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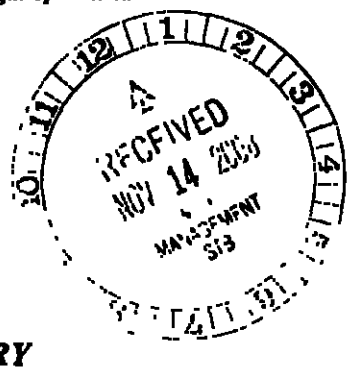

November 10, 2008

The Honorable Anne K Quinlan
Acting Secretary
Surface Transportation Board
395 E Street, SW
Washington, DC 20024

VIA ELECTRONIC FILING
AND OVERNIGHT DELIVERY

Re: Finance Docket 34284, Southwest Gulf Railroad—Construction and Operation Exemption—Medina County, Texas

Dear Secretary Quinlan:

This letter will consolidate, restate, and supplement prior record statements by the Medina County Environmental Action Association (MCEAA) regarding the agency's analysis of biological resources under the National Environmental Policy Act (NEPA) and the Endangered Species Act (ESA)

I. INTRODUCTION

This letter has been prompted by the decision of consulting agency U S Fish and Wildlife Service (FWS) to adhere to its original arbitrary, capricious, and unlawful concurrence in an equally arbitrary, capricious, and unlawful Section of Environmental Analysis (SEA) finding of "no adverse effect" on listed threatened and endangered species. FWS, which had been reviewing its position, communicated its decision not to reconsider to MCEAA in a conference call on October 24, 2008, involving Adam Zerrenner (Field Supervisor for FWS Austin), Joy Nicholopolous (FWS Texas State Administrator), Alison Arnold (FWS Field Biologist), and undersigned counsel and counsel's law clerk

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As a consequence, the legal defect in the agencies' "no adverse effect" finding remains substantially the same as the one MCEAA first objected to over four years ago.[1]

The agencies propose to let Vulcan [*hereinafter* including subsidiaries VCM and SGR] determine whether and when it will comply with the ESA for its proposed quarry and rail line project. Specifically, rather than determining whether species are present and how much of their habitat exists up front, as required by law, the agencies instead propose to let Vulcan divide its proposed quarry property into segments.[2]

Rather than requiring all of the surveying and mitigation up front, as required by law, the agencies instead propose to let Vulcan wait until just before it expands its quarry operations into a new segment of the property—and even then, FWS will not actually *require* surveys for those segments, but will merely hope that Vulcan sends them in time if it feels the need to apply for an incidental take permit.[3]

Rather than having a complete picture of what is present and how much mitigation (such as compensatory habitat acquisition) Vulcan should undertake, FWS will instead stand by passively while Vulcan's exploration, construction, and operations activities, to include the rail line, gradually degrade, encroach on, and ultimately clear and excavate the former habitat of species long since unlawfully "taken"[4] without any permit or compensatory mitigation

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[1] DEIS p D-85 (Letter, TGLF to Victoria Rutson, SEA, Feb 19, 2004, at 7) ("In the absence of focused counts [over the entire quarry property], FWS cannot guarantee that the applicant will not take a species during quarry excavation and operations, or during rail construction and operation")

[2] SDEIS Fig 3-7 (Showing Phase I Quarry Area, Rail Loading Area, and Plant Equipment Maintenance and Fuel Storage Area within boundary labeled "Vulcan's Biological Assessment Survey Area," the only portion of the quarry property where a biological assessment has been completed)

[3] Section 10 of the ESA provides a mechanism for authorizing the take of endangered species by an individual, association, private landowner, corporation, or state or local governmental entity, provided the take is incidental to, and not the purpose of, an otherwise lawful activity 16 U S C § 1539(a)(1)(B)

[4] Section 9 of the ESA makes it a violation of the Act for anyone to "take" an endangered species "Threatened" species are also protected by this provision 50 C F R § 17 31(a) The term "take" is defined to mean "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct " 16 U S C § 1532(19) The Secretary of the Interior defines "harass" and "harm" as follows

> Harass in the definition of "take" in the Act means an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering
>
> Harm in the definition of "take" in the Act means an act which actually kills or injures wildlife Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering

50 C F R § 17 3

As this letter will demonstrate, the agencies' foregoing approach underlying (and ultimately undermining) their "no adverse effect" finding is arbitrary, capricious, and unlawful

If Vulcan's construction and operations destroy habitat without adequate mitigation and shift mobile species on to MCEAA members' land, MCEAA members will experience a real economic harm, in the form of increased restrictions on their land. This is the same harm that Camp Bullis has experienced closer to San Antonio, due to much the same failure by FWS of allowing segmented development to degrade and destroy habitat rather than requiring all of the mitigation up front [5]

In addition MCEAA members have an aesthetic interest in the enjoyment of the native flora and fauna, particularly the birds, amphibians, and reptiles, that is part of their wider interest in preserving the working rural landscape of the historic and natural Quihi area. MCEAA members desire that these species survive and recover and not be placed in jeopardy by the construction and operation of Vulcan's quarry and rail line That cannot occur without full disclosure of the effects and thus an up front determination of the necessary mitigation MCEAA's members and adjacent property owners do not intend to bear that obligation on Vulcan's behalf

II. THE STB HAS FAILED TO COMPLETELY ASSESS EFFECTS

A The STB Has a Duty to Assess Effects on Species

Section 7 of the ESA requires that all federal agencies consult with FWS to ensure that the actions authorized, funded, or carried out by such agencies do not jeopardize the continued existence of any threatened or endangered species or adversely modify or destroy critical habitat of such species. 16 U.S.C. § 1536(a)(2) As the federal action agency, STB bears the responsibility to determine whether any action it authorizes, funds, or carries out may affect a federally listed or proposed species.[6]

B Under the ESA the Action to be Analyzed Includes the Quarry and the Rail Line

The action here, as MCEAA has argued, is a single, connected action with both a rail and quarry component.[7] SEA disagrees, at least under NEPA.[8] The issue under NEPA turns on whether the action for which agency approval is sought—the rail line—can

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[5] FWS is now engaged in covering itself for its past failures around Camp Bullis by stepping up enforcement for take, while doing absolutely nothing as the same harm is about to occur just to the west in Medina County See http //www mysanantonio com·military/Another_project_near_Bullis_is_probed html (last visited Nov 9, 2008) It is even more appalling in this Vulcan case because FWS knows in advance the exact planning and future development for the 1,700 acres in question

[6] *E g , City of Tacoma, Washington v F E R C* , 460 F 3d 53, 76 (D C Cir 2006) ("the ultimate responsibility for compliance with the ESA falls on the action agency")

[7] DEIS p D-83 to D-84, *see also, e g* , DEIS p, D-90–D-109

[8] FEIS p 2-2 to 2-11, DEIS p 4-2 (defining proposed action as rail line and loading area at quarry)

reasonably be said to cause the related action(s), i.e , the quarry.[9] It has been nearly ten years since the quarry was first proposed[10] and two years since the quarry received all necessary permits for operations,[11] yet Vulcan continues to wait on the rail license, making the causal relationship between the rail line and the quarry self-evident.

However, under the ESA, the test is not so limited In accordance with the extensive protective purposes of Section 7 of the ESA, "[t]he term 'agency action' has been defined broadly "[12] Notably, the regulatory definition of agency "action" encompasses actions "authorized . . . in part" by federal agencies.[13] Therefore, despite SEA's objections under NEPA, it is proper under the ESA for the proposed action to be viewed as a whole with a quarry component and a federally licensed[14] rail component It is particularly proper given that the proposed rail line will solely serve the quarry, will be wholly controlled by the quarry owner (Vulcan),[15] and will serve no other purpose

C All Effects Must Be Analyzed, Including Those of the Quarry

However the scope of the "action" is defined, though, the scope of the effects analysis is the same STB must account for the "total impact"[16] of the quarry and the rail line when determining whether this action may affect a federally listed or proposed species A walk through the definition of "effect" in the regulations demonstrates this:

> Effects of the action refers to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. Indirect effects are those that are caused by the proposed action and are later in

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9 FEIS p 2-6

10 *See* DEIS p D-2 to D-5 (letter from MCEAA referencing Feb 2000 meeting with Vulcan and Feb 2000 email from TxDOT employee), Planning for the quarry began in 1999 *See e g* , DEIS p F-34

11 *See* SDEIS p C-37 (regarding settlement of state permitting issues)

12 *NRDC v Houston*, 146 F 3d 1118, 1125 (9th Cir 1998), *see also Pacific Rivers Council v Thomas*, 30 F 3d 1050, 1054 (9th Cir 1994) ("there is little doubt that Congress intended to enact a broad definition of agency action in the ESA")

13 50 C F R § 402 02 (defining "action")

14 *See also* 50 C F R 402 02 (definition of action, subpart (c) includes "licensing) It is undisputed that the licensing of the rail line is an "action" being "authorized" within the meaning of 16 U S C § 1536(a)(2)

15 See DEIS p B-3 (acknowledging common ownership)

16 *National Wildlife Federation v Coleman*, 529 F 2d 359, 373 (5th Cir 1976) ("the relevant consideration," in whether an agency has "adequately considered" the effects of an action under the ESA, "is the total impact")

> time, but still are reasonably certain to occur. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification Interdependent actions are those that have no independent utility apart from the action under consideration.

50 C.F R. § 402 02 (definition of "effects") The proposed quarry, if not part of the action, is a "private actio[n] contemporaneous with the consultation in process." It is therefore part of the environmental baseline, because it is supposedly *certain to occur regardless of the rail line* Indeed, it is this very assumption that underlies SEA's conclusion that the quarry does not require analysis as a connected action under NEPA.[17]

Even if it the proposed quarry is not part of the environmental baseline—and it is hard to see how it would not be given the assumptions made by SEA under NEPA—it is related, as SEA admits [18] Therefore, the rail line is also an "interrelated action," part of a larger quarry-rail action that depends on the larger action for its justification It is undisputed that there will be no rail line without the quarry, as there are no other shippers currently or foreseeably present in the area

Under either scenario, whether part of the environmental baseline or as an interrelated action, the entire effect of the quarry—its construction, operations, and exploration activities—must be considered in making the "not likely to affect" determination, which it has not been to date.[19]

In support of the facts and argument herein MCEAA submits the attached exhibits in **Tabs 1-17** and **Maps 1-2**

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[17] FEIS p 2-7 ("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")

[18] DEIS p 4-4 ("the quarry and the rail line are related to the extent the rail line would serve the quarry")

[19] See 50 C F R § 402 12(a) ("A biological assessment shall evaluate the potential effects of the action on listed and proposed species and designated and proposed critical habitat and determine whether any such species or habitat are likely to be adversely affected by the action and is used in determining whether formal consultation or a conference is necessary"),

50 C F R § 402 13(a) ('If during informal consultation it is determined by the Federal agency, with the written concurrence of [FWS], that the action is not likely to adversely affect listed species or critical habitat, the consultation process is terminated, and no further action is necessary")

See also EI-1374 at 54-69 (MCEAA DEIS Comments, Jan 10, 2005)

III TO DATE, NUMEROUS SPECIES, HABITAT, AND EFFECTS ON SPECIES AND HABITAT HAVE NOT BEEN ANALYZED

A STB Determinations and FWS Concurrence to Date

To date STB has determined that construction and operation of any rail line alternative studied in the DEIS or SDEIS is not likely to affect any federally listed species or designated critical habitat.[20] For the DEIS alternatives, FWS has concurred as to the golden cheeked warbler only [21] For the FEIS alternatives, FWS has concurred as to the golden-cheeked warbler (*Dendroica chrysoparia*), the black-capped vireo (*Vireo atricapillus*), Comal Springs Riffle Beetle (*Heterelmis comalensis*), Comal Springs Dryopid Beetle (*Stygoparnus comalensis*), Fountain Darter (*Etheostoma fonticola*), Peck's Cave Amphipod (*Stygobromus* (=*Stygonectes*) *pecki*), San Marcos Gambusia (*Gambusia georgi*), Texas Wild-Rice (*Ziziana texana*), Texas Blind Salamander (*Typhlomoge rathbun*), and San Marcos Salamander (*Eurycea nana*), which were the species FWS identified as having potentially suitable habitat in the area of the SDEIS alternatives [22]

While specific unaccounted-for effects and impacts are discussed further in Part IV, *infra*, the record is clear that the "not likely to affect" determination relies on (1) the 2003 Biological Assessment (BA), which covered only "Phase 1" of the quarry site,[23] and (2) the "indication that [Vulcan] would continue to consult with [FWS] regarding impacts to federally listed species on the quarry site."[24] Reliance on either is improper.

B The Quarry Property Has Not Been Completely Surveyed For Species or Habitat

The 2003 BA purportedly surveyed, for the golden-cheeked warbler and black-capped vireo, only the southernmost portion of the quarry property, to include the Phase 1 quarry area, rail loading area, plant site, and plant equipment maintenance and fuel storage area [25] These were the only surveys purportedly done in accordance with FWS

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20 SDEIS Appx B-2 p 64 (summarizing concurrences)

21 EI-1479 (Letter from Robert Pine, FWS, to Victoria Rutson, SEA, May 19, 2005)

22 SDEIS Appx B-2 p 65

23 DEIS p F-30 to F 62 A previous biological assessment was conducted for the same segment of the property in 2001, but it lacked required surveys of the golden-cheeked warbler and the black-capped vireo in accordance with FWS protocol *See* DEIS p F-1 to F-30 (2001 BA) and Tab 1 (FWS survey protocols in effect as of July 9, 2004) Therefore, the 2003 BA, which incorporates the 2001 BA in full, is the relevant document·

24 SDEIS p 3-38 (statement of no adverse effect for all listed and threatened endangered species) The statement of no adverse effect is also based on STB's analysis of effects along the proposed rail alternatives, but the chief defect here is the failure to view those effects in conjunction with more significant yet unanalyzed effects on the quarry property, including the Phase 1 area with the rail loading loop

25 SDEIS Fig 3-7, DEIS p F-43, F-45 and F-60

protocols, which is the only method accepted by FWS to establish the presence or absence of these two bird species.[26]

On all other segments of the property, "screening" surveys were conducted for the birds [27] For all other species, including all terrestrial and all karst/cave species, no field surveys were conducted in the 2003 BA, the record does not reflect any additional surveying, including that alleged to have been done while "virtually all of the areas within the leased land boundaries were walked," beyond the screening surveys for the birds in Phases 2-5 [28] Further, the analysis of effects on terrestrial species was clearly based solely on a literature review and not on adequate field study [29] Many of the conclusory statements in the 2003 BA regarding the lack of potential species or habitat conflict with other, more recent portions of the record, as will be shown in Part III.D, *infra*

Instead, the 2003 BA proposes "broad scale low intensity surveys," apparently similar to the "screening" surveys, over the life of the project [30] The species will be long gone by the time these surveys occur, because their habitat will have long since been degraded and harmed by the effects of the quarry and rail line.

C The 2003 BA Analyzed Only the Effect of Habitat Clearing, For Only One Segment of the Quarry, and Arguably Only for One Listed Bird Species

The 2003 BA did not analyze the effect of encroaching construction, operations, and exploration, to include adverse "edge" effects that degrade habitat value for many hundreds of feet beyond the edge of development, land clearing, and mining These effects, as documented in the record in this proceeding, are discussed further in Part IV, *infra.*

Rather, the 2003 BA makes conclusory statements for the black-capped vireo that it "seem[s] quite tolerant of military activities and vehicle movement" at Fort Hood, Texas, based on purported expert reports that are not in the record [31]

The 2003 BA does not assess any effect besides direct habitat clearing on any species. The effect of direct habitat clearing is discussed for the golden cheeked warbler

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26 Tab 1 at 3

27 DEIS p F-43 and F-45

28 *See* DEIS p F-37

29 *See* DEIS p F-50 to F-52

30 DEIS p F-38

31 DEIS p F-44 Notice to the contrary should be taken that the military has taken steps at Fort Hood to *reduce and eliminate* conflict between the black-capped vireo and training activities, if the consultant's conclusory statement were correct, there would have been no need to do so http //dodbiodiversity com/case_studies/ch_5_2 html (last visited Nov 9, 2008) (' By leveraging protection to rarely used habitat areas and by lifting restrictions in highly used areas, we were able to greatly reduce military training and endangered species protection conflicts ')

for Phase 1 of the quarry.[32] No other effect on any species is discussed because the 2003 BA concludes, without basis in most cases, that they are not likely to be present in Phase 1.[33] For the remainder of the property the 2003 BA offers conclusory statements that "Prior to any brush-clearing or earth disturbing activities, [FWS] sanctioned surveys would be completed and a full 'Biological Assessment' would be prepared,"[34] and "if nesting warblers, or other sensitive species, are identified mining activities can be modified to avoid disturbing those species."

Wholly absent from the 2003 BA is any discussion or analysis of the effects of quarry and rail line construction and operation (including edge effects), as well as quarry exploration activities, on the species and habitat in these later segments or phases of the quarry property. The 2003 BA promises more surveys prior to "brush-clearing or earth disturbing," i.e., prior to direct habitat destruction, but what about indirect or cumulative taking of habitat and species from noise, vibration, lighting, and other sources of potential effects? A discussion of those effects does not appear in the record. MCEAA has discussed the legal duty to analyze indirect effects of an action—which is the same as the duty to analyze the effects of an interrelated action or an action that is part of the environmental baseline—in previous correspondence and incorporates that argument here.[35]

D The 2003 BA's Conclusory Statements Regarding the Likelihood of Species Presence and Habitat Are Contradicted by the Record

1 Karst, Cave, Aquifer, and Spring Species

The discussion of karst, cave, aquifer and spring species in the 2003 BA does not mention any such species by name. Rather, it layers conclusory statements to argue without basis that (1) there are no karst formations supporting cave or fissure habitat on the quarry property,[36] (2) there is no potential for impacts to such karst features known to exist on adjacent properties;[37] (3) "through extensive field observations and consultations with landowners, no sensitive recharge features have been identified in any of the five (5) Environmental Survey Areas or on any of the other parts of the 1,760 acre project site."[38]

The magnitude of the foregoing false statements in the 2003 BA and their conflict with the record is stunning. In its Water Pollution Abatement Plan (WPAP) submitted to the Texas Commission on Environmental Quality (TCEQ) in 2006, Vulcan identified no

32 DFIS p F-53 to F-54
33 DEIS p F-43 to F-44 and F-47 to F-52
34 DEIS p F-54
35 DEIS p D-203 to D-206 (Apr 19, 2004)
36 DEIS p F-47
37 DEIS p F-48
38 DEIS p F-49

fewer than *seventeen* sensitive recharge features on the quarry property,[39] and literally dozens of karst caves and fissures, including two caves and nine solution cavities.[40]

None of these karst or recharge features have been surveyed for listed threatened or endangered species, or for cultural resources for that matter.[41] While the absence of a subsurface hydrologic connection—if truly absent, and not merely a result of intermittent drought—might be probative of the lack of presence of the spring and aquifer species, it says nothing about the unsurveyed karst and cave species.

The failure to survey for karst species is not just a problem on the surface. As the report of MCEAA's expert, Dr. Lynn Kitchen, notes:

> The document . . does not address the potential for subsurface features. No studies were conducted to determine if any caves, solution cavities, or karst features are found below the surface. These features could be easily compromised by blasting activities. Once blasting is completed, protection of undetected features may be difficult. A sinkhole approximately 40 feet deep is located just west of the site. This sinkhole connects to a cave, the size of which is currently unknown. These types of subsurface features are relatively common in the quarry area and could be significant problems for the quarry and especially for protection of the aquifer. Vulcan should conduct subsurface investigations to ensure that large caves and other features are not present.[42]

Dr. Kitchen's analysis does not reflect idle concerns. The entire quarry site lies over the Edwards Aquifer Recharge Zone,[43] and is riddled with faults and features that transmit to the subsurface in ways not yet fully analyzed.[44]

Though Vulcan proposes to "report any sensitive features discovered during mining," and promises that they will be "protected, rated, and dealt with as described in the Temporary Stormwater Section, Attachment D, herein,"[45] the best management practices in Attachment D only purport to prevent sedimentation of such newly exposed

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39 **Tab 2** at 2 (Site Geology Narrative), *see also* **Map 1** (Overall Site Plan of Entire Quarry)

40 **Tab 2** at 5 (Site Geology Narrative), *see also* **Tab 3** (Geologic Assessment Tables and Comments) and **Map 1**

41 EI-471 at 6 (Jan. 10, 2004) (raising issue of cultural resources present in karst features)

42 **Tab 4** at 1-2 (Letter, Dr. Lynn Kitchen, Adams Environmental, to Richard Garcia, TCEQ, Aug. 21, 2006)

43 SDEIS Fig. 3-3, *see also* **Map 1**

44 **Map 1, Tab 2** at 8 (Site Geology Narrative) (noting faults as primary means of transmission to subsurface on the quarry property), *see also* **Tab 3** (Geologic Assessment Tables and Comments)

45 **Tab 5** at Atch. B (WPAP Recharge and Transition Zone Exception Form Attachment B)

features.[46] Perhaps this is because "*It is the intent of Vulcan to mine through such features, as stated elsewhere in this Water Pollution Abatement Plan.*"[47]

While the TCEQ might or might not ultimately sign off on such practices in a specific case as sufficiently protective of the aquifer's water quality, TCEQ is not responsible for assessing the impact on species.[48] There has been no provision for the karst and cave species on the quarry property in the analysis of effects or mitigation Nor is it reasonable to expect quarry operators to be on the lookout for such miniscule life forms during mining and blasting, which is why an up front inventory of the sensitive features above and below the ground is needed, as part of a comprehensive look at effects on the quarry property that MCEAA has long requested.

As Dr Kitchen explains:

> No environmental or geotechnical borings have been advanced [i e. placed in the record] on the project site to identify and delineate potential sources of perched groundwater. Perched groundwater consists of confined subsurface water deposits that are located above the normal aquifer elevations. These groundwater sources are generally confined by an impermeable layer that prevents downward percolation and recharge to the aquifer When quarried, the lateral confining layers may be breached, and the perched water table may drain into the excavated area. This may mobilize pollutants, and contribute to the overflow of the quarry's containment capacity. Local wells, especially those used for watering stock, may be using these groundwater sources and could be drained by construction of the quarry. These wells are often no more than 40 feet deep and may be susceptible to quarry activities Periodic borings along a grid of the project area should be advanced to search for and delineate potential perched groundwater features
>
> No surface or subsurface evaluations to screen for potential karst features have been conducted Subgrade karst features are essential to transportation of groundwater to the aquifer Without proper karst surveys, excavation and quarrying activities may disrupt groundwater flow and recharge into the aquifer Additionally, karst features provide habitat for numerous threatened and endangered species, and disruption of these environments may adversely impact these species. At a minimum,

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[46] **Tab 6** (WPAP Temporary Stormwater Section Attachment D)

[47] **Tab 7** at p 4 (WPAP Temporary Stormwater Section). *See also* **Tab 8** at p 8 (approved WPAP acknowledging same), **Tab 9** at ¶ 5C (site investigation report acknowledging same)

[48] *Cf* FEIS p 5-101 (referring to TCEQ aquifer rules as suitable mitigation for impacts to karst features) Even this condition only covers the rail line, and does not provide any protection on the quarry property, which undermines the no effect determination FEIS p 5-104 ("SEA believes that requiring SGR to comply with the Texas Edwards Aquifer rules for the proposed rail line construction and operation is sufficient mitigation")

periodic borings along a grid of the project area should be advanced to search for and delineate potential karst features [49]

The silence of the 2003 BA in the face of this evidence is enough to disqualify it as support for a reasoned "no adverse effect" determination for karst, cave, aquifer, and spring species Further, FWS stated that the effect on eight listed threatened and endangered aquifer and spring species should be considered for the SDEIS alternatives [50] These species were also purportedly analyzed in the 2003 BA, but their analysis was truncated by the aforementioned conclusory statement that recharge features were not present. SEA has recommended a mitigation condition for the rail alignments,[51] but has not factored that in to its endangered species determinations. SEA has also noted in the FEIS that there are karst features in the area near the loading track.[52]

2 Terrestrial Species

The SDEIS deems the Texas Tortoise and the Texas Horned Lizard to have a high potential to occur along all rail alignments.[53] Yet the 2003 BA, for similar if not identical habitat (including that of the rail loading loop), concludes they are unlikely to occur or that the habitat quality is marginal.[54] The 2003 BA also offers conclusory, vague statements about habitat quality.

The analysis for most species besides the golden-cheeked warbler and the black-capped vireo was based on a literature review and discussions with FWS staff, rather than field work.[55] Dr. Kitchen, MCEAA's expert, registered his objection to the conclusory nature of those findings,[56] which is reurged here particularly in light of the legal duty to consider the quarry's contribution to the total effect on each species.

E The 2003 BA is Stale

The 2003 BA is also stale and outdated It is not even clear if the same transects were walked in the years the studies were conducted.[57] The fact that adjacent landowners continued to report the presence of species on their land since its completion,[58] combined

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[49] **Tab 4** at 6 (Letter, Dr Lynn Kitchen, Adams Environmental, to Richard Garcia, TCEQ, Aug 21, 2006) It is possible that Vulcan already has some of this data from additional exploration it has since conducted on the property

[50] EI-1987 (Apr 12, 2006), SDEIS Appx B-2 p 65

[51] SDEIS p 3-34

[52] FEIS p 2-26

[53] SDEIS p 3-30

[54] DEIS p F-52

[55] SDEIS p 3-28

[56] EI-1287 at 15 & 23 (Jan 7, 2005), *see also* **Tab 10** (Letter, Dr Lynn Kitchen, Adams Environmental, to Jana Milliken, FWS, Jan 30, 2003) (criticizing habitat descriptions in 2003 BA as inadequate)

[57] **Tab 10** (Letter, Dr Lynn Kitchen, Adams Environmental, to Jana Milliken, FWS, Jan 30, 2003)

[58] EI-11978 (Sept 11, 2008)

with the 2003 BA's unlawfully limited scope, renders it unable to support a finding of no effect on species or habitat. Despite having nearly ten years to prepare an adequate biological assessment for its entire action, Vulcan has yet to do so

MCEAA also notes that this staleness problem will persist. How else will Vulcan know that its proposed on-site "buffer zone" mitigation is working without continuously surveying the segments of the property it has already mined through and disturbed, in addition to those it proposes to disturb? The answer is that the mitigation is not intended to work, because there is not intended to be any, because there won't be any species or quality habitat left by the time the surveys are conducted.

IV. THE EFFECTS OF QUARRY AND RAIL OPERATIONS ARE LIKELY TO TAKE SPECIES AND HABITAT

For the additional reasons given below, the scope and inadequacy of the 2003 BA and the segmentation and deferral of further investigation on the quarry property do not constitute the required "hard look" at the effects of this action required by law.

A. The Sources of Effects

The quarry consists of the areas to be mined by blasting and excavation; roads and conveyors connecting the mined areas to the plant area, a plant area consisting of unloading areas for massive dump trucks from the mined out areas, hoppers, conveyors, staging and stockpiling areas, screening and sorting machines, crushers, rinsing and wastewater treatment facilities, loading equipment, heavy duty diesel vehicles, generators, and rail cars [59]

Construction of the rail line and the plant area of the quarry will require pile driving, as well as a "broad array of powered noise producing mechanical equipment," described in the SDEIS [60] Construction of even the initial phase of the quarry implicates a wide array of activities, from clearing and grading, to crushing, to constructing runoff ponds, to erecting quarry plant equipment and constructing the rail line and roadways [61] Additional details regarding the destruction were provided in response to questions from TCEQ, including, among other things, onsite burning of cleared vegetation.[62]

The quarry is authorized to operate around the clock with an hourly processing limit of 1500 tons of aggregate per hour and a separate annual processing limit of 8 5 million tons per year.[63] The quarry will have five rock crushers [64] Vulcan also plans nighttime rail operations.[65] All of these operations will require lighting

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59 **Tabs 11** and **12** (Project Description), DEIS 4-102, **Map 2** (Site Plan for Plant Area)

60 SDEIS p 4-17, **Tab 13** at 22

61 **Tab 13** at 9, **Tab 14** (WPAP Sequence of Major Activities)

62 **Tab 13**, *Id* at 47

63 **Tab 15**

B Documentation of Effects in the Record

In general, there has been no analysis of whether any vibration, noise, nighttime lighting, or other quarry or rail construction or operation activity, including edge effects, will "harm" and "harass," and thus "take," listed threatened and endangered species over the entire quarry property There has been no such analysis even within the Phase 1 segment of the property, because the agencies have adopted the flawed 2003 BA. The environmental impact statements produced in this proceeding, and other studies, do not reflect that these effects will be confined to any one portion of the property or even within the boundaries of the property. MCEAA has raised this objection numerous times in the past.[66]

1 Noise

SEA characterized the existing noise environment as one where the primary sources of noise consisted of birds, insects and a few vehicles.[67]

However, the findings of SEA's own noise study, SDEIS ch. 4, indicate the potential for significant edge effects on species and habitat from encroaching construction, operations, and exploration.

Some of the edge effects from construction noise from the rail line on humans are documented in the DEIS and SDEIS, and exceed an adverse effect threshold of 80dBA[68] at ranges from 100 to 800 feet, depending on the construction activity[69] There is no discussion of the impact of these factors on species or habitat, particularly with respect to the rail loading loop area.

Nor have the effects of noise from construction of the quarry on species been assessed, even though the extent of blasting is described as "very audible" to humans off-site.[70] Therefore the analysis of effects is incomplete. Vulcan says it does not even measure the effect of blast-related noise, and only sample operational data was provided for certain plant operations.[71] Yet even these non-blasting activities were found to cause effects outside of the quarry property boundary[72]

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64 **Tab 16** at 3 (TCEQ response to air permit comments). **Map2.**

65 SDEIS p ES-5

66 *E g* , DEIS p D-17 (Letter, Dr Lynn Kitchen to Victoria Rutson, SEA, Jun 12, 2003) (requesting analysis of noise impacts on the black-capped vireo and golden-cheeked warbler and an inventory of karst features north of the loading loop), DEIS p D-86 (Feb 19, 2004), DEIS p D-155 (Feb 25, 2004), DEIS p D-204 & D-206 (Apr 19, 2004), EI-2708 at 14-15 (Jan 10, 2007)

67 DEIS p 3-43 & 3-47

68 SDEIS p 4-15 (describing the limit as one where "there may be adverse community reaction")

69 SDEIS p 4-18 to 4-19, DEIS p 4-75 & 4-77

70 SDEIS p 4-25

71 SDEIS Appx B-1 p 219-220

72 DEIS p 4-112

The SDEIS does a good job of discussing the operational noise impacts from the rail line outside of the quarry However, the record's discussion of operational noise impacts from the quarry and rail loading loop is conclusory, e g "sound levels from quarry operations . . could impact adjacent residences. . The noise impacts experienced by these residences would either be from the quarry or the rail line, but not from both."[73] The SDEIS also makes conclusory statements that rail loading activities on the quarry property "would be consistent with those generated by a quarry operation and would not result in off-site effects."[74] Setting aside the conclusory aspect, these statements (1) fail to address impacts to species and habitat and (2) also fail to adequately address synergistic effects associated with onsite and offsite impacts.

These findings underscore the fallacy of allowing Vulcan to control the timing of its own ESA compliance How does Vulcan know when to start surveys as it encroaches on a new segment of the quarry property? When do the edge effects start to harm and harass the species and degrade the habitat? Where in the 2003 BA, the DEIS, SDEIS, FEIS or in any of the mitigation to date is any of this stated? It is not stated because Vulcan never intends to deal with it Once the agencies unlawfully delegate their authority to Vulcan and let it off the hook for the full scope of necessary mitigation up front, Vulcan has control of the process for the remainder of the life of the quarry.

2 Vibration

Pile driving for the rail line will cause subsurface vibration impacts to water wells beyond the quarry property boundary,[75] as well as sensitive structures.[76] While the fact that there will be blasting at the quarry was noted,[77] the effect of vibration on species or habitat on and off the quarry property was not analyzed The cumulative effects analysis for vibration, as MCEAA has noted previously, consists of a conclusory statement that vibration would not propagate outside the property boundary, regardless of whether it was caused by construction, pile driving, blasting, or general operation.[78] That says nothing about what will happen within the property boundary or along the edges of habitat Vulcan is supposedly preserving or has not yet surveyed Yet that is precisely how the habitat destruction will occur.

3. The Effect of Lighting and Onsite Burning of Vegetation on Species and Habitat Were Not Analyzed

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[73] DEIS p 4-112, *see also* SDEIS at 4-25
[74] SDEIS p 4-20
[75] FEIS p 2-29 and 4-15 to 4-16, SDEIS p 4-26
[76] DEIS p 4-85
[77] SDEIS Appx B-1 p 216-217, SDEIS p 4-24
[78] SDEIS p 4-26, EI-2708 at 14-15 (Jan 10, 2007)

4 Conclusory Disposition of Construction Impacts

The DEIS claims there were "no occurrences of threatened or endangered animal species in the project area, and no known karst features (caves, caverns), which can harbor endangered species or insects. Nevertheless, it is possible that construction would disturb some endangered, threatened, or rare species "[79]

There are several problems with that statement. First, its conception of the "project area," when read in context with the surrounding passages and proposed mitigation is plainly limited to the rail line. Therefore, it demonstrates a failure to analyze the entire "action area" within the meaning of the ESA regulations that is necessary to support a finding of no effect.[80] Second, the statement that there are no known karst features is false for the reasons shown in the attached exhibit Tabs and Maps and Part III D.1, *supra*. Third, FWS has admitted that adjacent landowners have sighted the golden-cheeked warbler on their property, so there have been occurrences of endangered species in the project area.[81] Fourth, Vulcan plans to mine through and destroy karst features on the quarry property,[82] so even with a mitigation condition obligating Vulcan to investigate any karst features it discovers when constructing the rail line, there is still no protection for such features on the quarry property, a highly relevant and unconsidered factor that undermines the no effect determination Fifth, the admission that construction may disturb species also directly undermines the no effect determination.

C Rebuttal to Other Arguments

FWS and Vulcan advance three sets of justifications for their segmented approach. First, they claim that buffering and clearing out of season will protect the bird species from take. That is completely speculative and unsupported by the record. FWS and Vulcan have no idea what extent of buffering is necessary to protect the species and their habitat from edge effects of encroaching construction and operations, or even whether the species will be able to use the degraded buffer areas that remain, surrounded by quarry operations Avoidance strategies have not even been analyzed for most effects because the effects analysis was never completed for species and habitat on the entire quarry property. Therefore it is speculative, on this record, to assume that a given method of avoiding or lessening an effect will be sufficient to protect a species or its habitat from take.

Second, FWS and Vulcan rest on the idea of continued surveys over the life of the project, at times chosen by Vulcan. That unlawfully permits Vulcan to ignore edge

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[79] DEIS p 4-42 to 4-43

[80] 50 C F R § 402 02 ("Action area means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action") This failure is essentially the same as the failure to analyze the proper scope of effects noted above

[81] EI-11978 (Sept 11, 2008)

[82] **Tab 7** at 4 (WPAP Temporary Stormwater Section), *see also* **Tab 8** at 8 (approved WPAP acknowledging same), **Tab 9** at ¶ 5C (site investigation report acknowledging same)

effects and survey after the habitat has been degraded and the species driven away or killed. There is no mechanism to trigger a survey requirement in the record.

> Finally, FWS presents its red herring.
>
> If [FWS] were to require that Vulcan conduct three years of presence/absence bird surveys over its entire property up front, Vulcan may be inclined to immediately bulldoze all areas where no endangered species were recorded, and to maintain those areas in a barren condition to avoid having to conduct additional surveys on those areas in the future.[83]

At least in that scenario, Vulcan would have to fully disclose and mitigate for the entire quarry property, which is more than the present passivity of FWS will require. Under FWS's present position, Vulcan will not only be able to take species and habitat over time, at its own pace, without consequence, but it will also get the benefit of shifting its mitigation costs to its neighbors—adjacent landowners and MCEAA members who will see species driven onto their property with corresponding land use restrictions

[83] DEIS p B-23

V CONCLUSION

The STB, as the agency ultimately responsible for ESA compliance and the record support for the "not likely to adversely affect" determination, has a duty to correct the deficiencies in its existing no effect determination and should do so

Reliance on the FWS concurrence is ill-advised FWS is telling the residents of the action area that it can't do the job it is paid to do and require Vulcan to fully assess the effect on species and habitat up front, even though Vulcan has had nearly ten years[84] to do so. If it does, FWS is saying, then Vulcan might really harm the species and habitat (despite at least having to fully mitigate for whatever it destroys in that scenario), so instead, MCEAA members and adjacent landowners should just roll over, allow the species and habitat on the quarry property to be destroyed gradually over time, without adequate mitigation by Vulcan, and accept a servitude on their own land in gratitude That is the attitude of an agency that does not know how to stand up to a bully That is an attitude of cowardice That is the attitude of an agency that has gotten used to losing.[85]

Very truly yours,

THE GARDNER LAW FIRM
A Professional Corporation

/s/

David F. Barton

COUNSEL FOR PARTY OF RECORD
MEDINA COUNTY
ENVIRONMENTAL ACTION
ASSOCIATION, INC.

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[84] *See* DEIS p D-2 to D-5 (letter from MCEAA referencing Feb 2000 meeting with Vulcan and Feb 2000 email from TxDOT employee). Planning for the quarry began in 1999 *See e g* , DEIS p F-34

[85] Chris Bowman, *Analysis Bush Team Battered by Courts on Environment*, SACRAMENTO BEE, May 19, 2008 ('Of 78 federal court rulings and settlements in species cases resolved since January 2001, the Bush administration won just one"), *available at* http //www sacbee com/111/story/948788 html (last visited Nov 10, 2008)

Certificate of Service

I hereby certify that the foregoing has been served on all Parties of Record in *Finance Docket Number 34284*, by first class mail or more expeditious means, on this 10th day of November, 2008, including:

Dr. Robert Fitzgerald
Medina County Environmental Action Association
202 CR 450
Hondo, TX 78861

VIA HAND DELIVERY

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In addition to:

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Section of Environmental Analysis
Surface Transportation Board
395 E Street, S W.
Washington, DC 20024

VIA ELECTRONIC FILING
(No exhibits)

/s/
David F Barton
THE GARDNER LAW FIRM

for Party of Record
MEDINA COUNTY ENVIRONMENTAL
ACTION ASSOCIATION, INC

BEFORE THE SURFACE TRANSPORTATION BOARD

STB Finance Docket No. 34284

SOUTHWEST GULF RAILROAD COMPANY
CONSTRUCTION AND OPERATION—MEDINA COUNTY, TX

MEDINA COUNTY ENVIRONMENTAL ACTION ASSOCIATION

Exhibits

Tab 1	FWS Survey Protocols (July 11, 2004)
Tab 2	Narrative of Site Specific Geology from Vulcan WPAP
Tab 3	Geological Assessment, Tables, and Comments from Vulcan WPAP
Tab 4	Expert Report/Opinion. Letter, Dr. Lynn Kitchen, Adams Environmental, to Richard Garcia, TCEQ, Aug. 21, 2006
Tab 5	Vulcan WPAP Recharge and Transition Zone Exception Form
Tab 6	Vulcan WPAP Temporary Stormwater Section Attachment D
Tab 7	Vulcan WPAP Temporary Stormwater Section
Tab 8	Vulcan WPAP approval
Tab 9	Vulcan WPAP site investigation
Tab 10	Expert Report/Opinion: Letter, Dr. Lynn Kitchen, Adams Environmental, to Jana Milliken, FWS, Jan. 30, 2003
Tab 11	Project Description from Air Permit #76337
Tab 12	Project Description from Vulcan WPAP
Tab 13	Vulcan WPAP Response to TCEQ Questions
Tab 14	Vulcan WPAP Sequence of Major Activities
Tab 15	Equipment Table from Air Permit #76337
Tab 16	TCEQ Response to Comments for Air Permit #76337

Tab 17	Resume of Dr Lynn M Kitchen
Map 1.	Overall Site Plan of Entire Quarry
Map 2	Site Plan for Plant Area


EXHIBIT NO. 1

United States Department of the Interior

FISH AND WILDLIFE SERVICE
10711 Burnet Road, Suite 200
Austin, Texas 78758
512 490-0057
FAX 490-0974

JUL 9 2004

Brian Pietruszewski
Resources Law Group
555 Capitol Mall, Suite 1590
Sacramento, California 95814

FOIA Number 2004-00772

Dear Mr. Pietruszewski:

This responds to your June 17, 2004, Freedom of Information Act (FOIA) request for the following:

- The existing survey protocols for black-capped vireo and golden-cheeked warbler, or, in the alternative
- The most recent survey protocols in force that would presently apply.

Enclosed is one record responsive to your request. The enclosed document contains the language used in 10(a)(1)(A) scientific permits. No records have been withheld.

If you have any questions regarding this response or need further assistance, please contact Bill Seawell at 512 490-0057, extension 232.

