposed river crossing. In addition, depending on the time of year that construction is implemented, it is possible that perched groundwater could be encountered at some locations throughout the Project area. Regardless, any excavation required to complete the Project is not anticipated to extend far enough below the surface to result in significant adverse impacts to groundwater aquifers.

Groundwater quality could potentially be affected if a spill or contaminant release occurred during rail line construction. In addition, as the Proposed Action would entail the transportation of sulfuric acid, there is a potential for impacts to groundwater due to an accident and spill that could penetrate to the underlying aquifer. The likelihood of such a release, however, is extremely small due to use of proper containerization and handling during transport. In addition, there is a potential for release of small quantities of chemicals, including motor fuel, used during construction. The potential impacts of a chemical spill associated with the Proposed Action are further discussed in Section 4.11, Hazardous Materials.

No Action Alternative

Under the No Action Alternative, construction of a rail line would not take place. However, the potential for contamination of groundwater aquifers due to chemical spills remains. Under the No Action Alternative, chemicals associated with the Mine would be transported by truck over local and state roads. The potential for motor vehicle accidents resulting in chemical spills to groundwater aquifers remains. However, the potential for impacts arising from groundwater contamination is less than significant.

WETLANDS IMPACTS

It is not expected that the Proposed Action would result in significant adverse impacts to wetlands or floodplains from alteration of wetlands, loss of wetland habitat or vegetation, or alteration of volume or speed of flood flow.

The ACOE, pursuant to Section 404(e) of the CWA, is authorized to issue general permits on a statewide basis for the discharge of dredged or fill materials and/or the placement of structures that are components of a single and complete project (including all temporary and permanent features) that individually or cumulatively result in direct or indirect impacts to 1.0 acre or less of waters of the U.S. (including jurisdictional wetlands). Indirect impacts include impacts to waters of the U.S. or jurisdictional wetlands that are indirectly affected by flooding, excavation, or drainage, as a result of a project.

The Preliminary Jurisdictional Delineation for the proposed rail line divided the proposed rail line into three segments: southern portion, Gila River crossing, and northern portion. Estimated jurisdictional lands within each portion are shown in Table 4.9-1 below.

Table 4.9-1 Potential Jurisdictional Wetlands

Segment	Jurisdictional Area (Acres)
Southern portion	0.52 acres
Gila River crossing	9.27 acres
Northern portion	9.68 acres

Source: WestLand Resources, 2006; ACOE 2007.

No Action Alternative

Under the No Action Alternative, there would be neither construction nor operation of a new rail line within wetland areas. Therefore, no wetlands impacts would be anticipated.

4.10 GEOLOGY AND SOILS

SEA examined the potential for the Proposed Action to impact topography and geology within the Project area. Impacts would arise from the Proposed Action if it resulted in substantial changes to local geology or soils.

Geologic and Soil Impacts

Proposed Action

According to the geologic and geotechnical report prepared for SEA, soils and geologic conditions in the Project area do not pose a constraint to the Proposed Action.

In terms of geologic issues, alluvial soils in the Project area are expected to be generally excavatable to anticipated depths of 5 or more feet with conventional earthmoving equipment. However, soils in most portions of the Project area have been found to exhibit cohesionless characteristics (such as too sandy or too gravelly). As a result, some soils in the area are prone to caving and may be problematic for slope stability in trenches. Although limited areas of expansive soils (those with a relatively high capacity for shrinking and swelling) were identified, none of these areas are located near any critical facilities, such as bridge abutments, and no special treatment is recommended.

The proposed rail line would cross the Gila River as well as numerous natural drainages. These water features have the potential for scour that necessitate special engineering solutions. The potential for scour can be mitigated by use of standard engineering and design techniques such as using box culverts for small stream crossings, bridges on spread footings for crossings of canals and aqueducts, and bridges on deep foundations for the crossing of the Gila Rivers. These techniques are incorporated as mitigation measures.

In terms of geotechnical issues, the Project area is more than thirty miles from the nearest known area of earth fissures and significant land subsidence. There are no giant desiccation cracks traversing the Project area; the closest is more than eight miles away. There are no known active faults underlying the Project area; the closest fault area is approximately four miles south of the Project area. Groundwater depths in the Project area are such that the potential for liquefaction is low.

For the majority of the alignment, the topography of the Project area is relatively gentle and far from steep slopes, minimizing the likelihood of landslides. Only in the northern reaches of the Project area, where terrain to the north and east is more mountainous in character, are landslides likely to occur. In all, SEA has determined that with mitigation, the Proposed Action would have minimal impacts related to geology and soils.

No Action Alternative

Under the No Action Alternative, no rail line construction or operation would take place; no associated geologic or geotechnical impacts would be anticipated.

4.11 HAZARDOUS MATERIALS

SEA evaluated impacts related to hazardous materials to determine if the Proposed Action would have any of the following effects:

- Increase in generation or release of hazardous waste.
- Increase in quantity of hazardous materials transported.
- Potential disturbance of existing hazardous waste sites.

The following section evaluates hazardous waste impacts under both the Proposed Action and the No Action Alternative.

Proposed Action

The Proposed Action would not result in an increase in the generation or release of hazardous waste. Although the Proposed Action would entail the transport of materials (sulfuric acid) that would be considered a hazard in the event of an accidental spill, the Proposed Action would present no increase in the quantity of materials transported relative to the No Action Alternative. Under the No Action Alternative, a comparable amount of sulfuric acid would be transported to the Mine from Miami, Arizona, via public roadways.

According to statistics compiled by the FRA and analyzed by the Association of American Railroads, hazardous materials transported by railroad are much less likely to be involved in an accidental release than hazardous materials transported by truck. Analysis found that despite roughly equal amounts of ton-mileage, railroads had a number of hazardous materials incidents equal to about 6 percent of such incidents related to truck transport.¹¹

In the event of an accident, AZER has contingency plans for hazardous materials release related to emergencies, such as derailments and natural disasters. AZER emergency crews are headquartered at Claypool, Arizona, proximate to the Phelps Dodge processing facility in Miami, Arizona, and would respond to any incidents in the Project area involving the actual or potential accidental release of hazardous materials. In order to further minimize

¹¹ USDOT, Pipeline & Hazardous Materials Safety Administration, Hazardous Materials Incidents By Year & Mode, from <http://hazmat.dot.gov/pubs/inc/data/10yearfrm.htm> for 1995 through 2004. USDOC, 2002 Commodity Flow Survey (CFS), Table 1a, for truck ton-mi. FHWA Highway Statistics. ICC/STB Waybill Sample for rail ton-miles. In 2003, trucks hauled an estimated 110 billion ton-miles of hazmat, while railroads also hauled an estimated 110 billion ton-miles of hazmat.

the potential impact of any accidental releases, SEA recommends as mitigation the preparation of a detailed contingency plan for any incident on the proposed rail line involving the actual or potential accidental release of hazardous materials and the circulation of this plan to police and firefighting service providers in the Safford area.

