

NATURAL ENVIRONMENTAL ANALYSIS

NATIONAL FREEWAY - U.S. ROUTE 48
SECTION I

WOLF MILL to M.V. SMITH ROAD

CONTRACT NO. A 519-033-619
F.A.P. NO. A PD 155-1(42)



Maryland Department of Transportation
STATE HIGHWAY ADMINISTRATION

BUREAU OF LANDSCAPE ARCHITECTURE

Natural Environmental Analysis

U.S. Route 48

National Freeway

East of Cumberland to M.V. Smith Road

Contract No. A 519-000-672

Maryland Department of Transportation
State Highway Administration
Bureau of Landscape Architecture
Environmental Section
March 1, 1980

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INTRODUCTION

The National Freeway is an integral part of the Appalachian Regional Development Program, authorized by Congress in 1965. The law which authorizes the Appalachian Regional Development, administered by the Appalachian Regional Commission, is a comprehensive redevelopment law containing a mandate and supporting appropriators to provide and upgrade basic infrastructure needs of the area including transportation (Appalachian Development Highway Program), utilities, and site improvements for development of industry, housing, or medical support facilities. Section I begins at Wolfe near Maryland Route 395, and runs to the existing reconstructed portion at M.V. Smith Road on Green Ridge Mountain.

This report presents the findings of an environmental analysis within the study area from Cumberland to Green Ridge contained within Allegany County. The analysis consists of a compilation of the study area's natural and physical resources and a comprehensive evaluation of the environmental impacts anticipated from the proposed project, as required by the National Environmental Policy Act of 1969 and the Maryland Environmental Policy Act of 1973.

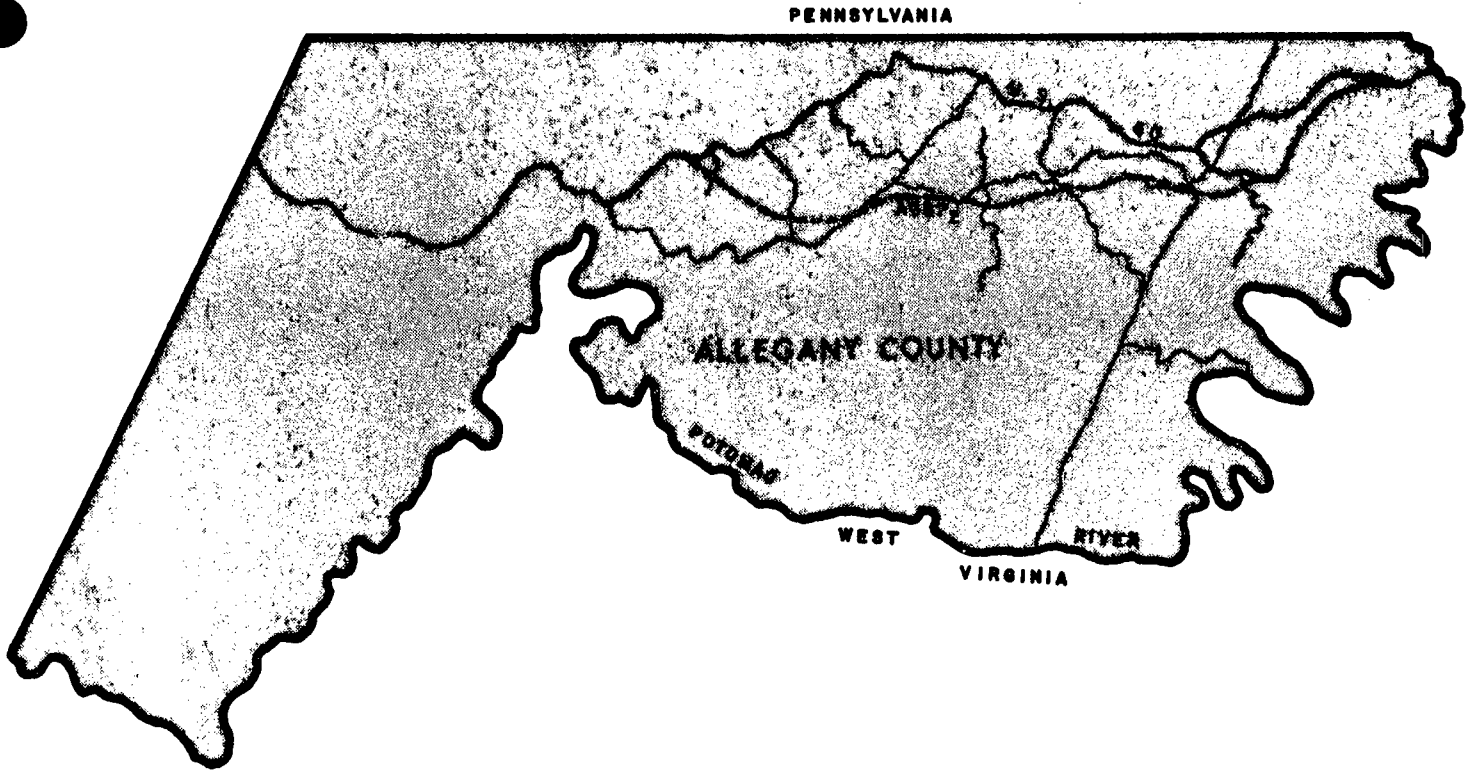
The main study areas for the project are within the Warrior-Evitts Mountain and the Sideling Hill Town Creek watersheds; the north-south boundaries are the Maryland State line and the Potomac River, a distance varying from 7 to 12 miles. The east-west limits, Evitts Creek and Green Ridge, are approximately 12 miles apart. Figure 1 shows the general location of the project area.

DESCRIPTION OF ALTERNATE

The proposed alternate for construction in Section I of the National Freeway is line AGBF₂. Beginning with an interchange at Wolfe Mill, AGBF₂ continues east along existing US 40 to an interchange with US 220. The alternate then turns southeasterly, crosses Jeffries Road, Irons Mountain between Big Knob and Little Knob, Collier Run, and then continues east along the southern edge of Bush Ridge. AGBF₂ then crosses Williams Road and roughly parallels Williams Road before crossing it again on Warrior Mountain. The proposed route then proceeds basically due east across Town Creek, Boyer Knob on Polish Mountain, through the Green Ridge State Forest linking up with Route 40 on the east side of Green Ridge at M.V. Smith Road.

A dual highway with twelve-foot lanes, outside shoulders of ten feet and a median of 58 feet is being considered. Access will be allowed only at interchanges.

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**LOCATION
MAP**

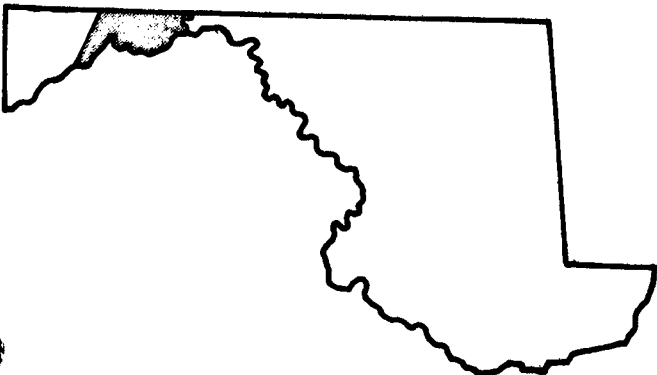
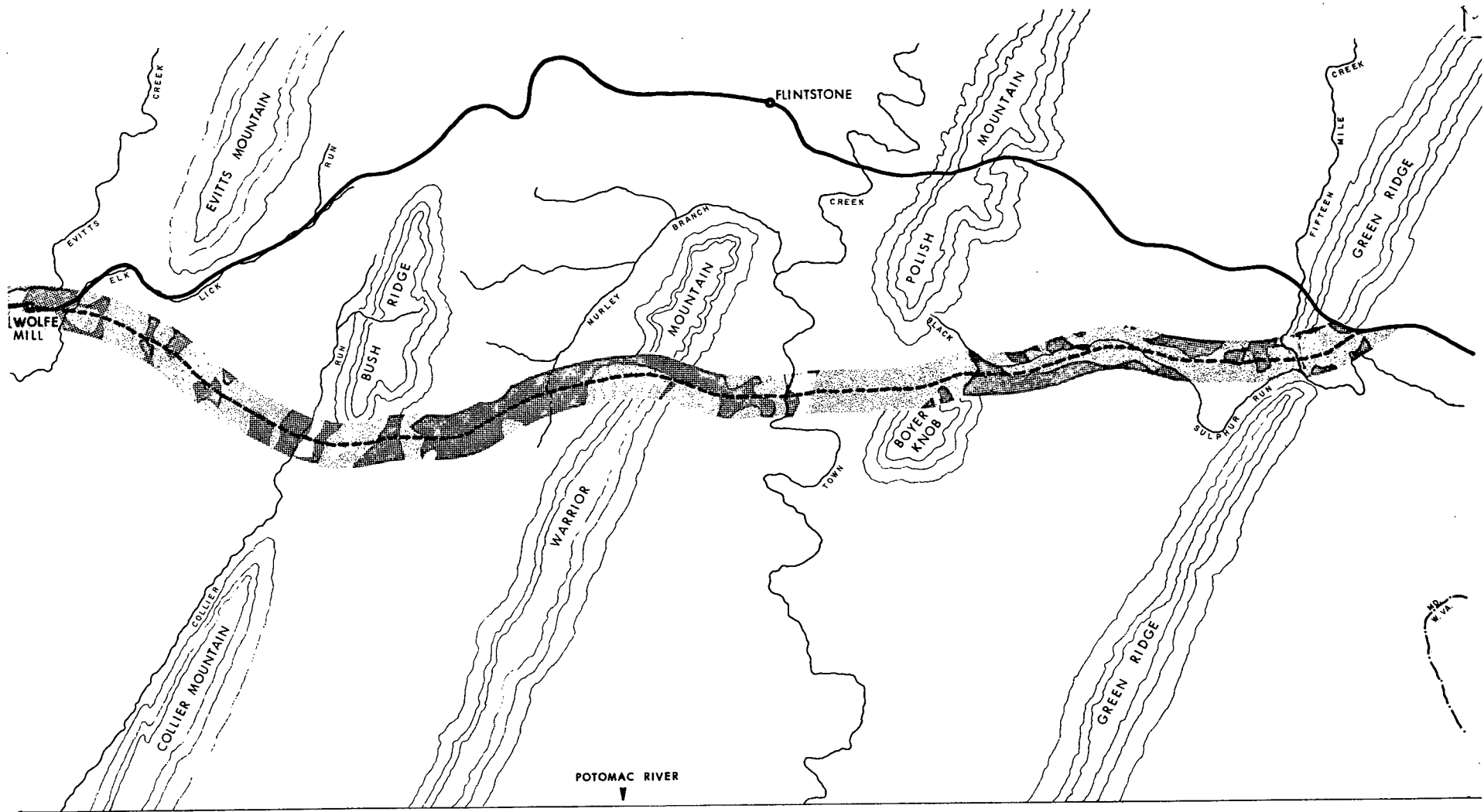
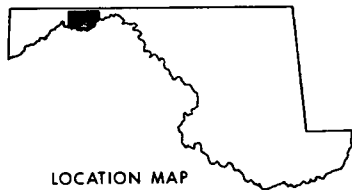


Figure 1
-4-







TOPOGRAPHY AND SLOPE MAP



LOCATION MAP

SLOPE LEGEND

-  3-10%
-  10-20%
-  20% and OVER
-  AGBF₂

SCALE - 1" = 1 MILE

FIGURE - 2

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AFFECTED ENVIRONMENT

1. Physiography Route 48

Geographically, this section of U.S. 48 is located in north central Allegany county with its east-west axis connecting Cumberland with M.V. Smith Road at the Green Ridge State Forest. This area of Western Maryland is considered the Valley and Ridge section of the Appalachian Highlands. The Valley and Ridge Section consists of synclines and anticlines which were formed (Figure 2) during the Tertiary period approximately 7 to 65 million years ago. These northeasterly trending ridges and valleys have been created by geologic folding and erosional processes.

Most of the corridor is drained by the Potomac River and its tributaries (Figure 2). A few large streams drain the synclinal valleys Fifteen Mile Creek, Town Creek, and Evitts Creek.

The valleys are generally cultivated due to the richer bottomland, alluvial type soils, while the ridges are forested. Many of the ridges have a very thin overburden underlain by non-resistant shale.

2. Topography and Geomorphology

Eight prominent geomorphological features occur in the study area. From east to west, they are: Town Hill (a synclinal ridge), Fifteen Mile Creek (a complex anticlinal valley), Green Ridge (an anticlinal ridge), Polish Mountain (a synclinal ridge), Town Creek (a synclinal valley), Warrior Mountain (an anticlinal ridge), Bush Ridge (an anticlinal ridge), and Evitts Creek (a synclinal valley).

The inclination of the resistant strata and level uplifting created long, sharp crested ridges while the narrow intervening valleys and elongated, sometimes rounded hills developed from erosion of the softer shales and limestones.

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The most prominent ridges are Warrior and Polish Mountains with their highest elevations being 2020' and 1607' respectively. Slopes along these two mountains can be quite steep. The eastern face of Warrior Mountain and the western face of Polish Mountain have slopes greater than 20% (see Figure 2). Another ridge of lesser vertical rise but greater slopes (50%) is Green Ridge. It measures approximately 1200' at its crest with slopes exceeding 35% on its western face.

Genetically, this landscape is in the mature part of the geomorphic cycle. The maximum relief has been reached with elevations from 600' to 200' above sea level. Streams dissecting the elevated areas create highly variable slopes from 5% to 40%.

3. Geology

The National Freeway corridor crosses an area of folded Paleozoic sediments which appear repetitively across the study area (Figure 3). The sediments consist of a series of sandstones, siltstones, shales, mudstones and limestones. The youngest formation exposed in the corridor is the Pocono group of Early Carboniferous (Mississippian-345 million years ago) age. This formation ranges from massive conglomerates containing milky quartz to micaceous sandstones and shales. The Pocono outcrops at the crest of Town Hill and is separated by Fifteen Mile Creek gorge and east at Sideling Hill. These beds of shale may contain thin layers of coal.

The Hampshire Formation forms the base of Town Hill approximately three miles wide running northeast to southwest. Massive sandstones and fine-grained argillaceous shales make up the Hampshire which outcrops at Fifteen Mile Creek and at the Potomac River. These shales make up most of the upper part of the formation. They are distinguished by their lack of grittiness and their fissility.

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These clastic rocks split very easily on their bedding planes and weather readily. This formation was the last laid down during the Devonian period (395 million years ago).

Proceeding west, the Jennings Formation has the greatest areal distribution of any formation in Allegany County. It forms Green Ridge, Polish Mountain, and most of the area in between. The deposits of the formation are almost wholly arenaceous. Sandy shales predominate with quartzose sandstones interbedded in no regular sequence in the lower and middle parts. In the upper part, heavy quartzitic sandstones predominate, though the sandy shales are in considerable abundance. The heavy quartzitic beds may contain important beds of fossiliferous conglomerate. The thickness of the Jennings Formation varies from 3500' at Jennings Run to 5000' along the Potomac at the mouth of Town Creek.

The eastern face of Warrior Mountain and the depression between Green Ridge and Polish Mountain contain the Romney Shale. This formation is an argillaceous fissile shale which weathers into fine angular fragments. Due to its lack of hard materials, the formation is prominent in the valleys, where it forms low ridges or rounded hills. Iron ore pockets have been found in various localities along the eastern base of Warrior Mountain.

The Oriskany Formation appears on the eastern slope and much of the western slope of Warrior Mountain. It enters largely into the structure of Martin Mountain and covers completely the central and southern portions of Collier Mountain. This formation consists of two well-marked lithological divisions which grade into each other. The lower part rests conformably upon the Helderberg and is a blue-black chert in nodules and layers, separated by thin beds of dark gray arenaceous shale. The upper part of the formation is a grayish-white sandstone, which is often calcareous.

The chert in an unweathered condition is in hard, deep blue-black masses and shows a great tendency to break into small-sized nodular blocks. Weathered specimens are almost invariably light-colored while unweathered surfaces have at times a pearly white appearance. The Helderberg-Oriskany contact line can often be easily followed by the chert fragments even if all the traces of contact are gone. These may be found in some of the fields near the top of Warrior and Martin Mountain. The thickness of the Oriskany ranges from 300' on the south of Monster Rock near Keyser, West Virginia to 150' thick, 2½ miles east of Cumberland.

The Helderberg formation completes the Devonian geologic time period. It makes up a large part of Warrior, Martin Mountain and flanks Evitts Mountain. Lithologically, the Helderberg is a limestone formation with argillaceous impurities occurring in some beds. The tentaculite limestone of New York is part of the Helderberg formation in Maryland and is over 400' thick. This limestone makes up the lower part of the formation, being a dark blue thin-bedded rock which in breaking gives a decided ring. The upper part is characterized by thin bands of chert, white to yellowish-white in color, heavily bedded and highly fossiliferous. The thickness of the whole formation is nearly 800'.

The Silurian system contacts some of the study area but is not quite as important as the Devonian. Some controversy exists placing the Helderberg formation in the beginning of the Devonian or the end of the Silurian period. It may be split between both.

The last formation to appear in the Silurian period is the Tonoloway limestone outcropping on the eastern and western slopes and circling the base of Martin Mountain. This formation consists of a sequence of limestones and calcareous shales sometimes separated by a sandstone member that is hard, dense and resistant to weathering.



Photo 1: Typical unstable soil structure incurred throughout study corridor AGBF2.

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This makes a prominent ledge-making member. The limestones in the upper part of this member are sufficiently pure to have been quarried. The limestone members of the Tonoloway are highly fossilized and about 30 species of ostracods have been identified in it. The thickness of the formation ranges from 600' to 700'.

The Wills Creek Shale lies conformably upon the Tonoloway limestone around Martin Mountain and also outcrops on the eastern slope of Evitts Mountain. It contains interbedded olive to yellowish-gray shale and limestone which weathers to a yellowish-gray. The clayey limestones in the upper part of the formation were used as a natural cement rock before the invention of the Portland cement process. The thickness of the Wills Creek Shale averages around 450'.

The McKenzie formation combines the Rose Hill formation to complete the study area. These formations cap off Evitts and Martin Mountains.

The McKenzie consists of interbedded gray shales and muddy limestones with some intercalated red shales and sandstones. About 240' of strata occur in this section.

The Rose Hill formation consists of olive to drab shales and some thin sandstones with two layers of purple-red iron-cemented sandstone near the middle. At Cumberland, this formation is around 522' thick.

4. Soils

The soil survey of Allegany County published by the U.S. Department of Agriculture provides the following general soil information (see Figure 4). The soils of the corridor generally follow the northeast-southwest directions of the mountains and valleys. From Green Ridge to the east side of Warrior Mountain, soils are in the Weikert-Gilpin association (Photo 1).

The Weikert soils are made up completely from shale. These soils are less than 20 inches to bedrock and are excessively drained. The Weikert soils have the lowest available supply of moisture in the county.

The Gilpin soils are a little less shallow and shaley than the Weikert. Both soils are considered a shaley silt loam. About 60% of this association is Weikert soils, 13% Gilpin and 27% minor soils. The Weikert-Gilpin surfaces again in the area from Evitts Mountain to Cumberland.

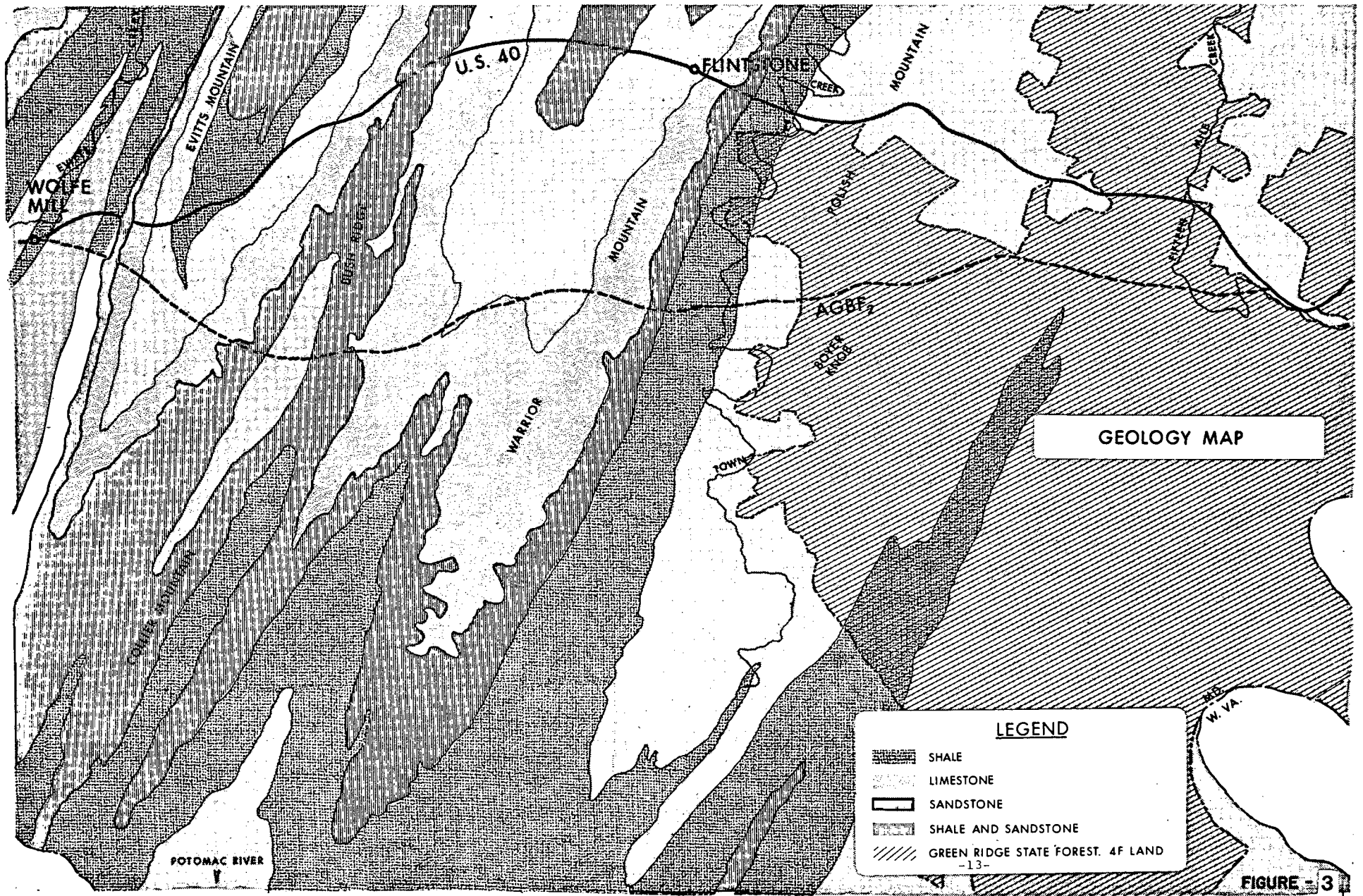
The gently sloping to rolling areas of the Weikert-Gilpin association are used for general farming and pasture. The soils in these areas are generally less productive than those in other parts of the county because of the shallow droughtiness of the Weikert soils. Stoney soils and steep areas are mostly wooded, but tree growth is slow on these soils and wood crops are not produced in large amount.

The Eliber-Dekalb-Opequon association is the only other division of soils in the study area. They comprise an area from the west side of Warrior Mountain to the east side of Evitts Mountain. The percentages of soils in this association are as follows: Eliber-27%, Dekalb-20%, Opequon-10%.

The Eliber soils usually make up the tops and sides of ridges. They consist of deep, well-drained, cherty soils that formed from material weathered in place from cherty, impure limestone. Water capacity of these soils is moderate.






A sample profile of these soils may be about 13 inches of cherty silt loam on the surface, a 29-inch cherty loam subsoil, and underlying at a depth of 42"-50" a yellowish-brown chert-loam consisting mainly of chert fragments. Hard limestone is at a depth of around 50". The soils are mainly used for orchards in the county.

The Dekalb series consists of moderately deep, well-drained soils formed from sandstone with occasionally a thin layer of shale or siltstone.



GEOLOGY MAP

LEGEND

-  SHALE
-  LIMESTONE
-  SANDSTONE
-  SHALE AND SANDSTONE
-  GREEN RIDGE STATE FOREST. 4F LAND

-13-

FIGURE - 3

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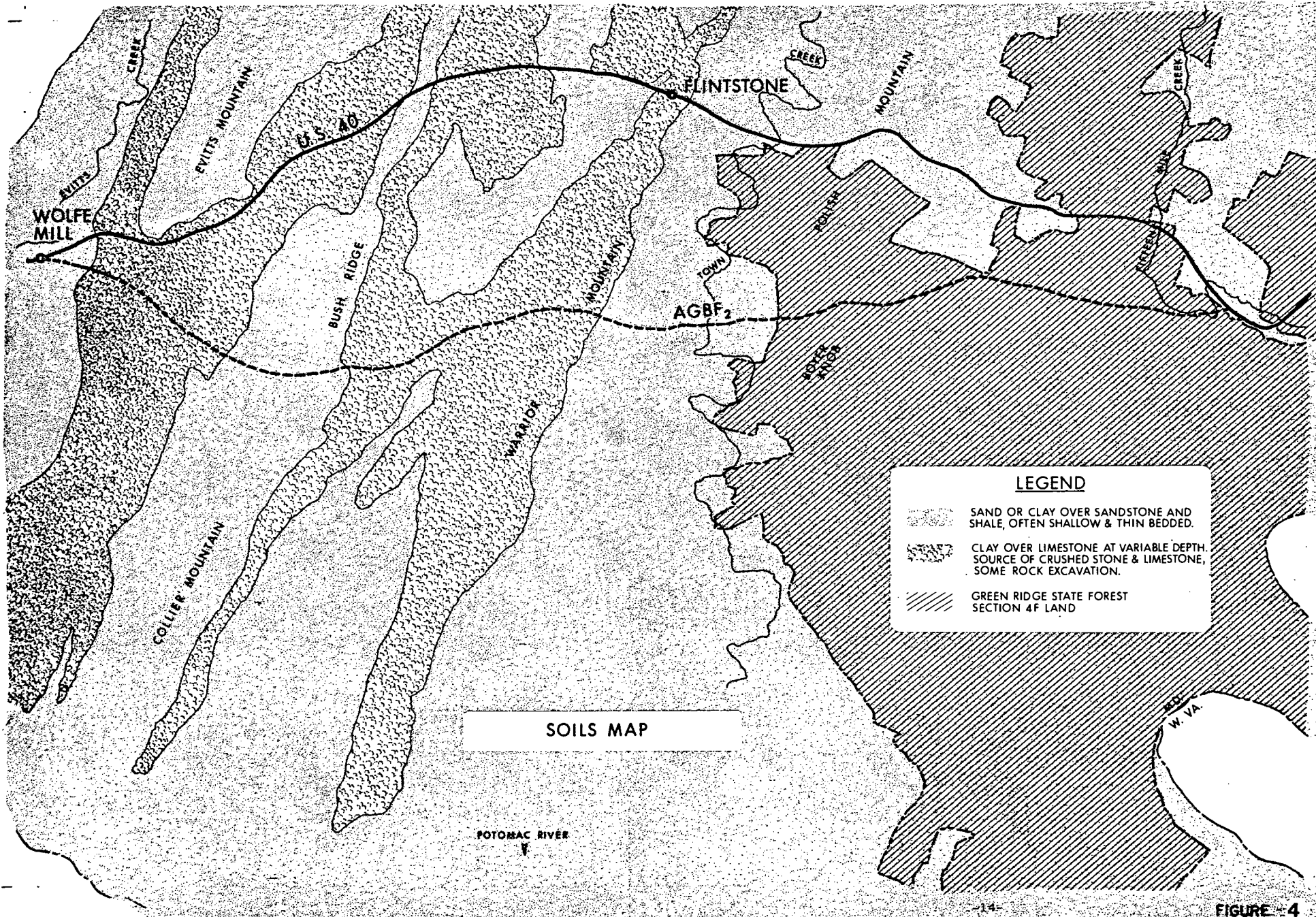


FIGURE - 4

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The surface layer is sandy loam about 8" thick, with a sub-soil of about 18" which is a heavy sandyloam. The substratum is at a depth of 26"-36" and is a sandy loam with many course fragments. Hard sandstone is at a depth of 36".

