



STATE OF TENNESSEE
TENNESSEE DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING SECTION
6601 CENTENNIAL BOULEVARD
NASHVILLE, TENNESSEE 37243-0360

February 17, 2009

Mr. Tom Love, Transportation Mgr. 1
Environmental Planning
9th floor – James K. Polk
505 Deaderick Street
Nashville, TN 37243

RE: Project No. 05097-1226-04
Pin No. ~~104213.00~~ *101423.00 DHD*
Pellissippi Parkway Extension (SR-162) from
SR-33 to SR-73 (321) alternates A, C, and D
Blount County

Dear Mr. Love:

Enclosed is the Geotechnical Report on the above project.

If additional information is needed, please advise.

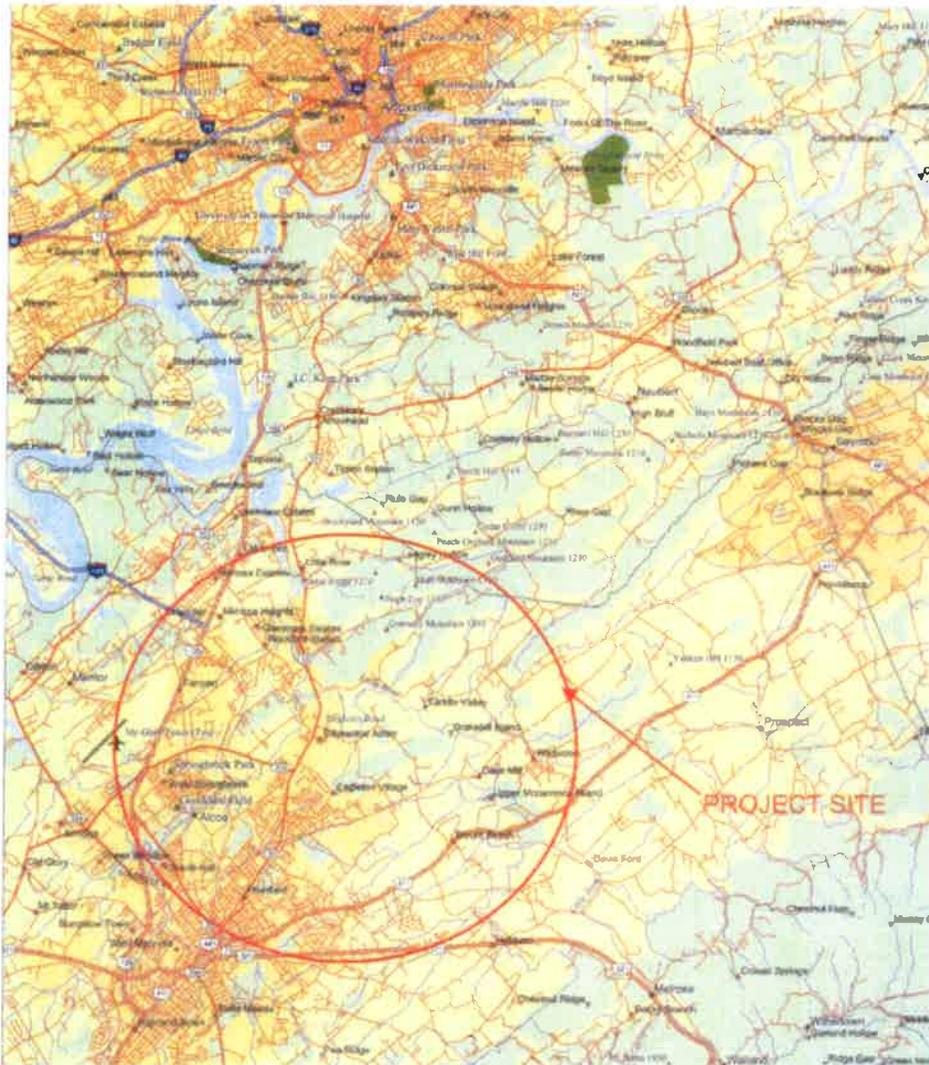
Sincerely,

M. Leonard Oliver, P.E.
Civil Engineering Manager 2

MLO:CJW
Enclosure

cc: Harry Moore

GEOLOGICAL REPORT
PRELIMINARY
PELLISSIPPI PARKWAY EXTENSION (SR-162)
FROM SR 33 TO SR73 (321)
ALTERNATES A, C, AND D
STATE PROJECT NO. 05097-1226-04
PIN NO. ~~104213.00~~ *101423.00 OHJ*
BLOUNT COUNTY