The Proposed Action has a relatively low potential to disturb existing hazardous waste sites. A review of Federal, state, and local databases that track hazardous material contamination indicated that the Project area contained no sites with known contamination. Field reconnaissance of the Project area identified three general locations where historic land uses (agricultural and exploratory oil well drilling) may have led to undocumented contamination related to buried or at-surface garbage and/or human waste, usage and/or disposal of herbicides and/or pesticides, and high concentrations of lead related to gunfire. With mitigation recommended by SEA, potential risks associated with encountering such sources of contamination during construction of the Proposed Action would be considered low.

No Action Alternative

Under the No Action Alternative, no rail line construction would take place. Therefore existing hazardous waste sites would not be disturbed and impacts would not be anticipated.

Transport of materials to and from the Mine would be via trucks using public roadways to the north and west of the Project area. Recent studies suggest that hazardous materials incidents are much more likely to occur when such materials are transported via truck versus train. Therefore, SEA has determined that the Proposed Action would have a beneficial impact over the No Action Alternative in terms of protection against accidental releases of hazardous materials.

4.12 AIR QUALITY

The Project area and its immediate surroundings are in an area determined by ADEQ to be in attainment for all criteria pollutants. As such, the Proposed Action does not require a General Conformity Determination.¹²

While no general conformity analysis is required, construction and implementation of the Proposed Action has the potential to increase localized concentrations of several criteria pollutants, including particulate matter (PM₁₀), carbon monoxide (CO), oxides of nitrogen (NO_x), and sulfur dioxide (SO_x). Construction and implementation of the Proposed Action also has the potential to increase volatile organic compounds (VOCs), which are considered precursors of ozone (O₃).

¹² ADEQ determination, 7/20/2006

Air quality impacts associated with the Proposed Action could also have visual impacts in the form of contributions to regional haze. Dust from construction activities, along with particulate and diesel emissions from operational activities, could contribute to haze, possibly affecting locations well outside of the Project area, including, but not limited to, the two Class I airsheds within 100 kilometers (the Gailuro Wilderness in Arizona and the Gila Wilderness in New Mexico).

Proposed Action: Project Construction

Construction activities would consist of clearing and grubbing, laying down the roadbed, laying track, and constructing a bridge over the Gila River. During the construction period (estimated to be approximately twelve months, assuming work is conducted eight hours per day on weekdays only) these activities have the potential to generate dust and air pollutants, primarily particulate matter, in the immediate Project area.

Construction related generation of particulate matter can be estimated using the US EPA AP-42 emission factors for heavy construction operations. Calculations are included in Appendix G. Table 4.12-1 below shows anticipated construction period emissions for PM₁₀ and PM_{2.5}.

Table 4.12-1 Construction Activity Related Particulate Matter Emissions

Construction Activity	PM ₁₀ Emissions	PM _{2.5} Emissions
General Land Clearing/Bulldozing/Compacting	6.93 tons per year	5.60 tons per year
Loading of Excavated Materials into Trucks/Dumping Fill Materials/Material Transfers	0.002 lbs per ton of material loaded	0.0004 lbs per ton of material loaded
Vehicular Traffic on Unpaved Roads	3.3 lbs per VMT	0.33 lbs. per VMT

Source: Kleinfelder, 2007.

The resulting temporary increase in particulate matter would have both local and regional adverse effects. PM₁₀ would primarily affect the immediate Project area, whereas PM_{2.5} would have the potential to affect the larger region. Larger and therefore heavier particulate matter would quickly settle to the ground in the immediate Project area. Smaller particulate matter could be transported by winds, until settling on the ground or becoming widely dispersed in the air.

Emissions related to temporary construction activities are not considered to have adverse effects due to their temporary nature and proposed occurrence within an area where no sensitive receptors are present. Construction best practices have been included as mitigation to minimize the generation of construction period dust and other emissions that could have regionally adverse effects. With mitigation incorporated, SEA has

determined that the Proposed Action would not cause significant adverse construction period air quality impacts, either locally or regionally.

Proposed Action: Project Operations

The Proposed Action would provide an alternative mode for transporting materials to and from the Mine. As such, SEA analyzed and compared the emissions from the proposed train from Miami to the Mine, and compared these to the emissions from trucks traveling between the same two points. Truck transport of materials was analyzed as the No Action Alternative relative to air quality.

Upon completion of construction, Proposed Action operations would entail one round-trip train per day, 365 days per year, powered by two GP-35 diesel locomotives. Emissions related to the operation of the rail line were estimated using USEPA Emissions Factors for Locomotives¹³ These factors set forth emissions levels (or tiers) associated with various engine types. The locomotives proposed to be used in the Proposed Action have engine assemblies that would be considered to be below Tier 0 levels.¹⁴

Although the Project area is defined as between AZER's existing mainline near Safford and the Mine, operational air quality impact estimates include emissions associated with travel between Miami and the Mine (a one-way distance of 93.75 miles). Emissions generated within the Project area alone (a one-way distance of about 12 miles) would be equal to about one-eighth of those associated with travel between Miami and the Mine.

Table 4.12-2 identifies estimated operational emissions for criteria pollutants for both the Proposed Action (train) as well as the No Action (truck) alternative.

¹³ USEPA 420-F-97-051

¹⁴ Tiers established for locomotives range from Tier 0 to Tier 2, with emissions levels decreasing from Tier 0 to Tier 2.

Table 4.12-2: Comparison of Annual Operational Emissions, Proposed Action and No Action Alternatives (tons/year)¹⁵

	Particulate Matter (PM 10)	Volatile Organic Compounds (VOCs)	Carbon Monoxide (CO)	Nitrogen Oxides (NOx)	Sulfur Oxides (SOx)
Proposed Action Alternative: New Rail Line	4.04	6.04	16.05	162.95	NA
No Action Alternative: Truck Transport	221.22	2.36	14.26	96.09	1.66

Source: Kleinfelder 2006; CirclePoint 2007.

The Proposed Action would generate lower levels of PM10 and SOx than the No Action Alternative. However, the Proposed Action generate higher levels of VOCs, CO, and NOX relative to the No Action Alternative.

This analysis assumes a direct trade off between the Proposed Action and the No Action alternative and has been provided for comparative purposes. However, it should be noted that under the No Action Alternative, the Mine would be served by the noted 80 truck trips while at the same time, the two AZER-owned GP-35 locomotives would remain in use along AZER’s mainline, rather than be put into service to the Mine. As such, the Proposed Action would lead to reduced emissions at both local and regional levels.

In sum, the No Action Alternative would lead to the generation of emissions from both truck and train trips; the Proposed Action would eliminate truck trips to the Mine. Therefore, based on this analysis, SEA has determined that the Proposed Action would not cause significant adverse operational period air quality impacts at the local or regional level; no mitigation measures would be necessary.

¹⁵ The Mine EIS estimates 80 daily truck trips between the Mine and the Phelps Dodge facility in Miami, approximately 94 miles west/southwest of the Mine. The Mine EIS did not specifically quantify air quality emissions associated with these truck trips. For the purposes of this analysis, however, truck emissions were estimated to allow for a better comparison of the Proposed Action and No Action alternatives.

Emissions estimated for the No Action Alternative are based on the following assumptions:

- 80 round trips per day between Miami and the Mine (187.5 miles round-trip), 365 days per year
- Truck fleet comprised of 40 tanker trucks and 40 boxcars
- Truck emissions estimates include both tailpipe emissions and fugitive paved road emissions
- Truck route includes 83.8 miles of rural arterial roadways and highways (including U.S. Highway 70) and 9.95 miles of local rural roads, including unpaved roads.

