

2.0 PROPOSED ACTION AND ALTERNATIVES

The Section of Environmental Analysis (SEA) received numerous comments in response to the Draft Environmental Impact Statement (DEIS) requesting that the scope of the proposed action be expanded to include the construction and operation of Vulcan Construction Materials, LP's (VCM's) quarry.

Those commenting on the DEIS also suggested that alternatives other than those examined in depth in the DEIS (Proposed Route, Alternative 1, Alternative 2, Alternative 3, and the No-Action Alternative) be assessed in the environmental review process, particularly a rail route that used portions of the old Medina Dam route, which SEA had excluded from detailed consideration in the DEIS. In response to these comments and additional information submitted by Southwest Gulf Railroad Company (SGR), SEA issued a Supplemental Draft Environmental Impact Statement (SDEIS) on December 8, 2006. The SDEIS described SEA's in-depth analysis of three additional rail routes (the Eastern Bypass Route, the Medina County Environmental Action Association (MCEAA) Medina Dam Alternative, and SGR's Modified Medina Dam Route, known collectively as the Eastern Alternatives), one of which used portions of the old Medina Dam route.

Commenters also stated that SEA had improperly based the No-Action Alternative analysis on truck transport of limestone aggregate from VCM's quarry to the Union Pacific Railroad Company (UP) rail line. Commenters believe that SGR has no intentions of constructing the quarry without the rail line because one is dependent on the other. They argue that the No-Action Alternative should instead be no change to existing conditions rather than the trucking option.

In order to address these comments, SEA is providing an expanded discussion of the proposed action and alternatives in this chapter. Section 2.1 provides a summary of the proposed action, including a description of changes that have occurred since the DEIS was published. In Section 2.2, SEA presents the rationale for not including the quarry as part of the proposed action.

Section 2.3 explains SEA's rationale for the No-Action Alternative. Section 2.4 summarizes all of the alternatives that have been considered. Section 2.5 presents the environmental analysis of a modification of one of the rail line alternatives. Finally, Section 2.6 provides SEA's comparison of all the alternatives considered in this proceeding, and Section 2.7 identifies the environmentally preferable alternative(s) and explains why SEA recommends them to the Surface Transportation Board (Board).

2.1 Proposed Action

The overall description of the proposed action remains unchanged from the information presented in Chapter 2 of the DEIS, with the exception of SGR's support of the Proposed Route. SGR has stated in writing (see #EI-2712 and #EI-3040) that it no longer seeks approval for the original preferred alignment (Proposed Route) through Quihi and does not oppose SEA's recommendation in the SDEIS to designate both the Eastern Bypass Route and the MCEAA Medina Dam Alternative as environmentally preferable routes. Of these two alternatives, SGR favors the Eastern Bypass Route. Subsequently, SGR has advised SEA that it does not oppose the Weiblen Modification to the Eastern Bypass Route (designated as the Modified Eastern Bypass Route in this Final Environmental Impact Statement (FEIS)), which SEA also recommends as environmentally preferable. SGR changed its decision on preferred routes based on potential concerns related to potential effects of the Proposed Route and the alternatives studied in the DEIS on the Quihi Area. Chapter 4 of the FEIS provides a full explanation of SGR's decision, which is set forth in the January 29, 2007 and August 3, 2007 letters from SGR's legal counsel, David H. Coburn, and included as #EI-2712 and #EI-3040 in Appendix C of this FEIS.

In addition, in response to concerns raised during the SDEIS process, the FEIS now presents information on a modification to the Eastern Bypass Route, referred to as the Modified Eastern Bypass Route. This modification was identified in an effort to mitigate potential impacts to the property owned by the Weiblens and to avoid the Castroville West Subdivision. See Section 2.4 of this chapter of the FEIS.

2.2 The quarry is not properly viewed as part of the proposed action

Throughout the environmental review process, commenters have asserted that VCM's proposed quarry and SGR's proposed rail line are connected actions that should be studied together as one comprehensive proposal. In Section 1.5 of the DEIS, SEA explained in detail that the proposed action is, for the purposes of SEA's environmental review, SGR's proposed rail line construction and operation, and does not include VCM's quarry. At the same time, however, SEA noted that, because the development and operation of the quarry has the potential to affect some of the same resources as the proposed rail line at about the same time as the rail line construction and operation, the quarry should be (and was) assessed as part of SEA's cumulative impacts analysis.

After reviewing the comments to the DEIS on the quarry and after conducting additional analysis on this topic, SEA continues to believe that the proposed action for the purposes of SEA's environmental review here is SGR's proposed rail line construction and operation, and that VCM's quarry should be included only as part of the analysis of cumulative effects. Below, SEA provides an in-depth discussion of why this is so. Due to the legal content of the comments received on this issue, the following discussion is more technical and contains more legal citations than are generally included in an Environmental Impact Statement (EIS), but SEA believes that this approach is necessary to appropriately respond to the comments received.

SEA is not considering VCM's quarry as part of the proposed action for the following reasons:

- VCM has sought only Board authority to construct and operate the proposed rail line. Therefore, including the quarry as part of the proposed action would not inform the Board's decision on SGR's petition to construct and operate the rail line;
- The Board has no jurisdiction or control over VCM's quarry;
- The Board has no authority to mitigate potential harms from the quarry;
- SEA's analysis of cumulative impacts contains an appropriate assessment of the impacts from the quarry that are relevant to the Board's decision-making;
- Board and judicial precedent support SEA's conclusion that the quarry should not be viewed as part of the proposed action; and
- Commenters' arguments for including the quarry as part of the proposed action are not supported by the facts or the relevant case law.

SEA discusses each of the above reasons in turn in the subsections that follow.

2.2.1 VCM has sought only Board authority to construct and operate the proposed rail line. Therefore, including the quarry as part of the proposed action would not inform the Board's decision on SGR's petition to construct and operate the rail line

The purpose of SEA's environmental review process is to ensure the Board's compliance with the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. 4321 et seq. and related environmental laws and regulations, as specified in the Board's rules at 49 Code of Federal Regulations (CFR) Part 1105. The purpose of NEPA is to focus the attention of the government and the public on the likely environmental consequences of a proposed agency action before it is implemented in order to minimize or avoid potential negative environmental impacts. See Marsh v. Oregon Natural Resources Council, 490 U.S. 360, 371 (1989). NEPA's EIS requirement has two purposes: "First, 'it ensures that

the agency, in reaching its decision, will have available, and will carefully consider, detailed information concerning significant environmental impacts.’ . . . Second, it ‘guarantees that the relevant information will be made available to the larger audience that may also play a role in both the decision making process and the implementation of that decision.’” Department of Transp. v. Public Citizen, 541 U.S. 752, 768 (2004) (Public Citizen)(quoting Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 349 (1989)). Thus, information that does not inform the agency’s decision need not be included in an EIS. “NEPA documents must concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail. Ultimately, of course, it is not better documents but better decisions that count. NEPA’s purpose is not to generate paperwork – even excellent paperwork – but to foster excellent action.” 40 CFR 1500.1 (b)-(c).

The Board has jurisdiction over rail transportation by rail carriers. 49 U.S.C. 10501. In the case at hand, SGR has petitioned the Board, under 49 U. S. C. 10502, for authority to construct and operate a rail line in Medina County, Texas. After completion of the environmental review process, the Board will decide whether to approve, deny, or approve with conditions SGR’s rail construction project. Thus, the EIS must include information that the Board needs to issue an informed decision on SGR’s proposal to construct and operate the proposed rail line. The quarry, however, is not part of the proposed action before the Board and has been subject to the approval process of other laws, not the Interstate Commerce Act.

If SEA were to expand the proposed action to include the quarry, the proposed action would essentially become a quarry project with transportation in general, and SGR’s rail line in particular, as components of that quarry project. See, e.g., U.S. Nuclear Regulatory Commission, Office of Nuclear Material Safety and Safeguards, Docket No. 72-22, Private Fuel Storage, L.L.C., Draft Environmental Impact Statement for the Construction and Operation of an Independent Spent Fuel Storage Installation on the Reservation of the Skull Valley Band of Goshute Indians and the Related Transportation Facility in Tooele County, Utah, June 2000 (assessing the construction and operation of a proposed private fuel storage facility and a new rail line). SEA would then need to assess alternatives to the quarry, as suggested by commenters, since the Council on Environmental Quality’s (CEQ) regulations for implementing NEPA at 40 CFR 1502.14 require examination of alternatives to the proposed action. Because SGR has indicated that the purpose and need for the quarry is to meet the limestone demand of the Houston and the southeast regions of Texas in an efficient manner, alternatives to the quarry could potentially include the development and operation of a quarry or quarries in other regions of Texas, other states in the United States, or even in other countries. These alternatives to the quarry would each have transportation components, which might or might not include rail. SEA then would need to assess the impacts of each of these quarry alternatives in comparative form, as specified at 40 CFR 1502.14, and identify an environmentally preferable alternative. But this analysis of quarry alternatives would not inform the Board’s decision on SGR’s proposal to construct and operate the rail line in Medina County, Texas.

For example, should SEA determine – hypothetically speaking – that the environmentally preferable quarry alternative would be to open a limestone quarry in Mexico and move the material by barge to the Houston and southeast regions of Texas, this would not be relevant to the Board’s decision because the Board has no authority to instruct VCM where to open quarries. Indeed, the Board has no authority over VCM at all in this proceeding. Rather, the Board’s authority is limited to determining whether to approve, deny, or approve with conditions SGR’s petition to construct and operate a rail line in Medina County, Texas, from VCM’s quarry to the UP rail line.

Even if there were no other alternative locations for the quarry and SEA’s environmental analysis could be limited to assessment of VCM’s proposed quarry in Medina County, Texas (as either rail or truck-served, or a No-Action Alternative consisting of no quarry, no rail line and no trucks), an analysis

of the quarry as part of the proposed action would be beyond the Board's jurisdiction and would not inform the Board's decision on whether to authorize SGR's proposal to construct and operate the proposed rail line.

SGR has repeatedly asserted that if the rail line is not built, VCM would operate the quarry entirely by trucks. While MCEAA and other commenters have questioned SGR's statements on this matter, the record indicates that VCM could and would operate the quarry by truck if the rail line is not built. Indeed, as discussed in Section 2.4 of the DEIS and Section 2.3 of this FEIS, truck transport of aggregate material is common at limestone quarries, and VCM's plans for truck transport of the aggregate from the quarry to the UP line appear to be feasible. Moreover, SGR has provided information indicating that VCM's quarry is moving forward and could potentially open before the Board's final decision on SGR's rail line construction proceeding (see Appendix D).

Thus, based on the information available, it appears that VCM's quarry would proceed and is proceeding regardless of the Board's decision on the applicant's rail construction proposal. For that reason, and because the Board has no authority over VCM or the development and operation of VCM's quarry, the quarry is not part of the proposed action in this case.

2.2.2 The Board has no authority or control over VCM's quarry

According to court decisions, the degree of legal or factual control over an action or project asserted by an agency is an important factor in determining whether to consider that action in the environmental review process. The courts here have stated that an agency exercises control over a project when: "(1) it exercises discretion over the project; (2) has given any direct financial aid to the project; and (3) the overall Federal involvement with the project is sufficient to turn essentially private action into Federal action." See Citizens Against Rails-to-Trails v. STB, 267 F.3d 1144 (D.C. Cir, 2001); Goos v. ICC, 911 F.2d 1283 (8th Cir. 1990); and NAACP v. Medical Center, Inc., 584 F.2d 619, 629 (3d Cir. 1978).

Applying these standards here, it is clear that the Board lacks sufficient control over VCM's quarry to make the quarry part of the proposed action. The only action before the Board – construction and operation of SGR's rail line – is not a condition precedent to VCM's opening of the new quarry, and the rail line and quarry projects are not two phases of a single action. The Board has given no financial aid to the quarry and lacks authority over VCM. Moreover, based on the record here, the quarry could proceed, and is proceeding, regardless of the Board's decision on the rail line construction and operation. Thus, the quarry and rail line projects are separate, independent projects.

2.2.3 The Board has no authority to mitigate potential harms from the quarry

As discussed in Chapter 5 of the DEIS, the Board can only impose conditions that are consistent with its statutory authority over rail transportation by rail carrier under the Interstate Commerce Act. Accordingly, any conditions the Board imposes must relate directly to the transaction before it, must be reasonable, and must be supported by the record before the Board. In this proceeding, the Board's power to impose mitigation extends only to the railroad applicant, SGR, and to potential impacts that could be caused by SGR's proposed rail line construction and operation. The Board does not have authority to regulate VCM or VCM's quarry, and thus could not impose mitigation to reduce potential harms from the quarry construction and operation. Therefore, an environmental analysis of the potential impacts of the quarry is not properly part of the EIS in this rail construction case. See Public Citizen, 541 U.S. at 769.

2.2.4 SEA's analysis of cumulative impacts contains an appropriate assessment of the impacts from the quarry

NEPA requires that agencies consider direct, indirect, and cumulative impacts in their environmental documents (CEQ 1997, 40 CFR 1508.7, 1508.8, and 1508.25). The cumulative impacts analysis provides information to the decision maker about the potential incremental effects of its actions. In other words, the analysis allows the decision maker to see how much the proposed action before its agency would contribute to the cumulative impacts on a particular resource. Cumulative impacts result when the impacts of different actions combine to cause greater impacts on a particular resource than the impacts that would be caused solely by the proposal before the agency. When an ecosystem or resource has been affected by one action and another action then affects that same ecosystem or resource before it has fully recovered from the effects of the first action, the ecosystem experiences a cumulative impact. See Considering Cumulative Effects under the National Environmental Policy Act, p. 7 (CEQ 1997). The analysis of cumulative impacts focuses on effects to specific resources. Thus, two actions that have different types of impacts, such as the construction and operation of a rail line and the development and operation of a quarry, but affect one or more of the same resources, need to be considered together in a cumulative impacts assessment. See Considering Cumulative Effects under the National Environmental Policy Act, p. 8 Table 1-2. (CEQ 1997). For example, construction and operation of SGR's rail line, and development and operation of VCM's quarry would each produce certain air emissions that could impact air quality in the project area. Thus, SEA has assessed the combined air quality impacts of the quarry and rail line in the cumulative impacts analysis. See Section 4.17.5 of the DEIS and Chapter 3 of this FEIS.

SEA's cumulative impacts analysis for SGR's rail construction proposal is set forth in Section 4.17 of the DEIS and Chapter 3 of this FEIS. The cumulative impacts assessment sets forth detailed information regarding the combined environmental impacts of the quarry and the rail line. NEPA requires no more.

2.2.5 Board and judicial precedent indicate that the quarry need not be considered as part of the proposed action

As discussed in Section 1.5 of the DEIS, information that does not inform the agency's decision need not be included in an EIS. Moreover, courts defer to agency determinations on what the appropriate scope of the environmental review should be in particular cases. See Sylvester v. U.S. Army Corps of Engineers, 884 F.2d 394, 399 (9th Cir. 1989). The Board's environmental regulations do not set forth a specific test for determining whether and how to consider particular related actions in the environmental review process. SEA has addressed this issue in past proceedings primarily by employing a "but for" test. See Riverview Trenton Railroad Company – Petition for an Exemption from 49 U.S.C. 10901 to Acquire and Operate a Rail Line in Wayne County, Michigan, STB Finance Docket No. 34040 (Environmental Assessment (EA), served October 15, 2001). Under the "but for" test, the agency includes as part of its analysis sections that would not occur "but for" the action that requires the agency's approval. However, the Supreme Court's decision in Public Citizen clarifies that under NEPA a "but for" causal relationship is not enough to make an agency responsible for a particular effect under NEPA and the relevant regulations. See Public Citizen - National Committee for the New River v. FERC, 373 F.3d 1373 (D.C. Cir 2004) (rejecting argument that "but for" test requires EIS on a proposed pipeline extension to consider the impacts of two non-jurisdictional generating plants). Rather, NEPA requires analysis of an effect only where there is a reasonably close causal relationship between the environmental effect and the alleged cause, analogous to the doctrine of proximate cause from tort law. See Public Citizen, 541 U.S. at 767 (citing Metropolitan Edison Co. v. People Against Nuclear Energy, 460 U.S. 766, 774 (1983)).

Furthermore, the Supreme Court now has ruled that agencies may reasonably limit their analysis to issues within the agency's own decision-making process. See Public Citizen, 541 U.S. at 768. The Court held that where an agency has no ability to prevent a certain effect due to its limited statutory authority over the relevant actions, the agency cannot be considered a legally relevant "cause" of the

effect, and such effects need not be studied in the agency's environmental review document. See Public Citizen, 541 U.S. at 770.

As set forth in Section 1.5 of the DEIS, based on Public Citizen and other relevant precedent, SEA believes that, apart from analysis as a cumulative or indirect effect, the effects of related actions need only be considered in the environmental review process if:

1. The action for which agency approval is sought can reasonably be said to cause the related action(s); and
2. The agency has the authority to prevent the related actions (and thus any effects caused by the related actions) from taking place.

As discussed above, and in Section 1.5.2 of the DEIS, SEA does not believe that the construction and operation of VCM's quarry meets this two-part test. Thus, VCM's quarry is not part of the proposed action for this proceeding.

2.2.6 Commenters' arguments for including the quarry as part of the proposed action are not supported by the relevant case law

Below, SEA has summarized the primary arguments raised in the comment letters for considering the quarry as part of the proposed action and has provided a response to each of these arguments.

Argument 1: The rail line lacks independent utility because it would not be built without the quarry. Thus, according to the CEQ's regulation regarding connected actions at 40 CFR 1508.25(a)(1)(iii), the quarry and rail line should be considered as a single action and should be studied as such.

SEA's Response: According to SGR, the proposed rail line and the quarry each have independent utility because, if the rail line were not built, VCM would transport the limestone by truck from the quarry to the UP rail line. SGR has submitted information that the quarry is moving forward and could potentially open prior to the Board's final decision on SGR's rail line construction proceeding (see Appendix D). Thus, the quarry could exist without the rail line though it would benefit from the rail line's presence. See Sylvester v. U.S. Army Corps of Engineers, 884 F.2d 394 at 400 (9th Cir. 1989). Where the agency does not have jurisdiction over another project and the other project could proceed without the agency's approval of the project over which it does have jurisdiction, it is appropriate to limit the Scope of the EIS to the project over which the agency does have jurisdiction. See Native Ecosystem Council v. Dombeck, 304 F.3d 886, 894-95 (9th Cir. 2002); Wetlands Action Network v. U.S. Army Corps of Engineers, 222 F.3d 1105, 1117 (9th Cir. 2000); and Highway Citizens Group v. Mineta, 349 F.3d 938, 962-63 (7th Cir. 2003).

Argument 2: A multi-factor test implemented by several agencies to determine whether actions are sufficiently related to be considered together in an EA is not applicable to situations where EISs are being prepared. The CEQ connected action regulation controls the scope of EISs.

SEA's Response: Those projects are not connected actions according to the meaning of the CEQ regulation at 40 CFR 1508F.25(a)(1), because the proposed rail line construction project will not automatically trigger construction of the quarry (or vice versa); the quarry is not dependent on the rail line project taking place; and the quarry and the proposed rail line are not interdependent parts of some larger action. The multi-factor test used by agencies including the U.S. Army Corps of Engineers (Corps) to determine whether actions are sufficiently related to be considered together in a NEPA document is not binding on the Board and in any event, is applicable to both EAs and EISs. The Corps regulations at 33

CFR Part 325, Appendix B, §7b specifically indicates that the multi-factor test applies to all NEPA documents (EAs and EISs).

2.3 No-Action Alternative

In the DEIS, SEA stated that, according to SGR, if the proposed rail line were not built, the limestone produced by the proposed quarry would be transported by truck from the quarry to the UP rail line. Thus, SEA viewed the use of truck transport as the No-Action Alternative in this case.

A number of commenters to the DEIS maintain that the use of trucks to transport the limestone from VCM's quarry to the UP rail line would not be feasible. They state that SGR and VCM are proposing this alternative to the rail transportation of the limestone as a ruse to demonstrate that rail transportation would be better for the environment and to avoid having SEA include the quarry as a connected action in the EIS. They allege that the roadway infrastructure of the area would not allow for the level of truck traffic needed to support proposed quarry operations and that flooding of area roadways would impede the truck transportation of the aggregate. Thus, they state that the No-Action Alternative for the environmental review process here should be no quarry, no rail line, and no trucks.

