

LANDS FOR POTENTIAL MINERAL RESOURCE DEVELOPMENT  
IN ANNE ARUNDEL COUNTY

1979

by  
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*This text is to be used in conjunction with the Map of Lands for Potential Mineral Resources Development in Anne Arundel County by Karen R. Kuff, et.al., 1978. Prepared in cooperation with Coastal Resources Division, Tidewater Administration (formerly Coastal Zone Unit, Energy and Coastal Zone Administration). Map and text partially revised in 1981 by Michele T. Oshman.*

As part of a continuing effort to supply the Baltimore-Washington area with sand and gravel, the mineral industry needs to expand or relocate their operations when deposits at existing sites become depleted. New locations are becoming increasingly difficult to establish due to:

- (1) the need to locate near the market to minimize transportation cost of the high tonnage consumed,
- (2) the lack of opportunity to mine in some areas due to urbanization, ownership, unfavorable zoning, or legal restrictions,
- (3) conflicting attitudes concerning surface mining,
- (4) the environmental problems associated with surface mining, and
- (5) the variable nature of the quantity and quality of sand and gravel resources.

All these factors contribute to serious conflicts over new sites for mining sand and gravel. Many of these conflicts can be minimized by identifying potential areas for mineral extraction and anticipating associated environmental problems.

The accompanying map at a scale of 1:62,500 shows lands for potential mineral resource development in Anne Arundel County. The map delineates areas underlain by sand and gravel resources, lands where mining cannot occur, and lands where mining could ultimately occur in the future. Similar maps were also prepared in 1979 for Baltimore, Cecil, Harford, Howard and Prince George's Counties. These maps were partially revised in 1981.

The sand and gravel industry provides basic raw materials for the construction of roads, houses, and office buildings, but does so at the cost of exploiting a non-renewable resource. By documenting the location of potential mineral resources in Anne Arundel County, this map will enable local, county, regional and State planners to devise a rational resource plan for extraction of sand and gravel. This will allow for efficient utilization of these resources and help insure an economically viable supply of sand and gravel for the future. A second purpose of the maps is to outline sites where future mining is likely to occur, thereby indicating areas where potential environmental management problems could arise. The early identification of environmental concerns for these areas will help prevent delays in the application process for a mining permit. A third purpose is the distribution of information to the public including mining companies trying to narrow the choices for future operations, or individuals who may wish to lease the mineral rights on their property. The map cannot replace an on-site mineral resource analysis, but it can show areas for further investigation into the quality of the unmined material.

The information presented here was compiled from field and office research. Data were obtained from Maryland's Department of Assessments and Taxation, Department of State Planning; Maryland Environmental Trust; Watershed Permits Division (active surface mining sites) and the Wetlands Permits Division of Water Resources Administration; Land Planning Services of Capital Programs Administration; Legal Department of the Department of Natural Resources; Maryland Geological Survey; Maryland Wildlife Administration; Maryland Agricultural Land Preservation Foundation of the Department of Agriculture; Maryland Historical Trust; United States Geological Survey; Department of Health and Mental Hygiene; and Anne Arundel County's Office of Planning and Zoning. Acknowledgement is given by the authors to all agencies and individuals who gave assistance and responded to the authors' inquiries. This study was prepared in cooperation with Coastal Resources Division, Tidewater Administration and was partially funded by the Office of Coastal Zone Management, National Oceanic and Atmospheric Administration.

This map shows the remaining lands in Anne Arundel County where mining may occur. The information is based on a series of quantifiable factors (shown in solid color on the map) that effectively eliminate some land from consideration for mineral resource development. These factors can be divided into four basic categories which can be considered to be permanent site selection restraints placed on the mining industry. They are: statutes, government ownership, pre-emptive land use, and depleted resources. A fifth category, zoning, was considered separately due to the fact that it can be changed by political action (horizontal line pattern on map). The vertical line pattern on the map shows a collection of secondary limiting factors. This defines areas where environmental or other considerations may deter but not prohibit the use of the land for mining. A final category is the presence or absence of known sand and gravel resources. The information for each category was outlined on separate maps and then compiled for the final product. The following is a description of each limiting factor used to determine lands for potential development in Anne Arundel County:

STATUTES - No law or legal restrictions have been found that strictly prohibit the establishment of mining operations in Anne Arundel County. Therefore, no lands were eliminated by this category from consideration for potential mineral resource development. Some laws, such as the State Wetlands Law, were not included here because they do not strictly deny mining, even though they may deter an operator due to the difficult, time-consuming and costly procedures required to obtain the necessary permits. This law is treated under Secondary Limiting Factors.

