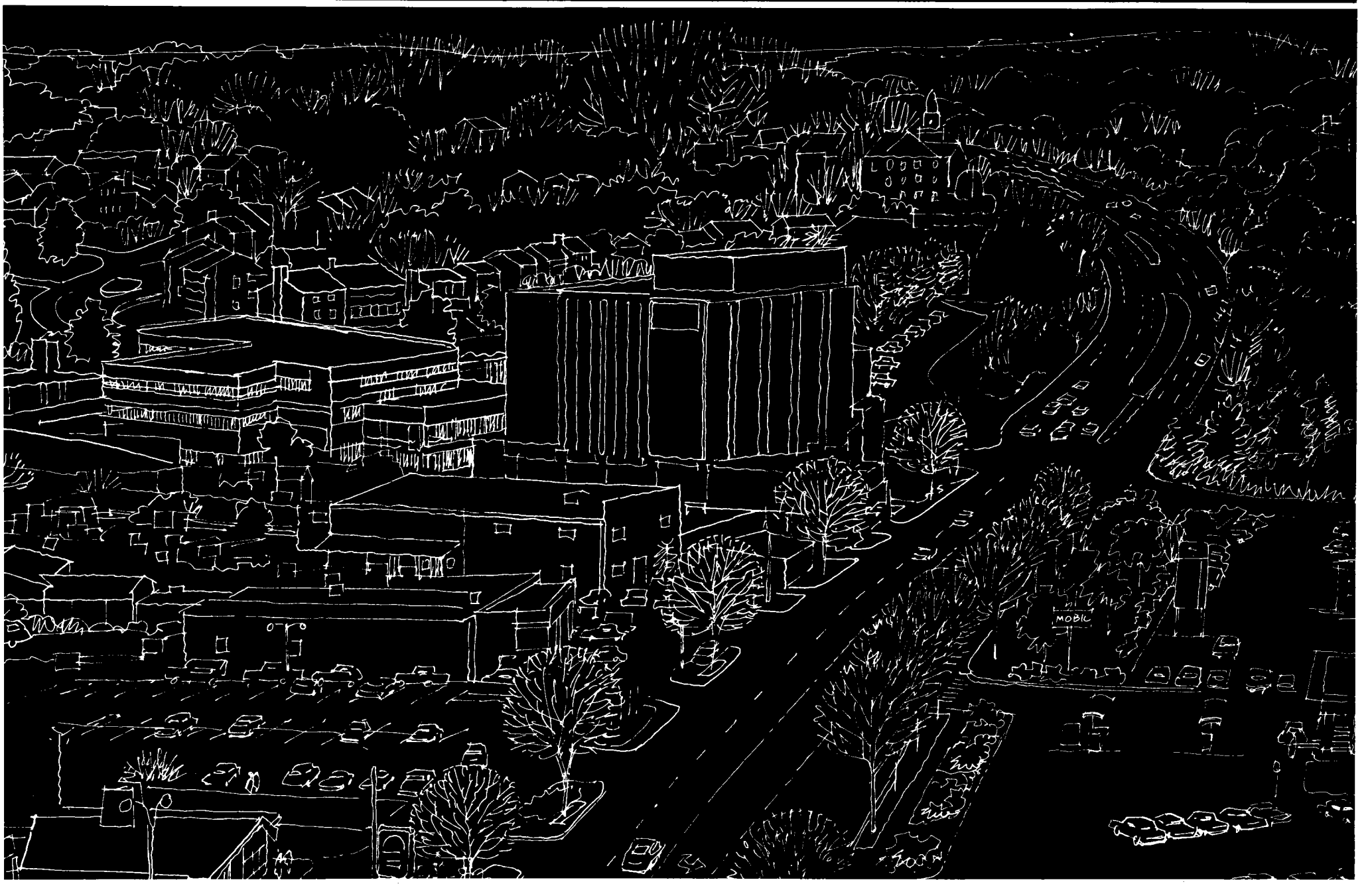
APPENDICES



APPENDIX A: ENVIRONMENT ANALYSIS[1]

SUMMARY

The major issues of major environmental concern within the Westbard Sector are:

- Noise pollution: which stems primarily from heavy traffic and industrial operations.
- Stream pollution: a compounded result of various development and flood control practices combined with sewage and septic leakages and illegal discharge.
- Natural system degradation: brought on by encroachment on the stream valley ecosystem and inappropriate utilization of land.