The commenters also allege that it is likely that VCM has concluded that trucking the limestone to the UP rail line is not economically feasible and argue that VCM would have to pass the costs of needed roadway upgrades onto local taxpayers. They believe that more detailed cost figures for the trucking alternative, as well as any costs that the community could be expected to suffer from roadway upgrading or maintenance, should be provided to permit a full economic analysis.

In the DEIS, SEA detailed why it believed that the use of truck transportation to haul limestone from the quarry to the UP rail line would be feasible. In order to respond to the comments received on this issue, SEA requested and received additional information from SGR regarding the trucking alternative. SEA also conducted additional research and analysis of the feasibility of this alternative, as detailed below.

Description of Trucking Operations

As stated in the DEIS (Volume I, pages 2-14 through 2-18), according to SGR, the truck transport of limestone from the quarry to the UP rail line would take place in the following manner:

Loading Operations: Trucks would be loaded at the quarry site by driving under multiple large elevated storage bins and, by the use of computer controls and hydraulic rams, a pre-measured quantity of aggregate would be dropped into the trailer bed of each truck. See Letter from SGR, #EI-793, DEIS, Appendix G, Page G-154.

Transport: Upon exiting the quarry, the trucks would travel about 2.5 miles on either County Road 351 or County Road 353, to Farm-to-Market Road (FM) 2676. The trucks would then proceed south on FM 2676 for about 3.5 miles and then east on County Road 4516 for about 3 miles to the point where a 100-acre truck-to-rail remote loading facility would be located. An alternative routing could involve traveling 2.4 miles southbound on County Road 353; 1.5 miles on a new, privately-owned road that would be constructed on property VCM currently owns connecting County Road 353 with County Road 365; about 1.25 miles south on County Road 365 to County Road 4516, and then east on County Road 4516 for about 1.3 miles to a private road that would lead to the loading facility. See Letter from SGR, #EI-793, DEIS, Appendix G, Page G-155.

Unloading Operations: At the remote truck-to-rail loading facility, the loaded trucks would drive in and stop over a subterranean hopper where the bottom of the trailer would open, and the aggregate would instantly drop down into the hopper. The aggregate would then be conveyed from the

hopper into waiting rail cars. Some of the aggregate trucked to the remote truck-to-rail loading facility would be stockpiled and manually loaded into rail cars using wheeled loaders. See Letter from SGR, #EI-793, DEIS, Appendix G, Page G-154. SGR estimates that it would take approximately six months to construct the remote truck-to-rail loading facility, and approximately 15 to 20 workers would be needed. See Letter from SGR, #EI-1664, DEIS, Appendix G.

Specifics of Operations: SGR projects that maximum quarry output for the reasonably foreseeable future would be about 5 million tons of limestone aggregate per year. Assuming a 250 workday year, and based on information provided by SGR, SEA estimates that approximately 850 loaded trucks per day would be required to transport the limestone. (SGR initially provided information stating that each truck would carry a maximum of 23 tons of aggregate per trip, but then provided information stating that use of the automated loading system could increase each truckload to an average of 24.5 tons.) Assuming an empty backhaul, approximately 1,700 single truck trips per day would be required. According to SGR, VCM would use a fleet of about 24 dedicated trucks to make multiple round trips per day. See Letter from SGR, #EI-793, DEIS, Appendix G, Page G-156-57. SGR stated that VCM has not made a final decision regarding the specific hours these trucks would operate, and indicated that no decision would be made until further study and consultation with appropriate officials. SGR stated that it is not unlikely that trucks would operate throughout the day, with the exception of between 2 pm and 6 pm, but that VCM would be unable to commit to specific hours of trucking operations at this time. See Letter from SGR, #EI-825, DEIS, Appendix G, Page G-177.

Feasibility of Trucking Aggregate

Truck transportation of aggregate is more common than rail transportation. Rail transportation of aggregate may sometimes be more economical than truck transportation, however, depending on the distance that the aggregate must be transported and the amount of aggregate mined per year. See “Quarryology 101: Lesson 1: Part 2,” Pit & Quarry, May 2, 2002, <<http://www.pitandquarry.com/pitandquarry/article/articleDetail.jsp?id=17957>>. As is clear from the record, VCM would prefer to use rail to transport the limestone from its proposed quarry to the UP rail line. SGR has stated that the primary purpose of its rail line is to transport the limestone in a more efficient manner than would be possible through truck transportation. See Letter from SGR, #EI-28, DEIS, Appendix G, Pages G-16-17. However, that does not mean that truck transportation of this volume of aggregate to the UP rail line would not be feasible.

For example, in Alamo North Texas Railroad Corporation – Construction and Operation Exemption – Wise County, TX, STB Finance Docket No. 34002 (STB served April 12, 2002), a proceeding involving a new rail line construction and operation, the project proponent provided information that 4 million tons per year of limestone aggregate were being transported by truck and that, if the proposed rail line were not built, expanded quarry operations would use trucks to transport 6 million tons of limestone per year. The Canyon Rock Quarry Expansion Project in Northern California proposed to increase production from 375,000 cubic yards (843,750 tons) of aggregate to 500,000 cubic yards (1,125,000 tons) of aggregate per year, all of which would move by truck. See Permit Resource Management Department, Sonoma County, California, Canyon Rock Quarry Expansion Project Draft Environmental Impact Report, Chapter IV, Section IV.A (May 7, 2004) <<http://www.sonoma-county.org/prmd/docs/eir/CanyonRockDEIR/index.htm>>.

Feasibility of Loading and Unloading Operations

SEA has researched the operations of truck-served quarries, and it appears that the type of loading and unloading operations proposed by VCM are not unusual. The VCM trucking operation proposes about 850 loaded trucks a day, each carrying an average of 24.5 tons of limestone. At the Sterling Materials quarry in northern Kentucky, conveyors are designed to transfer stone to trucks at the rate of 20 tons per minute. “Truckers position their beds under the end of the appropriate conveyor, pull a

green cord to start the conveyor, and pull a red cord to stop it. A concave mirror above the station allows truck drivers to evenly distribute stone in the bed and to determine when it is full. Drivers never get out of their trucks.” See Bob Drake, Hidden Resources, Rock Products (Primedia Business Magazines & Media Inc. 2005) <http://rockproducts.com/mag/rock_hidden_resources/>. Hanson Aggregates’ new Perch Hill quarry in Bridgeport, Texas, also plans to use high capacity truck shipping that would allow trucks to be automatically loaded. See The Quest for High Utilization: High Utilization at Perch Hill (Robers & Shaefer Company 2005) <<http://www.r-s.com/projects/OH20R6.htm>>.

As for the unloading operations proposed by VCM at the remote truck-to-rail loading facility, stockpiling large amounts of aggregates at quarry sites by using trucks is not uncommon. A “haul truck operator can stockpile about 5,500 tons of stone at night.” See Bob Drake, Hidden Resources, Rock Products (Primedia Business Magazines & Media Inc. 2005) <http://rockproducts.com/mag/rock_hidden_resources/>. Moreover, it appears that at least one company has developed specialized technology for high volume rail loading and unloading operations, including the loading of rail cars from dump trucks. See TransloadXpress Rail Unloading, Graniterock <<http://www.graniterock.com/transloadxpressrailunloading.html>>.

Feasibility of Roadway Use and/or Upgrades

In the DEIS (Volume I, page 2-15), SEA concluded that roadway upgrades would be needed to support the volume of truck traffic that would be required to transport the limestone from the quarry to the UP rail line if SGR’s proposed rail line were not built. SGR has stated that it would work with state and county officials to upgrade and improve the area roadways, and that roadway upgrades would be needed even if the rail line were built in order to accommodate the truck traffic needed to transport aggregate to local customers. See Letters from SGR, #EI-766, DEIS, Appendix G, page G-145, #EI-793, DEIS, Appendix G, pages G-155-156, and #EI-1439, SDEIS, Appendix B-1, page 4.

SGR states that if the rail line is not built, VCM’s primary plan would be to use existing public roadways to transport the aggregate by truck to the UP rail line. According to VCM, a private road would be constructed only if public roads could not be used. SGR states that VCM has not studied the precise roadway upgrades that would be needed for the public roadways in depth, but if it becomes necessary to address the upgrades in specific detail, VCM would work with state and county officials to discuss the upgrades that would be required. See Letter from SGR, #EI-1439, SDEIS, Appendix B-1, page 4.

SGR has provided information and a diagram about the private road that might be constructed, if necessary. According to SGR, the private road would be approximately 1.5 to 1.75 miles long, and would link County Road 353 to County Road 365, and intersect with FM 2676. SGR states that VCM estimates that this road could be built in about 7 weeks by an approximately 15-person crew. The private road would be a two-lane road, one lane in each direction. Each travel lane would be 12 feet wide, with 8-foot-wide shoulders on each side. SGR states that VCM does not believe that the private road would cross any major drainage features, and VCM would consult with the Corps and the Medina County Floodplain Administrator regarding any floodplain crossings. According to SGR, VCM would schedule routine maintenance of this roadway to fix small potholes and cracks on an ongoing basis. A resurfacing (chip and seal) would likely be necessary every three to five years, and a surface overlay would likely be necessary every eight to nine years, depending on the impact of weather conditions on the roadway. See Letter from SGR, #EI-1439, SDEIS, Appendix B-1, page 4.

SGR states that VCM would need to coordinate with the Texas Department of Transportation (TxDOT) regarding the intersection between FM 2676 and the private road. TxDOT has a permitting process that governs the construction of such access connections, which is available in the TxDOT manual titled “Regulations for Access Driveways to State Highways,” available at <http://www.dot.state.tx.us/mnt/default.htm>. See Letter from SGR, #EI-1439, SDEIS, Appendix B-1,

page 4. According to SGR, VCM believes that it would need to coordinate with county officials regarding the intersection between the private road and County Road 365. VCM is unaware of other permits that might be required to construct the private roadway.

SGR states that another private road could be constructed to connect to the remote truck-to-rail loading facility near the UP rail line at a point directly accessible to County Road 4516, if the facility were not built. According to SGR, the same roadway and maintenance standards described for the other private road would apply, but this private road would be shorter. Thus, the construction estimates for this road would be commensurately lower in terms of manpower and length of construction time than the estimates set forth above. According to SGR, because the exact location of the remote truck-to-rail loading facility has not been determined, more precise information about this other possible private road cannot be offered. See Letter from SGR, #EI-1439, SDEIS, Appendix B-1, page 4.

SEA conducted additional research regarding the type of roadway improvements that would be needed to support VCM's truck traffic if the rail line were not built. According to engineering experience gained from other projects, the roadways would typically need to be composed of a pavement structure consisting of 6 inches of lime-treated subgrade, 12 inches of cement-stabilized base material, and 3 inches of hot mixed asphalt pavement covering to support the proposed volume of truck traffic. A geotechnical investigation and pavement design would need to be performed to determine the actual pavement structure that would be required. For safety and maintenance reasons, the proposed truck traffic would also require 12-foot-wide travel lanes, and two-foot-wide paved shoulders, though these shoulders may actually be wider, as described by SGR above. See American Association of State Highway and Transportation Officials (AASHTO), A Policy on Geometric Design of Highways and Streets, 2001 and Texas Department of Transportation, Roadway Design Manual, February 2004. Generally, all counties in Texas upgrade their roadways in accordance with AASHTO and or TxDOT design criteria.

Roads within the proposed project area could be affected by flooding due to their proximity to the Federal Emergency Management Agency (FEMA) designated floodplain, their current roadway elevations, and the current capacity of the roadway hydraulic structures. Roads within the floodplain would have a higher frequency of flooding than roads located outside of the floodplain. Roadways are typically designed to handle certain flood frequencies and flood levels according to their type or roadway classification. Freeways and minor arterial and collector roads are designed for different storm frequencies than urban and rural roads (TxDOT, Hydraulic Design Manual, March 2004). If improvements were made to county roads and TxDOT Farm-to-Market roads located in the floodplain to support VCM's trucking operations, the installation or upgrading of the roadway hydraulic structures and approach roadways might be necessary. Generally, the County Floodplain Manager would be in charge of the FEMA requirements for the region.

Based on its engineering and public works experience from other projects, SEA believes that these upgraded roadways would successfully support truck transport from the quarry to the UP rail line, without any major maintenance costs, for up to 10 to 15 years.

Economic Feasibility

As stated in the Final Scope of Study for the EIS, SEA does not believe that a detailed cost-benefit analysis of rail versus truck transport would be appropriate or necessary here. The CEQ regulations state that in an EIS "the weighing of the merits and drawbacks of the various alternatives need not be displayed in a monetary cost-benefit analysis and should not be when there are important qualitative considerations." See 40 CFR 1502.23. As discussed in Sections 2.4 and 2.6 of the DEIS and Chapter 6 of the SDEIS, there are important qualitative considerations between rail transport and truck transport of the limestone, including the need to construct a 100-acre remote truck-to-rail loading facility for the truck transport that would not be needed for the rail transport. There are also differences in terms

of the potential environmental impacts that could be caused by rail transport and truck transport, primarily traffic safety, and impacts to air quality and groundwater and surface water resources.

It is also clear from the record that neither VCM nor SGR has developed final engineering plans for any of the rail alternatives being studied by SEA, and thus, any cost comparisons would be highly speculative. Moreover, this is not a case where it has been alleged that VCM and SGR lack the financial resources to implement this project, be it by rail or by truck.

Conclusion

In short, based on all the information available to date, SEA believes that truck transport of the limestone from VCM's quarry to the UP rail line would be feasible, and SGR has stated that VCM would pursue this option if the rail line were not built.

There is nothing in the record to indicate that SGR is making false and misleading statements or that VCM would not transport the aggregate by truck if the rail line were not built. (Indeed, in response to the concerns about truck transportation raised by certain commenters, SEA specifically questioned VCM's plans for the trucking alternative and requested SGR to provide detailed information regarding the use of trucks, which it did. See DEIS, Appendix G, pages G-123-25 and G-153-162; and SDEIS, Appendix B-1, #EO-198 and #EI-1439). Accordingly, SEA reaffirms here that the available information shows that VCM could (and would) transport the limestone by truck if the rail line were not built and that accordingly, trucking the limestone is properly considered to be the No-Action Alternative in this case.

2.4 Alternatives Considered

During the EIS process, SEA has conducted a thorough environmental review of seven rail alternatives, one modification (called the Modified Eastern Bypass Route), and the No-Action Alternative. The alternatives and one modification are as follows: the Proposed Route, Alternative 1, Alternative 2, Alternative 3, SGR's Modified Medina Dam Route, the MCEAA Medina Dam Alternative, and the Eastern Bypass Route (including the Modified Eastern Bypass Route).

These alternatives are described in detail in the DEIS and SDEIS, with the exception of the new Modified Eastern Bypass Route, which is discussed in Section 2.5 of this FEIS.

Please see the appropriate sections of the DEIS and SDEIS, and Sections 2.5 through 2.7 of this FEIS for SEA's discussion of all the alternatives that have been considered and a comparison of the alternatives and identification of the environmentally preferable alternative(s).

2.5 Environmental Analysis of the Modified Eastern Bypass Route

Several commenters on the SDEIS raised concerns that all three of the Eastern Alternatives would pass through the Weiblen Farm in locations that would disrupt irrigation systems and destroy their irrigated farmland operation (see Appendix B of the SDEIS, #EI-1990). Commenters also indicated that the Weiblen house is located at the intersection of the three Eastern Alternatives, and thus would be destroyed by all of the Eastern Alternatives considered in the SDEIS. Additionally, the Castroville West Subdivision has been recently developed in the vicinity of the Eastern Alternatives.

In an effort to mitigate potential impacts on the Weiblen property, and avoid the Castroville West Subdivision, SEA presents a modification to the Eastern Bypass Route, referred to as the Modified Eastern Bypass Route in this FEIS. This modification would follow the same right-of-way as the Eastern Bypass Route, assessed in the SDEIS, but would weave around the Weiblen property and Castroville West Subdivision. It would follow property lines to the extent practicable to minimize adverse impacts, and finally connect to the Proposed Route in the southern end of the alignment before connecting to the UP main line.

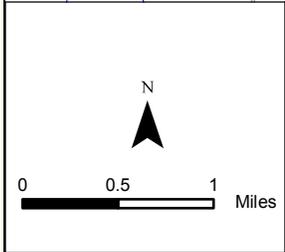
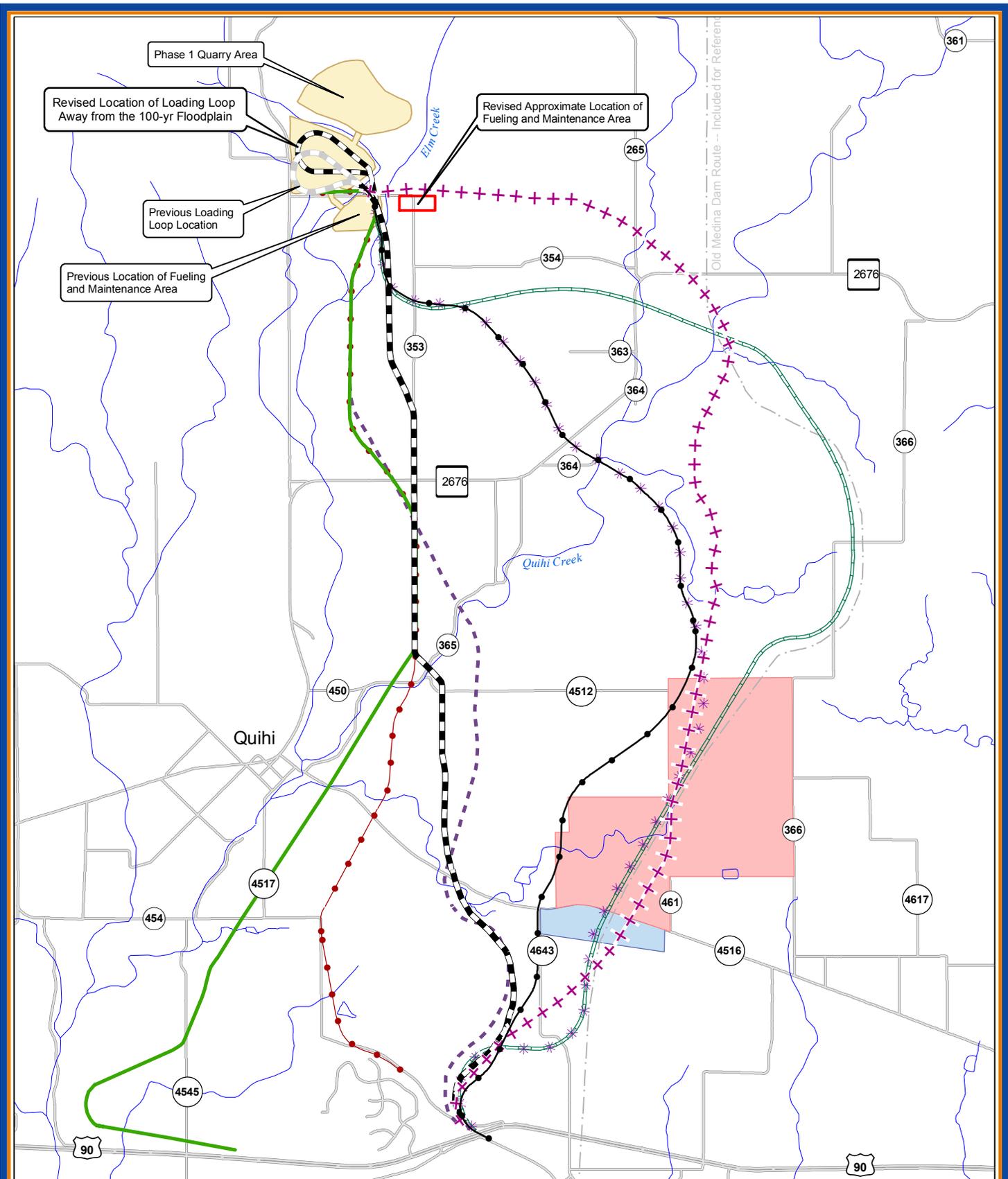
2.5.1 Potential Environmental Impacts of the Modified Eastern Bypass Route

This section presents SEA's study of the potential environmental impacts that would be associated with construction and operation of the Modified Eastern Bypass Route (see Figure 2-1). To compare this modification to the alternatives studied in the DEIS and SDEIS — the Proposed Route, Alternative 1, Alternative 2, Alternative 3, the Eastern Bypass Route, the MCEAA Medina Dam Alternative, SGR's Modified Medina Dam Route, and the No-Action Alternative — SEA has organized this section by resource area (e.g., air quality). This organization parallels the discussion of the affected environment and environmental consequences provided in Chapters 3 and 4 of the DEIS, and Chapters 3, 4, and 5 of the SDEIS. Each resource area subsection contains a brief description of the affected environment (i.e., existing environmental conditions), followed by a discussion of the potential environmental impacts of construction and operation of the Modified Eastern Bypass Route on that resource area.