The Opequon series consists of shallow, well-drained soils that are formed from hard limestone. They contain many course fragments of limestone. The soils are usually located on limestone ridges.

A representative profile would probably show; a surface layer of clay loam about 5" thick, a subsoil of heavy silty clay loam about 12" thick and hard limestone at about 20".

These soils are high in natural fertility and highly productive when managed properly. Only their low available water capacity downgrades their productiveness.

5. Water Resources

Surface Water

The valley and ridge physiographic province encompasses the Minor Atlantic Drainage basin. Two water provinces are associated in this drainage basin, Warrior-Evitts Mountain, and Sideling Hill-Town Creek Water Province. The Minor Atlantic basin drains eastward via the Potomac. Major streams in this basin include Evitts Creek, Town Creek, and Fifteen Mile Creek. There are thirty-two smaller tributaries, the most important being Elk Lick Run, Collier Run, Murley Branch and Black Sulfur Run.

The Potomac and the smaller tributaries flowing along or within the boundaries of Allegany County receive the runoff from precipitation which has fallen upon steep and undulating surfaces covered with trees for the most part. There are very few ponds and no marshes to retain the water in its course from the hillsides to the various creeks. The runoff is rapid and the amount of water that percolates into the soil to reappear as springs and to feed the summer flow is relatively small. In times of deficient rainfall, these streams shrink to a small percentage of their original size.

This seasonal diminution has prevented the use of the flowing water for the production of power.

In general, these major streams average about 1 cfs (cubic foot per second per square mile) flow. In times of flooding or large flows, these major streams may reach 5-7 cfs.

A stream's drainage area, along with its flows, may allow some amount of predictability as to severity and frequency of floods. Evitts Creek at Cumberland drains an area of 89 square miles while it discharges an average 30 cfs. Town Creek at Oldtown drains 148 square miles and discharges an average of 123 cfs at this station. The change in flow at different seasons can be quite staggering when in the case of Evitts Creek in a typical year, the flow in April may be 600 cfs while in September it may be 2 cfs. No data is available for Fifteen Mile Creek, but by personal observations over a period of one year, this stream is more highly variable than the other two.

The 100-year floodplains for each of the major streams crossed, vary from very broad to narrow. Figures 10a-10d show the limits of these floodplains for Evitts Creek, Elk Lick Run, Fifteen Mile Creek, and Town Creek. Black Sulphur Run and Collier Run floodplains will be delineated during design studies.

Surface Water Quality

The water of the north branch of the Potomac River is naturally somewhat dark in color. The discoloration is further increased by the effluents of sawmills, tanneries, and coal mines mostly west of the study area. At the point of confluence with Evitts Creek, the Potomac is already highly polluted from its 75-mile journey beginning at Fairfax Stone. Acid mine drainage and sewage treatment plant effluent seem to be its major problems.

Beginning with Evitts Creek and then continuing on to Collier Run, Town Creek and Fifteen Mile Creek, the Potomac becomes involved in a natural flushing and diluting action. The high standards, both chemically and bacteriologically, of the tributaries plus the large volumes of water help to clean up the Potomac.

The north branch of the Potomac, before connecting with Evitts Creek, does not meet water quality standards. From Evitts Creek east, the Potomac meets those standards through Allegany County. Water quality parameters such as dissolved oxygen, temperature and pH are met by all three major streams. Bacteriological standards are not met periodically during periods of low flow. The following parameters are checked monthly by the Water Resources Administration of the Maryland Department of Natural Resources at the three major streams and the Potomac in the study area: temperature, dissolved oxygen, pH, specific conductance, turbidity, chlorophyll A, nitrate, nitrite, phosphate, and biological oxygen demand.

Fifteen Mile Creek, Town Creek, and Collier Run have been designated as Class III--natural trout waters, while Evitts Creek and the Potomac River are designated as Class IV--recreational trout waters. These standards are delineated in the Water Resources Administration report Maryland Water Quality 77, Regulations. Except for broader oscillations in temperature, these standards are identical to the water quality standards promulgated for Class I Waters; Water Contact Recreation and Aquatic Life.

Many of these streams, such as Murley Branch, which originate in limestone, combine to make very fine trout streams. Their naturally high pH values and usual swiftness create ideal situations for trout, except during periods of low flow. Fifteen Mile Creek has been said to be one of the finest trout streams in Maryland and is the only one that is entirely within the limits of Maryland.

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Groundwater

A region's geology, topography and soils play a great role in the subsurface movement of water. Groundwater is water that has not run off or been caught up in evapotranspiration. Subsurface water is the portion of the hydrologic cycle which is the source of water for flora and stream recharge.

Porosity and permeability govern the volume of and movement of groundwater. Porosity pertains to the volume of water that can be stored within earth materials. Movement of groundwater through earth materials is controlled by the permeability of the materials.

The Sideling Hill-Town Creek water province reservoirs are recharged chiefly by local precipitation. The soils derived from these shales have a low moisture-holding capacity. The shales also have a low permeability and storage capacity. Much of the groundwater recharge takes place in this area in the late fall or early spring because during the summer, the water demands of the plants take up the excess and, during the winter, the soil is frozen preventing downward movement.

The water table in the province parallels the topography in a subdued fashion. The water table is closest to the surface in the valleys and at the Potomac River. Groundwater occurs chiefly under water table conditions, although locally artesian conditions exist.

The yield of most wells in the area is low, averaging 1-15 g.p.m. with the high 36 g.p.m. Aquifer tests and statistics on well yields indicate little difference in the hydrologic properties of the different shale units.

The chemical quality of the groundwater is sufficient for most domestic and farm purposes. The water from these shales is generally hard and alkaline. Sulfate occurs in higher than normal concentrations which may be due to the presence of hydrogen sulfide gas. This sulfide gas occurs in noticeable concentrations where shales are formed from organic muds.

The Warrior-Evitts Mountain water province is characterized by a mature topography, thin soil, rocky outcrops and only a few square miles of flat land. The groundwater recharge is estimated to be about one-fourth of the annual precipitation. The storage capacity of the rocks is relatively low so the water table rises rapidly during periods of groundwater recharge. During drought periods, the water table declines below the permeable weathered and fractured zone in which most of the groundwater is stored. Therefore, springs may fail and the yield of wells may decline substantially.

Generally, the limestone and sandstone units are the best aquifers and have the greatest capacity for groundwater storage. Groundwater discharge to the streams declines near the end of the summer. Some southerly flowing streams such as Collier Run and Mill Run drain the Oriskany and Romney formations and almost have no flow at the end of the summer. However, Murley Branch, draining limestone, has a flow of more than 2000 g.p.m. at the end of the summer. This indicates a high storage capacity of the limestone rocks drained by Murley Branch.

Based on information available at the time of this report, there are no sole source aquifers in this area as defined by the Safe Drinking Water Act, Section 1424(e) PL 93-523.

6. Climate

A middle latitude locality with a general atmospheric flow of west to east and four well-defined seasons, generally comprises Allegany County's climate. Data from the Cumberland climatological station is more specific.

The average annual temperature is 52.9° F. with July having the warmest and January the coldest. The record low for the period beginning July 1947-June 1965 was -9° F. in January 1963. The record high was 104° F. in July 1954. Temperatures of 32° F. and lower occur approximately 115 days a year in this area. Allegany county's growing season, the period between the last frost in the spring and the first frost in the fall, averages about 170 days.

The average annual precipitation of 37.33 inches is evenly distributed through the year with June the wettest month and November the driest. This is one of the drier microclimates in Maryland due to a "rain shadow" effect created by the Allegheny Plateau. Maryland's other cities outside the ridge and valley section average from 40-49 inches per year. The climate of the area is influenced greatly by the height and width of the mountain barriers which modify the large air masses moving eastward.

The maximum depth of snow on the ground was 30" on February 9, 1961. Seasonal snowfall averages around 32" with a maximum of 75" and a minimum of 11".

Prevailing surface winds are from the northwest to west-northwest except during the months of June through September when they become more southerly. Locally, violent winds may accompany some of the more intense summer thunderstorms. Thunderstorms occur on the average of about 35 days per year, are most frequent during the months of May through August and cause most of the heaviest rainfall.

Occasionally during the hurricane season (June through November), hurricanes approach near enough to affect the area's weather. They usually produce heavy rainfall but seldom have winds exceeding 50 mph.

7. Vegetation

Vegetation along the AGBF₂ study corridor is almost totally forest cover with the exception of some small farming operations. Farm size appears to be restricted by existing topography and economic feasibility.

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Four recognized forest associations occur along the study corridor (Brush, 1977): Chestnut Oak--Bear Oak Association (Green Ridge Forest), Hemlock--Birch Association (Town Creek Floodplain), Sugar Maple--Basswood Association (Twiggtown-Murley Branch area), and Chestnut Oak Association (Cumberland terminus). The stability of the forest ecosystem, especially within Green Ridge State Forest, has produced a stable community of associated forest vegetation including an abundant array of native shrubs and wildflowers.

Farming activities in the study corridor are geared toward small-scale livestock production for the purposes of subsistence and/or supplemental income. As such, farm crops grown for this purpose include corn and feed grains. Crop fields are generally interspersed with wood lots which are remnants of the one homogeneous land cover. The interspersion of cropland and wood lots buffered on the mountain slopes by extensive tracts of undisturbed forest, makes the entire study corridor extremely productive for a wide variety of wildlife species (Photo 2).

8. Unique/Sensitive Natural Areas

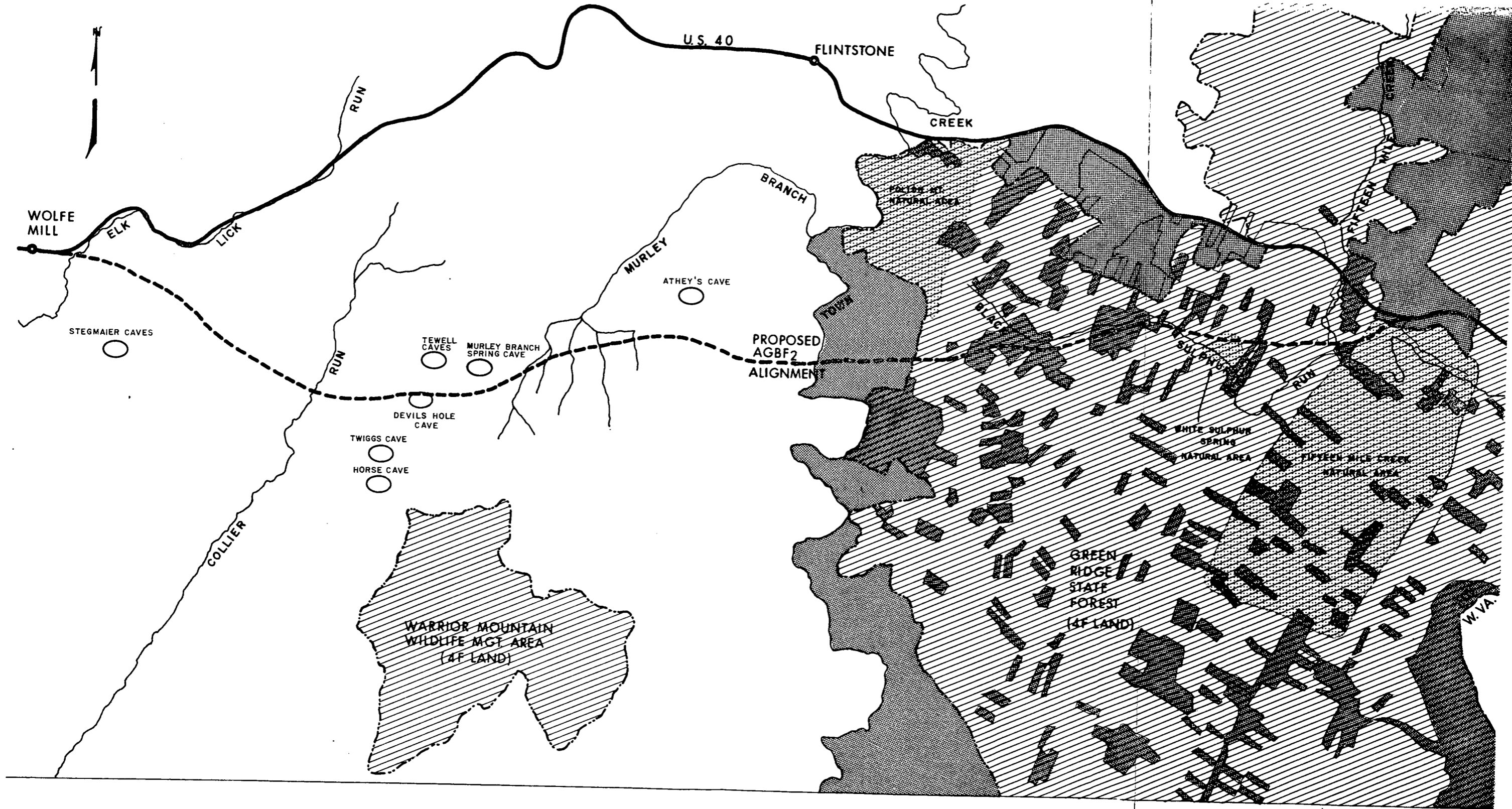
I. Green Ridge State Forest

Green Ridge State Forest (Figure 5) is one of the largest public land holdings on the east coast according to the Maryland Forest Service. Currently, the forest is 32,000 acres in size with the ultimate acquisition goal of an additional 20,000 acres. The proximity of this publicly-owned land to the urban metropolitan areas of Baltimore and Washington (3-hour driving time), helps to explain why the forest receives upwards of 85,000 visits per year. Expectations are that this number will steadily increase, especially with increased acreage acquisition and continued efforts towards energy conservation on the part of the motoring public. The forest is managed in the public interest for a wide variety of low density, dispersed recreational activities including hunting, fishing, camping, hiking, nature studies, etc.







Photo 2: Typical habitat west of Town Creek. Farmfields, ecotones and forested hilltops benefit those species under management in Green Ridge State Forest and Warrior Mountain Wildlife Management Area.

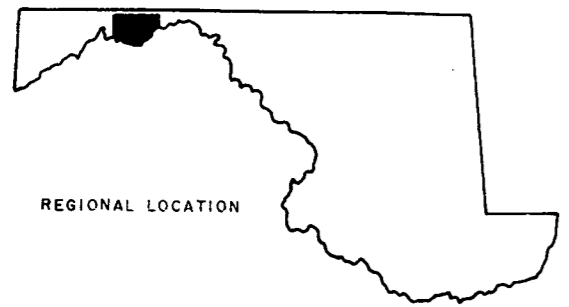
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SCALE - 1" = 1 MILE

KEY

-  LAND CURRENTLY OWNED BY THE MARYLAND STATE FOREST SERVICE
-  LAND PLANNED FOR FUTURE STATE FOREST ACQUISITION
-  UPLAND NATURAL AREAS
-  VARIOUS CAVES



NATURAL ENVIRONMENTAL FEATURES MAP

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In order to maximize the multiple use aspects of lands in public ownership, the Maryland Department of Natural Resources has begun to implement the features species concept of wildlife management. It is felt that this concept is a desirable method for insuring compatability of multiple use forest management and sustained wildlife benefits for forest users. Under the featured species concept, guidelines based upon the habitat requirements and mobility of a featured species direct the coordination of timber and wildlife management within forest compartments (Holbrooks, 1974).

Within the area to be acquired for the proposed alternative, wild turkey has been chosen as the designated features species (although deer, squirrel, and grouse are also abundant). There is tremendous hunting pressure placed on this species in Maryland. Approximately 13,000 turkey hunters work the available range for this species in Maryland (approximately 1,200 sq. mi.). Most of these hunters utilize Green Ridge State Forest. This places a pressure of approximately 11 hunters per square mile of turkey range in Maryland compared to a state such as West Virginia which has a pressure of about 4 hunters per square mile. The necessity for maintaining prime range land for this species is of paramount concern if a stable population of turkey is to be managed and maintained as a major attraction for Maryland sportsmen in this area of Green Ridge State Forest.

Being a bird of mature hardwood forests, this species needs extensive range (approximately 1,000 acres) characterized by a diversity and interspersion of hardwood species, a diverse and productive understory, and especially freedom from human disturbance. Increased human disturbance is likely to result in increased nesting failure, culminating in an overall population decline.

b. Warrior Mountain Wildlife Management Area

Warrior Mountain Wildlife Management Area (Figure 11) is approximately 2,600 acres of managed upland forest composed of oaks, hickories, and maple.

2

Some open areas are maintained. Game species present include deer, turkey, grouse, squirrel and rabbit. While this area will not be impacted by the proposed alignment, its proximity to the study area is important in terms of the contribution this area makes to the quality and abundance of wildlife species found in the study area west of Town Creek.

II. Upland Natural Areas

As part of an effort to inventory and designate areas of distinction within the state of Maryland, the Energy and Coastal Zone Administration of the Maryland Department of Natural Resources and the Maryland Department of State Planning have established a listing of such areas for Allegany County. Several of these areas occur within the study corridor and will be impacted either directly or indirectly by the AGBF2 alignment (Figure 5) .

a. Fifteen Mile Creek (Unit No. 0500)

This part of Green Ridge State Forest (3,640 acres) is a highly dissected mountainous area with diversely vegetated meandering coves and drier ridges of predominantly oak canopy (Photo 3). Forest access roads run throughout the site. Designated camping areas are located along the roads and run along Deep Run and Town Hill. Vistas of the stream valley and the diversity of the flora in the coves add to the forests scenic quality.

b. White Sulphur Springs (Unit No. 0600)

The White Sulphur Springs Area (114 acres) is located within Green Ridge State Forest just south of Sugar Bottom Road. The northern part of this natural area is a small clear cut with thick regeneration of oak, hickory, and pine with an average diameter of 10". To the southwest toward Black Sulphur Run, older stages of the same species occur. Black Sulphur Run has a cobble bottom to shale bed-rock. The floodplain area is approximately 100' wide and has large (30' diameter) white pines along the meandering 10' wide stream channel.



Photo 3: Fifteen Mile Creek and
contiguous forested flood-
plain.

c. Polish Mountain (Unit No. 0800)

The Polish Mountain Area (900 acres) is located within Green Ridge State Forest and also has the potential for being incorporated into the Maryland Wildlands Preservation System. Ultimate land acquisition would make this wildland unit (#47-1) approximately 1,250 acres.

Bordered on the east by dirt roads, this area drops over a thousand feet to its western boundary, Town Creek. The steep slopes make walking difficult, but there are a few deer trails running across the slope. The unit's proximity to Route 40 and the resulting road noise detract from its wild character, especially the northern section of this area closest to Route 40. In all other categories, however, the area meets the criteria for wildland designation.

III. Various Caves

Franz and Slifer (1971) have inventoried seven cave sites which are found in close proximity to the AGBF₂ corridors (Figure 5). Caves such as these offer an added attraction to outdoor recreational enthusiasts as well as providing a unique niche for a limited, but varied array of cave fauna.

Of special interest is the potential occurrence of the Indiana Bat (Myotis sodalis) in the caves within the study corridor (see Section 10, Endangered/Rare Species).

9. Wildlife

a. Terrestrial Ecosystem

The wildlife diversity and abundance within the study area is largely a result of the excellent environmental conditions that exist within the ecosystem as well as sound wildlife and forest management practices which have been employed over the years.

The proximity of crop land, planted primarily in feed grains, is an added source of food in time of biological stress. The interfaces between cultivated land and adjacent wood spots and streams have created ecotones (edge) which add cover for many of the more open land wildlife species which inhabit the study area. Rabbit and fox utilize areas such as these along with species of small rodents which form the base of a food chain for the predatory feeders such as fox, bobcat, birds of prey, etc. (Photo 4).

Fur bearer presence within the ecosystem is excellent. As stated, fox, raccoon, and rabbit are present along the ecotones. The major stream systems provide habitat for healthy populations of muskrat, beaver, and mink. The proximity to bottomland farm fields is considered to be of prime importance to muskrat due to increased food availability (Photo 5).

Breeding bird surveys (Bystrake 1970-78) reveal a high diversity of singbirds adapted to fill niches within heavily wooded ecosystems.

In Green Ridge State Forest, wildlife management practices have been implemented with the aid of Federal money in the form of Pitman-Robertson funds. Wildlife management practices include maintenance and development of permanent, herbaceous openings, wildlife shrub plantings, monitoring wildlife populations through field surveys, conducting hunter pressure survey, and providing technical assistance regarding timber management and custom farming operations beneficial to wildlife.

The wooded slopes and hollows throughout Green Ridge State Forest support healthy populations of many game species such as wild turkey, deer, grouse, and squirrel. Under the featured species concept of wildlife management, large stable populations of these species plus proximity to large urban areas make Green Ridge State Forest a major attraction for an ever-increasing number of hunters as well as passive outdoor enthusiasts.



Photo 4: Foreground: Farmland exhibiting typical interspersions of cropfields & ecotones beneficial to openland wildlife.

Background: Extensive managed forest ecosystem of Green Ridge State Forest.



Photo 5: Town Creek and contiguous floodplain
consisting of farmfields & woodlots.

b. Aquatic Ecosystems

Four watersheds which include 6 major stream channels are encountered along the length of the study corridor (Figure 5). These streams are the major receptors of groundwater and surface water runoff and ultimately flow into the Potomac River. The long-term stability of the ecosystem reflects itself in the excellent quality of the water flowing in these streams and in the numerous small tributaries which feed them. This high water quality combined with low siltation has helped produce a highly diverse benthic community which forms the base of the food chain for larger fish species.

With the aid of Federal Dingle-Johnson funding, stream surveys are conducted periodically as part of Maryland Fisheries Administration management practices. Because of naturally occurring low summer flow rates, the streams are best suited on a year-round basis for warm water species such as small-mouthed bass. However, an active trout stocking program is carried out in both Evitts Creek and Fifteen Mile Creek. In the past twenty years, over 100,000 trout have been stocked in Evitts Creek for the purpose of satisfying the spring trout season demand by fishermen from throughout the region. Fifteen Mile Creek was stocked with trout for the first time in 1979 and indications are that this will take place on a yearly basis into the foreseeable future.

Wetlands consist of those areas which are confined within the stream channels which flow through the study corridor. These streams can be classified as an upper perennial subsystem of the Riverine System of Wetlands (Cowardin, 1977). A diagram of the classification hierarchy for the Riverine System is shown in Table 2.

10. Endangered/Rare Species

Field review and contacts with the Maryland Department of Natural Resources Endangered Species Program revealed information pertinent to those species protected by Maryland and Federal law.

The Jefferson salamander (Ambystoma jeffersonianum) was investigated to determine if any known locations occurred within the study area. While several known breeding ponds are located within close proximity to the defined study area, no ponds have been inventoried within the boundaries established for actual road construction activities.

Bobcat occurrences along the Town Creek Valley have been noted by Askins (personal communication). This predator is protected by Maryland law as an endangered species. Trippensee (1953) states that bobcat may travel a circuit for four to five miles in a single night and may, during the winter, cover an area of ten to fifteen square miles. Thus, the occurrences which Askins notes shows that the study area is within the normal home range of an endangered species which needs extensive areas with a minimum of human interference to satisfy its life history and home range requirements.

Current studies are presently underway by the Maryland Department of Natural Resources to determine the presence of the federally protected Indiana bat (Myotis sodalis) in the limestone caves which are in close proximity to the study alignment. Historical records indicate that this cave dwelling species has been noted in two locations in Maryland, neither of which is in the study area. Letters from the Maryland Department of Natural Resources Endangered Species Program Director are included (Appendix) to provide a summary of the data which has been gathered so far regarding the potential presence of this species.

Aside from those species which are classified as endangered or threatened and thus protected by State or Federal law, there are also species of wildlife which are considered to be rare enough to warrant special consideration when planning actions which have the effect of disrupting stable ecosystems.

Responding to the requirements of the Endangered Species of Fish Conservation Act of 1975, Dietemann (1976) proposed a listing of those fish species which should be given legal protection under the act. A further result of this effort was to produce a listing of fish species which, while not protected by law, should be given close scrutiny due to the lack of sufficient data on which to base a conclusion regarding a status of either threatened or endangered. A list of these fish species appears in Table 3. Descriptions of these species can be found in Eddy (1956) and Davis (1974).

While field sampling did not reveal the presence of any of these species, recent sampling activities in the Potomac drainage (Davis and Enamait, 1978; Stauffer et al, in press) revealed that sample specimens of Pearl Dace (Semotilus margarita) and Slimy Sculpin (Cottus cognatus) have been collected. Thus Town Creek, with its particularly good water quality and interrelationship with the Potomac River drainage could offer habitat requirements necessary to support a population of these fish species.

The upland forested portions of the study area also represents a stable habitat for avian species which are considered to be of rare or unusual occurrence in Maryland. Robbins (1973) established a preliminary list of rare or endangered breeding birds of Maryland. Species which may utilize the study area are the Saw-whet owl (Aegolius acadicus) which was estimated at less than 25 breeding pairs in Maryland; the Common Raven (Corvus corax) which was estimated at less than five breeding pairs, and Bachman's Sparrow (Aimophila aestivalis) which was estimated at less than ten breeding pairs.

Bystrak (personal communication) indicates that other species which may prefer this particular ecosystem are Berwick's Wren (Thryomanes bewickii), Red-headed Woodpecker (Melanerpes erythrocephalus), Loggerhead Shrike (Lanius ludovicianus), and possibly the Worm-eating Warbler (Helmitheros vermivorus).

Concerning Berwick's Wren, Bystrak states that the hills from Clear Spring to Cumberland are, in effect, the only place left in Maryland where they are found and that the occurrences are very rare. This area is also the last place in the State that summer individuals of Bachman's Sparrow were seen. Since the stability of the ecosystem is one of the primary values of the study area, it is still possible that this rare breeding bird could be utilizing this area to fill its habitat needs. The Worm-eating Warbler which favors remote woods and in particular Chestnut Oak, may find the ridge areas of Polish Mountain a suitable habitat since this tree species tends to dominate the ridges in the study area.

ENVIRONMENTAL CONSEQUENCES

Physical Resources

Geologic, edaphic (soils) and water resources are usually closely interrelated. The ridge and valley section of Maryland illustrates this point well.

The short-term impact of siltation and sedimentation will be created because of shallow, loose soils and overburden. The combination of shallow soils (2-6") and steep slopes (50-55% grades) will make erosion control very difficult. In general, the soil types as described by the Soil Conservation Service of the Department of Agriculture place severe limitations for the location of highways. In an area such as this where the root mat is torn from the soil by walking on it, construction will create conditions conducive to severe erosion. Restoration of ground cover will be troublesome due to the lack of soil and fertility. This could create a long-range problem with siltation in damaged areas that won't revegetate quickly.

