

### 3.0 CUMULATIVE IMPACTS ANALYSIS

As discussed in Section 1.5 of the Draft Environmental Impact Statement (DEIS) and Section 2.2 of this Final Environmental Impact Statement (FEIS), the Section of Environmental Analysis (SEA) has studied Vulcan Construction Materials, LP's (VCM's) proposed quarry as part of the cumulative impacts analysis. Because SEA has received numerous comments regarding potential impacts that could be caused by the construction and operation of VCM's quarry, SEA is providing an expanded discussion of the cumulative impacts analysis in this chapter.

The Council on Environmental Quality's (CEQ) regulations for implementing the National Environmental Policy Act (NEPA) require agencies to consider three types of impacts: direct, indirect, and cumulative. Direct and indirect impacts are caused by the action, either in the present or future;<sup>1</sup> whereas, a cumulative impact is "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."<sup>2</sup> To assist Federal agencies in assessing cumulative impacts under NEPA, CEQ developed a handbook entitled Considering Cumulative Effects under the National Environmental Policy Act (CEQ 1997).

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.<sup>3</sup> For example, a direct effect of the proposed action plus a direct effect of a nearby action can equal a cumulative effect associated with the proposed action. If a rail line construction project would cause destruction of a certain species' habitat and a nearby roadway construction would cause more destruction to that same species' habitat, it is likely that cumulative or additive effects to the species and its habitat would result from the project.

The CEQ's guidelines include the following 11 steps for conducting a cumulative impact analysis:

#### Scoping

- Step 1: Identify the significant cumulative effects associated with the proposed action and define the assessment goals.
- Step 2: Establish the geographic scope for the analysis.
- Step 3: Establish a time frame for the analysis.
- Step 4: Identify other actions affecting the resources.

#### Describing the Affected Environment

- Step 5: Characterize the resources, ecosystems, and human communities identified in scoping in terms of their response to change and capacity to withstand stresses.
- Step 6: Characterize the stresses affecting these resources, ecosystems, and human communities, and their relationship to regulatory thresholds.
- Step 7: Define a baseline condition for the resources, ecosystems, and human communities.

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<sup>1</sup> See 40 CFR 1508.8 at <http://www.epa.gov/lawsregs/search/40cfr.html>

<sup>2</sup> See 40 CFR 1508.7 at <http://www.epa.gov/lawsregs/search/40cfr.html>

<sup>3</sup> See Considering Cumulative Effects under the NEPA, p. 7 at <http://ceq.eh.doe.gov/nepa/ccnepa/sec1.pdf> (CEQ 1997)

### *Determining the Environmental Consequences*

- Step 8: Identify the important cause-and-effect relationships between human activities and resources, ecosystems, and human communities.
- Step 9: Determine the magnitude and significance of cumulative effects.
- Step 10: Modify or add alternatives to avoid, minimize, or mitigate significant cumulative effects.
- Step 11: Monitor the cumulative effects of the selected alternative and adapt management.

SEA followed the 11 steps in CEQ's guidelines in its evaluation of whether or not the potential impacts of the proposed rail line construction and operation in combination with other projects in the area would cumulatively result in significant adverse environmental impacts, as further described below.

### *Scoping (Steps 1 through 4)*

As explained in Section 4.17 of the DEIS, and in compliance with CEQ's steps 1 through 4, SEA consulted with local, state, and Federal agencies, as well as with Southwest Gulf Railroad Company (SGR), and conducted public outreach and scoping activities to identify other past, present, and reasonably foreseeable future actions within the proposed project area. SEA determined that VCM's proposed quarry was the only project planned or that was reasonably foreseeable to take place in the same geographic area and time frame as SGR's proposed rail line construction. SEA therefore determined that the proposed construction and operation of the quarry could result in cumulative impacts and based its cumulative impact analysis on the combined effects that the rail line and quarry would have on the environment.

SEA determined that the resource study area for assessing cumulative impacts would encompass the quarry to the north and the existing Union Pacific Railroad Company (UP) rail line to the south, and would extend west to east to include all of the rail line alternatives under consideration.

Commenters suggested including rail traffic on the UP line through San Antonio as part of the cumulative impacts analysis. However, SEA has defined the geographic area for studying cumulative transportation and traffic safety impacts as the area from the new quarry to the existing UP rail line.

SEA does not believe that impacts on existing rail traffic in the San Antonio area need to be included in the cumulative impacts analysis for this proceeding. San Antonio is not within the geographic area of this project. Moreover, any such impacts on rail traffic in San Antonio would occur regardless of the proposed action and thus would not be caused by the proposed action itself. As explained in Section 4.18 of the DEIS, according to SGR, if the proposed rail line were not built (i.e., the No-Action Alternative), VCM would use trucks to transport the limestone aggregate from the quarry for approximately seven miles to the UP rail line that goes through San Antonio. Thus, the existing UP rail line through San Antonio would carry quarry traffic regardless of whether the proposed rail line is authorized and constructed. It is also worth noting that the existing UP line would experience only a minimal increase in rail traffic (4 trains per day) if this project is approved and implemented. Further, to the extent that its traffic increases, UP will have to comply with Federal Railroad Administration's (FRA's) safety requirements applicable to all active rail lines.

SEA established a five-year time frame (from the present to five years into the future) for assessing cumulative impacts, to encompass the phased in construction and operation of the proposed rail line and the quarry over the next five years. In addition, the five-year time frame was chosen because the Quihi area is a fast-growing portion of Medina County that currently does not have long-range planning or zoning. Therefore it is difficult to predict the condition in any given area beyond five years, and any such prediction would be speculative. Cumulative impacts include past, present, and reasonably foreseeable future actions, and other than the quarry and the proposed rail project, SEA has no specific information regarding any other existing or proposed development (including additional rail operations or their use by other potential

shippers) within the study area that would warrant inclusion as part of the cumulative impact analysis for this EIS.

**Describing the Affected Environment (Steps 5 through 7)**

In compliance with CEQ's steps 5 through 7, SEA's analysis incorporates the natural, cultural, social, and economic resources of the study area; a characterization of the important environmental or social factors; a description of pertinent regulations, administrative standards, and current development plans; and data on environmental and socioeconomic trends. Chapter 3 of the DEIS and Chapters 3, 4, and 5 of the Supplemental Draft Environmental Impact Statement (SDEIS) discuss the affected environment with regard to transportation of materials, energy resources, water resources, biological resources, physical resources, cultural resources, and socioeconomics. Chapter 4 of the SDEIS includes a detailed assessment of the noise environment, and Appendix F-2 of the SDEIS provides a detailed account of the historic landscapes. Section 4.17.1 of the DEIS contains information about past, present, and reasonably foreseeable future actions pertaining to the construction and operation of VCM's quarry and, finally, Section 3.3 of this chapter provides a summary of cumulative impacts for each resource area.

As described in Section 4.17.1 of the DEIS and discussed further below, SEA defined two specific activities from VCM's quarry that would generate cumulative impacts. These are the construction and operation of the quarry and the transportation of materials from the quarry to local markets by trucking.

**Determining Environmental Consequences (Steps 8 through 11)**

In compliance with CEQ's steps 8 through 11, SEA identified the potential cumulative impacts for all the environmental resource areas, and concluded that the proposed construction of approximately 7-11 miles of new rail line (depending upon which alternative alignment would be authorized and built), and operation of four trains per day (two roundtrips from the quarry to the UP rail line), would not create significant cumulative impacts for any resources except land use and cultural resources.

**3.1 Description of VCM's New Quarry and the Quarry Approval Process**

SGR submitted to SEA two biological assessments (BA) prepared in 2001 and 2003 by VCM that contain information about the proposed quarry. The area covered in the 2001 and 2003 BAs is shown in Figure 4.17-1 in the DEIS. According to the 2001 BA, development of the proposed quarry will be a multi-phased project, including the limestone quarry and associated crushing and screening facilities for the production and sale of construction aggregates used for building roads and bridges, and to fulfill other construction industry needs. The quarry area will include the following: a plant maintenance and fueling facility; mine(s); production areas; and buffer zones, green belts (i.e., contiguous areas of green space), and habitat conservation and enhancement areas.

A major portion of the quarry site lies over the Edwards Aquifer Recharge Zone (EARZ) with the southeast corner extending into the Edwards Aquifer transition zone (the surface area above the aquifer that is between the recharge zone and the zone where water can be extracted for use). The plant fueling and maintenance facility, as discussed in Chapter 2 of the DEIS (see Figure 2.5-1), would be located off of the EARZ, and on the transition zone.