Throughout this section, SEA refers the reader to sections of the DEIS and SDEIS that contain additional information, as appropriate, to avoid repetition. To allow an accurate comparison of the various alternatives, the following sections of this chapter depart from the approach used throughout the DEIS and SDEIS for the discussion of alternatives only to the extent that the methodology used or recommended mitigation address unique aspects of the Modified Eastern Bypass Route (i.e., issues that would not arise from construction and operation of the Proposed Route, Alternative 1, Alternative 2, Alternative 3, the Eastern Bypass Route, the MCEAA Medina Dam Alternative, SGR's Modified Medina Dam Route, and the No-Action Alternative), or information that was unavailable until the FEIS was prepared.

Section 2.6 of this Chapter provides a comparison of the Modified Eastern Bypass Route to the alternatives SEA studied in the DEIS and SDEIS. Section 2.7 includes SEA's discussion of the Environmentally Preferable Alternative(s). Chapter 1 of this FEIS includes a complete list of SEA's final recommended mitigation measures.

SEA acknowledges that comments to the DEIS and SDEIS called into question some of SEA's methodology for assessing particular resource areas; requested modifications to particular mitigation recommendations; and suggested additional mitigation measures to SEA. Responses to these comments are found in Chapters 5 and 6 of this FEIS.



Legend			
	Proposed Route		County Road
	Alternative 1		FM Road
	Alternative 2		US Highway
	Alternative 3		Weiblen Farm
	Eastern Bypass Route (Original)		Castroville West Subdivision
	Modified Eastern Bypass Route		
	SGR's Modified Medina Dam Route		
	MCEAA Medina Dam Alternative		

Figure 2-1
Southwest Gulf Railroad
Modified Eastern
Bypass Route

2.5.1.1 Transportation and Traffic Safety

Section 3.1 of the DEIS describes the existing transportation infrastructure of the proposed project area. There are several public roadways as well as two pipeline rights-of-way in the vicinity of the Modified Eastern Bypass Route. (See Figure 2-2.)

The Modified Eastern Bypass Route would cross a total of 15 roadways at-grade, which would include the following: 10 private drives/roads; four county roads (CR 454, CR 4516, CR 364, and CR 353 [twice]); and one state-maintained road (FM 2676).

As discussed in Section 4.1.2 of the DEIS, operation of trains at at-grade roadway crossings could cause a potential risk of accidents from derailments or collisions between trains and vehicles. Using the methodology set forth in Section 4.1.2 of the DEIS, SEA calculated the potential risk of accidents for the Modified Eastern Bypass Route.

The total distance covered by the trains transporting stone between the quarry and the UP rail line under the Modified Eastern Bypass Route would total approximately 9.1 miles, or 14.65 kilometers (km). Each train would be approximately 100 cars long, and there would be a total of two round trips a day, for a total of 5,860 railcar-km/day (i.e., 14.65 km x 400 railcar trips).

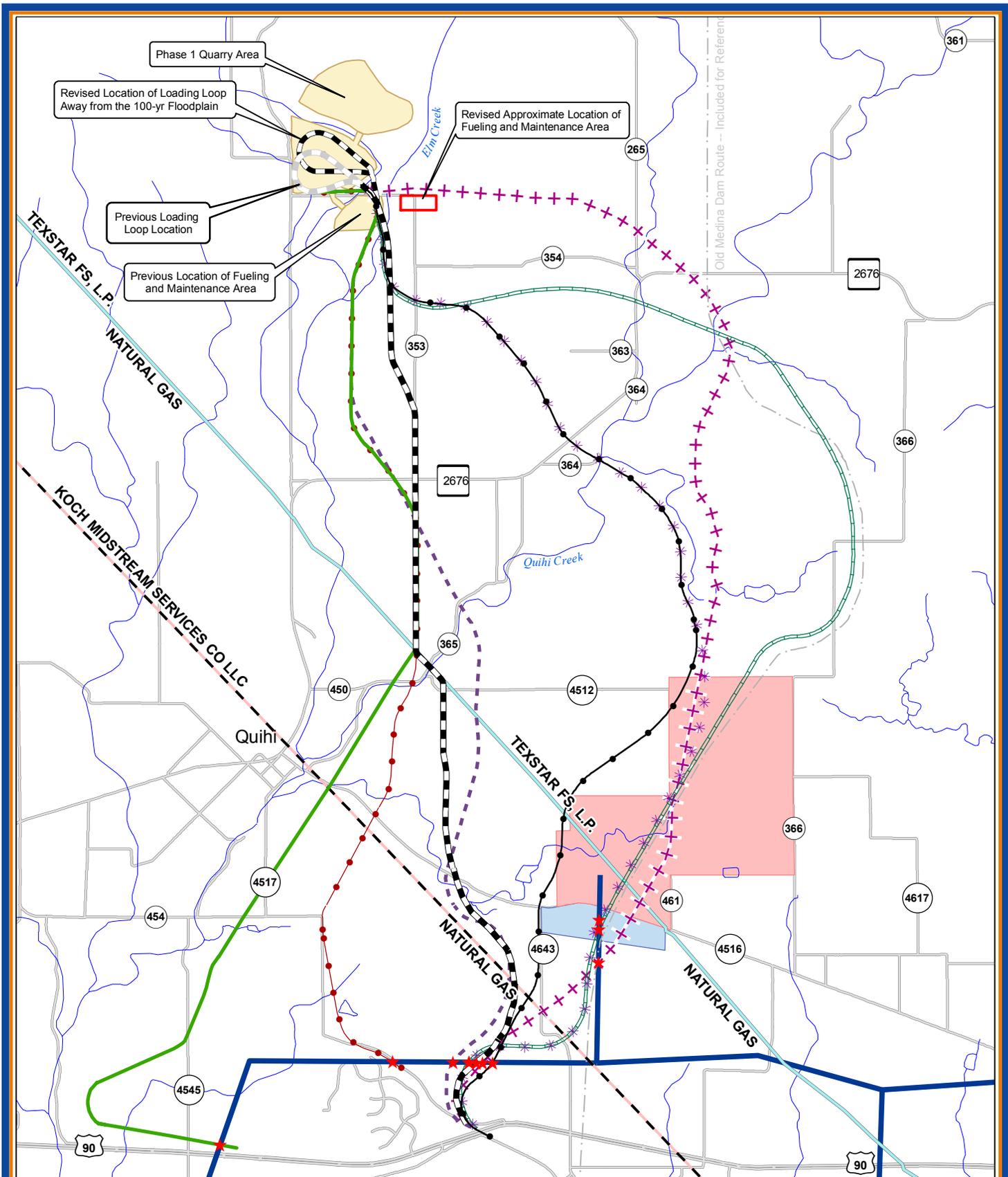
Using the Department of Energy (DOE) methodology set forth in Section 4.1.2 of the DEIS for regular trains,¹ the risk to human health and safety due to the operation of the Modified Eastern Bypass Route on an annual basis would equate to the following:

$$(4.26 \times 10^{-8} \text{injuries/railcar-km}) \times (5,860 \text{ railcar-km/d}) \times (250 \text{ days/year}) = 0.062 \text{ injuries and} \\ (2.27 \times 10^{-8} \text{injuries/railcar-km}) \times (5,860 \text{ railcar-km/d}) \times (250 \text{ days/year}) = 0.033 \text{ fatalities.}$$

But the actual risk would be lower in this case due to the use of dedicated trains.²

¹ “Regular” trains are those that may share use, either between passenger/freight or between various types of freight (Saricks and Kviteck, 1994).

² “Dedicated” trains are those used for a single freight type (Saricks and Kviteck, 1994).



Legend			
	Proposed Route		Transmission Line Crossing
	Alternative 1		Eastern Bypass Route (Original)
	Alternative 2		Modified Eastern Bypass Route
	Alternative 3		SGR's Modified Medina Dam Route
	MCEAA Medina Dam Alternative		Transmission Line
			Weiblen Farm
			County Road
			FM Road
			US Highway
			Castroville West Subdivision

**Figure 2-2
Southwest Gulf Railroad
Modified Eastern
Bypass Route
Pipeline ROWs and
Transmission Line
Crossings**

The Modified Eastern Bypass Route would have 15 at-grade road crossings of county roads and state-maintained roads. Applying the U.S. Department of Transportation (USDOT) statistics (USDOT, 2000) for grade crossings, as detailed in Section 4.1.2 of the DEIS, the accident risk at these grade crossings would be 0.22 accidents per year, resulting in 0.076 injuries and 0.022 fatalities. No USDOT statistics are currently available to evaluate the risk of accidents associated with private roadway/driveway crossings.

SEA provided an analysis of vehicular delays at at-grade crossings and potential pipeline safety issues at rail/pipeline crossings in Section 4.1 of the DEIS. Responses to associated comments are found in Chapters 5 and 6 of this FEIS, and recommended mitigation measures to address this issue are found in Chapter 1 of this FEIS. The vehicular delays at at-grade crossings during construction and operation of the Modified Eastern Bypass Route, and potential pipeline safety issues at rail/pipeline crossings, would be the same for the Modified Eastern Bypass Route as they would be for the Proposed Route, Alternative 1, Alternative 2, Alternative 3, the Eastern Bypass Route, the MCEAA Medina Dam Alternative, and SGR's Modified Medina Dam Route. SEA also recommends the same mitigation measures to reduce transportation and traffic safety impacts from construction and operation of the Modified Eastern Bypass Route as it has for the Proposed Route, Alternative 1, Alternative 2, Alternative 3, the Eastern Bypass Route, the MCEAA Medina Dam Alternative, and SGR's Modified Medina Dam Route (see Chapter 1 of this FEIS).

Because fewer county and private roads would be crossed, the construction and operation of the Modified Eastern Bypass Route would result in a lower USDOT risk of accident, injury, or fatality and would cause fewer impacts on transportation and traffic safety than the Eastern Bypass Route. Construction and operation of the Modified Eastern Bypass Route would not cause significant transportation and traffic safety impacts.

2.5.1.2 Public Health and Safety

Construction of the Modified Eastern Bypass Route would not result in significant impacts on public health and safety. Impacts such as air pollution, would primarily be caused by the emission of dust and criteria air pollutants.³ Because construction activities on any given segment of the rail line would be of short duration, any adverse impact on health would be temporary. Section 4.2 of the DEIS describes in greater detail the public health and safety concerns from construction of the proposed rail line.

Impacts on public health and safety from operation of the Modified Eastern Bypass Route would include risks of rail accidents, and risks caused by at-grade crossings of roadways.

The degree of potential environmental impacts caused by construction often relates to the size of the project. Because the Eastern Bypass Route and Modified Eastern Bypass Route would be of similar length, potential impacts from construction activities on public health and safety would be essentially the same for these rail alignments.

2.5.1.3 Hazardous Materials / Waste Sites and Existing Energy Resources

SEA did not identify any hazardous-material spill sites or hazardous waste sites within 500 feet of the Modified Eastern Bypass Route. SEA also conducted a search of the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database for

³ As defined by the U.S. Environmental Protection Agency's (EPA's) National Ambient Air Quality Standards (NAAQS), criteria air pollutants are the following: carbon monoxide; lead; nitrogen oxides; particulate matter; ozone; and sulfur dioxide.

Medina County, Texas, on April 4, 2006⁴ (CERCLIS, 2006).⁵ The CERCLIS database lists four sites in Medina County, including the following: the Hondo Army Airfield at the Hondo Municipal Airport in Hondo, Texas; the La Coste Refinery in La Coste, Texas; National Foam Cushion Manufacturing, Inc. in Natalia, Texas; and UP Natalia Derailment in Natalia, Texas. None of these sites is within 500 feet of the Modified Eastern Bypass Route.

According to data obtained from the Railroad Commission of Texas (RRC) in April 2006 (RRC, 2006), two natural gas pipeline rights-of-way occur within the proposed project area. These pipelines are further described in Chapter 3 of the DEIS and Chapter 3 of the SDEIS. Both pipeline rights-of-way would be crossed by the Modified Eastern Bypass Route. (See Figure 2-2.)

Along with the two natural gas pipeline rights-of-way (one active and one inactive), the Modified Eastern Bypass Route would also cross the Mosbacher high-tension transmission line once (Platts, 2006). This line is further described in the Chapter 3 of the SDEIS. (See Figure 2-2.)

Rail construction activities and railroad operations typically do not disturb hazardous-materials spill sites and hazardous waste sites located more than 500 feet from the rail line because these sites are too far away from the project area. Through site visits to the area and reviews of maps and aerial photography, SEA has not identified any existing hazardous-materials spill sites or hazardous waste sites within 500 feet of the Modified Eastern Bypass Route that could potentially be affected as a result of proposed construction activities. Similar results would occur for the original four alternatives described in Section 4.3.1 of the DEIS, and the Eastern Alternatives in Section 3.3.2 of the SDEIS.

SEA has determined that there is no risk of disturbing known hazardous materials or hazardous waste sites from construction and operation of the Modified Eastern Bypass Route. In addition, SEA believes that the potential for disturbing undocumented sites during construction and operation of this alternative would be extremely low, based upon the lack of nearby industrial activities, historical land uses in the area, SEA's review of aerial photography, and site visits.

There would also be no significant environmental concerns associated with the transmission line crossing shown in Figure 2-2 because the transmission line right-of-way has been previously disturbed and is currently being properly mowed and maintained. Although no height information on the transmission line was available, this type of line generally is built high enough off the ground to allow for the safe passage of trains underneath. However, as with the other rail alternatives, SGR would need to survey the locations of the poles in order to avoid them during rail line construction.

2.5.1.4 Worker Health and Safety

In Section 4.4 of the DEIS and Section 3.4 of the SDEIS, SEA discussed potential impacts of construction and operation of the Proposed Route, Alternative 1, Alternative 2, Alternative 3, the Eastern Bypass Route, the MCEAA Medina Dam Alternative, and SGR's Modified Medina Dam Route on worker health and safety within the project area. SEA's analyses assessed the following: air quality from dust and criteria air pollutant emissions caused by construction activities; risk associated with hazards of normal rail construction and operation activities; risk (as a probability) of nonfatal

⁴ CERCLIS database (visited on April 4, 2006) <cfpub.epa.gov/supercpad/cursites.cfm>.

⁵ CERCLIS is the acronym for Comprehensive Environmental Response, Compensation, and Liability Information System. This system contains information on hazardous waste sites, potentially hazardous waste sites, and remedial action activities across the nation; including sites that are on the National Priorities List (NPL) or being considered for the NPL.

injuries related to construction; risk (as a probability) of fatalities related to construction; risk (as a number) of nonfatal injuries related to normal operations for 30 years; and risk (as a number) of fatalities related to normal operations for 30 years.

Potential impacts from construction and operation of the Modified Eastern Bypass Route on worker health and safety would be essentially the same as those discussed for the other alternatives in the DEIS and SDEIS, and would not result in significant environmental impacts on worker health and safety. The environmental impacts on worker health and safety would also be similar to the public health and safety impacts discussed in Section 3.2 of the SDIES and Chapter 3 of the SDEIS, and would be a direct result of exposure to criteria air pollutants generated by construction activities. Because construction activities on any given segment of the rail line would be of short duration, any adverse impacts on worker health and safety would be temporary.

The degree of potential environmental impacts caused by construction often relates to the size of the project. Because the Modified Eastern Bypass Route and Eastern Bypass Route are of similar length, potential impacts from construction activities on worker health and safety would be essentially the same.

2.5.1.5 Water Resources

Section 3.3 of the DEIS and Section 3.5 of the SDEIS describe water resources within the project area, including groundwater, floodplains, surface water, and potential wetlands.

SEA has also examined relevant maps from the United States Geological Survey (USGS) and National Soil Information Systems (NASIS), field survey results (conducted by SEA in September of 2007), publications, and Texas Water Development Board (TWDB) databases to assess potential impacts on water resources from construction and operation of the Modified Eastern Bypass Route.

The geology and hydrogeology of the project area are described in Section 3.3.1 of the DEIS. The description presented there also applies to the Modified Eastern Bypass Route. No public water supplies are known to withdraw groundwater from either the Edwards Aquifer or Leona Formation within one mile of the Modified Eastern Bypass Route. No water wells screened in the terrace deposits were identified in the TWDB's Water Information Integration and Dissemination System (WIID). In addition, SEA did not identify any major or minor springs along the Modified Eastern Bypass Route. This route would be entirely within the Edwards Aquifer Artesian Zone, except for the loading track, which would be common to all rail alternatives.

Construction and operation of Modified Eastern Bypass Route could cause some minor adverse environmental impacts on groundwater resources, which would be essentially the same as the impact of the other rail alternatives. Section 4.5.2 of the DEIS discusses these impacts in greater detail.

Figure 2-3 illustrates the 100-year floodplain within the project area. The Modified Eastern Bypass Route would cross the floodplain in two locations. These crossings would be identical to the crossings that would result from construction of the Eastern Bypass Route, and would affect a total linear distance of 4,557 feet (FEMA, 2006).⁶ Both the Eastern Bypass Route and the Modified Eastern Bypass Route would impact more linear distance of floodplain than the other Eastern Alternatives.

⁶ This length does not include one additional crossing of the floodplain for a total of 4,080 feet for the loading track. This additional floodplain crossing would be the same for all alternatives.

As shown in Figure 2-4 below, the Modified Eastern Bypass Route would intercept the same watersheds and watershed areas as the Eastern Bypass Route (Cherry Creek 1.6 mi², Elm Creek 28.9 mi², Polecat Creek 2.3 mi², Quihi Creek 19.1 mi², and Unnamed Watershed 0.9 mi²). It would also cross the same number of streams (a total of five streams or six stream crossings [some streams are crossed twice]), including Cherry Creek, the main stem of Elm Creek, the main stem of Polecat Creek, Quihi Creek twice (the main stem once), and Unnamed Two Creek. Recent information received from SGR (see EI # 3225) indicates that SGR has moved the location of the loading loop off the floodplain, eliminating two creek crossings at Unnamed Creek. This is the case for all rail alternatives.

SEA reviewed aerial photographs and data obtained from the National Wetlands Inventory (NWI) (U.S. Fish and Wildlife Service (USFWS), 2006) to identify potential wetlands and waters of the U.S. within the project area. Data obtained from the NWI indicates the presence of five types of potential aquatic features⁷ within the project area. As discussed in the SDEIS, SEA determined that these aquatic features are stream channels or swales that are impounded for use, typically as livestock watering ponds. The features are mostly associated with area creeks and are used for irrigation by private landowners within the project area.

According to NWI maps (NWI, 2006), the Modified Eastern Bypass Route would cross one of the two stock ponds that would be crossed by the Eastern Bypass Route. This stock pond is located on the northern half of the route, and is classified as a Palustrine, unconsolidated shore, seasonally flooded, diked/impounded water feature (PUSCh) (see Figure 2-5). The pond is likely suitable for use as an irrigation source. The Modified Eastern Bypass Route has the potential to adversely impact this pond. In addition, SEA determined that impacts on wetlands could occur at the crossings of Elm, Quihi, and Cherry Creeks from any of Eastern Alternatives (including the Modified Eastern Bypass Route).