Noise in Westbard emanates from a number of sources. Highway noise is a major problem, particularly along River Road. Truck movement and other industrial activity (auto repair shops, cinder block plant, etc.) are cited by some residents as a noise problem. Aircraft noise from National Airport is noticeable in some neighborhoods located away from roadway noise sources. Railroad noise, while presently negligible, could become significant should more extensive use be made of the existing B&O rail line.

Developers should be made aware of high noise level areas and encouraged to provide sufficient acoustical insulation during construction of new residential structures. Residents should be advised of noise reduction measures available to them such as double glazed windows and caulking. Traffic rerouting and enforcement of existing noise laws would also prove effective.

Natural systems in the Westbard Sector have been substantially altered by structural uses of the land including buildings and parking areas. While certain soils are suitable for urbanization, development on other soils may lead to erosion and construction problems. Streams in Westbard and in the Little Falls drainage basin are seriously polluted. Neither Willett Branch nor Little Falls Branch meet the State of Maryland Class I Standards for water contact recreation or for aquatic life. Improvement in stream quality would also improve the aesthetic qualities for users of adjacent parks and woodlands. Major stream polluters include failing sewers, stormwater runoff, and chlorine discharges. Channelization and a wide variation in stream flow further compound the problem of stream scouring and reduced self-cleansing capability.

Stormwater runoff controls and pollution reduction measures should be included in all new development. Stricter control of known pollution sources and investigation into unknown sources should be encouraged. Old and leaking sewers and septic systems should be replaced. Chlorine discharges from Dalecarlia Water Treatment Plant effect Little Falls Branch but well downstream from Westbard. Such discharges should be phased out.

The recent completion of the replacement sewer projects described in the "Public Improvement" section above should provide some improvement in stream quality. In addition to the replacement sewers, the Washington Suburban Sanitary Commission (WSSC) has also done some grouting and Insituform lining work on existing sewers. Unfortunately, these streams are no longer being monitored by the County Department of Environmental Protection (DEP) so it will not be possible to determine the degree of water quality improvement.

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1 This section is an abbreviated version of a detailed report issued in February 1979. Limited copies are available on request.

NOISE

Traffic is the major source of noise in the area. Although trucks create the dominant peaks affecting the noise environment on River Road west of Little Falls Parkway, automobile traffic on River Road and Massachusetts Avenue is sufficient to cause speech interference on the porches of houses fronting on these roads. Industrial sources and trash removal are additional significant sources in localized areas. Aircraft noise, while noticeable, causes only a 1-5 dBA increase in the overall community noise level and should present no problems if present flight paths and operational patterns are maintained. Railroad noise, although not now a problem, could impact several residential communities if the line were to be converted to some form of transit or if freight hauling should increase. Average noise levels are shown on the attached "1978 Noise Contour" map.

Human Response

Human response to noise varies according to the type of activity in which a person is involved. While 70 dBA[2] might be desirable at a social gathering or sporting event, it would be undesirable while carrying on an important discussion or trying to relax. Since high noise levels restrict certain types of human activity, each land use category has certain limits which should not be exceeded if the land use is to maintain its proper function:

Industrial land use need only maintain levels low enough to protect workers' health and hearing (about 70 dBA). When communication is necessary, a small area, such as an office, can be reserved for this purpose.

Commercial and office use requires a fairly constant exchange of information and ideas, necessitating noise levels that will permit speech communication (about 65 dBA).