Sincerely,

Robert T. Pine
Supervisor

Enclosure

cc: Ecological Services FOIA Coordinator, Region 2, Albuquerque, NM

TAKE PRIDE IN AMERICA

MINIMUM PROCEDURES FOR DETERMINING THE PRESENCE/ABSENCE OF GOLDEN-CHEEKED WARBLERS AND BLACK-CAPPED VIREOS
Last updated 04/3/02

1. Endangered Species Permits must be obtained from FWS - Region 2 Office in Albuquerque (Stephanie Weagley 505/248-6663 or email FW2_TE_Permits@fws.gov) prior to work in occupied endangered species habitat. Texas Parks and Wildlife Department also requires persons working on endangered species to obtain a permit (512/389-4800). If there is a question about whether a permit is needed for conducting work in endangered species habitat, please call the Austin U S. Fish and Wildlife Service Office at 512/490-0057.

2. The survey seasons are as follows:

a. Black-capped vireo - April 10 to July 1* and
b. Golden-cheeked warbler - March 15 to May 15.

* A minimum of 50% of the surveys for the BCV must be conducted between April 10 and May 31

3. We recommend survey times start 30 minutes before sunrise. All surveys must be completed by one o'clock in the afternoon.

4 A minimum of five visits with no more than 1 visit within any 5-day period.

5. Total survey time should be a minimum of 4 hours per 100 acres of habitat per visit (habitat is defined in the U.S. Department of Interior, Fish and Wildlife Service's "Guidance Concerning Review of Endangered Species Habitat", Revised April 1994).

6. Surveys should be conducted on days when weather conditions are suitable for the detection of bird singing. Robbins (1981) makes recommendations for acceptable limits of weather conditions and optimal conditions for increasing detection. Robbins (1981) recommends a wind speed of 12 mph as a generally acceptable maximum for satisfactory count results.

7. A minimum of 1hour per visit is need regardless of the size of the site.

8. Taped or play back recordings of BCV or GCW or screech owl calls may be used only after the above methodology (5 visits, 4 hours/visit) have been exhausted and no birds have been located. Tapes must be used judiciously to avoid behavioral impacts. Tapes must be used to verify negative results (absence of target birds).

9. Reports must include date and year, weather (e.g., wind speed, temperature, precipitation), start and end time, number of birds heard or observed (to include absence of birds from a site), site name, whether tapes were used and observers' name(s). Two maps (7 5 min quad maps only) must be included in the report One map of the site with location of the project area and the survey routes and another map with the bird detections as described by the International Bird Census Committee (Committee) (1970). Descriptions of habitats found on the site must also be included in the report. If available, also include GPS location information Data collected in lat long (decimal degrees), NAD 83 is preferred. If collected in an alternate coordinate system, please report the coordinate system and datum the information was collected in. Also, please

report the GPS unit model and its accuracy, and if any real time correction or post processing was done.

The above methodology is limited to determining the presence/absence of golden-cheeked warblers and black-capped vireos. It does not provide sufficient data to determine bird densities or territories. The results of surveys must be reported (as described above) to the U.S Department of Interior, Fish and Wildlife Service in the annual permit report whether or not the survey detected any target species.

If bird densities or territorial mapping is needed then the methodology described by the Committee (1970) should be followed. The following exceptions apply: (1) the entire project area will be censussed, not a sample plot; (2) all detections on the edge of the project area will be recorded even if more than half of the territory is off the project area; (3) the survey season is as described above, and (4) the time spent per visit and the number of visits should be sufficient to document the densities of the target species and suspected territories in the project area. Reports should include the information discussed above (for presence/absence reports) as well as the locations of all bird detections (by sex and age if identifiable), nests (if incidentally), contemporaneous detections, etc. registered on 7.5 min quad maps (or larger scale) as established by the Committee. Actual locations should be mapped rather than indicating territories or areas of use. Suspected territories could be mapped in addition to actual locations. Descriptions of habitats found on the site, whether or not birds were located in it, must also be included in the report If available, you may include this information in the same format described in the first paragraph of this section.

10 Exceptions to this methodology may be allowed only through coordination with and approval of the Austin U.S Fish and Wildlife Service Office.

Field Supervisor
U.S. Fish and Wildlife Service
10711 Burnet Rd., Suite 200
Austin, Texas 78758
(512)490-0057/(512)490-0974 (FAX)

LITERATURE CITED

International Bird Census Committee. 1970. An International standard for a mapping method in bird census work recommended by the International Bird Census Committee. Audubon Field Notes. 24(6): 722-726

Robbins, C.S. 1981. Bird activity levels related to weather. Pp. 301-310. in C.J. Ralph and J.M Scott (eds.). *Estimating numbers of terrestrial birds. Studies in Avian Biology No. 6.* Cooper Ornithological Society. Lawrence, Kansas.


EXHIBIT NO. 2

ATTACHMENT D

Narrative of Site Specific Geology

Site Geologic Map (Figure 1)

Feature Position Tables (GPS Coordinates)

SITE GEOLOGY NARRATIVE

Vulcan Materials Medina Quarry

Introduction

The following is a site-specific discussion of existing geological conditions and potential recharge features identified within the Vulcan Materials Medina Quarry (SITE). This assessment was performed by **Raba-Kistner Consultants, Inc. (R-K)** on behalf of Vulcan Materials pursuant to applicable Edwards Aquifer Protection Program Rules as specified in *Title 30 of the Texas Administrative Code, Section 213 (30 TAC §213, effective June 1, 1999)* This assessment report is in the format required by the Texas Commission on Environmental Quality (TCEQ) for the Geologic Assessment portion of a Water Pollution Abatement Plan (WPAP) and was prepared in accordance with the *Instructions to Geologists for Geologic Assessments on the Edwards Aquifer Recharge/Transition Zones (TCEQ-0585, revised October 1, 2004)*

This geologic assessment report documents conditions observed within project boundaries between October 2004 and April 2005 Although the entire SITE was walked at 15 m transects in accordance with TCEQ requirements, particular attention was given to drainageways across the SITE as surface water runoff is concentrated in these areas and likelihood for encountering potentially sensitive recharge features is considered greater.

Site Description

Site Location: The SITE consists of an approximately 1,776-acre property located in northern Medina County, Texas. As depicted on ***Figure 1***, the SITE consists of three contiguous parcels encompassing portions of Elm and Polecat Creeks The respective parcels are roughly rectangular in shape and are designated as follows from south to north: Wurzbach Tract, Schweers Tract, and the Boehme/Balzen Tract The Wurzbach Tract is bordered to the southwest by County Road 351 and to south by County Road 353. County Road 351 crosses portions of the Schweers Tract along the western tract boundary Numerous unimproved farm roads cross the SITE. For purposes of this reporting, individual tracts are referred to collectively as SITE

An electronic site plan depicting topographic contour lines was not available to R-K at the time this geologic assessment was conducted Site boundaries provided by Vulcan Materials were translated to standard 7 5-min series topographic maps available from the U S Geological Survey (USGS) in order to create suitable base maps for the geologic assessment Topographic contours and the tract boundary for the Wurzbach Tract were subsequently provided by Overby Descamps Engineers in September 2005 and were utilized to generate the final Site Geologic Map for this tract Topographic contour lines presented on the attached Site Geologic Map for the Schweers and Boehme/Balzen Tracts were taken directly from published USGS 7 5-minute maps

Historical Property Use: On the basis of field observations and interviews with SITE owners, the SITE has been historically utilized for farming and ranching purposes. As described herein, several stock ponds and water wells are located within SITE boundaries to supply water for domestic and stock purposes. Additionally, the SITE is utilized for recreational purposes including hunting. Numerous deer blinds were observed throughout the SITE during field reconnaissance activities

Topography and Drainage. The northern portion of the Wurzbach Tract is comprised of an upland area. The predominant direction of surface runoff across the Wurzbach Tract is generally from this upland area toward Polecat and Elm Creeks located to the south and east, respectively. A review of Flood Insurance Rate Maps (FEMA, 1980) indicates that areas immediately surrounding these drainage features are located within the 100-yr floodplain

As depicted on ***Figure 1***, the central portion of the Schweers Tract is classified as hilltop (i e., a topographic high) The predominant direction of surface runoff from this topographic high is toward ephemeral drainageways of Polecat Creek to the south and Elm Creek and its associated drainageways to the north and east The Flood Insurance Map for Medina County indicates that areas surrounding Elm Creek along the north and east tract boundaries are located within the 100-yr floodplain.

The eastern portion of the Boehme/Balzen consists of predominately upland areas including a prominent topographic high in the northern portion of the tract Surface water runoff from the eastern upland area is directed toward Elm Creek and ephemeral drainageways to the northwest, west, and south, respectively. Runoff from the northern upland area is also directed to Elm Creek toward the south and east Areas immediately surrounding Elm Creek within this tract are located within the 100-yr floodplain

Classification of Recharge Features. As further described herein, numerous naturally occurring recharge features attributed to karstification of limestone terrain were identified within project boundaries Additionally, structural features, non-karst closed depressions and manmade features were identified and assessed using definitions and guidance provided in *Instructions to Geologists (TCEQ-0585, revised October 1, 2004)* Features identified within the SITE that met the criteria presented in this reference were mapped As part of initial site reconnaissance activities, potential recharge features were mapped on the Wurzbach Tract and assigned a sequential feature identification number. On the basis of subsequent site visits and further review, features that did not meet the criteria for mapping were removed from the feature list As a result of this review process, feature numbers are not sequential for the Wurzbach Tract Feature numbers were assigned a prefix designation based upon their location within respective tracts (i e , WZ - Wurzbach, SC - Schweers, and B - Boehme/Balzen)

The characteristics of all mapped features, and corresponding recharge sensitivities as defined by the TCEQ, are presented on the attached Geologic Assessment Table (TCEQ-0585-Table). As presented on the referenced assessment tables and further described herein, a total of seventeen features were classified as sensitive

Stratigraphy

As presented in the attached Stratigraphic Column, information pertaining to the lithologies of geologic units underlying the SITE was taken from Barnes (1983), Collins (1998), and Small and Clark (2000) The primary references utilized in this geologic assessment include the following 1) USGS Open-File Report by Small and Clark (2000); 2) USGS Medina Lake Study by Lambert, Grimm, and Lee (2000) and 3) Bureau of Economic Geology (BEG) STATE MAP geologic maps and associated geologic descriptions by Collins (1998). Information pertaining to the thickness of respective subsurface geologic units at the SITE was obtained on the basis of field observations performed during the assessment, and published geological sources The Site Geologic Map is presented as ***Figure 1.***

The extent of the Quaternary deposits to include Alluvium (Qal), Fluviatile Terrace Deposits (Qt), and the Leona Formation (Qle) were estimated from field observations and review of the BEG geologic maps. For the Wurzbach Tract, Qal, Qt, and Qle were mapped in association with primary drainageways to include Polecat and Elm Creeks For the Schweers and Boehme/Balzen Tracts, Qal and Qt were mapped along Elm Creek These units predominately include various proportions of gravel, sand, silt, and clay

In addition to Quaternary fluvial deposits, Lower Cretaceous formations to include the Georgetown Formation, Upper Devils River Formation and the Lower Devils River Formation were mapped at the SITE. The youngest of the Lower Cretaceous formations is the Georgetown Formation (Kgt). Kgt is comprised of reddish-brown, gray to light tan, marly limestone. Outcrops of the Kgt were not identified during field reconnaissance activities, however, erosional remnants were identified in soils within upland areas on the Schweers and Boehme/Balzen Tracts

As depicted on the Site Geologic Map, the Upper Devils River Formation (Kdvru) is exposed across the majority of the SITE. This formation is typically regarded as the approximate equivalent to the Person Formation (i.e., upper member) of the Edwards Limestone (Ked). Results of field reconnaissance indicate that the Lower Devils River Formation (Kdvrl) outcropping at the site is limited in areal extent The Kdvrl is typically regarded as the approximate equivalent to the Kainer Formation (i e , lower member) of the Ked. According to Small and Clark (2000), the Devils River Formation generally lacks distinct marker beds which allow for subdivision into the distinct members typically mapped in conjunction with Ked The division between the Edwards Formation and the Devils River (i e , NW-SE trending line) is located approximately 1,500 ft northeast of the northern SITE boundary (Small and Clark, 2000)

To the extent that the Kdvru and Person Formation of the Ked are equivalent, three distinct members may be recognized that include the following from top to bottom: (i) Cyclic and Marine Member - mudstone to packstone with miliolid grainstone and chert; (ii) Leached and Collapsed Member - unit includes crystalline limestone and mudstone to grainstone with massive limestone beds, and (iii) Regional Dense Member - unit consists of dense, argillaceous limestone with iron-oxide stains According to published sources, the upper or Cyclic/Marine Member contains subsurface caves with laterally extensive porosity The Leached and Collapsed Member is one of the most porous and permeable members and exhibits extensive lateral cave development in

some areas The Regional Dense Member has low permeability with solution enlargement along vertical fractures

As discussed above, the Kdvrl and the Kainer Formation of Ked are generally considered as equivalent, Therefore, four distinct members can be recognized to include the following from top to bottom· (i) Grainstone Member - the upper unit consists primarily of a white, crossbedded miliolid grainstone, and mudstone to wackestone with chert nodules; (ii) Kirschberg Evaporite Member - unit includes highly altered crystalline limestone and chalky mudstone which commonly exhibit boxwork porosity with neospar and travertine frame resulting from the leaching of evaporite layers; (iii) Dolomitic Member - unit consists of massively bedded, light gray mudstone to grainstone and crystalline limestone, and (iv) Basal Nodular Member - the lower unit consists of shaley nodular limestone, mudstone, and miliolid grainstone The upper Kdvrl (i e , Grainstone member equivalent) was exposed at the SITE on the Boehme/Balzen Tract along ***Feature B-S30 (F #5)*** Based upon the work of Small and Clark (2000), this member is described as having few fractures or caves Recrystallization of calcite within the limestone matrix generally reduces permeability within this member

Structure

The SITE is located within the Balcones Fault Zone and as such possesses a distinct structural trend. This zone consists of a northeast trending, *en echelon* normal fault system, which juxtaposes Upper Cretaceous lithologies in the southeast with Lower Cretaceous lithologies in the northwest. As a result of this larger-scale, regional faulting, minor internal fault sequences and fractures exist within this zone which follow the same structural trend and accommodate localized displacement.

Results of geologic assessment activities indicate the presence of the five relatively large-scale fault zones transecting the SITE oriented generally along the regional NE-SW trend As depicted on the Site Geologic Map, the fault zones are designated as F #2 through F #6, although, faults were also given feature designations per tract. These faults facilitate internal displacement within the Kdvru In addition, F #5 ***(Feature B-S30)*** also juxtaposes the Upper and Lower Devils River Formation. As depicted on the Site Geologic Map, F #1 trends to the NW-SE which is antithetic to the regional structural trend and inferred to facilitate internal displacement within the Kdrvu.

The locations of respective fault zones were mapped on the basis of the following field observations in conjunction with review of aerial photographs

- Distinct changes in soil and/or vegetation were observed across fault zones at several locations
- The presence of solution enlarged fractures rock outcrops oriented NE-SW, within inferred fault zones
- Distinct physiographic expression of the fault zones which was evidenced by lineations in drainage features and outcrops

USGS studies conducted by Small and Clark (2000) and Lambert, Grimm, and Lee (2000) indicate the presence of four normal fault zones transecting the SITE which generally correspond to those mapped in conjunction with field activities Review of published maps by Lambert, Grimm, and Lee (2000) indicates that F #2 corresponds to the Lincoln Fault and F #3 corresponds to the Seco Creek Fault Both of these studies indicate that F #4 corresponds to the Diversion Lake Fault. As further discussed in the potential for fluid migration section, normal fault zones that transect the SITE are generally considered as conduits to flow facilitating recharge to the Edwards Aquifer especially in drainageways where runoff and flow conditions are concentrated Pursuant to point assignment criteria presented in the Geologic Assessment Table, these faults are classified sensitive

Karst Features

Forty-three potential recharge features were identified within the SITE boundaries that may be attributed to karstification of the limestone terrain These features, some of which may be structurally controlled, include caves, solution cavities, a sinkhole, solution enlarged fractures, and other natural bedrock features A brief description of karst features is provided in the following paragraphs Please see *Comments to Geologic Assessment Tables* provided in ***Attachment A*** for complete descriptions of karst features

Caves

There were two caves identified within SITE boundaries located on the Schweers Tract ***(Feature SC-S14)*** and Boehme/Balzen Tract ***(Feature B-S19)***, respectively ***Feature SC-S14*** was formed by natural dissolution of limestone along F #4. This cave opening is greater than 3 ft in diameter with a vertical extent of approximately 6 ft and a horizontal extent of approximately 6 ft This feature is classified as sensitive owing to rapid infiltration potential. ***Feature B-S19*** was formed by natural dissolution of limestone The cave opening is approximately 4 ft in diameter and extends approximately 6 ft into the cliff face The vertical extent is approximately 12 ft forming a natural chimney that daylights through the top of the hill. Results of field reconnaissance indicated that the cave was developed due to cliff erosion and is not connected to the subsurface Feature is classified as sensitive solely based upon point assignment criteria.

Solution Cavities

A total of nine solution cavities were identified within SITE boundaries ***(Features WZ-S65, B-S1, B-S4, B-S6, B-S8, B-S18, B-S20, B-S21, and B-S27)*** Five of the nine identified solution cavities were formed by stream scour along drainage features The remaining solution cavities were formed by dissolution of limestone in other areas There was no evidence that any of the solution cavities identified and described as part of this assessment were connected to the subsurface. Therefore, these features were not classified as sensitive pursuant to applicable point assignment criteria Of the referenced solution cavities, ***Features B-S6 and B-S27*** were formed by dissolution of limestone along fault F #4

Sinkhole

One sinkhole *(Feature SC-S2)* was identified at the SITE on the Schweers Tract. It is inferred that ***Feature SC-S2*** was most likely formed by enhanced dissolution of limestone along F #4 and associated collapse The feature measures approximately 115 x 66 x 7 ft and is rimmed by limestone. Based on information from the property owner, it is R-K's understanding that the feature holds water for 1-2 days following significant rainfall events This feature is classified as sensitive due to inferred karst origin and moderate infiltration potential.

Solution Enlarged Fractures

A total of twenty-seven outcrops containing solution enlarged fractures were identified within SITE boundaries. In general, densities of these fractures are on the order of 1-3 per foot and the infilling is predominately fine-grained soils Apertures are somewhat variable for the features evaluated, however, the majority of the apertures ranged between 1 to 8 inches Collectively, the potential for infiltration at these locations is low and these features are not classified as sensitive

Other Natural Bedrock Features

Four features were classified as other natural bedrock features to include ***Features WZ-S63, SC-S18, SC-S19, and SC-S20*** These features were inferred to represent shallow surface collapse features enlarged by erosion. Although contained within limestone, features appear to reflect surface erosion (i e , upper weathered surface of limestone units) and do not appear to be connected to the subsurface ***Features SC-19 and SC-20*** are located along F #4 The features ranged in size with fine-grained soils infilling There was no evidence of preferred infiltration at these features

Non-Karst Closed Depressions

A total of thirty-nine non-karst closed depressions were identified at the SITE as the result of field reconnaissance activities The majority of these features appear to have formed by erosion primarily within the soil zone associated with the decay of tree roots, and subsequent enlargement by burrowing animals In all instances, features were probed with a non-conducting rod to evaluate subsurface extent These features are not connected with limestone bedrock and do not exhibit evidence of internal drainage or airflow. Those features that did not form as the result of erosion are described below Please see *Comments to Geologic Assessment Tables* provided in ***Attachment A*** for complete descriptions of non-karst closed depression features

Features WZ-S1 and WZ-S8 are dammed stock ponds that were constructed as the result of excavation activities These features appear to be completely contained within soil with no connection to underlying limestone bedrock ***Feature WZ-S19*** is a small area excavated into the alluvium by the land owner in order to obtain roadbed materials This feature appears to be completely contained within alluvial material with no connection to underlying limestone bedrock ***Features SC-S3 and B-S5*** are naturally occurring depressions near the headwaters of drainages that were subsequently enlarged by human activity and are currently utilized as stock ponds

There was no evidence of rapid infiltration at any of these features. Stock ponds were generally observed to be holding water at the time field activities were conducted

Pursuant to point assignment criteria presented in TCEQ-0586, all non-karst closed depressions were classified as not sensitive, having low potential of transmitting fluids to the subsurface

Manmade Features

As depicted on the Site Geologic Map, a total of six manmade features were identified within SITE boundaries As described in the following paragraphs, three of the six features (i e , water wells) may serve to enhance the transmission of runoff to the subsurface only in the event that surface completions are compromised ***(Features WZ-S45, SC-S7, and B-S11).***

Features WZ-S45, SC-S7, and B-S11 are water wells that are currently utilized to supply water for domestic/stock purposes These water wells were observed with a typical 6-inch diameter surface casing set within concrete pads Based on communication with respective property owners, it is R-K's understanding the wells onsite are completed to depths on the order of 340 ft In the event that the integrity of the surface seal and/or surface casing was to become compromised, these features may provide a conduit for the direct transmission of surface runoff to the Edwards Aquifer Therefore, these features were classified as sensitive based upon the point assignment criteria presented in TCEQ-0585

Additional information from the TWDB database indicates that the majority of water-supply wells in the SITE vicinity are completed to depths ranging from 300 ft to 380 ft below ground surface It is likely that these wells are completed and producing from the Kirschberg Evaporite Member which is generally considered to represent the most permeable and porous part of the Edwards Formation or its equivalent (I e , Kdvr).

Feature B-S13 was observed to be a rock-lined pit adjacent to the remains of an old settler house. The pit is partially back-filled with fine-grained soil and gravel The original function of the pit is believed to be a cistern utilized for the collection of rainwater The feature is not classified as sensitive.

The remaining two manmade features ***(Features SC-S26 and SC-S27)*** are located adjacent to the old ranch house in the northwest portion of the Schweers Tract. ***Feature SC-S26*** was observed to be a hand dug pit measuring approximately 6 ft in diameter by 3 ft in depth This feature was enclosed in a wooden structure which was formerly utilized as an outhouse The feature appears to penetrate upper weathered limestone strata and is partially backfilled with organics and soil. ***Feature SC-S27*** consists of a septic tank system that serves the old ranch house The capacity of the septic tank or leach field extent could not be determined on the basis of field observations However, based upon communications with the landowner and industry standards, the septic tank would be approximately 400 gallons in size with dimensions of approximately 6 ft in diameter by 3 ft high On the basis of available information, it appears that the septic tank penetrates upper weathered limestone strata to a depth of approximately 4 ft Referenced features were classified as not sensitive based upon an estimated low infiltration rate and small catchment area for surface runoff

Field reconnaissance activities also indicated the presence of a former outhouse and gray water discharge hole on the Wurzbach and Boehme/Balzen Tracts, respectively The outhouse on the Wurzbach Tract is located at the camp site near the southwest property corner and was observed to be comprised of a hand dug pit measuring approximately 2 ft in diameter by 4 ft in depth enclosed in a wooden structure The gray water discharge hole is located adjacent to the camp house in the central portion of the Boehme/Balzen Tract Based on information provided by the landowner, gray water (e g , dishwashing water, etc) from the camp house is discharged into the hole which measures approximately 2 5 ft in diameter and 2-4 ft in depth Both the hand dug pit associated with the outhouse and the gray water discharge hole appear to be completely contained within the alluvium with no connection to underlying limestone. As these features do not penetrate limestone bedrock and do not meet criteria for classification per TCEQ-0585, these features are not considered to represent recharge features

Potential for Fluid Migration to the Edwards Aquifer

The majority of the SITE is characterized by intact limestone with overlying soils having slow or very slow published infiltration rates. As discussed herein, the majority of the features mapped at the SITE have a low potential for infiltration based upon criteria set forth in Instructions to Geologists With the exception of a few man-made and karst features considered to represent sensitive recharge features, the overall potential for fluid movement (i e , surface-derived runoff) to the Edwards Aquifer across the majority of the SITE acreage is considered to be low

A primary mechanism for fluid migration exists along large-scale regional fault zones. The potential for surface water infiltration is most significant in areas where fault zones cross primary drainage features (e g Elm Creek, Polecat Creek) Owing to concentrated flows along drainage features following rainfall and runoff events, the potential exists for significant recharge to the Edwards Aquifer Pursuant to point assignment criteria presented in the Geologic Assessment Table, normal fault zones are classified as sensitive, based upon an estimated moderate to high relative infiltration rate and large catchment area for surface runoff along each fault zone.

The fact that fault zones serve as conduits to flow within the Edwards Aquifer is corroborated by the recent USGS study of the Medina Lake area (Lambert, Grimm, and Lee 2000) The study was performed to summarize the hydrogeology, hydrologic budget, and water chemistry of this area Results of the study indicated that water from Medina Lake is moving into the Edwards Aquifer primarily within two fault blocks comprising the eastern Medina storage unit where the SITE is located One of the fault blocks is bounded on the north by the Diversion Lake fault and on the south by the Haby Crossing fault This is particularly relevant as the Diversion Lake Fault is mapped as F #4 and this fault block encompasses the majority of the Schweers and Wurzbach Tracts It should be noted that the Haby Crossing Fault which is located approximately one mile to the south of the Wurzbach Tract has 600 ft of vertical displacement and is considered to be a flow-barrier fault of the Edwards Aquifer (Small and Clark, 2000)

The north fault block is described as the area bounded by the Vandenburg School Fault and the Haby Crossing Fault The south fault block is described as the area bounded by the Diversion Lake Fault and the Haby Crossing Fault (Lambert, Grimm, and Lee, 2000) This is particularly

relevant as the entire SITE is located within these respective fault blocks The Vandenburg School Fault is located approximately one mile to the north of the Boehme/Balzen Tract The Diversion Lake Fault transects the central portion of the SITE across the Boehme/Balzen and Schweers Tracts and is designated as F #4 The Haby Crossing Fault is located approximately one mile to the south of the Wurzbach Tract It is reported that this fault has 600 ft of vertical displacement and is considered to be a barrier to groundwater flow within the Edwards Aquifer (Small and Clark, 2000)

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FEATURE POSITION TABLE
Vulcan Materials Medina Quarry - Wurzbach Tract
Medina County, Texas

Feature Designation	Feature Type	Date Collected	Time Collected	North Latitude	West Longitude
WZ-S1	CD	10/12/04	11 11 39AM	N29 27 19 3	W99 01 24 2
WZ-S3	SF	10/12/04	1 29 07PM	N29 27 29 4	W99 01 31 2
WZ-S8	CD	10/13/04	1 42:16PM	N29 27 31 1	W99 00 49 4
WZ-S17	CD	10/20/04	8.52.51AM	N29 27 25 8	W99 01 00 0
WZ-S19	CD	10/20/04	10 32.22AM	N29 27 29 5	W99 00 55 1
WZ-S21	SF	10/22/04	12 58.07AM	N29 27 29 8	W99 01 27 3
WZ-S27	CD	10/28/04	9 52 56AM	N29 27 30 6	W99 01 01 1
WZ-S29	CD	10/28/04	12 24 03PM	N29 27 34 4	W99 01 05 5
WZ-S30	CD	10/28/04	2.57 48PM	N29 27 40 1	W99 01 08 8
WZ-S33	CD	10/29/04	11 00.54AM	N29 27 38 6	W99 01 12 1
WZ-35	CD	10/29/04	12 34 12PM	N29 27 36 2	W99 01 13 8
WZ-S36	CD	10/29/04	1 20 40PM	N29 27 55 8	W99 01 15.9
WZ-S37	CD	10/29/04	2 18 04PM	N29 27 32.8	W99 01 15 1
WZ-S38	CD	10/29/04	2 39 11PM	N29 27 28 8	W99 01 15 3
WZ-S39	CD	10/29/04	2 52 52PM	N29 27 29 6	W99 01 13 6
WZ-S40	SF	11/01/04	11 23.08AM	N29 27 55 8	W99 01 18 3
WZ-S42	CD	11/01/04	12 04 23PM	N29 27 54.1	W99 01 17 9
WZ-S44	CD	11/01/04	2 23 30PM	N29 27 38 8	W99 01 16 3
WZ-S45	MB	11/02/04	10 19 20AM	N29 27 29 4	W99 01 19 5
WZ-S46	CD	11/02/04	1 36 43PM	N29 27 46 3	W99 01 22 8
WZ-S47	CD	11/02/04	2 25.19PM	N29 27 53 6	W9 01 24 5
WZ-S48	CD	11/02/04	3 05 14PM	N29 27 36 7	W99 01 24 0
WZ-S50	CD	11/02/04	3 26 00PM	N29 27 34 9	W99 01 23 9
WZ-S52	CD	11/03/04	10.33.12AM	N29 27 46 1	W99 01 27 0
WZ-S53	CD	11/03/04	11 15.40AM	N29 27 34 7	W99 01 26 9
WZ-S54	CD	11/03/04	1 29 18PM	N29 27 31 4	W99 01 13 0
WZ-S55	CD	11/03/04	2.45 48PM	N29 27 33 4	W99 01 14 4
WZ-S56	CD	11/4/2004	9 03.51AM	N29 27 27 9	W99 01 25 8
WZ-S59	SF	11/05/04	9 18 39AM	N29 27 40 2	W99 01 32 1
WZ-S60	SF	10/13/04	11 46 56AM	N29 27 47.7	W99 01 22 6
WZ-S61	SF	11/05/04	11 02 45AM	N29 28 09.3	W99 01 31 7
WZ-S62	SF	11/05/04	12 11 45PM	N29 28 10 4	W99 01 29 4
WZ-S63	O	11/09/04	12.14 49PM	N29 28 03 7	W99 01 21 4
WZ-S65	SC	11/10/04	1.45 15PM	N29 28 00 1	W99 01 09 1
WZ-S67	CD	11/19/04	10 08 43AM	N29 28 15 3	W99 00 46 2
WZ-S68	SF	12/08/04	12 19 39PM	N29 27 28 1	W99 00 44 5
WZ-S69	SF	3/10/05	9 56 38AM	N29 28 00 1	W99 01 10 0
WZ-S70	SF	10/14/04	1 29 50PM	N29 28 09.7	W99 00 46 7
WZ-S71 (F #1)	F	10/12/04	1 29 07PM	N29 27 30 8	W99 01 31 1
WZ-S72 (F #2)	F	12/08/04	12 19 39PM	N29 27 28 1	W99 00 44 5
WZ-S73 (F #3)	F	11/05/04	11 02 45AM	N29 28 09 3	W99 01 31 7

NOTES

1) Geographic coordinates are presented in Latitude/Longitude (degrees, minutes, decimal seconds) format
2) North American 1927 datum, MEAN FOR CONUS (NAD27)
3) Data were collected utilizing a GARMIN V Global Positioning System (GPS)
4) Horizontal Accuracy RMS Value < 3 meter ground resolution (WAAS Enabled)
5) GPS data were collected by Richard Sample (R-K Project Professional) and Alberto Jimenez (R-K Project Geologist)

FEATURE POSITION TABLE
Vulcan Materials Medina Quarry - Schweers Tract
Medina County, Texas

Feature Designation	Feature Type	Date Collected	Time Collected	North Latitude	West Longitude
SC-S1	CD	11/29/04	1 45:48PM	N29 28 33 3	W99 00 56 5
SC-S2	SH	11/29/04	2.12.45PM	N29 28 35 3	W99 00 56 6
SC-S3	CD	11/29/04	2.35 53PM	N29 28 40 4	W99 00 48 9
SC-S4	CD	11/30/04	1 16 10PM	N29 28 43 2	W99 01 25 4
SC-S5	CD	11/30/04	1 35:12PM	N29 28 37 7	W99 01 26 3
SC-S6	CD	11/30/04	2 07 35PM	N29 28 40 1	W99 01 23 9
SC-S7	MB	11/30/04	3 41 03PM	N29 28 41.2	W99 01 18 9
SC-S8	CD	12/01/04	1 32.04PM	N29 28 24.1	W99 01 26.1
SC-S9	CD	12/01/04	3 16 54PM	N29 28 29.6	W99 01 21 3
SC-S10	SF	12/02/04	9 47 32AM	N29 28 17 3	W99 01 17 0
SC-S11	CD	12/02/04	12 01 27PM	N29 28 29 7	W99 01 14.1
SC-S12	SF	12/02/04	3.20 43PM	N29 28 34 5	W99 01 08 3
SC-S13	CD	12/14/04	11 39 12AM	N29 28 25 4	W99 01 08 0
SC-S14	C	12/14/04	2 32 38PM	N29 28 33 1	W99 01 04 0
SC-S15	SF	12/14/04	2.40 49PM	N29 28 32 8	W99 01 03 3
SC-S16	O	12/16/04	9 24.32AM	N29 28 20.1	W99 00 49 8
SC-S17	CD	12/16/04	9 51 37AM	N29 28 32.7	W99 00 48 6
SC-S18	SF	12/16/04	12 15.49PM	N29 28 21 0	W99 00 44 5
SC-S19	O	12/16/04	12 38 01PM	N29 28 38.2	W99 00 44 7
SC-S20	O	12/16/04	1 02:49PM	N29 28 37.7	W99 00 43 4
SC-S21	CD	01/04/05	2.32.38PM	N29 28 55 2	W99 01 00 1
SC-S22 (F #3)	F	12/16/04	12:15 49PM	N29 28 21.0	W99 00 44 5
SC-S23 (F #4)	F	12/14/04	2.40.49PM	N29 28 32.8	W99 01 03 3
SC-S24 (F #5)	F	01/04/05	3 05.00PM	N29 29 09.7	W99 00 54.3
SC-A25 (F #6)	F	01/04/05	3 20.15PM	N29 29 19 6	W99 01 02 8
SC-S26	MB	01/04/05	4 00:00PM	N29 28 43.0	W99 01 18 4
SC-S27	MB	01/04/05	4 05:00PM	N29 28 42.7	W99 01 17 5

NOTES:

1) Geographic coordinates are presented in Latitude/Longitude (degrees, minutes, decimal seconds) format
2) North American 1927 datum, MEAN FOR CONUS (NAD27)
3) Data were collected utilizing a GARMIN V Global Positioning System (GPS)
4) Horizontal Accuracy- RMS Value < 3 meter ground resolution (WAAS Enabled)
5) GPS data were collected by Richard Sample (R-K Project Professional) and Alberto Jimenez (R-K Project Geologist)

FEATURE POSITION TABLE

Vulcan Materials Medina Quarry - Boehme/Balzen Tract
Medina County, Texas

Feature Designation	Feature Type	Date Collected	Time Collected	North Latitude	West Longitude
B-S1	SC	01/06/05	9:10:51AM	N29 29 08 2	W99 00 42 1
B-S2	SF	01/06/05	11 05 46AM	N29 29 45 1	W99 00 44 5
B-S3	SF	01/06/05	12 10 46PM	N29 29 23 0	W99 00 38 4
B-S4	SC	01/06/05	12 50 33PM	N29 29 11 5	W99 00 34 7
B-S5	CD	01/06/05	2 32.09PM	N29 29 19.6	W99 00 04 4
B-S6	SC	01/06/05	3 09:13PM	N29 29 13 9	W98 59 56 0
B-S7	SF	01/10/05	11 32.26AM	N29 29 27 6	W99 00 29 5
B-S8	SC	01/10/05	2.02.13PM	N29 28 50 6	W99 00 02 2
B-S9	SF	01/11/05	10 05 15AM	N29 28 46 7	W99 00 00 9
B-S10	SF	01/11/05	1 49:23PM	N29 28 58.2	W99 00 11 5
B-S11	MB	01/11/05	3 24 29PM	N29 29 06.8	W99 00 28 4
B-S12	CD	01/12/05	10 41 27AM	N29 28 45 2	W99 00 31 3
B-S13	MB	01/28/05	9 33:48AM	N29 29 21 4	W99 00 06 6
B-S14	SF	02/02/05	2 29.26PM	N29 29 32.0	W99 00 16 4
B-S15	SF	02/03/05	10:28.25AM	N29 29 26 9	W99 00 27 5
B-S16	SF	02/03/05	1 27 42PM	N29 29 53.5	W99 00 27 3
B-S17	SF	02/04/05	8 53 04AM	N29 29 41 7	W99 00 38 5
B-S18	SC	04/07/05	9 25 07AM	N29 28 48 4	W99 00 31 4
B-S19	C	04/07/05	10 41 57AM	N29 28 49 4	W99 00 38.8
B-S20	SC	04/07/05	10.49 01AM	N29 28 49 7	W99 00 37 5
B-S21	SC	04/07/05	12 43 39PM	N29 28 52 1	W99 00 42 0
B-S22	SF	04/07/05	3 29:25PM	N29 29 7 68	W99 00 2.30
B-S23	SF	04/08/05	12 50 45PM	N29 29 23 1	W99 00 31.7
B-S24	SF	04/12/05	9 38 53AM	N29 29 44 2	W99 00 22.3
B-S25	SF	04/12/05	11 02 24AM	N29 29 54 2	W99 00 21 9
B-S26	CD	04/12/05	12 16.44PM	N29 29 18 6	W98 59 54 2
B-S27	SC	04/12/05	12:40 16PM	N29 29 15 2	W98 59 56 5
B-S28 (F #3)	F	01/11/05	10.05 15AM	N29 28 46.7	W99 00 00 9
B-S29 (F #4)	F	01/11/05	1 49.23PM	N29 28 58 2	W99 00 11 5
B-S30 (F #5)	F	01/10/05	11 32.26AM	N29 29 27 6	W99 00 29 5
B-S31 (F #6)	F	02/03/05	1.27 42PM	N29 29 53 4	W99 00 26 7

NOTES:

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2) North American 1927 datum, MEAN FOR CONUS (NAD27)
3) Data were collected utilizing a GARMIN V Global Positioning System (GPS)
4) Horizontal Accuracy RMS Value < 3 meter ground resolution (WAAS Enabled)
5) GPS data were collected by Richard Sample (R-K Project Professional) and Alberto Jimenez (R-K Project Geologist)


EXHIBIT NO. 3

TCEQ-0585
Geologic
Assessment

TCEQ – 0585

GEOLOGIC ASSESSMENT

For Regulated Activities on the Edwards Aquifer Recharge / Transition Zones

by

RABA-KISTNER CONSULTANTS, INC.

for

VULCAN MATERIALS MEDINA QUARRY

Geologic Assessment
For Regulated Activities
on The Edwards Aquifer Recharge/transition Zones
and Relating to 30 TAC §213 5(b)(3), Effective June 1, 1999

REGULATED ENTITY NAME: *Vulcan Materials Medina Quarry*

TYPE OF PROJECT ✓ WPAP __AST __SCS __UST

LOCATION OF PROJECT: ✓ Recharge Zone __ Transition Zone __ Contributing Zone within the Transition Zone

PROJECT INFORMATION

1 ✓ Geologic or manmade features are described and evaluated using the attached **GEOLOGIC ASSESSMENT TABLE.**

2. Soil cover on the project site is summarized in the table below and uses the SCS Hydrologic Soil Groups* (*Urban Hydrology for Small Watersheds, Technical Release No. 55, Appendix A*, Soil Conservation Service, 1986) If there is more than one soil type on the project site, show each soil type on the site Geologic Map or a separate soils map

Soil Units, Infiltration Characteristics & Thickness		
Soil Name	Group	Thickness (feet)
Dina association, gently undulating (DNC)	*C*	*Veneer-1.5 ft*
Divot clay loam, frequently flooded (Dp)	*C*	*1.5-8 ft*
Kavett-Tarrant association, undulating (KAD)	*D**	*1-1.5 ft*
Knippa clay, 0 to 1 percent slopes (KnA)	*C*	*2.5-6.5 ft*
Mereta clay, 1 to 3 percent slopes (MeB)	*C**	*Veneer-2 ft*
Pratley clay, 0 to 3 percent slopes (PrB)	*C*	*Veneer-3 ft*
Quihi and Devine soils, 1 to 8 percent slopes (QvD)	*C*	*1.5-4 ft*
Real association, undulating (RED)	*D**	*Veneer-1.5 ft*
Speck association, undulating (SPD)	*D**	*2-2.5 ft*
Tarrant-Rock outcrop association, undulating (TAD)	*D**	*Veneer-2 ft*
Tarrant-Rock outcrop association, hilly (TAF)	*D**	*Veneer-2 ft*
Tarrant and Speck soils, 1 to 8 percent slopes (TeD)	*D**	*Veneer-2 ft*
Topia clay, 0 to 2 percent slopes (TpB)	*D*	*2-4 ft*
Victoria clay, 0 to 1 percent slopes (VcA)	*D**	*4-6 ft*

*** Soil Group Definitions (Abbreviated)**

A. Soils having a high infiltration rate when thoroughly wetted

B Soils having a moderate infiltration rate when thoroughly wetted

C Soils having a slow infiltration rate when thoroughly wetted

D Soils having a very slow infiltration rate when thoroughly wetted

*Note: *The relative infiltration rates for these soils were taken from the Soils Survey of Medina County (USDA, 1977) as these were not specifically addressed in the Soil Conversation Service reference.*

3 ✓ A **STRATIGRAPHIC COLUMN** is attached at the end of this form that shows formations, members, and thicknesses. The outcropping unit should be at the top of the stratigraphic column.