2.5.1.6 Biological Resources

To gather and evaluate information on existing biological resources along the Modified Eastern Bypass Route, SEA conducted a field assessment on September 17, 2007. The methodology for this assessment was the same as that described in Section 3.6.1 of the SDEIS.

The existing conditions, major habitat types, and potential for federal and state listed threatened and endangered species to occur under the Modified Eastern Bypass Route are the same as those presented in Section 3.6.2 of the SDEIS. Tables 3.6-1 and 3.6-2 in the SDEIS present a list of special-status plant and wildlife species having the potential to occur within Medina County. Three of those species have the potential to occur within the project area, including the Texas Tortoise, Texas Horned Lizard, and Golden-cheeked Warbler. There is no designated Critical Habitat within the project area. One non-jurisdictional aquatic feature (a stock pond indicated by the NWI) and eight potential waters of the U.S (intermittent streams indicated by the USGS) occur within the right-of-way of the Modified Eastern Bypass Route.

⁷ Data obtained from the NWI maps revealed the presence of five types of aquatic features. These are “palustrine aquatic features” and include marshes, streams and open, shallow water. More specifically they are described by the NWI as PUSCh, PUBFh, PUBHh, PUSAh and PUBH, and are defined as: 1) PUSAh - Palustrine, Unconsolidated Shore, Temporarily Flooded, Diked/Impounded; 2) PUSCh - Palustrine, Unconsolidated Shore, Seasonally Flooded, Diked/Impounded; 3) PUBHh - Palustrine, Unconsolidated Bottom, Permanently Flooded, Diked/Impounded; 4) PUBFh - Palustrine, Unconsolidated Bottom, Semi-permanently Flooded, Diked/Impounded; 5) PUBH - Palustrine, Unconsolidated Bottom, Permanently Flooded.

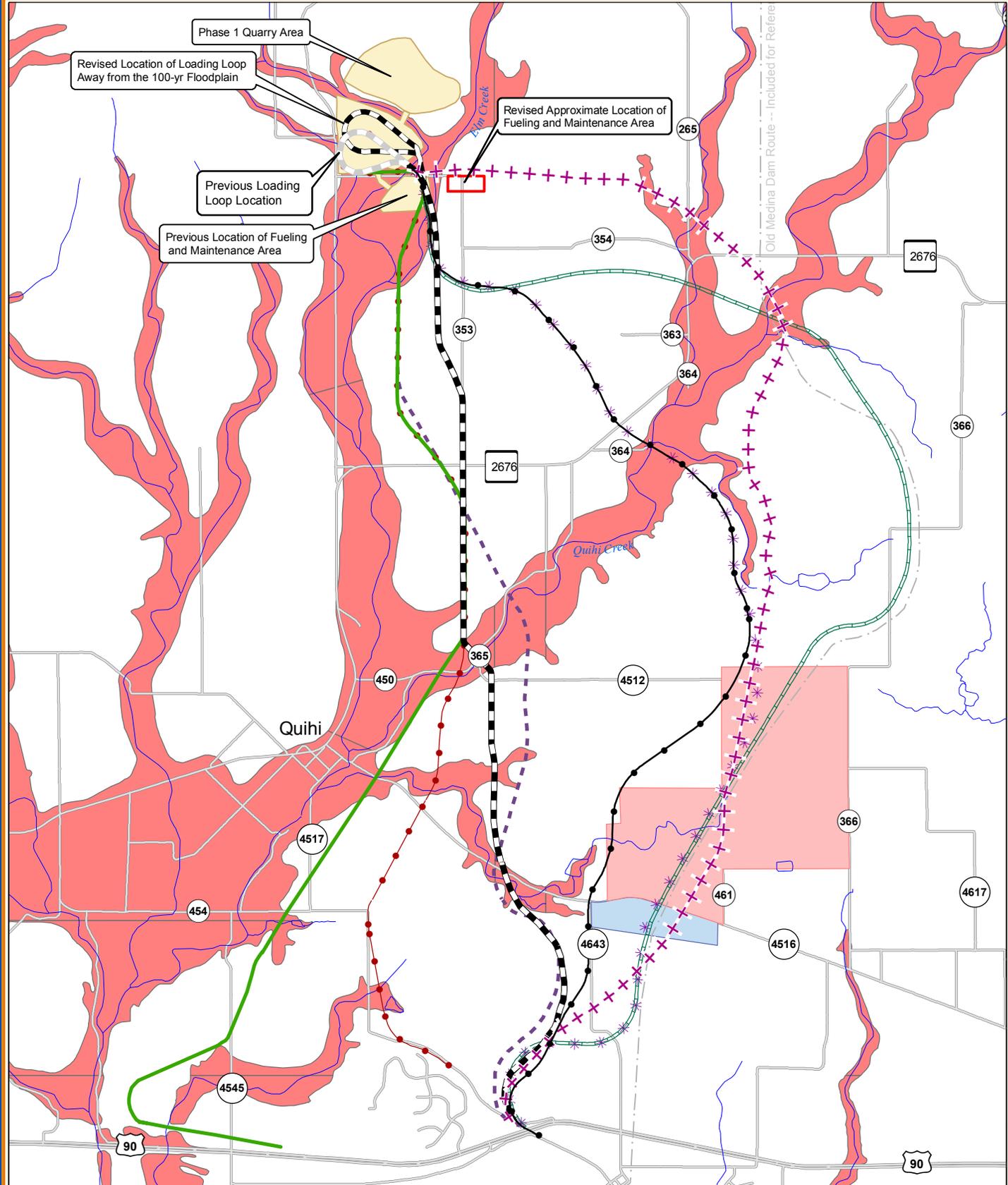
Potential environmental impacts on biological resources from construction and operation of the Modified Eastern Bypass Route would be similar to those listed in Section 3.6.3 of the SDEIS, and would include temporary disturbance to approximately 88.68 acres of potential habitat, as well as permanent disturbance to approximately 44.3 acres of potential habitat. One wetland, or stock pond, would likely be destroyed by construction and operation of the Modified Eastern Bypass Route, but appropriate mitigation measures associated with stock pond redevelopment outside the right-of-way are included in Chapter 1 of this FEIS. It also should be noted that this potential wetland, or stock pond, is not jurisdictional.

When assessing which alternative would have the least amount of impact on biological resources, consideration was given to the acreage of potentially suitable habitat (e.g., riparian areas, wetlands, waters of the U.S. crossings, and potentially suitable habitat for the Texas Tortoise, Texas Horned Lizard, and Golden-cheeked Warbler) that would be disturbed by a given alternative or modification. Table 2-1, below, details the project-related impacts on biological resources from the Eastern Bypass Route and Modified Eastern Bypass Route.

Table 2-1. Sensitive Biological Resources Crossed by the Eastern Bypass Route and the Modified Eastern Bypass Route

Alternative	Waters of the U.S. Intermittent Streams	Potential Wetlands (Stock Ponds)^(a)	Presence of Riparian Zones?	Disturbance to Habitat for Texas Tortoise and Texas Horned Lizard?	Disturbance to Habitat for Golden-cheeked Warbler?	Temporary Acreage Disturbed (80-foot right-of-way)	Permanent Acreage Disturbed (40-foot right-of-way)
Eastern Bypass Route	8	2	Yes	Yes	Minimal	89.21	44.60
Modified Eastern Bypass Route	8	1	Yes	Yes	Minimal	88.69	44.32

(a) The potential wetland within the project area is an aquatic feature impounded for use as a livestock watering pond. This feature appears to be an isolated hydric area and is unlikely to be under the jurisdiction of the Corps. However, as discussed in Section 3.5.2 of the SDEIS, SEA recommends that consultation with the Corps be undertaken prior to beginning any construction activities.



Phase 1 Quarry Area

Revised Location of Loading Loop
Away from the 100-yr Floodplain

Previous Loading Loop Location

Previous Location of Fueling and Maintenance Area

Revised Approximate Location of Fueling and Maintenance Area

Old Medina Dam Route -- Included for Reference

Legend

- Proposed Route
- Alternative 1
- Alternative 2
- Alternative 3
- Eastern Bypass Route (Original)
- Modified Eastern Bypass Route
- SGR's Modified Medina Dam Route
- MCEAA Medina Dam Alternative
- County Road
- FM Road
- US Highway
- Weiblen Farm
- Castroville West Subdivision
- Floodplain

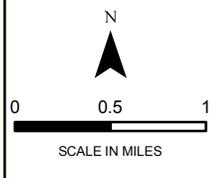
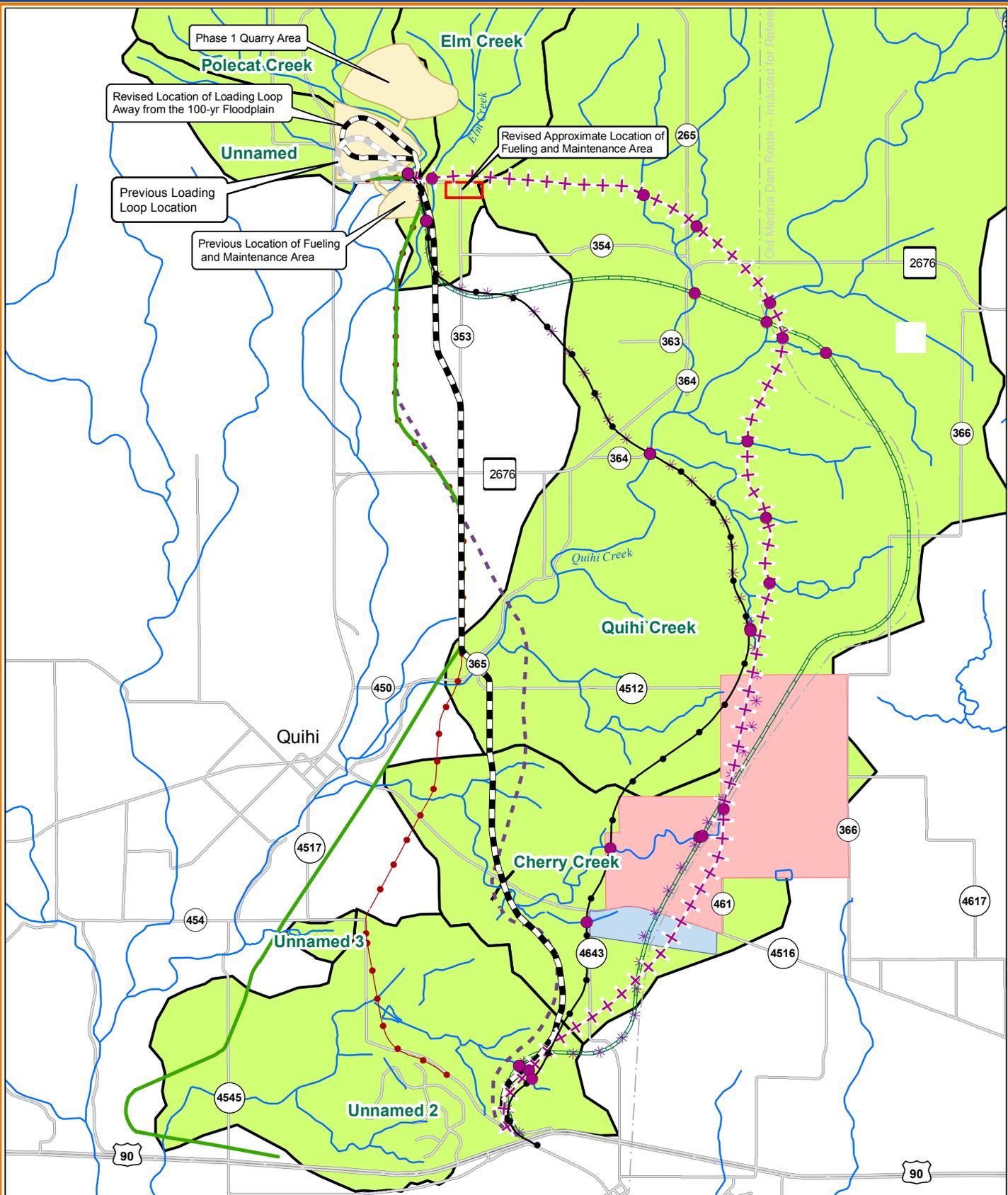


Figure 2-3
Southwest Gulf Railroad
Modified Eastern
Bypass Route
Floodplain Regions
Within Project Area



Phase 1 Quarry Area

Polecat Creek

Elm Creek

Revised Location of Loading Loop
Away from the 100-yr Floodplain

Revised Approximate Location of
Fueling and Maintenance Area

Unnamed

Previous Loading
Loop Location

Previous Location of Fueling
and Maintenance Area

Quihi

Quihi Creek

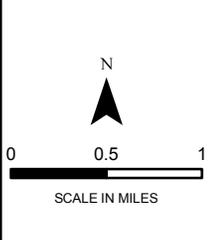
Cherry Creek

Unnamed 3

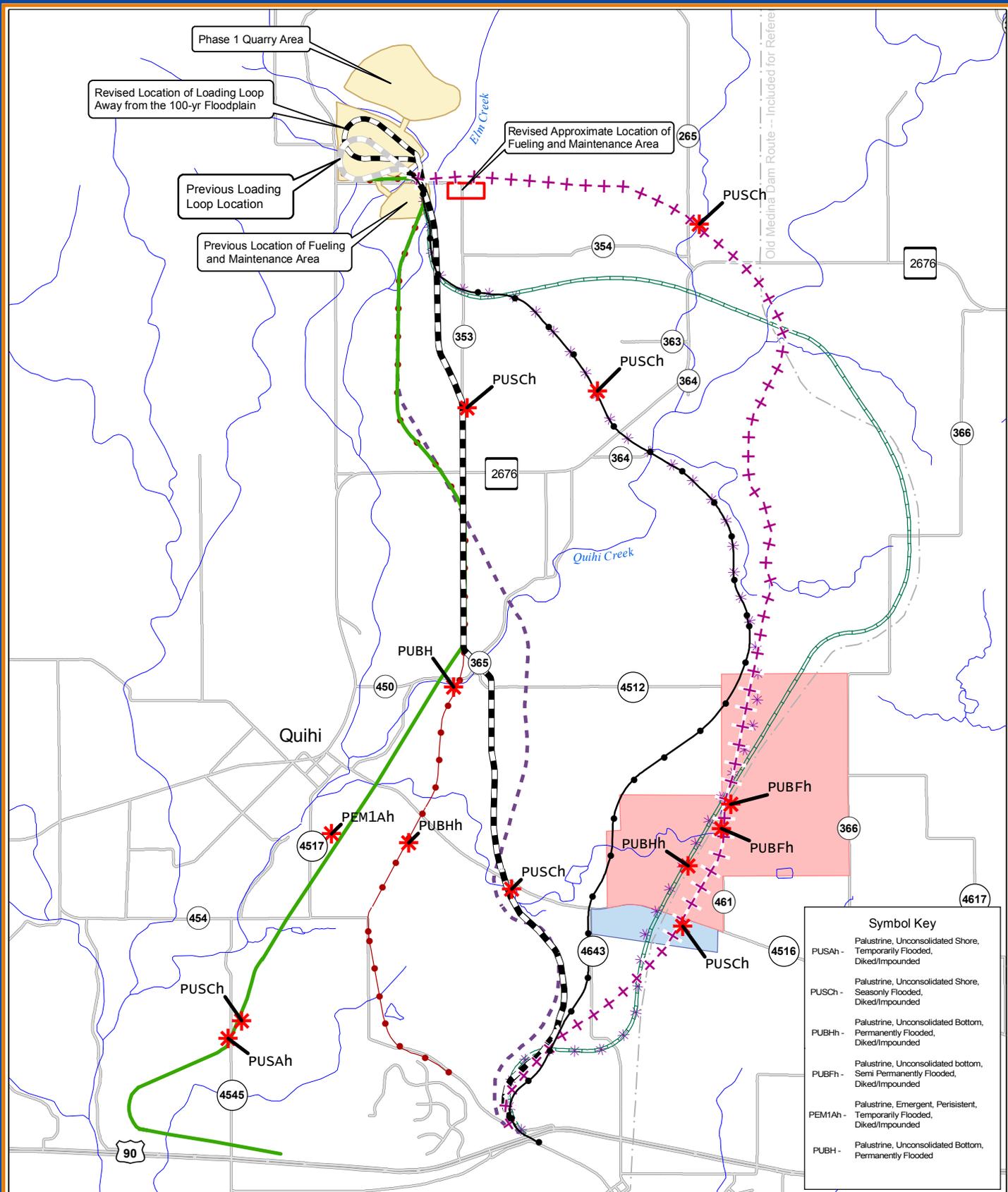
Unnamed 2

Figure 2-4

**Southwest Gulf Railroad
Modified Eastern
Bypass Route
Creek Crossings and
Watersheds**



Legend			
Proposed Route	Eastern Bypass Route (Original)	County Road	Eastern Alternative Creek Crossing
Alternative 1	Modified Eastern Bypass Route	FM Road	Creek Watershed
Alternative 2	SGR's Modified Medina Dam Route	US Highway	Weiblen Farm
Alternative 3	MCEAA Medina Dam Alternative	Castroville West Subdivision	



Phase 1 Quarry Area

Revised Location of Loading Loop
Away from the 100-yr Floodplain

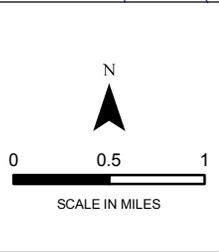
Previous Loading
Loop Location

Previous Location of Fueling
and Maintenance Area

Revised Approximate Location of
Fueling and Maintenance Area

Old Medina Dam Route -- Included for Reference

Symbol Key	
PUSAh -	Palustrine, Unconsolidated Shore, Temporarily Flooded, Diked/Impounded
PUSCh -	Palustrine, Unconsolidated Shore, Seasonally Flooded, Diked/Impounded
PUBHh -	Palustrine, Unconsolidated Bottom, Permanently Flooded, Diked/Impounded
PUBFh -	Palustrine, Unconsolidated bottom, Semi Permanently Flooded, Diked/Impounded
PEM1Ah -	Palustrine, Emergent, Persistent, Temporarily Flooded, Diked/Impounded
PUBH -	Palustrine, Unconsolidated Bottom, Permanently Flooded



Legend			
Proposed Route	Eastern Bypass Route (Original)	County Road	NWI Wetland
Alternative 1	Modified Eastern Bypass Route	FM Road	
Alternative 2	SGR's Modified Medina Dam Route	US Highway	
Alternative 3	MCEAA Medina Dam Alternative	Weiblen Farm	
		Castroville West Subdivision	

Figure 2-5
Southwest Gulf Railroad
Modified Eastern
Bypass Route
Potential Wetlands
Crossed

2.5.1.7 Air Quality

Please see Section 4.7.1 of the DEIS for the calculation methods used to estimate potential air emissions from the proposed rail operations. Please see Section 4.7.1 of the DEIS for a description of emission factors⁸ used for the air quality analysis in this FEIS, and a detailed discussion of these emission factors.

As discussed in Section 4.7.1 of the DEIS, Medina County is in attainment with all National Ambient Air Quality Standards (NAAQS) for criteria air pollutants. Given Medina County’s attainment status and the lack of defined significance criteria for these emissions, SEA decided to compare the combined stationary and mobile source emissions for each alternative with the U.S. Environmental Protection Agency’s (EPA’s) Title V major emission-source threshold of 100 tons-per-year (as further described in Section 4.7.1 of the DEIS).⁹ Emissions of criteria pollutants below this level are considered to be below the threshold of significance.

Section 3.5 of the DEIS describes the climate and air quality characteristics of the proposed project area. Table 3.7.5-1 in the SDEIS lists mobile source and rail loading emissions.

Effects on air quality from this project include reduced air quality from dust generated by rail construction equipment and burning of rail construction debris. However, because the project would be of short duration, these impacts would be temporary and accordingly would not be significant.

As discussed in Section 4.7.3 of the DEIS, air quality impacts from proposed rail operations would result from:

- Rail car loading activities at the quarry; and
- Mobile source emissions from locomotives.