According to the 2001 BA, the area where the quarry will be developed consists of approximately 1,700 acres, including the buffer zone. The mining operation will consist of breaking the limestone using modern blasting and conventional mining techniques. Outside contractors will bring explosive material components (typically ammonium nitrate and diesel fuel) used for the blasting into the quarry, with no on-site bulk storage of explosive materials. According to VCM, the explosives themselves will be consumed in the detonation, and any residues will adhere to the broken aggregate and be transported out of the quarry with the excavated limestone. The broken limestone will then be removed by heavy equipment and transported to the production facility for crushing, washing, and transport preparation.

According to the 2001 BA, the entire quarry site has been used primarily for cattle grazing with small areas used for hay and other crop production. The creeks located on the quarry site flow only for a very short period after rainfall events. VCM's plans call for establishing a 400-foot buffer zone that will extend completely around the project site, offering both a north-south and east-west buffer zone. VCM has also agreed to additional buffering at the border of the quarry site (see #EI-26224 in Appendix D of this FEIS).

The quarry will require approximately 100 long-term employees and place additional traffic loads on local roads. Based upon information submitted by SGR, Table 4.17-1 in the DEIS presents a summary of regulations for the stone industry in Texas that apply to the VCM quarry (as they do for any other Texas quarry).

For a rock quarry to become fully licensed to construct and operate, current Texas state laws require an air quality permit from the Texas Commission on Environmental Quality (TCEQ) and development and implementation of a Water Pollution Abatement Plan (WPAP) in compliance with the state's Edwards Aquifer Rules. In addition, a stormwater discharge permit must be obtained to protect water quality. VCM's quarry is currently fully licensed and could begin operations as soon as it is built.

In 2006, VCM submitted an application to the TCEQ for approval of a WPAP for proposed quarry operations. This plan was approved by the TCEQ on August 24, 2006, and imposes specific mitigation conditions for the operation of the quarry (see #EI-2525 in Appendix D of this FEIS). The purpose of the WPAP, which was developed following completion of comprehensive hydrological and floodplain studies of the quarry site, is to ensure protection of the Edwards Aquifer and nearby streams. This plan is a requirement for any industrial construction and operation that takes place over the recharge zone of the Edwards Aquifer.

According to the WPAP, the quarry will use water as a function of market demand and the resultant volume of material sold from the operations. SGR estimates that, in the early stages of the project, the volume of water to be used may range from 500 to 2,000 acre/feet annually. Included within this estimate is VCM's use of equipment and technology designed to continuously recycle and reuse water. Furthermore, VCM obtained water rights that would otherwise be used elsewhere. Therefore, the water appropriated from the Edwards Aquifer for quarrying operations does not represent an increase in total regional Edwards Aquifer usage.

In 2006, VCM also applied for an air quality permit from the TCEQ to operate the quarry. On February 2, 2007, the TCEQ granted the permit, which limits fugitive emissions from the quarry and imposes other requirements (see #EI 2830 in Appendix C of this FEIS). The air quality permit is further described in the Air Quality section of this chapter.

The quarry's air permit requires the use of Best Available Control Technologies (BACT) to control dust emissions. Emissions from the first section of the plant will be controlled by operating water sprays at the inlet and outlet of the crushers, screens, and conveyors. Partial enclosures will also be used at locations where the material is transferred from crushers to conveyors to reduce emissions from cross winds. The second section of the plant will consist of wash screens, conveyors, and processes where the material is drenched with or submerged in water. SGR states that this method of processing the material will control emissions well beyond BACT requirements because the material will be kept in a constantly saturated state. The crushers in this section of the plant will be equipped with water sprays at the inlet and outlet points. Emissions from the roads, active work areas, and stockpiles will be controlled using an 8,000-gallon water truck which will apply water to the road and work area. A side cannon on the truck will be used to water stockpiles as needed. In addition, the entry/exit road will be paved, watered, and washed to control dust. A wheel wash will be installed at the location where trucks enter the paved road from the unpaved area,

minimizing tracking of dirt onto the paved road. In addition, to control dust, signs will be posted limiting product trucks to 15 miles per hour on the facility property.

### **3.2 Transportation to Local Markets**

Local traffic will increase in two ways as a result of quarry construction, regardless of whether or not the proposed rail line is built. First, according to SGR, VCM will use trucks to transport limestone from the proposed quarry to local markets. Second, approximately 100 quarry employees will be commuting to and from work daily. It should be noted that these increases in local traffic are unrelated to the truck traffic that would be used to reach distant markets under the No-Action Alternative (use of trucks in lieu of a rail line). VCM plans to pave County Road 353 to accommodate local truck traffic needs, regardless of whether or not the proposed rail line is constructed.

SGR anticipates that approximately 100,000 tons per year of limestone from the quarry will be distributed to the local market, including areas in Medina County such as Quihi, Castroville, and Hondo regardless of whether or not the rail line is built. SGR estimates that an average of 24 roundtrips of truck traffic per day would be required to meet local market demand. These local trucks would travel on local roads west to Hondo, east to Castroville, and along various routes to other surrounding destinations. The trucks could also serve markets in western Bexar County. SGR estimates that the trucks would travel distances ranging from a few miles to as much as 40 miles.

### **3.3 Cumulative Impacts on Elements of the Human Environment**

#### **3.3.1 Transportation and Traffic Safety**

Below, SEA discusses the combined risk for all past, present, and reasonably foreseeable future actions that could contribute to the cumulative impacts on transportation and traffic safety within the project area.

Local traffic generated by the proposed quarry will impact transportation and traffic safety in the project area in addition to the impacts from SGR's rail construction and operation project or the truck traffic under the No-Action Alternative.

Train operations over any of the rail line alternatives studied would be four trains per day for the reasonably foreseeable future (i.e., five years) (two loaded trains and two empty trains). Truck operations under the No-Action Alternative would be approximately 1,700 trucks per day for the reasonably foreseeable future (850 loaded and 850 empty). Traffic from the quarry will include 200 employee car trips (100 trips commuting to the quarry and 100 trips commuting from the quarry) and about 48 trucks transporting material to local markets (24 loaded and 24 empty), regardless of whether or not the proposed rail line is built. SEA concludes that the risk of accidents affecting human health and safety would not be significant from the quarry-related employee vehicle and local truck traffic (that would be present regardless of whether or not the rail line is built) combined with either rail operation under one of the rail alternatives that have been studied or truck transport under the No-Action Alternative.

The methodology used to determine risks of accidents, injuries, and fatalities from local quarry traffic is described in Section 4.17.2 of the DEIS. The methodology used to determine risks of accidents, injuries, and fatalities from operations over the proposed rail line (under any of the alternative rail routes studied) or from operations under the No-Action Alternative is described in Section 4.1 of the DEIS.

Table 3.1 presents the cumulative risk of injuries and fatalities that would result from the quarry and rail construction and operation for each alternative that has been studied. To present cumulative risk for each alternative, it was necessary to combine the following risks: risk associated with the particular alternative, risk associated with local truck traffic, and risk associated with quarry-related employee vehicles. In order to effectively put these results in context, it should be noted that the current rates for

injuries and fatalities per year in Medina County are approximately 394 and 8 per year, respectively. (See Section 4.17 of the DEIS).

**Table 3.1 Combined Fatality and Injury Risks Associated with Each Alternative When Combined with Quarry and Local Truck Traffic <sup>a</sup>**

	Total Risk of Injuries <sup>b</sup> / Year				Total Risk of Fatalities <sup>c</sup> / Year			
	Alternative	Local Market Trucks	Quarry Employee Vehicles	Cumulative Total <sup>d</sup>	Alternative	Local Market Trucks	Quarry Employee Vehicles	Cumulative Total <sup>d</sup>
No-Action Alternative	2.6	0.06	0.61	3.27	0.1	0.002	0.007	0.11
Proposed Route	0.05	0.06	0.61	0.72	0.03	0.002	0.007	0.04
Alternative 1	0.06	0.06	0.61	0.73	0.03	0.002	0.007	0.04
Alternative 2	0.05	0.06	0.61	0.72	0.03	0.002	0.007	0.04
Alternative 3	0.05	0.06	0.61	0.72	0.03	0.002	0.007	0.04
Eastern Bypass Route (original and Modified Eastern Bypass Route)	0.06	0.06	0.61	0.73	0.03	0.002	0.007	0.04
MCEAA Medina Dam Alternative	0.07	0.062	0.61	0.74	0.04	0.002	0.007	0.05
SGR's Modified Medina Dam Route	0.07	0.062	0.61	0.74	0.04	0.002	0.007	0.05

- (a) Calculated using  $[(0.69 \text{ injuries/million truck-miles}) \times (15,300 \text{ truck-miles}) \times (250 \text{ days/year})] + 0.06 + 0.61$  for the No-Action Alternative, and  $[(4.26 \times 10^{-8} \text{ injuries/railcar-km}) \times (X \text{ railcar-km/d}) \times (250 \text{ days/year})] + 0.06 + 0.61$  for the rail alternatives.
- (b) Calculated using  $[(0.025 \text{ fatalities/million truck-miles}) \times (15,300 \text{ trucks-miles}) \times (250 \text{ days/year})] + 0.00 + 0.01$  for the No-Action Alternative, and  $[(2.27 \times 10^{-8} \text{ injuries/railcar-km}) \times (X \text{ railcar-km/d}) \times (250 \text{ days/year})] + 0.00 + 0.01$  for the rail alternatives.
- (c) Numbers have been rounded to the nearest hundredth.
- (d) Risks include: risk of alternative added to the risks associated with local traffic and quarry-related employee vehicles. For example, for the combined risks with the No-Action Alternative, the risks of injuries were calculated by adding: 2.6 for the No-Action trucks, plus 0.062 for the local market trucks, plus 0.61 for the quarry employee vehicles. Both the DEIS and SDEIS had provided these numbers separately.