**PRELIMINARY GEOLOGIC REPORT
PELLISSIPPI PARKWAY EXTENSION (SR 162)
FROM SR 33 TO SR 73 (US 321), BLOUNT COUNTY (ALTERNATES A, C, & D)**

**PROJECT NO. 05097-1226-04
GES FILE NO. 0505508
PIN 1014213.00**

EXECUTIVE SUMMARY

A Preliminary Geologic Report has been prepared to address the proposed Pellissippi Parkway Extension (SR 162) project in Blount County. The extension will connect the Parkway's present terminus at SR 33 (Old Knoxville Highway/Maryville Pike) with SR 73 (US 321/East Lamar Alexander Parkway). Three options are being considered for the extension of Pellissippi Parkway. Limited field inspections of the three Alternate Routes (A, C, and D) were conducted by driving reconnaissance in December 2008 and January 2009. Functional plans and various maps were also referenced during the desktop phase of the study. A figure illustrating the proposed Alternate Routes is provided in the attachment.

Topography varies considerably throughout the project site, ranging from nearly level to steeply rolling terrain, and will require the implementation of cut slopes and fill embankments where appropriate in order to construct the proposed roadway. The cuts and fills will require consideration upon selection of the final alignment. They are assumed to be generally minor to moderate in height and thickness, respectively, although more substantial cuts are expected in the steepest terrain.

Based on the results of the preliminary geologic study, there do not appear to be any significant geotechnical issues that can not be addressed during the design or construction phases of the proposed project.

**PRELIMINARY GEOLOGIC REPORT
PELLISSIPPI PARKWAY EXTENSION (SR 162)
FROM SR 33 TO SR 73 (US 321), BLOUNT COUNTY (ALTERNATES A, C, & D)**

**PROJECT NO. 05097-1226-04
GES FILE NO. 0505508
PIN 1014213.00**

INTRODUCTION AND BACKGROUND

Pursuant to a request received by the Geotechnical Engineering Section from the Environmental Planning Office, the Preliminary Geologic Report presented herein has been prepared to address the proposed Pellissippi Parkway Extension project and the three associated Alternate Routes under consideration. Limited field inspections of the proposed roadway alternates were conducted by driving reconnaissance in December 2008 and January 2009. Functional plans and geologic and topographic maps were utilized as sources of information.

Alternate A is the western-most of the three alignments, and it is generally parallel with the first half or so of Alignment C, from their common origin to a point of divergence just south of Wildwood Road. Both of these alternates are proposed four-lane divided routes with 300-foot Rights of Way. The alignments are generally cross-country, with variable areas of residential and commercial development being encountered, and follow no particular existing roadway. Several roadways intersect these proposed alignments.

Alternate D is the eastern-most alignment, with its origin located further north of the other two alternates. It is a proposed two-lane arterial route with 150-foot Right-of-Way. Alternate D initially follows the general route of the existing Sam Houston School Road, with a southern departure at Wildwood Road and subsequent intermittent

overlap with both Peppermint Road and Hitch Road. A very brief overlap is shared with Alternate C, immediately north of Davis Ford Road. The alignment is partially cross-country, with some residential and commercial development being encountered. Several roadways intersect the proposed alignment.

A fourth alignment, Alternate B, was previously proposed as an additional, eastern-most alternate. However, according to the design consultant, it was dismissed from further consideration and is not discussed in this report. A figure illustrating the proposed Alternate Routes is provided in the attachment.

GEOLOGY AND SITE CONDITIONS

The proposed project site is located within the varied topography of the Valley and Ridge Physiographic Province, in the north central portion of Blount County. The regional topography is dominated by alternating linear valleys and ridges that strike generally northeast to southwest. Topography within the project area ranges from rolling to hilly terrain, and from nearly level to moderately steep slopes. Much of the project area is underlain by grass-covered fields, and to a lesser extent wooded areas, with varying degrees of residential and commercial development throughout.