Table 2-2 shows the estimated rail car loading emissions of PM10¹⁰ and mobile source emissions from proposed rail operations over the Modified Eastern Bypass Route.

Table 2-2. Mobile Source and Rail Loading Emissions for the Modified Eastern Bypass Route

Mobile Source	Modified Eastern Bypass Route
	Ton/Year
NOx Emissions	61.6
CO Emissions	35.2
PM Emissions	3.2
HC Emissions	9.2
Rail Loading	
PM Emissions	27.7

NOx - Nitrogen oxides
CO - Carbon monoxide

PM - Particulate matter
HC - Hydrocarbon

⁸ Emission factors refer to the amount of pollution for a given pollutant and a given source released to the atmosphere relative to fuel consumed, miles traveled, or another type of unit of activity.

⁹ Title V is a Federal operating permit program, developed pursuant to the Clean Air Act.

¹⁰ PM10 are particulate matter emissions less than 10 microns in diameter.

Emissions from proposed rail operations over the Modified Eastern Bypass Route would be slightly lower than those over the Eastern Bypass Route, and both would be less than 100 tons per year for any criteria air pollutant. Thus, emissions from the Modified Eastern Bypass Route, as well as those from all the other rail alternatives considered in this proceeding, would be below the EPA's major source thresholds for Title V permit applicability and are not deemed to be significant.

2.5.1.8 Geologic Hazards and Soils

SEA studied the potential for landslide/mass movement hazards over the Modified Eastern Bypass Route (moderately rapid to rapid (on the order of one foot per year or greater) down slope transport of earth by means of gravitational body stresses). Section 3.6.2 of the DEIS describes the geologic hazards of the proposed project area in greater detail.

Soils in and around the Modified Eastern Bypass Route are generally the same as those described in Section 3.6.1 of the DEIS. However, the soils of the Modified Eastern Bypass Route consist of a greater area covered by the Victoria clay that occurs on the nearly level surface of the floodplain deposits, and Quaternary terrace deposits found on the eastern side of the study area.

Using USGS maps and associated data (USGS, 2001), SEA determined in the DEIS that the areas that would be most susceptible to landslides occur in or near the southern portion of the project area where the rail line would cross the Escondido Formation outcrop. SEA conducted an on-site visit (in March 2003) during preparation of the DEIS to field verify conditions. Results indicated that the rail routes studied in the DEIS were much lower on the slope of the hills than the area susceptible to landslides shown on the maps. The southern portion of the initial routes, as well as all of the Eastern Alternatives including the Modified Eastern Bypass Route, would be located completely upon the Escondido Formation. As a result, SEA believes that landslide hazards in the area of the Eastern Alternatives, including the Modified Eastern Bypass Route, would be negligible.

To evaluate potential impacts on soils, SEA compared the Modified Eastern Bypass Route to published soil maps. The Modified Eastern Bypass Route is primarily composed of soils associated with Victoria clay, Moneola gravelly clay, and the Quihi Series.

The Natural Resources Conservation Service (NRCS) of the U. S. Department of Agriculture, reviewed the seven rail alternatives (not including the Modified Eastern Bypass Route) to determine impacts on prime farmland soils, as part of the Farmland Protection Policy Act (FPPA) (see Appendix B, letter #EI-1959). The NRCS' AD-1006 Farmland Conversion Impact Rating for the rail route alternatives was based upon acres of prime farmland soils impacted. Table 2-3, below, presents the applied rating for the Eastern Bypass Route, and the approximate acreage of prime farmland soils for the Modified Eastern Bypass Route. Table 2-17 in Section 2.6 (in Comparison of Alternatives - Land Use), shows the NRCS Farmland Impact Conversion Rating for all of the rail alternatives (including the modified Eastern Bypass Route) and the No-Action Alternative.

Table 2-3. NRCS Farmland Impact Conversion Rating

Alternative Route	Prime Farmland Acres	AD-1006 Score
Eastern Bypass Route	48	130
Modified Eastern Bypass Route ^a	64	<142

(a) Although the NRCS did not provide an AD-1006 Farmland Conversion Impact Rating for the Modified Eastern Bypass Route, existing soil data was used to assess acres of prime farmland soils for comparison purposes.

The NRCS concluded that “sites receiving a score of less than 160 need not be given further consideration for protection and no additional sites need to be evaluated.”

The Modified Eastern Bypass Route was not specifically ranked by the NRCS. However, of all the alternatives studied in the DEIS and SDEIS, Alternative 1 would impact the most acreage of prime farmland (77 acres), and received a score of 142 (see Table 6.2.10-1 in the SDEIS). Therefore, it is reasonable to conclude that the Modified Eastern Bypass Route, which would affect even fewer acres of prime farmland (64 acres), would receive a lower score from the NRCS than Alternative 1. Given that both alternatives would have a score lower than 160 (significance threshold), SEA concludes that construction and operation of the Modified Eastern Bypass Route would not significantly impact prime farmland soils within the area.

Construction of the Modified Eastern Bypass Route would not disturb soils in the areas that are most susceptible to landslides particularly because the area that was first thought to have landslide risk (the southern portion of the project area) was later determined to have negligible landslide risk. Therefore, the risk of landslide hazards from construction and operation of the Modified Eastern Bypass Route appears to be negligible.

2.5.1.9 Karst Features

Section 3.6.3 of the DEIS describes karst features of the proposed project area.

Most of the Modified Eastern Bypass Route is underlain by the Leona or Escondido Formations, which are not conducive to the development of karst features (see Figure 3-8 of the SDEIS, and Table 3.3-1 of the DEIS). Therefore, the majority of this route has no potential to be impacted by the development of karst features. However, the area near the loading track would be susceptible to karst-feature development at a higher elevation than the 950-foot contour along Polecat and Elm Creeks. Additionally, a portion of the Modified Eastern Bypass Route extending approximately 1,500 feet to the south of the loading track area would have thin (i.e., few to tens of feet thick) Quaternary Alluvium deposits overlaying carbonate rocks with the potential to develop karst features (see Figure 3-8 of the SDEIS).

2.5.1.10 Land Use

The Modified Eastern Bypass Route would originate at the quarry location and extend south approximately 9.1 miles to the Del Rio Subdivision of the UP rail line near Dunlay. Most, if not all, of the right-of-way of the Modified Eastern Bypass Route would be on privately owned land. The Modified Eastern Bypass Route would follow the same alignment as the Eastern Bypass Route until just north of the Weiblen property (see Figure 2-1). At that point, the Modified Eastern Bypass Route would head southwest to avoid bisecting the Weiblen property. The Modified Eastern Bypass Route would still cross the Weiblen property, but would only separate a relatively small section of property from the main portion, as opposed to essentially dividing relatively equal-sized portions of the property into two parts. The Modified Eastern Bypass Route would then parallel the western border of the Castroville West Subdivision. According to the Medina County Appraisal District (MCAD) data, the Modified Eastern Bypass Route would cross a total of 32 individual properties, 30 of which are not owned by Vulcan or its subsidiaries. Twenty-six properties would be bisected by this route. See section 3.7 of the DEIS for a description of the current land use of the proposed project area.

Construction of the Modified Eastern Bypass Route would directly and temporarily affect approximately 88.68 acres, assuming a construction corridor of approximately 80 feet. According to NRCS soils data (Greenwade, 2006), approximately 63.6 acres of the corridor would be NRCS-

designated prime farmland. Approximately 44.3 acres would be permanently maintained by SGR following construction, although this area would no longer be available for agricultural use or grazing.

According to aerial photography, there are approximately 71 houses within ½ mile and 166 houses within one mile on either side of the alignment.

Construction and operation of the Modified Eastern Bypass Route would cause fewer land use impacts than the Eastern Bypass Route.

2.5.1.11 Environmental Justice

As discussed in Section 4.11 of the DEIS, the project area does not meet SEA’s environmental justice community of concern criteria. Therefore, construction and operation of the Modified Eastern Bypass Route would not have the potential to cause disproportionately high and adverse human health or environmental effects on environmental justice communities.

2.5.1.12 Noise and Vibration

Chapter 4 of the SDEIS describes the noise ambient level measurements and prediction methodology used for determining existing noise and analyzing potential noise impacts.

The Modified Eastern Bypass Route is 9.1 miles in length. It would begin in the northern portion of the study area at the quarry, extend to the south following the same alignment as the Eastern Bypass Route, and then separate from the Eastern Bypass Route to avoid much of the Weiblen property and all of the Castroville West Subdivision. The point of separation is located between noise measurement locations LT-E and ST-I, which is just north of the Weiblen property (see Figure 2-6). Immediately after the Modified Eastern Bypass Route would cross the road intersection of CR 4516 and CR 4643, the rail line would tie back into the Proposed Route and terminate at the tie-in with the UP line (just north of U.S. Highway 90).

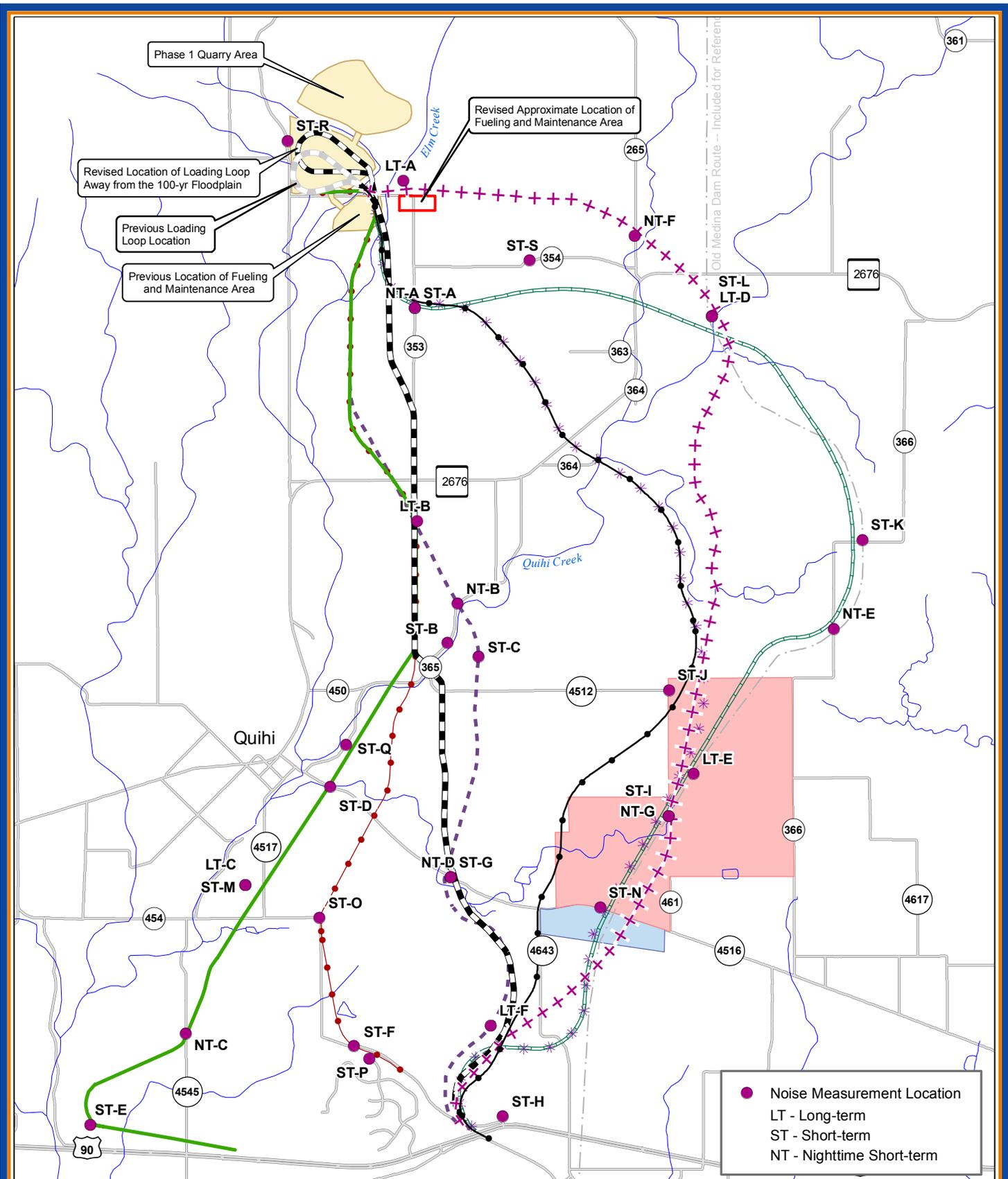
The quarry area is predominantly undisturbed, with six nearby residences. The Modified Eastern Bypass Route would traverse a rural landscape with widely scattered residences (except where several homes are clustered near the intersection of CR 353 and CR 354). The alignment would pass within 1,000 feet of a residence along FM 2676. Southeast of this residence, the alignment would traverse farmland, pastureland, and undisturbed land until passing two residences within 1,000 feet of Private Road (PR) 3660. South of these two residences, where the original and modified routes separate, the Modified Eastern Bypass Route would again traverse farmland, pastureland, and undisturbed land until passing within 1,000 feet of seven residences along County Road 4516. Based upon the long-term (LT) measurements, the existing L_{dn} along the Modified Eastern Bypass Route is 40 dBA (A-weighted decibels) along the northern portion, intensifies to 57 dBA along the mid-section, and drops back down to 50 dBA along the southern portion. Table 2-4, below, presents a summary of the overall existing LT community noise levels along the Modified Eastern Bypass Route.

Table 2-4. Existing Community Noise Levels (L_{dn})^{a,b}

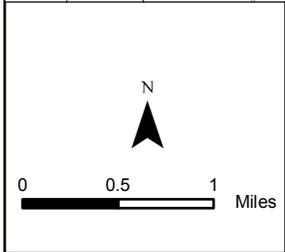
Route	LT-A	LT-B	LT-C	LT-D	LT-E	LT-F
Modified Eastern Bypass Route	40	57	-	-	-	50

(a) LT-Long Term. These locations correspond to those shown on Figure 2-6.

(b) Measured 24-hour Average Day-Night Sound Level



● Noise Measurement Location
 LT - Long-term
 ST - Short-term
 NT - Nighttime Short-term



Legend			
	Proposed Route		Eastern Bypass Route (Original)
	Alternative 1		Modified Eastern Bypass Route
	Alternative 2		SGR's Modified Medina Dam Route
	Alternative 3		MCEAA Medina Dam Alternative
	County Road		Weiblen Farm
	FM Road		Castroville West Subdivision
	US Highway		

Figure 2-6
Southwest Gulf Railroad
Modified Eastern
Bypass Route
Noise Measurement
Locations

SEA assessed the potential for adverse noise impacts from SGR’s proposed train operations over the Modified Eastern Bypass Route by comparing the predicted noise levels for the Modified Eastern Bypass Route with the Board’s adverse effect noise criteria of a 3 dBA or greater increase in existing L_{dn} , and an increase to an L_{dn} of 65 dBA or greater.

Table 2-5, below, shows the number of residences near the Modified Eastern Bypass Route that would experience a 3 dBA L_{dn} increase and the number of residences near the Modified Eastern Bypass Route that would experience both a 3 dBA L_{dn} increase, and an increase to an L_{dn} of 65 dBA or greater from SGR’s rail operations.

Table 2-5. Number of Residences Near the Modified Eastern Bypass Route

Noise Levels	Number of Residences
3dBA L_{dn} Increases	13
Increase to 65 dBA L_{dn} or greater and 3 dBA L_{dn} Increase	0

Based upon the analysis, SEA concludes that, as with all the other route alignments studied in this proceeding, the construction and operation related to the Modified Eastern Bypass Route would not cause significant adverse noise impacts. SEA also concludes that, with implementation of SEA’s recommended additional noise mitigation (see Mitigation Measures #F-64 through #F-75 in Chapter 1 of this FEIS,), construction vibration would not harm residences, cultural resources, or local water wells.

Existing vibration levels in the study area were not perceptible to SEA’s noise and vibration specialists conducting the field study. This included locations near existing railroad and highway traffic. As SEA explained in the SDEIS, the ambient vibration level in the study area is below 65 Vibration decibels (VdB), the human perception level for ground vibration according to Federal Railroad Administration (FRA) and Federal Transit Administration (FTA) guidelines (See SDEIS Chapter 4). Furthermore, SEA concludes that fragile and extremely fragile cultural resources in the study area are unlikely to be affected by the construction and operation of a rail line under any of the alternatives studied. The Modified Eastern Bypass Route also is not expected to create operations-related vibration impacts. SEA predicts no vibration impacts during the construction phase of the project for any of the potential rail alternatives. Pile driving could cause impacts to water wells for all alternatives, but these can be mitigated with SEA’s recommended mitigation (See Mitigation Measure #F-75 in Chapter 1 of this FEIS).

2.5.1.13 Recreational and Visual Resources

Section 3.10 of the DEIS and Section 3.13 of the SDEIS describes the recreational and visual resources within the proposed project area. Because no public recreational sites exist within the vicinity of the Modified Eastern Bypass Route, construction and operation of this alternative would have no recreational resource impacts other than some adverse visual impacts.

The Modified Eastern Bypass Route would cross only one of the two stock ponds described in relation to the original Eastern Bypass Route. This stock pond is likely used for irrigation, but it may also be used for recreation. The Modified Eastern Bypass Route has the potential to adversely impact irrigation and recreational uses of this pond.

2.5.1.14 Cultural Resources

Known Historic Period Resources

SEA’s research identified seven historic resource areas/clusters that could be affected by the Modified Eastern Bypass Route (see Table 2-6, below, and Figures 2-7 and 2-8). Five of these resource areas/clusters have been identified in the landscape study conducted as part of the environmental review in this proceeding as contributing elements to the Upper Quihi Rural Historic District, and two were previously identified by Gonzales, Tate, and Iruegas (GTI), SGR’s consultant on this proceeding during their preliminary survey of the Eastern Bypass Route (Iruegas and Penick 2005). These latter two are frame dwellings from the 1930s, which are located east of CR 4643. They are designated by GTI numbers HS1 and HS2, and were assigned numbers 348 and 349 in the windshield survey portion of the landscape study (this area was determined to be not part of the Rural Historic Districts, and was eliminated from detailed study during the intensive level survey). Current mapping shows that these two houses are located inside the Areas of Potential Effect (APEs) of the Modified Eastern Bypass Route. However, impacts on historic structures for this route would likely be limited to visual and setting impacts; no direct physical impacts on historic structures are anticipated.

Table 2-6. Historic Resource Areas within 1000 Feet of the Modified Eastern Bypass Route

ID #	Name/Type	Date	Location	National Register Status
335 A-J	Saathoff farmstead - bungalow frame house and outbuildings.	ca. 1910	Off CR353	Resource area contributes to eligible Rural Historic District and is individually eligible
333 A-P	Dittmar farmstead - Craftsman bungalow frame house and outbuildings.	ca. 1925	Off CR353	Resource area contributes to eligible Rural Historic District and is individually eligible
202 C	German-Alsatian stone dwelling in ruins.	ca. 1860	Off FM2676	Feature 202 C contributes to eligible Rural Historic District
204 A-S	Farmstead (German-Alsatian stone dwelling with frame addition and associated barns and landscape features).	ca. 1870	Off FM2676 and CR364	Resource area contributes to eligible Rural Historic District and is individually eligible
205	Portion of CR364, historic dirt road remnant.	19 th century	East of FM2676	Resource area contributes to eligible Rural Historic District
348	Frame House	early 20 th century	East of CR4643	Potentially eligible as an individual resource but not evaluated by prior studies
349	Frame House	early 20 th century	East of CR4643	Potentially eligible as an individual resource but not evaluated by prior studies

In addition to these seven resource areas/clusters located within the APEs (many of which consist of farms and their associated structures and fields), the landscape study noted that all of the Eastern Alternatives, including the Modified Eastern Bypass Route, would cross landscape features that also contribute to the Upper Quihi Rural Historic District. These features include Quihi and Elm Creeks (two of the eight water bodies identified as Resource Area/Cluster 46) and various county roads (collectively identified as Resource 389). A total of nine resources would be potentially affected

if the Modified Eastern Bypass Route is authorized and constructed.