4.13 NOISE AND VIBRATION

APPROACH AND METHODOLOGY

The STB's noise evaluation criteria for a project such as the Proposed Action is found at 49 CFR 1105.7(e)(5)(i)(a). This section sets forth a threshold for changes or increases in freight traffic on a line segment that would require detailed analysis. For a new line, such as the Proposed Action, there must be an increase of at least eight trains per day to require a noise analysis. If an analysis is required, the noise criteria set forth standard of what would constitute a significant adverse effect: either: 1) a 3 decibel increase in noise or 2) an increase in the average night-day noise level¹⁶ (Ldn) of 65 decibels or higher at any sensitive land use adjacent to the project.

Because the Proposed Action would involve only one round trip train trip per day and the very low existing ambient noise levels in the Project area, STB's criteria would suggest that no noise analysis whatsoever would be required.

However, SEA determined it appropriate to consider additional noise impact criteria from a cooperating agency in the analysis of this Proposed Action so that some quantifiable analysis would occur. The additional criteria applied are from the FRA's *High-Speed Ground Transportation Noise and Vibration Impact Assessment* (October 2005) guidance manual. Both FRA's and the Federal Transit Administration's (FTA) noise impact criteria are founded on well-documented research on community reaction to noise and are based on change in noise exposure using a sliding scale. Although higher levels of train noise are allowed in locations with high levels of existing noise, smaller increases in total noise exposure are allowed with increasing levels of existing noise. The criteria apply to train operations as well as to fixed facilities such as storage and maintenance yards, passenger stations and terminals, parking facilities, and substations.

FRA's Noise Impact Criteria group noise sensitive land uses into three categories as described in Table 4.13-1 below.

¹⁶ LDN is typically defined as an average noise level, measured over a 24 hour period, in which nighttime noise events (those occurring between 10:00 p.m. and 7:00 a.m.) are more heavily weighted, reflecting the fact that noises occurring during these hours are typically considered more disruptive than noise during daytime hours.

Table 4.13-1 Land Use Categories and Metrics for Train Noise Impact Criteria

Land Use Category	Noise Metric* (dBA)	Description of Land Use Category
1	Outdoor $L_{eq}(h)$ **	Tracts of land where quiet is an essential element in their intended purpose. Includes lands set aside for serenity and quiet, and such land uses as outdoor amphitheaters and concert pavilions, as well as National Historic Landmarks with significant outdoor use.
2	Outdoor L_{dn}	Residences and buildings where people normally sleep. Includes homes, hospitals and hotels where nighttime sensitivity to noise is assumed to be of utmost importance.
3	Outdoor $L_{eq}(h)$ **	Institutional land uses with primarily daytime and evening use. This category includes schools, libraries and churches where it is important to avoid interference with such activities as speech, meditation and concentration on reading material. Buildings with interior spaces where quiet is important, such as medical offices, conference rooms, recording studios and concert halls fall into this category, as well as places for meditation study and associate cemeteries, monuments and museums. Certain historical sites, parks and recreational facilities are also included.

Source: Federal Railroad Administration, 2005.

Note: *Onset-rate adjusted sound levels (L_{eq} , L_{dn}) are to be used where applicable. L_{eq} refers to the equivalent sound pressure level - the steady sound level that, over a specified period of time, would produce the same energy equivalence as the fluctuating sound level actually occurring. "(h)" refers to a specified time period, which typically range from one to twenty four hours.

** L_{eq} for the noisiest hour train-related activity during hours of noise sensitivity.

L_{dn} is used to characterize noise exposure for residential areas (Category 2). For other noise sensitive land uses such as parks and school buildings (Categories 1 and 3), the maximum 1-hour L_{eq} during the operating period is used.

There are two levels of impact included in the FRA criteria. This interpretation of these two levels of impact is summarized below:

- **Severe:** Severe noise impacts identify locations where a significant percentage of people would be highly annoyed by noise from the project. FRA particularly encourages noise abatement on train projects where such impacts are identified.
- **Moderate:** In this range of noise impact, the change in the cumulative noise level is noticeable to most people, but may not be sufficient to cause strong, adverse reactions from the community. In this transitional area, other project-specific factors must be considered to determine the magnitude of the impact and the need

for mitigation. These other factors can include the predicted increase over existing noise levels and the types and numbers of noise sensitive land uses affected.

The noise model used in determining the potential for noise impact along the proposed alignment is the FRA’s locomotive horn noise model. This model was developed for FRA to assess noise levels from both locomotive horns and freight rail operations. The inputs to the model include the number of trains per day, the number of locomotives and cars, the speed of the trains, and information regarding the existing noise environment.

NOISE IMPACTS

Proposed Action: Operational Period

Potential noise impacts associated with the Proposed Action were determined from application of FRA noise criteria as noted above. The following assumptions were used:

- One roundtrip per day, seven days a week, in the afternoon and early evening
- Train speed of 30 mph
- Average train length of two locomotives and twenty to twenty-five rail cars ¹⁷

The impact distances based on the input data and the assumed existing background noise are shown in Table 4.13-2. The distances for both Moderate and Severe impact are also shown for both locomotive horn use at at-grade crossings and operations outside of ¼ mile from at-grade crossings.

Table 4.13-2 Land Use Categories and Metrics for Train Noise Impact Criteria

Location	Distance to Moderate Impact (feet)	Distance to Severe Impact (feet)
Grade Crossings	2400	1000
Outside 0.25 mile from Grade Crossings	260	120

Source: HMMH, 2006.

¹⁷ The Proposed Action was revised subsequent to the completion of the noise analysis to entail the operation of somewhat shorter trains of twenty to twenty-five railcars powered by two locomotives. The proposed use of shorter trains than those analyzed (thirty cars in length, three locomotives) does not materially affect the findings of the noise analysis. In fact, the assumption of longer trains in the noise analysis provides a more conservative estimate of noise. The proposed use of two locomotives would generate lower noise levels than trains with three locomotives. Shorter trains would also yield shorter duration noise events than longer trains.

Based on the land use information and mapping provided, there are no residences or potentially noise sensitive land uses located within these impact distances. Three residential uses are located approximately 1,000 feet from the proposed rail line and are currently adjacent to AZER's mainline. Other land uses in the vicinity of the Proposed Action include agricultural uses, roadways, and open desert areas, none of which contain any noise sensitive land uses. In sum, SEA concluded that rail operations under the Proposed Action would not have the potential to cause a moderate or severe noise impact.

Proposed Action: Construction Period

Construction equipment has the potential for construction-period noise impacts in and around the Project area. Although construction of the entire proposed rail line is anticipated to take 12 months, the amount of time that work would actually occur at any given point along the line would be limited to a few weeks (with the notable exception of the Gila River bridge).

Construction equipment would include trucks, loaders, air compressors, and other materials; blasting activities are not anticipated to be necessary. Measured on the "A" scale of decibel readings, the noise levels from heavy construction equipment typically used in rail construction would range from 62 to 74 dBA at a distance of 500 feet, diminishing to a range from 58 to 70 dBA at 1,000 feet and 54 to 67 dBA at 2,000 feet.