Residential areas should maintain noise levels that do not interfere with relaxation and sleep. This may require that structures be set back from roadways or otherwise buffered to maintain an exterior level at the building line of 55-60 dBA L_{dn}[3]. Although a structure will attenuate noise by 10-20 dBA, additional accoustical attenuation within the structure may sometimes be needed to maintain interiors at or below 45 dBA L_{dn} for sleeping purposes.

The State of Maryland Department of Health and Mental Hygiene has developed exterior environmental noise guidelines for various classes of land use. They are 70 dBA L_{dn} for industrial land use, 64 dBA for commercial land use, and 55 dBA L_{dn} for residential land use. In order

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2 dBA is the standard expression for decibels, the unit of measurement of relative sound pressure, with a weighting to account for the sensitivity of the human ear.

3 L_{dn} stands for "Day/Night Noise Level" which indicates an average sound pressure level, reflecting the variations in noise over time, including a weighting for nighttime (10 P.M. - 7 A.M.) levels to account for the greater degree of distraction experienced at night and while trying to sleep. This descriptor is currently being used by the U.S. EPA, HUD and the State of Maryland for their noise standards.

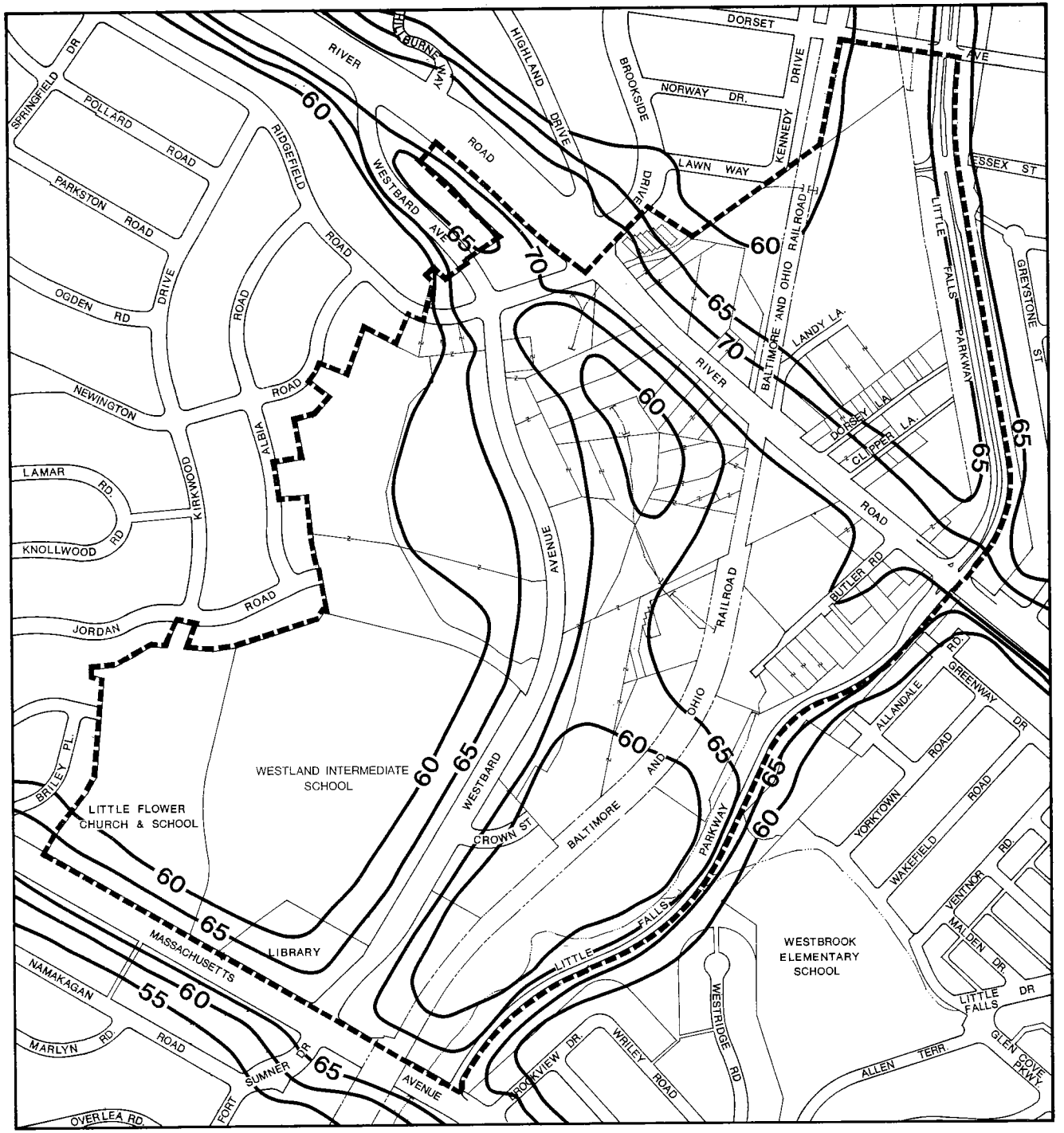

Figure 20

WESTBARD SECTOR PLAN

Montgomery County, Maryland

to attain these goals, the State has also adopted legally enforceable regulations pertaining to noise emissions from private real property as follows:

MAXIMUM ALLOWABLE NOISE LEVELS
BY ZONING CATEGORY (dBA)

Day/Night	Industrial	Commercial	Residential
Day	75	67	60
Night	75	62	50

Construction limits, frequency of occurrence, and exemptions are also provided for under the regulations.

The Montgomery County Noise Ordinance has established 55 dBA as the limit between residential properties. The County requires a 62 dBA limit at commercial and industrial property lines. Neither State nor County regulations apply to noise emanating from roadways, railroads, or airplanes.

Road Noise