As Table 3.1 shows, there is little variation in the cumulative risk of injuries and fatalities that would result from the quarry and local traffic, and the various rail alternatives. Cumulative risk associated with these alternatives would total between 0.72 and 0.74 for injuries, and 0.04 to 0.05 for fatalities. This would result in approximately a 0.2% increase in injuries per year from pre-quarry conditions, and approximately a 0.55% increase in fatalities per year from pre-quarry conditions. Thus, the incremental cumulative risk of injuries and fatalities from the proposed rail line, under any of the alternatives studied, when combined with those of the quarry is not significant. SEA's recommended mitigation (Mitigation Measures #F-1 through #F-15) would further reduce the impacts to transportation safety in the area from the proposed rail line construction and operation.

Cumulative risk from the quarry and the No-Action Alternative would total 3.27 for injuries, and 0.11 for fatalities. This would result in approximately a 0.8% increase in injuries per year from pre-quarry conditions, and approximately a 1.4% increase in fatalities per year from pre-quarry conditions.

Therefore, significant cumulative transportation and traffic safety impacts are not expected to result from combining the quarry operations and local truck traffic with the proposed rail transport.

### **3.3.2 Public Health and Safety**

Below, SEA discusses the combined risk for all past, present, and reasonably foreseeable future actions contributing to the cumulative impacts on public health and safety in the project area.

The construction and operation of the quarry facilities—including the quarry itself, the local truck traffic, and the fueling and maintenance facility at the quarry—have the potential to cause some adverse impacts, although not significant, on public health and safety beyond those impacts that would be caused by SGR’s rail line construction and operation or trucking operations under the No-Action Alternative. Construction and operation activities would have the potential to cause injuries and fatalities, mostly to workers. However, these risks to public health and safety related to the quarry would not be greater than those related to the construction and operation of any other industrial facilities and, therefore, are not considered significant.

Table 6.2.2-1 in Section 6.2.2 of the SDEIS presents a summary of the public 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 Medina County Environmental Action Association (MCEAA) Medina Dam Alternative, SGR’s Modified Medina Dam Route, and the No-Action Alternative (see Table 2-8 in Chapter 2 of this FEIS for a summary of impacts of the Modified Eastern Bypass Route). As explained there, the degree of potential public health and safety impacts caused by the proposed rail construction relates, in large part, to the length of the rail alternative. As such, the Proposed Route, Alternative 2, and Alternative 3 would likely result in fewer adverse impacts than the other rail alternatives because they are shorter in length. However, SEA does not anticipate that any alternative would cause significant public health and safety impacts if its final recommended mitigation measures are imposed and implemented. The No-Action Alternatives is expected to cause the greatest amount of 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.

As explained above and in Section 4.17 of the DEIS for the original four rail alternatives studied and the No-Action Alternative, and in this chapter for the Eastern Alternatives (including the Modified Eastern Bypass Route), no significant cumulative public health and safety impacts are expected to result from the combined effects of the quarry operations and local truck traffic and the proposed rail transportation on any of the rail route alternatives that have been studied or truck transportation under the No-Action Alternative.

### **3.3.3 Hazardous Materials/Waste Sites and Existing Energy Resources**

Below, SEA discusses the combined risk for all past, present, and reasonably foreseeable future actions contributing to the cumulative impacts on hazardous materials and existing energy resources within the project area.

Based on a search of the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database for Medina County, SEA has not identified any hazardous materials or waste sites in the quarry area. Consequently, SEA believes that the risk of disturbing known hazardous materials or sites from the construction and operation of the quarry and the fuel and maintenance facility is low.

Table 6.2.3-1 in Section 6.2.3 of the SDEIS 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, and the No-Action Alternative (see Table 2-9 in Chapter 2 of this FEIS for a summary of impacts of the Modified Eastern Bypass Route). Based on this analysis, SEA concludes that there would be no risk of disturbing known hazardous materials or sites from the construction and operation of any of the rail alternatives that have been studied or the No-Action Alternative, and that the potential for disturbing undocumented sites is very low. The rail line alternatives would each cross one active natural gas pipeline right-of-way, as well as one high-tension transmission line. Potential impacts from these crossings would be negligible and would be further reduced by SEA's recommended mitigation. (See Mitigation Measures #F-2 and #F-18 in Chapter 1 of this FEIS).

Given the lack of impacts on hazardous materials or waste sites from both this project and the quarry, no cumulative adverse impacts from hazardous materials or existing energy resources are expected to result from combining the quarry operations and local truck traffic with the rail transport proposed here.

### **3.3.4 Worker Health and Safety**

Below, SEA discusses the combined risk for all past, present, and reasonably foreseeable future actions contributing to the cumulative impacts on worker health and safety within the project area.

SEA has not quantified the risk of non-fatal injuries and fatalities related to the construction and operation of the quarry and related facilities, and does not have specific information regarding the size of the work force that would be required to build and operate these facilities. However, SEA believes that these risks would be no greater than those from other similar construction and operation activities for other industrial sites. Neither SEA's analysis, nor publicly available information about the quarry, suggests that significant adverse impact on worker health and safety (in the form of increased risk of injuries and fatalities) would result from construction and operation of the quarry facilities.

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 construction activities would be longer in duration. Based upon additional information provided by SGR regarding possible road upgrades under the No-Action Alternative (see #EI-1439 in Appendix B-1 of the SDEIS), and information obtained following issuance of the DEIS regarding construction of the truck-to-rail remote loading facility that would be needed to move all of the aggregate from the quarry by truck, SEA now concludes that the work force for construction activities under the No-Action Alternative would not necessarily be larger than for the rail alternatives. Furthermore, construction activities would likely be completed in less time than would be needed for the rail line construction.

Table 2-10 in Section 2.5.4 of this FEIS presents a summary of potential worker health and safety impacts associated with the construction and operation of the Proposed Route, Alternative 1, Alternative 2, Alternative 3, the Eastern Bypass Route (including the Modified Eastern Bypass Route), the MCEAA Medina Dam Alternative, SGR's Modified Medina Dam Route, and the No-Action Alternative. As Table 2-10 shows, the risk of non-fatal injuries and fatalities from construction activities (during the entire construction period) associated with any of the rail alternatives or the No-Action Alternative would be minor. However, the risk of non-fatal injuries and fatalities associated with operations (based on a 30-year lifespan) would be greater (though not significant) for truck transportation under the No-Action Alternative than for any of the rail alternatives that have been studied.

Based upon SEA's analysis, no significant adverse worker health and safety cumulative impacts are expected to result from combining the quarry operations and local truck traffic with the proposed rail transportation under any of the rail alternatives studied or truck traffic under the No-Action Alternative.

### 3.3.5 Water Resources

SEA also evaluated the cumulative impacts on water resources of the quarry and associated facilities, and the proposed rail line construction and operation. Below, SEA discusses the combined risk for all past, present, and reasonably foreseeable future actions contributing to the cumulative impacts on water resources in the project area.

The quarry has the potential to affect water resources in the area, as further described in Section 4.17.3 of the DEIS. In 2006, VCM submitted an application to the TCEQ for approval of a WPAP for the proposed quarry operations. As previously noted, this plan was approved by TCEQ on August 24, 2006, and imposes specific mitigation conditions for the quarry (see #EI-2525 in Appendix D of this FEIS). The purpose of the WPAP, which was developed following completion of comprehensive hydrological and floodplain studies of the quarry site, is to ensure protection of the Edwards Aquifer and nearby streams in the event of any industrial construction and operation that takes place over the recharge zone of the Edwards Aquifer. Nothing in the record that has been developed here suggests that the conditions in the plan would not adequately mitigate adverse impacts on water resources from the quarry construction and operation, as further explained below.