4. ✓ A **NARRATIVE DESCRIPTION OF SITE SPECIFIC GEOLOGY** is attached at the end of this form The description must include a discussion of the potential for fluid movement to the Edwards Aquifer, stratigraphy, structure, and karst characteristics of the site

5 ✓ Appropriate **SITE GEOLOGIC MAP(S)** are attached:

The Site Geologic Map must be the same scale as the applicant's Site Plan The minimum scale is 1" . 400'

Applicant's Site Plan Scale	1" = 400 '
Site Geologic Map Scale	1" = 400 '
Site Soils Map Scale (if more than 1 soil type)	1" = 700 '

6. Method of collecting positional data.
✓ Global Positioning System (GPS) technology.
___ Other method(s).

7. ✓ The project site is shown and labeled on the Site Geologic Map.

8. ✓ Surface geologic units are shown and labeled on the Site Geologic Map.

9. ✓ Geologic or manmade features were discovered on the project site during the field investigation They are shown and labeled on the Site Geologic Map and are described in the attached Geologic Assessment Table
___ Geologic or manmade features were not discovered on the project site during the field investigation.

10. ✓ The Recharge Zone boundary is shown and labeled, if appropriate

11. All known wells (test holes, water, oil, unplugged, capped and/or abandoned, etc):

✓ There are 3 (#) wells present on the project site and the location is shown and labeled (Check all of the following that apply.)
___ The wells are not in use and have been properly abandoned.
___ The well is not in use and will be properly abandoned.
✓ The wells are in use and comply with 16 TAC §76.
___ There are no wells or test holes of any kind known to exist on the project site

ADMINISTRATIVE INFORMATION

12 ✓ One (1) original and three (3) copies of the completed assessment have been provided

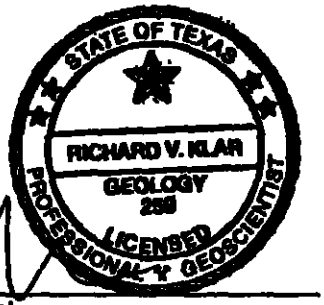
Date(s) Geologic Assessment was performed: October 2004 – April 2005
Date(s)

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer My signature certifies that I am qualified as a geologist as defined by 30 TAC 213.

Richard V. Klar, P.G.
Print Name of Geologist

(210) 699-9090
Telephone

(210) 699-6426
Fax



Signature of Geologist

3-9-06
Date

Representing: *Rabe-Kistner Consultants, Inc. on behalf of Vulcan Materials*
(Name of Company)

If you have questions on how to fill out this form or about the Edwards Aquifer protection program, please contact us at 210/490-3096 for projects located in the San Antonio Region or 512/339-2929 in the Austin Region.

Individuals are entitled to request and review their personal information that the agency gathers on its forms They may also have any errors in their information corrected To review such information, contact us at 512/239282

ATTACHMENTS

ATTACHMENT A

Geologic Assessment Tables (TCEQ-0585-Table)

Comments to Geologic Assessment Tables

GEOLOGIC ASSESSMENT TABLE						PROJECT NAME			Vulcan Materials Medina Quarry - Boehme/Balzen Tract												
LOCATION			FEATURE CHARACTERISTICS													EVALUATION			PHYSICAL SETTING		
1A	1B *	1C*	2A	2B	3	4			5	5A	6	7	8A	8B		9	10		11		12
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DOM	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE		TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		10							<40	≥40	<1.6	≥1.6	
B-S18	N29 28 48.4	W98 00 31 4	SC	20	Kdvru	75	1.5	0	N/S	0			F	5		25	✓			✓	Drainage
B-S19	N29 28 49 4	W98 00 38 6	C	30	Kdvru	6	6	12	NE/SW	10			F	9		49		✓	✓		Hillside
B-S20	N29 28 43 7	W98 00 37 5	SC	20	Kdvru	6	3	2	NE/SW	10			F	9		39	✓		✓		Hillside
B-S21	N29 28 52.1	W98 00 42 0	SC	20	Kdvru	3	1	6	NE/SW	10			F	5		35	✓			✓	Drainage
B-S22	N29 29 7 86	W98 00 2.30	SF	20	Kdvru	40	30		NE/SW	10	1/ft	1	F	9		39	✓		✓		Hillside
B-S23	N29 29 23 1	W98 00 31 7	SF	20	Qal	20	6		NE/SW	10	1-2/ft	0 04	F	9		39	✓			✓	Floodplain
B-S24	N29 29 44 2	W98 00 22 4	SF	20	Kdvru	25	20		NE/SW	10	1-2/ft	0 83	F	8		38	✓		✓		Hillside
B-S25	N29 29 54 2	W98 00 21 9	SF	20	Kdvru	15	10		E/W	0	1-2/ft	0.33	F	8		28	✓		✓		Hillside
B-S26	N29 29 16 8	W98 59 54.2	CD	5	Kdvru	>6	1.5	0	NE/SW	10			F	5		20	✓			✓	Drainage
B-S27	N29 29 15.2	W98 59 56 6	SC	20	Kdvru	8	4	1	NW/SE	0			C/F	5		25	✓			✓	Drainage
B-S28 (F #3)	N29 28 46.7	W99 00 00 9	F	20	Kdvru	1,000	50		NE/SW	10			F	35		65		✓		✓	Hillside
B-S29 (F #4)	N29 28 56 2	W98 00 11 6	F	20	Kdvru	2,800	50		NE/SW	10			F	35		65		✓		✓	Floodplain/ Hillside
B-S30 (F #5)	N29 29 27 6	W98 00 29 5	F	20	Kdvru/Kdvrl	1,800	50		NE/SW	10			F	35		65		✓		✓	Drainage/ Floodplain
B-S31 (F #6)	N29 29 53 4	W98 00 25.7	F	20	Kdvru	2,200	50		NE/SW	10			F	35		65		✓		✓	Floodplain/ Hillside

* DATUM NAD 27

2A TYPE	TYPE	2B POINTS
C	Cave	30
SC	Solution cavity	20
SF	Solution-enlarged fracture(s)	20
F	Fault	20
O	Other natural bedrock features	5
MB	Manmade feature in bedrock	30
SW	Swallow hole	30
SH	Sinkhole	20
CD	Non-karst closed depression	5
Z	Zone clustered or aligned features	30

8A INFILLING	
N	None exposed bedrock
C	Coarse - cobbles, breakdown sand, gravel
O	Loose or soft mud or soil organics leaves sticks dark colors
F	Fines, compacted clay-rich sediment, soil profile, gray or red colors
V	Vegetation. Give details in narrative description
FS	Flowstone, cements, cave deposits
X	Other materials

12 TOPOGRAPHY
Cliff Hilltop, Hillside, Drainage, Floodplain, Streambed

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[signature]

STATE OF TEXAS — [name] — GEOLOGY — LICENSED PROFESSIONAL GEOSCIENTIST

Date 3-9-06

Sheet 7 of 7

TCEQ-0585-Table (Rev 10-01 04)

GEOLOGIC ASSESSMENT TABLE

PROJECT NAME: *Vulcan Materials Medina Quarry - Boehme/Balcon Tract*

	LOCATION		FEATURE CHARACTERISTICS													EVALUATION			PHYSICAL SETTING		
1A	1B *	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (feet)			TREND (DEGREES)	DIP	DENSITY (#/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z								<2	2-5	<2.5	2.5	
B-S1	N29 29 08.7	W98 00 42.1	SC	20	Kdwu	15	3	0.5	E/W	0			F	5	25	✓			✓	Floodplain
B-S2	N29 29 46.1	W98 00 44.8	SF	20	Kdwu	10	8		NE/SW	10	1-3/ft	0.25	F	9	39	✓			✓	Floodplain
B-S3	N29 29 23.0	W98 00 38.4	SF	20	Qal	120	25		NE/SW	10	1-3/ft	0.33	F	9	39	✓			✓	Floodplain
B-S4	N29 29 11.5	W98 00 34.7	SC	20	Qal	>6	2.5	0.66	E/W	0			C/F	5	25	✓			✓	Floodplain
B-S5	N29 29 18.6	W98 00 04.4	CD	5	Kdwu	248	164		E/W	0			F	5	10	✓		✓		Hilltop
B S6	N29 29 13.8	W98 59 58.0	SC	20	Kdwu	15	3.5	2	E/W	0			F	5	25	✓		✓		Hillside
B-S7	N29 29 27.6	W98 00 29.5	SF	20	Kdwu	20	10		NE/SW	10	1-3/ft	0.25	F	9	39	✓			✓	Floodplain
B-S8	N29 28 50.6	W98 00 02.2	SC	20	Kdwu	7	2	2.5	NW/SE	0			F	5	25	✓			✓	Floodplain
B S9	N29 28 46.7	W98 00 00.9	SF	20	Kdwu	60	33		NE/SW	10	1-3/ft	0.66	F	9	39	✓		✓		Hillside
B-S10	N29 28 58.2	W98 00 11.8	SF	20	Kdwu	40	25		NE/SW	10	1-3/ft	0.66	F	9	39	✓		✓		Hillside
B S11	N29 29 06.0	W98 00 28.4	MB	30	Kdwu		WELL			0				35	65		✓	✓		Hillside
B-S12	N29 28 48.2	W98 00 31.3	CD	5	Kdwu	30	20	3.5	N/S	0			F	5	10	✓		✓		Hilltop
B S13	N29 29 21.4	W98 00 05.8	MB	30	Kdwu	7	7	2	E/W	0			F	5	35	✓		✓		Hilltop
B S14	N29 29 32.0	W98 00 18.4	SF	20	Kdwu	35	23		NE/SW	10	1-3/ft	0.66	F	9	39	✓			✓	Drainage
B-S15	N29 29 26.9	W98 00 27.8	SF	20	Kdwu	282	33		NE/SW	10	1-3/ft	0.66	F	9	39	✓			✓	Floodplain
B S16	N29 29 53.5	W98 00 27.3	SF	20	Kdwu	187	33		NE/SW	10	1-3/ft	0.66	F	9	39	✓		✓		Hillside
B-S17	N29 29 41.7	W98 00 38.5	SF	20	Kdwu	131	49		NE/SW	10	1/ft	1	F	9	39	✓		✓		Hillside

* DATUM *NAD 27*

2A TYPE	TYPE	2B POINTS
C	Cave	30
SC	Solution cavity	20
SF	Solution-enlarged fracture(s)	20
F	Fault	20
O	Other natural bedrock features	5
MB	Manmade feature in bedrock	30
SW	Swallow hole	30
SH	Sinkhole	20
CD	Non-karst closed depression	5
Z	Zone clustered or aligned features	30

8A INFILLING	
N	None, exposed bedrock
C	*Coarse - cobbles, breakdown sand, gravel*
O	Loose or soft mud or soil organics leaves sticks dark colors
F	Fines, compacted clay-rich sediment, soil profile, gray or red colors
V	Vegetation. Give details in narrative description
FS	Flowstone cements, cave deposits
X	Other materials

12 TOPOGRAPHY
Cliff, Hilltop, Hillside, Drainage, Floodplain, Streambed

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Richard V. Klar

STATE OF TEXAS — RICHARD V. KLAR — GEOLOGY — 239 — LICENSED PROFESSIONAL GEOSCIENTIST

Date 3-7-06

Sheet 8 of 7

TCEQ 0585-Table (Rev 10-01-04)

GEOLOGIC ASSESSMENT TABLE

PROJECT NAME: *Vulcan Materials Medina Quarry - Schwaers Tract*

LOCATION			FEATURE CHARACTERISTICS													EVALUATION			PHYSICAL SETTING		
1A	1B *	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DIM	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z								+6	+8	+1.5	+1.5	
SC-518	N29 28 21 0	W98 00 44 5	SF	20	Kdwu	100	100		NE/SW	10	1/ft	1.5	F	5	35	✓		✓		Hillside
SC-519	N29 28 34.4	W98 00 44 7	O	5	Kdwu	15	15	3	NE/SW	10			F	5	25	✓		✓		Hillside
SC-520	N29 28 37 7	W98 00 43 4	O	5	Kdwu	20	20	3	NE/SW	10			F	5	25	✓		✓		Hillside
SC-521	N29 28 55.2	W98 01 00 1	CD	5	Kdwu	15	10	1.5	NE/SW	10			F	5	25	✓		✓		Hillside
SC-522 (F #3)	N29 28 21 0	W98 00 44 5	F	20	Kdwu	1,980	60		NE/SW	10			F	35	65		✓		✓	Drainage/ Hillside
SC-523 (F #4)	N29 28 32 8	W98 01 03.3	F	20	Kdwu	3,300	50		NE/SW	10			F	35	65		✓		✓	Drainage/ Hillside
SC-524 (F #5)	N29 29 09 7	W98 00 54 3	F	20	Kdwu	1,980	60		NE/SW	10			F	35	65		✓		✓	Floodplain/ Hillside
SC-525 (F #6)	N29 29 19 6	W98 01 02.8	F	20	Kdwu	1,700	50		NE/SW	10			F	35	65		✓		✓	Hillside
SC-526	N29 28 43 0	W98 01 18 4	MB	30	Kdwu	Outhouse							O	5	35	✓		✓		Hilltop
SC-527	N29 28 42 7	W98 01 17.5	MB	30	Kdwu	Septic Tank								5	35	✓		✓		Hilltop

* DATUM: *NAD 27*

2A TYPE	TYPE	2B POINTS
C	Cave	30
SC	Solution cavity	20
SF	Solution-enlarged fracture(s)	20
F	Fault	20
O	Other natural bedrock features	5
MB	Manmade feature in bedrock	30
SW	Swallow hole	30
SH	Sinkhole	20
CD	Non-karst closed depression	5
Z	Zone clustered or aligned features	30

8A INFILLING	
N	None exposed bedrock
C	Coarse - cobbles, breakdown, sand gravel
O	Loose or soft mud or soil organics, leaves, sticks, dark colors
F	Fines, compacted clay-rich sediment soil profile gray or red colors
V	Vegetation. Give details in narrative description
FS	Flowstone, cements cave deposits
X	Other materials

12 TOPOGRAPHY
Cliff, Hilltop, Hillside, Drainage, Floodplain, Streambed

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Richard V. Klar

RICHARD V. KLAR
GEOLOGY
5581
LICENSED
PROFESSIONAL GEOSCIENTIST
STATE OF TEXAS

Date: 3-1-06

Sheet 5 of 7

TCEQ-0585 Table (Rev. 10-01-04)

GEOLOGIC ASSESSMENT TABLE

PROJECT NAME: *Vulcan Materials Medina Quarry - Schweers Tract*

LOCATION			FEATURE CHARACTERISTICS													EVALUATION			PHYSICAL SETTING		
1A	1B *	1C *	2A	2B	3	4			5	6A	6	7	8A	8B	9	10			11		12
FEATURE #	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DEPTH	DENSITY (FEET)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SUSCEPTIBILITY			CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		(FEET)						>5	<5		<1.0	>1.0	
SC-51	N29 28 33.3	W98 00 58.5	CD	5	Kdwu	40	40	1	NE/SW	10			F	5	20	✓			✓		Hilltop
SC-52	N29 28 35.3	W98 00 58.6	SH	20	Kdwu	115	88	7	E/W	0			C/F	25	40		✓		✓		Hillside
SC-53	N29 28 40.4	W98 00 48.9	CD	5	Kdwu	197	184	7	E/W	0			F	5	10	✓			✓		Hillside
SC-54	N29 28 43.2	W98 01 25.4	CD	5	Kdwu	8	6	1.5	E/W	0			F	5	10	✓			✓		Hilltop
SC-55	N29 28 37.7	W98 01 28.3	CD	5	Kdwu	20	10	2	NS	0			F	5	10	✓			✓		Hilltop
SC-56	N29 28 40.1	W98 01 23.9	CD	5	Kdwu	8	5	2	NE/SW	10			F	5	20	✓			✓		Hilltop
SC-57	N29 28 41.3	W98 01 18.9	MB	30	Kdwu		WELL		—	0				35	65		✓		✓		Hilltop
SC-58	N29 28 24.1	W98 01 26.1	CD	5	Kdwu	6	5	2	NE/SW	10			F	5	20	✓			✓		Hillside
SC-59	N29 28 29.6	W98 01 21.3	CD	5	Kdwu	25	10	0.83	E/W	0			F	5	10	✓			✓		Hilltop
SC 510	N29 28 17.3	W98 01 17.0	SF	20	Kdwu	>6	2	3	NW/SE	0	1-3/8	0.66	C/F	8	28	✓				✓	Drainage
SC 511	N29 28 29.7	W98 01 14.1	CD	5	Kdwu	>6	7	2	NW/SE	0			F	5	10	✓			✓		Hillside
SC-512	N29 28 34.6	W98 01 08.3	SF	20	Kdwu	>6	2	3	NW/SE	0	1-3/8	0.66	F	9	29	✓				✓	Drainage
SC 513	N29 28 25.4	W98 01 08.0	CD	5	Kdwu	9	9	1	NS	0			F	5	10	✓			✓		Hilltop
SC-514	N29 28 33.1	W98 01 04.0	C	30	Kdwu	6	3	8	NE/SW	10			C/F	30	70		✓		✓		Hillside
SC-515	N29 28 32.6	W98 01 03.3	SF	20	Kdwu	100	50		NE/SW	10	1/8	1	F	9	39	✓			✓		Hillside
SC-516	N29 28 20.1	W98 00 59.8	D	5	Kdwu	15	12	2.5	NE/SW	10			F	9	24	✓			✓		Hillside
SC-517	N29 28 32.7	W98 00 48.6	CD	5	Kdwu	18	9	3	NS	0			F	5	10	✓			✓		Hilltop

* **DATUM** *NAD 27*

2A TYPE	TYPE	2B POINTS
C	Cave	30
SC	Solution cavity	20
SF	Solution-enlarged fracture(s)	20
F	Fault	20
O	Other natural bedrock features	5
MB	Manmade feature in bedrock	30
SW	Swallow hole	30
SH	Sinkhole	20
CD	Non-karst closed depression	5
Z	Zone clustered or aligned features	30

8A INFILLING	
N	None, exposed bedrock
C	Coarse - cobbles breakdown and gravel
O	Loose or soft mud or soil organics, leaves sticks dark colors
F	Fines compacted clay-rich sediment, soil profile, gray or red colors
V	Vegetation. Give details in narrative description
FS	Flowstone, cements, cave deposits
X	Other materials

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Cliff, Hilltop Hillside, Drainage, Floodplain Streambed

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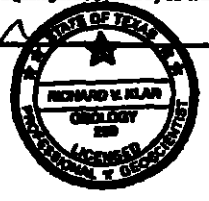

Date 2-9-06

Sheet 4 of 7

TCEQ 0585 Table (Rev 10-01-04)

GEOLOGIC ASSESSMENT TABLE

PROJECT NAME: *Vulcan Materials Medina Quarry - Wurzbach Tract*

LOCATION			FEATURE CHARACTERISTICS													EVALUATION			PHYSICAL SETTING		
1A	1B*	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10			11		12
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DIPS	DENSITY (NO/FT)	APERTURE (FEET)	SOIL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY			CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z								YES	NO		YES	NO	
WZ-SS5	N29 28 00 1	W98 01 09 1	SC	20	Kdwu	2.5	2	2	E/W	0			O	8	28	✓			✓		Hillside
WZ-SS7	N29 28 16 3	W98 00 46.2	CD	5	Kdwu	>5	2	2	NW/SE	0			F	10	15	✓				✓	Drainage
WZ-SS8	N29 27 28 1	W98 00 44.5	SF	20	Qal	28.5	28		NE/SW	10	1-3/ft	0.04	F	9	39	✓				✓	Floodplain
WZ SS9	N29 28 00 1	W98 01 10 0	SF	20	Kdwu	160	40		NE/SW	10	1/ft	1	F	8	38	✓			✓		Hillside
WZ S10	N29 28 09 7	W98 00 46 7	SF	20	Kdwu	48	19		NE/SW	10	1-3/ft	0.06	F	9	39	✓				✓	Hillside
WZ S11 (F #1)	N29 27 30 6	W98 01 31 1	F	20	Kdwu	2,000	50		NW/SE	0			F	35	55		✓			✓	Floodplain
WZ S12 (F #2)	N29 27 28 1	W98 00 44.5	F	20	Kdwu	2,250	60		NE/SW	10			F	35	65		✓			✓	Floodplain
WZ S13 (F #3)	N29 28 09 3	W98 01 31 7	F	20	Kdwu	1 700	50		NE/SW	10			F	35	65		✓			✓	Drainage/ Hilltop

* DATUM *NAD 27*

**As part of initial site reconnaissance activities, all potential recharge features were assigned a sequential feature identification number. On the basis of subsequent site visits and further review, features that did not meet the criteria for mapping pursuant to TCEQ-0585 (Instructions to Geologists revised October 1, 2004) were removed from the feature list. As the result of this review process, remaining feature numbers are not sequential.

2A TYPE	TYPE	2B POINTS
C	Cave	30
SC	Solution cavity	20
SF	Solution-enlarged fracture(s)	20
F	Fault	20
O	Other natural bedrock features	5
MB	Manmade feature in bedrock	30
SW	Swallow hole	30
SH	Sinkhole	20
CD	Non karst closed depression	5
Z	Zone, clustered or aligned features	30

8A INFILLING	
N	None, exposed bedrock
C	Coarse cobbles, breakdown sand, gravel
O	Loose or soft mud or soil organics, leaves, sticks, dark colors
F	Fines, compacted clay-rich sediment, soil profile, gray or red colors
V	Vegetation. Give details in narrative description
FS	Flowstone, cements, cave deposits
X	Other materials

12 TOPOGRAPHY
Cliff, Hilltop, Hillside, Drainage, Floodplain, Streambed

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RICHARD W. GLASS — GEOLOGY — LICENSED PROFESSIONAL GEOSCIENTIST

Date 3-9-06

Sheet 3 of 7

TCEQ-0585-Table (Rev. 10-01-04)

GEOLOGIC ASSESSMENT TABLE

PROJECT NAME: *Vulcan Materials Medina Quarry - Wurzbach Tract*

LOCATION			FEATURE CHARACTERISTICS													EVALUATION			PHYSICAL SETTING		
1A	1B *	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DIM	DENSITY (#/FT²)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		#						>5	5	<1.5	>1.5	
WZ-S40	N29 27 55.8	W98 01 18.3	SF	20	Kdwu	15	8		NE/SW	10	1-3/ft	0.33	F	8	38	✓		✓		Hillside
WZ S42	N29 27 54.1	W98 01 17.9	CD	5	Kdwu	15	8	2.5	E/W	0			F	5	10	✓		✓		Hillside
WZ S44	N29 27 38.8	W98 01 16.3	CD	5	Kdwu	40	30	0.5	E/W	0			F	5	10	✓		✓		Hilltop
WZ-S45	N29 27 25.6	W98 01 19.9	MB	30	Kdwu		WELL			0				35	65		✓	✓		Hilltop
WZ-S46	N29 27 29.4	W98 01 19.5	CD	5	Kdwu	>8	1.5	3	E/W	0			F	5	10	✓		✓		Hilltop
WZ S47	N29 27 46.3	W98 01 22.8	CD	5	Kdwu	8	8	2.5	E/W	0			F	5	10	✓			✓	Floodplain
WZ-S48	N29 27 53.6	W98 01 24.5	CD	5	Kdwu	15	3	2	E/W	0			F	5	10	✓		✓		Hilltop
WZ S50	N29 27 14.9	W98 01 23.9	CD	5	Kdwu	>8	5	3	E/W	0			F	5	10	✓		✓		Hilltop
WZ-S52	N29 27 48.1	W98 01 27.0	CD	5	Kdwu	15	4	2	NS	0			F	5	10	✓		✓		Hilltop
WZ-S53	N29 27 34.7	W98 01 28.9	CD	5	Kdwu	20	10	2.5	NE/SW	10			F	5	20	✓		✓		Hilltop
WZ-S54	N29 27 31.4	W98 01 13.0	CD	5	Kdwu	6	1	>6	NE/SW	10			F	5	20	✓		✓		Hilltop
WZ S56	N29 27 33.4	W98 01 14.4	CD	5	Kdwu	6	0.83	2	NE/SW	10			F	5	20	✓		✓		Hilltop
WZ-S56	N29 27 27.9	W98 01 25.8	CD	5	Kdwu	6	1	2	E/W	0			F	5	10	✓		✓		Floodplain
WZ S59	N29 27 40.2	W98 01 32.1	SF	20	Kdwu	164	19		E/W	0	1-3/ft	0.66	F	8	28	✓		✓		Hilltop
WZ-S60	N29 27 47.8	W98 01 32.5	SF	20	Kdwu	88	19		E/W	0	1 3/ft	0 5	F	8	28	✓		✓		Hilltop
WZ-S61	N29 28 09.3	W98 01 31.7	SF	20	Kdwu	88	13		NE/SW	10	1 3/ft	0 83	F	9	39	✓		✓		Hillside
WZ S62	N29 28 10.4	W98 01 29.4	SF	20	Kdwu	82	28		NE/SW	10	1-3/ft	0.25	F	9	39	✓		✓		Hillside
WZ S63	N29 28 03.7	W98 01 21.4	O	5	Kdwu	26	19	2	NS	0			F	8	13	✓		✓		Hillside

*** DATUM** *NAD 27*

****As part of initial site reconnaissance activities, all potential recharge features were assigned a sequential feature identification number On the basis of subsequent site visits and further review features that did not meet the criteria for mapping pursuant to TCEQ-0585 (Instructions to Geologists revised October 1 2004) were removed from the feature list. As the result of this review process, remaining feature numbers are not sequential.**

2A TYPE	TYPE	2B POINTS
C	Cave	30
SC	Solution cavity	20
SF	Solution-enlarged fracture(s)	20
F	Fault	20
O	Other natural bedrock features	5
MB	Manmade feature in bedrock	30
SW	Sinkhole	30
SI	Sinkhole	20
CD	Non-karst closed depression	5
Z	Zone clustered or aligned features	30

8A INFILLING	
N	None exposed bedrock
C	Coarse - cobbles breakdown sand gravel
O	Loose or soft mud or soil organics leaves sticks, dark colors
F	Fines compacted clay-rich sediment, soil profile gray or red colors
V	Vegetation Give details in narrative description
FS	Flowstone, cements, cave deposits
X	Other materials

12 TOPOGRAPHY
Cliff, Hilltop, Hillside, Drainage, Floodplain, Streambed

I have read, I understood, and I have followed the Texas Commission on Environmental Quality's Instructions to Geologists. The information presented here complies with that document and is a true representation of the conditions observed in the field. My signature certifies that I am qualified as a geologist pursuant to 30 TAC Chapter 213

STATE OF TEXAS
RICHARD V KLAR
GEOLOGY
2609
LICENSED
PROFESSIONAL GEOLOGIST

Date 1-7-05

Sheet 2 of 7

TCEQ-0585-Table (Rev 10-01-04)

GEOLOGIC ASSESSMENT TABLE

PROJECT NAME *Vulcan Materials Medina Quarry - Wurzbach Tract*

LOCATION			FEATURE CHARACTERISTICS												EVALUATION			PHYSICAL SETTING		
1A	1B *	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DIP	DENSITY (#/FT)	APERTURE (MM)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z								>5	2-5	<15	>15	
WZ 51	N29 27 19 3	W98 01 24.2	CD	5	Qt	63	48	4	—	0			F	5	10	✓			✓	Floodplain
WZ-53	N29 27 28.4	W98 01 31 2	SF	20	Kdwu	20	10		NW/SE	0	1-3/ft	0.5	F	5	25	✓			✓	Floodplain
WZ-58	N29 27 31 1	W98 00 48 4	CD	5	Qt	131	98	4	NE/SW	10			F	5	20	✓			✓	Floodplain
WZ 517	N29 27 25 6	W98 01 00 0	CD	5	Qt	15	7	2	E/W	0			F	5	10	✓			✓	Floodplain
WZ 519	N29 27 29 5	W98 00 58 1	CD	5	Qal	167	82	5	NE/SW	10			F	5	20	✓			✓	Floodplain
WZ-521	N29 27 29 8	W98 01 27 3	SF	20	Kdwu	20	10		NE/SW	10	1-3/ft	0.5	F	5	35	✓			✓	Floodplain
WZ 527	N29 27 30 6	W98 01 01 1	CD	5	Kdwu	32	28	0.83	E/W	0			F	5	10	✓		✓		Hilltop
WZ 529	N29 27 34 4	W98 01 05 5	CD	5	Kdwu	8	1.5	2	NE/SW	10			F	5	20	✓		✓		Hilltop
WZ 530	N29 27 40.1	W98 01 09 5	CD	5	Kdwu	8	2.5	2	NE/SW	10			F	5	20	✓		✓		Hilltop
WZ 533	N29 27 38 6	W98 01 12 1	CD	5	Kdwu	>8	1	> 2	NW/SE	0			F	5	10	✓		✓		Hilltop
WZ 535	N29 27 36 4	W98 01 13 8	CD	5	Kdwu	>6	1.5	2	NE/SW	10			F	5	20	✓		✓		Hilltop
WZ 536	N29 27 55.8	W98 01 15 9	CD	5	Kdwu	>6	1.5	2.5	N/S	0			F	5	10	✓		✓		Hillside
WZ 537	N29 27 32.6	W98 01 15 1	CD	5	Kdwu	>6	2	2	E/W	0			F	5	10	✓		✓		Hilltop
WZ 538	N29 27 28.6	W98 01 15 3	CD	5	Kdwu	>8	1	3	N/S	0			F	5	10	✓		✓		Hilltop
WZ 539	N29 27 29 6	W98 01 13.6	CD	5	Kdwu	6	1	1.5	N/S	0			F	5	10	✓		✓		Hilltop

* DATUM *NAD 27*

* As part of initial site reconnaissance activities, all potential recharge features were assigned a sequential feature identification number. On the basis of subsequent site visits and further review, features that did not meet the criteria for mapping pursuant to TCEQ-0585 (Instructions to Geologists revised October 1, 2004) were removed from the feature list. As the result of this review process, remaining feature numbers are not sequential.

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SW	Swallow hole	30
SH	Sinkhole	20
CD	Non-karst closed depression	5
Z	Zone, clustered or aligned features	30

8A INFILLING	
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V	Vegetation. Give details in narrative description
FS	Flowstone, cements, cave deposits
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12 TOPOGRAPHY
Cliff, Hilltop, Hillside, Drainage, Floodplain, Streambed

I have read, I understood and I have followed the Texas Commission on Environmental Quality's Instructions to Geologists. The information presented here complies with that document and is a true representation of the conditions observed in the field. My signature certifies that I am qualified as a geologist as defined by 30 TAC Chapter 213.

Date 8-9-06

Sheet 1 of 7

TCEQ 0586 Table (Rev. 10-01-04)

COMMENTS TO GEOLOGIC ASSESSMENT TABLES

Vulcan Materials Medina Quarry

Wurzbach Tract:

Feature WZ-S1:

Feature consists of a non-karst closed depression located within a drainageway associated with an unnamed tributary of Elm Creek along the southwest SITE boundary Feature appears to have been formed as the result of excavation activities and is utilized as a stock pond measuring approximately 53 x 48 ft. The feature appears to be completely contained within soil with no connection to underlying limestone bedrock

Feature WZ-S3.

Feature consists of solution-enlarged fractures along an inferred fault zone *(Feature WZ-S71 – F #1)* in the southwest corner of the SITE The visible outcrop area measures approximately 20 x 10 ft. The fractures are oriented NW/SE with apertures measuring approximately 4 to 6 inches. Fractures are infilled with fine-grained soils

Feature WZ-S8.

Feature is a non-karst closed depression located within a drainageway associated with an unnamed tributary of Elm Creek near the southeast corner of the SITE. Feature appears to have been formed as the result of excavation activities and is utilized as a stock pond measuring approximately 131 x 98 ft. The feature appears to be completely contained within soil with no connection to underlying limestone bedrock. This feature was holding water at the time of investigation.

Feature WZ-S17.

Feature consists of a non-karst closed depression located at the base of a tree. The feature appears to have been formed as the result of collapse and erosion of soil and limestone blocks overlying roots. Feature has been enlarged as the result of burrowing animals and is completely contained within soil with no connection to underlying limestone bedrock.

Feature WZ-S19

Feature is a non-karst closed depression near the southern boundary of the SITE Feature consists of a small area excavated into the alluvium by the landowner in order to obtain roadbed materials. The feature appears to be contained within alluvial materials with no connection to underlying limestone The feature measures approximately 157 x 82 ft and 6 ft in depth at the deepest point

Feature WZ-S21

Feature consists of solution-enlarged fractures. The visible outcrop area measures approximately 20 x 10 ft. The fractures are oriented NE/SW with apertures measuring approximately 6 to 9 inches Fractures are infilled with fine-grained soils

Feature WZ-S27.
Feature is a non-karst closed depression in the southern portion of the SITE adjacent to an interior unimproved roadway. Feature was apparently used as an animal wallow. The feature measures approximately 32 x 26 ft and 6 to 10 inches in depth. Feature is completely contained within fine-grained soils.

Feature WZ-S29:
Feature consists of a small non-karst closed depression and appears to have been enlarged as the result of burrowing animals. Feature appears to be completely contained within soil with no connection to underlying limestone bedrock.

Feature WZ-S30.
Feature consists of a small non-karst closed depression formed beneath a series of boulders and appears to have been enlarged as the result of burrowing animals Feature appears to be completely contained within soil with no connection to underlying limestone bedrock

Feature WZ-S33:
Same as Feature S-30

Feature WZ-S35.
Feature consists of a small non-karst closed depression formed beneath the root system of a tree by animal burrowing. Feature appears to be completely contained within soil with no connection to underlying limestone bedrock.

Feature WZ-S36 through WZ-S39.
Same as Feature WZ-S35

Feature WZ-S40
Feature consists of solution-enlarged fractures oriented NE/SW. The visible outcrop area measures approximately 15 x 8 ft. Apertures measure approximately 1 to 4 inches Fractures are infilled with fine-grained soils

Feature WZ-S42
Two relatively small, adjacent non-karst closed depressions formed and have been apparently enlarged as the result of burrowing animals Features appear to be completely contained within soil with no connection to underlying limestone bedrock

Feature WZ-S44
Feature is a non-karst closed depression located southwest of the center of the property Feature was apparently used as an animal wallow and measures approximately 49 x 26 ft and 6 inches in depth The feature was holding water at the time of the investigation

Feature WZ-S45
Feature is a water well with an approximately 6-inch diameter casing connected to a 3-inch diameter windmill riser pipe The windmill riser pipe extends approximately

1 5 ft above ground surface. Interviews with the land owner indicate the well is 17 pipe joints deep (approximately 340 ft). The surface casing is set within an approximately 4 x 4 ft concrete pad. A 12-ft diameter water tank is located immediately adjacent and is currently used to supply water for stock purposes. This feature is classified as sensitive owing to rapid infiltration potential if the surface seal were to become compromised.

Features WZ-S46:

Feature consists of a small non-karst closed depression formed beneath a series of boulders and tree roots The feature appears to have been enlarged as the result of burrowing animals and is completely contained within the soil with no connection to underlying limestone bedrock.

Feature WZ-S47:

Two relatively small, adjacent non-karst closed depressions that may be interconnected and appear to have been created and enlarged by burrowing animals Features appear to be completely contained within soil with no connection to underlying limestone bedrock.

Feature WZ-S48

Two relatively small, aligned east/west, non-karst closed depressions that are interconnected. The feature appears to have been created and enlarged by burrowing animals. Features appear to be completely contained within soil with no connection to underlying limestone bedrock.

Feature WZ-S50.

Feature consists of a small non-karst closed depression formed beneath a limestone fracture block as the result of soil erosion. The feature appears to have been enlarged by burrowing animals and is completely contained within the soil with no connection to underlying limestone bedrock.

Feature WZ-S52 through WZ-S55:

Same as Feature WZ-S35.

Feature WZ-S59.

Feature consists of solution enlarged fractures defined by tilted or up-ended limestone blocks Exposed outcrop area measures approximately 164 x 19 ft Fractures are oriented E/W with apertures measuring approximately 6 to 8 inches Fractures are infilled with fine-grained soil

Feature WZ-S60

Feature consists of solution-enlarged fractures The visible outcrop area measures approximately 98 x 19 ft Fractures are oriented E/W with fine-grained soil infilling Apertures measure approximately 3 to 6 inches.

Feature WZ-S61:

Feature consists of solution-enlarged fractures within a vuggy limestone outcrop The visible outcrop area measures approximately 98 x 13 ft oriented NE/SW. Apertures measure approximately 6 to 10 inches Fractures are infilled with fine-grained soils

Feature WZ-S62:

Feature consists of a fractured rock outcrop containing solution-enlarged fractures within a vuggy limestone outcrop. The visible outcrop area measures approximately 82 x 26 ft. Fractures are oriented NE/SW. Apertures measure approximately 1 to 3 inches. Fractures are infilled with fine-grained soils

Feature WZ-S63

Feature consists of an apparent surface collapse feature. There is no evidence of preferred infiltration and does not appear to be connected to any other solution features This feature is contained within limestone and infilled with fine-grained soils. The visible outcrop area measures approximately 26 x 19 ft oriented N/S

Feature WZ-S65:

Feature consists of a vertical solution cavity formed by dissolution of limestone with predominately organic infilling. This feature measures approximately 2 5 x 2 ft and 2 ft in depth There was no air flow observed from this feature.

Feature WZ-S67:

Feature is a horizontal non-karst closed depression formed by stream scour along a bedding plane forming a nick point in the drainageway. Feature is infilled with limestone fragments and fine-grained soil. This feature measures approximately 6 x 2 ft and is 2 ft in depth

Feature WZ-S68:

Feature consists of solution-enlarged fractures with fine-grained soil infilling. The visible outcrop area measures approximately 29.5 x 26 ft Fractures are oriented NE/SW. Apertures measure approximately 0 25 to 0 5 inches.

Feature WZ-S69:

Feature consists of solution-enlarged fractures and is infilled with fine-grained soil The visible area measures approximately 100 x 40 ft. Fractures are oriented NE/SW and are spaced approximately 1 ft apart. Apertures measure approximately 1 ft

Feature WZ-S70:

Feature consists of solution-enlarged fractures with soil infilling. The visible area measures approximately 49 x 19 ft Fractures are oriented NE/SW with apertures measuring approximately 1 inch

Feature WZ-SC71 (F #1)

This normal fault zone was mapped based upon field observations and review of published geologic references to include Small and Clark (2000), and Lambert, Grimm, and Lee (2000) Evidence of this feature (e g , lineations and solution enlarged fracture outcrops) was observed during field reconnaissance along the drainageway near the southwest corner of the property It is inferred that the feature serves to facilitate internal displacement within the Upper Devils River Formation. Given the extent of the catchment area and inferred moderate to high infiltration rate along the drainageway, the feature is classified as sensitive GPS coordinates for this feature were obtained at WZ-S3.

Feature WZ-SC72 (F #2).

This normal fault zone was mapped based upon field observations and review of published geologic references including Collins (1998), Small and Clark (2000), and Lambert, Grimm, and Lee (2000) Evidence of this feature (e g , lineations and solution enlarged fracture outcrops) was observed during field reconnaissance in the southeastern corner of the property The feature serves to facilitate internal displacement within the Upper Devils River Formation. Given the extent of the catchment area and inferred moderate to high infiltration rate along drainage features, the feature is classified as sensitive GPS coordinates for this feature were collected at WZ-S68. Lambert, Grimm, and Lee (2000) designated this fault as the Lincoln fault.

Feature WZ-SC73 (F #3).

This normal fault zone was mapped based upon field observations and review of published geologic references to include Small and Clark (2000), and Lambert, Grimm, and Lee (2000) Evidence of this feature (e g., lineations and solution enlarged fracture outcrops) was observed during field reconnaissance in the northwestern corner of the property. The feature serves to facilitate internal displacement within the Upper Devils River Formation Given the extent of the catchment area and inferred moderate to high infiltration rate along drainage features, the feature is classified as sensitive GPS coordinates for this feature were collected at WZ-S61 Lambert, Grimm, and Lee (2000) designated this fault as the Seco Creek fault

Schweers Tract:

Feature SC-S1

Feature consists of a naturally occurring, non-karst closed depression that appears to have been enlarged as the result of burrowing animals The feature measures approximately 49 x 49 x 1 ft Feature appears to be completely contained within soil with no connection to underlying limestone bedrock The feature was holding water at the time of observation

Feature SC-S2

This feature consists of a sinkhole formed by dissolution of limestone with fine-grained soil and cobbles, breakdown, sand and gravel infilling This feature was

most likely formed by enhanced dissolution along F #4 (i e., *Feature SC-S2*) The visible area measures approximately 115 x 66 x 7 ft oriented E/W. The feature is rimmed by limestone Based on information from the property owner, it is R-K's understanding that the feature holds water for 1-2 days following significant rainfall events This feature is classified as sensitive due to inferred karst origin and moderate recharge potential.