The closest sensitive receptors to the Project area are residential properties on a parcel adjacent to AZER's mainline; the closest residence to the Project area is approximately 1,000 feet away. However, SEA has determined that construction related noise impacts would be mitigated for residences within 2,000 feet of the proposed rail line by dispersal of heavy equipment along the line's entire length and the prohibition of construction during evening hours and weekends. No additional mitigation would be required to address construction period noise impacts.

No Action Alternative

Under the No Action Alternative, no rail line would be constructed or operated; therefore, no noise impacts would be anticipated in the Project area. Eighty daily round-trip trucks carrying materials to and from the Mine would access the Mine along local roads and highways; areas along these routes can be expected to experience noise associated with truck traffic.

VIBRATION IMPACTS

Proposed Action

Ground-borne vibration is the oscillatory motion of the ground about some equilibrium position that can be described in terms of displacement, velocity or acceleration. Because

sensitivity to vibration typically corresponds to the amplitude of vibration velocity within the low-frequency range of most concern for environmental vibration (roughly 5-100 Hz), velocity is the preferred measure for evaluating ground-borne vibration from surface transportation projects.

The most common measure used to quantify vibration amplitude is the peak particle velocity (PPV), defined as the maximum instantaneous peak of the vibratory motion. PPV is typically used in monitoring blasting and other types of construction-generated vibration, since it is related to the stresses experienced by building components. Although PPV is appropriate for evaluating building damage, it is less suitable for evaluating human response, which is better related to the average vibration amplitude. Thus, ground-borne vibration from trains is usually characterized in terms of the “smoothed” root mean square (rms) vibration velocity level, in decibels (VdB), with a reference quantity of one micro-inch per second. VdB is used in place of dB to avoid confusing vibration decibels with sound decibels.

The range of interest is from approximately 50 to 100 VdB, from imperceptible background vibration to the threshold of damage. Although the approximate threshold of human perception to vibration is 65 VdB, annoyance is usually not significant unless the vibration exceeds 70 VdB.

Because of the limited number of vibration-sensitive locations near the proposed alignment, a vibration screening assessment was conducted to determine the potential for vibration impact. A screening procedure is designed to be conservative, and potentially over-estimate any vibration impacts. For this project, a screening distance of 200 feet on either side of the proposed alignment was used for the assessment. This distance is recommended in both FRA and FTA guidance for diesel locomotives with rail cars. Based on the land use information and mapping provided, there are no vibration sensitive receptors within this distance. Therefore, SEA has determined that there would not be any significant adverse construction or operational vibration impact associated with the Proposed Action; no mitigation would be necessary.

No Action Alternative

Under the No Action Alternative, no rail line construction or operation would take place; no vibratory impacts would be anticipated within the Project area, as the transport of materials to and from the Mine would occur on public roadways significantly west of the Project area.

4.14 BIOLOGICAL RESOURCES

SEA assessed the biological resources and the potential for the Proposed Action to affect local species or to otherwise modify habitat in the Project area. Biological resources include vegetation and wildlife habitat, wildlife, wetlands, and special status species.

Direct impacts to biological resources are those caused by implementation of the Proposed Action and are usually immediate and site-specific. Indirect impacts are those caused by the Proposed Action but would occur later in time or farther removed in distance, but are still reasonably foreseeable. Impacts can be further categorized as short-term or long-term. Short-term impacts on wildlife are defined as impacts that do not persist beyond one or two reproductive cycles. Long-term impacts are defined as impacts that persist for more than ten years.

Unless otherwise noted, all information on biological resources was obtained from studies conducted by WestLand Resources, Inc, and reviewed independently for SEA by CH2M Hill. This includes the Biological Assessment prepared for the Proposed Action, included as Appendix D.

SEA used the following evaluation criteria for assessing the potential harm or loss to biological resources:

- Harm to or loss of individual or populations of threatened or endangered species.
- Loss or degradation of critical habitat, sanctuaries, refuges, use areas or migration corridors for threatened or endangered species.
- Loss of large numbers of non-threatened or non-endangered species.

BIOLOGICAL RESOURCES IMPACTS

PROPOSED ACTION

Vegetation and Wildlife Habitats

Construction and operation of the proposed rail line would have direct impacts on vegetation and wildlife habitats. The southern portion of the Project area below the Gila River is almost entirely agricultural. Approximately 2.5 miles of the Project area would cross these lands. The Proposed Action would directly impact and permanently convert approximately 24.63 acres of prime farmland, as noted in Section 4.2 above. It is estimated that an additional 24.63 acres of prime farmland would be indirectly affected. This acreage is entirely within the 200 foot wide corridor centered on the proposed rail line. While agricultural lands can provide habitat for some wildlife species, agricultural fields in general tend to support fewer wildlife species than natural habitats. Moreover, the loss of this farmland would consist of less than 0.07 percent of all irrigated farmland in Graham County.

At the proposed Gila River bridge (Bridge), the Proposed Action would result in the loss of 0.08 acres of existing riparian habitat and could result in temporary impacts to an additional 0.32 acres of riparian habitat. Project-related construction activities on site

would result in the clearing of a maximum of 0.4 acres of riparian habitat. It is highly likely that vegetation would reestablish itself relatively quickly following the anticipated twelve month construction period. Since the Gila River system is dynamic and subject to scour following storm events; the adjacent riparian habitat is generally not able to fully develop between storm events.

As was discussed under Surface Water Impacts (Section 4.9) construction of the Bridge would require placing temporary pipe culverts in the riverbed during the twelve month construction period. While river flows would be temporarily diverted through the construction area, the culverting is intended to avoid undue amounts of construction related sediment from entering the watercourse. Such culverting is used as a relatively typical engineering practice to protect watercourses from excessive sedimentation. However, SEA has determined that the Proposed Action would not result in the long-term alteration of any watercourse beds nor cause a loss of aquatic and riparian habitats through the enclosure of waterways.

The San Simon River would be within the 200-foot indirect impact area of the Proposed Action; the proposed rail line would be located along the outer (western) banks of the San Simon River. The Proposed Action would have no direct impact on the river: there is no crossing nor any construction activity proposed within the watercourse. Therefore, SEA has determined that the Proposed Action would have no impacts to watercourse beds, aquatic, or riparian habitats of the San Simon River.

North of the Gila River crossing to the Mine the proposed rail line would traverse primarily undeveloped Sonoran desertscrub vegetation for approximately 7.7 miles. As was assumed for other resources evaluation (e.g., Farmland and Agricultural Impacts), direct impacts are based upon an assumed 100 foot right-of-way for the proposed rail line. The indirect impact area is assumed to be an additional 50 feet on either side of the direct impact area. Temporary construction impacts would be expected to take place during the twelve month construction period within the 200 foot wide indirect impact area. Hence, the Proposed Action would directly impact and permanently convert approximately 93.33 acres of Sonoran desertscrub. An estimated additional 93.33 acres would be indirectly affected. Sonoran desertscrub habitat within the Project Area has similar structure and species composition found throughout much of the Gila River valley and the Sonoran desert region.