As another measure of potential impacts, SEA calculated the acreage within each APE that would be located within the Upper Quihi Rural Historic District. The APE of the Modified Eastern Bypass Route would cross 709 acres of the district, which is the same number of acres as the original Eastern Bypass Route.

Historic Period Archaeological Site Sensitivity

Since the current road network closely approximates the historic road network, and historic archaeological sites are often located near historic roads, historic archaeological site sensitivity was measured by identifying the number of historic road crossings associated with each alternative. The Modified Eastern Bypass Route would have six crossings of historic roads, which is the same number as the original Eastern Bypass Route.

Quantifying the number of road crossings does not take into account proximity to the areas of known high density of historic structures located at the northern end of the Eastern Alternatives where the routes would cross Quihi Creek. When these areas are taken into account, the proposed right-of-way of the Modified Eastern Bypass Route would have the potential to contain more historic archaeological sites than the MCEAA Medina Dam Alternative and SGR's Modified Medina Dam Route, but the same number of historic archaeological sites as the original Eastern Bypass Route.

Known Prehistoric Sites

The Texas Archaeological Sites Atlas documents only one prehistoric archaeological site near the proposed rights-of-way of the Eastern Alternatives, and this site is located within the Modified Eastern Bypass Route.

Site 41ME132 (the Buddy Mangold Site) is located on the edge of an upland plateau approximately 1,200 feet west of the MCEAA Medina Dam Alternative. Information about the site was recorded by Dr. Thomas Hester in July of 2003, but the site was found earlier and investigated by the late Buddy Mangold on the property of his brother, Russell. An avocation archaeologist, Buddy Mangold recovered evidence of intensive and long-term deposits from almost every time period from Paleoindian to the Contact Period in deposits reaching as deep as five feet below the surface. Although documentation of his excavations is not available, he left his collection to his friends and neighbors, Glenn and Cynthia Lindsey. Glenn Lindsey observed some of Mr. Mangold's excavations in progress, and the Lindseys have allowed Dr. Hester to analyze the collections.

Prehistoric Site Sensitivity

Even though only one documented prehistoric site has been recorded in the Modified Eastern Bypass, it is probable that other sites exist. To provide a more detailed analysis of the relative prehistoric archaeological sensitivity of the Eastern Alternatives, SEA developed a sensitivity model using available soils data. Soils data was used because substantial human settlements tend to be situated on relatively level, relatively well drained soils near streams and water sources, but not in active flood danger zones. However, this does not mean that all archaeological sites are located in such settings because short-term and special purpose sites can be located in a variety of additional settings. Quantitatively, the Modified Eastern Bypass Route would cross 5.85 miles of soils classified as archaeologically high sensitive, which is more than SGR's Medina Dam Route (4.1 miles), slightly more than the Eastern Bypass Route (5.8 miles), and about the same as the MCEAA Medina Dam Route (5.8 miles).

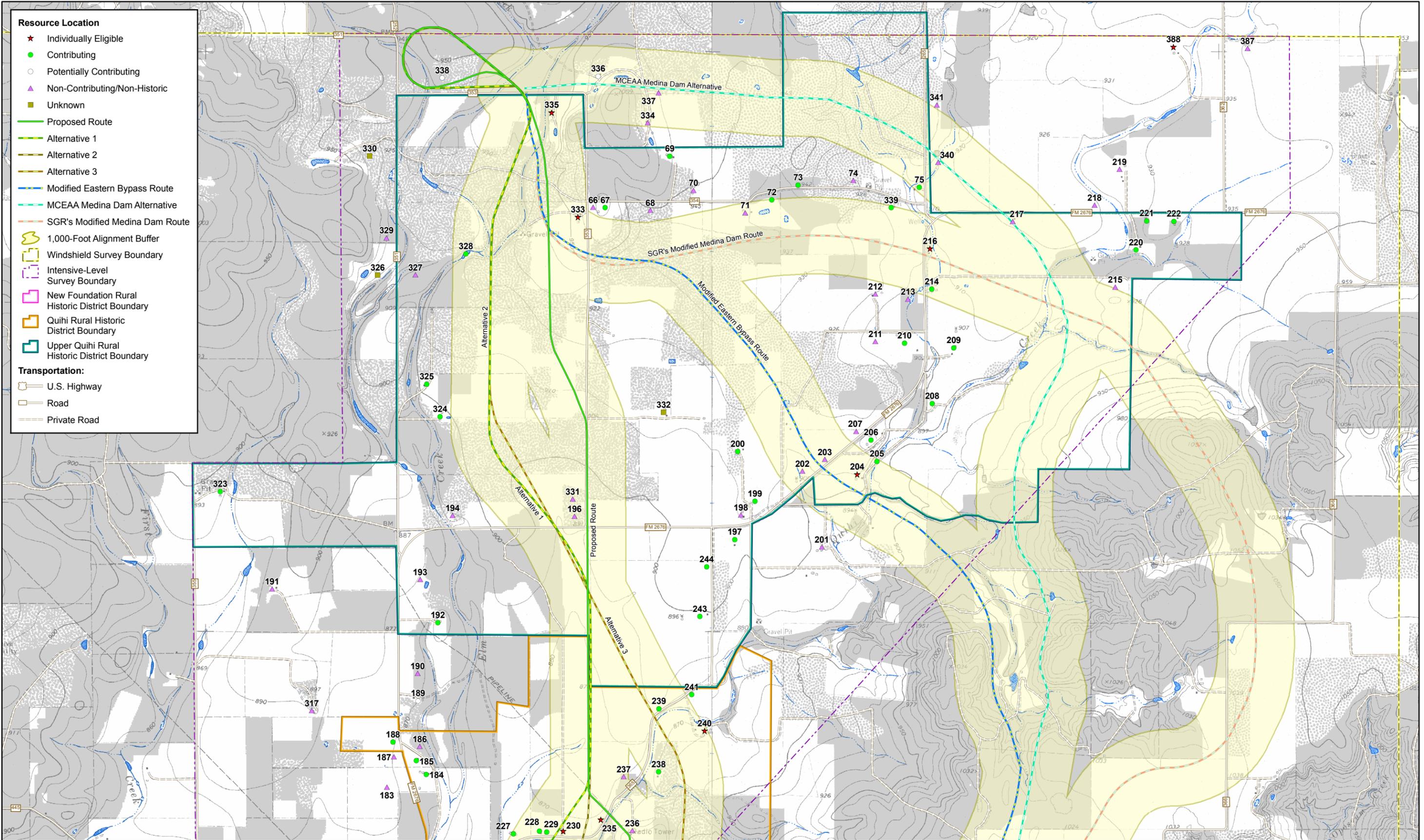
It should be emphasized that this sensitivity model is only intended as a general planning tool

to compare the multiple rail corridor alternatives. It does not attempt to depict the specific location of all archaeologically sensitive landforms. A more detailed depiction of archaeological sensitivity within the APE would require more detailed geomorphological analyses, in addition to the information presented here, including a systematic field survey. These surveys would be carried out only for the rail alternative(s) that are authorized and constructed, in accordance with the stipulations of the PA (See Appendix A-4 of this FEIS). Because portions of the Modified Eastern Bypass Route would cross drainage heads coming off the flat plateau, it would be more likely to contain prehistoric archaeological sites than any of the other Eastern Alternatives. (See Figures 2-7 and 2-8.)

2.5.1.15 Socioeconomics

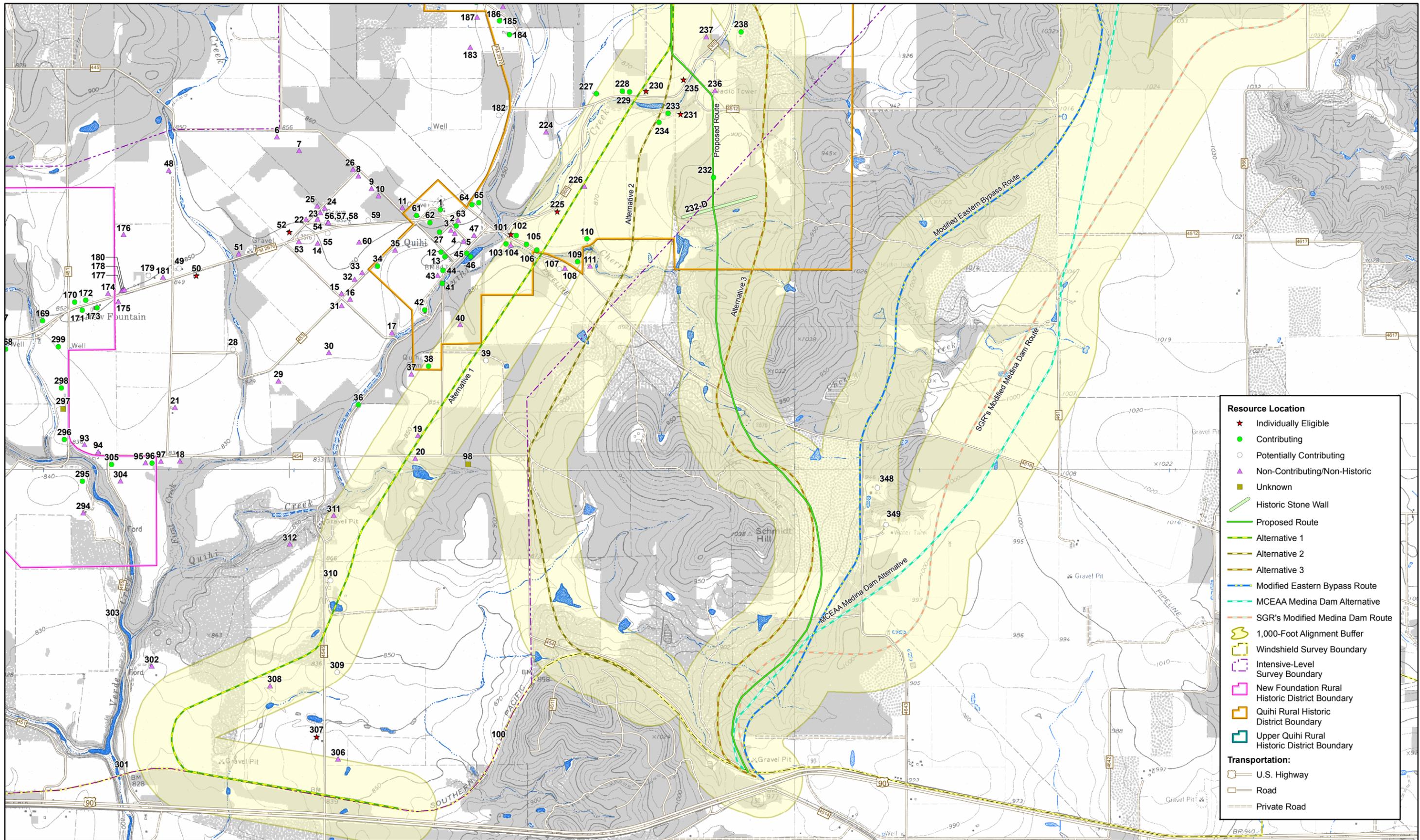
Section 3.12 of the DEIS and Section 3.15 of the SDEIS describe the socioeconomic characteristics (e.g., population, employment, and income) of the proposed project area.

Section 4.16 of the DEIS and Section 3.15 of the SDEIS describe socioeconomic impacts from construction and operation of the alternatives for the proposed rail line considered in those documents. Construction and operation of the Modified Eastern Bypass Route would result in essentially the same socioeconomic impacts as those described in the DEIS and SDEIS for the other alternatives. For the same reasons as those set forth in the DEIS and SDEIS, SEA concludes that construction and operation of the Modified Eastern Bypass Route would not significantly contribute to socioeconomic impacts within the proposed project area.



- Resource Location**
- ★ Individually Eligible
 - Contributing
 - Potentially Contributing
 - ▲ Non-Contributing/Non-Historic
 - Unknown
- Proposed Route**
- Proposed Route
 - Alternative 1
 - Alternative 2
 - Alternative 3
 - Modified Eastern Bypass Route
 - MCEAA Medina Dam Alternative
 - SGR's Modified Medina Dam Route
- Survey Boundaries**
- 1,000-Foot Alignment Buffer
 - Windshield Survey Boundary
 - Intensive-Level Survey Boundary
- Historic District Boundaries**
- New Foundation Rural Historic District Boundary
 - Quihi Rural Historic District Boundary
 - Upper Quihi Rural Historic District Boundary
- Transportation:**
- U.S. Highway
 - Road
 - Private Road

Figure 2-7
NRHP Status of Resources
in Intensive Level Survey Area
Quihi Vicinity, Medina County, Texas



Resource Location

- ★ Individually Eligible
- Contributing
- Potentially Contributing
- ▲ Non-Contributing/Non-Historic
- Unknown

Historic Stone Wall
 Proposed Route
 Alternative 1
 Alternative 2
 Alternative 3
 Modified Eastern Bypass Route
 MCEAA Medina Dam Alternative
 SGR's Modified Medina Dam Route
 1,000-Foot Alignment Buffer
 Windshield Survey Boundary
 Intensive-Level Survey Boundary
 New Foundation Rural Historic District Boundary
 Quihi Rural Historic District Boundary
 Upper Quihi Rural Historic District Boundary

Transportation:

- U.S. Highway
- Road
- Private Road

URS 9400 Amberglen Boulevard
Austin, TX 78729

File: P:\GIS Projects\SGR_SEIS\mxd\2007_10_03_Map5B-Contributing.mxd
Date: 10/11/2007 Design: JMW
Checked: DC
Senior: JJP



Figure 2-8
NRHP Status of Resources
in Intensive Level Survey Area
Quihi Vicinity, Medina County, Texas

2.6 Comparison of Alternatives

The following subsections compare all of the alternatives (including the No Action Alternative) that have been considered in the EIS process for this proceeding. As indicated previously, SGR has stated in writing (see #EI-2712 and #EI-3040) that it no longer seeks approval for the original preferred alignment (Proposed Route) through Quihi and does not oppose SEA's recommendation in the SDEIS to designate both the Eastern Bypass Route and the MCEAA Medina Dam Alternative as environmentally preferred routes. Of these two alternatives, SGR favors the Eastern Bypass Route. Subsequently, SGR advised SEA that it does not oppose the Weiblen Modification to the Eastern Bypass Route (designated as the Modified Eastern Bypass Route in this FEIS), which SEA also recommends as environmentally preferable. While authorization of the construction and operation of any of the rail alternatives studied in the DEIS is unlikely, SEA still provides summaries of the potential environmental impacts that could be caused by the construction and operation of each of the alternatives for each of the resource areas that have been evaluated.

2.6.1 Transportation and Traffic Safety

Table 2-7, below, presents a summary of transportation and traffic safety impacts that would be associated with construction and operation of the Proposed Route, Alternative 1, Alternative 2, Alternative 3, the Eastern Bypass Route, the Modified Eastern Bypass Route, the MCEAA Medina Dam Alternative, SGR's Modified Medina Dam Route, and the No-Action Alternative. Based upon SEA's analysis, due to fewer county road crossings and a lower risk of accidents, construction and operation of Alternative 2 would cause the fewest impacts to transportation and traffic safety, followed by Alternative 3, the Modified Eastern Bypass Route, the Proposed Route, the MCEAA Medina Dam Alternative, the Eastern Bypass Route, and Alternative 1. SGR's Modified Medina Dam Route would cause the most impacts to transportation and traffic safety because of the number and types of roadway crossings. However, construction and operation of any of the rail line alternatives, including SGR's Modified Medina Dam Route, would not cause significant transportation and traffic safety impacts.

As discussed in Section 4.1.4 of the DEIS, because of the large number of trucks that would be added to area roadways under the No-Action Alternative, SEA believes that the No-Action Alternative would have significant, adverse impacts on the transportation infrastructure and traffic safety of the area, and that these impacts would be worse than impacts resulting from the use of rail for the traffic at issue here.

Table 2-7. Transportation and Traffic Safety ^{a,b}

Routes	Routes Studied in the DEIS				Routes Studied in the SDEIS (Eastern Alternatives)				No-Action
	Proposed Route	Alternative 1	Alternative 2	Alternative 3	Eastern Bypass Route		MCEAA Medina Dam	SGR' s Modified Medina Dam	
					Eastern Bypass	Modified Eastern Bypass			
Length (miles)	7.5	9.0	7.0	7.5	9.2	9.1	9.9	10.9	---
Number of roads crossed (FM)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	---
Name of roads crossed (FM)	FM 2676 (P-S)	FM 2676 (P-S)	FM 2676 (P-S)	FM 2676 (P-S)	FM 2676 (P-S)	FM 2676 (P-S)	FM 2676 (P-S)	FM 2676 (P-S)	---
Number of roads crossed (CR)	6.0	7.0	4.0	5.0	6.0	4.0	5.0	7.0	---
Names of roads crossed (CR)	CR 454 (U), 4516 (P), 4512 (U), 365 (GS) 353 (2x) (GS)	CR 353 (GS), 365(GS), 4516 (P), 4517, 454 (U) 4545 (2x)	CR 353 (GS), 365 (GS), 4516 (P), 454 (U)	CR 353 (GS), 365 (GS), 4512 (P), 454 (U)	CR 353 (2x), 364, 4516, 4643, 454	CR 454, CR 4516, CR 364, CR 353 (2x)	CR 265, 461, 4516, 4643, 454	CR 353 (2x), 366 (2x), 4516, 4643, 454	---
Number of roads crossed (private)	3.0	4.0	2.0	2.0	11.0	10.0	10.0	8.0	---
Total Number of Roads Crossed	10.0	12.0	7.0	8.0	18.0	15.0	16.0	16.0	---
Number of single truck trips/day	48.0 (loc trk mkt)	48.0 (loc trk mkt)	48.0 (loc trk mkt)	48.0 (loc trk mkt)	48.0 (loc trk mkt)	48.0 (loc trk mkt)	48.0 (loc trk mkt)	48.0 (loc trk mkt)	1700.0
Risk of accident/year at-grade crossings	0.22	0.25	0.16	0.19	0.22	0.19	0.19	0.25	---
Risk of injury/year at-grade crossings	0.08	0.09	0.05	0.07	0.08	0.07	0.07	0.09	---

Table 2-7. Transportation and Traffic Safety ^{a,b} (Continued)

Routes	Routes Studied in the DEIS				Routes Studied in the SDEIS (Eastern Alternatives)				No-Action
	Proposed Route	Alternative 1	Alternative 2	Alternative 3	Eastern Bypass Route		MCEAA Medina Dam	SGR's Modified Medina Dam	
					Eastern Bypass	Modified Eastern Bypass			
Risk of fatality/year at-grade crossings	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.03	---
Risk of injury/year to human health & safety	0.05	0.06	0.05	0.05	0.06	0.06	0.07	0.07	2.60
Risk of fatality/year to human health & safety	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.10
Risk of injury/year (loc trk mkt)	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Risk of fatality/year (loc trk mkt)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Risk of injury/year (Employee Vehicles)	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61
Risk of fatality/year (Employee Vehicles)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Vehicular Delay at each grade crossing (minutes)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	---
Transportation & Traffic Safety Impacts	Not Significant								Significant

CR – County Road
GS – Gravel Surface

FM – Farm-to-Market
P – Paved P-S – Paved-State

U – Unimproved
loc trk mkt – Local truck market

(a) According to SGR, the track design would be based on the following: a maximum operating speed of 40 mph; an average operating speed of 25 mph; and an operating speed of 10 mph as trains approach and leave the quarry (i.e., crossing County Road 353). Based upon this information, SEA calculated that the delay times at at-grade intersections would range from 2.2 minutes, when the train would be at its maximum speed of 40 mph, to 8.9 minutes when the train would be

approaching or leaving the quarry at 10 mph (i.e., crossing County Road 353). However, based upon the average speed of 25 mph, most of the intersections would likely be blocked for approximately four minutes (as stated in Section 4.1.1 of the DEIS).

(b) Numbers have been rounded to the nearest hundredth.

