III.

Natural and Cultural Resources

A. Natural Resources

Halifax's natural resources are its fields, woods, wetlands, lakes and streams, sand deposits, and bogs. The low-lying lands, water resources and sand deposits support the extensive cranberry industry, a diminishing amount of other agriculture, and limited sand and gravel operations, while the overall mix of woods and open areas makes the town attractive for residential development.

Halifax's terrain is relatively low, ranging from 20' msl (above mean sea level) to 100' msl. There are many small hilly areas composed of gravely and sandy loams surrounded by extensive low-lying areas with soils ranging from moderately well-drained to poorly-drained. Many of these have been developed as cranberry bogs, while others remain wooded swamp. There are also extensive areas of flood plain along the Winnituxet River, most of it wooded swamp.

Soils

The National Resources Conservation Service (formerly Soil Conservation Service) describes associations of soils, which are commonly found together. Sometimes these have traits in common, but soils in an association can differ markedly. Hence this discussion of associations is followed by a map of Development Constraints including soils with severe limitations for on-site sewage disposal

The extent and characteristics of the major soil associations, adapted from the 1987 Halifax Open Space/Bay Circuit Plan by IEP, inc.,follow:

1. Peat-Muck-Scarboro-Raynham This covers 43% of the town and consists of poorly or very poorly drained organic and mineral soils on low, nearly level terrain including much swamp and floodplain. It is very limited for development due to wetness and low weight bearing capacity.

2. Merrimac -Windsor- Hinckley This covers about 36 % of the town. The soils tend to be droughty or fine sandy loams underlain with various combinations of sand, sand and gravel, or sand, gravel and cobbles. They can support intensive development, but the coarsest of the underlying soils offer very little filtering or biologic action. They can threaten groundwater unless modified or receiving leachate only from innovative-alternative systems giving a higher degree of treatment.

3. Deerfield - Belgrade-Ninigret (Silty Subsoil Variant*)* This covers about 8 % of the town, generally along lower slopes and floodplains. Nearly half (the Deerfield soils) are moderately well drained but often have groundwater water within 2 feet of the surface during wet seasons. The Belgrade soils (35%) generally have a silty loam surface over slowly permeable silt and very fine sand while the Ninigret sols (15%) have a sandy loam surface over slowly permeable subsoils. The remainder generally has moderately well drained soils over slowly draining compact glacial till. Between seasonally high groundwater and tight soils/ this third of the town is ill-suited to conventional septic systems.

Fig III-1 Dev. Constraints (our map)

Fig. III-2 Zonng and Absolute Constraints

4. Gloucester-Essex This association covers 4 per cent of the town, generally on nearly level plains and some low hills. Though the surface soils are generally well drained, a tight slowly permeable layer of till underlies them. This impedes the flow of effluent and causes the surface soils to be saturated during the wet season, thereby greatly restricting use of on site disposal systems.

Septic Limitations

Septic systems require permeable, aerated soils sufficiently above the water table (commonly 4 feet) to support bacterial action while allowing the liquid to percolate into the ground. Areas with extremely fine or tight soils can prevent such movement, while extremely coarse soils or a high water table can allow effluent to enter the groundwater without sufficient biological action. These problems can sometimes be mitigated by replacing tight soils with ones which percolate better, by elevating "mounded" systems above the groundwater, or by using certain "innovative or alternative" systems providing a higher degree of treatment, particularly nitrogen removal. These are allowable under Title V, the revised State Sanitary Code.

These potential mitigations, combined with the irregularity of soil patterns and the large size of most lots make mapped limitations only a general predictor of developability Outside of deep wetlands or ledge, engineers can design an approvable system in septicly-limited areas about 75% of the time. Thus mapped limitations are reported to be a better predictor of future maintenance problems than of developability.

In all, about 55% of the town is covered by soils, which are poorly suited to on-site disposal due to high water tables or low permeability, and some of the remaining sandy uplands may be too porous to offer effective treatment. The greatest portion of the severely limited soils are in the Peat-Muck-Scarboro-Raynham Association. These are found in wetlands, which would generally . remain unusable under the Wetlands Protection Act even if sewerage were available.

As Figure III-1 shows, the greatest concentration of soils with severe limitations for septic systems is in the southeastern portion of the town, while the most buildable sections of Halifax are in an arc from the Bridgewater line west of Thompson St. to Silver Lake. Figure III-2 from the Executive Office of Environmental Affairs Build Out Analysis complements the soils information on Figure III-1 by showing related development constraints caused by Wetlands, 100-Year Flood Plains and land within the River Protection Act's 100-foot minimum buffer .

Water Bodies

The town' s major water bodies are the East and West Monponsett Ponds, bracketing Rte. 58; Crystal Lake/Muddy Pond just south of Oak St. on the Pembroke line; the large Burrage Pond (a bog reservoir) spanning the Hanson line east of Elm St.; the big South Cranberry Pond south of Rte. 106; and the extensive emergent wetlands/bog reservoir north of Plymouth St. (sometimes called the Plymouth Street Pond or Stella's Pond). These include a total of 781 acres of open water according to the tabulated MacConnell maps. In addition, Silver Lake (in Pembroke, Plympton and Kingston) borders Halifax on the east and adds to the experience of open water.