Besides the Gila River, several ephemeral washes that flow into the Gila and San Simon Rivers are crossed by the Project area. Where the proposed rail line would cross any ephemeral washes, narrow bands of xeroriparian vegetation associated with washes would be directly impacted for 100 feet and permanently committed to the Project; an additional 100 feet of potential xeroriparian vegetation would be indirectly affected at each wash. Use of box culverts for wash crossings should allow xeroriparian habitat to be maintained below the crossings.

Wildlife

Construction of the rail line would temporarily displace local, small terrestrial wildlife associated with the agricultural lands, riparian, and desert scrub habitats. Smaller, less mobile wildlife, such as small mammals and reptiles, would be crushed by construction equipment during initial grading. Other wildlife, such as birds and larger mammals, would leave the vicinity of the Project Area as construction activities approached. In general, impacts to wildlife would be short-term, as wildlife is temporarily displaced during construction (anticipated to be twelve months). In addition, species that may be impacted by the Proposed Action are relatively common and have a wide distribution.

The Proposed Action would not likely impede existing wildlife movement patterns or fragment wildlife habitat. There would be a short-term disruption of movement from construction activity; this would be immediate and temporary. Use of box culverts for wash crossings should allow continued wildlife movement through the Project Area. Moreover, the proposed height of the Bridge would also minimize long-term disruption of wildlife movement through the Gila River corridor. Long-term impacts to wildlife movement are expected to be minimal.

Background noise levels would increase during the construction period. Although the construction noise disturbance would not be sustained over the long term, temporary construction noise may have short-term impacts to local wildlife. Additionally, noise associated with operations (one daily round trip train) may initially have the effect of disrupting wildlife behavior, but it is likely that most wildlife would adapt to this noise. Long-term impacts from operational noise are expected to be negligible.

Wetlands Impacts

It is not expected that the Proposed Action would result in significant adverse impacts to wetlands or floodplains from alteration of wetlands, loss of wetland habitat or vegetation, or alteration of volume or speed of flood flow.

The ACOE, pursuant to Section 404(e) of the CWA, is authorized to issue general permits on a statewide basis for the discharge of dredged or fill materials and/or the placement of structures that are components of a single and complete project (including all temporary and permanent features) that individually or cumulatively result in direct or indirect impacts to 1.0 acre or less of waters of the U.S. (including jurisdictional wetlands). Indirect impacts include impacts to waters of the U.S. or jurisdictional wetlands that are indirectly affected by flooding, excavation, or drainage, as a result of a project.

The Preliminary Jurisdictional Delineation for the proposed rail line divided the proposed rail line into three segments: southern portion, Gila River crossing, and northern portion. Estimated jurisdictional waters within each portion are shown in Table 4.9-1 above: 0.52

acres for the Southern portion; 9.27 acres for the Gila River Crossing, and 9.68 acres for the Northern portion.

Special Status Species

An initial screening analysis determined that no special status species were present along the 12.4-mile corridor, with the exception of habitat associated with the Gila River corridor. Designated Critical Habitat for two listed endangered species, the southwestern willow flycatcher (*Empidonax traillii extimus*) and the razorback sucker (*Xyrauchen texanus*), is present within the Project Area associated with the Gila River and adjacent riparian habitat. However, no nesting southwestern willow flycatchers were detected during the 2006 or 2007 (partial) survey season and the AGFD Heritage Database Management System has no recent records of razorback sucker in this reach of the Gila River.

An “Action Area” is defined by the USFWS as “all areas affected directly or indirectly by the Federal action and not merely the immediate area involved in the action.”¹⁸ For the purposes of impact assessment discussed below, the Action Area is defined as the Bridge and associated features. This definition takes into consideration the areas of direct surface disturbance from the Bridge, indirect effects associated with development in upland habitats, and the benefits derived from implementation of the Mitigation Measures described in Chapter 6.

Razorback Sucker: The Proposed Action has been analyzed for its potential to reduce the reproduction, numbers, or current distribution of the razorback sucker within the Gila River. The Gila River at the location of the Bridge is designated critical habitat for this species. Historically razorback suckers did occur in the Gila River in the Safford area; however, this species was extirpated from the area several decades ago. No razorback suckers have been found in this area for 10 to 15 years.¹⁹ Although relic individuals may exist, for all practicable purposes this species is extinct in the Gila River. Accordingly, no direct impacts to razorback sucker are anticipated from the Proposed Action.

Due to the absence of the razorback suckers within the Project Area, no indirect impacts would occur as a result of construction of the Project. Construction methods are designed to minimize potential impacts to surface water quality and there would be no change to the current flow conditions once construction of the Bridge is completed.

Southwestern Willow Flycatcher: The Proposed Action has been analyzed for its potential to reduce reproduction, numbers, or (current) distribution of this species. Construction of the Proposed Action under current field conditions is not likely to affect

¹⁸ USFWS 1998.

¹⁹ L. Fitzpatrick, personal communication, August 1, 2007; in WestLand Resources, 2007; Appendix D.

any of these factors for the Southwestern willow flycatcher. Only the Bridge portion of the Project area includes potential habitat for the Southwestern willow flycatcher. Southwestern willow flycatchers may use the Gila River in the Action Area as a movement/migration corridor to other, occupied suitable habitat along other portions of the river. However, two years of survey results for the Southwestern willow flycatcher within this portion of the Project area have resulted in no detections of nesting birds. The best available evidence, including agency records and two years of surveys with negative results, indicates that the Action Area is not occupied by any Southwestern willow flycatcher. This is most likely due to a lack of suitable habitat within the area of the Bridge. Therefore, construction of the Bridge is not likely to reduce reproduction, numbers, or distribution of the Southwestern willow flycatcher.

The Action Area does not presently contain suitable nesting habitat for the Southwestern willow flycatcher because it generally lacks the density and structure of vegetation known to be used by nesting flycatchers. Given this, no direct impacts to any individual Southwestern willow flycatchers are expected to result from construction of the Bridge or associated structures. Survey results indicate that the Southwestern willow flycatcher has not established a territory on or used the Action Area for nesting purposes.

The Proposed Action would result in the loss of 0.08 acres of existing riparian habitat and could result in temporary impacts to an additional 0.32 acres of potentially suitable Southwestern willow flycatcher habitat. In sum, the Proposed Action would result in the clearing of a maximum of 0.4 acres of riparian habitat. The near-absence of breeding habitat within the Project area, the limited magnitude of impacts, and the high likelihood that vegetation would re-establish itself relatively quickly would minimize direct effects to the Southwestern willow flycatcher. The Gila River system is dynamic and subject to scour following storm events; therefore adjacent riparian habitat is generally not able to fully develop between storm events. Indirect impacts to the Southwestern willow flycatcher and designated critical habitat are described in detail in the sections that follow.

Potential indirect impacts to designated critical habitat include:

- Changes in vegetation structure within the Action Area as a result of construction activities
- Increases in noise levels adjacent to Bridge during the operation and maintenance phase of the railway

The upland areas south of the Gila River, which are primarily agricultural, and the riparian strands adjacent to the Gila and San Simon rivers would be cleared to accommodate the support structures, Bridge embankment, and river training devices required for Bridge construction. There is approximately 0.4 acres of potentially suitable Southwestern willow flycatcher habitat within the area proposed to be cleared. Due to the

absence of territories located within this patch of riparian habitat, the removal of such vegetation is not likely to have any indirect impacts to the Southwestern willow flycatcher.