Feature SC-S3·

Feature consists of a naturally occurring, non-karst closed depression that appears to have been enlarged as the result of excavation activities and is utilized as a stock pond The feature measures approximately 197 x 164 x 7 ft oriented E/W Feature appears to be completely contained within soil with no connection to underlying limestone bedrock The feature was holding 1-2 ft of water at the time of observation

Feature SC-S4

Feature consists of a small non-karst closed depression formed beneath the root system of a tree by animal burrowing. Feature appears to be completely contained within soil with no connection to underlying limestone bedrock.

Feature SC-S5 and SC-S6.

Same as Feature SC-S4.

Feature SC-S7·

Feature consists of a water well with an approximately 6-inch diameter casing equipped with an electric submersible pump. The casing extends approximately 1.5 ft above ground surface. Notes written on the frame near the pump indicate the well is 16 pipe joints deep plus an additional 3 ft (approximately 339 ft total) The pump is set at approximately 319 ft. The surface casing is set within an approximately 4x4 ft concrete pad. Two concrete water tanks measuring 20 x 20 x 4 5 ft and 5 x 5 x 7 ft are located immediately adjacent and are utilized to supply water for domestic/stock purposes This feature is classified as sensitive owing to rapid infiltration potential if the surface seal were to become compromised.

Feature SC-S8.

Same as Feature SC-S4

Feature SC-S9

Feature consists of a small non-karst closed depression formed beneath the root system of a tree by animal burrowing Feature appears to be completely contained within soil with no connection to underlying limestone bedrock. The feature was holding water at the time of observation

Feature SC-S10

Feature consists of a solution-enlarged fracture outcrop containing fractures enlarged by stream scour Fractures contain fine-grained soil and gravel infilling The feature is located along the west bank of a drainageway

Feature SC-S11
Same as Feature SC-S4.

Feature SC-S12:
Feature consists of a solution-enlarged fracture outcrop containing fractures enlarged by runoff scour Fractures contain fine-grained soil infilling The feature is located along the north bank of a drainageway.

Feature SC-S13:
Feature consists of a non-karst closed depression contained within fine-grained soil. The feature appears to have been formed as the result of root collapse and enhanced by animal activity.

Feature SC-S14
Feature consists of a cave formed by natural dissolution of limestone along a fault zone (***Feature SC-S23 – F #4***) The opening is approximately 3 ft diameter with a vertical extent of approximately 6 ft and a horizontal extent of approximately 6 ft. The bottom of the feature appears to be lined with fine-grained soil, coarse gravel and limestone boulders This feature is classified as sensitive owing to rapid infiltration potential

Feature SC-S15
Feature consists of solution enlarged fractures defined by tilted or up-ended limestone blocks. Fractures contain fine-grained soil infilling. Exposed outcrop area measures approximately 100 x 50 ft Fractures are oriented NE/SW with apertures measuring approximately 6 to 8 inches This feature is located approximately 100 ft away from Feature SC-S14. This feature was utilized in the field as an indication of ***Feature SC-23*** (F #4).

Feature SC-S16:
Feature consists of a small surface collapse feature located along F #3 (i.e , ***Feature SC-S22***). Feature is contained within limestone and is infilled with fine-grained soil. There is no evidence of preferred infiltration and it does not appear to be connected to any other solution features The visible outcrop area measures approximately 15 x 12 x 2 5 ft oriented NE/SW.

Feature SC-S17
Same as Feature SC-S4

Feature SC-S18
Feature consists of solution-enlarged fractures located along F #3 (i e , ***Feature SC-S22***). Fractures are oriented NE/SW and contain fine-grained soil infilling The visible outcrop area measures approximately 100 x 100 ft Apertures measure approximately 4 inches to 1 5 ft.

Feature SC-S19.

Feature consists of a small surface collapse feature near F #4 (i e , *Feature SC-S23*) Feature is contained within limestone and infilled with fine-grained soil There is no evidence of preferred infiltration and it does not appear to be connected to any other solution features. The feature measures approximately 15 x 15 x 3 ft oriented NE/SW

Feature SC-S20.

Feature consists of a small surface collapse feature along F #4 (i.e , *Feature SC-S23*) Feature is contained within limestone and infilled with fine-grained soil. There is no evidence of preferred infiltration and does not appear to be connected to any other solution features The feature measures approximately 20 x 20 x 3 ft oriented NE/SW

Feature SC-S21.

Feature consists of a small closed depression beneath the root system of a tree and further exploited by animal burrowing. Feature appears to be completely contained within soil with no connection to underlying limestone bedrock

Feature SC-S22 (F #3).

This normal fault zone was mapped based upon field observations and review of published geologic references to include Small and Clark (2000), and Lambert, Grimm, and Lee (2000). Evidence of this feature (e.g., lineations, solution enlarged fracture outcrops, and a possible collapse feature) was observed during field reconnaissance in the southeastern corner of the property The feature serves to facilitate internal displacement within the Upper Devils River Formation. Given the extent of the catchment area and inferred moderate to high infiltration rate along drainageways, the feature is classified as sensitive GPS coordinates for this feature were collected at SC-S18. Lambert, Grimm, and Lee (2000) designated this fault as the Seco Creek fault.

Feature SC-S23 (F #4)

This normal fault zone was mapped based upon field observations and published geologic references to include Small and Clark (2000), and Lambert, Grimm, and Lee (2000) Both of these sources designated this fault as the Diversion Lake fault. Evidence of this feature (e g , lineations, solution enlarged fracture outcrops, possible collapse features, and a cave) was observed during field reconnaissance in the central portion of the property. The feature serves to facilitate internal displacement within the Upper Devils River Formation. Given the extent of the catchment area and inferred moderate to high infiltration rate along drainageways, the feature is classified as sensitive GPS coordinates for this feature were estimated from coordinates collected near SC-S15

Feature SC-S24 (F #5)

This normal fault zone was mapped as inferred based upon evidence of this feature (e g , lineations and solution enlarged fracture outcrops) observed during field reconnaissance The feature serves to facilitate internal displacement within the

Upper Devils River Formation Given the extent of the catchment area and inferred moderate to high infiltration rate along drainageways, the feature is classified as sensitive. GPS coordinates for this feature were collected near the midpoint of the fault trace

Feature SC-S25 (F #6):

This normal fault zone was mapped as inferred based upon evidence of this feature (e g , lineations, and solution enlarged fracture outcrops) observed during field reconnaissance. The feature serves to facilitate internal displacement within the Upper Devils River Formation. Given the extent of the catchment area and inferred moderate to high infiltration rate along drainageways, the feature is classified as sensitive. GPS coordinates for this feature were collected near the midpoint of the fault trace

Feature SC-S26

Feature consists of a hand dug pit measuring approximately 6 ft in diameter by 3 ft in depth enclosed in a wooden structure formerly utilized as an outhouse The outhouse is located adjacent to the old ranch house in the northwest portion of the tract Observations made during field reconnaissance indicate that the pit appears to penetrate upper weathered limestone strata and is partially backfilled with organics and soil.

Feature SC-S27

Feature consists of septic tank system that services the old ranch house on this tract. The total capacity of the tank or leach field extent could not be determined on the basis of field observations However, based on communications with the landowner and review of industry standards, it is estimated that the septic tank is 400-gallon capacity with dimensions of approximately 6 ft in diameter by 3 ft high. On the basis of available information, it appears that the septic tank penetrates upper weathered limestone strata to a depth of approximately 4 ft.

Boehme/Balzen Tract:

Feature B-S1:

Feature consists of a solution cavity located in a cut wall along the east side of a dry creek bed with fine-grained soil infilling. Feature was formed by high flow stream scour and has been exploited by animal activity. This feature measures approximately 15 x 3 x 0 5 ft and is oriented E/W There was no air flow observed from this feature

Feature B-S2

Feature consists of solution-enlarged fractures within a dry creek bed The visible outcrop area measures approximately 10 x 8 ft Fractures are oriented NE/SW Apertures measure approximately 0 25 to 3 inches Fractures are infilled with fine-grained soil

Feature B-S3:

Feature consists of solution-enlarged fractures within a dry creek bed The visible outcrop area measures approximately 120 x 25 ft. Fractures are oriented NE/SW and infilled within fine-grained soil. Apertures measure approximately 0 25 to 4 inches

Feature B-S4:

Feature consists of a solution cavity located in the rock face along the west side of a dry creek bed approximately 9 ft above the floor of the creek This feature is infilled with fine-grained soil and gravel Feature was formed by high flow stream scour and measures approximately 6 x 2 5 x 0 66 ft There was no air flow observed from this feature

Feature B-S5:

Feature consists of a non-karst closed depression formed by as the result of excavation activities Feature currently serves as a stock pond This feature measures approximately 246 x 164 ft and is oriented E/W.

Feature B-S6:

Feature consists of a solution cavity located in the rock face along the west side of a dry creek bed approximately 20 ft above the floor of the creek Feature was formed by high flow stream scour and is infilled with fine-grained soil. This feature measures approximately 15 x 3 5 x 2 ft and is oriented E/W. There was no air flow observed from this feature.

Feature B-S7

Feature consists of solution-enlarged fractures within a dry creek bed Fractures contain fine-grained soil infilling and are oriented NE/SW. The visible outcrop area measures approximately 20 x 10 ft Apertures measure approximately 1 to 3 inches

Feature B-S8:

Feature consists of a solution cavity located in the rock face along the east side of a dry creek bed approximately 3 ft above the floor of the creek. This feature is infilled with fine-grained soil. Feature was formed by stream scour and measures approximately 7 x 2 x 2 5 ft oriented NW/SE. Cave spiders were present in the feature, however, there was no air flow observed from the feature

Feature B-S9

Feature consists of solution-enlarged fractures Fractures contain fine-grained soil infilling and are oriented NE/SW The visible outcrop area measures approximately 66 x 33 ft Apertures measure approximately 1 0 to 8 inches

Feature B-S10

Feature consists of solution-enlarged fractures along F #4 (i e , *Feature B-S29*) located on a hillside with sharp relief Fractures are infilled with fine-grained soil and are oriented NE/SW The visible outcrop area measures approximately 49 x 26 ft Apertures measure approximately 2 to 8 inches

Feature B-S11.

Feature is a water well with an approximately 6-inch diameter casing equipped with an electric submersible pump. The casing is set within a concrete pad and extends approximately 1 0 ft above ground surface. The well supplies a camp house and a concrete water tank measuring 20 ft diameter x 3 ft deep This feature is classified as sensitive owing to rapid infiltration potential if the surface seal were to become compromised

Feature B-S12

Feature consists of a non-karst closed depression formed beneath tree root systems exploited by animal burrowing Feature appears to be completely contained within soil with no connection to underlying limestone bedrock and measures approximately 33 x 20 x 3.5 ft

Feature B-S13

Feature consists of a rock-lined pit adjacent to the remains of an old settler house. The visible part of the pit measures 7 ft in diameter x 2 ft deep The pit is partially filled with soil, organic material, and rock debris The original function of the pit is believed to be a cistern utilized for the collection of rainwater

Feature B-S14.

Feature consists of solution-enlarged fractures within a dry creek bed. Fractures contain fine-grained soil infilling and are oriented NE/SW. The visible outcrop area measures approximately 33 x 23 ft. Apertures measure approximately 1 to 8 inches

Feature B-S15:

Feature consists of solution-enlarged fractures The visible outcrop area measures approximately 262 x 33 ft. Fractures are oriented NE/SW and contain fine-grained soil infilling. Apertures measure approximately 3 to 8 inches.

Feature B-S16

Feature consists of solution-enlarged fractures in a drainageway containing fine-grained soil infilling. The visible outcrop area measures approximately 197 x 33 ft Fractures are oriented NE/SW and apertures measure approximately 3 to 8 inches

Feature B-S17.

Feature consists of solution-enlarged fractures located on a hillside Fractures contain fine-grained soil infilling and are oriented NE/SW The visible outcrop area measures approximately 131 x 49 ft Apertures measure approximately 2 inches to 1 ft

Feature B-S18

Feature consists of a solution cavity formed horizontally along a bedding plane and enhanced by infrequent spring flow This feature measures approximately 75 x 1 5 ft Cave spiders were present at the time of field reconnaissance Feature was

partially infilled by fine-grained sediments There was no air flow observed from this feature.

Feature B-S19

Feature consists of a cave formed by natural dissolution of limestone by percolating runoff. The opening is approximately 4 ft in diameter The cave extends approximately 6 ft into the cliff face and extends 8 ft to 12 ft horizontally The vertical extent is 12 ft forming a natural chimney and daylights through the top of the hill. There were no cave spiders present, however, air flow from the surface opening was observed. This feature is partially infilled with fine-grained soil. There was no evidence during field reconnaissance that the cave is connected to the subsurface This feature is classified as sensitive based solely upon point criteria

Feature B-S20.

Feature consists of a large horizontal solution cavity formed by dissolution of limestone partially infilled with fine-grained soil This feature measures approximately 6 x 3 x 2 ft and is oriented NE/SW.

Feature B-S21.

Feature consists of a solution cavity formed by stream scour This feature measures approximately 3 x 1 x 8 ft and is oriented NE/SW. This feature is infilled with fine-grained soils There was no air flow observed from this feature

Feature B-S22

Feature consists of solution-enlarged fractures located on a hillside along F #4 (i.e., **Feature B-S29**). The visible outcrop area measures approximately 40 x 30 ft Fractures are oriented NE/SW with fine-grained soil infilling. Apertures measure approximately 2 inches to 1 ft.

Feature B-S23:

Feature consists of solution-enlarged fractures located in a drainage The visible outcrop area measures approximately 20 x 6 ft. Fractures are oriented NE/SW with fine-grained soil infilling. Apertures measure approximately 0 25 to 0 5 inches

Feature B-S24

Feature consists of solution-enlarged fractures located on a hillside Fractures are infilled with fine-grained soils and oriented NE/SW The visible outcrop area measures approximately 26 x 20 ft. Apertures measure approximately 6 to 10 inches

Feature B-S25

Feature consists of solution-enlarged fractures located on a hillside The visible outcrop area measures approximately 15 x 10 ft Fractures are oriented NE/SW with fine-grained soil infilling Apertures measure approximately 2 to 4 inches

Feature B-S26.

Feature consists of a horizontal non-karst closed depression formed at the mouth of a drainage basin beneath a fallen block of limestone. This feature has been enlarged by animal burrowing and measures approximately 6 x 1.5 ft oriented NE/SW This feature is contained within fine-grained soil.

Feature B-S27.

Feature consists of a horizontal solution cavity enlarged by animal burrowing with fine-grained soil and limestone fragment infilling. This feature measures approximately 8 x 4 x 1 ft and is oriented NW/SE. There was no air flow observed from this feature.

Feature B-S28 (F #3).

This normal fault zone was mapped based upon field observations and a review of published geologic references to include Small and Clark (2000), and Lambert, Grimm, and Lee (2000) Evidence of this feature (e g , solution enlarged fracture outcrop) was observed during field reconnaissance in the southeastern corner of the property. The feature serves to facilitate internal displacement within the Upper Devils River Formation Given the extent of the catchment area and inferred moderate to high infiltration rate along drainageways, the feature is classified as sensitive GPS coordinates for this feature were collected at B-S9 Lambert, Grimm, and Lee (2000) designated this fault as the Seco Creek fault.

Feature B-S29 (F #4):

This normal fault zone was mapped based upon field observations and a review of published geologic references to include Small and Clark (2000), and Lambert, Grimm, and Lee (2000) Both of these sources designated this fault as the Diversion Lake fault. Evidence of this feature (e g , solution enlarged fracture outcrops) was observed during field reconnaissance in the central portion of the property. The feature serves to facilitate internal displacement within the Upper Devils River Formation Given the extent of the catchment area and inferred moderate to high infiltration rate along drainageways, the feature is classified as sensitive. GPS coordinates for this feature were collected at B-S10

Feature B-S30 (F #5).

This normal fault zone was mapped based upon evidence of this feature (e g , solution enlarged fracture outcrops) observed during field reconnaissance in the northern portion of the property The feature serves to facilitate internal displacement within the Devils River Formation and juxtaposes the Upper and Lower Devils River Formation Given the extent of the catchment area and inferred moderate to high infiltration rate along drainageways, the feature is classified as sensitive GPS coordinates for this feature were collected at B-S7

Feature B-S31 (F #6)

This normal fault zone was mapped based upon evidence of this feature (e g , solution enlarged fracture outcrops) observed during field reconnaissance in the northwestern portion of the property The feature serves to facilitate internal

displacement within the Upper Devils River Formation Given the extent of the catchment area and inferred moderate to high infiltration rate along drainageways, the feature is classified as sensitive GPS coordinates for this feature were approximated from B-S16

EXHIBIT NO. 4

AEI

ADAMS ENVIRONMENTAL, INC.
12018 Las Nubes St.
San Antonio, Texas 78233

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August 21, 2006

Mr. Richard Garcia, Regional Director
Texas Commission on Environmental Quality
Region 13
14250 Judson Road
San Antonio, Texas 78233-4480

RE: Comments on the WPAP for the Vulcan Materials Medina Quarry

Dear Mr. Garcia:

I sincerely appreciate the opportunity to provide comments on the Vulcan Materials Medina Quarry WPAP. I have been retained by MCEAA to review and comment on the submittal by Vulcan. Adams Environmental, Inc. is a local environmental firm here in San Antonio that has provided services to clients in Texas and the U.S. for over 10 years. We have a great deal of experience in the environmental issues in this area. Most of our business involves Section 404 Permitting, environmental assessments, environmental impact statements, natural resources management and planning, endangered species habitat studies, park planning, environmental site assessments and some experience with TRRP. I appreciate you taking time to review our comments and hope that you will seriously consider our suggestions for improvement of this plan.

GENERAL COMMENTS

Overall, the document appears to be somewhat inadequate, considering the size of the facility and the potential for contamination of the aquifer. I assisted with the development of a WPAP for a parking lot in San Antonio and much more detail and information was required for that 3.0 acre facility compared to this 1700 acre quarry. In fact, this submittal seems to be almost disrespectful of the regulations. Case in point is the discussion of the operation on the quarry which is cryptic at best. Nothing could be surmised concerning potential sources of surface water pollution from the information provided. As a citizen of San Antonio, I am very interested in protecting the aquifer, and I find it difficult to believe that Vulcan shares in that concern when the content of their WPAP is considered.

PROTECTION OF SENSITIVE FEATURES

The document does not provide sufficient details on the protection of sensitive features on the site. It does an adequate description of surface features, but does not address the potential for subsurface features. No studies were conducted to determine if any caves, solution cavities, or other karst features are found below the surface. These features could be easily compromised by blasting activities. Once blasting is completed, protection of undetected features may be difficult. A sinkhole approximately 40 feet

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deep is located just west of the site. This sinkhole connects to a cave, the size of which is currently unknown. These types of subsurface features are relatively common in the quarry area and could be significant problems for the quarry and especially for protection of the aquifer. Vulcan should conduct subsurface investigations to ensure that large caves and other features are not present.

SELF-SEALING SEDIMENTS

Pumping of very fine particles to mined portions of the quarry to create self-sealing, impermeable settling ponds has been proposed as a permanent best management practice for stormwater management. It is stated that the fine particles removed by washing of soils and left behind by blasting can be used to seal sedimentation basins and reuse ponds [*hereinafter* referred to jointly as "sedimentation basins"]. Water containing these materials will flow into sedimentation basins and these sediments will settle in the ponds, eventually forming an impermeable layer that can be used as a liner. I agree that, in principle, this could happen, but it takes a great deal of time in nature for it to occur. The WPAP does not address the timing issue of this process and cannot provide any well-established evidence that it actually would work. I also attempted to find support for this procedure, but could not find anything of substance.

Sedimentation basins on this site should be protected with an artificial liner to protect the aquifer. The stakes are too high on this site to use an unsubstantiated method of lining sedimentation basins and subjecting the aquifer to contamination with sediments and potential releases from fuel or lubricant spills from equipment. Clays and fine particles loose their cohesive properties and increase their permeability when impacted by hydrocarbon spills. This is not a place to test the integrity of an untested liner.

If the TCEQ allows this method of self-sealing, the quarry designers should be required to demonstrate both in a pilot study that this self-organizing, self-sealing practice of fine particles is actually effective in creating an impermeable boundary to prevent pollutants from entering the aquifer. This demonstration should also include a time-table to show how long the process will take before an impermeable seal is created. The demonstration should also provide alternative pollution best management practices to bridge the gap between implementation of this process and development of the impermeable layers. A thorough literature review should also be provided to support pilot study results.

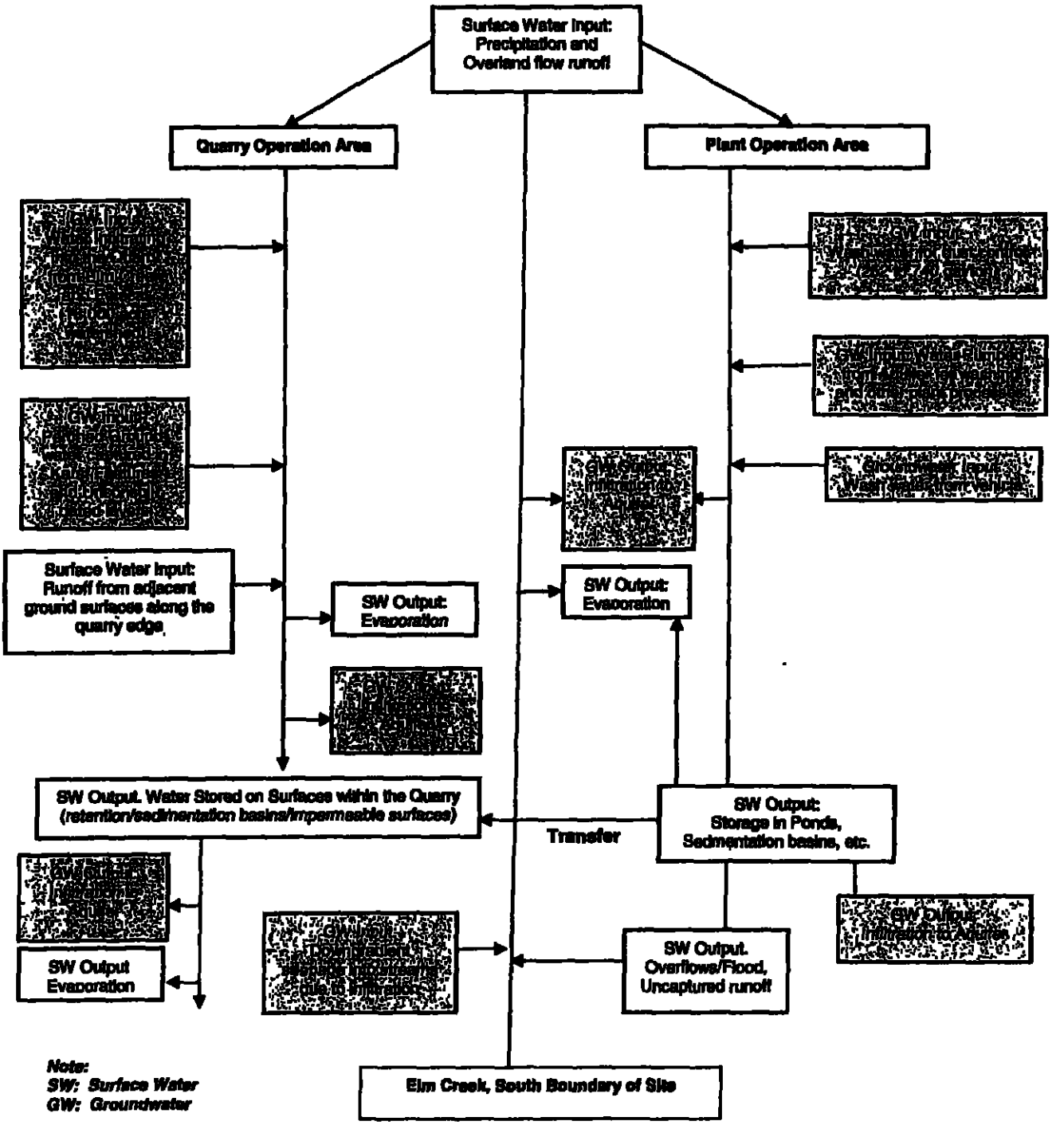
The WPAP indicates that only 37 acres of impermeable surfaces will be created by this project. The blasting process creates these fine particles that, according to Vulcan, are self-sealing. Those fine particles will fall all over the floor of the quarry and be compacted by equipment, causing the floor to be impermeable. If these particles are efficient as a retardant of potential pollutants into the aquifer in sedimentation basins, they would also act as a barrier of recharge water into formerly permeable portions of the recharge zone. If we accept the premise that those particles do indeed seal the ground surface, then the area of impermeable surfaces that are created by the project will be greater than 1000 acres. This is not addressed by the WPAP. Studies should be conducted to determine how this permanent loss of recharge water will affect surface and groundwater hydrology and the aquifer during the operation of the quarry and after the quarry has closed.

Finally, it is difficult to believe that even if the self-sealing process could take place within the required time frame, it would not be interrupted by the regular excavation of the sedimentation basins when they are reduced to 75% of original storage capacity (response to TCEQ Question 23B) or when the level of silt exceeds 6 inches (Permanent BMPs, original WPAP, TCEQ Form 0600 Attachment G.). It is not at all clear that the purported impermeability of the unlined sedimentation basins will be maintained while pursuing the WPAP's stated goal of sealing the quarry. Similarly, as noted above, if the assumption of impermeability in the sedimentation basins is justifiable, the assumption of impermeability when the fine particles are spread in the quarry requires further revisions to the hydrologic calculations.

WATER BUDGET

Another area that appears to be poorly addressed by the WPAP is the development of a water budget for the site. It is paramount that Vulcan collect information on the water balance for the site to determine if the quarry can operate and if recharge to the aquifer will be significantly impacted by the operation. The flow chart on the next page is a general schematic of the inflows and outflows of the quarry.

Water Budget Based on Stated WPAP Site Plan



Summary of Potential Hydrologic Inputs into the Quarry Excavation and Plant Operation:

1. Stream throughput (Polecat and Elm Creeks)
2. Perched groundwater tables (seepage into quarry from excavation walls)
3. Potential Karst Features
4. Precipitation
5. Pumped groundwater for use in quarry processes

Summary of Aquifer Loss Variables

1. Throughput of Polecat and Elm Creeks
2. Overflow from plant stormwater basins.
3. Fine particle packing to create impermeable settling ponds in mined out portions of the quarry. What is the volume of aquifer recharge water lost when small packing particles create impermeable surfaces? How will this affect aquifer recharge rates? When does the system become efficient (i.e. as a barrier to pollutants)?
4. Evaporation of process waters and stormwater retention waters.
5. Loss of hydrostatic pressure adjacent to stream corridors resulting from superelevation of the streams in relation to their surroundings.

Surface Water Inputs

According to the WPAP, 18,301 acres (inclusive of the 1,776-acre quarry site) drain through the tributary system located up-gradient and on the quarry site. No information regarding base stream flow data for the on-site streams was provided. With no losses due to infiltration or other processes, a maximum of approximately 66,432,629 cubic ft or 465 million gallons of water would be produced by a 1-in. storm event, potentially flowing through Elm Creek and Polecat Creek on the quarry site. This and other hydrologic calculations have not been disclosed in the WPAP. The final disposition of the water in the aquifer and flowing through the site should be calculated to determine overall impacts to the aquifer. Detailed stream analysis studies, which include hydraulic model estimates of channel conveyance during the 10, 25, 50 and 100-year storm events have been developed for Elm Creek, but these studies apparently focus only on the surface flow. In any case, the stream flood analyses were not disclosed with the WPAP..Because the quarry will be excavated to the edge of the 100-year floodplain of the streams, the infiltration rate of water in the stream would be increased (uninhibited flow through unconsolidated layers and karst features directly into the quarry). Depending on the findings, this accumulation of water in the quarry could flood the quarry, causing damage to equipment and imperiling the aquifer with potential releases of hydrocarbons from flooded equipment. This water could also eventually re-enter streams downgradient. Overall, the surface water-infiltration relationship has not been adequately addressed in the WPAP

Additionally, water will also flow into the quarry from the edges of the quarry following rainfall events. Precipitation will also enter the quarry directly. The WPAP does not appear to address contributions from sedimentation basins in the quarry.

Groundwater Inputs

No environmental or geotechnical borings have been advanced on the project site to identify and delineate potential sources of perched groundwater. Perched groundwater consists of confined subsurface water deposits that are located above the normal aquifer elevations. These groundwater sources are generally confined by an impermeable layer that prevents downward percolation and recharge to the aquifer. When quarried, the lateral confining layers may be breached, and the perched water table may drain into the excavated area. This may mobilize pollutants, and contribute to overflow of the quarry's containment capacity. Local wells, especially those used for watering stock, may be using these groundwater sources and could be drained by construction of the quarry. Many shallow wells and springs are located south of the quarry. These wells are often no more than 40 ft. deep and may be susceptible to quarry activities. Periodic borings along a grid of the project area should be advanced to search for and delineate potential perched groundwater features.

No surface or subsurface evaluations to screen for potential karst features have been conducted. Subgrade karst features are essential to transportation of groundwater to the aquifer. Without proper karst surveys, excavation and quarrying activities may disrupt groundwater flow and recharge into the aquifer. Additionally, karst features provide habitat for numerous threatened and endangered species, and disruption of these environments may adversely impact these species. At a minimum, periodic borings along a grid of the project area should be advanced to search for and delineate potential karst features.

According to water use records for the Vulcan quarries in San Antonio and Helotes, an estimated 252 to 740 gallons of Edwards or other aquifer water will be used to wash each ton of quarried material. If we consider the predicted production of the quarry (4-8 million tons per year), this means that the quarry will use between about 3,000 to over 20,000 acre feet of water use each year. Although the use of water in the washing of quarried materials is described in the WPAP as a "recycling process," water will inevitably be lost to inefficient process operations and evaporation. However, no quantification of the volume of water lost through inefficiencies in the system and evaporation has been conducted. Another 12 to 44 gal/ton of water will be used for dust suppression. Efforts should be made to quantify how much replacement water will be pumped from the aquifer over the operational lifetime of the quarry, as this water volume will constitute a drain on aquifer resources, and may affect stormwater and infiltration calculations in the WPAP.

Outputs from the Plant and Quarry Process

Most of the water flowing through the streams will bypass the quarry area and flow down gradient towards Quihi. The volume would be less water that infiltrates into the streambed. Also, some loss of surface water will occur via infiltration up gradient of the quarry and will flow into the periphery of the quarry via shallow groundwater in unconsolidated layers and karst features along the edge of the quarry. Stormwater overflow from detention ponds and sedimentation ponds will also leave the site.

Pumping of very fine particles to mined portions of the quarry and plant area to create self-sealing, impermeable settling ponds has been proposed as a permanent best management practice. The use of fine particles to develop an impermeable seal in mined portions of the quarry, if efficient as a retardant of potential pollutants into the aquifer, would also act as a barrier of recharge water into formerly permeable portions of the recharge zone. Studies should be conducted to determine how this permanent loss of recharge water will affect movement of area hydrology into the aquifer. Even more important, the presence of these materials on the surface of the quarry floor could render the floor permanently impermeable and this impermeable surface should be added to the 37 acres of impermeable areas already in the WPAP.

Water that would normally assist in recharging aquifer resources will be collected on impermeable areas of the quarry and in stormwater retention ponds. Additionally, groundwater used to process quarried materials will undergo some losses through evaporation – which may be considerable over the anticipated 40-year operational lifetime of the quarry. Quantitative studies should be conducted to estimate the amount of potential recharge water that will be lost to evaporation over the operation lifetime of the quarry.

The overall water balance should be prepared by Vulcan to illustrate how much water will enter and leave the site and how much water will no longer recharge or will be drawn from the aquifer. The current water balance sheets have only been prepared for the plant operation and not the quarry. Moreover, they address rainfall inputs at the plant site only, and do not address process outputs or upgradient runoff. The argument is made that the quarry is a closed system with no surface water outputs. However, the system is not closed if the floor or sides of the quarry are indeed permeable, which is highly likely and underscored by the abundance of sensitive features on the site.

SURFACE WATERS

The WPAP indicates that jurisdictional waters will be avoided by quarrying around the 100-year floodplains. However, no effort has been made to delineate ephemeral stream and other jurisdictional waters on the site. Observation of the USGS topographic map indicates that there are several potential jurisdictional ephemeral streams that will be destroyed by the excavation of the quarry. Mining operations would be considered fill operations in that blasting causes fill material to enter stream bed areas. Admittedly, the streams will be completely destroyed, but because of the method used for mining, the activity would still be considered to place fill in the streambed (which may now be at the bottom of the quarry!). Such actions require coordination with the U.S. Army Corps of Engineers. A detailed surface water delineation should be conducted to determine if the construction of the quarry or rail line will impact unnamed tributaries of Elm Creek and Polecat Creek.

Hydrostatic pressure, the balancing of water mass between the channel boundaries and adjacent ground water resources, will be greatly disturbed if the areas immediately adjacent to the stream beds are excavated and the stream super-elevated in relation to its surroundings. Base stream flow occurs not from precipitation run-off, but from groundwater infiltration into the stream because the bed of the stream is located below the ambient groundwater table. Even in ephemeral streams (which flow only for a short time

following precipitation events), the area groundwater table may be very shallow and located only a few feet below the stream bed. Plans for mining the quarry do not call for impacts to jurisdictional waters of the U.S. However, super-elevating the stream channels by mining the areas adjacent to on-site streams and lowering the base level of any local perched or shallow groundwater resources may effectively drain the stream by removing the hydrostatic pressure forces that maintain baseflow conditions (even in intermittent stream courses). This would effectively destroy the stream system by draining it of its groundwater hydrology. Thus, although Elm Creek and Polecat Creek would not be physically impacted, the functional values and flow characteristics of the streams would be significantly changed.

SPECIFIC COMMENTS FOR THE WPAP

1. More details should be provided concerning the method by which sensitive features will be protected. Equipment used for quarrying is large and many of these features are very small. It is difficult to understand how the surface of the quarry will be sloped away from the sensitive features when large equipment and blasting is used for mining operations.
2. The WPAP is not consistent in defining the depth of the aquifer under the quarry. Page 1, Attachment A indicates that the aquifer is over 300 ft. below the surface. Other parts of the WPAP list the top of the aquifer as 120 ft., 122 ft., and other various depths. I agree that the aquifer depth should be determined as an elevation, but these vary between 670 ft. MSL and over 900 ft. MSL according to the WPAP A more definitive determination of the aquifer level should be determined using on-site monitoring wells across the quarry area.
3. Mining equipment contains hydraulic and fuel reservoirs that are relatively large. Releases from these reservoirs can be significant. Is there any documentation in the WPAP that provides information as to methods for containment in case releases occur. A list of tank capacities was provided with the MSD sheets. Loaders have 425 gallon fuel tanks and 86 gallon hydraulic tanks. Apparently smaller loaders are used and contain 297 gallon fuel tanks and 46 gallon hydraulic tanks. Hauling trucks have 300 gallon fuel tanks with 12 gallon hydraulic tanks. Locomotives apparently have the largest tank capacities with 1440 gallon fuel tanks and 202 gallon hydraulic tanks. Overall, on the site, fuel tanks total 7110 gallons and hydraulic tanks total 903.6 gallons. Releases from loaders, haul trucks, and locomotives could be significant. In fact, a release from the fuel tank of a locomotive would be similar to that of any AST requiring a SPCC plan.
4. The WPAP mentions very fine sediments that self seal. Are the areas where these materials are placed included in the calculation for impervious surfaces?
5. Are volumes of hazardous materials provided? A list of the volumes of hazardous materials stored on site should be provided. This does not seem to be present on the application. The only mention is that they will be small volumes. Also, there appears to be no mention of explosives for blasting. Where will these materials be stored?
6. MSD sheets include a great deal of materials used for degreasing and cleaning parts. It was my understanding that vehicle maintenance areas are located off of the recharge zone. However, it appears that materials used for vehicle maintenance are

being listed for the plant and quarry areas. What will these materials be used for? Will they be used for railroad maintenance?

7. Attachment B indicates that stormwater runoff from the quarry will be contained. If this is the case, what is the final disposition of the contained water. Does it evaporate or does it infiltrate into the aquifer? What storm events can the quarry accommodate?
8. Exhibit 2.1 indicates that finished grading contours and the quarry pit bottoms cannot be shown because the exact depth of rock reserves is not known. However, other portions of the WPAP indicate that excavation will not exceed 130 ft. from the ground surface or 25 ft. above the potentiometric surface. The exhibit would lead one to believe that the depth of excavation is not really known at this time.
9. The geologic assessment appears to have covered surface geology quite well. However, for a project that involves deep excavation, it seems appropriate that borrowings be drilled to determine the presence of karst features below the surface as well as the location of the aquifer. Caves and other sensitive features could definitely be located below the surface of the ground. This is further evidence by the presence of caves and sinkholes in the vicinity of the quarry.
10. Page 8 of the geologic assessment indicates that fault zones serve as conduits to flow with in the Edwards aquifer. Again, the extent of these faults and their role in surface recharge following quarry excavation is not addressed. Also, infiltration of water from Polecat and Elm creek into faults and the impact of excavation on the flow of water within those faults is not addressed. An important question would be, "What percentage of the storm flow in these creeks will eventually infiltrate and flow into the quarry area due to excavation across fault lines."
11. TCEQ 0602 Attachment A: This response action is appropriate for areas lying over impermeable services. However, it fails to address the fact that any spill occurring on the quarry is subject to infiltration into the Edwards aquifer with only 25 ft. of protection. The impacts of a spill of any fuels, lubricants, other hazardous materials is extremely high due to the fact that the materials can infiltrate into the aquifer and contaminate drinking water used by a major metropolitan area. This should be addressed in a detailed spill response plan with proper preventative measures provided. Although the chances of it happening are remote, the release of fuel from the 1440 gallon tank of a locomotive could be devastating to the quality of water in the aquifer.
12. TCEQ-0602 Attachment B: In this attachment as well as many other parts of the document, explosive materials are not listed as potential contaminants. Additionally, the method of handling explosives in an area over the aquifer is not addressed. One would assume that borings will be drilled into the limestone and those borings filled with some type of explosive. What measures will be made to ensure that explosive material does not drain into faults, solution cavities, and other karst features that could be direct conduits into the aquifer.
13. TCEQ-0602 Attachment B: This attachment indicates that hazardous materials in the plant area will be stored in a small shed with an impervious floor. No mention of containment is provided. Also, the quantity of these materials is not provided in the plan. The materials should be stored on shelves with raised edges and in a store room with curbed floors to contain the spill. The height of the curb should be determined by the volume of material potentially released.

14. TCEQ-0602 Attachment B: The actual operation and maintenance of the concrete truck washout is not described anywhere in this document. What is the final disposition of materials washed from the trucks? Are soaps and detergents used for washing? Are oils and lubricants removed from the trucks separated from aqueous solutions?
15. TCEQ-0602 Attachment C: Are the bulleted items listed in the plant area in order of occurrence? If so, shouldn't the water quality basins be constructed before rough grading and clearing and stripping is conducted? Or at least temporary sedimentation basins strategically placed to catch flow along major drainage areas?
16. TCEQ-0602 Attachment C: How will sensitive features be protected from construction? Will the features be enclosed with silt fences? How will grading around the features be accomplished?
17. TCEQ-0602 Attachment I: A sample inspection report is provided in this attachment. The sample inspection report lists several pollution prevention measures that are to be inspected, but no method of measurement or evaluation is provided. For example, how will site clearing be evaluated by an inspector?
18. TCEQ-0602 Attachment J: Buffer zones are described as "undisturbed" in this section. Will ample space be provided for quarry equipment to travel along the edge of the quarry? If roads are placed along the edge of the quarry, are they included as part of the buffer area? If so, will these roads be restored to native vegetation once the quarry is closed?
19. TCEQ-0602 Attachment J: It is a nice touch that the landscaping along the front of the operations entrance will be highly enhanced, however, this represents only a minor portion of the entire periphery of the quarry area and enhancement of that boundary would also be desirable from a water quality perspective. Given that vegetative matter from the plant site will be placed on berms around the quarry boundary, has the effect of the piling of vegetation on runoff been fully addressed?
20. Permanent Stormwater Controls (Sheet 5 of 9): Note 6 indicates that if sediment escapes the construction site, off-site accumulations of sediment must be removed. No method to accomplish this task is provided in the document. The Vulcan quarry on Loop 1604 in San Antonio consistently produces excessive quantities of dust along the access road. This dust is accumulating on trees and vegetation as well as covering the road and the shoulders of the road. During rains, the sediment and dust is absorbed by stormwater and flows into a nearby creek. Apparently, no controls of dust originating from the transport of crushed rock in trucks are provided. Methods of cleaning crushed rock indicate that 93% of sediments and dust will be removed. This seems like a small amount except when the production of 8,000,000 tons of limestone per year is considered. This means that trainloads of crushed rock could produce significant quantities of dust, depositing them along the track as the train travels south from the plant area. At the very least, the train cars containing crushed rock should be covered to prevent blowing of fine particles. These materials could eventually find their way into surface waters along the tracks, especially where the train passes over Elm Creek near the exit from the plant area.
21. Permanent Stormwater Controls (Sheet 5 of 9)--Note 7: This note discusses the removal of sediments from sediment traps or sedimentation ponds. The method of removal is not discussed and should be discussed in detail, especially considering the fact that the liner in the sedimentation ponds is comprised of self-sealed sedi-

ments. Proper removal of sediments is extremely important to not compromise the integrity of the liner potentially causing leakage of material into the Edwards aquifer.