In addition, SGR, in consultation with the Medina County Floodplain Administrator, has refined the design of the quarry to minimize and/or eliminate impacts to flooding, as further described below.

#### Surface Water

As described in Section 4.17.3 of the DEIS, according to the 2001 BA, quarry excavations would not alter the course of the surface water resources in the area (i.e., Elm Creek). The quarry will be built in the topographically higher elevations of the project site and, accordingly, only minor run-off water and water from direct rainfall will enter the area of the quarry. Furthermore, the use of Best Management Practices (BMPs) (erosion control and stormwater management) specified in the WPAP (see #EI-2525 in Appendix D) and summarized below, will further reduce the release of sediment and runoff into local surface waters from the quarry. The WPAP requires VCM to do the following:

- Control stormwater runoff from the plant site and quarry areas by installing silt fences and rock berms to prevent and minimize erosion and sediment running off into nearby streams;
- Construct two retention basins and eight sand filters to ensure that 80% of the incremental increase in the annual mass loading of Total Suspended Solids (TSS) from the site caused by the long-term regulated activity is removed. The captured water would be pumped to the plant area and water treatment plant to be used in processing;
- Construct three water quality basins (two retention basins and one sand filter basin) to prevent pollution of stormwater runoff originating on site or upgradient of the processing and shipping area, and potentially flowing across and off the site after construction;
- Construct a full sedimentation/filtration basin to prevent pollution of stormwater runoff originating on site or upgradient of Stockpile B, and potentially flowing across and off the site after construction;
- Clear stockpile areas outside the railroad loading loop only as product is available and install a long-term (temporary) rock berm with silt fence down-gradient of the stockpile;
- Implement the following at the quarry pits:
  - Install a 200-foot-wide vegetated buffer adjacent to the site perimeter;
  - Install a temporary earthen berm to prevent stormwater runoff from leaving the pit; when the final limit of the quarry is reached, the temporary berm will become a permanent berm;

- Install a long-term (temporary) earthen berm with silt fence to prevent runoff from entering stream channels until the quarry pit has been excavated below stream channel;
- Install and operate six full sand filter basins to ensure that 80% of the incremental increase in the annual mass loading of TSS is removed from six assembly/staging areas for staff and vehicles;
- Collect and test sediment from water quality basins for Total Petroleum Hydrocarbons (TPH) and Benzene, Toluene, Ethylene, and Xylene (BTEX), and compare these levels with applicable Texas Risk Reduction Program (TRRP) rules (30 Texas Administrative Code (TAC) 350). Sediment will be properly classified based on analytical testing and will be further treated and disposed of, as necessary.
- Store all regulated quantities of hydrocarbons and hazardous substances on a separate site to the south of and off the recharge zone;
- Conduct scheduled vehicle maintenance on a separate site south of and off the recharge zone;
- Conduct only minor repairs on site; major repairs should be conducted on a separate site to the south of and off the recharge zone;
- Dispose of domestic wastewater twice a week through a TCEQ-registered waste disposal service;
- Protect all sensitive geologic features during mining by doing the following:
  - Convert the Wurzbach well to a piezometer (an instrument to measure the change in pressure of a material subject to hydrostatic pressure);
  - Maintain a positive slope while pits are mined out, away from all sensitive features to prevent flow from entering them;
  - Plug the two other wells (Schweers and Boheme/Belzen) when and if mining progresses within 100 feet of them;
  - Provide a 200-foot-wide vegetated buffer around the property boundaries (note that VCM has recently negotiated an even larger buffer with MCEAA, see #EI-2624 in Appendix D);
  - Mine only to a depth of 25 feet above the water table (potentiometric surface);
  - Stabilize quarry pits by compacting and removing all loose rock material and solid rock; and
  - Dismantle and remove plant area from the site at completion of mining.

The TCEQ-imposed stormwater requirements are fairly extensive and cover interim construction, long-term operation of the quarry and project completion. On October 30, 2007, SEA reviewed the construction plans for the quarry as well as plans and other documents from the WPAP file at the TCEQ Region B Central Records Facility in San Antonio, Texas. Based on that review, SEA has determined that the required BMPs listed above for the quarry either meet or exceed industry standards for water quality control.

Table 6.2.5-1 in Section 6.2.5 of the SDEIS presents a detailed summary of potential surface water impacts associated with construction and operation of all of the rail route alternatives that have been studied and the No-Action Alternative (see Table 2-11 in Chapter 2 of this FEIS for a summary of impacts, including the Modified Eastern Bypass Route). Based upon all of the available information, SEA concludes that, of all the rail alternatives, the Modified Eastern Bypass Route would cause the fewest

adverse impacts to surface water resources, followed by the Eastern Bypass Route, SGR's Modified Medina Dam Route, Alternative 2, the MCEAA Medina Dam Alternative, the Proposed Route, Alternative 3, and Alternative 1. The No-Action Alternative would cause more adverse impacts on water resources than the rail alternatives because non-point source pollutant would be carried as runoff to the local stream flow network from operation and maintenance of extensive trucking.

SEA concludes that cumulative impacts on surface water quality, from combining the effects of the quarry with the proposed rail line, would not be significant with the WPAP mitigation and SEA's final proposed mitigation. (See Mitigation Measures #F-35 through #F-46).

### Stream Crossings

As discussed in Chapter 3 of the SDEIS and Chapter 2 of this FEIS, lower order stream crossings are easier to traverse without impact than higher stream order crossings. Crossings of lower order typically have fewer intermittent flows, and wider, more mature riparian zones.

In Table 6.2.5-1 of the SDEIS, SEA had indicated that the loading loop track within the quarry would cross two streams of lower order (order 1) and thus would potentially have minor adverse impacts on those streams. However, recent information received from SGR (see EI#-3225 in Appendix D of this FEIS) indicates that the loading loop area would be moved away from the floodplain and would now avoid the crossing of those two streams. In addition, VCM would implement the BMPs described above to further prevent sediment from entering nearby streams. To compensate for four streamcrossing impacts from haul roads, the WPAP specifies (see #EI-2523 in Appendix A-2 of this FEIS) the following:

"In lieu of capturing and treating stormwater runoff from the four haul roads crossing streams, the 2,850 pounds of total suspended solids generated will be compensated for by the overtreatment provided in other onsite water quality structures."

As explained in Chapter 3 of the SDEIS and Chapter 2 of this FEIS, SEA concludes that, of the rail alternatives, Alternative 1 would cause the greatest adverse impact on surface waters because it would cross the greatest number of higher order streams (five streams of orders 3 and 4). 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 (including 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 streams of lower order (10 crossings of orders 1 and 2), followed by Alternative 3 (eight crossings of order 1 and 2), the Proposed Route (seven crossings of order 1 and 2), the Eastern Bypass Route (including the Modified Eastern Bypass Route) and SGR's Modified Medina Dam Route (five crossings each of orders 1 and 2), and Alternatives 1 and 2 (three crossings of orders 1 and 2). See Table 2-11 in Chapter 2 of this FEIS.

The following list of alternatives is presented in order of the total number of stream crossings, from greatest to fewest:

- MCEAA Medina Dam Alternative (11 crossings);
- Alternative 3 (9 crossings);
- Proposed Route (8 crossings);
- SGR's Modified Medina Dam Route (7 crossings);
- Alternative 1 and the Eastern Bypass Route (including the Modified Eastern Bypass Route) (6 crossings each); and
- Alternative 2 (5 crossings).

The No-Action Alternative would not cross any streams other than the ones currently crossed by existing roadways so no additional stream crossings would be required under the No-Action Alternative.

SEA concludes that, since the quarry and the loading loop do not cross any streams and the haul road stream crossing will be compensated for by the overtreatment provided by onsite water quality structures, cumulative impacts on stream crossings from combining the effects of the quarry with the proposed rail line would not be significant.

### **Floodplain/Flooding**

Medina County's floodplain permitting process follows the requirements of the Federal Emergency Management Agency's (FEMA's) National Flood Insurance Program (NFIP), set forth at 44 CFR 60.3, which was developed to implement the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973, 42 U.S.C. 4001 *et. seq.* Thus, this permitting process is essentially a Federal permitting process that has been delegated to the local Medina County authority. SGR has committed to complying with the local floodplain requirements.

On October 30, 2007, SEA met with the Medina County Floodplain Administration at the project site. The Floodplain Administrator indicated to SEA that the quarry was designed to meet the requirements of the floodplain regulations, and that as such, there would not be an increase in existing floodplain elevation as a result of the quarry project. SGR also indicated that it has now conducted field surveys and detailed engineering plans that serve as the official documents for construction, operation, and closure of the quarry, and that the floodplain boundaries depicted on the plans match the field-delineated boundaries approved by the Medina County Floodplain Administrator. Based on comments received on the DEIS and SDEIS and consultations with the Medina County Floodplain Administrator, SGR also has relocated the loading loop and fueling and maintenance facility to upland areas outside of the floodplain.