The Monponsett Ponds are fed by Stetson Brook draining Pembroke's Stetson Pond and other streams, and drain via Stump Brook and the Plymouth St. Pond through Robbins Pond in East Bridgewater and on to Taunton River. At the same time amounts sometimes reaching half of the

Fig.III-3 Monponsett Ponds

year-round total are diverted from the Monponsett Ponds in the Taunton Basin to Silver Lake the Jones River Basin to supplement Brockton's Silver Lake supply. This is allowed from October to May. Most of this water is ultimately returned to the Taunton Basin via Brockton's wastewater treatment plant on the Salisbury Plain River. The Monponsett Ponds may also be diverted from June to September to prevent flooding.

Depending on the operation of control structures west of the Plymouth St. Pond and others under Rte. 106, the Plymouth St. Pond flows west to Robbins Pond in East Bridgewater, or south through the Big South Cranberry Pond and on to the Winnetuxet and Town Rivers.

The Burrage, Big South Cranberry and Plymouth Street Ponds are significant as cranberry bog water supplies as is the West Monponsett Pond. Both of the Monponsett Ponds and Silver Lake are important as local and regional water supplies. They also have considerable wildlife, recreational and scenic values, though Silver Lake is only available for very limited fishing.

Silver Lake is in the South Coastal Basin and normally drains to Jones River, but it is the main source for the Taunton Basin Communities of Brockton and Whitman. Up to 11,000,000 gallons/day are treated, pumped to those communities, and discharged to that basin.

The town also has many streams feeding the Ponds and draining the town. Key among these are the Stetson Brook and White Oak Brook feeding the Monponpsett Ponds and Stump Brook draining them west to Robbins Pond in East Bridgewater. In addition the Winnetuxet River meanders west from the Plympton town line through wooded swamp in the southern end of town, joining the Town River at the Bridgewater town line to form the Taunton River. It is fed by several streams including the Monponsett Brook, Palmer Mill Brook and Lucas Brook.

Wetlands

Halifax appears to have at least 2660 acres of open wetlands, wooded swamp, and cranberry bogs covering about.24% of its area. As of the 1991 Mass. Map Down Project aerial survey (The MacConnell Maps), Halifax had 630 acres of wetlands, 5.7% of its area, compared to 2.7% region-wide. This figure is understood to greatly understate wetlands because it reflects summer-time leaves-on photos and lists wooded swamps under their respective forest cover type. In contrast, the USGS topographic sheets show wooded swamp based on wintertime leaves-off photos. The 1977 map shows 1360 acres, including 250 acres in the State-owned portions of Petersons' Swamp for a total of 1990 acres, or 17.9% of the town's area. Some of this may have since been converted to cranberry bogs. A more inclusive measurement based on the Massachusetts Wetlands Inventory and including cranberry bogs, bog reservoirs, and other open water except for the Monponsett Ponds, totals 4145 acres or 37% of the town's surface.

Cranberry Bogs

The 1991 map also shows 672 acres of "Woody Perennials". This category includes cranberry bogs, orchards, and nurseries, but this land is presumably all in bogs since the USGS map shows no orchards and no major nurseries are known. This category occupied 6.1% of the town vs. 2.5% of the region. Scaling from the 1997 Wetlands Inventory aerial photos gives a comparable 653 acres of bog. This may have grown slightly since several operators were expanding their bogs until the current falling prices.

Cranberry bogs are essentially wetlands, even when man-made, and generally are regulated as such under the State Wetlands Protection Act. One question, noted later, is whether man-made upland bogs, which depend on pumped water for flooding, remain protected wetlands if they are

abandoned and revert to upland vegetation. This study assumes that they do remain protected and un-developable. A different interpretation would increase the town's developable land.

Drinking Water Resources

The town's extensive areas of underlying coarse sandy/gravelly glacial deposits and extensive surface waters give it significant resources for potable water. A 1961 Map of water supply favorability in the Brockton-Pembroke Area shows that all of the mapped portion of the town is covered with stratified drift except for an area of glacial till at Hemlock Island. Much of this is very productive coarse material over 50 feet deep. It is commonly found in buried stream valleys, which often are quite different from the surface topography. Figure III-4 shows the pattern of such stratified drift in the Taunton Basin and indicates the large amount in Halifax. This suggests considerable supplies of presently undeveloped conventional groundwater.

The town is also reported to be relatively well suited to bedrock supplies. Figure III-5 shows contours of bedrock (note the buried stream valley going Northeast-Southwest) and the productivity of local test wells. Though the results are low compared to wells in soil, the test wells are generally in the most productive category - over 20 gallons / minute. Such wells are unlikely to be used due to relatively higher development costs, lower productivity, and less certain water quality (due to the potential transmittal of distant contaminants through rock fissures) than with conventional wells.