22. Permanent Stormwater Controls (Sheet 5 of 9)–Note 10: Stabilization following temporary or permanent cessation of construction should be discussed in greater detail. On this site, drought should not preclude the initiation of stabilization. The site will have ample sources of water for irrigation, including water trucks used for dust suppression. There is no discussion of the type of vegetation to be used for restoration of constructed areas. I strongly recommend that native plant species be used. A mixture of species such as little bluestem, buffalograss, curly mesquite, Indiangrass, silver bluestem, and sideoats grama would be a good choice for this area.
23. Permanent Stormwater Controls (Sheet 5 of 9)—General: This entire section is basically a list of the guidelines provided by the TCEQ. The section should be revised to provide detailed information applicable to this site.
24. Permanent Stormwater Controls (Sheet 5 of 9): The plan indicates that a berm will be placed along the south side of the Polecat creek to protect against flooding. However, contours for this berm are not shown. Contours on the northern portion of the site show an elevation of 960 MSL. At this portion of the site, this elevation would be located below the elevation of the 100-year flood plain. As drawn, this would indicate that flood waters could potentially encroach on the plant site. More details should be provided to indicate the height and composition of the berm.
25. General note: The location of the boundaries of the recharge zone are based on maps provided by the TCEQ and Edwards Aquifer Authority. It is common knowledge that these boundaries are general and not necessarily accurate. The location of the vehicle maintenance facility is based entirely upon these arbitrary boundaries. Considering the potential implications of locating a facility of this type over the recharge zone, the actual boundaries of the recharge zone should be delineated by a qualified professional geologist. This would ensure that fuel storage areas and maintenance areas are not located in areas susceptible to infiltration into the Edwards Aquifer.
26. Areas to Be Treated as Impervious—Sheet 1 of 1: If the fine materials in the quarried rock are self-sealing, I contend that stockpile areas should be listed as impervious. These stockpiles of gravel will contain fine particles which, according to Vulcan, over time will compact under the weight of the stockpile, effectively sealing the ground surface. This is especially true for gravel that is stockpiled prior to washing. It is also true for washed gravel, since only 93% of the fine materials are removed by washing. It is important to note that the entire functionality of the liner of the sedimentation ponds is based on self-sealing nature of these fine particles. Therefore, I would assume that stockpiles, whether washed or not would contain sufficient quantities of small particles to also self-seal the ground surface. In fact, if the self–sealing properties of the fine particles actually occurs, the entire floor of the quarry would probably be considered impermeable because of accumulation and compaction of these materials by equipment and precipitation, regardless of dust control measures. Vulcan needs to determine whether these materials actually self-seal or not. Long-term implications of these self-sealing properties could result in the loss of well over 1000 acres of permeable surfaces on the recharge zone within the area of the quarry.
27. Up-gradient Areas: The method by which the up-gradient watersheds are delineated is not provided. In fact, the delineation of some of the areas appears to be arbitrary.

In addition, the smaller areas of delineation are difficult to identify due to the fact that the boundaries are a mixture of quarry boundaries and watershed lines. For instance, Area 1 appears to be labeled incorrectly in that it lies in the same polygon as Areas 3 and 5. The actual function of these smaller watersheds is not explained. Do I assume that they will flow into the quarry or that they will be bermed, causing ponding of stormwater at the down gradient side of these areas. Detailed explanations of each watershed and methods of controlling flow should be included to make this figure more understandable.

28. Site Plan for Plant Area (Sheet 2 of 9:
    - o This plan shows the location of many sensitive karst features across the site, but fails to show how these features will be protected from impacts from construction and operation of the plant and quarry.
    - o Additionally, the plan shows recycled water bypass line and an unpaved road crossing Polecat Creek. Although both of these crossings would probably fall under Nationwide Permit 12 or Nationwide Permit 14, they are Federal permits which require coordination with Texas Historic Commission and the U.S. Fish and Wildlife Service.
    - o The plan fails to show the geologic outcrops found underlying the equipment maintenance area.
    - o Showing the location of animal burrows on this map is understandable, however, showing the location of deer blinds is not necessary.
    - o This plan further supports the concept that detailed information on the operation of this facility is extremely important and should be included as part of the WPAP. The function of each of the conveyor belts and rock rushers should be explained in text. A flow chart explaining the entire process should be provided and should include potential sources of contamination and preventative measures to be used to contain contamination throughout the plant site.
    - o This figure indicates that the equipment maintenance parking area is located about 600ft. from the boundary of the aquifer recharge zone. Again, this is extremely close to an arbitrary boundary, further justifying careful delineation of the actual boundary to ensure that this facility is not on the recharge zone.
29. Temporary Stormwater Controls (Sheet 3 of 9): The discussion of stockpile area disturbances indicates that no more than ten acres will be cleared at a time. Following clearing, the area will be stockpiled with rocks. At that point, it is stated that the area will be considered as re-established. This is clearly stretching the regulations to consider an area covered with stockpiled material as reestablished when no any attempt to restore vegetation is indicated. I feel that an area would only be considered reestablished if it is brought back to grade and vegetated with native plants.
30. Exhibit 2.1 Overall Site Plan: This plan indicates that no mining will encroach into jurisdictional waterways without proper agency approvals. However, mining appears to only avoid named creeks and tributaries and appears to completely dismiss the presence of minor ephemeral streams. These ephemeral streams appear as indentions along contours and should be described and delineated to determine their jurisdictional status. A complete surface water assessment should be conducted on the site to delineate any jurisdictional waters to determine if a Section 404 permit would be required.
31 Exhibit 2.1 Overall Site Plan: The crossing from Pit 2 to Pit 3 shows placement of a final rock berm across an unnamed tributary to Elm creek. Placement of this berm

would require coordination with the U S. Army Corps of Engineers and, at the very least, a nationwide permit.

32. Exhibit 2.1 Overall Site Plan: All crossings from various pits show roads crossing jurisdictional waters. Detailed drawings show that these crossings directly traverse the floodplain and stream. It can only be assumed that fill material will be placed into the jurisdictional waters for construction of the haul road. This action would require Nationwide Permit 14 if acres filled are less than 0.5 acres.
33. Exhibit 2.1 Overall Site Plan: The plan indicates that the quarry floor will be located 25 ft. above the top of the aquifer. It is common knowledge that the elevation of the top of the aquifer is highly variable. In the San Antonio area, the top of the aquifer varies from an elevation of 630 ft. MSL to 710 ft. MSL depending on rainfall. Placing the floor of the quarry at an elevation based on the present level of the aquifer seems to be a somewhat presumptuous. If the bottom of the quarry is placed 25 ft. above the aquifer during the dry season, the floor of the quarry could be inundated during a wet season. It is our opinion that the 25 ft. buffer between the bottom of the quarry and the top of the aquifer is not adequate and could present many logistical and environmental problems in the future. This buffer provides little or no protection for water quality.
34. Exhibit 2.1 Overall Site Plan: The detail on the revegetated, compacted final earthen berm indicates that its design may be somewhat faulty. The central core of each berm is comprised of organic matter, topsoil, and sediments all of which are subject to decomposition, water loss, and other structural changes that lend themselves to a decrease in soil volume and increase in density over time. This core material is then covered by another undescribed material approximately 1.5 ft. thick. It is my opinion that the core of each berm is comprised of material that would be subject to instability over time, causing the berm integrity to be compromised at times.
35. Exhibit 2.1 Overall Site Plan: The final rock berm in Quarry Pit 2 encroaches on the 100-year floodplain of Elm creek. Has this been cleared through FEMA or the local floodplain administrator?
36. Exhibit 2.1 Overall Site Plan: It seems quite curious that most of the sensitive geologic features found on the site are scored low. Is this a common finding in this area?
37. Temporary Stormwater Controls Sheet 4 of 9: The temporary stormwater control designs were apparently adapted from the City of San Antonio Department of Public Works Engineering Division. These drawings from the City of San Antonio are not officially stamped by a professional engineer. I would assume that for a project of this size and nature, drawings specific to the site should be used.

COMMENTS ON VULCAN'S RESPONSE TO TCEQ COMMENTS

Question 1:

- Bridges and trestles in this area are known to become clogged with woody materials and other objects moved by floodwaters. Trestles are especially sensitive to this type of problem. The impact of a clogged trestle on flood waters should be studied as part of this project.
- The answer provided for this question appears totally inadequate in that the actual design of the train tracks is not provided, design of the bridge and trestle is not shown, and details on maintenance and spill cleanup is lacking.

- Drippings into the creek bed should be removed immediately, not monthly. These materials will migrate downstream causing pollution of surface waters.
- It is stated that the area under the trestles will be scraped clean of drippings on a monthly basis. In other parts of the plan, it is stated that vegetation in the floodplain will not be disturbed. These procedures seem to contradict each other.
- If soil is scraped from the stream bottom, will the remaining soil be sampled to *determine if all contaminants have been removed*?
- What procedure will be used to contain a major spill of fuel or hydraulic fluid if released from a locomotive or other large equipment into the stream channel? I investigated the release of gasoline into a stream approximately two years after the incident occurred. The release flowed into a perennial stream which should restore itself much more rapidly than any ephemeral or intermittent stream due to constant dilution by perennial waters. However, even after two years, no aquatic or amphibious life was found in the stream for over one mile downstream. I feel that a spill prevention plan should be in place to prevent pollution of surface waters below and in the vicinity of the train tracks.

Question 2:

- It is stated that a large portion of the buffer area will be left in its native condition. *This is ambiguous and an exact distance or area should be used to describe the* area to be protected.
- The description of mining operations is cryptic at best. Even the most unknowledgeable person would be able to develop the process list that is provided in this question. Much more detail should be required. Each of the bulleted items need to be explained in detail. For example, how will the area be cleared? What equipment will be used to clear the area? What is the disposition of vegetation following clearing? Will it be burned? Will it be hauled? Will it be chipped? How will sensitive features be protected?
- The list includes drilling and blasting. No where in the plan is the procedure for blasting described. What materials will be used for blasting? Are these materials hazardous? How deep will drilling be? Will the borings be checked for sensitive features before blasting? How will sensitive features below the surface be protected during blasting if they have not been identified at the surface?

Question 3:

The answer to this question indicates that the maintenance area does not flow into the recharge zone. No evidence is provided to support this statement. Considering the fact that this facility is located within 600 ft. of the boundary of the recharge zone, I feel that a geologic assessment should be conducted to ensure that the site is not located on the recharge zone and not base the fact on the general boundary provided on the aquifer map.

Question 4:

All faults should be clearly delineated in the field prior to blasting activities. Inferred location of these faults is unacceptable if they're to be protected during blasting procedures.

Question 6:

The maximum mean depth within the proposed quarry should be based on the location of the top of the aquifer at its highest level.

Question 7:

It is obvious that more onsite borings should be conducted to determine the exact level of the Edwards aquifer on the quarry site. A grid of monitoring wells should be drilled on site to map the elevation of the top of the aquifer as well as to determine the direction of flow. The elevation of the aquifer should not be based on data collected in the 1950's, especially when those elevations range from 976 ft. to 687 ft.

Question 8:

It is difficult to believe that only five gallons of hydrocarbons will be kept on site for the quarry. Most equipment used for the quarry has hydraulic fluid reservoirs greater than 25 gallons capacity. One would assume that storage of more than five gallons of hydrocarbons would be required. Also, one would assume that much of the equipment would be fueled on site, possibly by use of fuel transport vehicles. This is not addressed by the plan. An important process to be discussed would be on-site lubrication and fueling of equipment.

Question 12:

Support for use of self-sealing sediments for sedimentation ponds is inadequate. Permeability as determined in the lab is not the same as for fine sediments accumulating in a pond naturally. It is well known that sediments can seal ponds over time but this takes many years of deposition and compaction. Information concerning the time required for the sediments to settle, compact, and seal is not provided. When the bottom of the pond is sealed, is there any assurance that the seal will not be compromised during pond maintenance and removal of excess sediments? Because this quarry is located in such close proximity to the top of the aquifer, and artificial or concrete liner should be required to ensure protection of the aquifer.

It is also curious that the plan purports that the fine materials created by blasting are self-sealing when contamination is discussed. These dusts will cover the entire bottom of the quarry and will be subsequently compacted in place by mining equipment. Thus, if the self-sealing properties of these materials is a fact, then the entire quarry should be considered an irreversibly impermeable surface.

Question 15:

The spill prevention plans are inadequate No procedure for spills on permeable surfaces is provided. These are the areas of greatest concern. Also, methods to analyze soils on the bottom and sides of pits excavated to remove hazardous spills are not provided. The actual procedure for spill response by employees is not listed. The answer only provides generalities and not specifics. The response for large spills only lists agencies to notify and not methods for first response.

This section indicates that fueling and maintenance may occur on-site, but other sections indicate that sufficient materials will not be present on-site to provide this service. Also, the plan only addresses prevention of the flow of spills into surface waters. No procedure is provided to prevent spill infiltration into the aquifer.

Question 20:

Buildup of drippings in the streambed over a month period is no an acceptable option. Those drippings will eventually be deposited downstream if a storm event occurs prior to removal. The streambed should be inspected daily and drippings removed by hand shoveling if they are found. This would ensure that only minor quantities of hydrocarbons may find their way to waters downstream.

Question 29:

This question is very important and to state that the difference between the top of the aquifer and the potentiometric surface cannot be quantified is unacceptable. If this is the case, then perhaps some other measurement should be used.

Question 37:

It should be noted that if material from the conveyors falls into the channel of Polecat Creek, this could be construed of placement of fill into waters of the U.S. and coordination with the U.S. Army Corps of Engineers (USACE) would be required. The method and timing of removal of materials falling into the creek should be coordinated with the USACE.

Question 48:

Haul roads will require Nationwide Permit 14 regardless of the area impacted or filled. If less than 0.1 acres is filled, notification of the USACE is not required unless cultural resources or endangered species are impacted by the activity. Coordination with the USFWS or THC is required for this action.

Question 50:

Earlier in the responses, it was stated that the potentiometric measurement would be well above the actual top of the aquifer. However, in this table, the top of the aquifer and the potentiometric surface elevation were the same This leads me to believe that the previous statement does not hold and the quarry will be excavated to 25 ft. above the top of the aquifer.

Attachment A: Nature of Exception

The exception is correct that water from the quarry will not discharge into surface waters. However, water will discharge into the aquifer. Proper control measures should be incorporated into the plan to protect the aquifer with permanent BMPs. However, if the fine materials actually self-seal on the bottom of the quarry, it would no longer be permeable after blasting and the aquifer would be protected. If this is the case, then the impermeable surfaces must be increased to well over 1000 acres.

I sincerely appreciate you considering these comments. This is a very large project that has significant impacts on the Edwards Aquifer and could have far reaching impacts on the citizens of the San Antonio metropolitan area. As you are aware, there are very few checks and balances for the establishment of quarries in the state of Texas and the WPAP is one of the few permits that allow for careful review of the design, construction and operation of the quarry with respect to the environment and the precious groundwater resources of this region. We have confidence that the TCEQ will do an excellent job in ensuring that Vulcan meets and even exceeds the regulations and guidelines for protection of surface waters and the Edwards Aquifer.

If you would like to discuss these comments or have any questions, feel free to call me at 210-317-7267.

Very truly yours,

Lynn Kitchen

Lynn M. Kitchen, Ph.D.
Principal Scientist

EXHIBIT NO. 5

Recharge and Transition Zone
Exception Request Form
30 TAC §213.9 Effective June 1, 1999

Regulated Entity Name: Vulcan Material Medina Quarry

1. __X__ **ATTACHMENT A – Nature of Exception.** A narrative description of the nature of each exception requested is provided as ATTACHMENT A at the end of this form. All provision of 30 TAC §213 Subchapter A for which an exception is being requested have been identified in the description.

2. __X__ **ATTACHMENT B – Documentation of Equivalent Water Quality Protection.** Documentation demonstrating equivalent water quality protection for the Edwards Aquifer is provided as **ATTACHMENT B** at the end of this form

ADMINSTRATIVE INFORMATION

3 __X__ One (1) original and three (3) copies of the completed application has been submitted to the appropriate regional office of the TCEQ

4. __X__ The applicant understands that no exception will be granted for a prohibited activity in Chapter 213.

5. __X__ The applicant understands that prior approval under this section must be obtained from the executive director for the exception to be authorized

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **RECHARGE AND TRANSITION ZONE EXCEPTION REQUEST FORM** application is hereby submitted for TCEQ review and executive director approval. The request was prepared by·

Environmental Services Manager, Southwest Division for Vulcan Construction Materials, L.P ,
Aleisha Knochenhauer
Print Name of Customer/Title

Signature of Customer Date 6/28/06

M \ProjecM \Project Files\055700\Interim Review TCEQ Questions - ONE DOCUMENT\Recharge and Transition Zone Exception Request Exhibit 38 doct

Last printed 6/28/2006 9:33 A.M

VULCAN MATERIALS MEDINA QUARRY

Attachment A – Nature of Exception

Vulcan Materials Medina Quarry hereby request an exception, in accordance with 30 TAC 213.9, to the requirement to implement permanent best management practices (BMP's) at the quarry pit at the conclusion of construction at the subject site. This requirement is set forth generally in 30 TAC 213 5 and more specifically n 30 TAC 213 5(b)(4)(D)(ii) which states in subsection (I) *"BMP's and measures must be implemented to control the discharge of pollution from regulated activities after the completion of construction"*

This exception from permanent BMP's, if granted, will be recorded in the county deed records, with a notice that if land use changes, the exemption for the whole site as described in the property boundaries required by §213.4(g) of this title, may no longer apply and the property owner must notify the appropriate regional office of these changes.

This exemption is requested because the normal procedure for sizing permanent BMP's (i.e 80% removal of TSS from impervious cover areas before they discharge from the site) is not applicable to the floor of the quarry pits. This is because they have no impervious cover and no surface water can surface discharge from said pits.

VULCAN MATERIALS MEDINA QUARRY

Attachment B – Documentation of Equivalent Water Quality Protection

Equivalent water quality protection for the Edwards Aquifer will be provided at the proposed quarry site as demonstrated by the following.

1 Protection of the aquifer with regard to infiltration in the pit floors will be ensured because the quarry operator will report any sensitive features discovered during mining.

If such sensitive features are encountered, they will be protected, rated and dealt with as described in the Temporary Stormwater Section, Attachment D, herein. This method of protection is essentially the same as that used in all construction on the recharge zone

2. Stormwater does not surface discharge from the quarry pit. Hence, equivalent water quality protection is provided for the surface waters discharging onto the Edwards Aquifer.

3 TCEQ regulations 30 TAC 213 5(b)(4)(D)(ii)(III)states: *"Where a site is used for low density single-family residential development and has 20% or less impervious cover, other permanent BMP's are not required. "* Since the TCEQ regards this as equivalent protection of the aquifer, the quarry pits with no impervious cover and no surface water runoff are actually better than a residential subdivision with less than 20% impervious cover.

TCEQ – 0602

TEMPORARY STORM WATER SECTION

Attachment D - "Temporary Best Management Practices"

TCEQ-0602
Temp. Best
Mgmt. Practices

VULCAN MATERIALS MEDINA QUARRY

TCEQ-0602

ATTACHMENT D
"Temporary Best Management Practices"

PLANT AREA

DURING PLANT CONSTRUCTION, WATER QUALITY WILL BE CONTROLLED THROUGH:

- ***CONSTRUCTION EXITS***
- ***SILT FENCING AND ROCK BERMS***
- ***CONCRETE TRUCK WASH PIT***
- ***SPILL CLEAN UP***

BEFORE ANY WORK BEGINS ON-SITE, CONTRACTOR WILL CONSTRUCT ALL ON-SITE AND OFF-SITE TEMPORARY STORM WATER POLLUTION CONTROLS AS SHOWN IN TCEQ-0600, CONSTRUCTION PLANS, SHEETS 3 AND 4. THE SEQUENCE FOR PLACEMENT OF THESE CONTROLS ARE AS FOLLOWS:

1. ***ERECTION OF SILT FENCES TO PREVENT CONTAMINATION OF FLOWS OFF-SITE;***

2. ***INSTALLATION OF ROCK BERMS DOWN GRADIENT OF ANY CHANNELS AND STREAMS CONSTRUCTED TO PREVENT POLLUTION OF SURFACE WATER FLOWS LEAVING THE SITE;***

3. ***CONSTRUCTION OF CONSTRUCTION ENTRANCE/EXIT TO KEEP ON-SITE SEDIMENTATION FROM LEAVING THE SITE; AND***

4. ***ERECTION OF CONSTRUCTION EQUIPMENT AND MATERIAL STORAGE AREA. CONSTRUCTION EQUIPMENT WILL BE STORED SOUTH OF THE RECHARGE ZONE WHEN NOT IN USE, AND MATERIALS SUCH AS PAINT, ETC., WILL BE STORED INDOORS.***

OTHER TBMP'S TO BE FOLLOWED INCLUDE:

1. ***HAUL ROADS TO BE DAMPENED FOR DUST CONTROL;***

2. ***ANY EXCESS DIRT TRACKED OFF-SITE SHALL BE REMOVED DAILY;***

3. ***EXCAVATION MATERIAL SHALL BE PLACED ON THE UPHILL SIDE OF THE TRENCH WHENEVER POSSIBLE.***

POLLUTION WILL BE PREVENTED FROM LEAVING THE SITE BY TEMPORARY EROSION CONTROL FENCES (SHOWN IN TCEQ-0600, CONSTRUCTION PLANS, SHEET 3). APPROPRIATE CONSTRUCION ENTRANCE/EXIT AND CONCRETE WASHOUT PITS WITH SILT FENCE DOWNGRADIENT OF SITE WILL ALSO BE CONSTRUCTED TO PREVENT OFF-SITE POLLUTION. THESE MEASURES ARE TO BE PROVIDED BEFORE CONSTRUCTION HAS BEGUN.

ALL CONTROL MEASURES INCLUDING SILT FENCE, CONSTRUCTION ENTRANCE/EXIT, CONCRETE WASHOUT PIT, AND CONSTRUCTION AND MATERIAL STORAGE WILL BE IN PLACE BEFORE CONSTRUCTION BEGINS IN ORDER TO MAINTAIN FLOW WITHOUT SEDIMENT, KEEPING SENSITIVE FEATURES AS NATURALLY OCCURRING AS POSSIBLE. CONTRACTORS ARE TO MAINTAIN THESE MEASURES TO KEEP THE MAXIMUM SEDIMENT CONTROL.

TCEQ-0602
Temp. Storm
Water Section

TCEQ – 0602

TEMPORARY STORM WATER SECTION

For Regulated Activities on the
Edwards Aquifer Recharge Zone

VULCAN MATERIALS MEDINA QUARRY

Temporary Storm Water Section
for Regulated Activities
on the Edwards Aquifer Recharge Zone
and Relating to 30 TAC §213 5(b)(4)(A), (B), (D)(i) and (G); Effective June 1, 1999

REGULATED ENTITY NAME: ***VULCAN MATERIALS MEDINA QUARRY***

POTENTIAL SOURCES OF CONTAMINATION
Examples: Fuel storage and use, chemical storage and use, use of asphaltic products, construction vehicles tracking onto public roads, and existing solid waste.

1. Fuels for construction equipment and hazardous substances which will be used during construction:

   N/A Aboveground storage tanks with a cumulative storage capacity of less than 250 gallons will be stored on the site for less than one (1) year

   N/A Aboveground storage tanks with a cumulative storage capacity between 250 gallons and 499 gallons will be stored on the site for less than one (1) year.

   N/A Aboveground storage tanks with a cumulative storage capacity of 500 gallons or more will be stored on the site. An **Aboveground Storage Tank Facility Plan** application must be submitted to the appropriate regional office of the TCEQ prior to moving the tanks onto the project.

   X Fuels and hazardous substances will not be stored on-site.

2. X **ATTACHMENT A - Spill Response Actions.** A description of the measures to be taken to contain any spill of hydrocarbons or hazardous substances is provided at the end of this form.

3. N/A Temporary aboveground storage tank systems of 250 gallons or more cumulative storage capacity must be located a minimum horizontal distance of 150 feet from any domestic, industrial, irrigation, or public water supply well, or other sensitive feature

4. X **ATTACHMENT B - Potential Sources of Contamination.** Describe in an attachment at the end of this form any other activities or processes which may be a potential source of contamination.

   X There are no other potential sources of contamination.

SEQUENCE OF CONSTRUCTION

5. X **ATTACHMENT C - Sequence of Major Activities.** A description of the sequence of major activities which will disturb soils for major portions of the site (grubbing, excavation, grading, utilities, and infrastructure installation) is provided at the end of this form. For each activity described, an estimate of the total area of the site to be disturbed by each activity is given.

6. X Name the receiving water(s) at or near the site which will be disturbed or which will receive discharges from disturbed areas of the project. **POLECAT CREEK / ELM CREEK**

TEMPORARY BEST MANAGEMENT PRACTICES (TBMPs)
Erosion control examples. tree protection, interceptor swales, level spreaders, outlet stabilization, blankets or matting, mulch, and sod. Sediment control examples· stabilized construction exit, silt fence, filter dikes, rock berms, buffer strips, sediment traps, and sediment basins Please refer to the Technical Guidance Manual for guidelines and specifications. **All structural BMPs must be shown on the site plan.**

7 X **ATTACHMENT D - Temporary Best Management Practices and Measures.** A description of the TBMPs and measures that will be used during and after construction are provided at the end of this form For each activity listed in the sequence of construction, include appropriate control measures and the general timing (or sequence) during the construction process that the measures will be implemented

X TBMPs and measures will prevent pollution of surface water, groundwater, and stormwater The construction-phase BMPs for erosion and sediment controls have been designed to retain sediment on site to the extent practicable. The following information has been provided in the attachment at the end of this form

a. A description of how BMPs and measures will prevent pollution of surface water, groundwater or stormwater that originates upgradient from the site and flows across the site. ***The plant site does not have any stormwater that originates from offsite. It is upgradient of all adjacent property. For quarry pit areas, see TCEQ-0600, Attachment B, 'Upgradient Drainage'.***

b A description of how BMPs and measures will prevent pollution of surface water or groundwater that originates on-site or flows off site, including pollution caused by contaminated stormwater runoff from the site.

c A description of how BMPs and measures will prevent pollutants from entering surface streams, sensitive features, or the aquifer.

d A description of how, to the maximum extent practicable, BMPs and measures will maintain flow to naturally-occurring sensitive features identified in either the geologic assessment, TCEQ inspections, or during excavation, blasting, or construction.

8. The temporary sealing of a naturally-occurring sensitive feature which accepts recharge to the Edwards Aquifer as a temporary pollution abatement measure during active construction should be avoided.

N/A **ATTACHMENT E - Request to Temporarily Seal a Feature.** A request to temporarily seal a feature is provided at the end of this form. The request includes justification as to why no reasonable and practicable alternative exists for each feature

X There will be no temporary sealing of naturally-occurring sensitive features on the site

9. X **ATTACHMENT F - Structural Practices.** Describe the structural practices that will be used to divert flows away from exposed soils, to store flows, or to otherwise limit runoff discharge of pollutants from exposed areas of the site Placement of structural practices in floodplains has been avoided.

10 **X** **ATTACHMENT G - Drainage Area Map.** A drainage area map is provided at the end of this form to support the following requirements.

N/A For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin will be provided

N/A For areas that will have more than 10 acres within a common drainage area disturbed at one time, a smaller sediment basin and/or sediment trap(s) will be used.

X For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin or other equivalent controls are not attainable, but other TBMPs and measures will be used in combination to protect down slope and side slope boundaries of the construction area.

what kind of BMPs will be used

N/A There are no areas greater than 10 acres within a common drainage area that will be disturbed at one time. A smaller sediment basin and/or sediment trap(s) will be used in combination with other erosion and sediment controls within each disturbed drainage area.

11 **N/A** **ATTACHMENT H - Temporary Sediment Pond(s) Plans and Calculations.** Temporary sediment pond or basin construction plans and design calculations for a proposed temporary BMP or measure has been prepared by or under the direct supervision of a Texas Licensed Professional Engineer. All construction plans and design information must be signed, sealed, and dated by the Texas Licensed Professional Engineer. Construction plans for the proposed temporary BMPs and measures are provided as at the end of this form.

12. **X** **ATTACHMENT I - Inspection and Maintenance for BMPs.** A plan for the inspection of temporary BMPs and measures and for their timely maintenance, repair, and, if necessary, retrofit is provided at the end of this form. A description of documentation procedures and recordkeeping practices is included in the plan.

13. **X** All control measures must be properly selected, installed, and maintained in accordance with the manufacturers specifications and good engineering practices If periodic inspections by the applicant or the executive director, or other information indicates a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations.

14 **X** If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e g , fugitive sediment in street being washed into surface streams or sensitive features by the next rain).

15. **N/A** Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50%. A permanent stake will be provided that can indicate when the sediment occupies 50% of the basin volume ***See Line Item 11 above.***

16. X Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges (e.g., screening outfalls, picked up daily).

SOIL STABILIZATION PRACTICES

Examples: establishment of temporary vegetation, establishment of permanent vegetation, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, or preservation of mature vegetation

17. X **ATTACHMENT J - Schedule of Interim and Permanent Soil Stabilization Practices.** A schedule of the interim and permanent soil stabilization practices for the site is attached at the end of this form.

18. X Records must be kept at the site of the dates when major grading activities occur, the dates when construction activities temporarily or permanently cease on a portion of the site, and the dates when stabilization measures are initiated

19. X Stabilization practices must be initiated as soon as practicable where construction activities have temporarily or permanently ceased.

ADMINISTRATIVE INFORMATION

20. X All structural controls will be inspected and maintained according to the submitted and approved operation and maintenance plan for the project.

21. X If any geologic or manmade features, such as caves, faults, sinkholes, etc , are discovered, all regulated activities near the feature will be immediately suspended The appropriate TCEQ Regional Office shall be immediately notified Regulated activities must cease and not continue until the TCEQ has reviewed and approved the methods proposed to protect the aquifer from any adverse impacts.

It is the intent of Vulcan to mine through such features, as stated elsewhere in this Water Pollution Abatement Plan.

22. X Silt fences, diversion berms, and other temporary erosion and sediment controls will be constructed and maintained as appropriate to prevent pollutants from entering sensitive features discovered during construction.

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **TEMPORARY STORMWATER SECTION** is hereby submitted for TCEQ review and executive director approval. The application was prepared by:

Aleisha Knochenhauer, Environmental Services Manager
Print Name of Customer/Agent

Signature of Customer/Agent

Date 3/9/06

8675 005
Admin Record

Vulcan WPAP 15 pages

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

August 24, 2006

Ms. Alesha Knochenhauer
Vulcan Construction Materials, LP
800 Isom Road, Suite 300
San Antonio, Texas 78216

Re: Edwards Aquifer, Medina County
NAME OF PROJECT: Vulcan Materials Medina Quarry; Located north of County Road 353 and east of County Road 351, Medina County, Texas
TYPE OF PLAN: Request for Approval of a Water Pollution Abatement Plan (WPAP); 30 Texas Administrative Code (TAC) Chapter 213 Edwards Aquifer; Edwards Aquifer Protection Program ID No. 2502.00, Investigation No. 462519, Regulated Entity No. RN104921630

Dear Ms. Knochenhauer:

The Texas Commission on Environmental Quality (TCEQ) has completed its review of the WPAP application for the referenced project submitted to the San Antonio Regional Office by Overoy Descamps Engineers, Inc. on behalf of Vulcan Construction Materials, LP on March 22, 2006. Final review of the WPAP submittal was completed after additional material was received on June 28, 2006, July 11, 2006, and July 18, 2006. As presented to the TCEQ, the Temporary and Permanent Best Management Practices (BMPs) and construction plans were prepared by a Texas Licensed Professional Engineer to be in general compliance with the requirements of 30 TAC Chapter 213. These planning materials were sealed, signed, and dated by a Texas Licensed Professional Engineer. Therefore, based on the engineer's concurrence of compliance, the planning materials for construction of the proposed project and pollution abatement measures are hereby approved subject to applicable state rules and the conditions in this letter. The applicant or a person affected may file with the chief clerk a motion for reconsideration of the executive director's final action on this Edwards Aquifer protection plan. A motion for reconsideration must be filed no later than 23 days after the date of this approval letter. *This approval expires two (2) years from the date of this letter unless, prior to the expiration date, more than 10 percent of the construction has commenced on the project or an extension of time has been requested.*

COMMENTS

Comments regarding the proposed quarry were provided, on April 24, 2006, August 3, 2006 and August 23, 2006, by the Medina County Environmental Action Association (MCEAA), The Gardner Law Firm, and Mr. Joseph F. Maszak. The MCEAA provided a petition with 104 signatures of persons in opposition to the quarry. These comments were considered in the application review and the major concerns were discussed in the associated investigation report (CCEDS #462519). On July 12, 2006, The Gardner Law Firm requested 30 additional days to respond to Vulcan Materials' response to the TCEQ's request for information. On August 3, 2006, additional comments were received from The Gardner Law Firm that included a table entitled, "MCEAA Party of Contested Case Hearing Signature List". This table included 77 signatures of members of MCEAA, their addresses, proximity of their property to the proposed quarry site, current medical conditions, and current land use of their property.

As the request of the TCEQ, comments supporting the subject quarry and/or related railroad were provided by Vulcan Materials from the Hondo ISD, City of Hondo, Medina County Historical Society, 26 individual letters, and a petition with 215 signatures. These comments were also considered in the application review.

PROJECT DESCRIPTION

The proposed commercial project is a limestone quarry that will have an area of approximately 1,776 acres on three tracts of land. As presented, approximately 1,070 acres will be quarried in four pits. The pits will be excavated and separated by existing ephemeral stream channels. As presented, the ephemeral stream channels will only be quarried with prior approval from all appropriate jurisdictional agencies. A plant site of 171 acres will include equipment for crushing, processing, washing, water recycling, settling ponds, stockpiling and distribution operations, including electric crushers, screens, material conveyors, scrubbers (wet and dry), screeners (wet and dry), load-out hoppers, a rail line, an access road, and haul roads. The impervious cover for the 1,776 acre site will be 39.27 acres (2.21 percent). No on-site sewage facility is proposed at this time. Project wastewater (domestic) will be collected in portable toilets and disposed of two times per week by a TCEQ registered waste disposal service. Blasting agents will be used in the mining process. The mining will proceed through the Edwards Limestone no deeper than 25 feet above the potentiometric surface of the Edwards Aquifer.

During the estimated 40 year life of the quarry, the first three phases of operation listed below may occur sequentially and/or simultaneously:

1. Site preparation,
2. Excavation and processing,
3. Pit closure, and
4. Site closure/reclamation.

POLLUTION ABATEMENT MEASURES

The Permanent Stormwater Section of the application states, "For water quality load calculations, the plan areas do not fall into the obvious categories of paved and grassed areas. The only true impervious cover on site is the paved entrance road (in area 2) which discharges off of the recharge zone. However, it is recognized that other areas will be packed down, thereby creating a runoff condition which is somewhere between pervious and impervious."

However, stormwater treatment was provided for impervious cover, which includes but is not limited to, "pavement including streets, driveways, parking lots, etc. . . . compacted road base, such as that used for parking areas. other surfaces that prevent the infiltration of water into the soil." (RG-348, Section 3.3.2)

The total suspended solids (TSS) generated by the increase in impervious cover is 37,385 pounds/year. The required load to be treated is 80% of the total, or 29,908 pounds per year. To prevent pollution of stormwater runoff originating on-site or up-gradient of the site and potentially flowing across and off the site after construction, the measures listed below will be provided to treat 32,591 pounds per year from

the on-site impervious cover outside of the quarry pits. No impervious cover in the quarry pits is proposed.

The retention basins are designed in accordance with the 2005 edition of the TCEQ's "Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices." The basins will incorporate sedimentation as described below. In lieu of irrigation of vegetation, the captured water will be pumped to the plant area and water treatment plant to be used in processing.

The full sedimentation/filtration basins are designed in accordance with the 2005 edition of the TCEQ's "Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices." The basins will incorporate sedimentation and filtration as described below.

1) During Site Preparation:

   A) Prior to creating pits by excavation, stormwater runoff from the plant site and quarried areas will be controlled by silt fences and rock berms as shown on the plan sheet in the application entitled, "Overall Site Plan of Entire Quarry" (Exhibit 2.1) signed by the project engineer on 6/28/06, hereafter referred to as Exhibit 2.1.

2) During Excavation and Processing:

   A) Two retention basins and eight sand filter basins will be constructed, operated and maintained to insure that 80% of the incremental increase in the annual mass loading of Total Suspended Solids from the site caused by the long-term regulated activity is removed. These quantities are calculated in accordance with technical guidance prepared or accepted by the executive director. For the two retention basins, in lieu of irrigation of vegetation, the captured water will be pumped to the plant area and water treatment plant to be used in processing

   B) Plant Site:

      i) Area A (Processing/shipping area): To prevent pollution of stormwater runoff originating on-site or up-gradient of Area A and potentially flowing across and off the site after construction, three water quality basins (two retention basins and one sand filter basin) will be constructed.

         (1) Basins A1 and A3 are retention basins designed in accordance with the 2005 edition of the TCEQ's "Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices," and are summarized in Tables IA and IB below.

Table IA

Summary of Water Quality Treatment Provided by Two Retention Basins

Watershed Area/Basin	Drainage Area (acres)	Imperv. Cover (acres)	Required Capture Volume (ft^3)	Design Capture Volume (ft^3)	Minimum Target TSS Removal (lbs/yr)	Design TSS Removal (lbs/yr)

A1	39.94	8.61	-27,094	32,513	6,557	8,196
A3	30.78	12.09	35,534	39,908	9,208	11,510
Total	70.30	20.70	---	---	15,765	19,706

Table IB		
Basin	Runoff Depth	Impervious Liner
A1	0.89"	Concrete
A3	0.97"	Concrete

(2) Basins A4 and B are full sand filter basins designed in accordance with the 2005 edition of the TCEQ's "Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices," and are summarized in Tables IIA and IIB below.

Table IIA Summary of Water Quality Treatment Provided by Two Full Sedimentation/Filtration Basins								
Watershed Area/Basin	Drainage Area (acres)	Imperv. Cover (acres)	Required Capture Volume (ft^3)	Design Capture Volume (ft^3)	Required Sand Filter Surface Area (ft^2)	Design Sand Filter Surface Area (ft^2)	Minimum Target TSS Removal (lbs/yr)	Design TSS Removal (lbs/yr)
A4	6.45	2.99	13,683	14,374	760	788	2,277	2,625
B	6.30	2.46	11,435	11,537	635	643	1,874	2,172
Total	12.75	5.45	---	---	---	---	4,151	4,797

Table IIB					
Basin	Runoff Depth	Surface Area of Sand Filter	Sand Thickness	Underdrain Piping	Impervious Liner
A4	1.44"	788	18"	Yes	Concrete
B	1.38"	643	18"	Yes	Concrete

11) Area B (Draining to Basin B): To prevent pollution of stormwater runoff originating on-site or up-gradient of Stockpile B and potentially flowing across and off the site after construction, a full sedimentation/filtration basin will be constructed. It is designed in accordance with the 2005 edition of the TCEQ's "Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices," and is summarized in Tables IIA and IIB above.

iii) Stockpile Areas: Per the note on the plan sheet entitled "Temporary Storm Water Controls and Long Term Temporary Best Management Practices" (Sheet 3 of 3), "stockpile areas outside of the railroad loop will be cleared only as product is available. Not more than 10 acres will be cleared at a time. A long term [temporary] rock berm with silt fence will be placed down gradient of the disturbed area. Once stockpile material is placed over the cleared area it will be considered as reestablished and a new area of not more than 10 acres may be cleared. A long term temporary rock berm with silt fence will be placed down gradient of the stockpile. Long term BMPs must be in place before any stockpiling can begin."