The proposed alignment will cross 32 perennial or intermittent streams, all of which will be adversely affected by siltation during construction.

This siltation can cause a decrease in dissolved oxygen (a measurement of the available oxygen for fish and plant life) and an increase in turbidity (a measurement of undissolved solids). During construction, at times of rain, these factors can combine to block off sunlight, diminishing respiration in aquatic plants and fish.

Erosion will be minimized and maximum protection provided for the floodplains, streams and slopes by maintaining forest cover and existing vegetation except where construction access or piers are needed (see Appendix , Memorandum of Agreement). Extraordinary erosion control measures will be taken to help protect the streams. Flexible hose bypass systems, similar to the Vail Pass, Colorado approach, along with retention ponds will be used to minimize sedimentation and erosion. Sediment will still impact area streams with these measures.

The construction of access roads leading to these and other stream areas and parts of the highway can prove to be environmentally damaging. This will be most true of construction in the floodplain and inner forested areas. Location and construction of access roads will be planned and controlled carefully. The Department of Natural Resources will assist in determining construction access routes and inspecting restoration work as per the Memorandum of Agreement (see Appendix). Full utilization of present access roads will be considered.

The AGBF² alignment crosses these parallel ridges and streams almost perpendicularly creating some very large cuts and fills. Much of the excavation will take place on steep inclines where shale and siltstone are the parent rock. This rock may be loose and very fragmented especially in the shaley areas creating long-term problems with rock slides and erosion. The angle of highway side slopes will be determined with the intent to eliminate or minimize these conditions.

Large cuts may also open up springs which will have to be diverted and channeled into streams. Some springs may have water of questionable quality depending on the type of rock from which they originate. Chemically, the erosion of the exposed rock and the character of the diverted springs may cause problems for the streams. PH may be lowered making the water more acidic, thus changing the conditions favorable to some fish and aquatic life. This may not hold true for some of the smaller streams and Evitts Creek which get their water from limestone areas, thus raising the pH. Some minerals such as magnesium and calcium could increase from leaching of parent rock. Further study of soil borings and measures to avoid any adverse impacts will be taken into the design phase. Reduction of tree canopy and understory will increase the temperature of the water in the streams. This factor, along with the higher turbidity and lower dissolved oxygen, may create conditions which will increase an already seasonally high coliform bacteria count.

Construction of the highway will result in a minimal decrease in the total area available for groundwater recharge. Large cuts may expose springs thus reducing the total amount of water in that aquifer. This could lower the water table in certain areas. Leaching of chemicals into presently contained aquifers could also pollute the water table.

Specifically, the most environmentally sensitive and affected areas will be:

1. Fifteen Mile Creek and the western slope of Green Ridge--A shallow overburden exists on the west slope (50% grade) of Green Ridge with a very loose ground cover. The floodplain is wide and very sensitive. A maximum of two piers for the bridge will be placed in the floodplain with access to them. No construction will occur on the west slope below elevation 840.

2. Black Sulphur Run--This area has a shallow overburden. Long and short term impacts on the stream are possible.
3. Polish Mountain, deep cut at Boyers Knob-- Probable erosion and possible opening of underground water exists in this area.
4. Town Creek--Large, wide floodplain with piers and access roads through it.
5. Warrior Mountain--A deep cut which could create erosion problems.
6. Collier Run--Siltation and pollution could affect the headwaters of this stream.
7. Evitts Creek--Siltation could occur in areas near Evitts Creek and reach the creek resulting in an adverse impact.
8. Potomac River--This river will be affected by minimal amount of siltation from its tributaries. The overall good quality of these tributaries definitely improve the quality after the Potomac exits the acid mine drainage areas of Western Maryland. The overall negative impact on this river should be minimal.

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Mitigation to the above effects through Green Ridge State Forest is proposed in the Memorandum of Agreement executed with the Department of Natural Resources. This agreement is enclosed as Appendix B . Generally, the mitigation will include:

- a. DNR and SHA will determine limits of construction contracts, construction access routes, and mobilization sites.
- b. Seasonal restrictions will be placed on construction activities.
- c. Flexible hose bypass systems will be used in small stream areas helping to prevent sedimentation.
- d. Specified low areas in terrain will be bridged by structural plate arches and a natural bottom for passage of water and wildlife.
- e. Specific mitigation for Fifteen Mile Creek, Black Sulphur Run, Town Creek, and the east slope of Polish Mountain has been devised for these sensitive areas.

These same principles will be utilized through the entire project.

2. Vegetation

The selection of Alternate AGBF₂ would, over its total proposed length and right-of-way boundaries, acquire approximately 965 acres of upland forest and agricultural land.

The loss of land within Green Ridge State Forest will be approximately 176 acres which are currently owned and 155 acres which are currently in private ownership but due to be acquired by the State Forest Service in the proposal to expand Green Ridge State Forest. A minimum of approximately 160 acres of this total (965 acrs) would be permanently removed by the construction of the road surface and shoulders.

Approximately 212 acres would be converted to maintained highway median vegetation of species of grasses and shrubs tolerant to the rather harsh environmental conditions which will exist between the eastbound and westbound lanes. The balance of the total acreage will be maintained as managed right-of-way extending from the shoulder of the highway to the outside boundaries of the transportation corridor. Vegetation on these areas is usually dominated by species selected for their effectiveness in soil and erosion control. Thus, existing vegetation will be replaced by soil stabilizing grasses and ground covers.

Specific environmental conditions that function in the study area will be impacted by the conversion to a transportation related land use. These include species diversity, species abundance interspersions, and habitat quality.

Species diversity is a measure of the variety of species in a community that takes into account the relative abundance of each species. An increase in diversity can have a positive impact in certain situations such as an urban or suburban environment where open space is at a premium. Extensive agricultural areas may also benefit from an increase in species diversity.

In the case of Alternate AGBF₂, alteration of species diversity will not result in an increase in the variety of species present but, more likely, a shift in the relative abundance of those species which are already present throughout the ecosystem resulting in the permanent loss of mature hardwood forest species. It has been estimated by the Maryland Forest Service that approximately \$56,000 worth of marketable timber exists within the right-of-way for the alignment through Green Ridge State Forest.

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The permanent loss of this resource will add to the steady decline of forest resources which Maryland has experienced in the last two decades. Estimates are that in the period from 1964 to 1976, forest resources have been reduced by 13%, the greatest decline in the Northeastern United States.

The removal of mature, mast-producing hardwood species creates an overall negative impact on the study area in terms of current and historical forest management strategies.

Interspersion is the placement or location of the various populations of species within the overall community. This encompasses the concept of the "edge effect" or ecotones which become established as the transition between two distinct land uses. In the AGBF₂ study area, interspersion is already high due to the farming and forest interfaces which currently exist. In Green Ridge State Forest, the presence of fire trails, lumber haul roads, and wildlife management techniques have served to create an interspersion of vegetation and ecotone (edge) areas which are of sufficient quantity and quality to be compatible with the overall objectives of both forest and wildlife management.

While the usual perception of edge creation is that it increases cover for various small mammals and has an overall beneficial impact on birds of prey, etc., it must be realized that forest and wildlife management strategy is geared not toward an increase in small mammals and birds of prey, but towards maintenance and stability of healthy forest wildlife species such as deer, wild turkey, squirrel, and grouse. The increased ecotone (edge) created by the construction of this highway will permanently alter the pattern of interspersion, resulting in a long-term negative impact to the management objectives for this section of Green Ridge State Forest.

To compensate for the forest resources lost to construction of the highway as well as the aesthetic intrusion and increased noise levels, replacement acreage will be purchased for the Maryland State Forest Service.

This commitment is put forth in an agreement negotiated by the Maryland State Highway Administration and the Maryland Department of Natural Resources (Appendix B). To the west of Town Creek, 634 acres of mixed agricultural and forest land will be altered into managed right-of-way and median vegetation. Of the total 634 acres, 95 acres will be converted to roadway surface. Food crop vegetation and existing ecotones will be reduced in favor of an increase in the ground cover, shrub, and tree species common to managed rights-of-way. This represents a decline of an additional food source for wildlife species in times of biological stress. This food source consists of a portion of the fall crop harvest which remains on the ground and to some degree remains available during the winter months when nutritional requirements are high and food availability is low.

Vegetation lost will be partially replaced through landscaping of the rights-of-way. Loss of productive croplands cannot, however, be replaced.

3. Wildlife

Terrestrial

Alternate AGBF₂ would traverse upon some of the best wildlife habitat for upland game available to sportsmen and wildlife enthusiasts, especially those who wish to travel only a short distance (3 hours) from major metropolitan areas. Through Green Ridge State Forest, land acquired for highway right-of-way will total 331 acres including 176 of 32,000 acres currently owned and 155 acres of 20,000 which are planned for acquisition.

The featured species approach to wildlife management in this forest indicates that the area for AGBF₂ alternate is best suited for the management of wild turkey. While studying the effects of highway (Route 48) on wildlife in Cooper's Rock State Forest in northern West Virginia, Michael (1976) noted that turkey avoided the area adjacent to the highway but did utilize the area .2 mile from the highway at levels unchanged during the study period (1971-1975).

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Thus the actual impact to turkey habitat due to the avoidance behavior noted by Michael increases to approximately 1,080 acres as the alignment passes through Green Ridge State Forest. Turkey habitat west of Town Creek to the terminus at Wolfe Mill will experience a decline by an additional 1,520 acres, although this area does not represent the same quality of habitat as that in Green Ridge State Forest, which according to the Maryland Wildlife Administration (1973), has the highest density of wild turkeys in the state of Maryland.

White-tailed deer is another species which is intensively managed in Green Ridge State Forest. The construction of Alternate AGBF₂ would open up previously forested acres and replace it with right-of-way vegetation of grasses and ground covers. During the spring of the year, these areas are attractive to deer (especially pregnant does) because they represent an abundant food source after a period (winter) of diminishing nutritional availability. The fall mating season also represents a period during the year when deer movement becomes more active (Jahn, 1959) and could become a hazard to traffic on the new alternate.

With respect to the small mammal populations which benefit from an extensively forested ecosystem, the placement of a new four-lane divided highway alignment can be as effective a barrier to dispersal as a body of fresh water twice as wide (Oxley et al, 1974). Oxley further states that the barrier effect created by the placement of a major highway may have important effects on small mammal populations due to the fragmentation of gene pools and should be considered, especially when roads are being planned through game reserves or parks.

To mitigate the direct loss of productive wildlife habitat, the State Highway Administration is committed to replace lands impacted through Green Ridge State Forest.

Comparable habitat value will be one of the criteria used in determination of replacement lands.

Mitigation to facilitate wildlife movements through underpasses along the complete length of the proposed alignment will conform to those procedures put forth in the joint State Highway Administration/Department of Natural Resources agreement (Appendix B). These underpasses which will generally follow existing drainage courses will lessen the impact of habitat and potential gene pool fragmentation.

While the direct impacts of road mortality and population fragmentation are of biological concern, other more subtle impacts upon the food chain can be expected. Heavy metal deposition in the roadside environment has been noted by Boyd (1972) and Shaheen (1975). The metals are derived from the normal wear of automotive parts during operation and from gases generated by automotive emissions. While research is still needed into the effects of these metals in the food chain, Giles et al (1973) and Price et al (1974) provide evidence of accumulation of lead by insects in areas of high traffic density and biological concentration of lead from herbivore to predator trophic levels. Gish and Christiansen (1973) also quantified the presence of certain heavy metals in earthworms along two Maryland highways. They noted that the concentration of lead and zinc were in levels which may be lethal to earthworm-eating animals such as birds, amphibians, reptiles, and mammals.

Noise impacts on wildlife have been studied by Memphis State University (1971). While there is an overall absence of information on the effects of noise on wild animal populations, the Memphis State study did indicate that noise may have a detrimental effect on the breeding efficiency of bird species such as bobwhite quail (or wild turkey) which utilized a calling method for attracting mates. With increased noise, increased calling becomes necessary. The possibility exists that this may increase predation.

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Maintenance operations associated with Alternate AGBF₂, including herbicide application have been reduced sharply in recent years both in terms of quantities and overall toxicity. House et al (1969) have provided an assessment of ecological effects of extensive or repeated use of herbicides.

De-icing compounds present a more noticeable impact on highway/wildlife relationships. While it is necessary to provide safety for the highway user, salt laden snow plowed onto the right-of-way may serve as abundant salt licks attracting deer into close proximity with moving traffic (Hanes et al, 1970). In terms of effects on smaller mammals, Trainer and Karstad (1960) diagnosed salt poisoning in wild rabbits, pheasants, and quail in Wisconsin. This poisoning, while occurring with unknown frequency, was found to be caused by salt spread on highways to control slippery road conditions.

Impacts to terrestrial systems, food chains, and animal behavior caused by salt deposition, heavy metal contamination, and noise emissions cannot be mitigated. The state of the art concerning these issues of biological significance is relatively new with most efforts focused on quantifying the magnitude of the problem. The potential adverse impacts on various microhabitats should be viewed as greatest when new transportation facilities are proposed through areas which have been previously maintained in a natural state. Because of the lack of supportive data, the magnitude of such impacts cannot be quantified.

Aquatic

Four watersheds and six major stream channels, including thirty-two subdrainages, will be crossed by Alternate AGBF₂. These streams are of high water quality (Class III, Natural Trout Waters and Class IV, Recreational Trout Water) and support a diverse benthic community which could be adversely impacted by sediment and erosion of highly unstable soils (see Soils Section). These soils are currently stabilized by the dense root systems of existing forest vegetation.

Evitts Creek (a receptor of impacts to Elk Lick Run) and Fifteen Mile Creek are stocked with trout in the Spring for the benefit of any increasing number of fishing enthusiasts. Construction during this period could effect the recreational opportunity in areas of these streams close to or immediately downstream from the construction site.

The state of the art for mitigating highway impacts to stream systems and floodplains has increased greatly in the past few years, and it is felt that through proper design and location of the proposed alternate, along with a multidisciplinary approach to recommend construction techniques, many of the historical problems related to highway construction can be mitigated or avoided.

During operation and maintenance of the highway, impacts associated with road runoff will be the primary concern in terms of maintaining the existing excellent water quality. In this area of impact analysis, the state of the art is extremely limited.

Heavy metals and de-icing compounds ultimately concentrate in the sediments and waters of receiving streams. Masters et al (1974) states that sodium from road salts can over-stimulate the growth of blue-green algae and that sodium and calcium ion exchange with mercury could, under special sediment conditions, release highly toxic mercury or other heavy metals to the overlying fresh water. Mercury and heavy metal concentrations in the AGBF₂ study corridor are unknown at this time.

With respect to de-icing compounds, Masters also states that sodium ferrocyanide, which in small quantities is combined with sodium chloride as an anti-caking additive, is soluble in water and can potentially generate cyanide in the presence of sunlight. Twenty parts per million (ppm) is the minimum required level of sodium ferrocyanide in salt purchased for use in Maryland. This minimum level has been established to insure that the anti-caking function is maintained.

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Test results, however, indicate that up to six times that amount (128 ppm) may be present. It should be noted that no maximum safe level has been established and needed, therefore impacts cannot be quantified.

Dissolved salt entering streams acts as a weak electrolyte thereby having the potential to change the electrical conductivity of the aquatic system (Adams). Hanes et al (1970) further states that a potential danger of salt contamination exists in streams where the water flow is small. Depending upon the concentration, natural selection may favor those species more tolerant to the altered environmental conditions at the expense of the existing diversity of benthos. Research into the quantification of long-term effects of small amounts of artificially induced salt on species of fresh water organisms has yet to be sufficiently performed.

Endangered Species

No direct or indirect impacts are expected to occur that will negatively impact the Maryland endangered salamander (Ambystoma jeffersonianum).

Bobcat (Lynx rufus) occurrences in the Town Creek Valley have been identified by track signs. This species is fairly secretive in its daily movements and activities. While human interference is a major factor in determining the quality of bobcat habitat, vehicular traffic on a linear transportation corridor is not expected to be as disruptive an influence to the continued existence or mobility of this species as are other forms of human intrusion (Paradiso, 1969). If sufficiently wide corridors of natural habitat are maintained along the floodplains underneath the proposed alignment, the "islanding" effects resulting in habitat segmentation will be lessened for a species such as bobcat which requires a large home range. Prevention of movements onto the right-of-way must be maintained in order to lessen the possibility of a vehicle related mortality to this species.

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Road-kill data from Western Maryland indicates that bobcat have been killed as a result of entry onto primary and secondary road systems (Hockman et al 1977).

The existence of the federally protected Indiana Bat (Myotis sodalis) in several cave sites adjacent to the alignment is a possibility. Coordination with the Department of Natural Resources is being maintained on a continuing basis regarding any developments concerning their ongoing studies of these sites. Coordination will also be maintained throughout the design and construction phases of this project.

4. Unique/Sensitive Natural Areas

a. Green Ridge State Forest

The greatest impact to the public lands in Green Ridge State Forest will be the loss of approximately 330 acres which are currently owned or planned for future acquisition. This figure represents the total land acquired for highway construction and right-of-way acquisition. Comparable to this impact is the "islanding" effect or segmentation of contiguous land resources into smaller parcels.

Alternate AGBF₂ will segment a parcel of land approximately 6,700 acres in size confining it between existing U.S. 40 to the north, Town Creek to the west, and U.S. 48 to the south. Green Ridge is presently divided into a northern and southern area due to presence of U.S. 40. Selection of AGBF₂ will further fragment the forest into a northern, central, and southern section. Figure 5 indicates the relationship of the proposed Alternate to the Green Ridge State Forest land holdings. The ramifications of this will be felt throughout the range of recreational opportunities available to the public. Prime wildlife and hunting habitat will be severed; habitat will be reduced; pristine areas for hiking and camping which previously had enjoyed extremely low ambient noise levels will now be influenced by noise generated from the traffic to be routed through this alignment.

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To mitigate the conversion of land from a managed forest to a transportation corridor, the State Highway Administration is committed by the joint memorandum (Appendix B) to pay for and to help facilitate the purchase of replacement lands. These lands, although the exact location has not been determined, will be within the ultimate acquisition boundaries established for Green Ridge State Forest. The replacement concept will facilitate the acquisition of land which otherwise could be in the distant future.

The dissection of the forest by the highway alternate cannot be totally mitigated. However, the joint agreement on mitigation procedures does provide for the design and construction of wildlife underpasses which will serve to reduce the fragmentation of animal populations.

b. Fifteen Mile Creek Natural Areas

Fifteen Mile Creek is the only stream which is completely owned (and thus protected) by the state of Maryland from one state border (Pennsylvania) to another (West Virginia). The natural area which was inventoried by the Department of Natural Resources encompasses the floodplain and much of the surrounding watershed of Fifteen Mile Creek, south of Route 40. Especially pristine and of high scenic quality, this area would be severed at its northern boundary by the proposed facility bringing auditory and visual intrusions to the existing serenity.

Aesthetic design features are proposed in order to lessen the visual impact created by the highway. The features are specified in the agreement between the Maryland State Highway Administration and the Maryland Department of Natural Resources (Appendix B).

c. White Sulphur Springs Natural Area

This upland natural area is a relatively small (114 acres) area of floodplain and surrounding forest.

Since the area is small, the location of alignment AGBF₂, with its noise, visual, and land consumptive impacts, would permanently alter the aesthetic qualities which make the site of special significance to the forest user.

Visual and auditory impacts cannot be mitigated for this particular site due to the nature of its size. Floodplain encroachment will be minimal.

d. Polish Mountain Natural Area

This area is one of the few sites in the Ridge and Valley Province of Maryland which has been retained for possible inclusion into the Maryland Wildlands System. While no land will be directly taken, the selection of alignment AGBF₂ and the subsequent "islanding" effect it will create, will impact this area to some degree.

It is noted that the only negative aspect of this site, as it currently exists, is the presence of noise from U.S. Route 40, the northern boundary. Noise will still be generated into the northerly section of the proposed wildland due to the continued presence and use of existing U.S. 40. However, the level of noise will be reduced through the diversion of a large proportion of existing and future traffic onto the National Freeway alignment. Being a significant distance from the southern boundary of the proposed wildland area (Figure 5), noise generated from the new road will become a part of the overall background noise levels which currently are experienced in this area.

e. Various Caves

The seven cave sites located in proximity to the AGBF₂ alignment may potentially be impacted by construction activities associated with road construction especially if blasting is needed to facilitate earth and rock removal. Since these caves offer a unique recreational opportunity, the methods of construction in the vicinity of such structures will be investigated as well as the potential effects from long-term vibration associated with high truck traffic volumes.

These potential impacts will be discussed as part of the interdisciplinary coordination which will be maintained throughout the current and future phases of project development.

5. Visual Quality

Visual quality is very subjective and responses to a given view vary according to the individual. When a highway is placed through previously undeveloped land, as in the case of alignment AGBF2, the observer's view of and from the road must be compared with his view of the landscape before the road was there. The more the setting is disturbed, the greater the visual impact caused by the highway.

To give a visual overview of the study area is to characterize the physical landscape with the most distinct natural and man-made landforms, waterforms, rock formations, vegetation patterns, architectural, and cultural elements.

The proposed project study area is a natural landscape moderately steep to rolling. The most prominent elements are the steep ridges forming a wall of vegetation consisting of mixed deciduous hardwood and evergreens.

As the ridges slope toward the valley, the view becomes more defined with exposed rocks, rock outcroppings, large stands of uniform tree cover, and smaller groups of vegetation breaking the continuous open space.

The view from the valley, in many areas, is along open landscape of well-maintained farmsteads, cropland, pastureland, and vegetation types. A number of distinct structures, churches, and cemeteries are found here to give cultural, historic, and architectural significance to the area.

Because of the strongly dissected valley and ridge terrain, a number of ponds, springs, and feeder streams are found in the project area carrying water to Evitts, Town, and Fifteen Mile Creek. As the creeks and streams meander through the forestland and farmsteads, they attract the attention of farm animals, wildlife, and recreational enthusiasts.

To fully appreciate and characterize the physical landscape of this area, it is imperative that each of the various elements be viewed not only individually but collectively in terms of function. By doing this, one can visualize a sense of unity and harmony that now exists in this natural setting.

Visual Impacts Associated with Construction

Construction will impact many of the elements, either natural or man-made, of the physical landscape as it now exists. Highway cut and fill slopes will replace existing landforms and highway related structures, i.e. bridges and drainage structures, will present a foreign element into a natural setting.

With this in mind, alignment AGBF₂ will also be a visual intrusion to Green Ridge State Forest. Construction will traverse the State Forest, expose and remove acreage now used for recreation.

However, construction will introduce a very good view, if not spectacular (from the highway) in some areas.

Impacts to mitigate visual impacts within Green Ridge State Forest are contained in the Agreement between the Maryland Department of Natural Resources and the State Highway Administration. These measures include slope revegetation, aesthetic treatment of structures, limits on signing, and replacement lands to compensate for visual impact.

APPENDIX A

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APPENDIX B

62

MARYLAND DEPARTMENT OF TRANSPORTATION
AND
MARYLAND DEPARTMENT OF NATURAL RESOURCES
AGREEMENT GOVERNING THE AGBF2 LINE
FOR U. S. 48 IN GREEN RIDGE FOREST

Introduction

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Since the last segment of the National Freeway (Section I) in Western Maryland must pass through the Green Ridge Forest in some location, the Department of Natural Resources and the Department of Transportation, State Highway Administration, have had joint meetings, discussions, and field inspections in an attempt to determine conditions under which the highway could pass through the Forest. The decision has been made that the route should follow AGBF2. This decision is based upon the joint determination that this alignment represents the most appropriate, feasible and acceptable of all alignments considered, from the point of view of service, engineering, and impact on the forest, and the proposed wildland in the Town Creek Area. It is clearly understood that the following conditions do not supersede or obviate the need for any permits or approvals, but are intended to set forth those concepts of design and construction that the Department of Natural Resources, in its custodial responsibility for these lands, believes necessary to minimize the intrusive nature of the proposed freeway on the Forest. The purpose of this document is to set forth the areas of understanding between the two agencies concerning the alignment known as AGBF2. Financing the construction of this alignment and associated mitigation measures is, of course, contingent upon availability of funds through the State's normal budgeting process.

It is understood that the design of the freeway would embody aesthetically pleasing and environmentally sensitive design concepts that are appropriate to the Green Ridge State Forest. A design approach, similar to that documented in the I-70, Vail Pass Colorado report, would be the foundation on which to build these mitigative and mutually beneficial concepts.

With this goal in mind, the following stipulations form the basis of an understanding between the two agencies under the assumption that line AGBF2 would be implemented.

STIPULATIONS

I. General Conditions

- A. To formulate and incorporate aesthetic and environmentally sensitive elements into the design, an interdisciplinary approach will be utilized. To accomplish this, expertise in the following areas will be involved: landscape architecture, total environmental planning, and highway and bridge engineering. The Maryland Department of Natural Resources and State Highway Administration environmental staff will provide expertise in the preservation of forests, drainage courses and stream protection, wildlife, vegetation, and other natural environmental factors. The Federal Highway Administration and State Highway Administration will ensure that the meaningful and sustained input from these disciplines is incorporated into the design of this corridor.

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- B. The Department of Natural Resources and other members representing the interdisciplinary approach will participate in the review of each phase of the design and problems arising during construction.
 - C. Traffic noise from the National Freeway will have an adverse effect upon land adjacent to the proposed right of way. To mitigate this disturbance the State Highway Administration and the Department of Natural Resources shall acquire replacement land identified in Attachment I to this agreement. The Administration shall attempt to negotiate a purchase of this land. If necessary, the SHA Office of Counsel and Office of Real Estate will implement condemnation proceedings in the name of the Department of Natural Resources for any or all of these parcels, in accordance with procedures to condemn property for other State agencies. The Administration shall pay for the land whether acquired by negotiated purchase or by condemnation. The maximum liability incurred by the Administration under this paragraph is One Million Dollars (\$1,000,000). Acquisition of this land will begin in the first year that State Highway Administration advertises for construction within Green Ridge Forest. Provision of the replacement land is in addition to payment of the fair market value for the right of way for the National Freeway.
 - D. Consistent with existing SHA policy, roadway illumination will not be used, with the possible exception of interchange ramps at the eastern limit of the forest.
 - E. Retention ponds to minimize effects of this project will be used where necessary, as determined by DNR/SHA during design phase.
 - F. All signing of the highway in the forest will be held to a minimum.
 - G. Department of Natural Resources will assist in determining limits of construction contracts, construction access routes, and in establishing mobilization sites and inspecting restoration work prior to final acceptance by SHA. Construction access points will be predetermined and included in the contract documents.
 - H. Construction activities will be guided by certain seasonal restrictions.
 - I. Steel to be weathered, but not painted, if so desired by DNR.
 - J. Flexible hose bypass systems, similar to Vail Pass Colorado approach, to be used in smaller stream areas in order to prevent sediment and erosion wash.

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- K. Revegetation other than for stabilization should blend with surrounding area of forest and be indigenous, subject to Department of Natural Resources concurrence.
 - L. Contractors will be required to submit proposed sites for waste disposal to the DNR for review prior to SHA issuances of notice to proceed to construction. DNR will not approve any sites within Green Ridge Forest or any 100 year flood-plains.
 - M. Aesthetic treatment of all structures within the Green Ridge State Forest shall be jointly developed between DNR and SHA during the design phase. Stone Facing will be used wherever feasible and practical.
 - N. The State Highway Administration shall provide the funds necessary to pay the salary and expenses of a Department of Natural Resources' environmental inspector for the National Freeway. This person and associated DNR staff shall be responsible for direct liaison with SHA construction management personnel regarding the strict enforcement of, and adherence to, contract specifications in matters affecting DNR and the intent of this agreement during and, for a limited period (to be determined jointly by DNR and SHA), after the construction of the National Freeway in Green Ridge Forest. It is anticipated that this inspector will be used full-time during the construction phase and part-time during the jointly agreed upon period following construction.
 - O. This Agreement shall be construed and interpreted in accordance with the law of Maryland; it shall be subject to ratification by the Board of Public Works, and it is subject to the budgetary constraints contained in the laws and Constitution of the State.