Although the WPAP for the quarry does not directly address flooding, it will help minimize or prevent any diversion of stormwater into local streams. For all these reasons, the quarry is unlikely to contribute to flooding in the area or worsen any adverse impacts on flooding that would be caused by the proposed rail line alone, especially now that the loading loop will be located away from the floodplain. Although cumulative impacts on floodplains would not be significant, Mitigation Measures #F-VM2, #F-38 and #F-39 (see Chapter 1 of this FEIS) have been developed to protect floodplains.

The stream crossings for the rail alternatives for this project that have been studied could cause adverse impacts on flooding in the area because they would all require crossing a number of intermittent streams, and could involve the use of fill (i.e., added material) at these stream crossings. The added fill would increase the width of the floodplain above the stream crossings because it would change the hydraulic conditions at the crossings. SEA is recommending Mitigation Measure #F-39 that would require SGR to obtain all required U.S. Army Corps of Engineers (Corps) permits for stream crossings to minimize impact from added fill.

In this FEIS, SEA has compared all of the alternative rail alignments that have been studied in terms of the number and type of floodplain crossings for each alternative; the length to which each potential rail route would intercept the floodplain; and conclusions as to which routes would be easier to engineer in a manner that would mitigate potential impacts to the floodplain.

The following list of alternatives is presented in order of least distance that each alternative would cross the floodplain to greatest distance:

- MCEAA Medina Dam Alternative (3,996 feet);
- SGR's Modified Medina Dam Route (4,335 feet);

- Eastern Bypass Route and the Modified Eastern Bypass Route (4,557 feet);
- Proposed Route (6,220 feet);
- Alternative 2 (8,570 feet);
- Alternative 3 (9,970 feet); and
- Alternative 1 (12,220 ft).

The following list of alternatives is presented in order of least number of floodplain crossings to greatest number of floodplain crossings:

- Eastern Bypass Route (including the Modified Eastern Bypass Route) (two crossings);
- Alternative 2 (three crossings);
- MCEAA Medina Dam Alternative / SGR's Modified Medina Dam Route (four crossings each); and
- Proposed Route / Alternative 1 / Alternative 3 (four crossings each).

In Section 4.5.3 of the DEIS, SEA discussed the potential impacts to existing flood conditions that SGR's proposed rail line construction and operation could cause. SEA continues to believe that, with implementation of its recommended mitigation conditions, impacts to existing flood conditions under any of the potential rail route alternatives that have been studied would not be significant, especially now that SGR has relocated the loading loop of the floodplain.

The mitigation conditions in this FEIS include SGR's voluntary mitigation (#F-VM2), which would require SGR to design stream crossings in a manner that would not exacerbate pre-existing flooding risks. Specifically, SGR has agreed to conduct appropriate hydrological modeling before beginning construction and to incorporate the resulting design criteria into the design of the proposed rail line to avoid or minimize adverse impacts to existing floodplain conditions. As part of this modeling, SGR has agreed to do the following:

- Compile information regarding existing land use, topography, drainage features, impervious surfaces, and other information needed for the modeling effort.
- Conduct additional surveying, as required, to obtain data related to existing channel geometry.
- Coordinate with the Medina County Floodplain Administrator and the Corps to discuss the project and address reasonable mitigation requirements.
- Delineate the overall watershed and sub-watersheds, and related drainage patterns corresponding to relevant points of interest.
- Compile an existing-conditions hydrologic model, based upon existing watershed characteristics and regional design storm information to determine the 2-, 5-, 10-, 25-, 50-, 100-, and 500-year design storm intensities, and related stream or flood-flow rates for these recurrence intervals.
- Develop existing-conditions hydraulic models of appropriate points of interest, such as stream crossings so that the existing conditions-hydraulic model can be compared to the existing floodplain data.
- Analyze the proposed bridges and other proposed structures on the rail line that may impact the floodplain and the watershed, producing a technical report that addresses the estimated extent of the existing floodplains in the project vicinity and provides appropriate design criteria for minimum bridge openings, culvert locations and sizes, bridge lengths and low chord heights, bank stabilization, scour protection, and erosion control measures.

- Design a WPAP and a Stormwater Pollution Prevention Plan (SWPPP), and provide a narrative description of plans to mitigate water quality impacts during and after construction of the rail line.

SEA also recommends mitigation that would require SGR to do the following: use Best Engineering Practices in the design of the rail line stream crossings to avoid increasing floodplain width; design and implement site-specific “scour and instability countermeasures” to minimize local and downstream instability from stream crossings; comply with the reasonable requirements of FEMA; and obtain a Medina County Floodplain permit for each crossing prior to initiating any rail line construction activities. See Chapter 1 of this FEIS, Mitigation Measures #F-35 through #F-38.

SEA has also proposed additional mitigation measures to address concerns regarding debris blocking crossings and the maintenance of evacuation routes. See Chapter 1 of this FEIS, Mitigation Measures #F-VM2, #F-44, #F-46, #F-49, and #F-50.

If the recommended mitigation in the FEIS regarding stream crossings for SGR’s rail line construction and operation is imposed and implemented, and VCM complies with the WPAP approved by the TCEQ and with the FEMA regulations through the floodplain permitting process, SEA concludes that there would be no significant adverse cumulative impacts on surface waters and floodplains from combining the quarry operations and local truck/vehicle traffic with the proposed rail line construction and operation.

Because no stream or floodplain crossings (other than the ones currently crossed by existing roadways) would be necessary under the No-Action Alternative, SEA would expect no significant adverse cumulative impacts on surface waters or floodplains from combining the quarry operations and local truck/vehicle traffic with the trucking to distant markets that would occur under the No-Action Alternative.

### Groundwater

Both the construction of the proposed rail line and the quarry would have the potential to adversely impact groundwater quality within the project area. However, the mitigation recommended in this FEIS and the mitigation that has been imposed for the quarry should minimize the potential for cumulative effects.

As discussed above, the quarry would be located primarily within the EARZ. However, all quarry-related activities would be regulated under the State’s Edwards Aquifer Rules at Title 30 TAC Chapter 213. These rules are administered by the TCEQ and enforced via the WPAP. If all the mitigation measures required in the WPAP are implemented, the likelihood of a significant adverse impact from quarry operations on groundwater quality is very low. Furthermore, the fueling and maintenance facility would be located south of the quarry and off the EARZ, and would be subject to the Spill, Control, and Countermeasures Plan (SPCC) recommended mitigation, which is intended to further minimize the potential for contamination of the Edwards Aquifer from spills.

Table 6.2.5-2 in Section 6.2.5 of the SDEIS provides a summary of potential impacts on groundwater resources 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 (see Table 2-12 in Chapter 2 of this FEIS for a summary of these impacts including the Modified Eastern Bypass Route). All of the rail alternatives that have been studied would have an essentially equivalent minor risk of causing adverse impacts on groundwater resources. All of the rail alternatives would cross the same major and minor aquifers, and avoid areas that contain environmentally important groundwater resources. Implementing SEA’s recommended mitigation would reduce any potential impacts (see Mitigation Measures #F-21 through #F-34). The No-Action

Alternative would have a slightly higher potential for adverse impacts on groundwater due to a higher increase in truck traffic.

Given that, under SEA's recommended mitigation measures, construction and operation over the proposed rail line (under any of the rail line alternatives studied) would result in little or no impact on groundwater resources, and that separate mitigation has been imposed for the quarry under the WPAP, SEA is satisfied that the cumulative impacts on groundwater resources and quality from combining the quarry operation and local truck traffic with the proposed rail line would not be significant.

### Wetlands

Both the construction and operation of the proposed rail line and the quarry would have the potential to adversely impact wetlands in the project area. SEA did not conduct a quantitative analysis of wetlands at the quarry site. However, based upon the biological assessments conducted for quarry development by VCM and subsequently approved by the U.S. Fish and Wildlife Service (USFWS), no jurisdictional wetlands were identified within the Phase I area (i.e., the area to be developed during the first phase of the project) of the quarry development.

Table 6.2.5-3 in Section 6.2.5 of the SDEIS provides a summary of potential impacts on wetland resources that would be crossed by all of the rail route alternatives studied and the No-Action Alternative (see Table 2-13 in Chapter 2 of this FEIS for a summary of impacts, including the Modified Eastern Bypass Route). The alternatives were ranked based upon the number of aquatic features (i.e., wetlands) that would be crossed.