C) Quarry Pits:

i) The quarry pits will have a 200' wide vegetated buffer adjacent to the site perimeter, as shown on the plan sheet in the application entitled, "Overall Site Plan of Entire Quarry" (Exhibit 2.1).

ii) Until each quarry pit area is mined below its lowest surface elevation, a temporary earthen berm will be constructed to prevent stormwater runoff from leaving the disturbed area. When the final limit of the quarry is reached, the temporary berm will then become a permanent berm.

iii) Lift Stabilization: Quarry stabilization is defined in the application as "when all loose rock material has been compacted or removed to solid rock."

iv) Surface Stream Crossings: Until each quarry pit area is mined below its lowest surface elevation, a temporary earthen berm, or rock berm with silt fence, will be constructed to prevent stormwater runoff from entering the stream channels. When the quarry pit is excavated below the stream channel, the berms will no longer be necessary. A detail is shown on the plan sheet in the application entitled, "Overall Site Plan of Entire Quarry" (Exhibit 2.1). Stream channel crossings for vehicles are addressed below.

v) Six full sand filter basins (summarized in the Table IIAs and IIB below) will be constructed, operated and maintained to insure that 80% of the incremental increase in the annual mass loading of Total Suspended Solids from six assembly/staging areas for staff and vehicles is removed. Their locations are shown on Exhibit 2.1.

Table IIA

Summary of Water Quality Treatment Provided by Six Full Sedimentation / Filtration Basins

For Quarry Pits

Watershed Area/Basin	Drainage Area (acres)	Impervious Cover (acres)	Required Capture Volume (ft^3)	Design Capture Volume (ft^3)	Required Sand Filter Surface Area (ft^2)	Design Sand Filter Surface Area (ft^2)	Minimum Target TSS Removal (lbs/yr)	Design TSS Removal (lbs/yr)
Pit 1 to Pit 2	2.67	2.67	17,446	17,990	969	1,003	2,033	2,302

Pit 2 to Pit 1	2.67	2.67	17,446	17,990	969	1,003	2,033	2,302
Pit 2 to Pit 3	0.67	0.67	4,378	9,007	243	506	510	538
Pit 3 to Pit 2	0.67	0.67	4,378	9,007	243	506	510	538
Pit 1 to Pit 4	1.35	1.35	8,821	9,007	490	506	1,028	1,164
Pit 4 to Pit 1	1.35	1.35	8,821	9,007	490	506	1,028	1,164
Total	9.38	9.38	--	--	--	--	7,142	8,088

Table IIIB

Basin	Runoff Depth	Surface Area of Sand Filter	Sand Thickness	Underdrain Piping	Impervious Liner
Pit 1 to Pit 2	1.5"	969	18"	Yes	Concrete
Pit 2 to Pit 1	1.5"	969	18"	Yes	Concrete
Pit 2 to Pit 3	1.5"	243	18"	Yes	Concrete
Pit 3 to Pit 2	1.5"	243	18"	Yes	Concrete
Pit 1 to Pit 4	1.5"	490	18"	Yes	Concrete
Pit 4 to Pit 1	1.5"	490	18"	Yes	Concrete

In lieu of capturing and treating stormwater runoff from the four haul roads crossing streams, the 2,850 pounds of TSS generated will be compensated for by the overtreatment provided in other on-site water quality structures. Treatment of the TSS is accounted for in Tables IV and V below.

Table IV

Summary of TSS Load from Haul Road Stream Crossings & Plant Area

Watershed Area/Basin		Drainage Area (acres)	Imperv. Cover (acres)	Required Capture Volume (ft^3)	Design Capture Volume (ft^3)	Required Sand Filter Surface Area (ft^2)	Design Sand Filter Surface Area (ft^2)	Minimum Target TSS Removal (lbs/yr)	Design TSS Removal (lbs/yr)
Haul Road	Pit 1 to Pit 2	0.65	0.65	--	--	--	--	495	0
	Pit 2 to Pit 3	0.16	0.16	--	--	--	--	122	0

	Pit 1 to Pit 4	0.31	0.31	---	---	---	---	236	0
	A4	0.43	0.43	---	---	---	---	328	0
	B	0.39	0.39	---	---	---	---	298	0
Plant Area	A1	0.37	0.37	---	---	---	---	282	0
	A3	1.43	1.43	---	---	---	---	1089	0
Total		3.74	3.74	---	---	---	---	2,850	0

Table V

Summary of TSS Load

(Pounds/year)

Watershed Area/Basin	Impervious Cover (Acres)	Minimum Target TSS Removal (lbs/yr)	Design TSS Removal (lbs/yr)
Table IA	20.70	15,765	19,706
Table IIA	5.45	4,151	4,797
Table IIIA	9.38	7,142	8,088
Table IV	3.74	2,850	0
Total	39.27	29,908†	32,591‡

† - Target removal = 29,908#. As shown in Table IV, seven haul road stream crossings will not be treated directly, but by compensation in other basins as presented in Tables IA, IIA, IIIA, and summarized in Table V

‡- Design removal exceeds target removal by 2,683 pounds/year (32,591 – 29,908 = 2,683).

vi) *Disposal of Sediment from Water Quality Basins:* Sediment is to be collected and tested for TPH (TX-1005) and BTEX (8021 or 8260). Per Vulcan Materials' letter dated July 19, 2006, "Analytical results will be compared to published action levels defined by TCEQ pursuant to applicable Texas Risk Reduction Program (TRRP) rules (30 TAC 350). Action levels will be utilized as a basis for comparison to evaluate potential hydrocarbon impacts to sediments. By definition, actions levels are constituent-specific and correspond to maximum concentrations that can remain in affected environmental media within a residential land use setting. On the basis of analytical testing data, sediment will be properly classified and subject to the following procedures.

"Sediments that do not exhibit measurable concentrations of hydrocarbon contaminants or are at concentrations below TCEQ action levels will not be subject to further special handling procedures and will be used onsite as part of the earthen perimeter berm."

"Sediments that exhibit hydrocarbon concentrations in excess of TCEQ action levels will be staged and subject to onsite treatment in order to reduce hydrocarbon concentrations to acceptable levels prior to use."

"As part of the treatment process, sediments will be evenly distributed within the containment area to facilitate the rapid volatilization and natural attenuation of residual hydrocarbons constituents. If necessary, the treatment process may be enhanced by the periodic addition of hydrocarbon degrading microorganisms. Hydrocarbon concentrations will be monitored throughout the treatment process by periodic sampling and analysis. Once a determination is made that residual hydrocarbon concentrations are below TCEQ action levels, sediments will be used onsite as part of the earthen perimeter berm."

A detail of the encapsulated sediment is shown on the plan sheet in the application entitled, "Overall Site Plan of Entire Quarry" (Exhibit 2.1).

D) Hydrocarbons and Hazardous All regulated quantities of hydrocarbons and hazardous substances will be stored on a separate site to the south of and off the Recharge Zone

E) Scheduled vehicle maintenance will be conducted on a separate site to the south of and off the Recharge Zone.

F) Minor maintenance such as repair or replacement of tires, wheels, faulty bed sensors on haul equipment, broken windshields, communication equipment, broken hoses and belts, welding of equipment or parts, etc. may be conducted on-site. All other vehicle maintenance will be conducted on a separate site to the south of and off the Recharge Zone

G) Wastewater: Project wastewater (domestic) will be and disposed of twice per week a TCEQ registered waste disposal service

H) Sensitive Features. All geologic features are proposed to be mined out. Protective measure to be provided for the features during plant operation and/or excavation are listed below

i) Plant Site Area A: The Wurzbach well (WZ-S45) will be converted to a piezometer (an instrument used to measure the change of pressure of a material subject to hydrostatic pressure).

ii) Plant Site Area B: No sensitive features are present in Plant Site Area B.

iii) Quarry Pits. As pits are mined out, a positive slope will be maintained away from all sensitive features to prevent flows from entering them. A detail drawing is shown on the plan sheet in the application entitled, "Overall Site Plan of Entire Quarry" (Exhibit 2.1)

iv) Wells in Quarry Areas: The two other wells (Schweers well & Boehme/Belzen well) will be properly plugged when and if mining progresses to within 100 feet of them

I) Vegetated Buffer: A 200 foot wide buffer will be provided around the property boundaries, as shown on the plan sheet in the application entitled, "Overall Site Plan of Entire Quarry" (Exhibit 2.1). For the internal ephemeral streams, a 200 foot buffer, as measured from the center line of the stream, will be provided, as shown on the plan sheet in the application entitled, "Overall Site Plan of Entire Quarry" (Exhibit 2.1).

J) Vertical Separation Between Quarry Floor & Potentiometric Surface:

A vertical separation distance of 25 feet above the water table has been approved by the TCEQ at the Deep Creek Quarry (Medina County) and the Adkins Ranch Quarry (Williamson County), however, the applicant has committed to mine no deeper than 25 above the potentiometric surface.

The on-site wells will be used to measure the water elevation. If the wells cannot be entered, they will be properly plugged and replaced with piezometers.

K) Quarry Pit Stabilization: The application states that conventional stabilization practices are not practical in a quarry. When mining lifts are excavated, and at the completion of the excavation for each pit, stabilization will be defined as, "when all loose rock material has been compacted or removed to solid rock."

3) Pit Closure:
An exception was requested to the requirement to provide permanent best management practices (BMPs) for the quarry pits after completion of quarrying. The justification offered for granting the exception was that there will be no increase in impervious cover and there will be no runoff from the site. Equivalent protection will be provided by the quarry pits because it will retain 100% of the sediment loading without discharging to surface water.

4) Site Closure/Reclamation.
The quarry pits will be addressed as described in 3) above. The plant area will be dismantled and removed from the site.

The proposed measures described above are presented to meet the required 80 percent removal of the increased load in total suspended solids (TSS) caused by the project.

A request was made for an exception to the requirement of permanent BMPs for this project after pit closure and/or site closure/reclamation. The justification provided was that "the normal procedure for sizing permanent BMPs (i.e. 80% removal of TSS from impervious cover areas before they discharge from the site) is not applicable to the floor of the quarry pits. This is because they have no impervious cover and no surface water discharge from said pits." Equivalent water quality protection is presented to be provided because, 1) the quarry operator will report any sensitive features discovered during mining, 2) stormwater does not surface discharge from the quarry pit, and 3) since the TCEQ regards this (single family residential subdivisions with 20% or less impervious cover) as equivalent protection of the aquifer, the quarry pits with no impervious cover and no surface water runoff are actually better than a residential subdivision with less that 20% impervious cover."

The excavation and processing phase, where the long-term temporary BMPs described above will be provided, is analogous to a retail, office or residential project where permanent BMPs are required after completion of construction. The site closure/reclamation phase of a quarry is not analogous to "completion of construction" for non-quarry types of commercial development.

Point 1 of the equivalent water quality protection presented above [the quarry operator will report any sensitive features discovered during mining] is irrelevant at the stage of pit closure or quarry closure/reclamation because all mining will have been completed.

Point 2 of the equivalent water quality protection presented above [stormwater does not surface discharge from the quarry pit] is irrelevant. The TCEQ agrees that stormwater will not leave the quarry pits, however, the quarry floor will become the surface, albeit disturbed, of the Edwards Aquifer Recharge Zone

Point 3 of equivalent water quality protection presented above [since the TCEQ regards this (single family residential subdivisions with 20% or less impervious cover) as equivalent protection of the aquifer, the quarry pits with no impervious cover and no surface water runoff are actually better than a residential subdivision with less that 20% impervious cover.] is an invalid comparison. The stabilization of a residential subdivision with vegetation is not the same as quarry stabilization ("when all loose rock material has been compacted or removed to solid rock.").

GEOLOGY

According to the geologic assessment included with the application, the Georgetown Formation and the Devil's River Formation (upper and lower) are exposed at the 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). The San Antonio Regional Office conducted a site investigation on May 26, 2006. The plant area and areas to be quarried were observed. The site was mostly covered with thick vegetation (juniper, oak, brush, and grass) and was accessible by ranch roads and walking. The following features were observed - three on-site water wells (WZ-S45, SC-S7, B-S11), six faults (WZ-S71, WZ-S72, SC-S22, SC-S23, B-S30, B-S31), one sinkhole (SC-S2), three closed depressions (WZ-S8, WZ-S56, B-S5), five solution enhanced fractures (WZ-S68, SC-S15, SC-S16, B-S15, B-S17), two caves (SC-S14, B-S19), and one solution cavity (B-S20). The site is generally as described in the geologic assessment. The features will be mined out. Protective measures during plant operation or excavation that will be provided for the features are listed above in Paragraph F of the Pollution Abatement Measures Section.

SPECIAL CONDITIONS

Plant Operations & Quarrying:

I. The BMPs for the plant site and stockpile area shall be operational prior to any crushing, processing, washing, water recycling, stockpiling, etc.

II. The BMPs for the stream crossings shall be operational prior to site preparation, overburden removal, excavation, etc in each quarry pit

III Project wastewater (domestic) will be collected twice per week by a TCEQ registered waste

disposal service for appropriate disposal off of the site This approval does not authorize domestic wastewater disposal on the site

IV. Exhibit 2.1 shows a greywater disposal pipe at the cabin on the Beehme/Belzen property. All other on-site sewage facilities shall comply with the applicable requirements of 30 TAC 285. Within 90 days of the date of this letter, provide documentation from the Medina County Authorized Agent for OSSF that wastewater disposal at the site complies with the applicable requirements of 30 TAC 285.

V. The surface vegetation is to be disposed of by incineration. The ash shall be properly disposed of according to 30 TAC 330 or 30 TAC 335, as applicable.

VI. No part of the quarry floor shall be any closer than 25 feet above the potentiometric surface. Prior to September 1, 2007, and every five years thereafter, the potentiometric surface for the entire site shall be derived from three seasonal measurements, in each of the three on-site wells concurrently, and reported to the TCEQ as a potentiometric map for the site. The surface elevations and depths to water shall also be reported on the map for each well and each collection event. For uniformity, the collection times should be coordinated with regional data collection conducted by such agencies as the EAA, USGS, Medina County Underground Water Conservation District or other relevant agencies The quarry floor shall stay 25 feet above the highest elevation of the potentiometric surface.

VII. All sediment and or media removed from the retention basins and the full sedimentation/ filtration basins during maintenance activities shall be properly disposed of according to 30 TAC 350, as applicable. Treatment and disposal records shall be kept on site and available for review by Commission staff for the life of the project.

VIII. Perimeter berms shall be inspected and maintained annually, or more often if necessary, to ensure functionality. Maintenance records shall be kept on site and available for review by Commission staff for the life of the project.

IX. A 200 foot buffer, as measured from the centerline of the dry stream channels shall be provided. The dry stream channels shall not be quarried without a modification to this approved WPAP

X. The quarry will excavate along the stream channels that pass through the site, thus creating an aqueduct of the natural channels Authorization from the TCEQ's South Texas Watermaster may be required pursuant to Chapter 11.121 of the Texas Water Code to divert surface water from the streams to the quarry pits. This letter does not provide authorization for any requirements of the TCEQ's Watermaster Program for stream crossings for the haul roads and railroad.

XI. Based on the plan review, the nature of the regulated activity (site closure/reclamation), the BMPs provided during the excavation and processing phase, commission regulations, and consistency with previous quarry approvals pursuant to 30 TAC 213, and not the justifications provided, the TCEQ grants the exception requested for not providing BMPS after the plant site and quarrying operations have been completed.

XII. This approval does not authorize manufacturing of explosives on the site.

XIII Exhibit 2.1 shows car bodies, and existing structures to be demolished before quarrying. The car bodies and demolished structures shall be disposed of according to all applicable state and federal regulations

XIV. Perform quarterly geologic inspections of the site for sensitive features

XV Provide feature recognition training for plant and quarry operators.

XVI This project shall conform to all applicable local, state, and federal requirements.

Post Plant Operations & Post Quarrying:

XVII. At the conclusion of quarrying, and pursuant to 30 TAC 213.4(j)(2&3), the holder of any approved Edwards Aquifer protection plan must notify the appropriate regional office in writing and obtain approval from the executive director prior to initiating any change in the nature or character of the regulated activity from that which was originally approved or a change which would significantly impact the ability of the plan to prevent pollution of the Edwards Aquifer; and any development of land previously identified as undeveloped in the original water pollution abatement plan.

XVIII. The water quality basins shall remain operational as long as impervious cover remains on the site

XIX. Unless authorized by a modification to the WPAP, maintenance records shall be maintained for the impervious cover, retention basins, sedimentation/filtration basin, and plant area operations still present after site closure/reclamation.

STANDARD CONDITIONS

1. Pursuant to Chapter 7 Subchapter C of the Texas Water Code, any violations of the requirements in 30 TAC Chapter 213 may result in administrative penalties.

Prior to Commencement of Construction:

2 Within 60 days of receiving written approval of an Edwards Aquifer protection plan, the applicant must submit to the San Antonio Regional Office, proof of recordation of notice in the county deed records, with the volume and page number(s) of the county deed records of the county in which the property is located. A description of the property boundaries shall be included in the deed recordation in the county deed records. A suggested form (Deed Recordation Affidavit, TCEQ-0625) that you may use to deed record the approved WPAP is enclosed.

3 All contractors conducting regulated activities at the referenced project location shall be provided a copy of this notice of approval. At least one complete copy of the approved WPAP and this notice of approval shall be maintained at the project location until all regulated activities are completed.

4. Modification to the activities described in the referenced WPAP application following the date of approval may require the submittal of a plan to modify this approval, including the payment of appropriate fees and all information necessary for its review and approval prior to initiating construction of the modifications.

5 The applicant must provide written notification of intent to commence construction, replacement, or rehabilitation of the referenced project. Notification must be submitted to the San Antonio Regional Office no later than 48 hours prior to commencement of the regulated activity. Written notification must include the date on which the regulated activity will commence, the name of the approved plan and program ID number for the regulated activity, and the name of the prime contractor with the name and telephone number of the contact person. The executive director will use the notification to determine if the approved plan is eligible for an extension.

6. Temporary erosion and sedimentation (E&S) controls, i.e., silt fences, rock berms, stabilized construction entrances, or other controls described in the approved WPAP, must be installed prior to construction and maintained during construction. Temporary E&S controls may be removed when vegetation is established and the construction area is stabilized. If a water quality pond is proposed, it shall be used as a sedimentation basin during construction. The TCEQ may monitor stormwater discharges from the site to evaluate the adequacy of temporary E&S control measures. Additional controls may be necessary if excessive solids are being discharged from the site.

7 All borings with depths greater than or equal to 20 feet must be plugged with non-shrink grout from the bottom of the hole to within three (3) feet of the surface. The remainder of the hole must be backfilled with cuttings from the boring. All borings less than 20 feet must be backfilled with cuttings from the boring. All borings must be backfilled or plugged within four (4) days of completion of the drilling operation. Voids may be filled with gravel

During Construction:

8 During the course of regulated activities related to this project, the applicant or agent shall comply with all applicable provisions of 30 TAC Chapter 213, Edwards Aquifer. The applicant shall remain responsible for the provisions and conditions of this approval until such responsibility is legally transferred to another person or entity.

9. If any sensitive feature (caves, solution cavities, sink holes, etc.) is discovered during construction, all regulated activities near the feature must be suspended immediately. The applicant or his agent must immediately notify the Regional Office of the discovery of the feature. Regulated activities near the feature may not proceed until the executive director has reviewed and approved the methods proposed to protect the feature and the aquifer from potentially adverse impacts to water quality. The plan must be sealed, signed, and dated by a Texas Licensed Professional Engineer.

10 Three wells exist on the site. All water wells, including injection, dewatering, and monitoring wells must be in compliance with the requirements of the Texas Department of Licensing and Regulation under Title 16 TAC Chapter 76 (relating to Water Well Drillers and Pump Installers) and all other locally applicable rules, as appropriate

11 If sediment escapes the construction site, the sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain) Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50 percent Litter, construction debris, and construction chemicals shall be prevented from becoming stormwater discharge pollutants.

12. The following records shall be maintained and made available to the executive director upon request: the dates when major grading activities occur, the dates when construction activities temporarily or permanently cease on a portion of the site, and the dates when stabilization measures are initiated.

13. Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, and construction activities will not resume within 21 days. When the initiation of stabilization measures by the 14th day is precluded by weather conditions, stabilization measures shall be initiated as soon as practicable

<u>After Completion of Construction:</u>

14 A Texas Licensed Professional Engineer must certify in writing that the permanent BMPs o measures were constructed as designed. The certification letter must be submitted to the San Antonio Regional Office within 30 days of site completion.

15 The applicant shall be responsible for maintaining the permanent BMPs after construction until such time as the maintenance obligation is either assumed in writing by another entity having ownership or control of the property (such as without limitation, an owner's association, a new property owner or lessee, a district, or municipality) or the ownership of the property is transferred to the entity. The regulated entity shall then be responsible for maintenance until another entity assumes such obligations in writing or ownership is transferred. A copy of the transfer of responsibility must be filed with the executive director through the San Antonio Regional Office within 30 days of the transfer. A copy of the transfer form (TCEQ-10263) is enclosed.

16 Upon legal transfer of this property, the new owner(s) is required to comply with all terms of the approved Edwards Aquifer protection plan. If the new owner intends to commence any new regulated activity on the site, a new Edwards Aquifer protection plan that specifically addresses the new activity must be submitted to the executive director Approval of the plan for the new regulated activity by the executive director is required prior to commencement of the new regulated activity

17 An Edwards Aquifer protection plan approval or extension will expire and no extension will be granted if more than 50 percent of the total construction has not been completed within ten years from the initial approval of a plan. A new Edwards Aquifer protection plan must be submitted to the San Antonio Regional Office with the appropriate fees for review and approval by the executive director prior to commencing any additional regulated activities

18. At project locations where construction is initiated and abandoned, or not completed, the site shall be returned to a condition such that the aquifer is protected from potential contamination

If you have any questions or require additional information, please contact John Mauser of the Edwards Aquifer Protection Program of the San Antonio Regional Office at 210/403-4024.

Sincerely,

for Glenn Shankle
Executive Director
Texas Commission on Environmental Quality

/Enclosures

Enclosures: Deed Recordation Affidavit, TCEQ-0625
Change in Responsibility for Maintenance on Permanent BMPs, TCEQ-10263

cc: Mr. Dennis Hoyt, PE, Overby Descamps Engineers, Inc.
Mr. David Montgomery, Medina County
Mr. Robert J. Potts, Edwards Aquifer Authority
Ms. Luana Buckner, Medina County Underground Water Conservation District
Ms. Kathy Brown, TCEQ MC 173
TCEQ Central Records

PREPARED F OPERATION WITH THE TEXAS COMMISSION ON ENVIR NTAL QUALITY
The preparation of this report wa d through grants from the State of Texas through the Tex mission on Environmental Quality

SUB EDAQ/Medina/Vulcan Quarry - Quihl/3-22-06

VULCAN CONSTRUCTION MATERIALS LP
CN600355485

VULCAN MATERIALS MEDINA QUARRY
RN104921630

Investigation # 482519 **Incident #**

Investigator: JOHN MAUSER **Site Classification:** COMMERCIAL

Conducted: 03/22/2006 – 03/03/2006 **SIC Code:** 1422

Program(s): EDWARDS AQUIFER

Investigation Type : Site Assessment **Location :** NE OF COUNTY RD 353 AND COUNTY RD 351

Additional ID(s) : 13-06032201

Address: ; , **Activity Type :** REGION 13 - SAN ANTONIO
EAPPNGPR - EAPP Non-Grant Plan Review
EAPPSTEASM - EAPP Site Assessment

Principal(s) :

Role	Name
RESPONDENT	VULCAN CONSTRUCTION MATERIALS LP

Contact(s) :

Role	Title	Name	Phone	
Participated in Investigation		MR HUGO WURZBACH	Work	(830) 741-3529
Regulated Entity Contact		MR DENNIS HOYT	Fax	(210) 828-3599
			Work	(210) 828-3520
Participated in Investigation	ASSISTANT	MR JAMES TONNE JR	Work	(830) 426-4955
			Cell	(830) 426-1214
Participated in Investigation	ENVIRONMENTAL SPECIALIST	MR EDDIE SAUCEDO	Work	(210) 524-3543
Regulated Entity Mail Contact	ENVIRONMENTAL SERVICES MANAGER - SOUTHWEST DIVISION	MS ALEISHA KNOCHENHAUER	Work	(210) 524-3542
			Fax	(210) 524-3500
Participated in Investigation		MS ROBIN TREMALLO	Work	(210) 222-2204
Participated in Investigation	PLANT MANAGER	MR RONNIE GADBAW	Work	(210) 524-3500
Participated in Investigation		MR TERRY DUDLEY PE	Work	(210) 222-2204
Participated in Investigation		MS EMILY THOMPSON	Work	(210) 222-2204
Participated in Investigation		MR RICHARD KLAR	Work	(210) 699-9090
Participated in Investigation		MR RICHARD SAMPLES	Work	(210) 699-9090
Participated in Investigation		MR DENNIS HOYT	Work	(210) 828-3520

Other Staff Member(s) :

Role	Name
QA Reviewer	HEATHER BEATTY
QA Reviewer	LYNN BUMGUARDNER
Investigator	AMY BURROUGHS

Supervisor	BOBBY CALDWELL
Investigator	JOHN GARCIA
Investigator	ELAINE GROSENHEIDER

Associated Check List

Checklist Name	Unit Name
EDWARDS AQUIFER INITIAL SITE INVESTIGATION	Quihi Quarry

Investigation Comments :

The investigation was conducted to review the referenced WPAP application (EAPP 2502.00)

The application was received on 3/22/06 Began review on 5/3/06 Investigator went to R-11 on 3/8/06 to review recent quarry applications Site investigation conducted on 5/26/06.

Table of Contents

1 Background:

Effective on 3/21/90, the Edwards Rules defined "regulated activity" to include "clearing, excavation or any other activities that alter or disturb the topographic, geologic or recharge characteristics of a site."

For review of this application, four previously approved quarry application were evaluated [KBDJ, Ruby Ranch Site, 10/28/05 - RN103140695 (Hays County), Austin Equipment Site, 12/5/05 - RN104543780 (Williamson County); Deep Creek Quarry, 3/3/06 - RN104600115 (Medina County); and Adkins Ranch Quarry, 4/3/06 - RN104910823 (Williamson County)].

The applications and approval letters for KBDJ and Austin Equipment sites had been contested and were reviewed by the Commission. The Commission's decision on a requested Motion to Overturn and a Motion for Reconsideration for the KBDJ site was denied at the Commissioner's agenda on 2/3/06 The Commission's decision on a requested Motion to Overturn and a Motion for Reconsideration for the Austin Equipment site was denied at the Commissioner's agenda on 2/22/06.

Comments opposing the subject quarry were provided, within the 30 day comment period, by the Medina County Environmental Action Association (MCEAA), The Gardner Law Firm, and Mr Joseph F Manak. The MCEAA provided a petition with 104 signatures opposing the quarry. These comments were considered in the application review and the major concerns were discussed in the associated investigation report (CCED6 #462519) On July 12, 2006, The Gardner Law Firm requested 30 additional days to respond to Vulcan Materials' response to the TCEQ's request for information

At the request of the TCEQ, comments supporting the subject quarry were provided by Vulcan Materials from the Hondo ISD, City of Hondo, Medina County Historical Society, 26 individual letters, and a petition with 215 signatures. These comments were considered in the application review

2 Project Description

The proposed commercial project is a limestone quarry and will have an area of approximately 1,776 acres on three tracts of land As presented, approximately 1,070 acres will be quarried in four pits. The pits will be excavated and separated by existing ephemeral stream channels. As presented, the ephemeral stream channels will only be quarried with prior approval from all appropriate jurisdictional agencies. A plant site of 171 acres will include equipment for crushing, processing, washing, water

recycling, stockpiling and distribution operations, including electric crushers, screens, material conveyors, scrubbers (wet and dry), screeners (wet and dry), load-out hoppers, a rail line, an access road, and haul roads. The impervious cover for the 1,778 acre site will be 39.27 acres (2.21 percent) Project wastewater (domestic) will be collected in portable toilets and disposed of by weekly by a TCEQ registered waste disposal service Blasting agents will be used in the mining process. The mining will proceed through the Edwards Limestone no deeper than 25 feet above the potentiometric surface of the Edwards Aquifer. According to the application, the potentiometric surface varies, due to faulting, from 975 to 987 feet above mean sea level (amsl). No on-site sewage disposal facility is proposed at this time. Portable toilets will be used. Project wastewater (domestic) will be and disposed of two times per week by a TCEQ registered waste disposal service

During the estimated 40 year life of the quarry, the first three phases of operation listed below may occur sequentially and/or simultaneously:

A. Site preparation,
B Excavation and processing,
C. Pit closure, and
D. Site closure/reclamation

3 Site Assessment Investigation.

A site assessment investigation (SAI) was conducted on 5/26/06, with Eddie Saucedo & Ronnie Gadben (Vulcan Materials); Hugo Wurzbach (land owner); James Tonne (land owner's associate); Terry Dudley, Robin Tremaine, & Emily Thompson (Edwards Aquifer Authority); Dennis Hoyt (Overby Descamps Engineers); Rick Kier & Rick Semple (Raba Kistner Consultants, Inc.), Richard Garcia, Bobby Caldwell, Amy Burroughs, Mara Contreras, and John Mauser (TCEQ).

The plant area and areas to be quarried were observed. The site was mostly covered with thick vegetation (cedar, oak, brush, and grass) and accessible by ranch roads and walking.

According to the geologic assessment included with the application, the Georgetown Formation and the Devil's River Formation (upper and lower) are exposed at the site. Transects of 15 meters revealed 99 geologic and manmade features on the project site. A total of 11 features were assessed as sensitive (2 wells, 7 faults, 1 closed depression, and 1 cave). The San Antonio Regional Office conducted a site investigation on May 26, 2006 The plant area and areas to be quarried were observed The site was mostly covered with thick vegetation (cedar, oak, brush, and grass) and accessible by ranch roads and walking. The following features were observed - three on-site water wells (WZ-S45, SC-S7, B-S11), four faults (WZ-S71, SC-S22, SC-S23, B-S29), one sinkhole (SC-S2), two closed depressions (WZ-S62, B-S5), three solution enhanced fractures (WZ-S69, B-S15, B-S17), two caves (SC-S14, B-S19), and one solution cavity (B-S20).

At the time of the site investigation, the wells were in use (livestock and domestic) The Wurzbach well supplied a stock tank. It was reported to have been drilled by a cable tool and cortacrewed into the subsurface. Because of the twist and the downhole equipment, the water level could not be measured. The water levels in the other two wells (livestock & domestic use) were reported The faults observed in the field were soil filled, grass covered fractured rock. As illustrated on the site geologic map, the fractured rock outcrops are in alignment with named faults in the area. Although not observed in the field, the site geologic map illustrates several abandoned vehicles and a greywater discharge hole. The site is generally as described in the geologic assessment. The features are proposed to be mined out. No features are proposed to be sealed Protective measures to be provided for the geologic and manmade features during plant operation and/or excavation are listed below in the Pollution Abatement section.

4 Pollution Abatement

1 BMPs for sensitive geologic and manmade features located on the project site

A. Plant Site Area A: The Wurzbach well will be converted to a piezometer (an instrument used to measuring the change of pressure of a material subject to hydrostatic pressure)

B. Plant Site Area B: No sensitive features are present in Plant Site Area B.

C. Quarry Pits. A positive slope will be maintained away from all sensitive features to prevent flows from entering them. A detail drawing is shown on the plan sheet in the application entitled, "Overall Site Plan of Entire Quarry" (Exhibit 2.1).

D. Wells in Quarry Areas: The two other wells (Schwaers well & Boehme/Belzer well) will be properly plugged when and if mining progresses to within 100 feet of them.

II. Operational BMPs:

During the operational life of the plant site and quarries, the total suspended solids (TSS) generated by the increase in impervious cover is 37,385 pounds/year. The required load to be treated is 80% of the total, or 29,908 pounds per year. To prevent pollution of stormwater runoff originating on-site or up-gradient of the site and potentially flowing across and off the site after construction, treatment will be provided by the BMPs described in the approval letter for 32,591 pounds per year of TSS from the on-site impervious cover. No impervious cover is proposed in the quarry pits.

III Permanent BMPs:
As stated previously, during the estimated 40 year life of the quarry, the first three phases of operation listed in the table below may occur sequentially and/or simultaneously. Apparent analogous stages for commercial/residential developments are listed to the right.

Quarry Activity	BMP	Commercial/Residential Activity	BMP
Site preparation construction	TBMPs	Site preparation &	TBMPs
Excavation & processing	Long-term TBMPs	Post-construction operations	BMPMs
Pit Closure	To be decided	No equivalent	NA
Site Closure/ Reclamation	To be decided	No equivalent	NA

DISCUSSION: In the context of 30 TAC 213, "permanent" seems to mean for the operational life of the project. In that sense, the operational life of a quarry would seem to mean during the excavation and processing phase (approximately 40 -50 years), after which, the quarry site is closed/reclaimed. For a shopping center, the operational life is until the shopping center is replaced, before which, a WPAP, with appropriate "permanent" BMPs, would be reviewed for approval consideration. During the operational life of a quarry, the "permanent" BMPs would be a long-term temporary BMP(s) designed and constructed exactly like a "permanent" BMP(s) for a shopping center. Both would reduce the TSS from the impervious cover by 80%. END OF DISCUSSION

A request was made for an exception to the requirement of permanent BMPs for this project. As stated previously, this regulated activity will proceed in four phases (site preparation, excavation and processing, pit closure, and site closure/reclamation). The excavation and processing phase, where the long-term temporary BMPs described above will be provided, is analogous to a retail, office or residential project where permanent BMPs are required after completion of construction. The site closure/reclamation phase of a quarry is not analogous to "completion of construction" for non-quarry types of commercial development.

Point 1 of the equivalent water quality protection presented in the application [the quarry operator will report any sensitive features discovered during mining] is irrelevant at the stage of pit closure or quarry closure/reclamation because all mining will have been completed.

Point 2 of the equivalent water quality protection presented in the application [stormwater does not surface discharge from the quarry pit] is irrelevant. The TCEQ agrees that stormwater will not leave

the quarry pits, however, the quarry floor will become the surface, albeit disturbed, of the Edwards Aquifer Recharge Zone

Point 3 of equivalent water quality protection presented in the application [since the TCEQ regards the (single family residential subdivisions with 20% or less impervious cover) as equivalent protection of the aquifer, the quarry pits with no impervious cover and no surface water runoff are actually better than a residential subdivision with less that 20% impervious cover.] is an invalid comparison. The stabilization of a residential subdivision with vegetation is not the same as quarry stabilization as defined in the application ("when all loose rock material has been compacted or removed to solid rock.").

In addition, an affidavit from Thomas Owen Mathews, II, notarized on August 12, 2004, was reviewed, and is quoted in part below. As understood, and cited below, Mr Mathews professional opinion is that sediment on a quarry floor occludes porosity and permeability, and inhibits vertical fluid migration

"Quarry operations pulverize and compact much of the material on the surface, reducing permeability and slowing infiltration from the surface to the ground water. This reduced permeability serves to filter water as it moves downward in the same way that sand or other fine materials are used as a filtering medium. As the infiltration occurs at a slower rate, it allows time for any sediment that may be present in the water to settle out onto the quarry floor. We know that this process of sedimentation and filtration takes place because the sediment that settles out can be seen after rain events and because over a period of time these areas of infiltration tend to become less permeable and hold water. This indicates that the fractures are retaining the sediment and thus causing the area to hold water for long periods The occurrence of this process can be seen in almost any quarry or associated settling pond operating in the central Texas area, or elsewhere."

With the proposed special condition immediately following this paragraph, and based on the plan review, the nature of the regulated activity (site closure/reclamation), the BMPs provided during the excavation and processing phase, additional discussion provided in this report, commission regulations, and consistency with previous quarry approvals pursuant to 30 TAC 213, and not the justifications provided, it is recommended that the TCEQ grant the requested exception and not require post-excavation and processing phase (site closure/reclamation) BMPs (permanent BMPs)

PROPOSED SPECIAL CONDITION: At the conclusion of quarrying, and pursuant to 30 TAC 213.4(j)(2&3), the holder of any approved Edwards Aquifer protection plan must notify the appropriate regional office in writing and obtain approval from the executive director prior to initiating any change in the nature or character of the regulated activity from that which was originally approved or a change which would significantly impact the ability of the plan to prevent pollution of the Edwards Aquifer; and any development of land previously identified as undeveloped in the original water pollution abatement plan,

After the conclusion of mining, quarry properties are retained by the mining company or, if the site is leased, returned to the owner. However, some quarries in the San Antonio area have been used for zoos, golf courses, and amusement parks The future use of the subject quarry is unknown. Since there will be a change in the nature of the regulated activity from excavation and processing to no activity, or some unknown activity, it is suggested that an appropriate "permanent" BMP for a quarry may be to require a new WPAP, or modification with appropriate BMPs for the post-excavation and processing phase of the quarry This would be analogous to requiring a new WPAP or modification for the replacement of a commercial development.

5 Responses to Comments Opposing the Quarry Four letters commenting on the proposed quarry with numerous issues were received from. Medina County Environmental Action Association (MCEAA) - 2 letters, The Gardner Law Firm (representing MCEAA), and Mr. Joseph F. Manak Vulcan Materials' response to these comments are attached, An additional letter dated July 19, 2006 was received from the Gardner Law Firm requesting 30 days to comment on Vulcan Materials' response to the TCEQ's July 12, 2006 request for additional technical information Region 13's response to the major issues are included below:

A. Incremental Increase in TSS. This project will construct 39 27 acres of impervious cover Treatment of the incremental increase will be provided by two retention basins and eight sedimentation/filtration basins, as described in the WPAP application and the Permanent Pollution Abatement Measures of the TCEQ's approval letter

B Disposal of Sediment from Water Quality Basins Sediment is to be collected and tested for TPH (TX-1005) and BTEX (8021 or 8260). Per Vulcan Materials' letter dated July 19, 2006, "Analytical results will be compared to published action levels defined by TCEQ pursuant to applicable Texas Risk Reduction Program (TRRP) rules (30 TAC 350) Action levels will be utilized as a basis for comparison to evaluate potential hydrocarbon impacts to sediments. By definition, actions levels are constituent-specific and correspond to maximum concentrations that can remain in affected environmental media within a residential land use setting. On the basis of analytical testing data, sediment will be properly classified and subject to the following procedures proposed by the applicant:

"Sediments that do not exhibit measurable concentrations of hydrocarbon contaminants or are at concentrations below TCEQ action levels will not be subject to further special handling procedures and will be used onsite as part of the earthen perimeter berm."
"Sediments that exhibit hydrocarbon concentrations in excess of TCEQ action levels will be staged and subject to onsite treatment in order to reduce hydrocarbon concentrations to acceptable levels prior to use."

"As part of the treatment process, sediments will be evenly distributed within the containment area to facilitate the rapid volatilization and natural attenuation of residual hydrocarbons constituents. If necessary, the treatment process may be enhanced by the periodic addition of hydrocarbon degrading microorganisms. Hydrocarbon concentrations will be monitored throughout the treatment process by periodic sampling and analysis. Once a determination is made that residual hydrocarbon concentrations are below TCEQ action levels, sediments will be used onsite as part of the earthen perimeter berm."

A detail of the encapsulated sediment is shown on the plan sheet in the application entitled, "Overall Site Plan of Entire Quarry" (Exhibit 2.1)

The investigator recommends acceptance of the proposed treatment & disposal.

C. Protection of Sensitive Features: No features will be closed or plugged. All features are proposed to be mined out. During quarry excavation, a positive slope will be maintained away from all sensitive features to prevent flows from entering them. A detail drawing is shown on the plan sheet in the application entitled, "Overall Site Plan of Entire Quarry" (Exhibit 2.1)

D Effects of Blasting on the Edwards Aquifer: No published papers were found to verify that water quality impacts result from the use of blasting agents such as ammonium nitrate.

E. Infiltration of Stormwater in Sensitive Features and the Quarry Pits: Infiltration is expected to occur on the property whether it remains in its natural state or becomes a quarry. A quarry pit will retain 100% of the sediment loading without discharge to the surface. With respect to the subsurface, the answer to the previous concern about the effects of blasting is restated, "In response to the suggestion that blasting, equipment movement and material removal operations could crack the quarry floor and contaminate the aquifer, staff performed a literature review. Staff was unable to locate any published data that verified that water quality could be impacted from the use of blasting agents. Therefore, at this time, water quality should not be impacted by the quarrying activities on the quarry floor."

Furthermore, in review of the affidavit quoted above from Thomas Owen Mathews, II, if sediment on a quarry floor occludes vertical permeability and fluid migration, some unquantified measure of TSS reduction would seem to be occurring during the operational life and the post-operational life of the quarry.