River Road is the noisiest road in Westbard. Not only are the traffic volumes greatest, but the percentage of medium and heavy trucks is highest. Sirens from emergency vehicles cause the peak levels experienced and could result in activity disturbance and sleep disruption. Speech interference can certainly be expected on the front porch of houses facing River Road (L_{dn} = 69 dBA at 100 feet) adjacent to Westbard. Some annoyance might be expected even in the second row of houses.

Much of the single-family housing near River Road in the Westbard Planning Area is setback about 200 feet from the centerline, thus reducing noise impact. East of Little Falls Parkway on River Road, however, houses are setback only 50 feet and are subjected to substantial noise levels.

Much of the truck noise can be attributed to the industrial area, with truck engines and squeaky brakes causing high peaks during acceleration and braking. Any method that would smooth the flow of truck traffic into and out of the industrial areas would be advantageous from a noise viewpoint. If additional heavy trucks are expected to serve the area, it would be helpful to provide access other than past the residential units on Ridgefield Road and Westbard Avenue.

Massachusetts Avenue has the second highest traffic volumes in the planning area. Due to a lower percentage of heavy trucks, the noise level is noticeably lower. However, houses fronting on Massachusetts Avenue (L_{dn} = 65 dBA) could benefit from accoustical insulation since occasional trucks or sirens can cause distraction.

The southern portion of Westbard Avenue is on a hill, and therefore experiences slightly more road noise than would otherwise be expected. A new townhouse development will benefit from the site design which locates parking near the road, with living areas situated away from the road. The northern portion of Westbard has higher traffic volume and a higher percentage of trucks. The corner of Westbard Avenue and Ridgefield Road is an undesirable site for residential development and is another reason to consider placing an urban park in the vacant R-60 parcel. Site design and accoustical insulation is needed to obtain a satisfactory noise environment for nearby dwellings.