The Little River is located to the east-northeast of the project area, and drains a considerable portion of the regional area.

Geologic data were derived from the site investigation and from review of available geologic maps. Geologic mapping indicates that the proposed project vicinity is underlain by limestone and dolostone to calcareous shale and clastic shale bedrock. The geology of the area is relatively complex, with a number of minor and major thrust

faults being present, resulting in the repetition of several geologic formations at the ground surface.

Residual soils developed from weathering of the underlying geologic parent materials range in thickness from a thin mantle cover to a relatively thick layer of several feet. Additionally, karst topography with sinkhole features is present within the project area. A review of topographic mapping indicates a few areas of sinkholes that could possibly impact the proposed alignments. It must be noted that sinkholes may be encountered during construction of any of the alternate routes.

The greatest number of mapped sinkholes is located along SR 35/US 411 (Sevierville Road), from east of Davis Ford Road to east of Hitch Road, and primarily to the south of Sevierville Road. Short segments of all three alternates could possibly be affected by the presence of sinkholes in these areas.

A smaller number of mapped sinkholes is present along the northern half of Peppermint Road, which could affect a short segment of Alternate D.

A large sinkhole is mapped on the north side of Brown School Road, near its eastern intersection with Wildwood Road. The concurrence point of Alternates A and C lies within this sinkhole, and flooding was observed during a field reconnaissance in early January 2009 (further discussed below). Periodic flooding in this area may be an issue in the evaluation of these alternates. Areas of mapped sinkholes of potential interest to the project are tentatively defined in Figure 1 (attached).

Vegetation along the proposed alignments ranges from grass cover to wooded areas. Several small streams are located along the alignments, with generally shallow banks with light to moderate vegetation. A number of small ponds are present, with a few being located within the limits of the proposed alignments.

The greatest cuts are expected at the beginning of Alternates A and C, particularly within the ridge located west of Old Mount Lebanon Road and east of Jackson Heights Road. Moderate to steep cuts may be encountered throughout these alignments, with less steep cuts being anticipated along Alternate D. Minor to moderate fills are also to be expected.

RECOMMENDATIONS

As is conventional practice, a subsurface investigation program with auger drilling and potential core drilling should be conducted along the finalized alignment.

The topography encountered along each of the proposed alignments is varied, and a range of minor to moderate cuts and fills are anticipated.

Although no specific areas of unstable ground were observed, there is always the potential for slope stability problems to exist throughout the proposed alignments, both in soil and in rock. Detailed evaluation of the actual slope conditions, particularly within cut slopes in steep rocky terrain, will be necessary prior to determination of actual stability analyses and slope geometry. However, it appears that any slope stability problems, should they exist, may be addressed either during the design phase or the construction phase of the finalized alignment. Cut slopes in soil and rock that are anticipated to be higher than about 30 feet in elevation should be considered as candidate slopes for benching.

Limited areas of flooding were observed immediately north of East Brown School Road during a field reconnaissance in early January 2009. The flooded area involved the centerline of Alignments A and C at their concurrence point, both left and right of centerline. The flooding was due to the extensive and significant rainfall events that

occurred prior to January 9 across the region. The potential for flooding in the future should be considered as these alignments are being evaluated. In addition, several small streams and a few ponds throughout the project area will require consideration.

If further information is needed regarding the soil and geologic conditions along the proposed roadway alignments, please contact the Region I Geotechnical Engineering Office.