F Flooding Flooding issues are the responsibility of the County Floodplain Administrator; and, the quarry pits are expected to retain all stormwater runoff

G Stormwater Runoff - Plant Area. To prevent stormwater runoff, the operator must comply with the TPDES Multi Sector Industrial General Permit and the General Construction Permit, as applicable

H. Stormwater Runoff - Quarry Pit Areas: Under TPDES General Permit No TXR050000, retention of stormwater within a quarry pit is an acceptable practice. Citing from Part I Definitions, "All definitions in

Section 26.001 of the Texas Water Code and 30 TAC 305 shall apply to this permit and are incorporated by reference. "

Per Section 26.001(19) of the Texas Water Code (TWC), "'To discharge' includes to deposit, conduct, drain, emit, throw, run, allow to seep, or otherwise release or dispose of, or to allow, permit or suffer any of these acts or omissions."
Prior to the excavation of a quarry pit, for all stormwater not retained on site, the operator must comply with the TPDES Multi Sector Industrial General Permit and the General Construction Permit, as applicable. After sufficient excavation, the quarry pit should retain the sediment loading without discharge to the surface.

I Quality of Stormwater Runoff to Quarries. For this project, stormwater quality is concerned with total suspended solids and hazardous materials TSS has been addressed by the proposed BMPs, and previous comments. Hazardous material spills are addressed in the next paragraph.

J. Hazardous Materials Spills: No regulated quantities of hydrocarbons or hazardous substances are proposed to be stored on the Edwards Aquifer Recharge Zone. Concerning potential spills from vehicles, spill prevention and control measures, Vulcan Materials must follow the measures described in Section 1.4 16 of RG-348. Hydrocarbon and/or hazardous material spillage to the surface and subsurface is regulated by the TCEQ under 30 TAC 330 or 30 TAC 335, and requires remediation.

K. Wastewater: Concerning the definition of wastewater, wastewater can be characterized as domestic or industrial. Portable toilets will be used at the site to collect domestic wastewater. It is to be collected and disposed of properly by a TCEQ registered waste hauler Industrial wastewater is not a "waste" unless it is released from storage. Any on-site stormwater which is collected and filtered for reuse is not considered to be wastewater. Any stormwater not collected would be uncollected stormwater.

L. Water Table Protection: Vertical Separation Between Quarry Floor & Potentiometric Surface: The applicant has chosen to maintain a minimum vertical separation distance of 25' above the potentiometric surface. The potentiometric surface is defined in the Dictionary of Geological Terms (1986) as the, "Surface to which water in an aquifer would rise by hydrostatic pressure." In a confined aquifer, this is the level the aquifer water will rise to in a well bore Thus elevated water level is caused by the water pressure in the confined aquifer.

According to information provided by the applicant, "In general the aquifer is under some amount of pressure at any given location (on the site) due to the presence of substantial overburden thickness and the presence of local confining units. On the basis of available information (i.e. information available through WID and other published studies), the difference between the top of the aquifer and the potentiometric surface cannot be quantified."

A vertical separation distance of 25 feet above the water table has been approved by the TCEQ at the Deep Creek Quarry (Medina County) and the Adkins Ranch Quarry (Williamson County), however, the applicant has committed to mine no deeper than 25 above the potentiometric surface Staying 25 feet above the potentiometric surface is more protective of the aquifer than staying 25 feet above the water table.
The on-site wells will be used to measure the water elevation. If the wells cannot be entered, they will be properly plugged and replaced with piezometers.

M. Permanent BMPs for Quarry Pits There are no permanent BMPs required for the quarry pits because no new impervious cover is proposed. Wastewater and hydrocarbon and hazardous substance storage issues are addressed elsewhere in this report.

N Removal of Overburden: Removal of overburden and mining 130 feet into the ground brings the Edwards Aquifer in closer contact with contaminants such as diesel fuel, nitrates and other unspecified pollutants Bulk storage of hydrocarbons and hazardous substances and vehicle maintenance will occur off the Recharge Zone. Portable toilets will be provided and emptied weekly by a TCEQ registered waste disposal service.

8. WPAP Approvals Referenced.

KBDJ, Ruby Ranch Site, 10/28/05 - RN103140695 (Hays County)
Austin Equipment Site, 12/5/05 - RN104543780 (Williamson County)
Deep Creek Quarry, 3/3/06 - RN104800115 (Medina County)
Adkins Ranch Quarry, 4/3/06 - RN104910823 (Williamson County)

TCEQ's Executive Director's Response to Motions to Overturn the Executive Director's Decision - KBDJ, LP - TCEQ Docket No 2004-0988-EAQ

TCEQ's Decision to Deny Request for Motion to Overturn and Motion for Reconsideration of KBDJ, Ruby Ranch Site - TCEQ Docket No. 2004-0988-EAQ, signed by Kathleen Hartnett White, Chairman, 2/3/06

TCEQ's Executive Director's Response to Motions to Overturn the Executive Director's Decision - Austin Equipment Company - TCEQ Docket No. 2005-2078-EAQ

TCEQ's Minutes of the Texas Commission On Environmental Quality's 2/22/06, Agenda, for Motion to Overturn the Executive Director's approval of the application by Austin Equipment Company for Approval of Water Pollution Abatement Plan - TCEQ Docket No. 2005-2078-EAQ

Affidavit of Thomas Owen Mathews, II, notarized on 8/12/04

Affidavit of Thomas Mathews, notarized on 10/17/05

[redacted]

Signed J Mauran Date 8-3-06
Environmental Investigator

Signed Bobby D. Caldwell Date 08/28/2006
Supervisor

Attachments: (In order of final report submittal)

___Enforcement Action Request (EAR)
✓Letter to Facility (specify type) Approval
Investigation Report
___Sample Analysis Results
___Manifests
___NOR
___Maps, Plans, Sketches
___Photographs
✓Correspondence from the facility
✓Other (specify)
PAP Application
Communications History

AEI
A WBE-HUB Firm

ORIGINAL

ADAMS ENVIRONMENTAL, INC.
12403 Nacogdoches Road, Suite 106
San Antonio, Texas 78217

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OCA
DJB
GKT

December 30, 2003

8675.002
C

Jana Milliken
U.S. Fish and Wildlife Service
10711 Burnet Road, Suite 200
Austin, TX 78758

RE: Golden-Cheeked Warbler Surveys Conducted for the Proposed Vulcan Materials Limestone Quarry North of Quihi, Texas

Dear Jana:

I sincerely appreciate you providing information concerning the golden-cheeked warbler (GCW) surveys conducted by Horizon Environmental Services, Inc. for the proposed railway and Vulcan Materials limestone quarry north of Quihi, Texas. After reviewing the reports, I would like to offer the following comments:

1. There seems to be some confusion as to the size of the project area. In 2001, the project area was described as 100 acres investigated on a 640-acre parcel. In 2002, the project area was described as 200 acres. What was the actual acreage of the study or survey area, and where was it located?
2. Most of these surveys involve walking transects. I assume that the same transects were walked each season, but this assumption cannot be confirmed in the information provided. Further, no maps were provided showing the location and length of transects used for the surveys.
3. The data collected for each survey was somewhat cryptic. It was very difficult to determine how the GCW were being identified. I assume that this was by either sight or sound, but the actual methods were not outlined.
4. If the field data worksheets are correct, it is indicated that each survey covered 200 acres in 4 hours. This does not really sound feasible. However, if maps had been provided showing the transects, the short amount of time spent might have seemed more plausible.
5. None of the data sheets indicated use of a GPS, and no maps were prepared according to standard guidelines for GCW surveys. I am assuming that these will be furnished in a more formal report in the future.
6. The description of habitat for the survey area was inadequate. As you know, the age and density of Ashe juniper has a great impact on the potential for GCW. In addition, the composition of the deciduous woody plant component of the plant community is very important. Information on the species composition based on foliar cover was not provided, making an evaluation of the site as potential GCW habitat impossible. In

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addition, the description of ground species would lead one to believe that the site was completely covered by prickly-pear and wildflowers, with no grasses present.

7. The field data sheets were not sufficiently descriptive. I would assume that during a 4-hour survey, more descriptive and helpful data could have been accumulated and provided to support the assumption that GCWs were not present.

Although I tend to agree with the fact that much of the area impacted by the railroad construction is not high-quality GCW habitat, some of the creek basins that I have observed show some potential as suitable habitat. I do not feel that this report provides substantial evidence to assume that GCWs are not present on the site. Considering the impact of this project on the natural environment, I strongly believe that a more formal, detailed report would be in order.

In addition to these comments, the report did not address habitat on the southern end of the railroad. That area should also be surveyed for potential habitat, even though it is on the southern extent of GCW habitat. Portions of the southern area contain mature stands of juniper mixed with deciduous hardwoods. Whether these areas are located on the railroad cannot be determined because an accurate map has not been prepared for our use, and the exact location of the railroad right-of-way has not been published to date.

Also, the studies were conducted for the preferred alternative only. I would assume that studies should be conducted for all alternatives, at least to provide an opinion as to the suitability of habitat on each alternative and to select the best alternative based on habitat impacts.

Again, I sincerely appreciate the opportunity to review these reports. As you know, I am representing the Medina County Environmental Action Association, Inc. (MCEAA) and want to make sure that federal agencies are addressing all aspects of impacts to the environment. This is a highly controversial project, and a critical and thorough review of all submittals to federal and state agencies is extremely important. Such reviews will increase public confidence in federal regulatory agencies and will assure concerned citizens that Vulcan Materials has performed all due diligence prior to initiation of this project, if it is permitted.

I would appreciate you calling me if you have any questions concerning my comments. In addition, I would thoroughly enjoy walking portions of the site with you to gain insight as to the opinions of the U.S. Fish and Wildlife Service on this project and to relay those thoughts to MCEAA. I think this would be an excellent opportunity for you to instill even more confidence in the public regarding your agency.

Very truly yours,

Lynn M. Kitchen, Ph D.
Senior Environmental Scientist

LMK.srk

Process Description and Flow Diagram

Form PI-1 Section VIII C

Vulcan Construction Materials, L.P.
Air Quality Permit Application – Rock Crushing Plant
Process Description
Medina County, Texas

The following process description is an explanation of material processing by the subject facilities that may be read in conjunction with the process flow diagram and plot plan. The emission point numbers (EPNs) that correlate with the equipment are listed below for ease of use with the flow diagram. The stockpile areas (STK), roads (PRD and URD) and tanks (T1 – T10) are also discussed below and are represented on the plot plan.

Raw aggregate material from the quarry is loaded into a Hopper (EPN 1) by haul truck or front-end loader. The hopper's feeder transfers (EPN 2) the majority of material to Screen #1 (EPN 3). Some excess material may be transferred to an underlying conveyor (EPN 2a). Material from the first deck of Screen #1 is fed to Crusher #1 (EPN 5) and material from the second deck is transferred (EPN 4a) directly to the conveyor beneath Crusher #1. Material passing through Screen #1 is transferred (EPN 4b) to an underlying conveyor (EPN 6). Material from this conveyor is transferred (EPN 7) to either the conveyor (EPN 21) beneath Crusher #1 or to another conveyor (EPN 8) which transfers (EPN 9) material to Screen #2 (EPN 10) Material from the first deck of Screen #2 is transferred (EPNs 11a -c) to one of three conveyors (EPNs 12a, 13, 19). Material from the second deck of Screen #2 is transferred (11a-b) to one of two conveyors (EPN 13, 19). Material from the third deck of Screen #2 is transferred (11a or 11e) to one of two conveyors (EPNs 16, 19). Material passing through Screen #2 is transferred (11e) to an underlying conveyor (EPN 16). Material from Screen #2 may be conveyed (EPN 13) and transferred (EPN 14) to a bin which feeds material to Crusher #2 (EPN 15) Material from Crusher #2 is conveyed (EPN 8) back to Screen #2. Material from Screen #2 may be conveyed (EPN 12a) and transferred (EPN 11d) to another conveyor (EPN 12) then stockpiled. Material from Screen #2 may be conveyed (EPN 16) and transferred (EPN 17) to a radial stacker (EPN 18) which stockpiles material. Material from Screen #2 may be conveyed (EPN 19) and transferred (EPN 20) to a conveyor (EPN 23) Material from the conveyor (EPN 21) beneath Crusher #1 is transferred (EPN 22) to another conveyor (EPN 23), where it combines with material from Screen #2. This material is then transferred (EPN 24) to a Scrubber (EPN 25).

From the Scrubber (EPN 25), material is transferred (EPNs 26 and 27) to either Wet Screen #1 (EPN 28) or Wet Screen #2 (EPN 29). Material from the first deck of Wet Screen #2 is transferred (EPN 30a) to a conveyor (EPN 31) and transferred (EPN 32) to a bin that feeds material to Crusher #3 (EPN 33). Material from Crusher #3 is conveyed (EPN 34) and transferred (EPN 35) back to Wet Screen #2. Material from the second and third decks of Wet Screen #2 combines with material from all three decks of Wet Screen #1 and is transferred (EPN 30b) to a radial stacker (EPN 40) that stockpiles material on a surge pile.

The material from the surge pile is transferred (EPN 41) by feeders to an underlying conveyor beneath the surge pile, where it is conveyed (EPN 42) and transferred (EPN 43) to Wet Screen #3 (EPN 44). Material from Wet Screen #3 may be transferred (EPN 45a) to a conveyor (EPN 52) that transfers (EPN 46) material to a bin that feeds material to Crusher #4 (EPN 47) and to Crusher #5 (EPN 48). The material from both crushers is conveyed (EPN 49) and transferred (EPN 50) to Wet Screen #4 (EPN 51). Material from Wet Screen #4 may be reprocessed through Crusher #4 and Crusher #5. Combined material from Wet Screen #3 and #4 may be transferred (EPN 45b-c) to

individual conveyors (EPN 61-62) and stockpiled. Material from Wet Screen #3 and #4 may be transferred (EPN 45d) to a conveyor (EPN 53) that transfers (EPN 54) material to Wet Screen #5 (EPN 55). Material from each screen deck of Wet Screen #5 may be transferred (EPN 56a-d) to individual conveyors (EPN 63-66) and stockpiled.

Material passing through Wet Screen #1 (EPN 28) combines with material passing through Wet Screen #2 (EPN 29) and is pumped to a bin followed by a Classifier (submerged process). Material passing through Wet Screens #3, #4 and #5 is pumped to a second bin and Classifier (submerged process). Material from each Classifier is pumped to individual Sand Screws (submerged process), where it is transferred (EPNs 36 and 57) to individual conveyors (EPNs 37 and 58). The conveyors transfer (EPNs 38 and 59) the material to individual radial stackers (EPNs 39 and 60) for stockpiling.

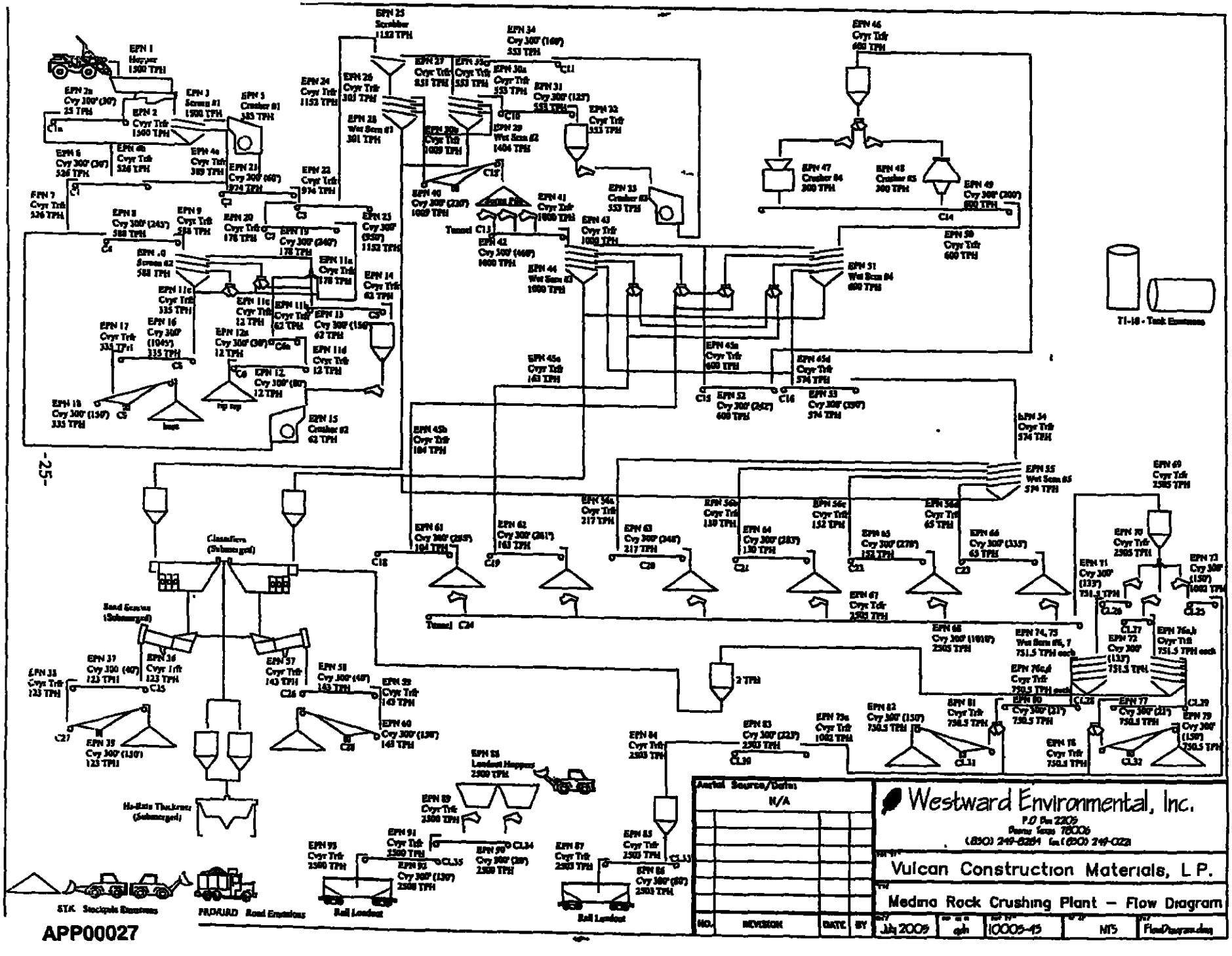
The six surge piles after Wet Screens #3, #4, and #5 all feed their respective tunnel feeders which transfer (EPN 67) the material to a conveyor beneath the surge pile. Material is conveyed (EPN 68) and transferred (EPN 69) to a bin. Material from the bin may be transferred (EPN 70) by feeder to three individual conveyors. Material may be conveyed (EPN 71) and transferred (EPN 76a) to Wet Screen #6 (EPN 74), conveyed (EPN 72) and transferred (EPN 76b) to Wet Screen #7 (EPN 75), or conveyed (EPN 73) and transferred (EPN 73a) to another conveyor (EPN 83). Material retained on the screen decks of Wet Screen #6 and #7 is transferred (EPN 74c-d) to individual conveyors (EPN 77 and 80). Material passing through Wet Screen #6 and #7 is pumped to a bin that feeds material to a Classifier (submerged process) that also receives material from Wet Screens #3, #4, and #5. Material from Wet Screen #7 is conveyed (EPN 77) and transferred (EPN 78) to either a radial stacker (EPN 79) and stockpiled or to a conveyor (EPN 83) Material from Wet Screen #6 is conveyed (EPN 80) and transferred (EPN 81) to either a radial stacker (EPN 82) and stockpiled or to a conveyor (EPN 83). Material is conveyed (EPN 83) and transferred (EPN 84) to a bin that transfers (EPN 85) material to conveyor (EPN 86). The conveyor transfers (EPN 87) material to awaiting loadout vehicles.

Material processed by the plant may be loaded out for shipment offsite via Loadout Hoppers (EPN 88). Material from the hoppers is transferred (EPN 89) by feeders to an underlying conveyor. Material is conveyed (EPN 90) and transferred (EPN 91) to another conveyor where it is conveyed (EPN 92) and transferred (EPN 93) to loadout vehicles

There are nineteen stockpile areas designated as STK A – S.

One paved road (PRD) is proposed for the site and will act as the primary entrance and exit for product truck traffic. There are multiple unpaved roads (URD) that will be utilized by plant vehicles and product trucks. Unpaved Road 1 represents the longest route in which product trucks will travel on the site and will support traffic associated with loadout of product from the site by trucks. Unpaved Road 2 represents the longest route in which haul trucks will travel on the site when used to transport material generated by the plant that will not be loaded out for shipment from the plant area. Unpaved Road 3 accounts for the fuel truck traffic.

There are ten tanks (T1 – T10) proposed for storing various hydrocarbon materials to be utilized for fueling and mauntenance of plant equipment


Aerial Source/Date: N/A
Westward Environmental, Inc.
P.O. Box 2205
Pearsall, Texas 78061
(830) 249-8284 fax (830) 249-0228
Vulcan Construction Materials, L.P.
Medina Rock Crushing Plant – Flow Diagram
NO. REVISION DATE BY
July 2009
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MTS
FlowDiagram.dwg
STK Stockpile Emissions
FRDRIAD Road Emissions
Rail Loadout
Rail Loadout
T1-18 - Tank Emissions
Tunnel C13
Tunnel C24
2 TPH

APP00027

TCEQ-0587
Project
Description

TCEQ – 0587

GENERAL INFORMATION FORM

Attachment C - "Project Description"

VULCAN MATERIALS MEDINA QUARRY

ATTACHMENT C

"PROJECT DESCRIPTION"

THIS PROJECT CONSISTS OF CREATING A ROCK QUARRY ON APPROXIMATELY 1,776 ACRES OF LAND. SAID ROCK QUARRY IS TO BE LEASED AND OPERATED BY VULCAN MATERIALS QUARRY. BASED UPON CURRENT DEMANDS, IT IS EXPECTED THAT THE QUARRY OPERATIONS WILL CONTINUE FOR APPROXIMATELY 40 OR MORE YEARS. APPROXIMATELY 1,070 ACRES OF THE 1,776 ACRES WILL BE MINED. SEE VULCAN *MINING PLAN, EXHIBIT 2, TCEQ-0584.*

IN SUPPORT OF QUARRY MINING OPERATIONS, A PLANT AREA WILL BE DESIGNED AND CONSTRUCTED CONTAINING EQUIPMENT FOR CRUSHING, PROCESSING, WASHING, WATER RECYCLING, STOCKPILING AND DISTRIBUTION OPERATIONS. THIS PLANT AREA CONSISTS OF APPROXIMATELY 171 ACRES TO INCLUDE ROADS AND RAILROAD SPURS FOR SITE ACCESS.

ROCK CRUSHING PLANT

THE FOLLOWING IS A GENERAL DESCRIPTION TAKEN FROM VULCAN'S AIR QUALITY PERMIT APPLICATION (JULY 1, 2005) OF THE MATERIAL PROCESSING PLANT BY THE SUBJECT FACILITIES THAT MAY BE READ IN CONJUNCTION WITH THE PLANT PLOT. PLEASE REFER TO THE SITE PLAN FOR CORRELATION (SEE TCEQ-0600, PERMANENT STORM WATER SECTION, ATTACHMENT F, CONSTRUCTION PLANS, SHEET 2).

RAW AGGREGATE MATERIAL FROM THE QUARRY IS LOADED INTO A HOPPER BY HAUL TRUCK OR FRONT-END LOADER. THE HOPPER'S FEEDER TRANSFERS THE MAJORITY OF MATERIAL TO SCREEN #1. SOME EXCESS MATERIAL MAY BE TRANSFERRED TO AN UNDERLYING CONVEYOR [C1A]. MATERIAL FROM THE FIRST DECK OF SCREEN #1 IS FED TO CRUSHER #1 AND MATERIAL FROM THE SECOND DECK IS TRANSFERRED DIRECTLY TO THE CONVEYOR [C2] BENEATH CRUSHER #1. MATERIAL PASSING THROUGH SCREEN #1 IS TRANSFERRED TO AN UNDERLYING CONVEYOR [C1]. MATERIAL FROM THIS CONVEYOR IS TRANSFERRED TO EITHER THE CONVEYOR [C2] BENEATH CRUSHER #1 OR TO ANOTHER CONVEYOR [C4] WHICH TRANSFERS MATERIAL TO SCREEN #2. MATERIAL FROM THE FIRST DECK OF SCREEN #2 IS TRANSFERRED TO ONE OF THREE CONVEYORS [C6 – C5 – C7]. MATERIAL FROM THE SECOND DECK OF SCREEN #2 IS TRANSFERRED (11A-B) TO ONE OF TWO CONVEYORS [C5 – C7].

MATERIAL FROM THE THIRD DECK OF SCREEN #2 IS TRANSFERRED (11A OR 11E) TO ONE OF TWO CONVEYORS [C8 – C7]. MATERIAL PASSING THROUGH SCREEN #2 IS TRANSFERRED (11E) TO AN UNDERLYING CONVEYOR [C8]. MATERIAL FROM SCREEN #2 MAY BE CONVEYED [C5] AND TRANSFERRED TO A BIN WHICH FEEDS MATERIAL TO CRUSHER #2. MATERIAL FROM CRUSHER #2 IS CONVEYED [C4] BACK TO SCREEN #2. MATERIAL FROM SCREEN #2 MAY BE CONVEYED [C6A] AND TRANSFERRED TO ANOTHER CONVEYOR [C6] THEN STOCKPILED. MATERIAL FROM SCREEN #2 MAY BE CONVEYED [C8] AND TRANSFERRED TO A RADIAL STACKER [C9] WHICH STOCKPILES MATERIAL. MATERIAL FROM SCREEN #2 MAY BE CONVEYED [C7] AND TRANSFERRED TO A CONVEYOR [C3]. MATERIAL FROM THE CONVEYOR [C2] BENEATH CRUSHER #1 IS TRANSFERRED TO ANOTHER CONVEYOR [C3], WHERE IT COMBINES WITH MATERIAL FROM SCREEN #2. THIS MATERIAL IS THEN TRANSFERRED TO A SCRUBBER.

FROM THE SCRUBBER, MATERIAL IS TRANSFERRED TO EITHER WET SCREEN #1 OR WET SCREEN #2. MATERIAL FROM THE FIRST DECK OF WET SCREEN #2 IS TRANSFERRED [C11] TO A CONVEYOR [C10] AND TRANSFERRED TO A BIN THAT FEEDS MATERIAL TO CRUSHER #3. MATERIAL FROM CRUSHER #3 IS CONVEYED [C11] AND TRANSFERRED BACK TO WET SCREEN #2. MATERIAL FROM THE SECOND AND THIRD DECKS OF WET SCREEN #2 COMBINES WITH MATERIAL FROM ALL THREE DECKS OF WET SCREEN #1 AND IS TRANSFERRED TO A RADIAL STACKER [C12] THAT STOCKPILES MATERIAL ON A SURGE PILE.

THE MATERIAL FROM THE SURGE PILE IS TRANSFERRED BY FEEDERS TO AN UNDERLYING CONVEYOR [C13] BENEATH THE SURGE PILE, WHERE IT IS CONVEYED [C13] AND TRANSFERRED TO WET SCREEN #3. MATERIAL FROM WET SCREEN #3 MAY BE TRANSFERRED TO A CONVEYOR [C15] THAT TRANSFERS MATERIAL TO A BIN THAT FEEDS MATERIAL TO CRUSHER #4 AND TO CRUSHER #5. THE MATERIAL FROM BOTH CRUSHERS IS CONVEYED [C14] AND TRANSFERRED TO WET SCREEN #4. MATERIAL FROM WET SCREEN #4 MAY BE REPROCESSED THROUGH CRUSHER #4 AND CRUSHER #5. COMBINED MATERIAL FROM WET SCREEN #3 AND #4 MAY BE TRANSFERRED TO INDIVIDUAL CONVEYORS [C18 OR C19] AND STOCKPILED. MATERIAL FROM WET SCREEN #3 AND #4 MAY BE TRANSFERRED TO A CONVEYOR [C16] THAT TRANSFERS MATERIAL TO WET SCREEN #5. MATERIAL FROM EACH SCREEN DECK OF WET SCREEN #5 MAY BE TRANSFERRED TO INDIVIDUAL CONVEYORS [C20, C21, C22, C23] AND STOCKPILED.

MATERIAL PASSING THROUGH WET SCREEN #1 COMBINES WITH MATERIAL PASSING THROUGH WET SCREEN #2 AND IS PUMPED TO A BIN FOLLOWED BY A CLASSIFIER (SUBMERGED PROCESS). MATERIAL PASSING THROUGH WET SCREENS #3, #4 AND #5 IS PUMPED TO A SECOND BIN AND CLASSIFIER (SUBMERGED PROCESS). MATERIAL FROM EACH CLASSIFIER IS PUMPED TO INDIVIDUAL SAND SCREWS (SUBMERGED PROCESS), WHERE IT IS TRANSFERRED TO INDIVIDUAL CONVEYORS [C25 & C26]. THE CONVEYORS [C25 & C26] TRANSFER THE MATERIAL TO INDIVIDUAL RADIAL STACKERS [C27 & C28] FOR STOCKPILING.

THE SIX SURGE PILES AFTER WET SCREENS #3, #4 AND #5 ALL FEED THEIR RESPECTIVE TUNNEL FEEDERS WHICH TRANSFER THE MATERIAL TO A CONVEYOR [C24] BENEATH THE SURGE PILE. MATERIAL IS CONVEYED [C24] AND TRANSFERRED TO A BIN. MATERIAL FROM THE BIN MAY BE TRANSFERRED BY FEEDER TO THREE INDIVIDUAL CONVEYORS [CL25, CL26, CL27]. MATERIAL MAY BE CONVEYED [CL26] AND TRANSFERRED TO WET SCREEN #6, CONVEYED [CL27] AND TRANSFERRED (EPN 76A &B) TO WET SCREEN #7, OR CONVEYED [CL25] AND TRANSFERRED [CL28] TO ANOTHER CONVEYOR [CL30]. MATERIAL RETAINED ON THE SCREEN DECKS OF WET SCREEN #6 AND #7 IS TRANSFERRED INTO INDIVIDUAL CONVEYORS [CL29 & CL28]. MATERIAL PASSING THROUGH WET SCREEN #6 AND #7 IS PUMPED TO A BIN THAT FEEDS MATERIAL TO A CLASSIFIER (SUBMERGED PROCESS) THAT ALSO RECEIVES MATERIAL FROM WET SCREENS #3, #4 AND #5. MATERIAL FROM WET SCREEN #7 IS CONVEYED [CL29] AND TRANSFERRED [CL32] TO EITHER A RADIAL STACKER AND STOCKPILED, OR TO A CONVEYOR [CL30]. MATERIAL FROM WET SCREEN #6 IS CONVEYED [CL28] AND TRANSFERRED [CL31] TO EITHER A RADIAL STACKER AND STOCKPILED, OR TO A CONVEYOR [CL30]. MATERIAL IS CONVEYED [CL30] AND TRANSFERRED TO A BIN THAT TRANSFERS MATERIAL TO CONVEYOR [CL33]. THE CONVEYOR TRANSFERS MATERIAL TO AWAITING LOAD-OUT VEHICLES.

MATERIAL PROCESSED BY THE PLANT MAY BE LOADED OUT FOR SHIPMENT OFFSITE VIA LOAD-OUT HOPPERS. MATERIAL FROM THE HOPPERS IS TRANSFERRED BY FEEDERS TO AN UNDERLYING CONVEYOR [CL34]. MATERIAL IS CONVEYED AND TRANSFERRED TO ANOTHER CONVEYOR [CL35] WHERE IT IS CONVEYED AND TRANSFERRED TO LOAD-OUT VEHICLES.

STOCKPILE AREAS ARE DESIGNATED AS STK A-S.

VULCAN MEDINA QUARRY WPAP

Edwards Aquifer, Medina County
NAME OF PROJECT: Vulcan Materials Quarry; Located north of County Road 353 and east of County Road 351; Medina County, Texas
TYPE OF PLAN: Request for Approval of a Water Pollution Abatement Plan (WPAP); 30 Texas Administrative Code (TAC) Chapter 213 Edwards Aquifer; Edwards Aquifer Protection Program ID No. 2502 00, Investigation No. 462519, Regulated Entity No. RN104921630

RESPONSE TO TCEQ QUESTIONS
June 12, 2006

Note: A Table of Contents of Attachments is included after the responses to questions.

FORM 0587 GENERAL INFORMATION FORM #7A

Question 1 - Railroad tracks are shown on the site plan, but not addressed in the project description. Provide a description of the railroad and railroad tracks.

Vulcan is working with Southwest Gulf Railroad to serve the quarry. The railroad tracks will enter the plant from the southeast and loop the plant site in order to provide access to the stockpiles for loading into the train cars. The ballast under said track will drain toward water quality basins. Side tracks are provided for queing (re-ordering of railroad cars) and minor railroad car maintenance (such as welding, etc). Major car maintenance involving hydrocarbons will be handled off the site and off the recharge zone.

The tracks will enter the plant from the Southeast by crossing Elm Creek. A bridge or trestle will be designed by a Texas Licensed Professional Engineer (P E.) to provide appropriate spans and hydraulic flows under the structure Medina County Floodplain Administrator will be consulted in regard to the FEMA Zone "A"

The surface of the railroad structure will be policed weekly for spills or drippings which might require immediate action in accordance with the spill plan. The area of the creek bottom under the railroad structure will be inspected monthly and scraped off when a build up of

drippings are visible. The waste from said scraping will be loaded into a truck for proper disposal off the recharge zone.

The load out facility will be capable of loading two (2) each, 100 car trains per day.

FORM 0587 GENERAL INFORMATION FORM #7B

Question 2 – The project description provides details for the plant area, but not the quarrying operations. Provide a description of the quarrying operations.

As soon as permits are obtained, a portable crusher will be placed into operation. Prior to start up of the permanent plant, a temporary Settling Pond (approximately 35 Acre/Foot) will be created at one of the two locations as shown on Exhibit 2.1 "Overall Site Plan of Entire Quarry". Said temporary pond will be used until a permanent pond can be created on the site

After approximately 1 year, the first pit will be large enough to be converted to a Settling Pond as described elsewhere in this WPAP The mining of the quarry will begin northeasterly of the plant site as shown on Exhibit 2.1 "Overall Site Plan of Entire Quarry" and progress in small increments, of 10 to 15 Acres per year, in a northwesterly direction. Clearing and stripping will be delayed until it is necessary for mining A buffer of approximate 200' will be maintained adjacent to all neighboring properties. A large portion of said buffer will be left in its native condition Vulcan will not mine into jurisdictional water ways without proper agency approvals, including the Medina County Floodplain Administrator. Creek or drainage way crossings for haul roads will be treated by sand filter basins. In order to obtain 80% removal of TSS, non crossing areas of the haul roads and equipment staging areas will be over treated As the quarries are mined, Vulcan will insure that the banks of the dry creeks are maintained at elevations which will not allow quarry pits to flood In order to accomplish this, prior to any excavation near the FEMA Zone "A", proper submittals will be made to the Medina County Floodplain

Administrator and if necessary, FEMA. The shot design for the proposed quarry is predicated on providing adequate shot rock to meet the productive capacity of the facility See Exhibit 7 "Estimated Gradation of Shot Rock" attached at the end of these responses.

All compacted base Equipment Staging Areas along the creeks shall be approved by the floodplain administrator. Pit runoff will not discharge to creeks or waterways General description of quarry process·

- Clear
- Strip
- Drill
- Blast
- Load into haul vehicles
- Haul to plant
- Process rock at plant
- Load to trains or trucks for export.

As a permanent BMP, quarrying will not proceed below the elevation of the potentiometric water surface, plus 25' A positive slope shall be maintained away from faults and other sensitive features to prevent flows from entering them. There will be four (4) different pits over the life of the mine.

See Exhibit 2 1 "Overall Site Plan for Entire Quarry" for more information on protection of sensitive features.

VULCAN MEDINA QUARRY WPAP

TCEQ – 0602
ATTACHMENT C
"SEQUENCE OF MAJOR ACTIVITIES"

The construction of the quarry plant site will be accomplished first This will involve the following general list of activities:

- *Placement of Temporary and Long Term Temporary BMP's*
- Construction of paved road and unpaved roads
- Crushing operations in support of construction activities
- Construction of Temporary Water Quality Basins at plant site
- Clearing and stripping on approximately 167 Acres (over the Recharge Zone)
- Rough grading (cut and fill) on approximately 120 acres
- Construction of Permanent Water Quality Basins
- Construction and erection of quarry equipment
- Construction of rail spurs

Some of these activities may occur simultaneously. However, all required Temporary BMP's will be in place prior to the activity.

7C This answer was provided with answer to question 7B, but is restated as follows

All areas down stream and adjacent to the plant area will have rock berm and silt fence to filter any water leaving the site

For the pit area, the rock berm and silt fence previously mentioned in 7A2 and shown on Exhibit 2.1 "Overall Site Plan of Entire Quarry" will serve to filter water leaving the site. Once the pits are excavated, run off will be contained in them.

7D In order to maintain recharge to the maximum extent possible, Vulcan will not mine into the creeks or water ways receiving off-site drainage. Also, the pits do not allow water to exit the site.

FORM 0602 TEMPORARY STORMWATER SECTION #7B

Question 17 - No TBMP's are discussed or illustrated on the plan sheet for the proposed railroad.

Temporary BMP's for the plant site will provide necessary controls for the construction of the on-site railroad loop.

Temporary BMP's for construction of the railroad structure over Elm Creek are as follows

1 Do not cut trees except as required for construction Leave roots when possible

2 Do not strip the construction area, i e leave vegetation

3 As piers are drilled, remove and dispose of the spoil outside of the floodplain within the plant site

4 Do not store any construction materials or equipment in the floodplain

6 inches and are located on hilltops within the referenced property These core holes locations were observed during the site assessment investigation. Since these borings are plugged and do not serve as a conduit for fluid transmission to the Edwards Aquifer, these were not considered to represent mappable features and were not included in the geologic assessment report

FORM 0600 PERMANENT STORMWATER SECTION #52 - 2

Question 52 – 2 - Comments from the site assessment investigation (SAI): Describe how and when Vulcan will comply with 30 TAC 213.7.

There are three (3) wells on the site Prior to the start of plant construction, the well on the Wurzbach Tract near the plant entrance will be plugged in accordance with the following:

§213.7 Plugging of Abandoned Wells and Borings

(a) All identified abandoned water wells, including injection, dewatering, and monitoring wells must be plugged pursuant to requirements of the Texas Department of Licensing and Regulation under 16 TAC Chapter 76 (relating to Licensing and Regulation of Water Well Drillers and Water Well Pump Installers) and all other locally application rules, as appropriate.

The other two (2) will remain in use by land owners until the quarry operations progress to within 100' horizontally from them At that time, they will be plugged as per the previously stated regulation.

FORM 0600 PERMANENT STORMWATER SECTION #52 - 3

Question 52 -3 - The WPAP does not appear to address the removal and disposal of the vegetation on the site.

As the quarry is enlarged, prior to stripping other areas, an earthen berm less than 6' high will be built in increments at locations shown on Exhibit 2 1 "Overall Site Plan of the Entire Quarry". Overburden soil will be placed over tree residual The berm shall then be compacted and vegetated with native grasses. Steps are as follows

1 Place silt fence on the down hill side of the proposed berm increment

2. Clear and burn trees and brush in accordance with the local Fire Marshall requirements or mulch Haul and place residual from the trees around the quarry perimeter. Cover with overburden soil as it is removed from areas to be quarried.

Said earthen berm shall be discontinued at drainage ways. Rock berms with silt fence on the downhill side (which allow drainage to flow through) will be placed at said drainage ways. See Exhibit 2.1 "Overall Site Plan of Entire Quarry".

FORM 0600 PERMANENT STORMWATER SECTION #52 - 4

Question 52 - 4 - Comments from the site assessment investigation (SAI): If the vegetation is to be mulched, how will composting that produces a reducing environment be prevented?

If mulching is used, composting will be mitigated by placing it in permanent berms as shown on the Exhibit 2.1 "Overall Site Plan of Entire Quarry".

FORM 0600 PERMANENT STORMWATER SECTION #52 - 5

Question 52 - 5 - Comments from the site assessment investigation (SAI): The WPAP does not appear to address the removal, relocation, and erosion control of the topsoil.