Industrial Noise

Local industry is another source of noise in the Westbard Sector. Locations where industrial noise is particularly noticeable are discussed below:

Between Westbard Avenue and Little Falls Parkway

south of River Road. This large area is the primary source of industrial noise in Westbard. Among the industrial uses are four auto repair shops, a cinder block company, a fuel oil distributor, and a foundation underpinning company. Sufficient noise is produced by these and other industries, as well as trucks which serve them, during daylight hours to impact several nearby apartment complexes and single-family homes. The residents affected are those living in Kenwood Apartments (L_{dn} = 70 dBA) on River Road, homes located south of Little Falls Parkway, and the residences in Westwood Towers on Westbard Avenue.

Clipper Lane and Vicinity. Traffic on Clipper Lane just off River Road is a source of noise for residents of the Kenwood Apartments. A substantial number of trucks serve Ridgewell Caterers located at the end of Clipper Lane. However, it is the noise from waste disposal trucks (peak 76 dBA) in the early morning hours (often as early as 3 AM) that causes the greatest annoyance for residents.

Westwood Shopping Center. The Westwood Shopping Center on Westbard Avenue is a source of noise for surrounding residents. Although a large number of cars are accommodated here each day, the noise produced by them is not as great as that created by delivery trucks and waste disposal vehicles. Trucks deliver both at the front and rear of the shopping center. Residents of Kenwood Place (peak 63 dBA) and Westwood Towers are concerned about periodic noise intrusion resulting from these deliveries.

Aircraft Noise

Under present flight procedures, aircraft from National Airport follow the Potomac River to the Cabin John Bridge where they then spread out. If changes to this policy are made to allow the aircraft flights to spread out sooner, the impact on the Westbard area is likely to be much greater.

FAA policy modifications for National Airport are likely to include the use of quieter, wide-body aircraft. The present policy of discontinuing flights between 10:00 PM and 7:00 AM and maintaining flight patterns over the Potomac River keeps noise intrusion at a minimum. The County has adopted a policy supporting a 50 percent reduction in the number of air carrier flights out of National Airport.

Railroad Noise

The Georgetown Branch of the B&O Railroad line passes through the area and is another potential source of noise. Freight activity along the line presently occurs at irregular intervals and represents temporary intrusions. When it appeared likely that the B & O Railroad would abandon the Georgetown Branch, the Planning Board considered possible conversion of the right-of-way for some form of public transit such as a trolley line (light rail transit). Feasibility studies for light rail indicate that adjacent residential areas in Westbard would experience a moderate 5-7 dBA L_{dn} increase in the noise level. Some sort of noise attenuation might be needed, such as a low wall, to deflect sound. However, the B & O Railroad now reports the need to continue the freight service indefinitely thereby negating other possible uses of the right-of-way.

NATURAL SYSTEMS

This section examines the natural systems in Westbard associated with both land and water. The topics discussed include soils and bedrock, water quality, water quantity, erosion and sedimentation, channelization and aquatic life, and woodlands and wildlife. The discussion covers present conditions and corrective measures.

STREAM CHANNELIZATION & ENCLOSURE

- Sector Plan Boundary
- ✱✱✱✱ Channellized Section
- ●●●● Piped Section
- ■ Drop Structure
- Natural
- Preliminary 100 Year Ultimate Floodplain
- Slopes Over 15%

✱ Information shown is based on preliminary data and subject to change

Figure 21

WESTBARD SECTOR PLAN

Montgomery County, Maryland

0 150 300 600 900 F

0 45 90 180 270 M

September 1982

Soils and Bedrock

The principal soils in the Westbard Sector are Manor, Glenelg, Worsham, and Glenville silt loams. Glenelg soils are found in the northeast portion of the sector along River Road and Little Falls Parkway. These soils are generally well suited for urbanization. They are well drained and foundation conditions are generally good. The slopes range from 0 to 8 percent, allowing for easy grading. Construction on Glenelg soils should not present much of a problem unless deep excavation is necessary on thin overburdens (less than 20 feet).