The following list of alternatives is presented in order of least number of aquatic features crossed to greatest number of aquatic features crossed:

- Alternative 3 (no aquatic features crossed);
- SGR's Modified Medina Dam Route and the Modified Eastern Bypass Route (one aquatic feature crossed);
- Proposed Route, Alternative 2, and the Eastern Bypass Route (two aquatic features crossed);
- Alternative 1 (three aquatic features crossed); and
- MCEAA Medina Dam Alternative (four aquatic features crossed).

The No-Action Alternative would not cross any aquatic features, but would have the potential to add pollutants to nearby wetlands from maintenance and road widening, as well as from the water that would be used to control dust emissions.

SEA concludes that, to the extent that all the mitigation measures recommended by the USFWS for the quarry to protect biological habitats and by SEA for the rail line to protect wetland resources are implemented, no significant cumulative impacts on wetland resources would result from combining the quarry operations and the local truck traffic with the proposed rail line.

### **3.3.6 Biological Resources**

Both the quarry development and operation, and the proposed rail construction and transportation have the potential to adversely impact biological resources in the area. However, as further described in Section 4.17.4 of the DEIS, according to the 2001 and 2003 BAs, quarry operations will avoid riparian areas and there will be no impacts on aquatic resources from operation of the quarry. Moreover, mitigation measures have been imposed for the quarry by the USFWS to establish naturally vegetated corridors and buffer zones to minimize impacts on terrestrial biological resources. Clearing of vegetation within the

quarry site will be limited to outside the breeding season for the Golden-cheeked Warbler (GCW), a Federally-listed species, unless otherwise approved by USFWS, to further reduce the chance of an incidental take occurring due to the quarry development.<sup>4</sup> Furthermore, the areas with the highest potential to provide habitat for the GCW will be set aside as buffer zones and undisturbed wildlife preserve areas surrounding the quarry operations. VCM will also conduct additional surveys and coordination with USFWS as the quarry development progresses.

Table 6.2.6-1 in Section 6.2.6 of the SDEIS provides a summary of potential impacts on biological resources from 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, and the No-Action Alternative (see Table 2-14 in Chapter 2 of this FEIS for a summary of impacts of the Modified Eastern Bypass Route). As explained there, each of the proposed rail routes would cross habitat that is potentially suitable for the state-listed Texas Tortoise and Texas Horned Lizard. Therefore, SEA used the total acreage that would be permanently disturbed by each proposed rail route alternative as the basis for measuring and comparing potential impacts of the rail alternatives.

The following list of rail alternatives is presented in order of least acres of habitat impacted to greatest acres of habitat impacted:

- SGR's Modified Medina Dam Route (52.9 acres);
- MCEAA Medina Dam Alternative (48 acres);
- Eastern Bypass Route (44.6 acres) and Modified Eastern Bypass Route (44.3 acres);
- Alternative 1 (44.0 acres);
- Alternative 3 (34.0 acres);
- Proposed Route (32.0 acres); and
- Alternative 2 (30.0 acres).

Due to the need, under the No-Action Alternative, for a remote truck-to-rail loading facility, a material stockpile site near the UP line and U.S. Highway 90, and necessary road widening, the No-Action Alternative would impact far more acres of potential habitat than any of the rail alternatives. At least 125 acres of potential habitat would be affected by the No-Action Alternative, including 100 acres for the remote truck-to-rail loading facility, 25 acres for rail tracks needed to connect to the existing UP line, and an additional undetermined acreage for necessary road widening.

SEA concludes that, to the extent that all of the mitigation measures imposed by the USFWS for the quarry and recommended in this FEIS for the rail line (see Mitigation Measures #F-50 through #F-57) are implemented, no significant cumulative impacts on biological resources would result from combining the quarry operations and the local truck traffic with the proposed rail transport.

### **3.3.7 Air Quality**

Both the quarry development and operation, and the proposed rail construction and operation have the potential to adversely impact the air quality in the area. Various quarry operations will generate air emissions impacting air quality within the project area. These air emissions would require consistency with the State Implementation Plan (SIP) to ensure that emissions would not prevent the Medina County/San

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<sup>4</sup> USFWS defines an “incidental take” as the number of individuals of a protected species reasonably likely to be taken or the extent of habitat likely to be disturbed or destroyed as a result of a proposed action. The Endangered Species Act of 1973 (as amended) defines to “take” as to “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect...” a federally listed threatened or endangered species (16 USC 1532(19)).

Antonio Metropolitan Area from attaining National Ambient Air Quality Standards (NAAQS). Accordingly, in 2006 VCM applied for an air quality permit from the TCEQ for the operation of the quarry. On February 2, 2007, the TCEQ granted the permit.

This permit contains several general and special conditions that define the level of operation, allowable emissions, and emission controls for quarry operators (see #EI-2830 in Appendix D of this FEIS). Specifically, this permit requires the following:

- Opacity of emissions from any transfer point on belt conveyors or any screen shall not exceed 10% and from any crusher shall not exceed 15%;
- No visible fugitive emissions from the crusher, screens, transfer points on belt conveyors, material storage or feed bins, stockpiles or plant roads shall cross the property line. Visible emissions shall not exceed 30 seconds in duration in any six-minute period. If this condition is violated, additional controls or process changes may be required to limit visible particulate matter (PM) emissions;
- Production at this facility is limited to 1,500 tons per hour (tph) and 8,500,000 tons per year (tpy) on a rolling 12-month basis;
- Permanently mounted spray bars shall be installed at the inlet and outlet of all crushers, at all shaker screens, and at all material transfer points;
- No visible emissions shall be observed from the saturated processes;
- The primary entrance and exit for product truck traffic shall be paved with a cohesive hard surface which can be cleaned by sweeping or washing. Upon detection of visible particulate emissions, the paved road shall be watered. All other roads and vehicle traffic areas shall be sprinkled with water and/or environmentally sensitive chemicals upon detection of visible particulate emissions;
- All aggregate stockpiles and active work areas shall be sprinkled with water and/or environmentally sensitive chemicals;
- Raw material stockpile heights are site specific and shall not exceed 45 feet in height unless approved by the TCEQ Regional office and/or any appropriate local air programs with delegation;
- A truck wash station shall be installed and operated. This station shall direct water sprays onto the undercarriage of product trucks to remove mud and/or road dust; and
- The quarry must comply with imposed emission limits on volatile organic compound (VOC) from diesel, gasoline, and oil tanks.

Truck transportation of aggregate from the quarry to local markets would affect air quality due to fugitive dust emissions and diesel combustion exhaust from the 24 roundtrips per day that would be required. (See Section 4.7 of the DEIS for the methodology used to calculate these emissions, and the significance criteria that SEA used in this analysis).

Rail transport of aggregate from the quarry to the UP line would affect air quality by contributing emissions from rail car loading and mobile source emissions from locomotives. Table 6.2.7-1 in Section 6.2.7 of the SDEIS provides a summary of the air emission calculations and associated potential impacts on air quality, estimated by SEA, from 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 (see Table 2-15 in Chapter 2 of this FEIS for a summary of impacts of the Modified Eastern Bypass Route). For the rail line alternatives, the potential air quality impacts would largely be a function of the length of the route. Operations over the Proposed Route, Alternative 2, and Alternative 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, finally, SGR's Modified Medina Dam Route.

Operation over any of the rail route alternatives would not exceed 100 tpy of any criteria pollutant, which is the U.S. Environmental Protection Agency's (EPA) major emission-source threshold for Title V permit applicability, and the threshold for significance that SEA has used here. Furthermore, SEA's proposed mitigation (see Mitigation Measures #F-58 through #F-61) would further reduce these emissions. However, proposed truck operations under the No-Action Alternative would cause substantially greater air emissions from mobile sources, and would produce significant air emissions from truck loading and unloading activities.

SEA concludes that, to the extent that VCM complies with the conditions imposed in the TCEQ air quality permit, and that all the mitigation measures recommended by SEA in this FEIS for SGR's rail line construction and operation are implemented, no significant cumulative impacts to air quality would result from combining the quarry operations and the local truck traffic with the proposed rail line. Furthermore, these combined effects would have no adverse impact on the NAAQS attainment status of the area.

### **3.3.8 Geological Hazards and Soils**

SEA did not evaluate the potential landslide/mass movement hazards associated with the quarry construction and operation. However, SEA's evaluation of these hazards associated with the proposed rail line construction and operation showed that none of the rail alternatives that have been studied would cross the Escondido formation outcrop (at the south end of the project area) where landslide hazards have the potential to occur. Therefore, the risk of landslide hazards associated with the construction and operation of any of the rail alternatives would be negligible.

Given that the quarry is not located near this area, SEA concludes that the cumulative impacts from geological hazards associated with the rail construction and quarry projects would be negligible.