2.6.2 Public Health and Safety

The degree of potential environmental impacts caused by rail construction often relates to the length of the project; therefore, the Proposed Route, Alternative 2, and Alternative 3 would be slightly more favorable than the other rail alternatives because they are shorter. With appropriate mitigation, SEA does not anticipate that any alternative would cause significant public health and safety impacts. However, the No-Action Alternative could cause the greatest adverse impacts due to the large number of trucks that would be needed to transport the aggregate, which would increase the risk for potential highway accidents. (See Table 2-8.)

Table 2-8. Public Health and Safety

Routes	Routes Studied in the DEIS				Routes Studied in the SEIS (Eastern Alternatives)				No-Action
	Proposed Route	Alternative 1	Alternative 2	Alternative 3	Eastern Bypass Route		MCEAA Medina Dam Alternative	SGR's Modified Medina Dam	
					Eastern Bypass	Modified Eastern Bypass			
Length (miles)	7.5	9.0	7.0	7.5	9.2	9.1	9.9	10.9	---
Criteria Air Pollutant Emissions from Construction	Short Duration								Short Duration
Chance of Train Collisions	Very small								----
Chance of Derailment	Very small								----
Public Health and Safety Impacts	Not Significant								Larger risk of accidents due to the large number of trucks

2.6.3 Hazardous Materials / Waste Sites and Existing Energy Resources

Table 2-9 presents a summary of the hazardous materials/energy resources impacts that would be associated with the construction and operation of the Proposed Route, Alternative 1, Alternative 2, Alternative 3, the Eastern Bypass Route, the MCEAA Medina Dam Alternative, SGR's Modified Medina Dam Route, the Modified Eastern Bypass Route, and the No-Action Alternative. SEA concludes that there is no risk of disturbing known hazardous materials or sites from the construction and operation of any of the rail alternatives or the No-Action Alternative, and that the potential for disturbing undocumented sites is extremely low. The rail line alternatives each would cross one active natural gas pipeline right-of-way, as well as one high-tension transmission line.

Table 2-9. Hazardous Materials/Energy Resources

Routes	Routes Studied in the DEIS				Routes Studied in the SDEIS (Eastern Alternatives)				No-Action
	Proposed Route	Alternative 1	Alternative 2	Alternative 3	Eastern Bypass Route		MCEAA Medina Dam	SGR's Modified Medina Dam	
					Eastern Bypass	Modified Eastern Bypass			
Length (miles)	7.5	9.0	7.0	7.5	9.2	9.1	9.9	10.9	---
Number of hazardous waste sites (500 ft.)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Number of hazardous-waste spill sites (500 ft.)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CERCLIS sites (500 ft.)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Impacts to energy resources	None								
High-tension transmission line Right-of-way crossings	1.0	1.0	1.0	1.0	2.0	1.0	2.0	2.0	---
Number of gas pipeline right-of-ways	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	---
Number of active pipelines	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Hazardous materials/energy resources impacts	Not significant								

2.6.4 Worker Health and Safety

Table 2-10 presents a summary of worker health and safety impacts that would be associated with construction and operation of the Proposed Route, Alternative 1, Alternative 2, Alternative 3, the Eastern Bypass Route, the Modified Eastern Bypass Route, the MCEAA Medina Dam Alternative, SGR's Modified Medina Dam Route, and the No-Action Alternative. The risk of non-fatal injuries and fatalities from construction activities (during the entire construction period) associated with any of the rail alternatives and the No-Action Alternative would be very minor. However, the risk of non-fatal injuries and fatalities associated with operations (over a 30-year operation life cycle) would be greater for truck transportation under the No-Action Alternative than for any of the rail transportation alternatives.

Table 2-10. Worker Health and Safety

Routes	Routes Studied in the DEIS				Routes Studied in the SEIS (Eastern Alternatives)				No-Action ^a
	Proposed Route	Alternative 1	Alternative 2	Alternative 3	Eastern Bypass Route		MCEAA Medina Dam Alternative	SGR's Modified Medina Dam	
					Eastern Bypass	Modified Eastern Bypass			
Length (miles)	7.5	9.0	7.0	7.5	9.2	9.1	9.9	10.9	---
Impacts from dust	Minor								Minor
Criteria air pollutant emissions from construction	Minor								Minor
Hazards associated with normal rail construction and operation activities	Minor								Minor
Chance non-fatal injuries related to construction (entire construction period)	Minor (1.5)								Minor Similar to rail alternatives
Chance fatalities related to construction (entire construction period)	Minor (less than 0.0005)								Minor Similar to rail alternatives
Fatalities related to construction and upgrade of roads	---	---	---	---	---	---	---	---	Not significant
Worker non-fatal injuries related to normal operation (30 years)	24	24	24	24	24	24	24	24	75
Worker fatalities related to normal operation (30 years)	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.22
Chance of worker injuries or fatalities	Not significant								
Worker health and safety impacts	Not significant								

(a) In the DEIS, SEA stated that the work force needed for construction activities under the No-Action Alternative would likely be larger than for the rail alternatives and that the construction activities would be longer in duration. Based on additional information provided by SGR about possible road upgrades under the No-Action Alternative and information regarding construction of the truck-to-rail remote loading facility, the record now shows that the work force for construction activities under the No-Action Alternative might not be larger than for the rail alternatives, and that construction activities would likely be completed in less time than would be needed for the rail line construction. This does not affect SEA's conclusion that the risk of injuries and fatalities associated with operations would be higher under the No-Action Alternative.

2.6.5 Water Resources

SEA concludes that Alternative 1 would be the rail route that has the potential to cause the greatest adverse impacts to surface waters because it would cross the greatest number of streamlines of higher order (five streamlines of orders 3 and 4).¹¹ Lower order crossings are easier to traverse without impact than higher order crossings. Crossings of lower order typically have fewer intermittent flows, and wider, more mature riparian zones. Alternative 2 and SGR's Modified Medina Dam Route would each have four higher order crossings. The Proposed Route, Alternative 3, the Eastern Bypass Route, the Modified Eastern Bypass Route, and the MCEAA Medina Dam Alternative would have the fewest higher order crossings (three each).

The MCEAA Medina Dam Alternative would cross the most streamlines of lower order (eight crossings of orders 1 and 2), followed by Alternative 3 (six crossings of order 1 and 2), the Proposed Route (five crossings of order 1 and 2), the Eastern Bypass Route, the Modified Eastern Bypass Route and SGR's Modified Medina Dam Route (three crossings each of orders 1 and 2), and finally Alternatives 1 and 2 (one crossing of orders 1 and 2).

As far as total number of streams, the MCAA Medina Dam Alternative would cross more intermittent streams/creeks (11 crossings) than any of the other rail alternatives, followed by Alternative 3 (9 crossings); the Proposed Route (8 crossings); SGR's Modified Medina Dam Route (7 crossings); Alternative 1, the Eastern Bypass Route, and the Modified Eastern Bypass Route (6 crossings, each); and Alternative 2 (5 crossings). (See Figure 2-4 and Table 2-11).

In terms of the amount of floodplain that would be crossed, the Eastern Alternatives (the Eastern Bypass Route, the Modified Eastern Bypass Route, the MCEAA Medina Dam Alternative, and SGR's Modified Medina Dam Route) would cross less floodplain than the four rail line alternatives studied in the DEIS (the Proposed Route, Alternative 1, Alternative 2, and Alternative 3). The MCEAA Medina Dam Alternative would cross the least length of floodplain (3,996 feet), followed by SGR's Modified Medina Dam Route (4,335 feet), the Eastern Bypass Route and the Modified Eastern Bypass Route (4,557 feet, each), the Proposed Route (6,220 feet), Alternative 2 (8,570 feet), Alternative 3 (9,970 feet), and Alternative 1 (12,220 ft). The Eastern Bypass Route and the Modified Eastern Bypass Route would cross the floodplain only twice while the other alternatives would cross the floodplain at least four times. (See Figure 2-3 and Table 2-11).

¹¹ Stream order is a method of numbering streams as part of a drainage basin network. The smallest unbranched mapped tributary is called first order; the stream receiving the tributary is called second order, and so on. Lower order streams typically have fewer intermittent flows, and wider, more mature riparian zones. Thus, lower order streams are easier to traverse without impact.

Table 2-11. Surface Water Resources

Routes	Routes Studied in the DEIS				Routes Studied in the SDEIS (Eastern Alternatives)				No-Action	Loading Loop ^(a)
	Proposed Route	Alternative 1	Alternative 2	Alternative 3	Eastern Bypass Route		MCEAA Medina Dam	SGR's Modified Medina Dam		
					Eastern Bypass	Modified Eastern Bypass				
Length (miles)	7.5	9.0	7.0	7.5	9.2	9.1	9.9	10.9	---	2.0
Number intermittent creeks/streams crossed	8.0	6.0	5.0	9.0	6.0	6.0	11.0	7.0	---	0
Number watersheds crossed	5.0	6.0	5.0	3.0	5.0	5.0	5.0	5.0	---	1
Number main stem creeks/streams crossed (order 3 and 4) ^(b)	3.0	5.0	4.0	3.0	3.0	3.0	3.0	4.0	---	0
Names of main stem creeks/streams crossed	Quihi Creek, Elm Creek, Polecat Creek	Quihi Creek, Elm Creek, Polecat Creek, Cherry Creek, Unnamed 2	Quihi Creek, Elm Creek, Polecat Creek, Cherry Creek	Quihi Creek, Elm Creek, Polecat Creek	Elm Creek, Polecat Creek, Quihi Creek, Cherry Creek	Elm Creek, Polecat Creek, Quihi Creek, Cherry Creek	Quihi Creek, Elm Creek, Polecat Creek	Elm Creek, Polecat Creek, Quihi Creek (twice)	---	---
Number of lower order stream crossings (order 1 and 2)	5.0	1.0	1.0	6.0	3.0	3.0	8.0	3.0	---	0
Number of floodplain crossing points	4.0	4.0	4.0	4.0	2.0	2.0	4.0	4.0	---	0
Floodplain length crossed ^(c)	6220.0	12,220.0	8570.0	9970.0	4557.0	4557.0	3996.0	4335.0	---	0
Surface water resources impacts	Not significant with appropriate mitigation								See below ^(d)	Not significant given that the loading loop has been moved away from the floodplain

- (a) The loading track would either be a two-mile loading loop or a series of one-mile parallel tracks. Because the exact configuration and location of the series of parallel tracks is not yet known, SEA has assessed impacts from the loading loop configuration. Recent information provided by SGR now indicates that the loading loop would no longer cross any streams. As per EI # 3225 in Appendix D and Figure 5-2 in Chapter 5 of this FEIS, stream crossings have been revised to reflect this new information on record.
- (b) Total number of stream crossings for each alternative rail route has been revised to eliminate crossings for the loading loop.
- (c) The floodplain lengths shown in this table have been updated to reflect that the loading loop has been moved off the floodplain and will no longer cross it. See Figure 5-2 in Chapter 5 and EI # 3225 in Appendix D of this FEIS.

(d) Greater impacts than proposed action because non-point source pollution deposits on roadways would be carried as runoff to local stream flow network. Maintenance activity on roadways would also impact water resources.

All of the rail alternatives would have a similar low risk of causing adverse impacts to groundwater resources. All of the rail alternatives would cross the same major and minor aquifers, and would avoid areas that are environmentally unfavorable. Implementing SEA's recommended mitigation could further reduce potential impacts. The No-Action Alternative would have the greatest potential for adverse impacts to groundwater due to the increased truck traffic. (See Table 2-12).

Table 2-12. Groundwater Resources

Routes	Routes Studied in the DEIS				Routes Studied in the SDEIS (Eastern Alternatives)				No-Action	Loading Loop ^(a)
	Proposed Route	Alternative 1	Alternative 2	Alternative 3	Eastern Bypass Route		MCEAA Medina Dam	SGR's Modified Medina Dam		
					Eastern Bypass	Modified Eastern Bypass				
Length (miles)	7.5	9.0	7.0	7.5	9.2	9.1	9.9	10.9	---	2.0
Number of major or minor groundwater spring sites along or near the routes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	0.0
Number of major or minor aquifers crossed	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	---	2.0
Names of aquifers crossed	Edwards (artesian zone) and Leona Gravel Aquifers									
Construction impacts	Minimal									
Operational impacts	Minimal									
Avoids areas that are environmentally unfavorable	Yes									
Groundwater resources impacts	Not significant with appropriate mitigation									

(a) The loading track would either be a two-mile loading loop or a series of one-mile parallel tracks. Because the exact configuration and location of the series of parallel tracks is not yet known, SEA has assessed impacts from the stream crossings of the loading loop configuration.

Based on SEA's analysis of wetland resources, the alternatives were ranked from the least to the greatest impacts, according to the number of aquatic features crossed. The following conclusions

summarize SEA’s analysis: Alternative 3 would have the least impacts of all the rail alternatives on wetlands because it would not cross any aquatic features. SGR’s Modified Medina Dam Route and the Modified Eastern Bypass Route each would cross one aquatic feature. The Proposed Route, Alternative 2, the Eastern Bypass Route, and the Modified Eastern Bypass Route all would cross two aquatic features. Alternative 1 would cross three aquatic features and the MCEAA Medina Dam Alternative would cross four aquatic features. The No-Action Alternative would not cross any aquatic features, but has the potential to add pollutants to nearby wetlands from maintenance and widening of roads, and from the water that would be used to control dust emissions. (See Figure 2-5 of this FEIS and Table 2-13 below).

Table 2-13. Wetland Resources

Routes	Routes Studied in the DEIS				Routes Studied in the SEIS (Eastern Alternatives)				No-Action
	Proposed Route	Alternative 1	Alternative 2	Alternative 3	Eastern Bypass Route		Medina Dam Alternative	SGR’s Modified Medina Dam	
					Eastern Bypass	Modified Eastern Bypass			
Length (miles)	7.5	9.0	7.0	7.5	9.2	9.1	9.9	10.9	---
Number of aquatic features crossed (NWI)	2.0	3.0	2.0	0.0	2.0	1.0	4.0	1.0	0.0
Construction impacts	Minimal								Road improvements could add pollutants to wetlands near existing streams.
Operation impacts	Not significant								Impacts could arise from dust emissions generated by truck traffic and possible water resources for controlling dust.

2.6.6 Biological Resources

Based upon SEA’s analysis, the alternatives and modification were ranked from those routes that would have the greatest impacts to those that would have the least impact (see Table 2-14, below). Because each of the rail route alternatives would cross potentially suitable habitat for two state-listed species, the Texas Tortoise and Texas Horned Lizard, SEA used the total acreage that would be disturbed per alternative as the basis for comparison.

Based upon the need for a remote truck-to-rail loading facility, a material stockpile site near the UP line and U.S. Highway 90, and road widening, the No-Action Alternative would impact the greatest amount of potential habitat, which would total a minimum of 125 acres (including 100 acres for the remote truck-to-rail loading facility and 25 acres for rail tracks that would be needed to connect to the existing UP line), plus additional undetermined acreage for road widening. SGR's Modified Medina Dam Route would be ranked second with the potential to impact approximately 52.9 acres. The MCEAA Medina Dam Alternative would be ranked third with the potential to impact approximately 48 acres. The following alternatives and modification are listed in order, ranking from fourth through eighth: the Eastern Bypass Route and Modified Eastern Bypass Route (approximately 44.6 acres), Alternative 1 (approximately 44 acres), Alternative 3 (approximately 34 acres), the Proposed Route (approximately 32 acres), and Alternative 2 (approximately 30 acres).

Table 2-14. Biological Resources

Routes	Routes Studied in the DEIS				Routes Studied in the SDEIS (Eastern Alternatives)				No-Action
	Proposed Route	Alternative 1	Alternative 2	Alternative 3	Eastern Bypass Route		MCEAA Medina Dam	SGR's Modified Medina Dam	
					Eastern Bypass	Modified Eastern Bypass			
Length (miles)	7.5	9.0	7.0	7.5	9.2	9.1	9.9	10.9	---
Temporary displacement of biological habitat (acres) ^(a)	64.0	82.0	62.0	68.0	89.2	88.68	96.0	105.7	---
Permanent displacement of biological habitat (acres)	32.0	44.0	30.0	34.0	44.6	44.3	48.0	52.9	125.0 (truck-to-rail remote loading)
Impacts from construction	Minimal disturbance to Texas Tortoise and Texas Horned Lizard Habitats								Additional permanent habitat displacement for road widening
Operation impacts related to potential of striking animals and risks from mowing and vegetation control	Minimal								Greater than for rail line alternatives
Sensitive plant communities (yes/no)	No								---
Sensitive wildlife resources (yes/no)	No								---
Threatened and endangered species	Not likely to adversely affect								---
Disturbance to Texas Tortoise and Texas Horned Lizard habitats during operation	Minimal								
Biological Resources impacts	Not significant with appropriate mitigation								Not significant

(a) These areas do not include the 22 acres of disturbance from the rail loading area.

2.6.7 Air Quality

Table 2-15, below, provides a summary of the potential impacts to air quality from the Proposed Route, Alternative 1, Alternative 2, Alternative 3, the Eastern Bypass Route, the Modified Eastern Bypass Route, the MCEAA Medina Dam Alternative, SGR's Modified Medina Dam Route, and the No-Action Alternative. Air quality impacts are largely a function of the length of the route. Operations over the Proposed Route and Alternatives 2 and 3 would produce the fewest mobile source emissions, followed by Alternative 1, the Modified Eastern Bypass Route, the Eastern Bypass Route, the MCEAA Medina Dam Alternative, and lastly, SGR's Modified Medina Dam Route. However, none of the operations of the rail routes would exceed 100 tons-per-year of any criteria pollutant, which is EPA's major emission-source threshold for Title V permit applicability, and the threshold for significance that SEA used here. Furthermore, the mitigation measures recommended (see chapter 1 of this FEIS), would further reduce these impacts.

Proposed truck operations under the No-Action Alternative would cause significantly greater air emissions from mobile sources, and would also produce significant air emissions from truck loading and unloading activities.

Table 2-15. Air Quality

Routes	Routes Studied in the DEIS				Routes Studied in the SDEIS (Eastern Alternatives)				No-Action
	Proposed Route	Alternative 1	Alternative 2	Alternative 3	Eastern Bypass Route		MCEAA Medina Dam	SGR's Modified Medina Dam	
					Eastern Bypass	Modified Eastern Bypass			
Length (miles)	7.5	9.0	7.0	7.5	9.2	9.1	9.9	10.9	---
Mobile source emissions (NOx) (ton/year)	50.0	61.1	50.0	50.0	62.2	61.6	66.1	71.6	337.0
Mobile source emissions (CO) (ton/year)	28.5	34.9	28.5	28.5	35.5	35.2	37.7	40.9	1306.0
Mobile source emissions (PM) (ton/year)	2.6	3.1	2.6	2.6	3.2	3.2	3.4	3.7	8.4
Mobile source emissions (HC) (ton/year)	7.5	9.2	7.5	7.5	9.3	9.2	9.9	10.7	109.5
Rail loading emissions (PM) (ton/year)	27.7	27.7	27.7	27.7	27.7	27.7	27.7	27.7	---
Truck loading emissions-paved road (PM) (ton/year)	---	---	---	---	---	---	---	---	1316.01
Truck loading emissions-Non-paved road (PM) (ton/year)	---	---	---	---	---	---	---	---	3181.6
Construction impacts	Not significant								
Operation impacts	Minor								Significant

2.6.8 Geologic Hazards and Soils

None of the rail alternatives would cross the Escondido Formation outcrop where landslide hazards have the potential to occur.

2.6.9 Karst Features

As shown in Table 2-16, none of the alternatives studied would cause adverse impacts to karst features. The MCEAA Medina Dam Alternative would cross less area that is susceptible to karst feature development than the other rail alternatives.