Manor silt loam soils are the primary soil type in the western two-thirds of the Westbard area. When associated with steep slopes, Manor silt loam soils may be highly susceptible to erosion and siltation during construction. Extensive grading and filling for major structures could contribute to erosion problems.

MdB2[4] soils have 3-8 percent slopes and are very well drained. These soils occur in a few small areas on either side of River Road, northwest of the railroad tracks. MdC2[4] soils have 8-15 percent slopes and are less suitable for development due to erosion potential. These soils are located in the core of the area, west of Westbard Avenue. MdD2[4] soils have 15-25 percent slopes and are not well suited for development due to a high erosion potential. These soils occur in small areas in the center and along the edge of the Westbard area.

In addition, there are small areas of Worsham and Glenville Silt Loam soils (0-8 percent slopes) which are principally located along Willett's Branch, Little Falls Branch, and other smaller streams. These soils are poorly drained creating construction problems. They are susceptible to frost action, seasonal high water table, and flooding. Excavation sites may fill with water and foundations and basements may remain wet in areas where these soils occur. Such problems are common to all floodplains. Development on these soils tend to increase runoff and reduce the base flow of streams.

The depth to bedrock throughout most of Westbard is less than 20 feet. Bedrock outcrops are present along Little Falls Branch. The bedrock types are Gneiss, as well as a small area of Schist. Surface materials associated with Gneiss and Schist are generally well drained.

Water Quality

One of the knotty environmental problems confronting Westbard is the poor water quality of the two local streams. Willett Branch, which traverses the developed area and Little Falls Branch, which enters from the east to join the Willett Branch and flows south to the Potomac River at the District Line. The overall water quality of these two streams has steadily deteriorated over the years. Field inspections in November of 1978 revealed an abundance of green filamentous (stringy) algae in both streams, a biological indication of eutrophication[5] and probable sewage contamination. The poor quality of Willett Branch is confirmed by a consultant's study of the Little Falls Basin.

In the past, the bulk of the water pollution in Westbard and the Little Falls basin has emanated from two non-point sources: 1) sanitary sewage and 2) stormwater runoff.

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4 Manor silt loam soil designations.

5 Overfertilization of a body of water by nutrients.

Sanitary Sewage

Monitoring of pollution in the streams discloses an increasingly serious problem with sanitary sewage. While there may be numerous other causes, three major contributing factors are known to exist:[6]

1) Failing sewer systems in the headwaters of Little Falls and Willett Branches;
2) A failing sewer system in the mid-section of Little Falls Branch (below Massachusetts Avenue); and
3) Failing septic systems in the vicinity of the Dalecarlia Reservoir.

In response to these problems, the replacement sewers discussed in the "Public Improvement" section above were constructed by WSSC. These new lines and additional grouting and Insituform work on existing sewers should provide some improvement in water quality.

The failure of septic systems downstream from Westbard in the vicinity of the Dalecarlia Reservoir has been a major contributor to the sewage problem in the Little Falls Basin. However, this problem may have been alleviated by the installation of grinder pumps during the past year.

Stormwater Runoff

Stormwater runoff is the second major source of non-point pollution. Runoff from urban areas includes soil, fecal wastes from domestic animals, heavy metals from automobiles, oil and grease from paved surfaces, chlorides from road salting, nitrous oxides from organic and atmospheric sources, phosphates from lawn fertilization, litter, and various other pollutants. Substantial reduction of these pollutants from Westbard and other areas could be achieved if some of the following stormwater management practices were employed:

1) Periodic street and parking lot maintenance and cleaning program.
2) Installation of oil and grease traps in parking lots and industrial areas.
3) Increase and identification of service stations accepting used motor oil.
4) Installation of litter traps in and along drainage ditches, culverts, roadways, etc.
5) Public education on the proper use of pesticides and fertilizers.
6) Implementation of soil conservation practices.
7) Additional water quality monitoring stations.
8) Increased sanitary and storm sewer maintenance.