As of January 1, 1977, all surface mining operations (non-coal) are required by the Surface Mining Act of 1975 (Annotated Code of Maryland, Natural Resources 7-6A01 to 7-6A31) to obtain permits from the Water Resources Administration of the Department of Natural Resources. This act supercedes any county surface mining law. Under this act, all mineral producers must obtain an operator's license. The issuing of permits is based primarily on the compliance by the mining company with all county and local government grading and sediment control restrictions. The Surface Mining Act does not restrict the location of an operation as long as other relevant permits have been obtained. It does, however, establish an overall standard for environmental protection measures.

GOVERNMENT OWNERSHIP - This category contains all local, County, State and Federal government land holdings. Government ownership is assumed to preclude mining by private individuals and companies because (1) the government has other uses for the land, (2) any mining that would be done would be for governmental purposes and therefore exempt from the Surface Mining Law and (3) there is a negative overall governmental policy regarding mining of sand and gravel on public lands. The boundaries shown were obtained from the Anne Arundel County Topographic Map and 1977 tax maps. Included in this category are the larger Board of Education properties, Fort Meade, Baltimore-Washington International Airport, Crownsville State Hospital, water reservoirs, parks, and all other government holdings.

PRE-EMPTIVE LAND USE - This category identifies all lands that have been pre-empted from mining due to urban development. Included are: dense residential development (greater than one house per 15,000 square feet), industrial parks, cemeteries, airport runways, transportation networks, permanent private institutions, e.g., the Holy Trinity School and the Maritime Institute of Technology and Graduate Studies, landfill sites, large buildings, marinas, parking lots and other land whose use effectively precludes mining. Both 1977 air photos and tax maps were used to determine pre-emptive land uses. Certain land uses, such as golf courses, clubs and other private recreational facilities, were not considered to be an absolute eliminating factor and therefore were included under Secondary Limiting Factors.

DEPLETED RESOURCES - For this category an assumption was made that sites of current and former mining operations do not constitute a potential source of mineral resources. The 1976 Mineral Resources and Mined Land Inventory of Anne Arundel County, published by the Maryland Geological Survey, was combined with the Surface Mining Law's permit information and with field mapping to establish areas where prior mining has depleted mineral resources. All types of mining operations were included.

ZONING - Zoning was put into a separate category because it is subject to change. The zoning pattern (horizontal line) on the map shows those areas where mining was strictly prohibited in 1979. In Anne Arundel County mining is permitted in RA, Agricultural; W<sub>2</sub>, Light Industrial; W<sub>3</sub>, Heavy Industrial; and DD, Deferred Development Districts by special exception. All other zoning districts in the County prohibit mining. All zoning information was obtained from the Anne Arundel County Office of Planning and Zoning. In Annapolis, an incorporated town with separate zoning regulations, mining or extractions can occur as a permitted use in I<sub>2</sub> or General Industrial Districts. It is prohibited in all other areas. Boundaries of these zoning units were transferred from the zoning maps of the Planning and Zoning Commission in Annapolis.

SECONDARY LIMITING FACTORS - This category includes lands which may have certain restrictions against mining, but are not permanent site selection restraints for the mining industry. The following list describes each factor used in this category:

(a) Flood Plains - These sites are environmentally sensitive areas, and while mining is not prohibited in these areas, recent conservation practices may make it difficult to obtain approval for mining. In Anne Arundel County, the county's subdivision regulations prohibit development in the 100 year flood plain and the Grading and Sediment Control Ordinance states that within the 50 year flood plain grading permits shall be denied. Neither states absolutely that mining cannot occur in the flood plain, only that subdivision and developments are prohibited. Yet these regulations could possibly be used to inhibit mining. Boundaries were taken from Flood Prone Area Maps by U.S. Geological Survey and from the Anne Arundel County Geologic Map (Glaser, 1976).

(b) Department of Natural Resources Acquisition Lands - Under the Annotated Code of Maryland, Natural Resources, 5-208, "Eminent Domain-Forests and Parks", the Department of Natural Resources can obtain an injunction prohibiting any change in land use of the properties within its acquisition boundaries if mining conflicts with planned use in any of these areas. The Land Planning Services of Capital Programs Administration provided information on these areas.