Background noise levels would increase during the construction period and although the noise disturbance would not be sustained, it may have temporary impacts to Southwestern willow flycatcher behavior. Additionally, after construction the noise created from the one round trip per day may initially have the effect of disrupting willow flycatcher behavior, but it is likely that birds would adapt to this noise and eventually their nesting and breeding habits would be undisturbed. Indirect impacts to any southwestern willow flycatcher from vegetation clearing and increased noise levels are expected to be negligible.

Critical Habitat

The USFWS Section 7 Consultation Handbook defines the destruction or adverse modification of critical habitat as “a direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species. Such alterations include, but are not limited to, alterations adversely modifying any of those physical or biological features that were the basis for determining the habitat to be critical.”

Razorback Sucker: The Project area includes the Gila River channel and is therefore likely to have temporary adverse effects to critical habitat for razorback sucker. These effects are likely to stem from disturbance due to temporary dewatering of limited areas within the Gila River channel, which is required in order to construct the bridge support piers. Flows would pass under the temporary road via pipes placed within the road. Potential temporary changes during construction include increased sediment and changes in sediment patterns, alteration of stream morphology, and accelerated erosion.

Installation of piers for the Bridge would impact a small area of critical habitat for the razorback sucker. The area of critical habitat to be permanently disturbed by construction of the Bridge associated with the Permitted Activities is 1.8 acres (the area of the 100-foot-wide corridor). An additional 7.3 acres within the Action Area (500-foot-wide corridor) may be temporarily disturbed during Bridge construction. There are 517 river miles of critical habitat designated for the razorback sucker in the State of Arizona. The maximum area of potential impact to razorback sucker critical habitat is 500 linear feet or 0.095 miles. This accounts for 0.02 percent of razorback sucker critical habitat in Arizona. The permanent nature of the Bridge and its piers would impact a small portion of critical habitat for the razorback sucker. However, the Gila River flows would be maintained in their current condition, subject to change in response to storm events. The Proposed Action would not result in any permanent change in flow regime or cause any ponding or increased sedimentation.

Road and bridge construction would lead to permanent removal of about 0.08 acre of riparian vegetation. Loss of riparian vegetation may destabilize streambanks, reduce cover and nutrient input, increase water temperatures, and remove or deplete the filtering capacity of the riparian zone for sediment and pollutants. Railway construction and activity adjacent to the stream may result in minimal changes in riparian vegetation and stream channel morphology that reduces the quality and availability of razorback sucker critical habitat. In order to mitigate these minor impacts to critical habitat equipment staging and storage areas would be situated outside of the river bed. Additionally, all construction equipment would be removed from the river channel prior to the onset of storm events.

Construction of the Bridge would not compromise the functionality of the Gila River ecosystem. Therefore, adverse impacts and long-term changes to critical habitat for the razorback sucker are not anticipated.

Southwestern Willow Flycatcher: Completion of the Project activities requires vegetation clearing within an area that the Federal government has designated as critical habitat for the Southwestern willow flycatcher. The Project would result in permanent impacts to 0.08 acres and temporary impacts to an additional 0.32 acres of potentially suitable southwestern willow flycatcher habitat with no documented history of occupancy. The Upper Gila Management Unit encompasses 17,043 acres of land along 101 river miles of rivers and streams within Graham, Greenlee, and Gila Counties, Arizona. The downstream-most segment of the Upper Gila Management Unit encompasses the Safford Valley and extends for approximately 43 river miles from the upper end of the Earven Flat, above the City of Safford, through the Safford Valley to the San Carlos Apache Tribal boundary. Impacts to designated critical habitat, temporary and permanent combined, account for 0.002 percent of designated critical habitat for the southwestern willow flycatcher in the Upper Gila Management Unit.

The construction of the Project would not appreciably diminish the value of critical habitat for either the survival or recovery of the Southwestern willow flycatcher (text modified from WestLand Resources, 2007; Appendix D).

NO ACTION ALTERNATIVE

Under the No Action Alternative, there would be no construction nor operation of a rail line within the Project area. There would therefore be no impacts to vegetation and wildlife habitats, wetlands, or special status species.

4.15 SECTION 4(F) AND 6(F)

Proposed Action

Only one facility within or proximate to the Project area is a Section 4(f) resource. This facility, Dry Lake Park, is held by the City of Safford, Arizona, under a R&PP Patent. This Patent was issued to the City of Safford by the BLM under the provision that the land would serve as a primary recreation facility unless otherwise authorized by the BLM.

In a letter to SEA dated July 12, 2006, the BLM stated that it would not authorize the rail line to pass through Dry Lake Park due to the proposed rail line's incompatibility with land uses under the R&PP. As noted in Chapter 2.0 (Proposed Action and Alternatives), an alternative traversing Dry Lake Park was considered but rejected, primarily in response to the potential for conflict with the purpose of Dry Lake Park.

The rail line included in the Proposed Action does not traverse Dry Lake Park but rather is located approximately 1,500 to 2000 feet to the east of the park's eastern boundary. As a result, SEA has determined that the Proposed Action would not result in any impacts to 4(f) properties.

There are no Section 6(f) resources in the Project area nor its immediate vicinity. Therefore, SEA has determined that the Proposed Action would have no impacts to any Section 6(f) resources.

No Action Alternative

Under the No Action Alternative, rail construction would not take place; materials would be transported to and from the Mine on existing roads as described in the Mine EIS. As the proposed action analyzed in the Mine EIS did not include the construction or operation of any transportation facilities, analysis of potential impacts to Section 4(f) or Section 6(f) resources was not required.

5.0 Agency Consultation and Coordination

Agency consultation activities were undertaken with Federal, state, and local agencies to inform them about the proposed construction and operation, to identify issues of concern, and to obtain information about environmental resources within the area of the Proposed Action.

Specifically, on June 13, 2006, the Section of Environmental Analysis (SEA) sent consultation letters to Federal, state, and local agencies describing the Proposed Action, showing the proposed rail alignment, and requesting that any concerns be identified. Early consultation was to provide the agencies and officials with an opportunity to provide input at an early stage in the environmental review process, prior to preparation of the EA. Follow up with a number of these agencies continued throughout the development of the EA in 2006 and 2007.

On March 20, 2006, SEA invited FRA to be a cooperating agency because AZER indicated that it may use Federal Funds from the Railroad Rehabilitation and Improvement Financing Program (administered by FRA) to construct the rail line. On September 21, 2006, FRA accepted SEA's invitation; related correspondence is included in Appendix I.

Other agencies consulted were:

Federal Agencies

- United States Department of Agriculture (USDA)
 - US Forest Service
- United States Department of the Interior
 - Bureau of Land Management (BLM)
 - Bureau of Reclamation
 - National Park Service (NPS)
 - Office of American Indian Trust
 - United States Fish and Wildlife Service (USFWS)
- United States Geological Survey (USGS)
- United States Army Corps of Engineers (ACOE)
- United States Environmental Protection Agency (USEPA)

- United States Department of Transportation (DOT)
 - Federal Aviation Administration (FAA)

State Agencies

- Arizona Department of Water Resources (ADWR)
- Arizona Department of Agriculture
- Arizona Department of Environmental Quality (ADEQ)
- Arizona Department of Mines and Mineral Resources
- Arizona Department of Transportation (ADOT)
- Arizona Department of Game and Fish (ADGF)
- Arizona Geological Survey
- Arizona State Historic Preservation Office (SHPO)
- Arizona Corporate Commission

Local Agencies

- City of Safford, Arizona
- Graham County, Arizona

SEA conducted a site visit on July 18, 2006, which was also attended by SEA's third-party consultant and representatives of AZER.