As discussed below under Infrastructure, the town's present developed supplies yield about twice a typical day's demand. Explorations have found other potential wells. One at Stump Brook would have needed considerable treatment for iron and manganese. A second one south of the first YMCA well off of the East Monponsett Pond promises a similar yield and has recently been developed.

Habitat

The town's mix of woods, fields, rivers, and wetlands support diverse wildlife including some Species of Special Concern according to the Massachusetts Natural Heritage Program. Some major wetlands are impounded and used as cranberry bog reservoirs. The streams and their banks often form a corridor for wildlife movement.

Species found locally include raccoons, muskrats, otters, and deer, along with many species of ducks and hawks, and occasional swans and eagles. The ponds hold Large Mouth Bass, Pickerel, White and Red Perch, Sunfish, Eels, and Horn Pout and are spawning grounds for Alewives.

Species of special concern which the Massachusetts Natural Heritage Program lists as found on the Winnetuxet River Flood Plain include the Plymouth Gentian (Sabatia Kennedyana) and the Spotted Turtle (Clemmys Gutatta). Figure III-5 shows the Estimate Habitats of Rare Wildlife, which dwell in wetlands, and therefore could understate the areas critical to upland-dwelling Rare and Endangered Species or Species of Special Concern.

Fig III-4 Stratified Drift

Fig III-5 Groundwater in Bedrock

Fig III-6 Wildlife Habitat

B. Cultural Resources

Halifax's cultural resources include its civic center around Town Hall, many historic buildings and places, and its man-made landscape. These include houses, home sites, churches, various public buildings, business sites, and cemeteries reflecting the town's early years and its continuing growth and evolution.

The town's historic and archaeological sites include the following:

1. The Musterfield Land off of South St. indicated by a marker there.

2. The Town-owned site of the Tomson House, the first European dwelling in Halifax, east of Thompson St.

3. The 1734 Tomson Cemetery on Thompson St..

4. The recently restored 1830s Pope's Tavern across from Town Hall used by the Council on Aging.

5. The Town Hall, built in 1906 to replace an earlier Greek revival building, and then nearly doubled in size in the same style in the late 1980s.

6. The Wamsutta Stone on White Island Road reflecting King Phillip's War.

7. The Historic Society building, a former School and Fire Station moved for the Society.

8. A 19th Century former blacksmith shop moved from Plymouth St. to South St.,

9. A mid-19th Century (1852) church on Plymouth St. just west of Town Hall

10. The 1730s Sturtevant Cemetery on Plymouth St.

11. The former Brockton Store on Plymouth St., just west of Town Hall - recently moved across the street to a more accessible, sympathetic site.

12. Early Mill sites off of Furnace St., Old Plymouth St., and Palmer Mill Rd.

13. The dramatic open views across cranberry bogs are also a cultural feature in being human creations, though in a natural setting.

14 A residual canal running northeast from Stump Pond toward West Monponsett Pond.

15. The State's first Civil War monument

The most compelling concentration of historic / civic sites is along the central section of Plymouth St. encompassing the Town Hall, the Congregational Church, Popes Tavern, the Police Station, the Blacksmith Shop, the Brockton Store, the Library and the linked, handsome, recently expanded Elementary School; the 1905 Central School being converted to a new Police Station; and at a slight distance, the Post Office. This Civic Center area is an elegant contrast to the

residential / strip commercial development bracketing to the east and west. Under Historic Commission leadership, the Town has designated this remarkable concentration of resources The Halifax Historic District.

C. Scenic Resources

Halifax's scenic resources include the dramatic views across both Monponsett Ponds from the Monponsett St. isthmus; other views of bogs and fields from Thompson St.; the remaining rural sections of South Halifax; the extensive open vistas across the Plymouth St. Pond at the gateway to the town from East Bridgewater, and across the wet meadows between Franklin St. and Monponsett St., and south of Wood St.; and the evocative Old Plymouth St. /Elm St. neighborhood.

Much of this reflects a disappearing past. The gateway view is compromised by a small industrial park in the foreground; much of the rural landscape is increasingly screened by Form A development along the roads, or upstaged by unsympathetic subdivisions; and the center of town is preceded by a commercial strip growing west along Rte. 106. As the 1987 Open Space/Bay Circuit Plan observed, " The ride through Halifax on Rte. 106 is interesting as one encounters both a feeling for rural New England, and then for present day suburban New England. The town should examine opportunities to protect (its) scenic and historical heritage along Rte 106. (It) remains ripe for high levels of commercial and residential development."

Landmarks such as the Boston Store continue to be preserved, and thanks to imaginative use of Site Plan review powers by the Planning Board and other town bodies, much of the recent commercial development is far more attractive than comparable development in other communities. However the continuing strip development still detracts from the handsome character around the Town Hall and disperses commercial activity that could be in a more compact, walk-able traditional center

22/20 LOCUS

24/22 LOCUS