II. Specific Mitigation Areas

- A. Continuity of existing trails used to provide access for timber management, logging, fire control, emergency evacuation, wild-life access and hiker/campers. The following areas, identified by study line stations, indicate a need to provide access by means of structures over or under the main roadway. Stations 1804+, 1777+, 1610+, and 1597+. It is understood that these stations may change as more detailed identification (mapping field surveys) becomes available. It is also understood that access will be provided from the end of the structure at Station 1777+ to the trail located at Station 1781+, as well as a connection of the access crossing at Station 1804+ to the trail at Station 1797+. All trail road structures over or under mainline will be a minimum 15 feet wide. Trail road and crossing grades will not exceed 10%, except where jointly agreed by SHA and DNR. It is anticipated that the services of experts in wildlife management will be used to ensure that provisions for wildlife crossings will be reasonably effective.

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B. Continuity and Protection of Natural Drainage Courses

The following areas have been identified as low points in the terrain. It will be necessary to keep these areas open for unrestricted passage of water, wildlife, and hiker/campers at Stations 1861+, 1824+, 1815+, 1793+, 1786+, 1771+, 1740+, 1693+, 1660+, 1658+, 1656+, and 1639+. Department of Natural Resources/State Highway Administration agree that structural plate arches (SPA) providing a 12 foot vertical clearance and a natural bottom will be used at these locations, except where DNR/SHA may agree in the design phase that such a measure may not be feasible. Where the use of SPA will be structurally unsound, concrete box culverts with a natural floor will be used.

C. Major Stream Crossings


The purpose of these recommendations is to indicate the mitigating features necessary to minimize the impact of construction at the following stream crossings. They are not intended to supersede or exclude specific requirements that may, subsequently be included in Sediment Control Plans and Waterway Construction Permits as required by law. The additional mitigative measures and restrictions on construction activities will be implemented pursuant to conditions outlined in the plans and permits which may be issued by the Department of Natural Resources.

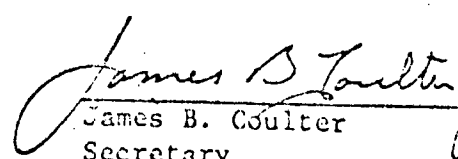
1. Fifteen Mile Creek - The SHA will construct, and DNR accepts in concept, subject to further permit actions a four span segmental concrete girder structure (similar to Vail Pass) or, as an alternate subject to joint DNR/SHA concurrence, a steel box girder structure. The structure in this location will involve three piers, two of which would be on the valley floor, and a third adjacent to existing Fifteen Mile Creek Road. The profile grade line of the structure will be designed to a minimum elevation of 840 feet at the east slope of the fifteen mile creek valley. There will be no relocation of the road or the creek. In order to provide maximum protection for the floodplain, stream, mill race, and to prevent erosion and sediment problems, there will be no clearing and grubbing in the valley or the slopes leading to the valley throughout the length of the structure, with the exception of that required for construction access and the piers. Other mitigation measures and restrictions on construction activities will be implemented pursuant to conditions outlined in the Sediment Control Plan and Waterway Construction permit to be issued by the Department of Natural Resources. The design for access and restoration shall be included in SHA's design contract and subject to SHA/DNR design team concurrence. The construction of the access roads, as well as the restoration of the area upon completion of the work in the valley, shall be included in the contract for construction of the bridge. Any proposed changes by the contractor shall be subject to joint SHA/DNR approval.

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- 2. Black Sulphur Run - This run and the entire 100-year floodplain will be bridged. Piers may be placed in the floodplain but set back from the stream so as not to affect the channel. There will be no slope construction within 100 feet of the stream.
- 3. Town Creek - The crossing of Town Creek will have a high level, multi-span bridge with no box culverts. Actual length will be subject to final determination of the width of the 100-year floodplain.
- D. Eliminate relocation of Black Sulphur Road as shown in the existing study report and a portion of relocated George Road. Every attempt will be made to bridge the existing Black Sulphur Road. The existing intersection of Black Sulphur Road and George Road should remain undisturbed if possible.
- E. Scenic Overlooks and Picnic/Rest Area (not considered mitigation) The Picnic/Rest Area 1670+ is not considered as mitigation and will be removed from further consideration. Scenic overlooks such as the one at 1775+ do not create adverse impacts and therefore may be retained.
- F. A SPA with 6 foot vertical clearance should be used under relocated Jacob's Road. If the use of SPA at this location is structurally unsound, concrete box culvert with a natural floor will be used.
- G. The natural drainage course on the east slope of Polish Mountain from Station 1620+ to 1640+ will be retained in its natural state. A minimum 100 foot buffer of natural ground will be kept between the centerline of the water course and the highway construction slopes. This also applies to the drainage course on the west slope of Polish Mountain, Station 1595+ to 1605+.
- H. The State Highway Administration will build an acceptable game crossing along the Polish Mountain ridge. If no other access is available for logging operations in this area, the structure may have to be designed for truck loadings and tie into the existing road along the ridge.

I concur that the conditions noted in this document are adequate to mitigate the adverse effects regarding Location Approval of Alignment AGBF2 through Greed Ridge State Forest.

 2/1/80
 James J. O'Donnell Date
 Secretary
 Department of Transportation

 Jan 30, 1980
 James B. Coulter Date
 Secretary
 Department of Natural Resources

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ATTACHMENT I

These properties are listed in order of priority. Acquisition shall proceed until the dollar limit in paragraph IC is reached.

<u>Current Property Owner</u>	<u>Acreage</u>	<u>Liber/Folio</u>
Helen Rohman	274	479/864
Samuel Goldberg	108a	344/107
Walter A. McKinney	300.00a	400/1
Louis C. Norris	37.50a	470/344
A. L. Fanget McArthur	187.50E	210/552
Jones A. Potts	300. a	?
Nellie Issacs	457 a	269/337
Ernest Slider	132 a	161/597
Sherman M. Wilson	49.82a P.T.	404/448
Lena P. Struckman	42.20a	292/37
Charles M. Evans	250.0 a	347/388
Estel K. McLaughlin	685 (?)	60/509

APPENDIX C

922 May Road
Lititz, PA 17543

December 21, 1978

Mr. William Branch
Maryland State Highway Planning
2323 West Jappa Road
Brooklandville, MD 21022

Dear Mr. Branch:

In reference to our telephone conversation of this date, I am happy to send to you this note containing some of my observations on the wildlife and furbearers that can be found utilizing Town Creek Valley.

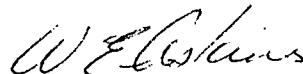
Over a period of approximately fifteen years I have trapped this valley for furbearers and have found that it contains a very healthy population of beaver, muskrat, mink and raccoon. I have on eight or ten different occasions been able to track and verify the tracks of bobcat also using this valley.

I most certainly hope that in the planning of this expressway some thought will be given to the fact that this is one of the better semi-wilderness areas that can still be found in Maryland. I would certainly hope that nothing would be done that would jeopardize the fact that this can still be the home of the bobcat in western Maryland.

If you would like further information concerning the animals and their populations in this valley, please feel free to contact Mr. Donald Lawson, Box 158, Ijamsville, Maryland 21754.

If I can be of any further help to you regarding this information, please feel free to contact me.

Sincerely,



William E. Askins

WEA:kf

RECEIVED

DEC 26 1978

G. R. ANDERSON



United States Department of the Interior

FISH AND WILDLIFE SERVICE

MIGRATORY BIRD AND HABITAT RESEARCH LABORATORY
LAUREL, MARYLAND 20811

Feb. 12, 1979

Bill Branch
MD St. Highway Adm.
Bureau of Landscape Architecture
2323 West Joppa Rd.
Brooklandville, MD 21022

Bill:

Here are the results of that Breeding Bird Survey route in Allegany County that I promised. The individual counting locations are marked on the enclosed map. The cover map has pages delineated. All birds listed on p. 1 on the summary sheet were seen or heard between the respective parentheses on the map; p. 2 etc.

One rather rare and apparently decreasing bird I forgot to mention that occurs in that area is Bewicks' Wren. The hills from Clear Spring to Cumberland are effectively the only place they are left in Maryland and they are very rare there. They are most common within 10 or 20 miles of the Allegany-Washington Co. border.

Please remember that these results are only an index to relative abundance of different breeding species in the area, and are in no way a complete list of the species that occur there (perhaps 80%). It is, of course, also no indication of actual numbers of the species that are recorded. It merely shows which species are common and which are rare.

I hope I didn't give you the impression that there is absolutely no possibility of Bachmans' Sparrow in the area. It remains the last place in the State that any summer individuals were seen and the habitat is still there. A thorough scrutiny of the area could still turn some up.

Two other species occurring in the area that are of some concern to many people are Red-headed Woodpecker and Loggerhead Shrike. Both are somewhat rare throughout Maryland and nest or probably nest in the area in question.

Other possibilities include Common Raven, Turkey, and Common Nighthawk.

Danny Bystrak
Danny Bystrak
Wildlife Biologist
Migratory Nongame Birds



JAMES B. COULTER
SECRETARY

STATE OF MARYLAND

72
LOUIS N. PHIPPS, JR.
DEPUTY SECRETARY

DEPARTMENT OF NATURAL RESOURCES
ENERGY & COASTAL ZONE ADMINISTRATION
TAWES STATE OFFICE BUILDING
ANNAPOLIS 21401
TELEPHONE (301) 269-3382

March 28, 1979

Mr. Bill Branch
State Highway Administration
Bureau of Landscape Architecture
2323 West Joppa Road
Brooklandville, MD 21022

Dear Bill:

Enclosed please find the Maryland Uplands Natural Area Study site information and map for Allegany County as requested per our phone conversation on 3/28/79. I hope this will suffice your needs until we can get the computer printouts completed. If I can be of any further assistance to you in interpreting the field data sheets, please do not hesitate to contact me.

Sincerely,

A handwritten signature in cursive script that reads "Frank H. Rice".

Frank H. Rice

FHR:ps
Enc.

73

MARYLAND

DONALD E. MACLAUCHLAN
Director
301-269-3776



FOREST SERVICE • PARK SERVICE
DEPARTMENT OF NATURAL RESOURCES

DAVID L. HATHWAY
Chief of Staff
301-269-3776

TUNIS J. LYON
Deputy Director
Forest Service
301-269-3776

JAMES E. MALLOW
Deputy Director
Park Service
301-269-3761

Tawes State Office Building
Annapolis, Maryland 21401

July 13, 1979

Mr. Bill Branch
Environmental Specialist
Landscape Division
State Highway Administration
Brooklandville, Maryland 21022

Dear Mr. Branch:

A timber inventory of the construction corridor of the National Freeway alternate Route A.G.B.F. 2 reveals a total estimated timber value of \$56,202.62.

The inventory was completed by Mr. John Mash, Forest Manager for Green Ridge State Forest. Approximately 166 acres of state forest land were involved in the inventory.

I strongly urge that no irreversible action concerning this timber be taken until the latest possible date.

Sincerely yours,

W.A. Clinton Irwin
W. A. Clinton Irwin
Environmental Specialist

WACI/fdb

RECEIVED

JUL 16 1979

C. R. ANDERSON

September 5, 1979

Mr. Gary Taylor
Non-Game and Endangered
Species Program Director
Md. Wildlife Administration
P.O. Box 68
Wye Mills, Maryland 21679

RE: Md. US 48 (National Freeway)
Summary of Inter-Agency Coordination
Regarding Endangered Species

Dear Mr. Taylor:

As I am proceeding toward the final statement of biological resources and impact analyzes for the above referenced project (alt. ACBP2 only), I felt it would be appropriate at this time to review the data which we have collected so far as it relates to your ongoing efforts in behalf of those species which are protected by Maryland and/or Federal law.

Field review with Mr. Ken D'Loughy of your staff enabled us to locate existing inventoried breeding ponds for the endangered salamander (Ambystoma jeffersonianum). It is apparent that no conflicts are present at this time between the continued existence of these ponds and the proposed highway alignment.

Further contacts with informed private sources revealed information on bobcat occurrences within the project study area. A letter concerning this was forwarded to your office as part of the coordination process which we have established and maintained over the past few years.

I understand that ongoing studies are now taking place regarding the potential occurrence of the federally protected Indiana bat (Nyctis sodalis) in several caves which are located within the study area. We will maintain continued coordination on this issue as it may involve a section 7 consultation with the U.S. Department of Interior.

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Mr. Gary Taylor
September 5, 1979
Page 2

If there are any further issues which you feel should be discussed, please let me know. As always, our office expects to insure as best we can that no conflicts develop between our proposed activities and the continued existence of species which are either considered to be endangered or threatened.

Sincerely,

William L. Branch
Environmental Specialist

WLB:cls

cc: Mr. Carlo Brunori
Mr. Bob Zepp
Mr. Frank Koller



MARYLAND DEPARTMENT OF NATURAL RESOURCES
WILDLIFE ADMINISTRATION

BERNARD F. HALLA
DIRECTOR
EARL H. HODIL
DEPUTY DIRECTOR

TAWES STATE OFFICE BUILDING
ANNAPOLIS, MARYLAND 21401
(301) 269-3195

September 14, 1979

Mr. William L. Branch
State Highway Administration
Bureau of Landscape Architecture
Joppa and Falls Roads
Brooklandville, Maryland 21022

Dear Mr. Branch:

As I indicated to you in our telephone conversation on August 30, 1979, the Wildlife Administration has just this spring initiated surveys to determine the distribution and population status of Maryland cave-dwelling bat species, including the Indiana bat (Myotis sodalis), a Federal endangered species.

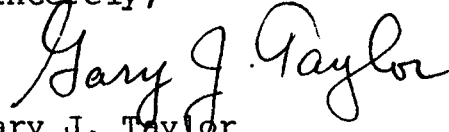
There are five identified caves within the area of project influence for Maryland US 48. These are identified on the attached map; four are located near the corridor for route AGBF and the fifth is located near the corridor for AGEENA. Our current information on bat usage in these caves is incomplete, however we will survey all these caves this winter to document bat usage.

The scale of the project map I have to work with is inappropriate to determine if any of these caves are in the corridor of the proposed highway alignment. Since your office has large scale route alignment maps, you are in the best position to determine this. Consequently I am enclosing more complete and specific information on the location of the caves, derived from Franz and Slifer's publication on the caves of Maryland (Franz, R. and D. Slifer, 1971. Caves of Maryland. Md. Geological Survey, educational series no.3; reprinted 1976.) I am also enclosing instructions on how to use Franz and Slifer's location technique. The caves in question are Athey's Cave, Devils Den, Devils Hole, Murley Branch Spring and Tewell caves. If you find it necessary to visit these sites, let me know and I'll plan to accompany you.

I appreciate your continued interest in insuring that endangered species are not adversely impacted by planned highway projects.

If you have any further questions, feel free to contact me.

Sincerely,



Gary J. Taylor
Nongame & Endangered
Species Program Manager

GJT:bw
cc: Mr. Carlo Brunori
enc.

RECEIVED

SEP 14 1979

C. R. ANDERSON



MARYLAND DEPARTMENT OF NATURAL RESOURCES
WILDLIFE ADMINISTRATION

BERNARD F. HALLA
DIRECTOR
EARL H. HODIL
DEPUTY DIRECTOR

TAWES STATE OFFICE BUILDING
ANNAPOLIS, MARYLAND 21401
(301) 269-3195

January 21, 1980

Mr. William L. Branch
State Highway Administration
Bureau of Landscape Architecture
Joppa & Falls Roads
Brooklandville, Maryland 21022

Dear Bill:

The status of our western Maryland Cave Dwelling Bats Investigation, specifically for those caves located adjacent to the proposed AGBF2 alignment for the National Freeway, is as follows:

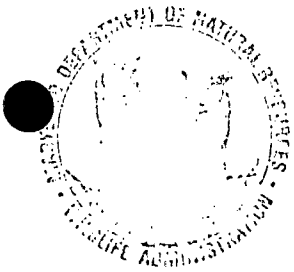
1. Athey's Cave: no bat use as hibernaculum.
2. Murley Branch Spring Cave: permission not yet secured from owner to investigate cave. Anticipate investigation will be accomplished within next 30 days.
3. Tewell Caves: not yet surveyed. Survey anticipated within 30 days.
4. Devils Hole Cave: several surveys accomplished from October 1979 through last week. Moderate use primarily by Eastern pipistrelles, but 2 little brown bats also documented.
5. Stegmaier Caves: access not yet secured. Survey anticipated within 30 days.
6. Twiggs Cave: entrance permanently sealed by landowner who denied permission anyway to survey cave.
7. Horse Cave: entrance not yet located. Survey anticipated within 30 days.

I'll keep you apprised as our investigations proceed.

Sincerely,

Gary J. Taylor
Nongame & Endangered
Species Program Manager

GJT:bw



MARYLAND DEPARTMENT OF NATURAL RESOURCES
STATE OFFICE BUILDING
ANNAPOLIS, MARYLAND 21401
(301) 269-3191

BERNARD F. HALLA
DIRECTOR
EARL H. HODII
DEPUTY DIRECTOR

TAWES STATE OFFICE BUILDING
ANNAPOLIS, MARYLAND 21401
(301) 269-3191

February 22, 1980

Mr. William L. Branch
State Highway Administration
Bureau of Landscape Architecture
Joppa and Falls Roads
Brooklandville, Maryland 21022

Dear Bill:

Here's the latest update on survey results from our Maryland Cave Dwelling Bats Investigation, specifically for those caves located adjacent to the proposed ACBF2 alignment for the National Freeway. This information was collected subsequent to that contained in my letter to you dated January 21, 1980. Included here is information only on those caves which were investigated since my previous letter to you.

1. Murley Branch Spring Cave: owner indicated cave is inaccessible to investigators since it is a spring source. Bat use here is questionable, but perhaps the entrance could be sampled by mist netting during the summer.
2. Towell Caves: cave entrances exceedingly small (inaccessible to investigators). Mist netting would be the only means of sampling for bat use.
3. Horse Cave: moderate use by Eastern pipistrelles documented in early February.

I'll continue to keep you apprised of our survey results.

Sincerely,

Gary J. Taylor
Nongame & Endangered
Species Program Manager

GJT:bw

AIR QUALITY ANALYSIS

U.S. Route 48--East of Cumberland
to M.V. Smith Road

Contract No. A 519-033-619

Department of Transportation
State Highway Administration
Bureau of Landscape Architecture
Environmental Section

March 17, 1980

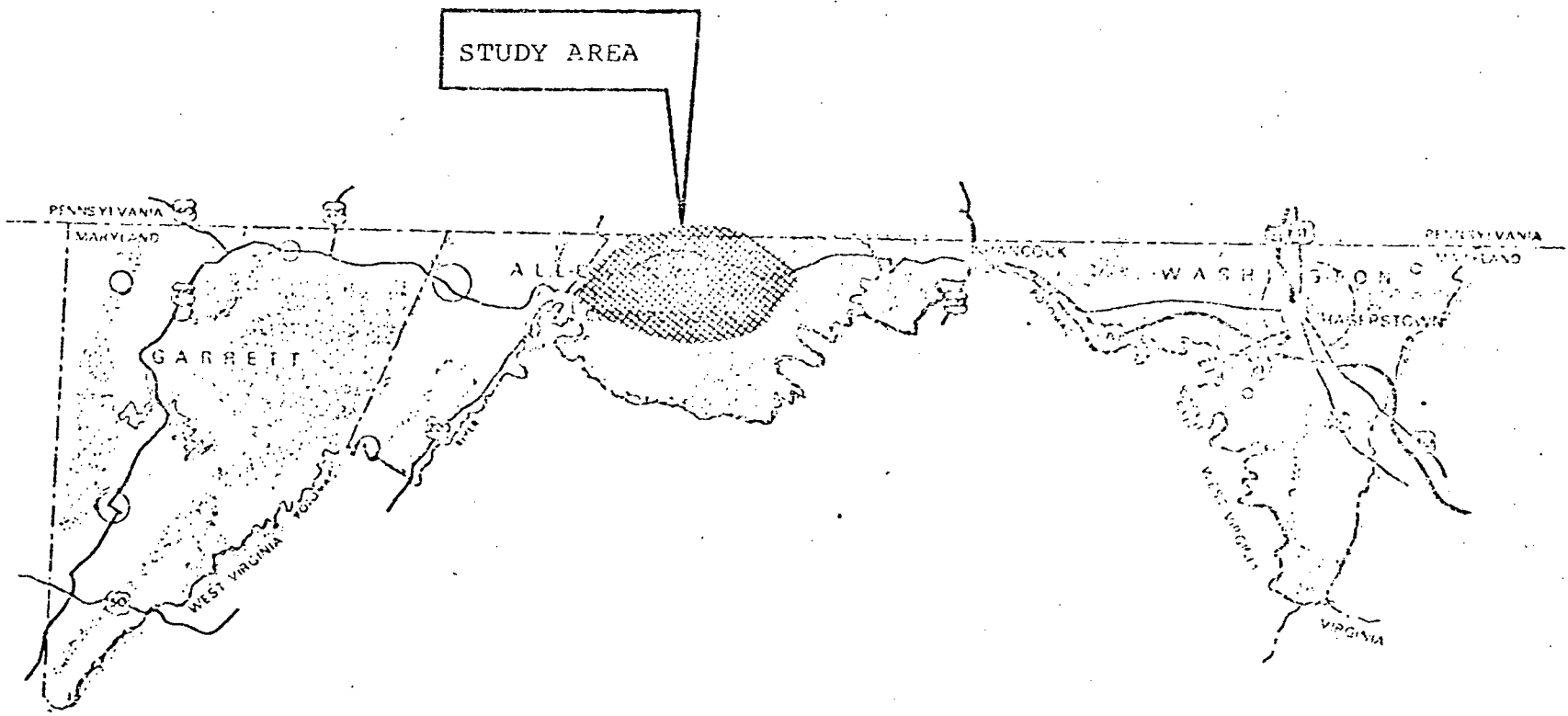
I. INTRODUCTION

A. Project Description

The proposed project is the completion of the National Freeway, U.S. Route 48, in Allegany County, Maryland. The portion of the project addressed herein is Section I, from Wolfe Mill, approximately 2.5 miles east of Cumberland, to M.V. Smith Road; a distance of approximately 16.9 miles (see Figure I).

The proposed alternate for construction of Section I of the National Freeway is line AGBF₂. Beginning at Wolfe Mill where an interchange will be provided, AGBF₂ continues east along existing U.S. 40 to an interchange with Corridor O of the Appalachian Development Plan, U.S. 220. The alternate then passes southeasterly between Big Knob and Little Knob, crosses Collier Run and continues east along the southern edge of Bush Ridge. AGBF₂ crosses Williams Road near the southwestern most boundary of the Breakneck Road Historic District and roughly parallels Williams Road before crossing it again on Warrior Mountain. The proposed route then proceeds basically due east across Town Creek, through the Green Ridge State Forest, linking up with the present U.S. Route 40 on the east side of Green Ridge and following the existing road's alignment to the improved section beginning at M.V. Smith Road.

The proposed typical section is a dual highway with twelve (12) foot lanes, outside shoulders of ten (10) feet, and a median of 58 feet. Climbing and descending lanes would be accommodated. Access, as mentioned, would be allowed only at interchanges.




 PUBLIC USER SPACE

FIGURE I
 PROJECT VICINITY MAP
 U.S. Route 48
 (National Freeway)
 Section I

Air Quality

The proposed project is located within the Cumberland-Keyser Interstate Air Quality Control Region, a Priority III area as designated by the U.S. Environmental Protection Agency. Air pollutant monitoring is conducted at the Maryland Department of Health and Mental Hygiene's Airmon 8 station in Cumberland. No carbon monoxide violations of the National Ambient Air Quality Standards were monitored for 1978.

An air quality analysis was conducted to determine potential air quality impacts from the proposed construction of the National Freeway, US Route 48. The following assumptions were used in the analysis:

1. The EPA HIWAY line source model was used to derive near-field carbon monoxide concentrations.
2. Motor vehicle emission factors were determined utilizing the EPA MOBILE 1 program.
3. The Cumberland, Maryland carbon monoxide data published in the 1978 Maryland Department of Health and Mental Hygiene Air Quality Data Report was used to determine background carbon monoxide concentration in the corridor. Levels for 1985 (E.T.C.) and 2005 (design year) were derived using the rollback method. The resulting data is shown in Table I.
4. Inspection/Maintenance (I/M) was assumed to be in effect in 1982 including mechanic training, 30 stringency and benefits applied to all post-1965 model vehicles.

TABLE I

Carbon Monoxide Background concentration--Cumberland
mg/m³

	One-Hour	Eight-Hour
1978 ¹	11	7
1985 ²	4.5	2.9
2005 ²	4.8	3.1

¹From 1978 Maryland Air Quality Data Report
²Data from rollback calculations

5. It was assumed that all vehicles are in the hot-stabilized mode based upon the fact that the proposed project is a freeway and vehicles will have been operating for more than 505 seconds prior to entering the facility. A worst-case temperature of 0° F. was used. Assumptions regarding use of catalyst, control of truck emissions, and deterioration are those inherent in the MOBILE 1 program.

6. Worst-Case Meteorology

One-Hour

Wind Speed=1 m/sec

Stability Class-F

Wind Direction=that which will produce maximum concentration at receptor of concern.

Mixing Ht. 350 m (from Holzworth, 1972)

Eight-Hour

Wind Speed=2 m/sec before 17:00
1 m/sec after 17:00

Stability Class-D before 17:00
F after 17:00

Wind Direction=same as 1-hour

Mixing Ht. - same as 1-hour

Eight areas were analyzed to determine the impact of the project on microscale carbon monoxide levels. All eight are near the western terminus of the project as this section is expected to carry the heaviest volumes of traffic and right-of-way is the narrowest along the project. Each of the eight areas is described below. The location of these receptors is shown on Figures II and III.

- Receptor 1 -- A single family residence right of Station 983+50±.
- Receptor 2 -- A single family residence right of Station 991+00±.
- Receptor 3 -- Mason's Barn Restaurant south of US Route 48.
- Receptor 4 -- Office of the Colonial Manor Motor Lodge.
- Receptor 5 -- Motel unit of the Colonial Manor Motor Lodge closest to US Route 48.