This early notification and coordination was intended to facilitate the timely identification, evaluation, and resolution of environmental and regulatory issues during preparation of the EA. Although some of the responding agencies did not have comments or concerns about the scope of the Proposed Action, other agencies requested that specific issues be discussed in the EA. The following is a summary of specific comments received in correspondence during the consultation process.

Arizona State Parks

Efforts should be taken to survey the Project area in its entirety to identify the presence or absence of historic properties. In addition, Arizona State Parks requests that Indian tribes be consulted at a government-to-government level pursuant to 36 CFR 800.4(a)(4).

Graham County Engineer

Requested more specific information regarding the railroad crossing at Upper Solomon Road and expressed concerns about potential impacts on the floodplain. Provided information regarding County permits and approval processes.

The Bureau of Land Management

BLM would not be able to authorize a railroad on any alignment that would traverse Dry Lake Park – such an alignment would take place on land under an existing Recreation and Public Purposes (R&PP) Patent held by the City of Safford; any rail line would be inconsistent with the purpose of the Recreation and Public Purposes Act.

Arizona Department of Agriculture

Listed recommendations for minimizing adverse effects to existing vegetation.

Arizona Department of Transportation

Addressed potential environmental impacts, transportation resources that could be affected, and any permits or approvals which would be required by ADOT for the proposed alignment in the vicinity of U.S. Highway 70.

ADOT subsequently requested (in a December 2006 email to the third party contractor) that one or more public meetings should be held prior to STB's approval of the Proposed Action.

United States Department of Agriculture

Provided information on the steps necessary if a Federal Agency is going to convert any prime or unique farmland to a non-agricultural use.

City of Safford

The proposed rail alignment through Dry Lake Park would traverse an existing Recreation and Public Purposes (R&PP) Patent held by the City of Safford. A rail line through the park would be inconsistent with the purpose of the Recreation and Public Purposes Act.

Bureau of Indian Affairs Western Region

Requested to be included in all future outreach and to receive copies of any documents produced when they are made available to the public for review and commenting. Requested that the EA include correspondence and consultation efforts with affected tribes, where necessary.

State of Arizona Game and Fish Department

The Proposed Action would be located in a Designated Critical Habitat area for two special status species, the Razorback sucker and Southwestern willow flycatcher. Offered recommendations regarding the placement of track rails, ties, trestle, and culverts to avoid impacts to vegetation and other wildlife.

6.0 Mitigation Measures

This chapter presents the preliminary recommendations of the Section of Environmental Analysis (SEA) for environmental mitigation of those impacts arising from the Proposed Action as identified in Chapter 4.0, Potential Environmental Impacts.

SEA reviewed all information available to date and completed its independent analysis of the construction and operation of the proposed rail line, including all the comments and mitigation requested by various Federal, state, and local agencies, as well as other concerned parties. SEA recommends that if the Board approves the Proposed Action such approval be subject to the mitigation measures presented below.

SEA's analysis identified no adverse impacts for the following environmental topic areas:

- Community and Socio-Economics
- Environmental Justice
- Utilities/Public Services
- Visual/Aesthetics
- Noise/Vibration
- Section 4(f) and Section 6(f) Resources

6.1 SEA RECOMMENDED MITIGATION MEASURES BY ENVIRONMENTAL TOPIC

TRANSPORTATION/TRAFFIC SAFETY

1. In order to minimize delays of vehicular traffic during construction of the road crossings, AZER shall schedule the work so that construction of the roadway approaches would be completed before construction work within the roadway occurs. AZER shall also ensure that any necessary lane closures correspond with minimum off-peak traffic volumes to reduce any delays due to construction activities.
2. AZER shall consult with appropriate Federal, state, and local transportation agencies to determine the final design and other details of

the grade-crossing and associated warning devices on U.S. Highway 70 and Airport Road. Specifically,

- 2.1 Construction in the U.S. Highway 70 right-of-way may require an encroachment permit from the Arizona Department of Transportation.
- 2.2 Construction of at-grade road crossings are subject to the review and approval of the Arizona Corporation Commission.
- 2.3 Any at-grade crossing warning devices shall meet the design and operational specifications of the Arizona Department of Transportation.
3. AZER shall consider school bus schedules in planning and executing the necessary road work.
4. AZER shall make reasonable efforts to identify all utilities that are reasonably expected to be materially affected by the proposed construction within the right-of-way.
5. AZER shall raise the elevation of the proposed at-grade rail crossing over U.S. Highway 70 to be consistent with the elevation of the adjacent bridge over the San Simon River to ensure that visibility will not be a concern for drivers on the roadway.
6. AZER shall install an advanced visual warning (remote flashing signals) on U.S. Highway 70 on the downslope moving away from the bridge east of the San Simon River.
7. AZER shall ensure that all maintenance and inspections are in compliance with Federal Rail Administration standards. AZER shall also ensure that its contractor uses practices recommended by American Railway Engineering and Maintenance of Way Association for project-related construction.

LAND USE/AGRICULTURAL RESOURCES

8. AZER shall work with farmers and other property owners to remedy actual damage to property caused by project-related construction.
9. AZER shall negotiate with affected property owners to minimize severance impacts.

10. AZER shall ensure all construction debris is removed and disposed of in a proper and legal manner consistent with all Federal, state and local disposal procedures.
11. AZER shall limit construction activities and vegetation clearing to the proposed right-of-way, to the extent possible.

CULTURAL AND PALEONTOLOGICAL RESOURCES

Identified Historic Properties

Twelve historic properties have been identified through a combination of archival research and in-field survey work. No paleontological resources have been identified.

12. To avoid, minimize, or mitigate potential impacts to the previously identified historic properties, AZER shall:
 - 12.1 Develop a Treatment Plan for the Proposed Action, prior to the commencement of construction. The Treatment Plan shall:
 - Ensure that archival research and/or in-field eligibility testing is conducted, as appropriate, to complete the evaluation process for any unevaluated resources.
 - Ensure that site specific work plans are developed for each historic property subject to adverse effect. The work plans shall outline measures required to mitigate effects to the resource where feasible.
 - Ensure that the work plans are followed for archaeological data recovery, and that archaeological monitoring is conducted during construction of the Proposed Action.
 - 12.2 Incorporate any additional conditions as set forth by the SHPO under the Section 106 consultation process. To the extent any eligible resources would be adversely affected, these additional mitigation requirements shall be documented in a Memorandum of Agreement (MOA). SEA has already included several mitigation measures above and will continue to consult with SHPO throughout the NEPA process, including the Final EA any additional mitigation measures and any agreement documents such as an MOA.