This answer was provided with the answer to question 52.3, but is restated as follows

As the quarry is enlarged, prior to stripping other areas, an earthen berm less than 6' high will be built in increments at locations shown on Exhibit 2 1 "Overall Site Plan of the Entire Quarry" Overburden soil will be placed over tree residual The berm shall then be compacted and vegetated with native grasses Steps are as follows

TCEQ-0602
Sequence of
Major Activities

TCEQ – 0602

TEMPORARY STORM WATER SECTION

Attachment C - "Sequence of Major Activities"

VULCAN MATERIALS MEDINA QUARRY

TCEQ-0602
ATTACHMENT C
"SEQUENCE OF MAJOR ACTIVITIES"

PLANT AREA

THE CONSTRUCTION OF THE QUARRY PLANT SITE WILL BE ACCOMPLISHED FIRST. THIS WILL INVOLVE THE FOLLOWING LISTED ACTIVITIES:

- CLEARING AND STRIPPING ON APPROXIMATELY 167 ACRES (OVER THE RECHARGE ZONE)
- ROUGH GRADING (CUT AND FILL) ON APPROXIMATELY 120 ACRES
- CRUSHING OPERATIONS IN SUPPORT OF CONSTRUCTION ACTIVITIES
- CONSTRUCTION OF WATER QUALITY BASINS ON APPROXIMATELY 2.7 ACRES
- CONSTRUCTION OF PAVED ROADS (APPROXIMATELY 1.25 ACRES) AND UNPAVED ROADS (APPROXIMATELY 13.5 ACRES)
- CONSTRUCTION OF RAIL SPURS ON APPROXIMATELY 6 ACRES
- CONSTRUCTION AND ERECTION OF QUARRY EQUIPMENT

QUARRY AREA

THE MINING OF THE QUARRY ON THE REMAINDER OF THE 1,776 ACRES WILL BEGIN NEAR THE EAST PLANT AREA AND PROGRESS IN ACCORDANCE WITH TCEQ-0584 WATER POLLUTION ABATEMENT PLAN APPLICATION, EXHIBIT 2 - "VULCAN MINING PLAN", AND EXHIBIT 2.1 - "QUARRY SITE PLAN", IN TCEQ-0584 AFTER ATTACHMENT B. OVER THE LIFE OF THE QUARRY, THESE ACTIVITIES WILL DISTURB APPROXIMATELY 1,070 ACRES.

Equipment Table
Form PI-1 Section VIII E 3

TABLE 17 ROCK CRUSHERS

1. Maximum Operating Schedule: 24 hours/day 7 days/week 52 weeks/year
   Does the facility operate at night? X Yes ____ No

2. Maximum plant production rates: 1500 tons/hour 8,500,000 tons/year

	Type (example. Cone)	Capacity(tons/hour)
a) Primary Crusher:	Impact	1500
b) Secondary Crusher(s):	Impact, Impact	61, 553
c) Tertiary Crusher(s):	Impact, Cone	300, 300

3. The following pieces of equipment will be controlled as shown:

Equipment	None	Water Spray	Suction to Baghouse	Other (Explain)
a) Feed Hoppers	X			
b) All Belt Transfer Points		X		AS NEEDED
c) Inlet of all Crushers		X		AS NEEDED
d) Outlet of all Crushers		X		AS NEEDED
e) All Shaker Screens		X		AS NEEDED

4. If water sprays are used, provide the following data:

   a) Total water rate to nozzles: 1-5 gal/minute
   b) Nozzle pressure: 40 psi
   c) Number of nozzles at each spray bar location (if variable, reference each item from above): 1 - 3

-OR- If baghouse is used, attach a Table 11 "Fabric Filters"

5. Average material moisture content: >1.5%

6. Stockpiles have the following controls: ____ None X Water ____ Chemicals

   Maximum acreage covered by stockpiles: 96.2 acres

7. In-plant roads will be: ____ Paved & Vacuumed ____ Paved & Swept ____ Oiled

   X Sprinkled with Water and/or Chemicals ____ Other:

8 Please provide the following information for all vehicles which travel on plant property

Vehicle Type	Speed	Weight (tons) Empty	Weight (tons) Full	No. of wheels	Distance Traveled per round trip (miles) Paved	Distance Traveled per round trip (miles) Unpaved
Haul Trucks (ex 777)	15	71	177	6		0.72
Loaders (ex 992)	15	105	126	4		0.10
Trailer Trucks	15	15	40	18	0.33	1 17
Tandem Trucks	15	12	24	12	0 33	1 17
Fuel Trucks	15	5	19.6	6	0 33	2 31

revised 1/4/94

TCEQ DOCKET NUMBER 2006-0816-AIR

APPLICATION OF	§	BEFORE THE
VULCAN CONSTRUCTION	§	TEXAS
MATERIALS, L P. FOR	§	COMMISSION
AIR QUALITY PERMIT NO 76337	§	ON
MEDINA COUNTY, TEXAS	§	ENVIRONMENTAL
RN104680905, CN600355465	§	QUALITY

EXECUTIVE DIRECTOR'S RESPONSE TO COMMENTS

The Executive Director of the Texas Commission on Environmental Quality (the commission or TCEQ) files this Response to Public Comment (Response) on the application for Air Quality Permit No 76337 and the Executive Director's preliminary decision

As required by Title 30 Texas Administrative Code § 55 156, before an application is approved, the Executive Director prepares a response to all timely, relevant and materia , or significant comments The Office of Chief Clerk timely received comment letters in response to public notice and oral comments at a meeting held in Hondo, Texas on April 6, 2006 This Response addresses all timely public comments received, whether or not withdrawn If you need more information about this permit application or the permitting process please call the TCEQ Office of Public Assistance at 1-800-687-4040. General information about the TCEQ can be found at our website at www tceq state tx us

BACKGROUND

Description of Facility

Vulcan Construction Materials, L P (Vulcan) applied to the TCEQ for a New Source Review Authorization under Texas Clean Air Act, Tex Health & Safety Code § 382 0518 This will authorize the construction of new facilities that may emit air contaminants The permit would authorize the construction of a rock crushing plant, consisting of five crushers, ten screens and associated equipment processing quarried limestone. The plant would be located near Rio Medina in Medina County, Texas The facilities will emit the following air contaminants particulate matter (PM) and volatile organic compounds (VOC)

Procedural Background

Before work is began on the construction of a new facility or a modification of an existing facility that may emit air contaminants, the person planning the construction or modification must

EXHIBIT
AR-7

obtain a permit or permit amendment from the commission The permit application was received on July 8, 2005 and declared administratively complete on July 18, 2005 The Notice of Receipt and Intent to Obtain an Air Quality Permit (public notice) for this permit application was published on August 4, 2005 in the *Hondo Anvil Herald*, in *Conexion* and *El Noticias* The Notice of Preliminary Decision and Notice of Hearing was published on June 22, 2006 in the *Hondo Anvil Herald* and in *Conexion* A public meeting was held on April 6, 2006 in Hondo, Texas The public comment period ended on July 24, 2006 On July 6, 2006, Vulcan requested that this application be directly referred to the State Office of Administrative Hearings (SOAH) SOAH took jurisdiction at a hearing held on September 12, 2006 in Hondo, Docket Number 582-06-2731, with the following persons named as parties Vulcan Construction Materials, L P , the Office of Public Interest Counsel of the TCEQ, the TCEQ Executive Director, and Medina County Environmental Action Association (MCEAA) Because this application was administratively complete after September 1, 1999, this action is subject to the procedural requirements adopted pursuant to House Bill 801, 76th Legislature, 1999

COMMENTS AND RESPONSES

AIR QUALITY ISSUES

Application and Draft Air Quality Permit

COMMENT NO. 1: The permit would only cover one aspect of the quarrying activities while other aspects are covered by other permits or not at all Quarries are not regulated by the state. (Bob Fitzgerald for MCEAA) Could the quarry operation continue when the temperature drops below 32 degrees? (Lester & Joyce Landrum)

RESPONSE NO. 1. The TCEQ's jurisdiction is established by the Legislature and is limited to the issues set forth in statute Accordingly, the TCEQ has jurisdiction to consider the rock crushing operation, but not other quarrying activities such as mining and blasting There are no temperature factors in a review of this type of application Further, the review does not take into consideration freezing of the water used for controls at the quarry If ground water is used, the water will probably be at a temperature much greater than 32 degrees, so all spray bars should be operational Vulcan would be responsible for having adequate water regardless of the ambient air temperature

COMMENT NO 2: Sulfur emissions from Vulcan's asphalt operation have negatively impacted his health and comfort Vulcan's trucks spill asphalt on the roads Vulcan claims to have a permit to operate 24 hours a day The asphalt operation produced a foul odor as a result of an explosion (William Rigby)

RESPONSE NO 2 The current application is for a permit authorizing construction of a Rock Crushing Plant, and the draft permit does not include any authorization for any asphalt operation

Vulcan's asphalt plant in Helotes, is not part of this application Vulcan obtained separate authorization for that plant since it is located in a different part of the county

COMMENT NO 3 How many rock crushers does the permit cover? (John Kennerly) What would be the exact location of the proposed rock crusher? (MCEAA, Lester Landrum) The permit application is deceptive because it lists Rio Medina instead of Quihi when Quihi is closer (Alyne Fitzgerald, Tom & Mary Walpole)

RESPONSE NO. 3: The draft permit would authorize one rock crushing plant consisting of five individual rock crushing facilities The rock crushing plant is proposed to be located on County Road 353 in Rio Medina, Medina County, Texas The application contains a plot plan which shows the where the various facilities will be located on the site It is the applicant's responsibility to list the appropriate address on the application, and it is the applicant's decision as to which community to list on the application if the proposed location is not within the limits of an incorporated city The commission relies on the latitude and longitude coordinates supplied by the applicant in its application to determine the precise proposed location of the plant and therefore naming "Quihi" or "Rio Medina" does not affect administrative or technical completeness determinations

COMMENT NO. 4: What would be the rock crusher's hours of operation? (Lester Landrum, Katherine Baxter). Are rock crushers operated after dark so that people cannot see the dust? (Katherine Baxter) Would the proposed rock crusher be allowed to operate on ozone action days? (MCEAA, Joe McKay) What would be the effect of the emissions on an air quality day, and what would the air quality be in surrounding areas? (Lynette Stewart) Concerned that the commission may issue the permit despite the existence of air quality days in San Antonio (Ray Wardwell)

RESPONSE NO 4: Vulcan has represented an operating schedule of 24 hours per day, 7 days per week and 52 weeks per year, operating after dark based on production decisions of the owner and operator Vulcan must comply with the terms of the permit all times, including if operating at night The VOC emissions will be 0 6 tons per year (tpy), and therefore the rock crushing plant is not a major source of emissions that could contribute to ozone formation Further, Medina County is attainment for ozone and is not part of the San Antonio Early Action Compact area Therefore, no contribution to ozone formation that would adversely affect the area is expected

COMMENT NO. 5: Vulcan should go beyond legal requirements and disclose data regarding water usage, utilize enclosures for emissions sources, consider background emission sources, conduct comprehensive modeling, and use air quality and moisture content monitors (Lilian Pietrusiewski for MCEAA)

RESPONSE NO 5 The TCEQ follows all applicable legal requirements and associated guidance for reviewing permit applications and issuing air quality permits Specifically, the commission does not prescribe controls but rather reviews the application to ensure the facility will use best available control technology The controls proposed by Vulcan in its application meet or exceed best available

Lynn M. Kitchen, Ph.D.
Principal Scientist

EDUCATION

B S	Wildlife and Fisheries Sciences	Texas A&M University	1976
M S	Range Science	Texas A&M University	1977
Ph D	Agronomy-Crop Science	University of Kentucky	1980

PROFESSIONAL BACKGROUND

Dr Kitchen is an environmental scientist with broad-based experience in various types of environmental studies. He has over thirteen years of experience in investigation of hazardous waste problems, with special emphasis on the interaction of pesticides in the environment In addition, Dr Kitchen has extensive experience in training and education and has served as an associate and assistant professor at two major universities He has managed numerous projects involving NEPA issues, environmental investigations of wetland areas, and threatened and endangered species.

Dr. Kitchen served as the project manager for the development of a Land Use and Management Plan for the natural areas owned by the City of San Antonio. He is currently preparing the Integrated Natural Resource Management Plan and associated EA for the Nellis Air Force Base and Range, comprising over 3.0 million acres of land Dr. Kitchen has served as project leader for preparation of environmental assessments for three international bridges on the U S.-Mexico border, including the Pharr-Reynosa International Bridge, the Los Ebanos-Gustavo Diaz-Ordaz International Bridge, and the Donna-Rio Bravo International Bridge. He has prepared Records of Environmental Consideration and EAs for various project projects at Ft. Bliss, Ft Sam Houston, and Nellis Air Force Base for the U.S. Army Corps of Engineers

Dr Kitchen has a great deal of experience in the delineation of wetlands and development of mitigation plans in Texas, Ohio, Mississippi, Louisiana, and Virginia He has successfully negotiated and obtained Section 404 permits and Nationwide permits in several locations across the U S He has a practical knowledge of the Clean Water Act and its impact on construction and other projects

Dr Kitchen has conducted enumerable projects involving the use of GIS and image analyses in the field of environmental science He lead a project at Kelly AFB to develop a GIS database for environmental issues encountered during the privatization of the base. He has used GIS to model vegetational communities,

AEI

predict recovery of ecosystems following impacts, soil remediation, remedial design, wetland delineation and mitigation design, and facility siting/management He developed a GIS model to be used by the City of San Antonio, to determine the potential level of sensitivity of natural resources in newly acquired lands and another model to assist land managers in determining the proper use of natural areas based on type of improvement and sensitivity of the environment

MEMBERSHIPS

Society of Wetland Scientists
Air and Waste Management Association

EXPERIENCE

NEPA ENVIRONMENTAL ASSESSMENTS

- Currently preparing the EA for the Integrated Natural Resource Management Plan for Nellis Air Force Base and The Nevada Test and Training Range
- Preparing the natural resources, water resource, and archeological sections of the EIS for the expansion of the San Antonio International Airport
- Assisting in the review and comment of an EIS prepared for the Surface Transportation Board for the construction of a new railroad to a proposed limestone quarry in Medina County, Texas
- Preparing the environmental section of a feasibility study for the construction of a new international bridge in Del Rio, Texas
- Preparing the EA for the construction of a new communications Squadron Facility in Nellis AFB, NV
- Preparing the EA for expansion of a landfill at the Tonopah Test Range south of Tonopah, NV
- Preparing the EA for the privatization of housing at Barksdale AFB, LA
- Prepared the EA for the construction of a shoppette at Fort Sam Houston in San Antonio, Texas
- Prepared an environmental assessment for the construction of a golf green in Paso Lajitas, Mexico
- Conducted field inspections and documentation for the FCC EAs for over 30 cellular antenna sites for several cellular telephone providers in Texas
- Reviewed the technical content of an Environmental Assessment prepared by the Air Force for the establishment of a red horse practice area at Kelly AFB in San Antonio, Texas
- Prepared a Limited Environmental Assessment for eight antenna sites for Houston Cellular to meet the requirements of an FCC license.

- Provided technical review of the Biological Assessment Section of the Environmental Impact for the privatization of Kelly AFB in San Antonio, Texas
- Prepared Environmental Assessments according to FCC requirements for 9 antenna sites for PrimeCo in New Orleans, Louisiana
- Prepared Environmental Assessments according to FCC requirements for over 140 antenna sites in Arkansas and Oklahoma for Southwestern Bell Communications
- Prepared a Record of Environmental Consideration for 6 solid waste management units at Ft Bliss prior to remediation for hazardous wastes Included investigation of wetlands, endangered species, and sensitive habitat - El Paso TX
- Prepared a draft EA for the Donna-Rio Bravo International Bridge - Donna TX (Project not completed due to lack of funding)
- Assisted in the preparation of the original environmental assessment for the construction of an International Bridge - Los Ebanos TX
- Prepared the revised EA for the Los Ebanos International Bridge to accommodate a change in the location of the bridge - Los Ebanos TX
- Prepared the environmental assessment for the Texas Department of Transportation and the General Services Administration for their facilities associated with the Pharr-Reynosa International Bridge - Pharr TX
- Assisted in the preparation of the original environmental assessment for the Pharr-Reynosa International Bridge on the Rio Grande River - Pharr TX
- Prepared the environmental assessment and assisted on the design of constructed wetlands for a low tech wastewater treatment facility at the DeAnda/Saenz Colonia near Mercedes, Texas
- Assisted in the development of a comprehensive city plan with a major emphasis on the environmental issues associated with the development of a river corridor These issues include wetlands, endangered species, water quality control, and other impacts on biotic components of the environment - Kerrville TX
- Provided biological monitoring services to ensure compliance of McCarthy Brothers Co to recommendations in the EA and FONSI for the Pharr-Reynosa International Bridge. Includes the restoration of a prior converted wetland into a wetland to collect stormwater from the bridge - Pharr TX
- Prepared the Biological Resources Section Application for Certification (EA) for an electric co-generation plant - Sacramento CA
- Conducted an aquatic/terrestrial biological survey to determine the impact of a release of unleaded gasoline from a pipeline on the biotic community - Gonzales TX

NATURAL RESOURCE AND PARKS PROJECTS

- Prepared an Integrated Natural Resources Management Plan to outline proper land management and resource conservation for Air Force personnel at Nellis Air Force Base, Nevada

- Primed the team that developed a Land Use and Management Guidance Document for approximately 5000 acres of natural areas recently acquired by the City of San Antonio under Proposition 3 The plan included the development of two GIS models to assist land managers in developing plans for the areas
- Assisting Brooks City-Base with the design of a detention pond system to include wetlands and streams as well as a nature trail environment for tenants at the facility in San Antonio, Texas
- Assisted with the preparation of a master plan for the improvement of the South Lions Skate Park
- Assisted with the preparation of a master plan for the improvement of the South Lions Park and proposed natural area
- Assisted Bexar Land Trust in the preparation of a baseline report for a conservation easement for a 404 acre property in Kendall County, Texas
- Assisted Bexar Land Trust in the preparation of a baseline report for a conservation easement for a 14 acre property in San Antonio, Texas
- Assisted Bexar Land Trust in the preparation of a baseline report for a conservation easement for a 150 acre property in Kendall County, Texas developed for the preservation of black-capped vireo and golden-cheeked warbler habitat
- Assisted in the preparation of the SAWS Retreat Center master plan in south Bexar County, Texas.

WETLAND AND ENDANGERED SPECIES PROJECTS

- Assisted in the field work and report preparation for monitoring of a wetland and stream mitigation site for 5 years at a landfill in Hancock County, Ohio
- Preparing a Section 404 Permit for the expansion of a landfill in Shreveport, LA
- Preparing a Nationwide Permit 39 for the construction of a shopping center in northwest San Antonio, Texas
- Conducted a surface water assessment for the improvement of Krelwald Road in Bexar County, Texas
- Prepared a biological assessment for Las Vegas Buckwheat and Las Vegas Bearpoppy on a 400 acres parcel of land for Nellis AFB in Nevada
- Prepared a Biological Monitoring report for Desert Tortoise during the construction of a target facility at the Nevada Test and Training Range north of Las Vegas, NV
- Conducted a wetland and stream assessment for a shopping center in Kyle, Texas Recommendations for avoidance allowed the shopping center to be constructed without the need for a Section 404 Permit.
- Prepared the Biological Assessment the Desert Tortoise for submission for a biological opinion for the USFWS for at Nellis AFB, NV

- Assisted the City of Stockdale in redesigning a flood plain in a manner that avoided impacts of waters of the U S and avoided the need for a Section 404 Permit
- Conducted initial assessment of surface waters through aerial photographs and GIS for a 100-mile pipeline for transmission of water from a collection site in Gonzales County, Texas to Northeast Bexar County for San Antonio Water System
- Currently conducting surface water assessments and delineations for preparation of a Nationwide Permit 12 for the installation of a 20-mile segment of the Gonzales County Carrizo Aquifer Program for San Antonio Water System
- Developed and designed the mitigation plan for the rechanneling of a stream by a developer in east Austin, Texas
- Assisted in the assessment of stream and wetland habitat potentially impacted by a new development on the banks of Lake Travis in Travis County, Texas
- Prepared the Nationwide Permit 3 for the repair and restoration of the San Antonio River at Brackenridge Park
- Prepared a Nationwide Permit 14 for road improvements in the Val Verde Estates subdivision in Del Rio, Texas
- Coordinated a survey and prepared a report for the U S Air Force on the impacts of military action on the desert tortoise, an endangered species potentially found on Nellis Air Force Base, Nevada
- Prepared the Section 404 Individual Permit and mitigation plan for construction of a shopping center in Kyle, Texas
- Currently preparing a Nationwide Permit 39 and mitigation plan for construction of a shopping center in Leander, Texas
- Prepared the application for a Section 404 Permit for the construction of a new landfill near Wilmot, OH Currently, the antidegradation report and mitigation plan are being developed for impacts to a stream and 11.8 acres of wetlands The project is currently in the final permitting phase and a mitigation plan involving the creation of about 7,000 ft. of intermittent stream and 17 4 acres of wetlands has been submitted to the USACE
- Prepared the Nationwide Permit 12 pre-construction notification and Section 401 Certification for the installation of a 12-mile long sewer line along a stream and river in Muskingum County, Ohio The alignment was subsequently changed and an amendment was prepared for the changes
- Assessed impacts to surface waters for the construction of a shopping center in northwest San Antonio, Texas The assessment resulted in design changes to prevent significant impacts and Section 404 permitting for the project
- Assessed a wetland and stream for the construction of a shopping center in Georgetown, Texas
- Assessed a stream for jurisdictional status for the construction of a shopping center in Laredo, Texas

- Investigated the causes of algal infestations and leakage of ponds located at the *Lajitas Resort in Lajitas, Texas*
- Prepared the Nationwide Permit 14 and endangered species assessment for the construction of a 3-mile road section in Northwest Bexar County for Bexar County The road crosses several ephemeral and intermittent streams
- Assessed a wetland adjacent to a landfill in Bedford, Ohio to avoid impacts that might require Section 404 Permitting.
- Prepared Nationwide Permit 3 notifications for 29 excavation/inspection sites for a pipeline for Colonial Pipeline Company in south Louisiana. The work included coordination with the New Orleans District of the U S Army Corps of Engineers, Louisiana Department of Natural Resources, and the U S Fish and Wildlife Service
- Prepared a Coastal Use Permit for a pipeline repair for Colonial Pipeline Company at a site on the southwest side of Lake Borgne near Shell Beach, LA The permit is *currently being reviewed*
- Prepared a Coastal Use Permit for a pipeline repair for Colonial Pipeline Company at a site on the north side of Lake Lery near Kenilworth, LA
- Prepared a Coastal Use Permit for a pipeline repair for Colonial Pipeline Company at a site on the south side of Lake Lery near Kenilworth, LA
- Prepared a Nationwide Permit 12 and endangered species assessment for the construction of a 2-mile sewer line for the Southside Independent School District in San Antonio, Texas The sewer line was to be bored under the Medina River
- Conducted a surface water assessment for the proposed construction of a park in Live Oak, Texas
- Conducted and endangered species (Golden Cheeked Warbler) and wetland assessment for the construction of a sports complex on the west side of San Antonio, Texas
- Conducted an Endangered species and surface water assessment for the proposed *site for construction of the Alamo Community College Northeast Campus*
- Prepared a surface water assessment for the rehabilitation of the San Antonio River at Brackenridge Park in San Antonio, Texas It was determined that no wetlands would be impacted by the project Construction along the river qualified for NWP-3 that allows for maintenance and repair activities along surface waters
- Conducted a wetland and endangered species assessment for a 2300 acre parcel of land on Padre Island approximately 15 miles north of South Padre Island Least tern habitat was observed and several issues identified including seagrass beds in Laguna Madre, coastal wetlands, coastal management zone, and jurisdictional areas below the mean high tide mark
- Conducted a wetland and endangered species assessment for the replacement of a pipeline crossing an unnamed tributary to Black River near Bovina, Mississippi The site was found to have no endangered species issues and fell under NWP-12 with no required notification

- Conducted a wetland assessment for a 480 ft guy wire antenna tower south of Port Isabel
- Conducted a wetland assessment and stream jurisdictional determination for a parcel of land on the northwest side of San Antonio for H-E-B Grocery Company
- Prepared a wetland delineation and Nationwide Permit 12 for the installation of a sewer line in Laredo, Texas
- Served as technical advisor for the design of a wetland stormwater treatment system and wetland mitigation plan for the construction of a power plant near Jackson, OH
- Conducted a wetland assessment and delineation for the construction of a retail grocery store in Friendswood, Texas Two small wetlands were found on the site and it was determined that the site qualified for a post construction notice under Nationwide Permit 39
- Conducted a wetland delineation for the expansion of a retail grocery store in Waco, Texas. A wetland was found on the site, but the wetland was determined to be potentially isolated and may not require permitting and a NWP-39 pre-construction notification was not required
- Conducted a wetland assessment for excavation and maintenance of a pipeline in Beaumont, Texas It was determined that the excavation would not impact or fill wetlands and a Section 404 Permit would not be required
- Assisted in the development of the wetland plant design for a 10-acre constructed wetland to be used for treatment of wastewater from the City of Lajitas, Texas The project is currently in the design phase and construction is expected to be completed by September 2001
- Conducted a wetland delineation for an 80 acre parcel of land near Krotz Springs, LA The site consisted of a matrix of small wetlands which were mapped using transects and eventually topographic analyses Specific mapping was used to locate an upland area for expansion of an oil refining facility
- Currently preparing a Section 404 Permit for the construction of a parking lot for the Veterans Administration Hospital in San Antonio, Texas Project involves filling of an ephemeral stream and compensation for impacts by enhancement of the existing stream channel
- Reviewed a wetland delineation prepared for the construction of a new store in Plano, Texas Found that an upland ditch had been improperly designated as jurisdictional waters of the U S Subsequently rewrote the wetland delineation to reflect changes
- Prepared a Section 404 permit for the Hancock County Landfill near Findlay Ohio The project included preparation of the Antidegradation Report and Section 401 Certification and development of a formal mitigation plan for construction of a new stream and 4 0 acre wetland The site is now in the 5-year monitoring phase for mitigation

- Delineated a 0 6 acre pond and prepared a report for the USACE to have a 1995 determination by the USACE to be extended for a future site of a grocery store The site is a well-developed urban area in Rockport, Texas and the client desires to fill the pond to allow for construction of the store and parking facility
- Conducted a wetland assessment and endangered species habitat survey (Black-Capped Vireo and Golden Cheeked Warbler) for a 1000-acre ranch near Canyon Lake, Texas
- Preparing the Section 404 Permit for the rechanneling of Chippewa Creek near a Type IV landfill in Cleveland, Ohio The project is currently in the pre-application phase
- Conducted a Golden-Cheeked Warbler/Black-Capped Vireo habitat assessment for a 1000-acre ranch near Canyon Lake, Texas
- Developed a GIS model to predict the establishment of new wetlands around a proposed reservoir in King William, Virginia. Data was collected from established reservoirs in the area and used as a basis for the model
- Assisted in the design and construction of a treatment wetland system at a carbon black plant near Addis, LA The system was used to treat sewage originating from bathrooms and showers in the plant
- Delineated wetlands and determined level of damage caused by the release of sediments from a newly constructed landfill at Stewart Air National Guard Base in Newburgh, New York
- Conducted a field reconnaissance to determine if a proposed pipeline to be installed by the San Antonio Water System would impact waters of the U S. or if construction might require Section 404 Permitting The project included documentation of vegetation communities associated with the impacted riparian areas and methods used to avoid and/or mitigate impacts
- Conducted a wetland delineation for an electric cogeneration plant and associated pipeline for a confidential client in Geismar, Louisiana
- Prepared a report to determine the status of a wastewater treatment lagoon as jurisdictional waters of the U S for a confidential client in Terra Haute, Indiana
- Assisted in designing a constructed wetland for treatment of wastewater from East Central High School in Bexar County, Texas
- Prepared a wetland delineation report and Nationwide Permit 26 for the Hancock County Landfill Expansion project near Findlay OH
- Prepared a wetland delineation report and Section 404 permit application for the Franklin County Landfill Expansion near Columbus OH
- Prepared a wetland delineation report and Section 404 permit for expansion of a water supply plant near Akron OH Developed a mitigation banking site for compensation of lost wetland acreages associated with the water supply plant expansion

- Prepared a Section 404 Permit and wetland delineation for the construction of a paint shop for Ford Motor Company in Lorain County, OH
- Conducted wetland field reconnaissance study for a land parcel to be acquired by Abbott Laboratories - Columbus OH
- Provided technical assistance in the development of a remedial design for contaminated wetlands for an industrial client - Jackson MS
- Assisted in a wetland field reconnaissance study for a wastewater pump station to be constructed for the City - Houston TX
- Provided biological monitoring services to ensure compliance of McCarthy Brothers Co to recommendations in the EA and FONSI for the Pharr-Reynosa International Bridge. Included the restoration of a prior converted wetland into a wetland to collect stormwater from the bridge - Pharr TX
- Audited pipeline, well, and compressor facility documentation for a client to determine if the sites were in compliance with Section 404 Permitting regulations of the Clean Water Act - Tuscaloosa County AL
- Assisted the Jackson Office of Malcolm Pirnie by reviewing a wetland delineation and EPA wetland mitigation opinion for a Superfund site - Columbia MS
- Conducted a wetland field reconnaissance study for GATX to locate potential wetland areas on a facility location Completed a wetland assessment followed by a delineation for the Metropolitan Transit Authority - Houston TX.
- Conducted a habitat survey for Black-Capped Vireos and Golden-Cheeked Warblers, two federally endangered species, for a confidential client in San Antonio TX

ENVIRONMENTAL SITE ASSESSMENTS

- Prepared the Affected Property Assessment Report and Response Action Completion Report for the cleanup of an industrial facility in San Antonio, Texas The facility was contaminated with lead and nickel The reports are currently under review by the TCEQ
- Provided technical support and research for litigation and mediation over the cleanup of an office furniture painting facility in San Antonio, Texas Work included review of the Affected Property Assessment Report and other historic documents pertinent to the case.
- Prepared an ESA for the purchase of a gas collection and compressor facility near Moore, Texas
- Prepared a Phase I and Phase II ESA for a commercial building/warehouse on Rittiman Road in San Antonio, Texas The Phase II report included soil sampling and analyses, coordination of a mold survey, and working with the TCEQ for regulatory assistance and file review
- Collected and analyzed soil samples near a mercury mine near Terlingua, Texas

- Prepared ESAs for two pesticide storage facilities in Dallas and Oklahoma City for a confidential client
- Conducted the field investigations for the preparation of NEPA/Section 106/Phase I Site Assessments for over 30 cellular antenna sites in central Texas
- Prepared an ESA for the acquisition of an adhesives facility for Arlon Adhesive and Films in Dallas, Texas The ESA included a cursory environmental audit and a Phase II study which found a small, isolated area of soil contaminated with toluene
- Managed a project that conducted an environmental compliance audit of a canning facility located in Crystal City, Texas
- Managed the preparation of an environmental site assessment and asbestos survey of a property located in San Antonio, Texas for the United Services Automobile Association The project also included a limited Phase II ESA to determine if fill material contained any petroleum hydrocarbons or RCRA Metals
- Prepared an environmental site assessment for two separate housing projects to be constructed in Eagle Pass, Texas
- Prepared an ESA for a golf course near Canyon Lake, Texas
- Prepared an ESA, wetland assessment, and endangered species study (Golden-Cheeked Warbler/Black-Capped Vireo) for a 1000-acre ranch near Canyon Lake, Texas.
- Prepared an ESA for a housing project in Cotulla, Texas
- Project manager for preparation of 11 ESAs for potential land acquisitions for the San Antonio Water Systems in Medina and Bexar Counties, Texas
- Assisted in the preparation of an ESA for San Antonio Water Systems for a 100-ft buffer around Mitchell Lake south of San Antonio, Texas
- Prepared an Environmental Compliance Audit and Environmental Site Assessment for a printing company building in Oklahoma City, OK
- Prepared environmental site assessments for 140 antenna sites for Southwestern Bell Communications in Arkansas
- Prepared environmental site assessments for 9 antenna sites for PrimeCo in New Orleans, Louisiana
- Project leader for selection of an environmentally feasible site for a multi-modal transportation terminal for the Municipal Planning Organization - San Antonio TX
- Assisted in the preparation of an environmental audit for two properties potentially acquired by Wendy's, Inc - San Antonio TX
- Prepared a property transfer audit for the U S General Services Administration Customs and Immigration Facilities associated with the Pharr-Reynosa International Bridge - Pharr TX
- Conducted a Site Assessment for the Harlandale Independent School District for the acquisition of 20 acres for an athletic facility - San Antonio TX

- *Conducted a Site Assessment for a multilevel building for Kinetic Concepts, Inc* - San Antonio TX

GIS PROJECTS

- Created two models for assisting the Parks and Recreation Department of the City of San Antonio to use as a decision-making tool for developing land use and management plans for natural areas owned by the city
- Developed a GIS database for the environmental and safety management of Air Force properties being transferred to commercial businesses at Kelly AFB Currently, the soil management portion of the database is complete and the asbestos and safety databases are being developed and programmed in ArcView and Access 97
- Preparing a GIS database to inventory, model, and spacially locate plant communities on the Government Canyon State Natural Area near San Antonio, Texas using currently available maps and satellite imagery/ground truth data
- Used GIS to map the project site and design a rechanneled stream and 6 7 acre wetland for mitigation required by a Section 404 Permit at the Hancock County Landfill near Findlay, OH Work included developing a 3-D model to assist in estimating the watershed to provide surface water for the wetland mitigation site
- Used GIS to map geological and biological features for a 21,000-acre property around Lajitas, Texas for use in land resource management
- Developed a GIS model to predict the establishment of new wetlands around a proposed reservoir in King William, Virginia Data was collected from established reservoirs in the area and used as a basis for the model
- Used GIS to assist in modeling groundwater response to environmental conditions and pumpage rates for three aquifers in Kendall County, Texas using *ArcView*
- Mapped and determined correlations and potential causes of incidences of high lead concentrations in the blood of adults and children in Bexar County using *ArcView*
- Determining the high-risk area for the establishment of mosquito-borne diseases in Bexar County, Texas using *ArcView*
- Assisted in preparing spacial maps illustrating the establishment of sunflower plant communities in a wetland complex in south Texas
- Served as Task Leader to use GIS mapping techniques in the siting of a landfill for the City of San Antonio TX GIS was used to integrate public opinion and technical criteria to determine the desirable sites for landfill siting
- Provided GIS training (ArcView) for employees at Operational Technologies, Inc in San Antonio, Texas.
- Prepared a report to determine the feasibility of providing solid waste collection and transport services for unincorporated areas of Bexar County GIS mapping techniques were used in determining waste centroids, transportation costs, and overall collection costs

- Used GIS to prepare the action plans for the remediation of hazardous waste spills at service centers operated by Bexar County Mapping techniques were used to delineate contaminated areas and estimate costs for various risk reduction scenarios
- Mapped and documented contaminant levels associated with a vehicle maintenance facility in Midland, Texas using ArcView
- Documented excavation and cleanup activities using GIS at a vehicle maintenance facility in New Orleans, Louisiana
- Using ArcView, prepared a grid base map and database for documentation of the contaminant levels and remediation of a jet parking and fueling area at Laughlin Air Force Base near Del Rio, Texas
- Used ArcView to rectify an aerial map and document the level of carbon tetrachloride in monitoring wells for groundwater modeling for a vehicle maintenance facility near Creola, Alabama
- Delineated concentrations of various chemical constituents located in a solid waste unit at Ft Bliss, El Paso TX. GIS mapping techniques were used to map and inventory the contaminated areas
- Used GIS mapping techniques to develop a remedial action plan for the Mississippi Department of Transportation on a site used for the expansion of U S Highway 61, in Tunica County, MS Various pesticides contaminated the site
- Used GIS mapping techniques to delineate areas contaminated by various petroleum products due to a leaking pipeline at a petroleum plant in St Gabriel LA
- GIS was used to delineate wetlands and to determine and site a mitigation project in Akron OH
- Used GIS mapping techniques to locate and assess wetlands located on the site of a future landfill in Wilmot OH Functional values and attributes of the wetlands were calculated, stored and illustrated using GIS The watershed and storm volume feeding proposed wetlands was determined using ArcView

SOLID WASTE PROJECTS

- Prepared bid documents and contracts for solid waste collection and transport for The Woodlands TX.
- Conducted a wetland impact investigation for runoff from a landfill at Stewart Air National Guard Base in New Jersey
- Project leader for the solid waste screening study for Montgomery County which was used to supplement future solid waste planning activities in Subregion I of the Houston Galveston Area Council
- Preparing the Section 404 Permit for the rechanneling of Chippewa Creek near a Type IV landfill in Cleveland, Ohio The project is currently in the pre-application phase

- Task leader for the award winning site selection project for a Regional Environmental Enterprise Zone (including a 1000-acre landfill) using GIS Mapping and other techniques - San Antonio TX Also assisted in the development of the conceptual design of the facility
- Project Leader for the development of a solid waste collection and transport feasibility study for the unincorporated areas of Bexar County TX
- Project leader for the delineation of wetlands, preparation of the Section 404 Permit, preparation of the Section 401 Certification Antidegradation Report, and design of a mitigation plan for construction of the Ridge Landfill near Wilmot, Ohio Approximately 38 acres of wetlands and deep water habitat were evaluated and delineated for this project
- Prepared a wetland delineation report and Section 404 Permit for the Hancock County Landfill Expansion project near Findlay OH
- Prepared a wetland delineation report and Section 404 Permit application for the Franklin County Landfill Expansion near Columbus OH
- Prepared a wetland and riparian community delineation report, Section 404 Permit application, and Section 401 Certification Application and Antidegradation Report for the rechanneling of a stream adjacent to the Hancock County Landfill Expansion project near Findlay OH The project includes the construction of a new streambed and a 6 7 acre wetland for mitigation
- Served as project leader for the development of an environmental training curriculum and associated courses for the Lower Colorado River Authority, Austin TX The curriculum includes extensive training in solid waste management, procedures, and regulations
- Project leader for preparation of the Regional Solid Waste Management Plan for the Alamo Area Council of Governments - San Antonio TX

HAZARDOUS WASTE PROJECTS

- Project leader for the cleanup of an industrial site in San Antonio, Texas following corrective action The site was contaminated with petroleum hydrocarbons, lead, nickel, and chromium. The APAR and RACR have been completed for the site are currently being reviewed by the TCEQ
- Reviewed and audited environmental records for HEB Grocery Stores in Texas
- Prepared 11 different Integrated Contingency Plans for the Greater Kelly Development Corporation, EG&G-MSSA, and other tenants at Kelly AFB
- Project leader for the preparation of an environmental compliance audit for the Silgan Plant in Crystal City, Texas
- Reviewed and rewrote the SPCC Plan and Pollution Prevention Plan for GKDC at Kelly AFB

- Project leader for a site audit and remediation for the property transfer of a sand mine near Brady, TX
- Project leader for an environmental compliance audit of all Bexar County Public Works Service Centers The audit concentrated on Right-To-Know, Hazard Communication, hazardous waste and material handling and storage, air quality, stormwater, and other environmental issues - San Antonio TX The project is currently entailing remediation of historic spills. GIS is being used to delineate areas of excavation and estimate remediation costs
- Prepared a Record of Environmental Consideration for 6 sites prior to remediation for hazardous wastes Includes investigation of wetlands, endangered species, and sensitive habitat - El Paso TX
- Providing technical assistance in the development of a remedial design for contaminated wetlands for an industrial client - Jackson MS
- Conducted an aquatic/terrestrial biological survey to determine the impact of a release of unleaded gasoline from a pipeline on the biotic community - Gonzales TX
- Provided technical review for a project determining the unit costs, application rates, categorization and substitution of various pesticides used for urban pest control in New York City - New York City Water Board, NY
- Assisted the Jackson Office of Malcolm Pirnie by reviewing a wetland delineation and EPA wetland mitigation opinion for a Superfund site - Columbia MS
- Assisted in summarizing information for a remedial investigation report for a multi-site UST project for the Texas Natural Resource Conservation Commission - South Texas
- Assisted the environmental group in Albany, NY on a remediation project for PCB contaminated dredge material and soil from the Hudson River The project is determining a method to model and subsequently minimize the potential hazards developing from PCB contaminated dredge material that will be stored in a containment area near the river - Albany NY
- Assisted in writing remedial investigation report for a UST project on Durango Street Conducted field sampling and managed data and report writing for an industrial/UST site in downtown San Antonio TX
- Project leader for selection of an environmentally feasible site for a multi-modal transportation terminal for the Municipal Planning Organization - San Antonio TX.
- Conducted a Site Assessment for a multilevel building for Kinetic Concepts, Inc - San Antonio TX

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2 Kitchen, L M , C E Rieck, and W W Witt 1980 Absorption and translocation of ^{14}C fosamine in three woody species Weed Research 20 285-289

3 Kitchen, L M , W W Witt, and C E Rieck 1981 Inhibition of chlorophyll accumulation by glyphosate Weed Sci 29 513-516

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9 Godley, J L and L M Kitchen 1986 Interaction of acifluorfen with fluazifop for annual grass control Weed Sci 34 936-941

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14 Griffin, J L , B J Hook, R S Peregoy, and L M Kitchen 1990 Emergency and yield of 2,4-D treated seed cane J Am Soc Sugarcane Technol 10 56-60

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3 Vidrine, P R , J L Griffin, R L Rogers, L M. Kitchen, and E.J. Retzinger 1989 Antagonism associated with Graminicide-broadleaf herbicide tank mixtures Louisiana Agricultural Experiment Station Bulletin No 810 14 pages

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