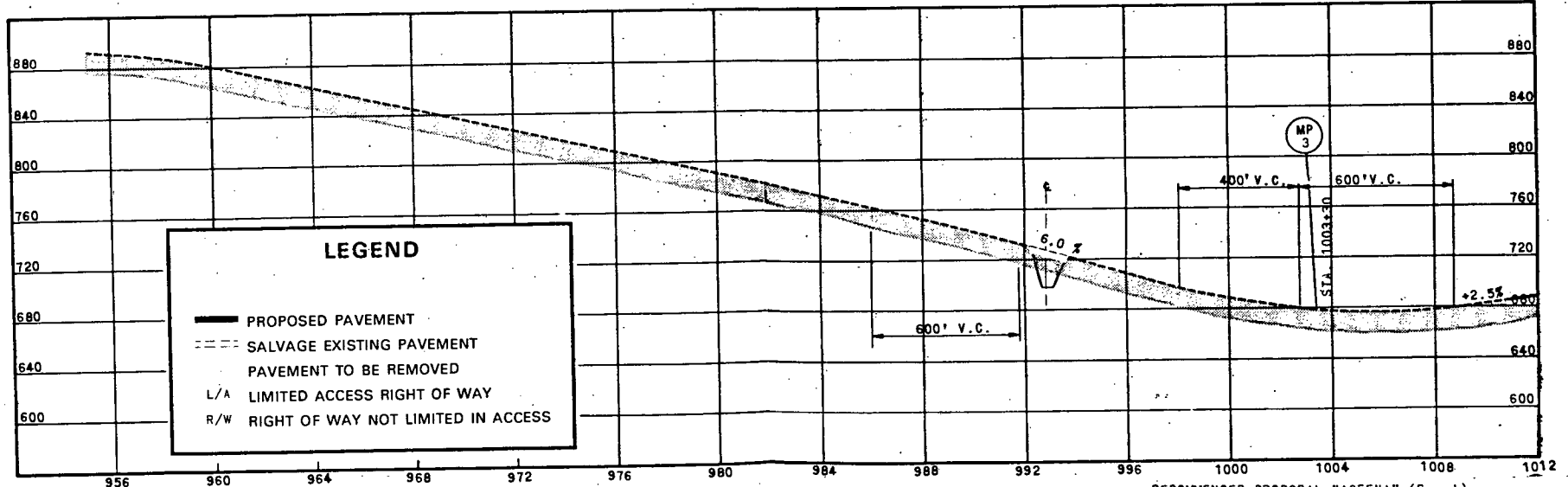
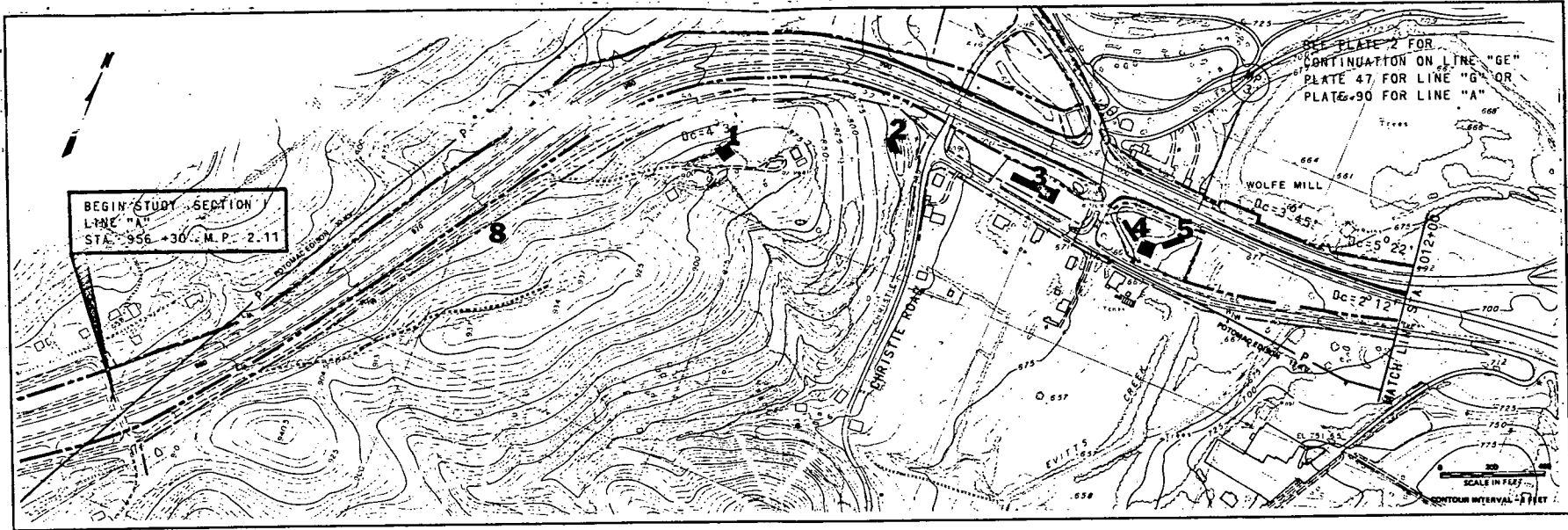
- Receptor 6 -- Three story residence right of Station 1033₊.
- Receptor 7 -- A single family residence right of Station 1038₊.
- Receptor 8 -- Edge of right-of-way of Station 973+75₊.

The receptors selected for the analysis are all within the western portion of the study area. These receptors were chosen because they represent the area of the project where the greatest volumes of vehicles and lowest speeds occur and right-of-way is narrowest. Receptors located along the remainder of the proposed improvement and existing U.S. Route 40 all experience lesser traffic volumes and rights-of-way are wider. The analysis assumes that the worst-case analysis for the selected receptors is indicative of carbon monoxide concentrations greater than would result along the remainder of the alternate.

The microscale carbon monoxide analysis utilized the following traffic data which was prepared by the Maryland State Highway Administration's Bureau of Highway Statistics.

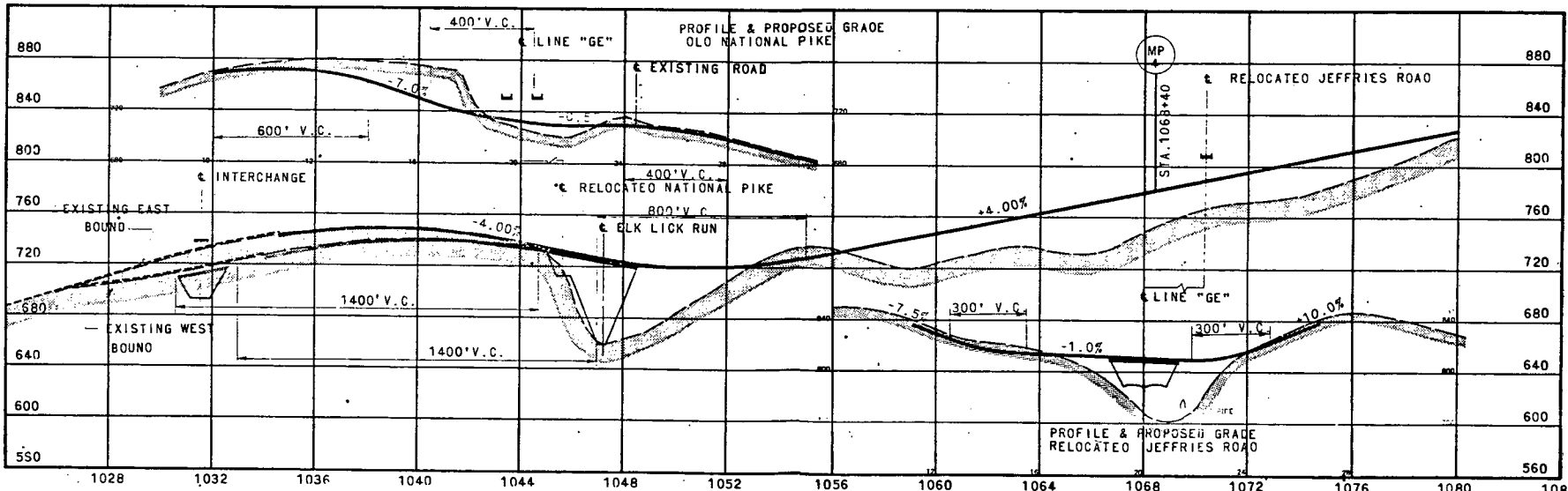
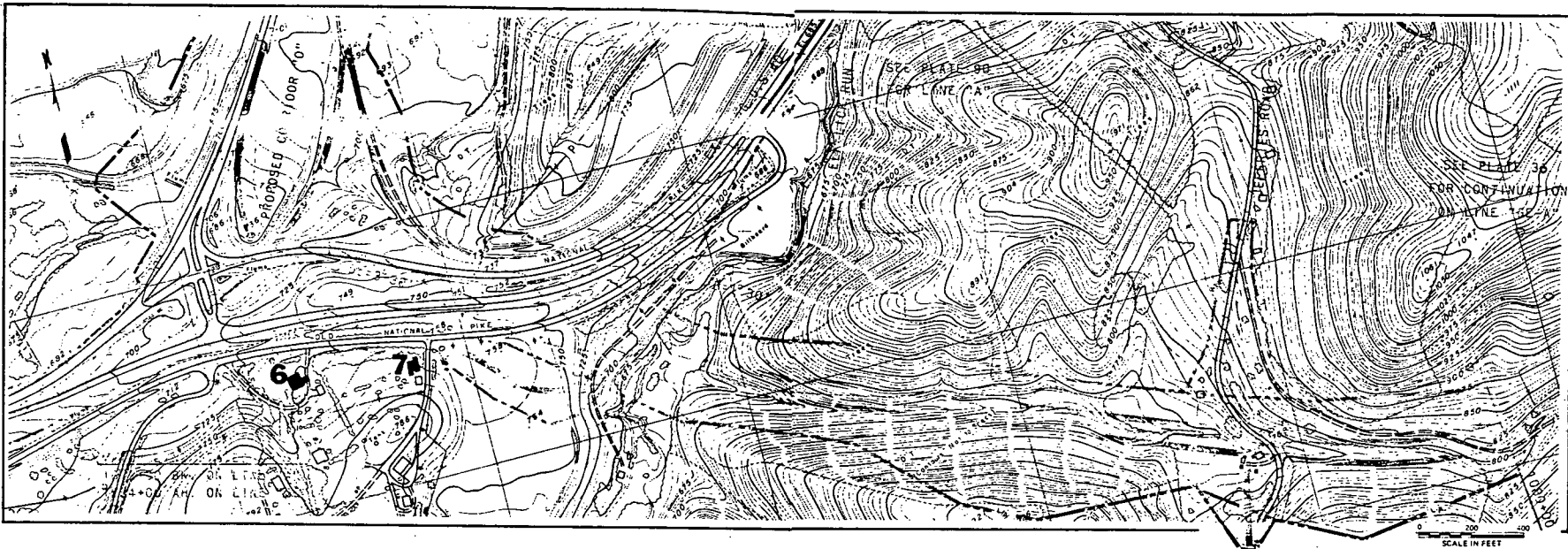
TRAFFIC PARAMETERS

Average Daily Traffic (ADT)	See Figure IV & V
Design Hour Volume (DHV)	9% of ADT
Directional Distribution in Peak Hour	51%
Truck Mix	13% of ADT 14% of DHV
Heavy Duty Gas (ADT)	-- 2.3%
Heavy Duty Diesel (ADT)	-- 6%
Heavy Duty Gas (DHV)	-- 2.4%
Heavy Duty Diesel (DHV)	-- 9%
Operating Speeds -- No Build	1985 Peak -- 30 mph Off-Peak 55 mph 2005 Peak -- 30 mph Off-Peak 55 mph
Build	1985 Peak & Off-Peak 55 mph 2005 Peak -- 35 mph Off-Peak 55 mph
Diurnal Curve	SEE TABLE II



RECOMMENDED PROPOSAL "AGEENA" (Sec. 1) LINE "A" STA. 956+30 TO 1012+00 FIGURE II

AP



RECOMMENDED PROPOSAL "AGEENA" (Sec. 1)
 LINE "GE" STA. 1024+00 TO 1080+00

FIGURE III

47

1985
2005

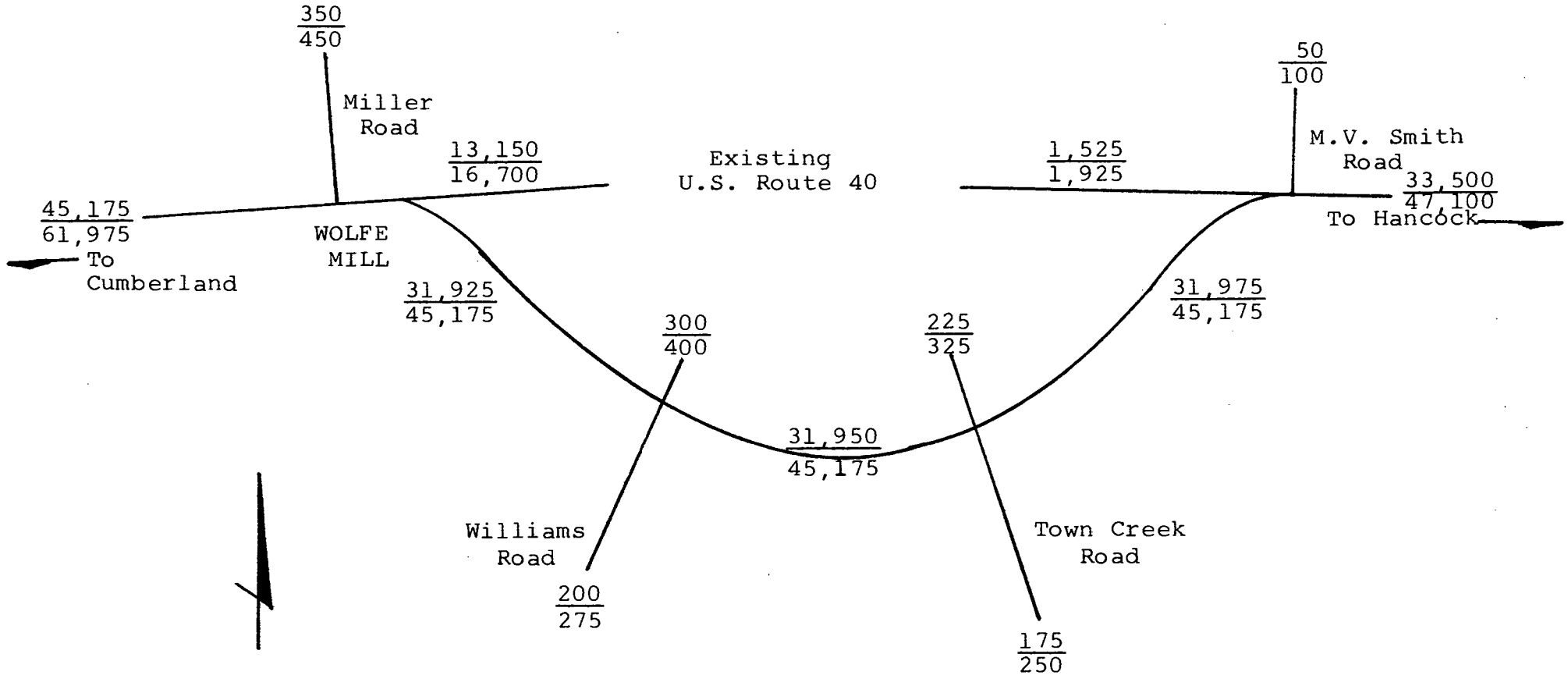


FIGURE IV
AVERAGE DAILY TRAFFIC
U.S. Route 48--National Freeway
AGBF₂
Wolfe Mill to M.V. Smith Road
BUILD ALTERNATE

48

1985
2005

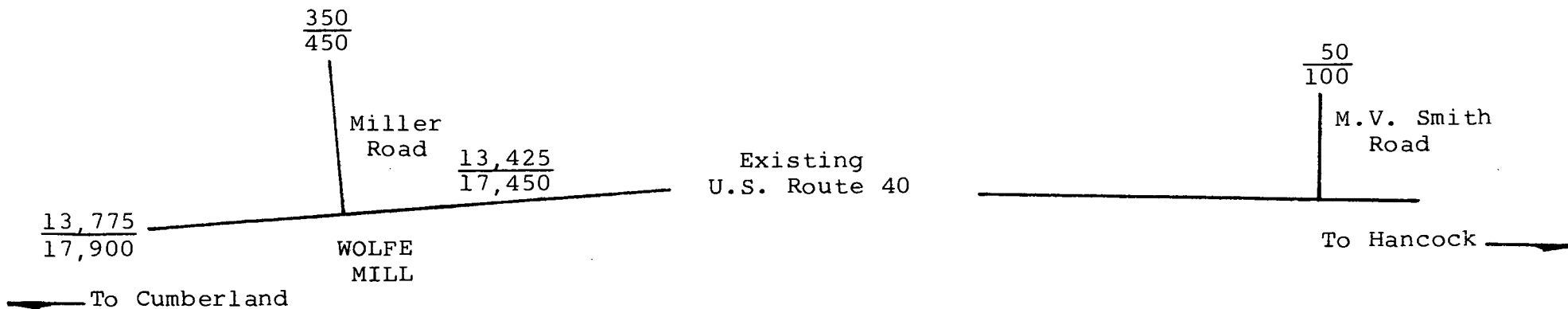


FIGURE V
AVERAGE DAILY TRAFFIC
U.S. Route 48--National Freeway
AGBF₂
Wolfe Mill to M.V. Smith Road
NO BUILD ALTERNATE

69

TABLE II
DIURNAL TRAFFIC CURVES
U.S. Route 48--National Freeway
(Section I)
AGBF₂

<u>Hour</u>	<u>Percent of ADT</u>	<u>Hour</u>	<u>Percent of ADT</u>
12M-1 am	1	12N-1 pm	6
1-2 am	1	1-2 pm	6
2-3 am	1	2-3 pm	7
3-4 am	1	3-4 pm	8
4-5 am	1	4-5 pm	9
5-6 am	1	5-6 pm	7
6-7 am	3	6-7 pm	5
7-8 am	5	7-8 pm	5
8-9 am	6	8-9 pm	4
9-10am	5	9-10pm	3
10-11am	5	10-11pm	2
11am-12N	6	11pm-12M	2

The microscale analysis calculated worst-case one and eight-hour carbon monoxide concentrations for the estimated year of completion (ETC) and the design year for both the build and no-build alternates. The eight-hour analysis determined that the period of 2-10 p.m. represents the worst consecutive eight hours based upon traffic volumes and meteorological data. Table III presents the anticipated one and eight-hour carbon monoxide levels for the no-build and build alternates.

No violations of either the one or eight-hour standards are anticipated from the proposed project. All concentrations are substantially below standards with a slight increase with the Build Alternate. This is due to the significant increases in traffic with the build conditions, based upon anticipated diversion from existing facilities if the proposed project is constructed.

Consistency With the State Implementation Plan

Location of the project within the Cumberland-Keyser Interstate Air Quality Control Region requires the consideration of micro-scale carbon monoxide concentrations and construction impacts in determining consistency with the Maryland State Implementation Plan.

The project Air Quality Analysis assessed the microscale carbon monoxide impact of the facility. This analysis determined that no violation of State or Federal Ambient Air Quality Standards for carbon monoxide will occur adjacent to the project during the completion and design years.

The consistency of the project in relation to construction activities was addressed through consultation with the Maryland Bureau of Air Quality and Noise Control. The State Highway Administration has established Specifications for Materials, Highways, Bridges, and Incidental Structures which specify procedures to be followed by contractors involved in State work. The Maryland Bureau of Air Quality and Noise Control has reviewed these Specifications and has found them consistent with the Regulations Governing the Control of Air Pollution in the State of Maryland. Analysis of microscale carbon monoxide and construction impacts and coordination with the U.S. Environmental Protection Agency and the Maryland Bureau of Air Quality Control (see Appendix) the project has been determined to be consistent with the State Implementation Plan.

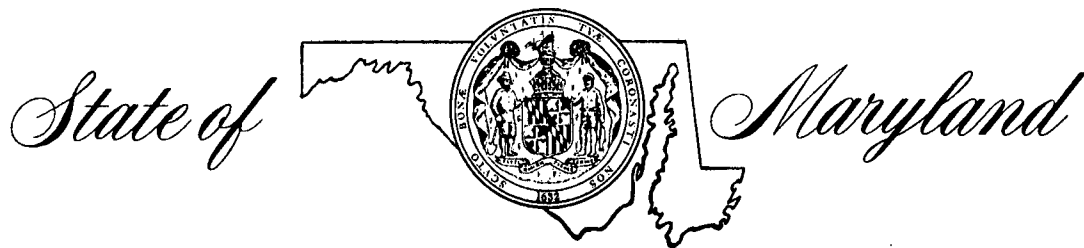
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TABLE III
Carbon Monoxide Concentrations¹
mg/m³

Receptor	1985				2005			
	No-Build		Build		No-Build		Build	
	1 hr.	8 hr.	1 hr.	8 hr.	1 hr.	8 hr.	1 hr.	8 hr.
1	5.7	3.2	6.9	4.0	5.5	3.3	6.7	3.6
2	6.5	3.4	8.5	4.7	5.9	3.4	7.9	4.0
3	6.6	3.4	8.6	4.8	6.0	3.4	8.0	4.0
4	7.3	3.6	10.2	5.4	6.4	3.5	9.3	4.3
5	8.6	3.9	12.7	6.4	6.1	3.5	11.2	4.8
6	7.1	3.5	9.7	5.1	6.3	3.5	8.9	4.2
7	6.5	3.4	8.6	4.8	6.0	3.4	8.0	4.0
8	7.4	3.6	10.2	5.4	6.4	3.5	9.3	4.5

¹ Concentrations include background levels from Table I
One-hour National Ambient Air Quality Standard-40 mg/m³
Eight-hour National Ambient Air Quality Standard-10 mg/m³

APPENDIX



ENVIRONMENTAL HEALTH ADMINISTRATION
DEPARTMENT OF HEALTH AND MENTAL HYGIENE

201 WEST PRESTON STREET • BALTIMORE, MARYLAND 21201 • Area Code 301 • 383- 3245

Harry Hughes, Governor

Charles R. Buck, Jr., Sc.D. Secretary

February 20, 1980

Mr. Charles R. Anderson, Chief
Bureau of Landscape Architecture
Joppa & Falls Roads
Brooklandville, Maryland 21022

Dear Mr. Anderson:

RE: Contract A 519-033-619 U.S. Route 48 -
East of Cumberland to M. V. Smith Road

We have reviewed the Air Quality Analysis for the above subject project and have found that it is not inconsistent with the Programs' plans and objectives.

Thank you for the opportunity to review this analysis.

Sincerely yours,

A handwritten signature in cursive script that reads "W. K. Bonta".

William K. Bonta, Chief
Division of Program Planning & Analysis
Air Quality Programs

WKB:bab



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
6TH AND WALNUT STREETS
PHILADELPHIA, PENNSYLVANIA 19106

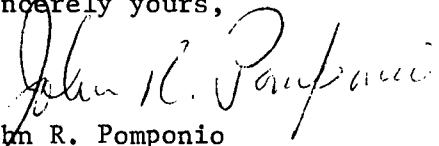
Mr. Charles R. Anderson, Chief
Bureau of Landscape Architecture
Maryland State Highway Administration
2323 West Joppa Road
Brooklandville, Maryland 21022

Re: U.S. Route 48, East of Cumberland to M.V. Smith Road

Dear Mr. Anderson:

We have reviewed the air quality analysis for the project referenced above, and we have no objections to the project from an air quality standpoint.

Sincerely yours,


John R. Pomponio
Chief
EIS & Wetlands Review Section

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NOISE ANALYSIS

The National Freeway

U.S. Route 48

(Section I)

Wolfe Mill to M.V. Smith Road

A 519-033-619

APD 155-1(42)

Maryland Department of Transportation
State Highway Administration
Bureau of Landscape Architecture
Environmental Section
January 16, 1980

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I. INTRODUCTION

A. Project Description

The proposed project is the completion of the National Freeway, U.S. Route 48 in Allegany County, Maryland. The portion of the project addressed herein is Section I, from Wolfe Mill, approximately 2.5 miles east of Cumberland, to M.V. Smith Road; a distance of approximately 16.9 miles (see Figure Ia).

The proposed alternate for construction of Section I of the National Freeway is line AGBF₂. The alignment is shown on Figure Ib & Plates 1-18. Beginning at Wolfe Mill where an interchange will be provided, AGBF₂ continues east along existing U.S. 40 to an interchange with Corridor O of the Appalachian Development Plan, U.S. 220. The alternate then passes southeasterly between Big Knob and Little Knob, crosses Collier Run and continues east along the southern edge of Bush Ridge. AGBF₂ crosses Williams Road near the southwestern most boundary of the Breakneck Road Historic District and roughly parallels Williams Road before crossing it again on Warrior Mountain. The proposed route then proceeds basically due east across Town Creek, through the Green Ridge State Forest, linking up with the present U.S. Route 40 on the east side of Green Ridge and following the existing road's alignment to the improved section beginning at M.V. Smith Road.

The proposed typical section is a dual highway with twelve (12) foot lanes, outside shoulders of ten (10) feet, and a median of 58 feet. Climbing and descending lanes would be accommodated. Access, as mentioned, would be allowed only at interchanges.