Storm Drains

Another contributing source of water pollution in the Little Falls Basin is the illegal discharging of waste water and materials into storm drains. At present, a serious pollution problem occurs at the storm drain outfall at 4701 Willard Avenue. Much of this problem is directly attributable to the presence of No. 2 heating oil and rock dust. Little Falls Branch has the highest total solids content of any county stream and a primary cause is the continuous discharge of rock dust into the stream. The source of the heating oil remains unknown. Cooperation with the District of Columbia is needed for additional monitoring to locate and halt the illegal fuel oil discharge.

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6 Source: Montgomery County Department of Environmental Protection.

Point Source Pollution

One municipal facility, the Dalecarlia Water Treatment Plant, discharges a daily average of 1.5 million gallons of highly chlorinated water into the Little Falls Branch. The net effect of this discharge is two-fold: chlorine, as a biocide, effectively kills all aquatic organisms below the point of discharge, and it creates a chemical barrier in the lower reach of Little Falls Branch, thereby preventing the biotic repopulation of upstream areas from Potomac River sources. The Dalecarlia Treatment Plant does have an EPA discharge permit. Reduction and eventual total elimination of all chlorinated discharges is planned over a five-year span.

Other point sources of pollution include the Little Falls Swimming Club which may be contributing chlorinated wastes into Little Falls Branch, and the cinder-block plant in Westbard which may be discharging waste water and materials into Willett Branch.

Water Quantity

Water quantity is the second major water problem affecting Little Falls and Willett Branches.[7] The intensive urbanization of parts of this watershed and the ensuing high proportion of impervious surfaces have created two major hydrologic problems: a diminution of normal base flow resulting from reduced groundwater recharge and the rapid drainage due to the stream channelization, and excessive runoff during storm events. Intensive development within the floodplain at Westbard and other areas in the watershed has necessitated the channelization and enclosure of streams in order to provide flood protection. Some of the effects of these two problems have been:

1) A reduced ability of the streams to dilute pollutants.
2) Small feeder streams, which once supplied water and aquatic life, are covered up or have dried up.
3) Flooding and stream bank erosion.
4) Loss of stream biota due to flash flows.

Field inspection of Westbard and its streams revealed evidence of those four effects and the general lack of suitable stormwater management facilities. An underground storage pipe in the townhouse development on Westbard Avenue is the only known stormwater management facility.

Preliminary maps of the 100-year ultimate floodplain show that the flood area extends beyond the boundary of the channelized and/or piped sections of the stream. For instance, although the stream is piped through the Marriott tract, the floodplain covers a wide expanse across the northern section of the parcel. This floodplain will inhibit redevelopment of the site because Section 50-32 of the County's Subdivision Regulations restricts development within the 100-year ultimate floodplain. A 25-foot setback from the floodplain is required for any building.

A study of the Little Falls Watershed is being prepared as part of a series of stormwater management plans for all watersheds in the County. When complete, the study will include management recommendations for Willett Branch.

The preliminary 100-year floodplain (Figure 22) extends beyond the stream channels in several places. At River Road an under-sized culvert results in the 100-year floodplain extending to three single-family houses on Lawn Way and the six townhouses along Brookside Drive. Little Falls Park is also subject to flooding.

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7 The M-NCPPC is currently conducting a watershed management study of Little Falls Basin to include delineation of floodplains.

Many of the negative impacts of urbanization in Westbard could have been substantially reduced had some of the following stormwater management techniques and facilities been implemented:

1) Rooftop storage with controlled release.
2) Underground storage via wells, cisterns or storage tanks.
3) Detention/retention basins.
4) Infiltration pits.
5) Use of standard dissipation techniques at all storm drain outfalls.
6) Use of drainage swales and berms.
7) Use of grass-lined ditches.
8) Stabilization of disturbed areas via vegetative covering.
9) Use of dutch drains.
10) The banning of construction in the 100-year ultimate floodplain.