The current land use at the quarry site is typically unimproved, or minimally improved, rangeland created by removal of woody plants. The U.S. Geological Survey (USGS) classifies land uses in the area of the quarry as the following: evergreen forest, cropland and pasture, and shrub and brush rangeland (USGS, 2001). This land is low in agricultural value, and the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) does not classify this land as prime farmland.

NRCS reviewed all of the rail alternatives that have been studied to determine potential impacts to prime farmlands. The Farmland Conversion Impact Rating (FCIR) prepared by NRCS for each of the rail alternatives indicates that no alternatives would significantly impact prime farmland soils within the project area. Although Alternative 3 and the Proposed Route received slightly lower (better) FCIR scores from NRCS, the MCEAA Medina Dam Alternative would impact the least amount of acreage of prime farmland soil of any of the rail line routes. As indicated in Table 6.2.10-1 in the SDEIS, the No-Action Alternative would impact the greatest amount of prime farmland soils (see Table 2-17 in Chapter 2 of this FEIS for a summary of impacts of the Modified Eastern Bypass Route).

Based on all of this information, SEA concludes that the cumulative impacts to prime farmlands and geological features from the construction and operation of the quarry and the proposed rail line would not be significant, and therefore, no mitigation measures have been developed.

### **3.3.9 Karst-Feature Impacts**

The portion of the quarry site lying over the EARZ has the potential for the presence of karst features such as caves, caverns, and voids. According to the geologic assessment included in VCM's WPAP application (see #EI-2525 in Appendix D of this FEIS), the Georgetown Formation and the Devil's Formation (upper and lower) are exposed at the quarry site. Transects of 15 meters revealed 99 geologic and manmade features on the project site. A total of 12 features were assessed as sensitive (3 wells, 6 faults, 1 sinkhole, and 2 caves). These features will be mined out and the associated activities (such as blasting and excavation) could potentially expose or damage caves or caverns that have not been charted. However, comprehensive protective measures for these features will be implemented during excavation of the quarry site. These measures are described in detail in the WPAP (see #EI-2525 in Appendix D of this FEIS) and are summarized in Section 3.3.5 of this chapter.

Activities related to the quarry that damage or otherwise affect karst features could impact both local water resources and biology. The destruction of caves, voids, and conduits would locally impact subsurface permeability, as well as subsequent groundwater recharge to the underlying Edwards Aquifer. Subsurface voids could also provide habitat for several cave-adapted species of arachnids and insects protected under the Endangered Species Act (ESA) that are known to inhabit caves within the region, as identified in Table 3.4-1 of the DEIS.

On a regional scale; however, impacts on inflows to the Edwards Aquifer would be minimal regardless of potential local impact, because neither the quarry nor the portion of the proposed rail line over the EARZ would represent a significant amount of recharge capacity.

Field surveys conducted by VCM within southern portions of the quarry have not found any surficial karst features that provide habitat for known threatened and endangered species. While quarry operations could expose previously uncharted voids, voids that are not exposed directly to the surface are not known to provide habitat for protected species. Therefore, it is unlikely that impacts to voids with no surficial karst features during quarry operations or rail construction and operation would impact protected species' habitat.

The MCEAA Medina Dam Alternative would cross less area that is susceptible to karst feature development than the other rail alternatives. As shown in Table 6.2.9-1 in Section 6.2.9 of the SDEIS, however, none of the rail line alternatives would result in adverse impacts on karst features (see Table 2-16 in Chapter 2 of this FEIS for a summary of impacts of the Modified Eastern Bypass Route).

SEA believes that quarry operations, when combined with any of the rail alternatives, would not impact karst features in a way that would result in a significant impact to either the Edwards Aquifer or known threatened and endangered species. However, SEA has recommended specific mitigation measures that require SGR to identify potential sinkhole formation and karst features and these measures further reduce the risk of potential impacts to karst features (see Chapter 1 of this FEIS, Mitigation Measures #F-78 and #F-79).

### **3.3.10 Land Use**

Development and operation of the quarry will permanently alter land use in those areas that will be mined. The current land use at the quarry site is typically unimproved, or minimally improved, rangeland created by removal of woody plants. The USGS classifies land uses in the area of the quarry as the following: evergreen forest, cropland and pasture, and shrub and brush rangeland (USGS, 2001). This land is low in agricultural value, and the NRCS does not classify this land as prime farmland. Currently, VCM is leasing the quarry property, and there are three homes within 0.5 miles of the proposed quarry operations. Impacts on the uses of surrounding properties will be minimal due to the planned establishment of buffer zones.

As discussed in Section 4.10 of the DEIS, construction and operation of the proposed rail line would have some adverse effects on land use, which could be reduced but not entirely eliminated, with SEA's recommended mitigation measures. Potential impacts on land use from the quarry will be significant and permanent, notwithstanding the planned buffer zones and other conditions imposed as part of the quarry permitting process.

Table 6.2.10-1 in Section 6.2.10 of the SDEIS provides a summary of potential impacts on land use from the rail alternatives and No-Action Alternative (see Table 2-17 in Chapter 2 of this FEIS for a summary of impacts of the Modified Eastern Bypass Route). 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 FCIR (i.e., best) scores from the NRCS. The Proposed Route would cross the least number of properties not owned by SGR or its affiliates. Alternative 1 would have the least number of houses within 0.5 miles of the alignment.

The No-Action Alternative would cause the greatest impact on land use because it would permanently alter the land use of approximately 125 acres of shrub and brush rangeland for the truck-to-rail remote loading facility, the rail tracks needed for the UP connection, and undetermined acreage associated with road widening and upgrades.

Therefore, SEA concludes that construction and operation of the proposed rail line, when combined with proposed quarry operations, would contribute to the cumulative impacts on regional land use that the quarry will cause. However, SEA believes that with the recommended mitigation that would require SGR to ensure access to severed properties, replace irrigation systems, and develop additional water sources for livestock (see Mitigation Measures #F-62 and #F-63), the cumulative land use impacts on regional land use would not be significant.

### **3.3.11 Environmental Justice**

The location of the quarry operation and the proposed new rail lines are shown in Figure 2.1-2 of the DEIS, Figure 2-1 of the SDEIS, and Figure ES-1 and 2-1 of this FEIS. The potential communities of concern (COCs) for the quarry operation would be the same as for the proposed new rail line and, as discussed in Section 4.11 of the DEIS, SEA has determined that no environmental justice COCs exist within the area of the proposed new rail construction.

Because there are no environmental justice COCs within the project area, the proposed rail line construction and operation, together with the quarry development and operation, would not result in disproportionately high and/or adverse cumulative impacts on environmental justice COCs.

### **3.3.12 Noise and Vibration**

#### **Noise**

As described in Section 4.3.3.1 of the SDEIS, quarry construction and operations will emit noise pollution related to rock drilling, crushing, processing, and blasting that could impact adjacent residences. The blasting activity at the quarry will occur approximately once per day. The blasting procedure results in a very brief sound at off-site areas. The sound will be perceived as a thump or a short rumble sound like distant thunder because of its predominantly low frequency content. The sound will be very audible in the northern portion, and perhaps audible in the central portion, of the study area. With no shielding, the sound could briefly approach a maximum of 95 A-weighted sound level (dBA) at the nearest residence approximately 1,200 feet away, but will dissipate within a second. There will not be a substantial amount of acoustic energy expended in this brief blasting noise event; therefore, its effects on the overall sound levels, combined with any of the rail alternatives, should be minimal.

The other noise sources at the quarry will be very similar to conventional construction noise. The distances to the limits of the quarrying activity, plus the shielding provided by landforms, should act to appreciably reduce blast and quarry operations noise at the nearest sensitive receptors. Thus, quarry noise will not materially contribute to the noise caused by construction and operation of any of the proposed railroad alternatives or the noise from trucking operations under the No-Action Alternative. Accordingly, no adverse cumulative impacts would be expected.

The following list of alternatives is presented in order of most noise impacts from rail construction and operation, to least noise impacts from rail construction and operation:

- No-Action Alternative;
- Alternative 1;
- Alternative 2 / Eastern Bypass Route / MCEAA Medina Dam Alternative / SGR's Modified Medina Dam Route;
- Proposed Route;
- Modified Eastern Bypass Route; and
- Alternative 3.

Based on its analysis, SEA concludes that no significant cumulative impacts from noise would be expected to result from the combined effects of the quarry operations and local/vehicle truck traffic, and the proposed rail transport. (See Section 4.6, page 4-26 of the SDEIS). Nonetheless, Chapter 1 of this FEIS presents several mitigation measures (see Mitigation Measures #F-64 through #F-74) which would further reduce noise impacts.