(c) Easements - Three types of easements are included in this category: agricultural, environmental and historical easements. Land covered by these easements are, in most cases, owned by private individuals, but the Foundation or Trusts in charge of these easements have acquired the right to restrict any activities which would alter the present characteristics of the land. Agricultural districts were not included because they restrain changes in land use for only five years unless there was evidence that the area was being considered for easement purchase. The organizations providing information on easements were: Maryland Historical Trust, Maryland Environmental Trust and the Maryland Agricultural Land Preservation Foundation of the Department of Agriculture.

(d) Historic Sites and Districts - Places of historical value that are on the Federal Register of Historic Sites fall in this category. Before these areas can be altered, a public hearing must take place which could result in either delay or denial of mining. Information was obtained from the Maryland Historical Trust and the Archeology Division of the Maryland Geological Survey.

(e) Prior to altering any official tidal wetlands, the State Wetlands Law (Annotated Code, Natural Resources, 9-101 to 9-501) requires that a license be obtained. It does not strictly prohibit mining, but to do so would be difficult, time consuming and costly. Wetlands Permit Division of the Department of Natural Resources provided official boundaries.

(f) Country clubs, golf courses and some private recreational facilities are included in this category. These areas possibly could be mined because they have not been pre-empted by urban development. However, the cost of purchasing the land or getting the owner's approval could make extraction improbable. Information was taken from tax maps and air photos.

RESOURCES - The stippled area on the map depicts the deposits of sand and gravel that, within the limits of this study, are lands for potential mineral resource development. The boundaries of deposits which have a high probability of containing sand and gravel were determined from literature descriptions and from the 1976 Mineral Resources and Mined Land Inventory of Anne Arundel County. Included in the resource grouping of sand and gravel deposits are the sand facies of the Potomac Group, portions of the Magothy Formation, Patuxent River Terrace Deposits, Terrace Deposits, and some alluvium. These units were selected primarily by noting the presence of prior and current mining operations or by field observations and literature descriptions. Not all lands for potential mineral development necessarily contain sand and gravel resources of equal economic value, because the deposits are not of uniform lithology.

Certain "unmeasurable" factors reduce the availability of mineral resources which could not be included in this study. These are:

- (1) prohibitive property values,
- (2) public attitude,
- (3) informal public policy towards mining which results in refusal of special exception requests by zoning boards,
- (4) individual property owner's denial of access,
- (5) overall economic conditions and constraints,
- (6) percentage of a sand and gravel deposit that is economically useable, and
- (7) changes that will occur with the passage of time.

Therefore, the lands for potential mineral resource development shown on the map represent the maximum area available in 1981. This maximum area of sand and gravel remaining amounts to about 5% of the County's total area. However, when the "unmeasurable" factors are applied on a case by case basis, they will considerably reduce the extent of the potential mineral resource areas. For example, the impact of spreading urban development will be to greatly decrease the available resource in the years ahead.

The demand for sand and gravel in building construction, public works, and highways will continue unless a substitute is found. The quantity required will vary depending upon the market and general economic situation, but the basic need will still exist. Historically, Anne Arundel County has been extensively mined for

sand and gravel due to its abundance and the proximity of the resources to the market. If the mining industry continues to locate and operate in the county, the costs of transportation would remain low compared to importing the aggregate. However, the county's zoning practices have eliminated most of the potential deposits of sand and gravel. This fact is very evident on the map. The lands remaining with a potential for mineral resource development in Anne Arundel County therefore will be subject to competition for mining rights from the sand and gravel industry.

The Surface Mining Law of 1975 is designed to eliminate or minimize the environmental, aesthetic, and reclamation problems that could accompany the development of the remaining lands in Anne Arundel County. Once the law has been firmly established, the advantage of having a locally derived resource could be further enhanced by using rational resource planning and sequential land use techniques. The practice of permitting the removal of economic deposits of sand and gravel in developing areas would insure a continuing supply of sand and gravel to the consumers. Rational resource planning should involve the establishment of mineral resource zones where sufficient geological information indicates that sand and gravel extraction be given priority over other land uses. It may also be possible to reserve areas containing sand and gravel for future consumption. Whatever the method chosen, the non-renewable nature and limited supply of sand and gravel resources and the effects of the Surface Mining Law in Anne Arundel County suggest that lands with a potential for mineral resource development should be an integral element in planning for the future.

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