Future development or redevelopment in Westbard should utilize the most applicable of these techniques. Also, natural open space should be retained to the extent possible, including buffer areas along the streams. Consideration should also be given to the redesign and modification of large treeless parking lots to include landscaped vegetative islands and the underground storage of water. Multi-level parking facilities should be encouraged wherever possible in order to retain the maximum feasible amount of open green space to absorb and retard stormwater runoff.

Erosion and Sedimentation

Erosion and sedimentation are other watershed problems affecting both water quality and quantity. In Westbard, land surface and stream channel erosion and sedimentation are not serious problems because of the high percentage of impervious surfaces and the topography and geology of the stream valley.

To insure that future Westbard development and redevelopment does not increase land surface and stream channel erosion and sedimentation, good watershed management practices and techniques should be applied. These are:

1) The banning of construction on excessively steep slopes,
2) Minimizing the extent of impervious areas,
3) The use of gravel or asphalt pedestrian walkways/paths,
4) The covering of spoil piles.

General Stream Valley Degradation

Channelization

Stormwater management is affected by the extent of the channelization and enclosure of both Little Falls and Willett Branches (see Stream Channelization and Enclosure map). Within the Westbard Sector Plan area roughly 4,138 feet, or 68 percent, of the length of the streams have been channelized or enclosed. The use of trapezoidal and rectangular shaped concrete channels to protect floodplain development has resulted in wide, uniformly shallow streams with a mean depth of less than one inch. This extremely shallow depth is responsible for two critical negative effects: it allows rapid thermal fluctuation, and it provides absolutely no habitat for aquatic life.

While stream channelization may solve local flooding problems it may result in concentrating runoff further downstream. From an environmental perspective stream channelization and enclosure should be used only as a last resort. However, where channelization is unavoidable, a vee-shaped cross-section would provide some stream

depth, thereby mitigating some of channelization's negative effects.

Aquatic Life

The net result of these previously discussed water quality and quantity problems is the absence of all fish and most aquatic life from these two streams. In 1975 no fish were collected at 17 sampling stations in the Little Falls Basin. Recent field inspection reconfirmed previous reports of "dead streams." The absence of even pollution-tolerant species dramatizes the severity of the environmental problems which confront Westbard and the Little Falls Basin. This loss of aquatic quality, habitat, and life has deleteriously impacted other life forms which were dependent upon these streams for food and habitat (e.g.: stoneflies, mayflies, frogs, salamanders, aquatic turtles, herons, and raccoons). The result is a reduced or broken food chain and the elimination of many former basin species.

Should future water quality improve in Little Falls and Willett Branches, the re-population of fish can be attained only through artificial stocking. This would be necessary to circumvent shallow water areas and migration-blocking obstructions such as the four foot high concrete drop structure in Little Falls Branch.

Woodlands and Wildlife

Wildlife associated with woodlands and other natural habitat will normally decrease in number and diversity in highly urbanized areas. Wildlife habitat can be protected by leaving a bordering, non-mowed vegetative strip along tree lines and streams. These vegetative strips would: filter overland flow of decayed grass cuttings and leaves, and create an "edge effect," thus providing more food, cover, and habitat for area wildlife. In general, length and irregularity of shape of the vegetative strip(s) are more conducive to creation of good wildlife habitat than width and uniformity of shape.

The local wildlife food supply can be further supplemented through the planting of food bearing annuals, perennials, shrubs, and trees. A few of the many examples are: lespedezas, legumes, grasses, sunflowers, jerusalem artichokes, blackberries, and persimmons. In addition to providing food and cover, many of these plants have additional erosion control and ornamental value.

Conclusion

Many of the land and water problems discussed in this report are common to developed commercial and industrial areas. Nevertheless, it may be possible through good site planning for new development and the introduction of good management practices to undo some of the environmental abuses which have occurred in Westbard and elsewhere in the Little Falls Basin.