#### **Vibration**

Based upon SEA's vibration analysis (see section 4.4 of the SDEIS), operations from Alternative 1 would cause vibration impacts on two houses. None of the other rail alternatives would create operations-related vibration impacts. (Vibration impacts to cultural resources are discussed separately in Chapter 5 of the SDEIS.)

As discussed in Section 4.4 of the SDEIS, SEA predicts no significant vibration impacts during the construction phases of the rail project. Pile driving could cause vibration impacts on water wells. Chapter 1 of this FEIS presents a mitigation measure designed to minimize adverse vibration impacts during construction activities (see Mitigation Measure #F-75). This mitigation measure would ensure that a pre-construction survey would be conducted to locate nearby wells, monitoring of vibration levels would occur during construction, and the peak particle velocity limit of 2.72 inches per second in any axis would not be exceeded.

SEA believes that damaging or perceptible quarry activity-related ground vibration, including blasting vibration, will not extend beyond the quarry boundary. SGR has provided information stating that blasting at the quarry will occur approximately five times per week when the quarry facility is operating at its design capacity, and that the duration of any given blast will range from approximately one-third to one and one-half of a second. According to SGR, VCM will design all blasts using BACT, as it does at other quarries. SGR states that VCM will design its blasts so as to comply with the widely applied blast-induced vibration guidelines set forth in Report RI 8507 issued in 1980 by the U.S. Bureau of Mines. (See #EI-1664 in Appendix D of this FEIS). Therefore, no adverse cumulative impacts from vibration are likely to occur.

Cumulative impacts from vibration within the project area would not be significant under any of the rail alternatives or the No-Action Alternative. Nonetheless, Chapter 1 of this FEIS presents mitigation

measures designed to protect against vibration by requiring SGR to locate nearby wells and monitor vibration levels during pile driving activities (see Mitigation Measure #F-75).

### **3.3.13 Recreation and Visual Resources**

The planned buffer zones surrounding the quarry will reduce the visual impacts of the quarry. As discussed in Section 4.14 of the DEIS and Section 3.13 of the SDEIS, none of the rail line alternatives would cause significant adverse impacts on recreation and/or visual resources. However, increased truck traffic from the No-Action Alternative and construction of the remote truck-to-rail loading facility that would be necessary could have a greater impact than any of the rail alternatives with respect to visual resources.

The cumulative impacts of the quarry development and operation, and the rail line construction and operation could adversely impact visual resources in the area. Although SEA does not believe that these impacts would be significant, recommended mitigation measures are included in Chapter 1 of this FEIS in order to further minimize any potential impacts (See Chapter 1 of this FEIS, Mitigation Measures #F-VM4 and #F-47). These measures would require SGR to survey the location of stock ponds, and avoid them or replace them, and maintain native grass and shrubs within the right-of-way.

### **3.3.14 Cultural Resources**

As described in Chapter 5 of the SDEIS (Section 5.3) , cultural resources potentially impacted by the quarry construction and operation include potential prehistoric and historic sites. A review of records at the Texas Historical Commission (THC) did not identify any known historic or prehistoric sites. However, local residents have reported that there are at least two sinkholes in the vicinity of the proposed quarry and multiple mound features that have been reported on the Wurzbach property. A recent geotechnical investigation performed by VCM as part of the WPAP application for the quarry also identified one sinkhole and two caves. The sinkholes, mounds, and caves have not been confirmed by an archeologist, but sinkholes were often used as human burial features by Native Americans.

Table 6.2.15-1 in Section 6.2.15 of the SDEIS summarizes the information that SEA has gathered concerning historic and prehistoric cultural resources within the region that would be affected by the rail construction project. As explained there, Alternative 1 and the No-Action Alternative would have the greatest 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 rail alternative). In addition, Alternative 1 would intersect the largest acreage within two historic districts (including the core of the original Quihi Historic District Area), and 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 it would have a greater impact on the historic districts in the area due to the visual, vibration (depending upon distance from the roadway to historic structures), and auditory effects of truck traffic, as well as the extensive modification of the historic road network that would be necessary to accommodate only truck transport for quarry traffic.

Alternative 2 is ranked second highest in potential cultural resources impacts. Although it ranks fourth in total historic district acreage that would be impacted, it is second in the number of individual National Register-eligible resources within the Area of Potential Effect (APE)<sup>5</sup> and has higher potential to affect archaeological resources.

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<sup>5</sup> The APE for all rail routes that have been studied is 1000 feet on either side of each alignment, or a 2000-foot-wide corridor centered on the alignment.

The Proposed Route and Alternative 3 are ranked third and fourth, respectively, in potential cultural resources impacts. They would both have relatively large areas of disturbance within two historic districts, but they 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. However, the railroad no longer supports the proposed Route and none of these routes are being recommended as environmentally preferable.

The Eastern Alternatives would have fewer cultural resources impacts than the other rail routes that have been studied because they would be further away from the Historic Quihi area. The Eastern Bypass Route (and the Modified Eastern Bypass Route discussed in this FEIS) are ranked sixth and fifth overall among the combined group. Although the SGR Modified Medina Dam route would have more acreage of disturbance within the Upper Quihi Rural Historic District, the Eastern Bypass Route and the Modified Eastern Bypass Route would likely have a greater impact because they would intersect an older portion of the district in relatively close proximity to two German-Alsatian farms, and an historic road remnant. They would also likely include more prehistoric and historic archaeological sites.

SGR's Modified Medina Dam Route and the MCEAA Medina Dam Alternative are both ranked the least likely of all alternatives to have potential impacts on cultural resources. The SGR Modified Medina Dam Route would cross Farm-to-Market Road (FM) 2676 and Quihi Creek in a portion of the landscape that has more modern landscape elements than the other rail routes studied, such as 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 would skirt the northern and eastern margins of the Upper Quihi Rural Historic District.

Due to the significance of the cultural resources in the area, it is likely that the development and operation of the quarry, and the construction and operation of the rail line under any alternative could cause significant adverse cumulative impacts on cultural resources. However, these impacts will be minimized with the implementation of the Programmatic Agreement (PA) which sets out the requirements for compliance with the National Historic Preservation Act (NHPA) (see Appendix A-3 of this FEIS). The PA, among other things, requires SGR to develop, in consultation with SEA and the THC, an effects resolution plan before proceeding with construction of any portion of the proposed rail line under any of the Eastern Alternatives, should the Board authorize one or more of these alternatives. SEA believes that with the implementation of the PA, which has been executed by all the necessary parties, the cumulative impacts on cultural resources would be reduced or minimized to the extent possible.

### **3.3.15 Socioeconomics**

As stated in Section 4.16 of the DEIS, SGR expects that, on average, approximately 15-25 people would be employed during rail construction for approximately 12 months. To the extent that employee wages are spent within the local area, the construction phase of the project would have a beneficial effect on the local economy. However, given the relatively small number of construction employees and limited duration of construction activities, the effects would be minor. According to SGR, as many as 24 employees would be needed to operate the rail line regardless of the selected route. The addition of these jobs to the local market would have a minor beneficial effect.

Because quarry construction and operation will create new jobs within the project area (in addition to those jobs that would be generated by construction and operation of a rail line), the quarry will beneficially contribute to cumulative impacts on the socioeconomics of the region. These impacts are expected to include an increase in the county tax base, which could benefit local schools and other local services.

However, during scoping, several commenters stated that the quarry would adversely affect the socioeconomics of the area in the following three ways: 1) potential loss of income and/or revenue associated with subdividing and/or developing private properties; 2) loss of hunting revenues due to wildlife disruption; and 3) decrease in property values.

While specific individuals may not wish to live near the quarry nor the proposed rail line, SEA cannot definitively determine whether or not this fact alone would cause a reduction in property values within the area. As stated in Section 4.16 of the DEIS and Chapter 5 of this FEIS (see Comment SE-05, #EI-1289), property values are determined by a myriad of subjective factors, including visual aesthetics, availability of schools, employment opportunities, transportation infrastructure, access to commercial establishments, land use, water quality, and air quality, among others, that cannot be accurately quantified.

However, because all of the alternatives would likely cause similar impacts on the socioeconomics of the region and the socioeconomic impacts from construction and operation of the proposed rail line would likely be small, SEA concludes that the cumulative effects of the proposed rail line and the quarry would not significantly contribute to socioeconomic impacts within the project area, or region.

### **3.3.16 Conclusion**

SEA concludes that the construction and operation of the rail line under any of the environmentally preferable routes recommended by SEA (when implemented with SEA's recommended mitigation measures) combined with the construction and operation of the quarry (when implemented with quarry-related state required and SEA mitigation) would not significantly contribute to cumulative impacts in the project area.