George E. Sutton, Jr., PG
Geologist 3



Harry Moore, PG
Transportation Manager 1



M. Leonard Oliver, PE
Civil Engineering Manager 2

GS:kw
January 26, 2009

FIGURES

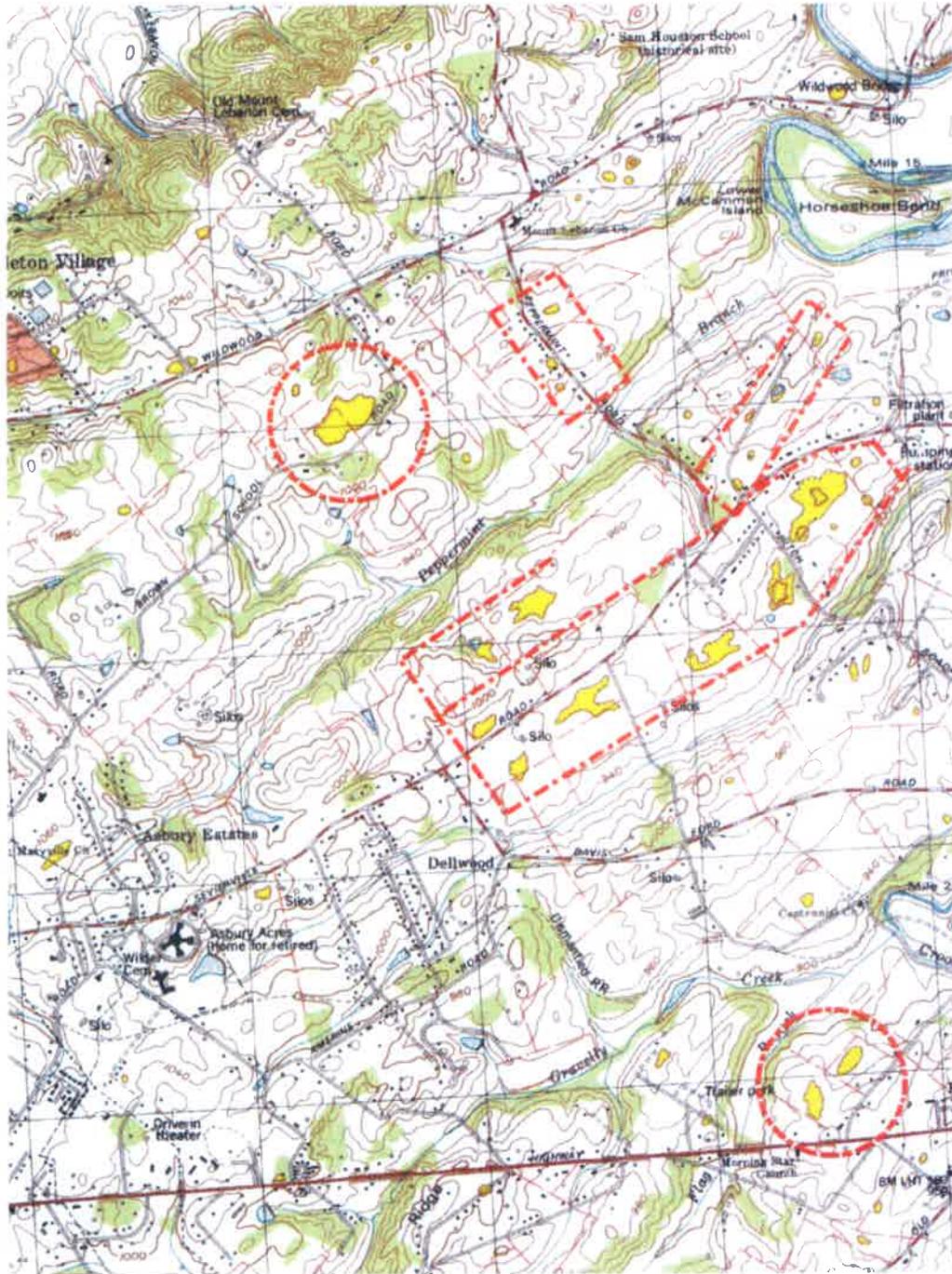


Figure 1: Sinkholes (in yellow) of potential interest to the project. Areas of karst are generally outlined with dashed red lines (from USGS 7.5-minute Maryville Quadrangle).

FIGURES



Figure 2: Area of flooding northwest of East Brown School Road, just west of its intersection with Talbott Lane.



Figure 3: Enlargement of area of flooding shown in Figure 2.

FIGURES



Figure 4: Relatively flat to gently sloping meadow, southeast of East Brown School Road, west of Talbott Lane (viewing opposite direction from Figure 2).



Figure 5: Typical rolling topography, viewing northwest from Wildwood Road at East Brown School Road intersection.