B. Summary of Impacts

The proposed AGBF₂ alignment of the National Freeway would result in adverse noise impacts at noise sensitive

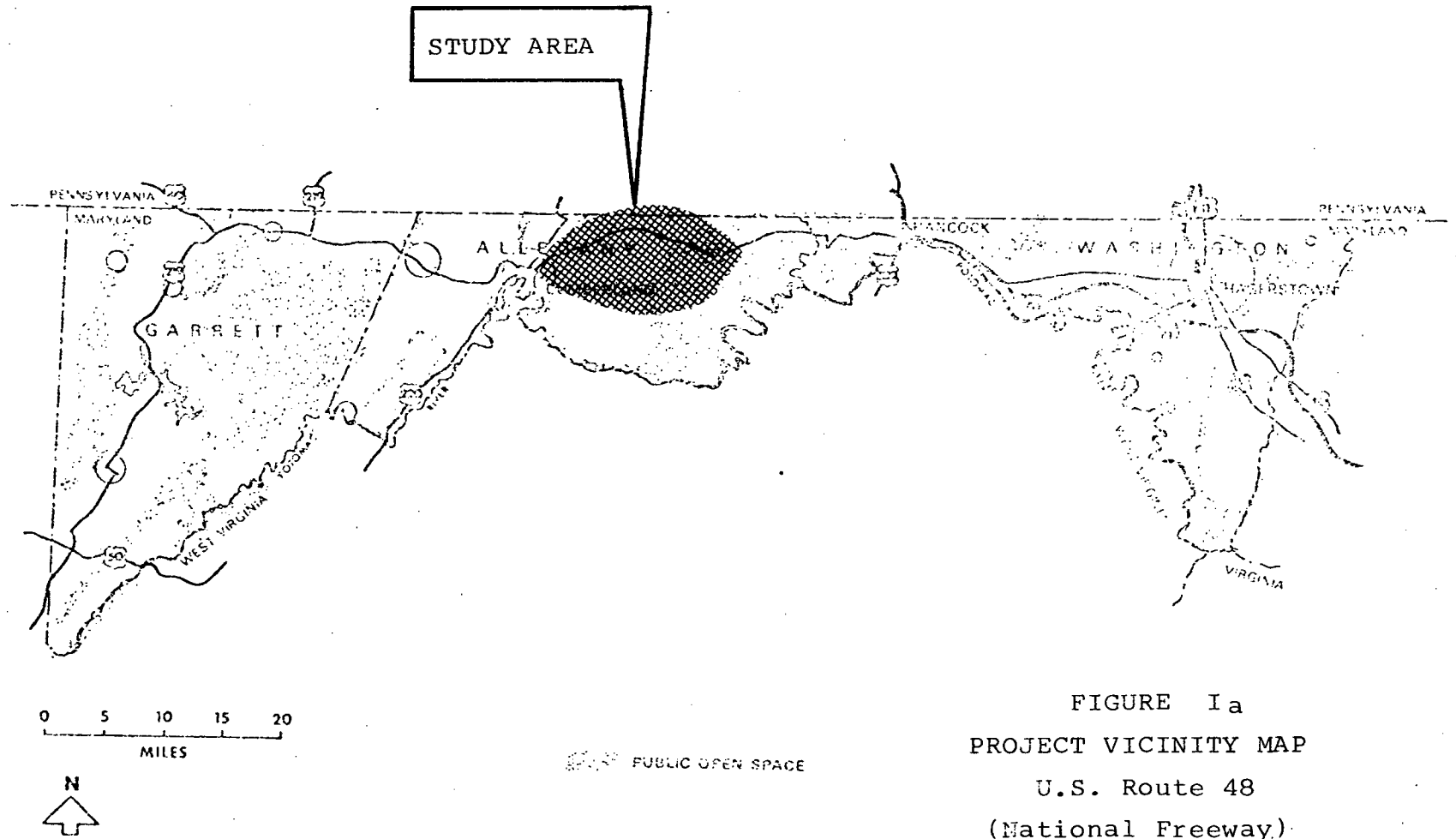
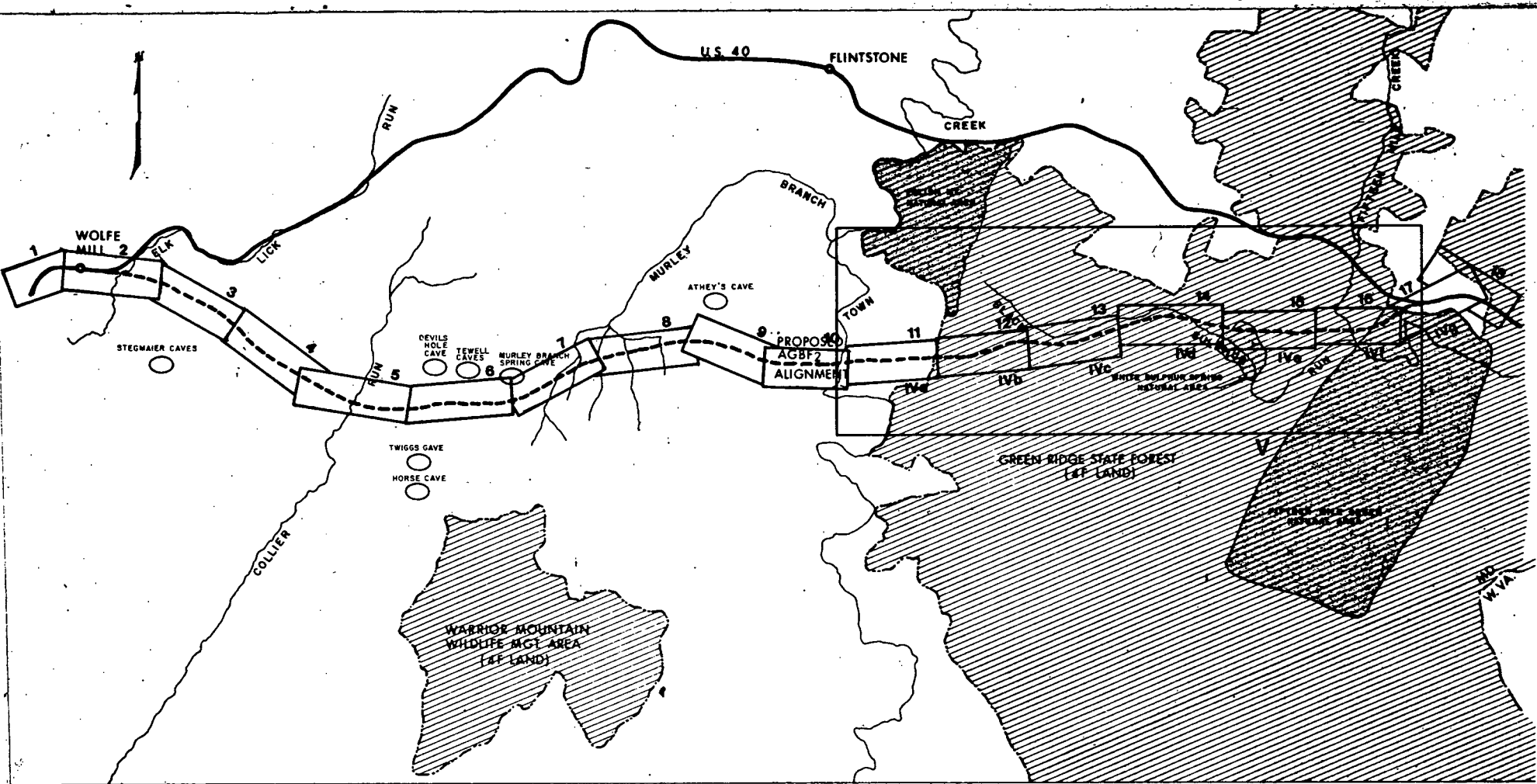


FIGURE Ia
PROJECT VICINITY MAP
U.S. Route 48
(National Freeway)
Section I



SCALE - 1" = 1 MILE

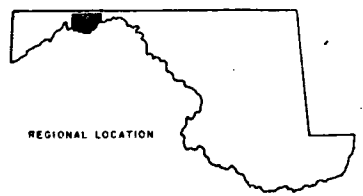




FIGURE 1b
 PLATE/FIGURE INDEX
 U.S. Route 48 - National Freeway
 Section I - AGBF₂

KEY
 Ex.  - Plate #
 - Figure #

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All ambient and predicted levels in this report are L₁₀ exterior noise levels unless otherwise noted.

103

Design Noise Level/Activity Relationship
(from FHPM 7.7.3)

Design Noise Levels - dBA

<u>Leq (h)¹</u>	<u>L10(h)²</u>
57 (Exterior)	60 (Exterior)

Description of Activity Category

A) Tracts of land in which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose. Such areas could include amphitheaters, particular parks or portions of parks, open spaces, or historic districts which are dedicated or recognized by appropriate local officials for activities requiring special qualities of serenity and quiet.

67 (Exterior)	70 (Exterior)
------------------	------------------

B) Picnic areas, recreation areas, playgrounds, active sports areas, and parks which are not included in Category A and residences, motels, hotels, public meeting rooms, schools, churches, libraries, and hospitals.

72 (Exterior)	75 (Exterior)
------------------	------------------

C) Developed lands, properties or activities not included in Categories A or B above.

For requirements on undeveloped lands see paragraphs 11a and c.³

52 (Interior)	55 (Interior)
------------------	------------------

D) Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

¹Leq(h) - The equivalent steady state sound level which would contain the same acoustic energy as the time-varying sound level for a period of one hour.

²L₁₀(h) - The sound level that is exceeded 10 percent of a one hour period.

³FHPM 7.7.3, Section II

NOISE ABATEMENT MEASURES FOR LANDS WHICH ARE UNDEVELOPED ON THE DATE OF PUBLIC KNOWLEDGE OF THE PROPOSED HIGHWAY PROJECT.

- a. Noise abatement measures are not required for lands which are undeveloped on the date of public knowledge of the proposed highway project (except as provided in paragraph 11b).
- b. For lands which are undeveloped on the date of public knowledge of the highway project, the highway agency should treat the activity or land use as developed land in the following situations:
 - (1) the development was planned, designed, and programmed before the highway studies and there is firm evidence that the development has been only temporarily delayed, or
 - (2) the development is planned, designed, and programmed during the highway project planning and design; there is a very high probability of the development being constructed; and the developer has considered the noise impacts to the extent reasonable and practicable.
- c. A highway agency may request Federal-aid participation in the cost of providing noise abatement measures for undeveloped lands along Type IA and IB projects when the noise analysis demonstrates a need in the following situations:
 - (1) development occurs between the date of public knowledge of the proposed highway project and the actual construction of the project, or
 - (2) the probability of development occurring within a few years is very high and a strong case can be made in favor of providing noise abatement measures as part of the highway project based on consideration of need, expected long term benefits to the public interest, and the difficulty and increased cost of later incorporating abatement measures into either the highway or the development.

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II. EXISTING NOISE ENVIRONMENT

A. Study Area Description

The project study area is generally rural in character, with sparse, widely scattered development. Development is most prevalent along existing U.S. 40. The topography of the area is generally mountainous with a majority of the study area vegetated with mature trees and other plant growth. Only small scale, isolated commercial establishments (along existing U.S. 40) were noted; no major industrial or commercial areas were identified in the area. The single largest feature in the study area is the Green Ridge State Forest which extends from east of Town Creek to the eastern project terminus.

B. Noise Sensitive Area Descriptions

Twenty-four (24) noise sensitive areas were identified in the project area. Table II gives a brief description of each area.

In addition, the Green Ridge State Forest was studied for potential noise impacts. The parkland contains primitive camping areas and hiking trails, picnic areas, public fishing areas, game management areas, etc., designed for low intensity recreational use. No developed regular use areas were noted adjacent to the proposed alignment of AGBF2.

105

TABLE II
 NOISE SENSITIVE AREAS
 U.S. Route 48--National Freeway
 AGBF₂

<u>Noise Sensitive Area</u>	<u>Description</u>
1	Three (3) single family residences located adjacent to cut section of existing U.S. 40 (westbound) at western terminus of the study area. Ambient noise is dominated by traffic from U.S. 40. Access to U.S. 40 is via service road.
2	Two (2) single family residences; one a single story frame and the other a two-story stone located atop a hill west of Christie Road south of existing U.S. 40. The area is surrounded by dense, mature woodland. Outdoor activity areas include a combination basketball/tennis court (under construction) and a single-story stone building next to a swimming pool. Traffic noise and natural sounds (rustling leaves, insect sounds, etc.) dominate the ambient acoustic environment. Access to U.S. 40 is via service road.

106

Noise Sensitive Area

Description

3

One (1) single family, single-story brick residence located off west side of Christie Road, south of existing U.S. 40. Traffic noise dominates the ambient acoustic environment.

4

One (1) two-story, single family frame residence located on north side of existing U.S. 40, east of Christie Road with access to westbound U.S. 40. Ambient noise dominated by traffic noise from U.S. 40.

5

Colonial Manor Motor Lodge, located on south side of existing U.S. 40, east of Christie Road and north of Old National Pike, with access to U.S. 40 via service road. The motor lodge consists of three separate structures; a two-story brick mansion with two one-story brick motel unit buildings on either side of the mansion. The two-story mansion serves as the motel office and operator's residence and is an identified historic structure. All three motel buildings are air-conditioned. No noise sensitive exterior use areas exist as part of the motel property. Ambient noise environment is dominated by traffic from U.S. 40.

Noise Sensitive Area

Description

6

One (1) three-story, single family, stone mansion located on south side of Old National Pike, south of existing U.S. 40 with access to Old National Pike. Ambient noise dominated by traffic from U.S. 40. The house is historic. An existing wooded area and natural berm located between the Old National Pike and existing U.S. 40 serves as a buffer zone, reducing somewhat noise intrusion from U.S. 40.

7

One (1) two-story, single family stone residence located on south side of Old National Pike, south of existing U.S. 40 just east of NSA 6. The house is historic. Access is to Old National Pike. The buffer zone described for NSA 6 also benefits NSA 7.

8

One (1) single family, single story frame residence located on east side of Jeffries Road, north of the proposed alignment of AGBF2. Access is to Jeffries Road. Ambient acoustic environment is dominated by natural sounds.

Noise Sensitive Area

Description

9

Allegany Beagle Club. One (1) single story frame building, not air-conditioned, with several small sheds, kennels located about the club property. The club is located on east side of Hinkle Road (access to same), and north of proposed AGBF2 alignment. Natural sounds dominate the ambient acoustic environment.

10

One (1) single family, single story frame residence located on east side of Hinkle Road with access to same. The house is located south of proposed alignment of AGBF2. Ambient sound level dominated by natural sounds.

11

One (1) two-story, single family frame and stone (historic) residence with barn located approximately 1100' north of Williams Road with access drive to same. Proposed AGBF2 would be located 500'-600' to the south of this sensitive area. Presently, ambient noise levels are dominated by natural sounds.

12

One (1) two-story, single family historic frame residence with out-buildings located on north side of Williams Road with access drive to same. Proposed AGBF2 would pass 400'-500' to the north of NSA 12. Natural sounds dominate the ambient acoustic environment.

Noise Sensitive Area

Description

13

One (1) single family, single story frame residence located approximately 450' off south side of Williams Road with access road to same. Alternate AGBF₂ would pass about 500' to the north of the residence. Natural sounds dominate the ambient acoustic environment.

14

One (1) two-story, single family frame residence located north of Williams Road in the vicinity of proposed AGBF₂ and proposed relocated Williams Road. The house is an historic structure with access to Williams Road. Present acoustic environment dominated by natural sounds.

15

One (1) single family, single story frame residence located on north side of Williams Road with access to same. The area is also situated north of proposed AGBF₂. Ambient sound levels dominated by natural sounds.

16

One (1) single family, single story frame residence located on south side of Williams Road with access to same. Proposed AGBF₂ would pass approximately 500' south of the house. Ambient acoustic environment is dominated by natural sounds.

Noise Sensitive Area

Description

17

Murley Branch Methodist Church and two (2) single family residences located southeast of Williams Road with access to same. The church is of frame construction, not air-conditioned, and a recognized historic structure. There are also ruins of another historic structure located behind the church building. Proposed AGBF2 would be located approximately 700' southeast of the sensitive receptors. Ambient noise levels are dominated by natural sounds.

18

One (1) two-story, single family frame residence located on north side of Williams Road with access to same. The proposed AGBF2 alignment would pass approximately 700' south of the residence. Ambient acoustic environment dominated by natural sounds.

19

One (1) single family, two-story frame residence with outbuildings located on south side of Williams Road with access to same. The alternate AGBF2 would pass approximately 700' southwest of the residence. Ambient sound levels dominated by natural sounds.

Noise Sensitive Area

Description

20

One (1) single story, single family frame residence located approximately 300' south of Town Creek Road with access to same. Alignment AGBF2 would be located approximately 600' to the north of this dwelling. Ambient sound levels are dominated by natural sounds.

21

One (1) single family, two-story frame residence located on east side of Town Creek Road with access to same. The AGBF2 alignment would pass approximately 550' to the south of NSA 21. Natural sounds dominate the ambient sound levels at this site.

22

One (1) single family, two-story frame residence with outbuildings located at the junction of Merten Avenue and Jacobs Road with access to both roads. Alignment AGBF2 would be located approximately 550' to the south of this area. Natural sounds dominate the ambient acoustic environment.

23

One (1) single family, two-story frame residence with shed located on north side of Merten Avenue with access to same. Proposed AGBF2 alignment would pass approximately 400' to the north of this site. The section of Merten Avenue, west of NSA 23 would be relocated as part of the AGBF2 alignment. Natural sounds dominate the ambient sound levels.

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Noise Sensitive Area

Description

24

One (1) single family residence located on east side of M.V. Smith Road approximately 700' off the south side of existing U.S. 40 with access to M.V. Smith Road. Dominant noise source is traffic from existing U.S. 40 and natural sounds.

C. Ambient Noise Level Measurements

A field measurement program to determine ambient noise levels was conducted utilizing the latest methods for environmental noise analysis. Figure II presents a schematic of the instrumentation system and equipment used.

The ambient noise measurement program was conducted on weekdays between the hours of 11:00 a.m. and 4:30 p.m. The duration of each noise level measurement was ten minutes. Study of rush hour conditions (4-6 p.m.) showed no discernable trend towards increased noise levels during this period. Spot noise level measurements were also made at various remote locations within the Green Ridge State Forest to establish the ambient noise levels typical of the State Forest lands. The results of the measurement program are presented in Table III.

In an acoustic analysis, measurement of ambient noise levels is intended to establish the basis for impact analysis. The ambient noise levels as recorded represent a generalized view of present noise levels. Variations, with time, of total traffic volume, truck traffic volume, speeds, etc. may cause fluctuations in ambient noise levels of several decibels. However, for the purposes of impact assessment, these fluctuations are not sufficient to significantly affect the assessment.

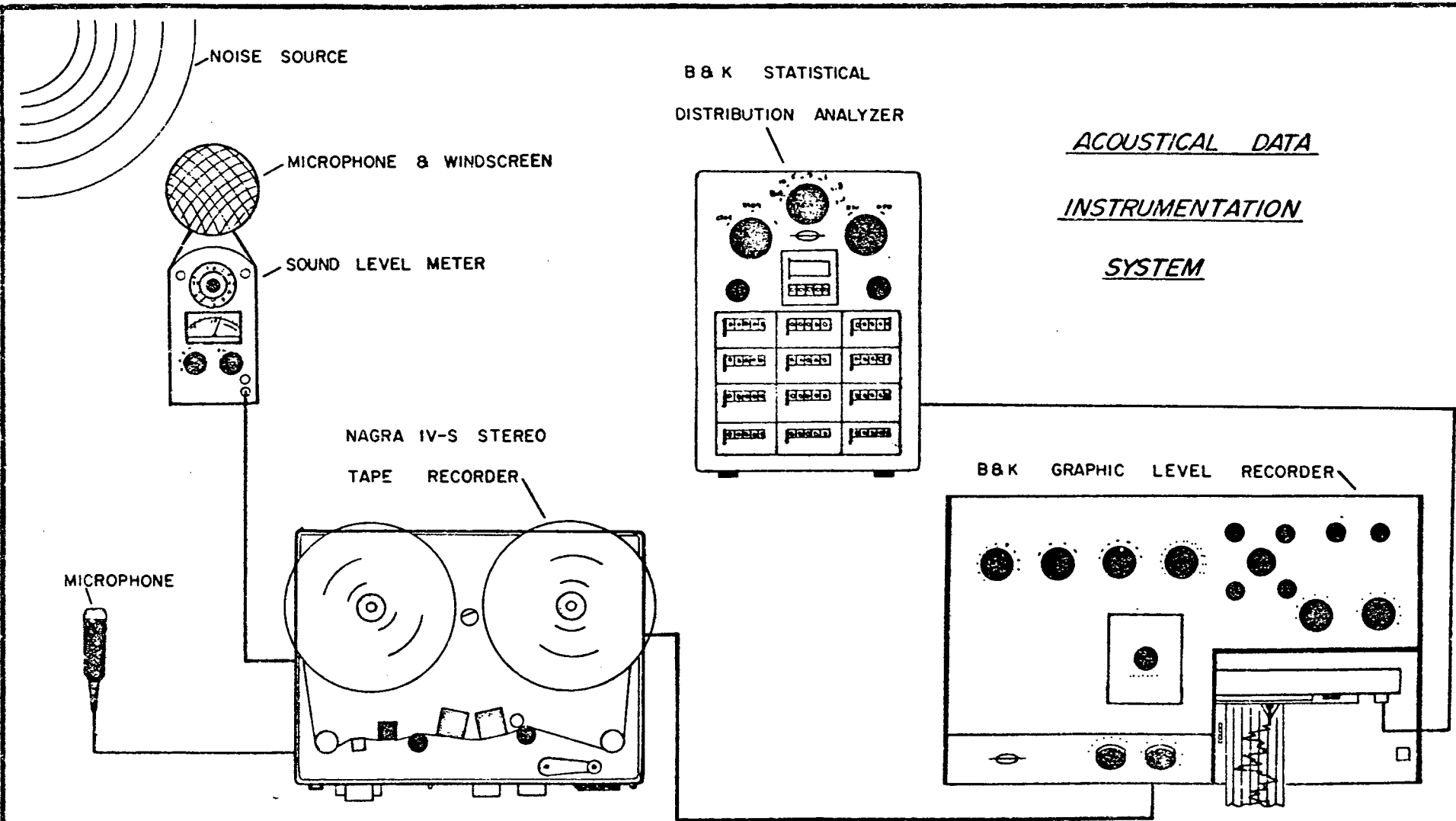


Figure II

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TABLE III
Ambient Noise Levels

U.S. Route 48--National Freeway
AGBF2

Measurement Dates: August 7, 8, & 9, 1979

<u>Noise Sensitive Area</u>	<u>Time of Measurement</u>	<u>Ambient L10</u>
1	11:45 am	62 dBA
2	12:25 pm	57 dBA
3	4:00 pm	67 dBA
4	3:30 pm	73 dBA
5	3:30 pm	73 dBA
6	4:25 pm	63 dBA
7	12:45 pm	55 dBA
8	2:15 pm	38 dBA
9	1:35 pm	39 dBA
10	1:35 pm	39 dBA
11	2:20 pm	37 dBA
12	2:20 pm	37 dBA
13	2:20 pm	37 dBA
14	2:20 pm	37 dBA
15	2:20 pm	37 dBA
16	2:40 pm	36 dBA
17	2:40 pm	36 dBA
18	2:05 pm	41 dBA
19	12:15 pm	40 dBA
20	12:00 noon	38 dBA
21	12:00 noon	38 dBA
22	1:00 pm	38 dBA
23	1:00 pm	38 dBA
24	11:00 am	61 dBA

III. PREDICTED NOISE LEVELS FROM PROPOSED IMPROVEMENTS

A. Prediction Methodology

The method used to predict the future noise levels from the proposed AGBF₂ alignment of the National Freeway (U.S. 48) plus normal traffic volume increases with time was developed by the Federal Highway Administration of the U.S. Department of Transportation. The FHWA Highway Traffic Noise Prediction Model (FHWA Model) utilizes an experimentally and statistically determined reference sound level for three classes of vehicles (autos, medium duty trucks, and heavy duty trucks) and applies a series of adjustments to each reference level to arrive at the predicted sound level. The adjustments include 1) traffic flow corrections, taking into account number of vehicles, average vehicle speed, and specifies a time period of consideration; 2) distance adjustment comparing a reference distance and actual distance between receiver and roadway and including roadway width and number of traffic lanes; and 3) adjustments for various types of physical barriers that would reduce noise transmission from source (roadway) to receiver.

The prediction calculations were performed utilizing a computer program adaptation of the FHWA Model on a Texas Instruments SR-59 programmable calculator.

B. Summary of Traffic Parameters

Traffic information for this analysis was supplied by the Maryland State Highway Administration's Bureau of Traffic Engineering and Bureau of Highway Statistics for the design year (2005). A summary is given on the next page.

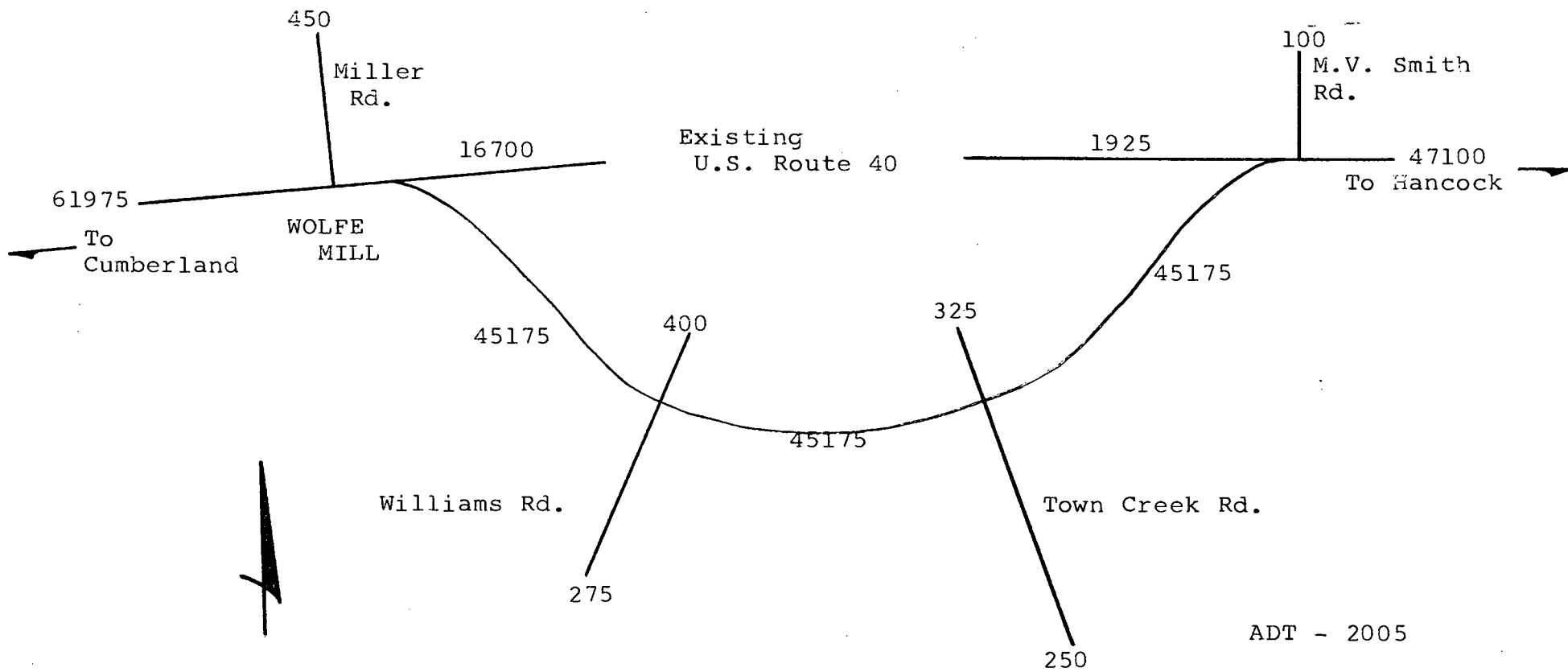
116

Average Daily Traffic (ADT)	See Figure III
Design Hour Volume (DHV)	9% of ADT
% Trucks:	13.5% of DHV
Medium Duty	2.1%
Heavy Duty	11.4%
Speed	55 mph
Diurnal Traffic Curve	See Tables IVa & b

C. Prediction Results

Resultant noise levels for the design year are presented in Table V.

Additional analysis was performed to establish the extent of noise impact that could be expected in areas adjacent to Alternate AGBF2 through Green Ridge State Forest. Figures IVa-g show the 70 dBA contour lines. Also, Figure V shows the 50 dBA L10 noise level contours projected for the parkland. The prediction modeling took into account barrier effects due to topographic and other natural features as well as barrier affects from cut/fill or elevated highway sections.



-20-

ADT - 2005

FIGURE III
 AVERAGE DAILY TRAFFIC
 U.S. Route 48 - National Freeway
 AGBF₂
 Wolfe Mill to M.V. Smith Rd.