Table 2-16. Karst Features

Routes	Routes Studied in the DEIS				Routes Studied in the SEIS (Eastern Alternatives)				No-Action
	Proposed Route	Alternative 1	Alternative 2	Alternative 3	Eastern Bypass Route		MCEAA Medina Dam	SGR's Modified Medina Dam	
					Eastern Bypass	Modified Eastern Bypass			
Length (miles)	7.5	9.0	7.0	7.5	9.2	9.1	9.9	10.9	---
Sensitive karst features crossed within 1 mile	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---
Impacts to karst features with recommended mitigation	None								---
Karst features impacts	No impacts								No impacts

2.6.10 Land Use

Table 2-17, below, provides a summary of potential impacts on land use from each of the alternatives that has been studied. Due to its shorter length, Alternative 2 would disturb the least amount of land. However, the MCEAA Medina Dam Alternative would impact the least acreage of prime farmland soil, and Alternative 3 and the Proposed Route received the lowest Farmland Conversion Impact Rating (FCIR) (best) scores from the NRCS. The Proposed Route would cross the least number of properties not owned by SGR or its affiliates. Alternative 1 has the least number of houses within 0.5 miles from the alignment and within one mile of the alignment. The No-Action Alternative would cause the greatest impacts to land use because it would permanently alter the land use of approximately 125 acres of shrub and brush rangeland for the remote truck-to-rail loading facility, and the rail tracks needed for the UP connection, and would require alteration to an undetermined acreage for necessary road widening and upgrades.

NRCS reviewed seven rail alternatives (all but the Modified Eastern Bypass Route) to determine impacts to prime farmlands. Based on this, SEA calculated the impact to farmlands from the Modified Eastern Bypass Route to be 63.6 acres. As stated in the DEIS and the FEIS, SEA calculated the prime farmland impacted by the Modified Eastern Bypass Route by overlaying the route on Prime Farmland Soils data provided by the NRCS and utilizing the right-of-way width. SEA concludes that none of the alternatives would significantly impact prime farmland soils in the area because none of the alternatives exceeds NRCS thresholds of significance (i.e., a NRCS score of 160 or greater).

Table 2-17. Land Use

Routes	Routes Studied in the DEIS				Routes Studied in the SEIS (Eastern Alternatives)				No-Action
	Proposed Route	Alternative 1	Alternative 2	Alternative 3	Eastern Bypass Route		MCEAA Medina Dam Alternative	SGR's Modified Medina Dam	
					Eastern Bypass	Modified Eastern Bypass			
Length (miles)	7.5	9.0	7.0	7.5	9.2	9.1	9.9	10.9	---
Temporary area disturbed length x 80 ft right-of-way (ac), excluding loading track ^(a)	64.0	82.0	62.0	68.0	89.2	88.68	96.0	105.7	---
Permanent area disturbed (ac), excluding loading track ¹⁶	32.0	44.0	30.0	34.0	44.6	44.3	47.9	52.9	125 (remote rail-to-truck loading facility and tracks, without including additional acreage for road widening)
Prime farmland soils impacted (NRCS) (ac) ^(b)	48.6	77.2	59.2	48.4	48.0	63.6	35.0	69.0	79
Important farmland AD-1006 score (NRCS)	123.0	142.0	138.0	120.0	130.0	<142	125.0	134.0	---

(a) Land use displaced does not consider the 22 acres associated with the rail loading area.

(b) SEA notes that NRCS used a 100-foot right-of-way to compute the amount of prime farmland acreage that would be impacted by each of the Eastern Alternatives, as opposed to the 80-foot right-of-way that was used to compute the amount of acreage that would be impacted by the other rail alternatives. While use of an 80-foot right-of-way could yield slightly different numbers in terms of acreage of prime farmland soils impacted by each of the Eastern Alternatives, these different numbers would not change SEA's overall results or conclusions.

Table 2-17. Land Use (Continued)

Routes	Routes Studied in the DEIS				Routes Studied in the SEIS (Eastern Alternatives)				No-Action
	Proposed Route	Alternative 1	Alternative 2	Alternative 3	Eastern Bypass	Modified Eastern Bypass	MCEAA Medina Dam Alternative	SGR's Modified Medina Dam	
Total number of properties crossed according to Medina County Appraisal District	22.0	31.0	24.0	24.0	32.0	32.0	22.0	26.0	Creekwood subdivision is within 1 mile of remote truck-to-rail loading facility and 3 residences are within ½ mile from the facility
Number of properties crossed (not owned by SGR or affiliates)	10.0	20.0	18.0	16.0	30.0	30.0	20.0	24.0	---
Number of properties bisected by the rail line	11.0	23.0	23.0	23.0	32.0	26.0	22.0	26.0	---
Houses within 0.5 miles (based on updated 2004 aerials) ^(a)	74.0	41.0	104.0	88.0	78.0	71	72.0	76.0	3.0 (remote loading facility)
Houses within 1.0 miles (based on updated 2004 aerials)	190.0	103.0	169.0	182.0	167.0	166	145.0	166.0	Creekwood subdivision
Adverse impacts that could not be fully mitigated	Potentially for all rail alternatives								Greater adverse impacts than any of the rail line alternatives

(a) The number of houses within ½ and 1 mile of each alignment presented in the DEIS were updated based on the most current aerial photography available (2004) and field visit verifications conducted in 2006.

2.6.11 Environmental Justice

SEA determined that there are no environmental justice communities of concern within the project area and, thus, that none of the alternatives would cause disproportionately high and adverse human health or environmental effects on environmental justice communities.

2.6.12 Noise and Vibration

Construction and operation of Alternative 3 would cause the fewest noise impacts, followed by the Modified Eastern Bypass Route and then by the Proposed Route. Alternative 2, the Eastern Bypass Route, the MCEAA Medina Dam Alternative, and SGR's Modified Medina Dam Route would cause slightly greater noise impacts than Alternative 3, the Modified Eastern Bypass Route, and the Proposed Route, but less than Alternative 1 and the No-Action Alternative. Potential noise impacts from construction and operation of Alternative 1 would be more than for any of the other rail line alternatives, although the No-Action Alternative would cause more noise impacts than any of the rail alternatives.

Operation over Alternative 1 would cause vibration impacts to two houses. None of the other rail alternatives would create operations-related vibration impacts. Conventional construction activities under any of the rail alternatives or the No-Action alternative would not cause vibration impacts; pile driving activities could cause impacts to water wells, although potential impacts would be reduced by SEA's recommended Mitigation Measure #F-75. (See noise and vibration report in Appendix C-3 of the SDEIS for additional information).

2.6.13 Recreational and Visual Resources

As indicated in the DEIS and SDEIS, none of the alternatives studied would cause significant adverse impacts on recreation and visual resources. However, increased truck traffic from the No-Action Alternative could be perceived as worse than any of the rail alternatives with respect to visual resources.

2.6.14 Cultural Resources

Table 2-18 summarizes all of the information that SEA has gathered concerning historic and prehistoric cultural resources in the region that would be crossed by the rail alternatives and the No-Action Alternative. This table illustrates that Alternative 1 and the No-Action Alternative would have the most potential impacts on cultural resources. Alternative 1 would be located near many more known and suspected historic structures (over twice as many as any other alternative); it would intersect the largest acreage within two historic districts (including the core of original Quihi); and it would cross the most amount of terrain that has high potential for containing archeological resources. The No-Action Alternative would likely have fewer archaeological impacts (because it would probably involve less ground disturbance than the rail alternatives), but would have a greater impact on the historic districts due to extensive modification of the historic road network that would be needed and the potential visual and vibration impacts that would result (depending upon the distance from the roadway to the individual historic structures), as well as the effects of high volumes of truck traffic.

Alternative 2 is ranked second highest in potential cultural resources impacts. Although it ranks fourth in total historic district acreage impacted, it is second in the number of individual National Register-eligible resources within the APE¹² and has higher potential to affect archaeological resources.

The Proposed Route and Alternative 3 are ranked third and fourth, respectively, in potential cultural resources impacts. They would both traverse relatively large areas within two historic districts, but would be situated further east from the core of the Quihi Rural Historic District than Alternative 1 and Alternative 2, and would encounter fewer individual National Register-eligible resources.

¹² The APE was defined as 1000 feet on either side of each alignment to coincide with the historic resources assessments that were completed for the Proposed Route, and Alternatives 1-3 (see DEIS, Section 3.11, Section 4.15, and Appendix I). Thus, the APE for each route is a corridor about 2000 feet in width.

The Eastern Alternatives would have significantly fewer cultural resources impacts than the original four rail routes studied. The Modified Eastern Bypass Route is ranked fifth highest among all of the alternatives in potential cultural resources impacts. Although SGR's Modified Medina Dam Route (which is ranked seventh, along with the MCEAA Medina Dam Alternative) would have more acreage within the Upper Quihi Rural Historic District than the Modified Eastern Bypass Route, the Modified Eastern Bypass Route would likely have a greater impact because it would intersect an older portion of the district in relatively close proximity to two German-Alsatian farms and an historic road remnant. It is also more likely to include a higher number of prehistoric and historic archaeological sites.

The original Eastern Bypass Route is ranked sixth highest in potential cultural resources impacts. As was the case for the Modified Eastern Bypass Route, although SGR's Modified Medina Dam Route (which is ranked seventh, along with the MCEAA Medina Dam Alternative) would have more acreage within the Upper Quihi Rural Historic District than the Eastern Bypass Route, the Eastern Bypass Route would likely have a greater impact because it would intersect an older portion of the district in relatively close proximity to two German-Alsatian farms and an historic road remnant. Similarly, it is more likely to include a higher number of prehistoric and historic archaeological sites than the MCEAA Medina Dam Alternative and SGR's Modified Medina Dam Route, but fewer than the Modified Eastern Bypass Route.

SGR's Modified Medina Dam Route and the MCEAA Medina Dam Alternative are ranked seventh, the least likely of all the alternatives to have potential cultural resource impacts. The SGR Modified Medina Dam Route would cross FM 2676 and Quihi Creek in a portion of the landscape that has more modern landscape elements, such as more widely-spaced farms, larger open fields, and fewer visual boundaries. The MCEAA Medina Dam Alternative would cross more archaeologically sensitive terrain than the SGR Modified Medina Dam Route, but it would skirt the northern and eastern margins of the Upper Quihi Rural Historic District. Assuming that the Board authorizes one or more of the Eastern Alternatives, and that SGR decides to build and operate one of those routes, the PA, which has been signed by all the necessary parties, sets up the process that will be used to identify and mitigate potential effects on historic resources.

Table 2-18. Cultural Resources

Routes	Routes Studied in the DEIS				Routes Studied in the SEIS (Eastern Alternatives)				No-Action
	Proposed Route	Alternative 1	Alternative 2	Alternative 3	Eastern Bypass Route		MCEAA Medina Dam Alternative	SGR's Modified Medina Dam	
					Eastern Bypass	Modified Eastern Bypass			
Length (miles).	7.5	9.0	7.0	7.5	9.2	9.1	9.9	10.9	---
Known Prehistoric Sites within about 1000 feet (National Register eligible).	None	None	None	41ME133 (100 ft east)	None	41ME132	None	None	---

Table 2-18. Cultural Resources (Continued)

Routes	Routes Studied in the DEIS				Routes Studied in the SEIS (Eastern Alternatives)				No-Action
	Proposed Route	Alternative 1	Alternative 2	Alternative 3	Eastern Bypass Route		MCEAA Medina Dam Alternative	SGR's Modified Medina Dam	
					Eastern Bypass				
Overall Ranking of Potential Archaeological Site impacts (1=highest).	3	1	2	4	7	5	6	8	Possibly less impacts than rail alternatives.
Known Historic Resources.	7	22	10	8	7	9	5	8	---
National Register Listed Historic Resources.	1	0	1	0	0	0	0	0	---
Total Acreage of Rural Historic District(s) Crossed.	1169	1280	1161	1217	709	709	636	863	More impact on districts than rail alternatives.
Overall Ranking of Cultural Resources Impacts.	3	1	2	4	6	5	7	7	1

2.6.15 Socioeconomics

All of the alternatives studied would cause similar impacts on the socioeconomics of the region.

2.7 Environmentally Preferable Alternative(s)

SEA has conducted a thorough environmental review of seven rail line alternatives and one modification to the Eastern Bypass Route (the Proposed Route, Alternative 1, Alternative 2, Alternative 3, the Eastern Bypass Route, the Modified Eastern Bypass Route, the MCEAA Medina Dam Alternative, and SGR's Modified Medina Dam Route), as well as the No-Action Alternative (i.e., the use of trucks to transport limestone from VCM's quarry to the UP rail line), as presented in the DEIS, SDEIS, and this FEIS.

As explained in detail in Section 6.2 of the SDEIS, SEA's analysis indicates that the No-Action Alternative would have the potential to cause much greater environmental impacts than any of the rail route alternatives studied. Due to the large amount of truck traffic that would be needed to transport limestone from the quarry to the UP rail line under this alternative (i.e., approximately 850 loaded and 850 empty trucks per day), the No-Action Alternative would cause significant adverse impacts on the

transportation infrastructure and traffic safety of the project area, and would produce significant emissions of criteria air pollutants. Truck transportation also would have the potential to cause more adverse impacts on groundwater and surface water from non-point source pollutants (e.g., oils, greases, and rubber) that would be deposited on area roadways and carried as runoff into the local streamflow network. Moreover, construction of the remote truck-to-rail loading facility that would be necessary under the No-Action Alternative would destroy more potential biological habitat than would construction of any of the rail route alternatives, and visual impacts from operation of trucks and construction of the facility would likely also be greater than for the proposed rail route alternatives.

In addition, the truck operations would cause more adverse noise impacts than the rail route alternatives. The No-Action Alternative would also have a greater impact on both historic districts due to roadway upgrades that would extensively modify the historic road network, and the visual and auditory effects of the high-volume truck traffic. Thus, based upon the aforementioned reasons, SEA concludes that the No-Action Alternative is less preferable from an environmental standpoint than construction and operation of the proposed rail line under any of the rail alternatives.

Of the rail line alternatives that SEA has studied, it appears that Alternative 1 has the potential to cause the greatest environmental impacts. Alternative 1 would cross the largest number of streamlines of higher order, as well as the most acres of floodplain. In addition, potential adverse noise impacts from operations over Alternative 1 would be greater than for any of the other rail alternatives, and operations over Alternative 1 would cause vibration impacts to two houses within the area. Construction and operation of Alternative 1 would also cause the greatest impact on cultural resources. This route would be located near many known and suspected historic structures; intersect a large acreage within two historic districts (including the core of original Quihi); and would cross the most acres of terrain that have high potential for containing archeological resources. Thus, SEA concludes that Alternative 1 is the least environmentally preferable rail route alternative.

The Proposed Route, Alternative 2, Alternative 3, and the Eastern Alternatives (the Eastern Bypass Route, the Modified Eastern Bypass Route, the MCEAA Medina Dam Alternative, and SGR's Modified Medina Dam Route) would each have certain advantages and disadvantages over the other rail routes studied. Due to fewer county road crossings and a lower risk of accidents, construction and operation of Alternative 2 would cause the fewest impacts to transportation and traffic safety of any of the rail alternatives. Alternative 3 would have the fewest impacts to wetland resources because it would not cross any aquatic features or stock ponds. Alternative 3, the Modified Eastern Bypass Route, and the Proposed Route would cause the least amount of adverse noise impacts to noise sensitive receptors from rail operations. The Proposed Route would cross the fewest number of private properties that are not owned by SGR or its affiliates.

On the other hand, all Eastern Alternatives, including the Modified Eastern Bypass Route, would cause significantly fewer impacts to cultural resources and would also have fewer impacts on the 100-year floodplain than the Proposed Route, Alternative 2, or Alternative 3, SGR's Modified Medina Dam Route and the MCEAA Medina Dam Alternative would cause the fewest impacts to cultural resources of any of the rail alternatives; the MCEAA Medina Dam Alternative would also be the least intrusive to the historic districts and would cross the least amount of floodplain. The Eastern Bypass Route and the Modified Eastern Bypass Route have the potential to cause somewhat more cultural resource impacts than the other two Eastern Alternatives, but would have fewer floodplain crossing points than any of the other alternatives. The Eastern Alternatives also are all slightly longer (ranging from 9.2 to 10.9 miles) than the Proposed Route, Alternative 2, and Alternative 3 (ranging from 7 to 9 miles), and thus have the potential to cause proportionally greater environmental impacts in the areas of transportation and traffic safety, biological resources, air quality, and land use.

Although the somewhat longer lengths of the Eastern Alternatives would result in greater environmental impacts than the Proposed Route, Alternative 2, and Alternative 3 in some resource areas, as discussed throughout the DEIS and SDEIS, SEA believes that the majority of potential environmental impacts from the construction and operation of the proposed rail line under any of the alternatives would either be minimal or could be substantially reduced through SEA's recommended mitigation. Moreover, SEA does not believe that the increased impacts from the slightly longer lengths of the Eastern Alternatives would be significantly different from the impacts that would be caused by the construction and operation of the Proposed Route, Alternative 2, or Alternative 3. SEA concludes that these differences in terms of transportation and traffic safety, biological resources, air quality and land use impacts would be minor.

On the other hand, as discussed in Chapter 5 of the SDEIS, SEA's analysis shows that the historic districts, particularly the Quihi Rural Historic District, are a significant resource in the project area. Thus, the fact that the Eastern Alternatives (including the Modified Eastern Bypass Route) would cause fewer impacts to cultural resources and would not traverse the boundaries of the Quihi Rural Historic District, indicates that the Eastern Alternatives would be environmentally preferable to the Proposed Route, Alternative 2, and Alternative 3. Furthermore, as stated previously, SGR has stated in writing (see #EI-2712 and #EI-3040) that it no longer seeks approval for the original preferred alignment (Proposed Route) through Quihi and does not oppose SEA's recommendation in the SDEIS to designate both the Eastern Bypass Route and the MCEAA Medina Dam Alternative as environmentally preferable routes. Of these two alternatives, SGR favors the Eastern Bypass Route. Subsequently, SGR has advised SEA that it does not oppose the Weiblen Modification to the Eastern Bypass Route (designated as the Modified Eastern Bypass Route in this FEIS), which SEA also recommends as environmentally preferable.

As stated above, and in the DEIS and SDEIS, aside from the potential impacts to cultural resources (especially the Quihi Rural Historic District), SEA believes that the potential impacts from the construction and operation of the rail line under each of the alternatives that have been studied would generally be similar and relatively minor. Because all of the Eastern Alternatives, including the Modified Eastern Bypass Route, would avoid traversing the Quihi Rural Historic District, SEA believes that these routes are environmentally preferable to all of the routes originally studied in the DEIS.

SEA has compared the Eastern Alternatives in terms of potential impacts to the other environmental resource areas assessed in this FEIS to determine whether one or more of the Eastern Alternatives should be designated as the most environmentally preferable alternative. SEA's analysis shows that SGR's Modified Medina Dam Route would cause more impacts to transportation and traffic safety than the Eastern Bypass Route, the Modified Eastern Bypass Route, or the MCEAA Medina Dam Alternative; would require more higher order stream crossings; and is the longest of the Eastern Alternatives (which would cause slightly more environmental impacts in certain resource areas, as discussed above). Thus, SEA believes that SGR's Modified Medina Dam Route is the least environmentally preferable of the three Eastern Alternatives.

The Eastern Bypass Route and the Modified Eastern Bypass Route would have fewer floodplain crossing points than the MCEAA Medina Dam Alternative; would cross fewer aquatic features; would have fewer total stream crossings; and would be slightly shorter in length. The Modified Eastern Bypass Route would cross fewer aquatic features than the original Eastern Bypass Route. The Modified Eastern Bypass Route and the MCEAA Medina Dam Alternative would have slightly fewer impacts to transportation and traffic safety than the Eastern Bypass Route. On the other hand, the MCEAA Medina Dam Alternative would cross a smaller amount of floodplain; would impact prime farmland soils to a lesser degree; would cross less area that is susceptible to karst feature development, would have less overall impacts to existing land uses; and would have slightly fewer impacts to cultural resources than the Eastern Bypass Route and the Modified Eastern Bypass Route.

However, all of the information available shows that these distinctions are not sufficient to differentiate among these three routes and designate either the Eastern Bypass Route (including the Modified Eastern Bypass Route or the MCEAA Medina Dam Alternative as the sole environmentally preferable alternative. Thus, it is appropriate to designate the Eastern Bypass Route (including the Modified Eastern Bypass Route) and the MCEAA Medina Dam Alternative) as the environmentally preferable alternatives out of all of the alternatives plus the No Action Alternative studied in the environmental review process for this proceeding.