Unanticipated Discoveries

13. In the event that any unanticipated archaeological sites, human remains, funerary items, or assorted artifacts are discovered during construction, AZER shall immediately cease all work and notify SEA, the SHPO, and interested Federally recognized tribes. SEA shall then consult with the SHPO, interested Federally recognized tribes, AZER, and any other consulting parties, if any, to determine if any additional mitigation measures are necessary.
14. Unanticipated discoveries shall be recorded, evaluated, and mitigated in accordance with their significance and National Register of Historic Properties eligibility.

HYDROLOGY AND WATER QUALITY

Applicable Requirements of Other Agencies

15. AZER shall obtain all Federal permits, including the Clean Water Act Section 404 permit required by the U.S. Army Corps of Engineers for project-related encroachment of jurisdictional waters of the U.S. prior to the initiation of any project-related construction.
16. Prior to project construction, AZER shall obtain an Arizona Pollutant Discharge Elimination System permit from the Arizona Department of Environmental Quality.
17. Prior to project construction, AZER shall obtain a floodplain development permit from Graham County, Arizona.

Construction Practices and Activities

18. AZER shall require its construction contractor to utilize best management practices to include:
 - 18.1 Practices to reduce erosion and sedimentation that could occur as a result of construction;
 - 18.2 Disturbance of the smallest area possible around water resources;
 - 18.3 Reseeding areas as soon as practicable to prevent erosion;
 - 18.4 Use of native species where practicable for revegetation;
 - 18.5 Development of a spill prevention plan prior to construction, including measures to be taken should a spill occur;
 - 18.6 Maintaining construction and maintenance vehicles to ensure good working order;

- 18.7 Daily inspections of all equipment for any fuel, lube oil, hydraulic, or Freon/antifreeze leaks;
 - 18.8 Practices to prevent/minimize disturbance to bottom sediments during the proposed Gila River crossing.
- 19. As part of the construction process, AZER shall repair eroded areas on the downstream side of the track bed in order to minimize the entrance of sedimentation into waterways.
 - 20. AZER shall develop and construct crossings of waterways and drainages as follows:
 - 20.1 Bridges supported on conventional spread footings shall be used where the rail line alignment crosses the Montezuma Canal, Union Canal south of the Gila River, and an unnamed aqueduct north of the Gila River.
 - 20.2 The bridge over the Gila River shall be supported on deep foundations due to potential scour erosion from the river. Deep foundations could include piles or cast-in-place drilled shafts. The depths of the foundations would be established based upon bridge loading, scour predictions, and other factors. As it is anticipated that scour erosion could extend to significant depths, AZER shall consult with an expert in scour effects in designing the plans for this crossing.
 - 20.3 Concrete box culverts shall be used for drainage crossings other than the Gila River and irrigation canals.
 - 21. AZER shall ensure that erosion control measures for culvert crossings shall remain in place until the construction process is completed and the immediate area has been stabilized with a non-erosive cover.
 - 22. For wells located within the proposed right-of-way but outside the grading limits, AZER shall cap or otherwise close the wells in accordance with state regulations.

Maintenance and Operations

- 23. AZER shall develop a bridge maintenance plan in compliance with Federal Railroad Administrations regulations.
- 24. AZER shall require that appropriate vegetation control measures are followed and that herbicides applied during right-of-way vegetation control procedures are approved by the U.S. Environmental Protection Agency for such purposes.
- 25. AZER shall ensure that the company conducting vegetation control is duly licensed.

26. AZER shall require that herbicide spraying not be undertaken on days with high winds and that on marginally windy days, an additive may be used to minimize any potential unwanted overspray.

GEOLOGY AND SOILS

27. AZER shall vegetate/reclaim disturbed areas as soon as practicable after project-related construction ends along a particular stretch of rail line. The goal of the reclamation shall be the permanent (re)establishment of native ground cover on disturbed areas.
28. AZER shall conduct a preconstruction survey of the area to identify areas that have a history of landslides. Project plans shall be revised to incorporate features in appropriate locations to reduce the potential for landslides to impede operations at various points of the rail line.
29. AZER shall ensure that for the duration of trenching activities, all excavations are safely sloped and/or include an adequately constructed and braced shoring system, in compliance with Occupational Safety and Health Administration (OSHA) regulations for employees working in an excavation that may expose employees to the danger of moving ground. If material is stored or equipment is operated near an excavation, stronger shoring shall be used to resist the extra pressure due to superimposed loads.
30. Prior to construction, AZER shall consult with utility companies in the Project area to determine the location of any surface or subsurface utilities existing in the Project area. AZER shall then document (with photographs, video, official documentation, etc.) the pre-construction condition of all such utilities that may be impacted by construction of the proposed rail line.

HAZARDOUS MATERIALS

31. Prior to initiating any project-related construction activities, AZER shall develop a spill prevention plan for hazardous materials for the construction and operation of the rail line. At a minimum, the spill prevention plan shall address the following:
 - 31.1 Definition of what constitutes a reportable spill;
 - 31.2 Requirements and procedures for reporting spills to appropriate government agencies;
 - 31.3 Methods for containing, recovering, and cleaning up spilled material;
 - 31.4 Equipment available to respond to spills and location of such equipment;

- 31.5 Training of personnel and training records;
 - 31.6 List of government agencies and AZER personnel to be contacted in the event of a spill.
32. AZER shall ensure that operational period safety measures shall include those set forth in current Hazardous Materials Regulations applicable to the safe and secure rail transportation of hazardous materials. AZER shall manage hazardous materials in accordance with handling instructions included in applicable Material Safety Data Sheets.
33. In the event that construction activities would encroach upon abandoned fire/trash pits, abandoned septic tanks, abandoned wells, and/or areas where bullets are found at or near the top of the ground surface, AZER shall provide appropriate corrective action. Corrective actions for these matters shall include abandoning wells in accordance with Arizona Department of Water Resources guidance, removal and landfilling of trash from trash pits (and backfilling as appropriate), and abandoning septic systems in accordance with County or other applicable regulations.

AIR QUALITY

34. AZER shall implement standard construction mitigation measures (best management practices) to reduce fugitive dust emissions during construction. These mitigation strategies include watering all active construction areas (including unpaved access roads and parking and storage areas) at least twice daily; covering all trucks hauling soil, sand, and other loose materials; and applying soil binders on unpaved roads and employee/ equipment parking areas.

BIOLOGICAL RESOURCES

35. AZER shall comply with all measures required by the U.S. Fish and Wildlife Service during the Section 7 consultation process of the the Endangered Species Act.
36. AZER shall coordinate with the U.S. Army Corps of Engineers regarding possible Section 404 of the Clean Water Act permitting requirements.
37. Per Mitigation 18 above, AZER shall implement General Best Management Practices to avoid or minimize impacts to jurisdictional wetlands and waterways.
38. In order to mitigate impacts to designated critical habitat, AZER shall ensure equipment staging and storage areas are situated outside of the river bed. Additionally, all construction equipment shall be removed from the river channel prior to onset of storm events.
39. AZER shall notify the Arizona Department of Agriculture 20 to 60 days prior to plant destruction to allow for the opportunity to salvage native vegetation. The Arizona Native Plant Law prevents the sale and transport of native vegetation without first obtaining a permit from Arizona Department of Agriculture. Those salvaging the plants shall obtain the necessary salvage permit.

7.0 Report Preparation and References

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