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TABLE IV
DIURNAL TRAFFIC CURVES

U.S. Route 48--National Freeway
(Section I)
AGBF₂

a) U.S. Route 40 near Wolfe Mill

<u>Hour</u>	<u>Percent of ADT</u>	<u>Hour</u>	<u>Percent of ADT</u>
12M-1 am	1	12N-1 pm	6
1-2 am	1	1-2 pm	6
2-3 am	1	2-3 pm	7
3-4 am	1	3-4 pm	8
4-5 am	1	4-5 pm	9
5-6 am	1	5-6 pm	7
6-7 am	3	6-7 pm	5
7-8 am	5	7-8 pm	5
8-9 am	6	8-9 pm	4
9-10am	5	9-10pm	3
10-11am	5	10-11pm	2
11am-12N	6	11pm-12M	2

b) U.S. Route 40 near M.V. Smith Road

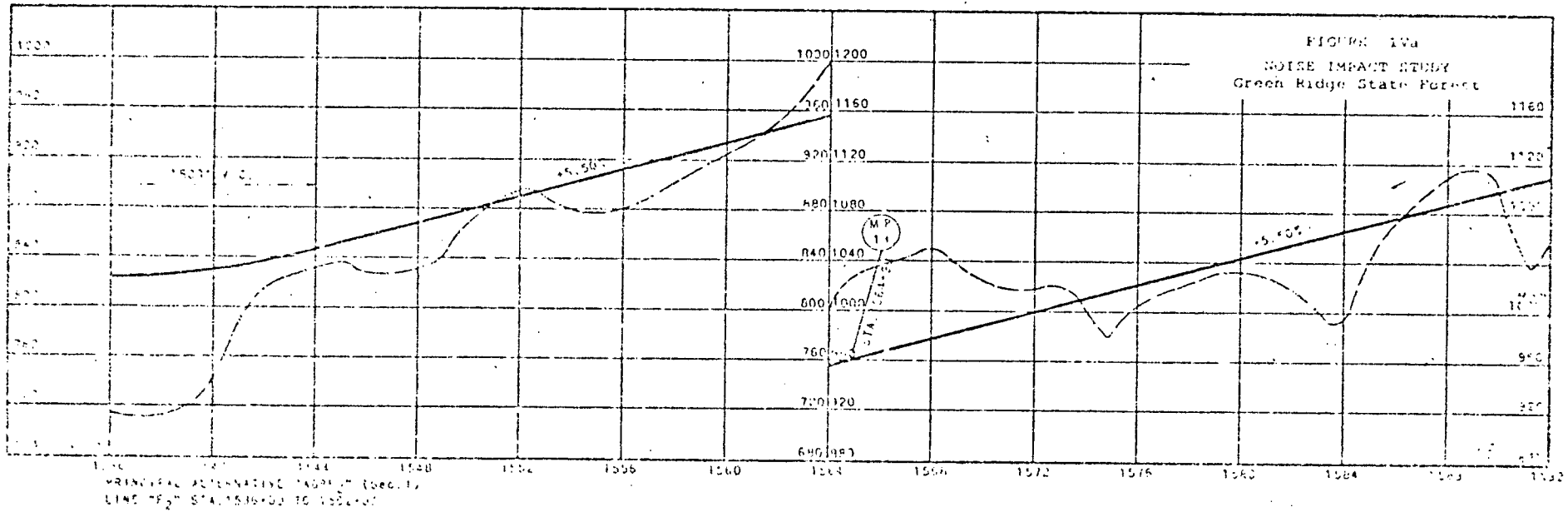
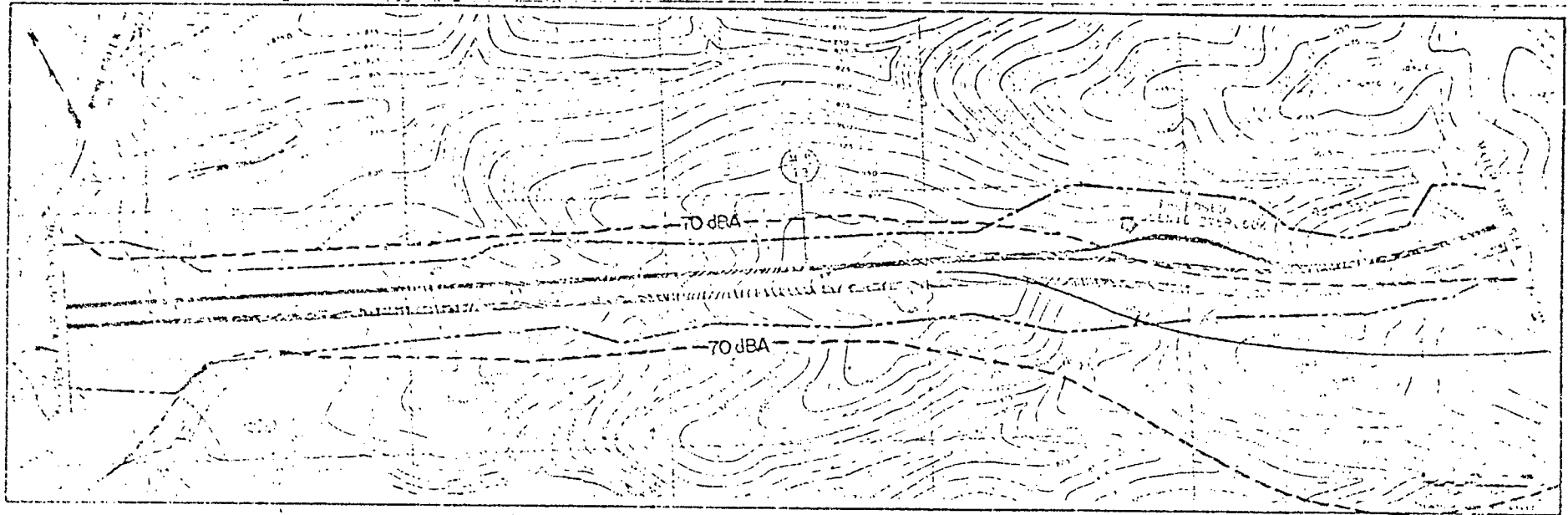
<u>Hour</u>	<u>Percent of ADT</u>	<u>Hour</u>	<u>Percent of ADT</u>
12M-1 am	1	12N-1 pm	6
1-2 am	1	1-2 pm	7
2-3 am	1	2-3 pm	6
3-4 am	1	3-4 pm	8
4-5 am	1	4-5 pm	8
5-6 am	2	5-6 pm	6
6-7 am	3	6-7 pm	5
7-8 am	4	7-8 pm	5
8-9 am	4	8-9 pm	4
9-10am	5	9-10pm	4
10-11am	6	10-11pm	3
11am-12N	6	11pm-12M	3

PROJECT NOISE LEVELS

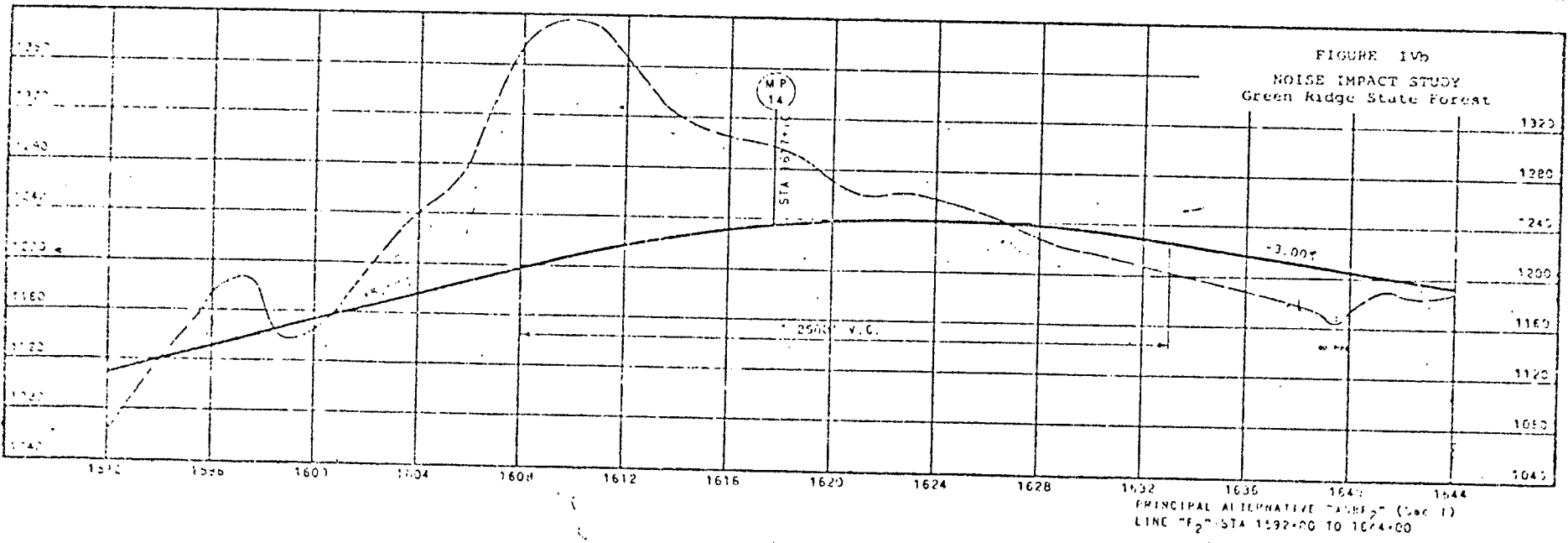
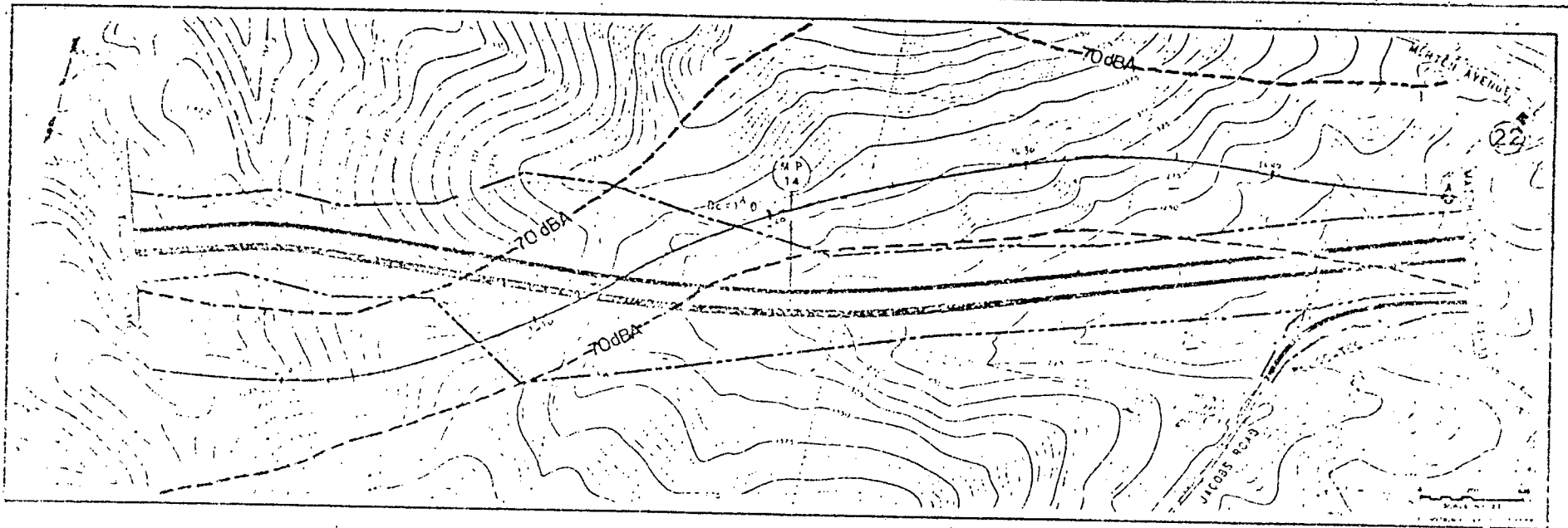
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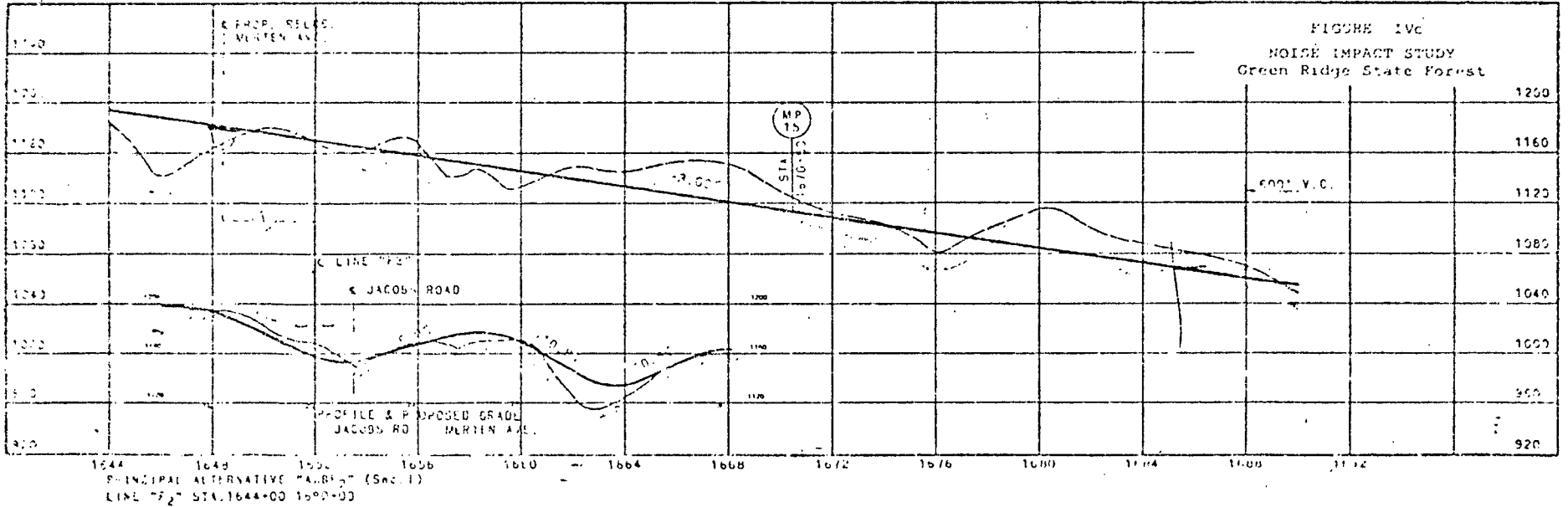
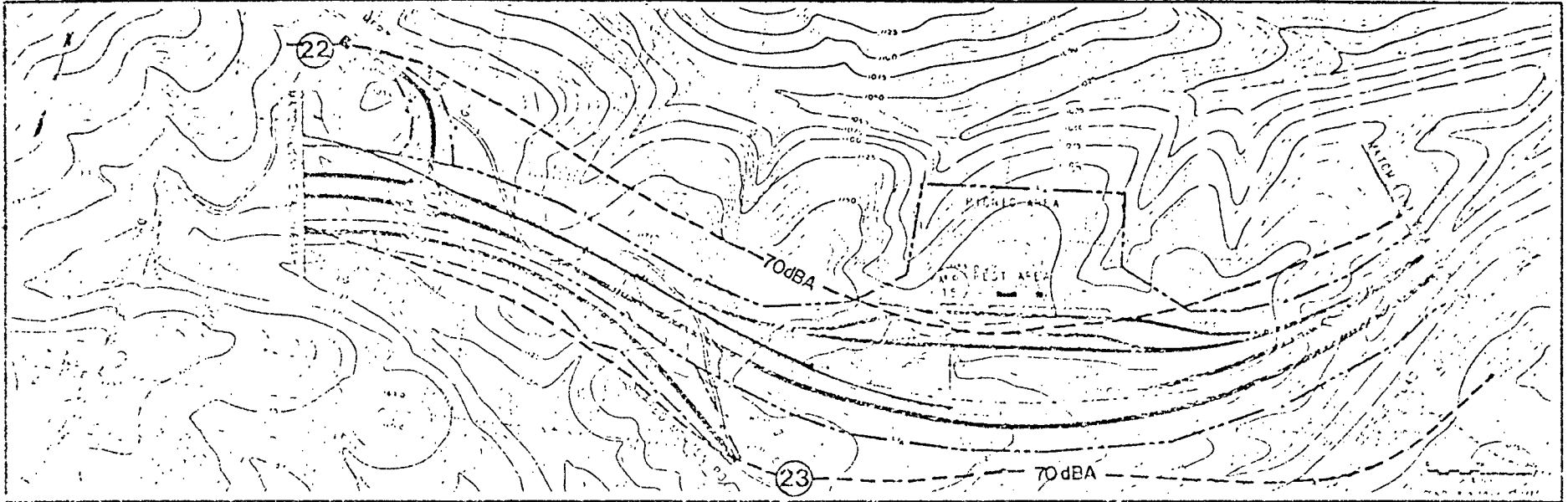
U.S. Route 48--National Freeway
Section I--AGBF₂

NSA	DESCRIPTION	AMBIENT L ₁₀	DESIGN YEAR (2005) L ₁₀
1	Residential	62 dBA	77 dBA*
2	Residential	57 dBA	73 dBA*
3	Residential	67 dBA	77 dBA*
4	Residential	73 dBA	82 dBA*
5	Motel/ Historic	73 dBA	82 dBA*
6	Residential/ Historic	63 dBA	74 dBA*
7	Residential/ Historic	55 dBA	74 dBA*
8	Residential	38 dBA	67 dBA
9	Beagle Club	39 dBA	69 dBA
10	Residential	39 dBA	67 dBA
11	Residential/ Historic	37 dBA	68 dBA
12	Residential/ Historic	37 dBA	68 dBA
13	Residential	37 dBA	67 dBA
14	Residential/ Historic	37 dBA	61 dBA
15	Residential	37 dBA	61 dBA
16	Residential	36 dBA	64 dBA
17	Church/Hist. Residential	36 dBA	57 dBA
18	Residential	41 dBA	59 dBA
19	Residential	40 dBA	67 dBA
20	Residential	38 dBA	68 dBA
21	Residential	38 dBA	68 dBA
22	Residential/ Historic	38 dBA	70 dBA
23	Residential	38 dBA	71 dBA*
24	Residential	61 dBA	65 dBA
	Green Ridge State Forest	35-40 dBA	See Contour Maps (Figures IVa-g)
			*Federal design noise level exceeded

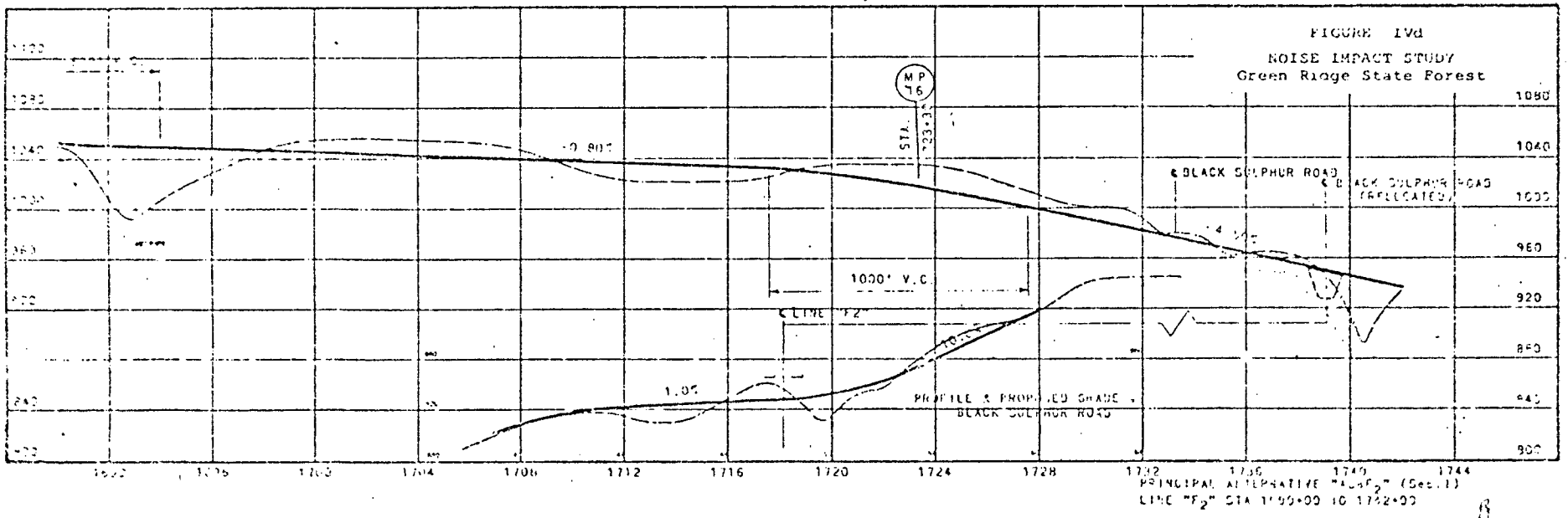
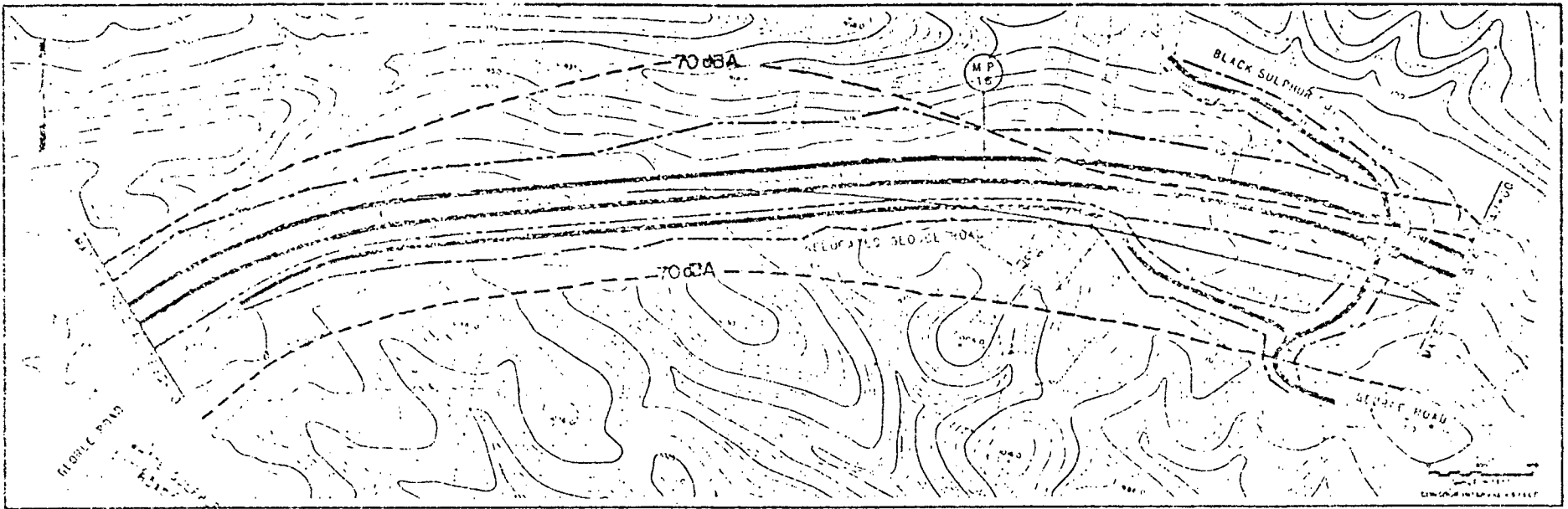


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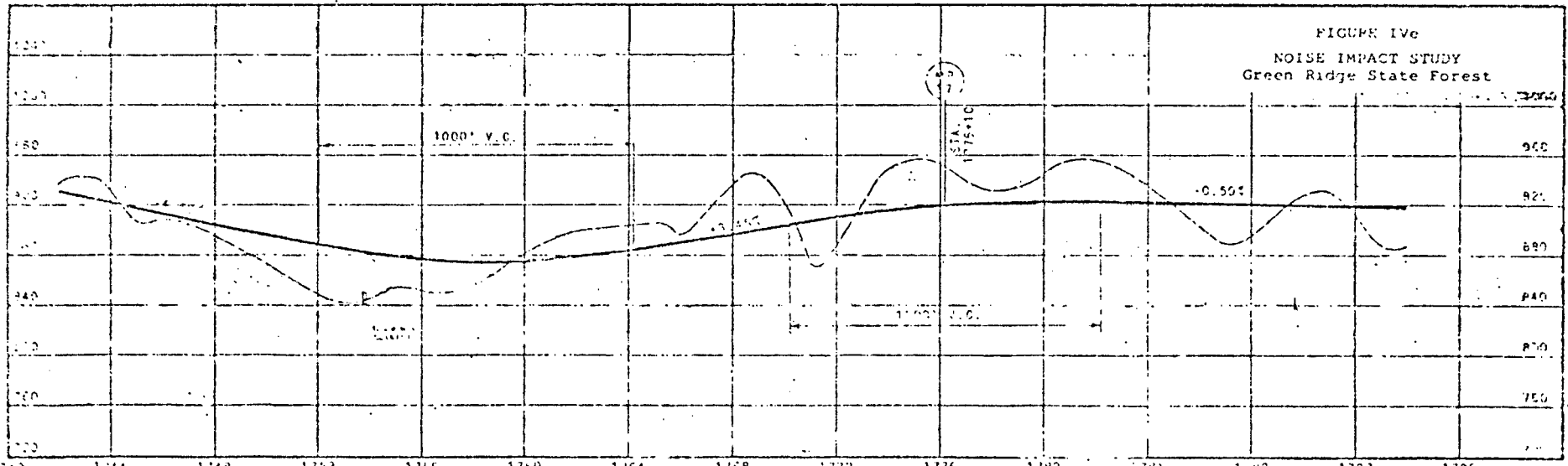
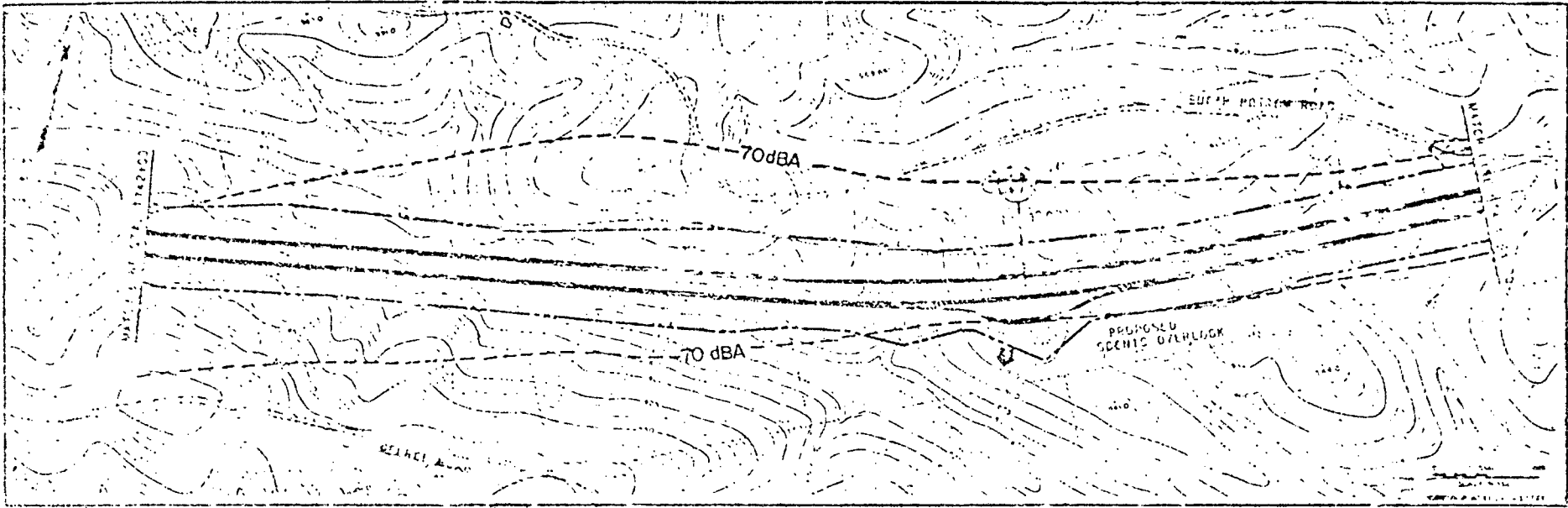
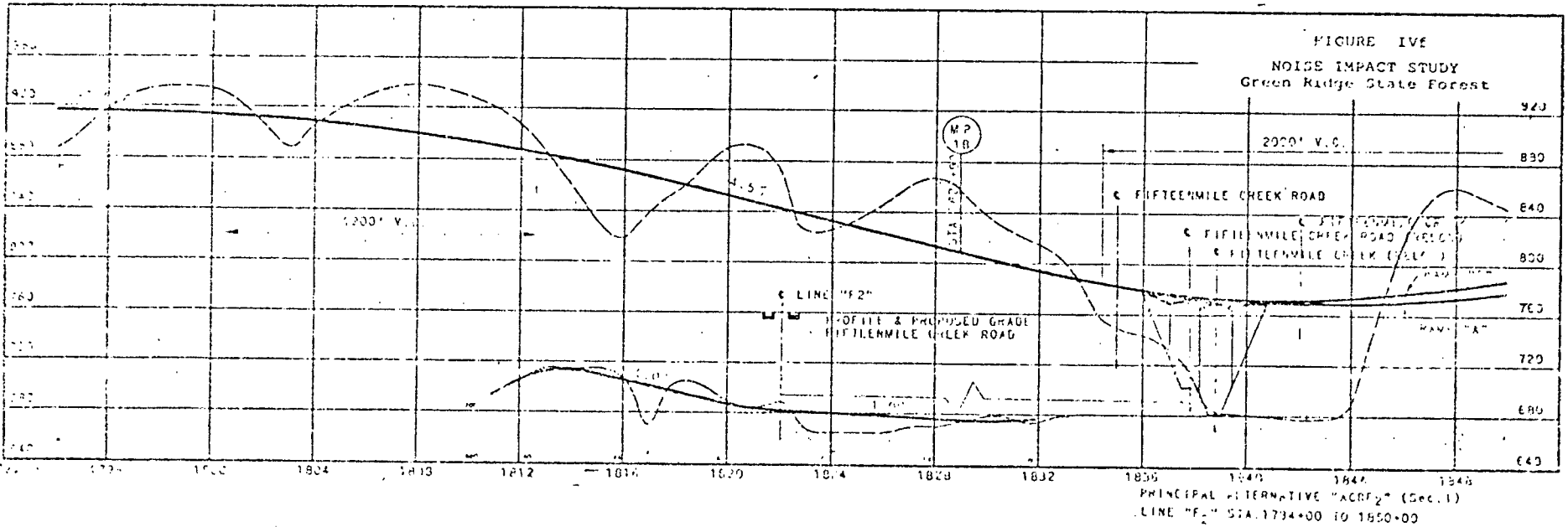
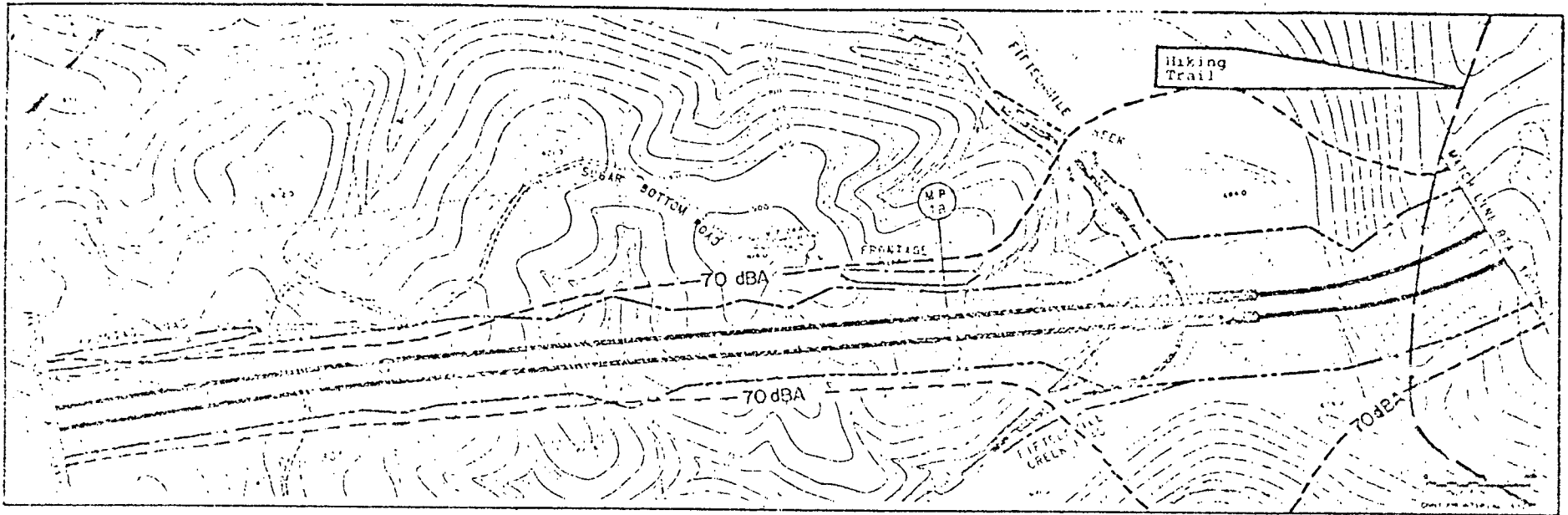


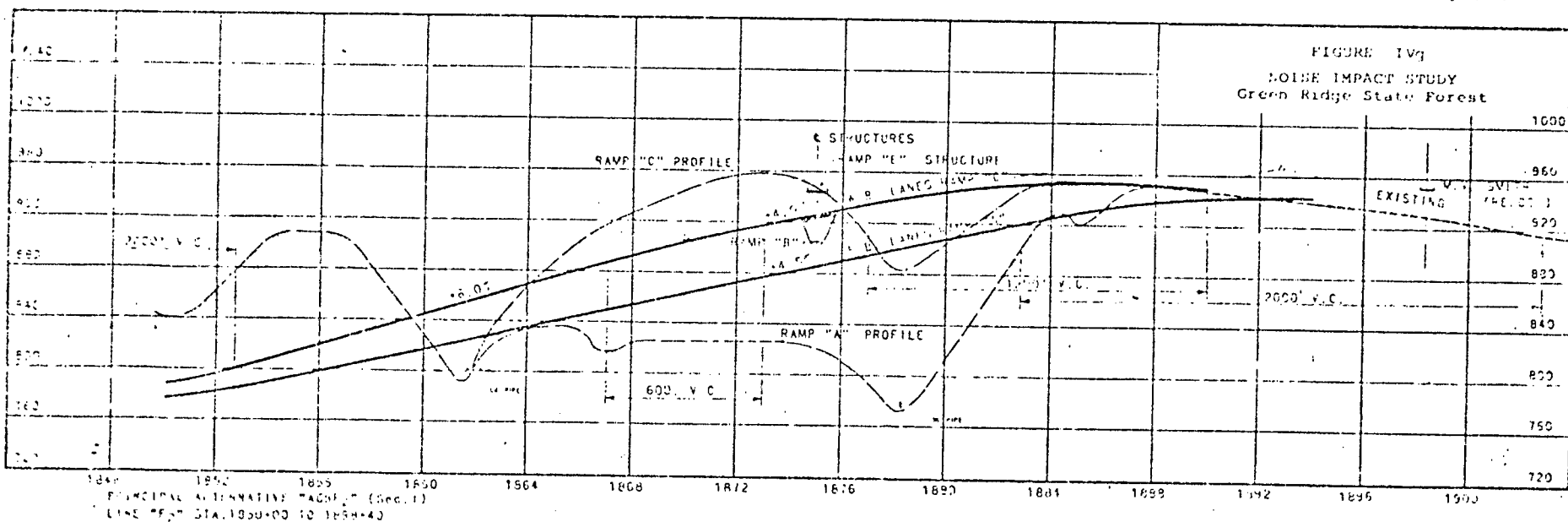
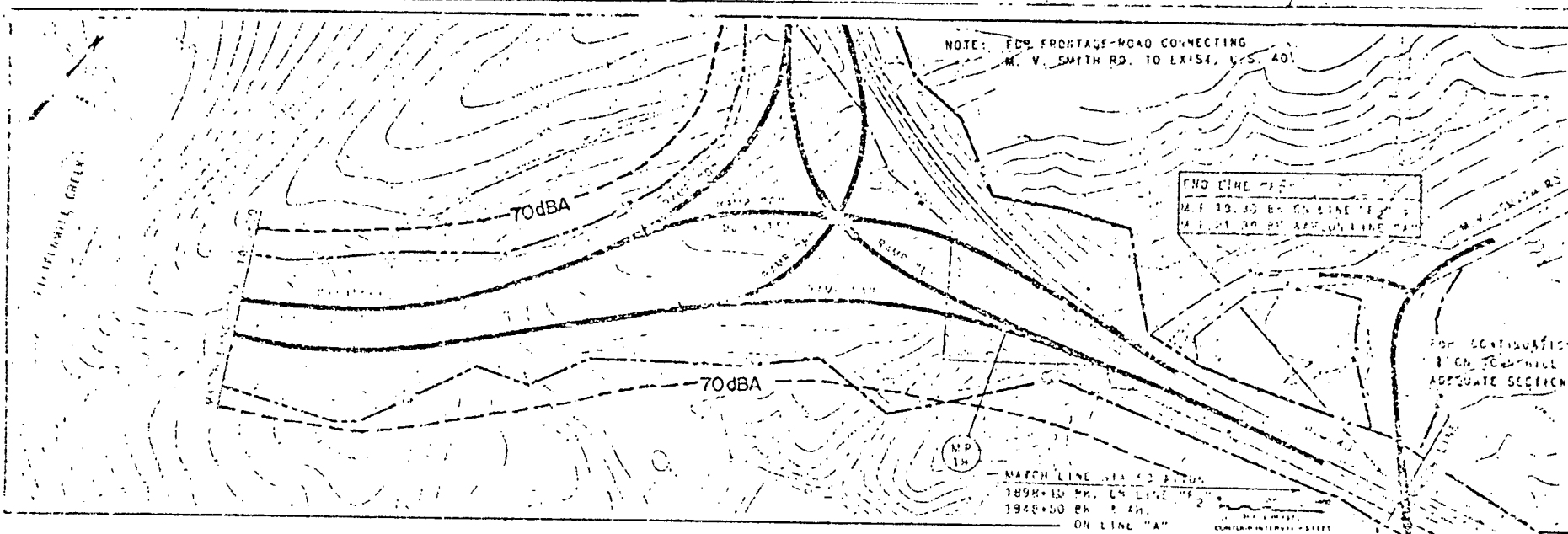
FIGURE IVe
NOISE IMPACT STUDY
Green Ridge State Forest

PRINCIPAL ALTERNATIVE "A" (S-c.1)
LINE "1" S14.1747+00 TO 1794+00

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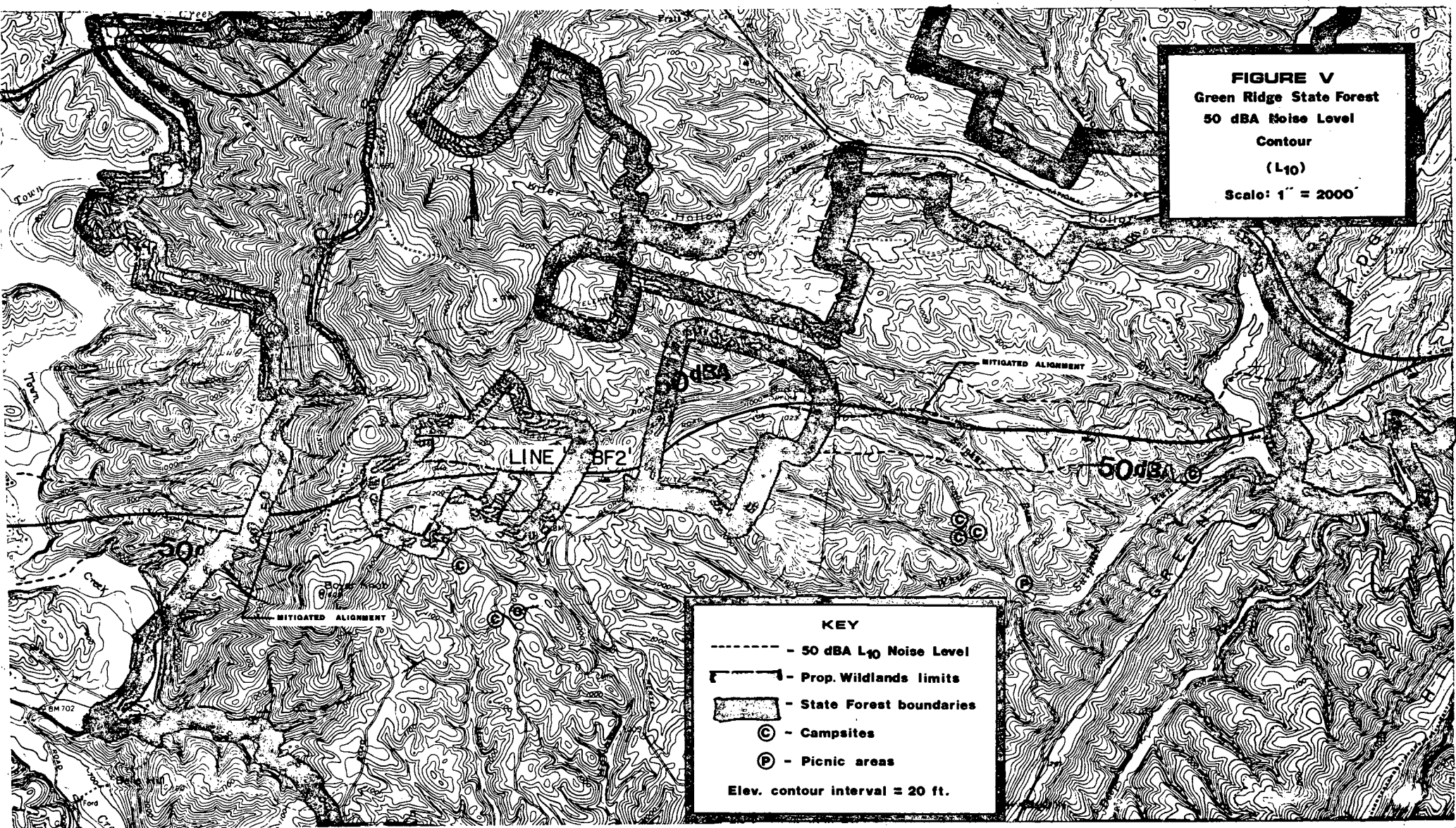


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1260

FIGURE V
Green Ridge State Forest
50 dBA Noise Level
Contour
(L10)
Scale: 1" = 2000'



IV. IMPACT ASSESSMENT

A. Impact Analysis

The determination of environmental noise impact is based on the relationship between the predicted noise levels, the established design noise levels and the ambient noise levels in the project area. The applicable criteria is the Federal Highway Administration's design noise level/activity relationship (see Table I) published in FHPM 7.7.3.

Impact assessment is also based on the change in L10 noise levels from existing levels. The degree or amount of the change is assessed according to the following criteria:

<u>L10 Change over Ambient</u>	<u>Degree of Impact</u>
Decrease over Ambient	Positive
0-5 dBA Increase	Negligible
6-10 dBA Increase	Minor
11-15 dBA Increase	Significant
over 15 dBA Increase	Severe

Whenever the design year L10 noise levels exceed design criteria (Table I), or are increased by 10 dBA or more over ambient conditions, noise abatement measures (in general, noise barriers) are considered to minimize impact. Consideration is based on the size of the impacted area (number of structures, spacial distribution of structures, etc.), the predominant activities carried on within the area, the visual impact of the control measure, practicality of construction, and economic feasibility.

Economic assessment is based on the following assumptions. An effective barrier should at least extend in both directions to four (4) times the distance between receiver and roadway (source). For the purposes of comparison, a total cost of 100 per linear foot is assumed to estimate total barrier cost. The following discussion will present an assessment of the AGBF2 alignment on the basis of the aforementioned assessment criteria.

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1) General

Twenty-four (24) noise sensitive areas were studied for potential noise impacts from Alternate AGBF₂. All of the areas are category 'B' land use areas (see Table I) for which the Federal L₁₀ design noise level of 70 dBA applies.

Increases in noise levels adjacent to the proposed AGBF₂ alignment would be greatest (18-37 dBA) for that portion of the alignment proposed for "new location." The noise sensitive areas located along the "new location" portion of AGBF₂ are numbers 8-23. The severe increases in noise levels are due to the fact that present (ambient) L₁₀ levels are extremely low (36-41 dBA); man-made noise sources such as traffic, etc., are not typically present near these areas.

Noise level increases at sensitive areas near existing U.S. 40 where AGBF₂ would merge with existing facilities, would be somewhat less (4-19 dBA). Ambient L₁₀ noise levels near existing U.S. 40 are already dominated by traffic noise and thus, are higher (55-73 dBA). The sensitive areas located near existing U.S. 40 are numbers 1-7 & 24.

NSA 24 would experience a negligible increase of 4 dBA in noise levels by the design year. The controlling noise source would still be traffic on U.S. 40. Traffic on M.V. Smith Road would have a negligible effect on noise levels at NSA 24.

Eight (8) of the twenty-four sensitive areas identified would experience noise levels in excess of Federal design criteria. They are NSA's 1-7, & 23. Minor to severe noise level increases would occur at these areas.

2) Impacts on Section 4(f) Lands

The Federal Highway Administration, through FHPM 7.7.2, requires an evaluation of potential impacts on properties designated as Section 4(f) lands. Section 4(f) of the Federal Aid Highway Act of 1968 states that publicly owned land or any

land from an historic site may be used for Federal Aid highway projects only if no other feasible alternative to the use of such lands can be found, and if the project includes all possible planning to minimize impacts on the 4(f) lands resulting from such use. Such lands would include land from a public park, recreation area, wildlife or waterfowl refuge of national, state or local significance, or any land from an historic site of national, state, or local significance.

The following presents a discussion of the projected noise impacts on Section 4(f) lands affected by the proposed AGBF₂ alignment.

a)Historic Sites

Eight (8) noise sensitive areas previously identified were found to include some historic structures or property. The historic sites that would experience adverse noise impacts from the proposed AGBF₂ alignment are listed in Table VI.

The six historic properties that would experience severe impacts would realize increases of 19-37 dBA over present levels. Ambient levels at these sites range from 36-55 dBA and are not currently influenced by traffic noise.

Special study was warranted at NSA 5, Colonial Manor Motel, because the L₁₀ noise level projected for the design hour (peak hour), shown in Table III, is not representative of the "worst-case" noise impact. Noise level projections were made based on the diurnal traffic curve (Table IVa) for various times of the day. In addition, computations of interior noise levels were made using the method described in the FHWA report TS-77-202, "Insulation of Buildings Against Highway Noise." The results are given in Table VII.

Exterior and interior design noise level criteria (categories 'B' and 'D' respectively) would be exceeded during the design hour and throughout the day; from approximately 7 a.m.-8 p.m.

TABLE VI
 HISTORIC SITES
 U.S. Route 48--National Freeway
 Section I--AGBF²

<u>Site Name/Description</u>	<u>Part of¹ NSA #</u>	<u>Degree of Noise Impact</u>	<u>Design Noise Level Exceeded?</u>
Turkey Flight Manor Colonial Manor Hotel	5	Minor	Yes ³
Concrete Block House	6	Significant	Yes
Carlton Farm	7	Severe	Yes
Tewell Stone House ²	11	Severe	No
May Long House ²	12	Severe	No
Scott Robinette House ²	14	Severe	No
Rush Church ² Rush School (ruins) ²	17	Severe	No
House (2-story frame) ²	22	Severe	No

¹See Table II, Noise Sensitive Areas for description of the historic structure(s)

²Site within Breakneck Road Historic District

³See Table V and discussion in Section IV.A.2a

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TABLE VII
 DIURNAL NOISE ANALYSIS
 Noise Sensitive Area 5
 (Colonial Manor Motel)

<u>Hour(s)</u>	<u>Description</u> ¹	<u>Exterior L10</u>	<u>Interior L10</u> ²
8 am-8 pm	Negligible	79-81 dBA	56-58 dBA
8 pm-9 pm	Rest/Sleep	78 dBA	55 dBA
9 pm-10pm	Rest/Sleep	77 dBA	54 dBA
10pm-12M	Sleep	75 dBA	52 dBA
12M -6 am	Sleep	71 dBA	48 dBA
6 am-7 am	Sleep	77 dBA	54 dBA
7 am-8 am	Sleep	79 dBA	56 dBA

¹Types of indoor activities that would typically occur at this area during the hour(s) shown.

²Based on estimated 23 dBA exterior-to-interior noise reduction for the two motel rooms closest to highway.

However, there are no exterior use areas associated with the motel that require reduced noise levels and interior occupancy of the motel rooms during the day (9 a.m.-8 p.m.) is negligible. During nighttime hours (8 p.m.-7 a.m.), when interior usage of the motel rooms is common, interior design criteria would not be exceeded. From 7 a.m.-9 a.m. (morning rush hour), interior criteria would be exceeded. Overall noise impacts would be minor at NSA 5 and would apply for 1-2 hours out of 24.

b)Green Ridge State Forest

Impacts from noise would be severe on portions of the Green Ridge State Forest. Ambient L₁₀ noise levels within the forest range from 35-40 dBA. The introduction of a new roadway into remote areas of the state forest would result in substantially increased noise levels. The extent of noise intrusion was studied along the entire section of AGBF₂ that would be located within the Green Ridge State Forest. Noise level contours were generated and are shown on Figures IVA-g & V. The large variation of the width of the noise impact corridors is the result of topographic and other natural features that would act as barriers to the propagation of noise into the forest lands. Also, the barrier effects from cut/fill or elevated roadway sections were also taken into account.

The noise impacts noted are based upon the present character of the State Forest land that would abut the proposed AGBF₂ alignment. Presently, the environment of the forest is free of virtually all extraneous noise (traffic, etc.) except for natural sounds such as rustling leaves, stream flows, etc. With the introduction of traffic noise into such an environment, the character of the surrounding lands would be significantly altered even at relatively large distances from the highway. At the distances shown by the 50 dBA contour lines on Figure V, ambient noise levels would be increased approximately 10 dBA over present levels. Such an increase results in an approximate doubling of the perceived "loudness" of the sound or noise.

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It should be noted that outside the 50 dBA corridor shown on Figure V (i.e. at distances of greater than 1000-1500 feet), the accuracy of the noise prediction model is reduced. At such large distances, atmospheric conditions such as wind, humidity, etc. tend to become a more significant factor in sound propagation and attenuation and the prediction method is unable to accurately model such conditions.

One hiking trail and the public fishing area along Fifteen Mile Creek would be affected by AGBF2 (see Figure IVf). The hiking trail would be severed by the alternate alignment. The fishing area along Fifteen Mile Creek would be impacted by noise from the elevated road section. Noise propagation down the Fifteen Mile Creek valley would be extensive (Figure VI f) because the noise propagation path would generally be high above ground and little or no additional attenuation from intervening vegetation or other features would occur.

One campsite located along White Sulfur Run (see Figure V) would experience an approximate 10-15 dBA increase in noise over present levels. The site would be located approximately 800 feet from proposed AGBF2. No other campsites or picnic areas would be located closer than 2000 feet from the proposed roadway.

3) Feasibility of Noise Controls

Noise control potential was investigated for NSA's 1-7 & 23 where design year L10 noise levels would exceed Federal design criteria. Except for NSA 5, all these areas consist of 1-3 individual residences. Noise abatement for 1-3 residences would not be cost-effective. Abatement costs estimated for each area are listed as follows:

<u>NSA</u>	<u>Abatement Costs</u>	<u>Cost per Residence</u>
1	\$180,000	\$60,000
2&3	210,000	70,000
4	70,000	70,000
6&7	180,000	90,000
23	140,000	140,000

At NSA 5, the Colonial Manor Motel, full noise abatement measures would not be warranted. Exterior design criteria would be exceeded throughout the day and night, however, there are no exterior use areas associated with the motel that would require reduced exterior noise levels.

Though interior design noise levels would be exceeded at various times of the day, for those hours during which the greatest adverse impact could be realized (8 p.m.-7 a.m.) design criteria would be satisfied (see Table V). Abatement measures for, at most, 2 hours of the day (i.e. during which interior human activities could be disturbed) would not be cost-effective. Abatement alternatives such as a noise barrier would range in cost from \$40,000-\$50,000.

Abatement at the historic sites identified in the study area is not feasible. Each of the sites consist of only one structure and abatement for single structures would not be cost-effective.

None of the structures would be less than 400' from the proposed highway which would limit potential noise reductions affected by barriers to a maximum of 5 dBA (negligible reduction).

Landscape screening as a partial noise abatement measure would be feasible in some locations. Plantings would be placed within the right-of-way in the vicinity of NSA's 1 & 11. At these areas, there is little or no existing mature vegetation between the sensitive area and the proposed highway to provide a visual buffer zone.

No partial abatements would be implemented for any other noise sensitive areas. Natural features such as existing vegetation and topography provide a visual buffer zone between the highway and NSA's 2, 3, 6, 7, & 12-24. Also, at NSA's 8, 9, & 10 cut or fill sections of the proposed highway also act as visual barriers for the areas.

4) Exceptions to Design Noise Levels

Exceptions to Federal design noise levels are requested for NSA's 1-4, 6, 7, & 23 based upon the cost for the benefits derived (see Section IV.A.3 of this report).

An exception request is being made for NSA 5 based on the design hour violation of Federal design noise levels. However, levels are predicted to be such that during critical human use hours, Federal design criteria would be satisfied.

During those hours when design criteria would be exceeded, no adverse impacts to human activities (indoor or outdoor) would occur (also see Section IV.A.3).

B. Impacts on Undeveloped Land

The majority of land within the study area is presently undeveloped particularly in the corridor surrounding relocation alignment AGBF2. The following presents the predicted noise levels that could be expected at the given distances from the proposed roadway centerline in the design year:

<u>Distance from Roadway</u>	<u>L10 Noise Level*</u>
200'	77-80 dBA
400'	74-77 dBA
600'	72-74 dBA
800'	70-73 dBA
1200'	69-71 dBA
1500'	67-70 dBA

*The range of L10 values reflects the effect of changes in roadway grade over the proposed alignment.

It should be noted that these values do not reflect topographic or other barrier effects. Thus, the values can be considered as representative of "worst-case" conditions only.

A large portion of the undeveloped land in the study area is part of Green Ridge State Forest. Noise contour lines generated to show the extent of noise impacts on the forest land are shown on Figures IVa-g.

C. Construction Impacts

Impacts from construction related noise would occur along the proposed project route. This type of project would likely employ the following pieces of equipment which would be sources of construction noise:

- Bulldozers and earthmovers
- Graders
- Frontend loaders
- Dump and other diesel trucks
- Pile drivers
- Compressors

Since the major construction activities would take place on "new location," impacts upon residences would be limited. It is probable that construction would not occur between the hours of 5:00 p.m. and 7:00 a.m. and would likely be limited to weekdays only. Thus, construction noise impacts on residences would be minimal.

Impacts on the State forest land will be lessened by limiting construction to weekdays only. Use of the State forest by hikers and campers is greater on weekends and would not be disrupted by construction noise.

Maintenance of construction equipment will be regular and thorough to minimize noise emissions because of inefficiently tuned engines, poorly lubricated moving parts, poor or ineffective muffling systems, etc.

D. Coordination with Local Officials

To coordinate and promote effective and compatible land use planning and development, consideration should be given to potential adverse impacts from highway generated noise. As an aid to local government officials, a copy of this report has been forwarded to the following agency:

Allegany County Planning & Zoning Commission
 County Office Building
 Prospect Square
 Cumberland, Maryland 21502

In addition, a copy of "The Audible Landscape: A Manual for Highway Noise and Land Use" has also been sent to the above agency.