II. Population & Land Use Characteristics

II. WATERSHED POPULATION AND LAND USE CHARACTERISTICS

Population Profile

Population in the Watershed

The Darby Creek Watershed is home to many people. An exact count is hard to pinpoint, because several counties and many different municipalities are involved. Moreover, Watershed boundaries do not parallel municipal boundaries. As a result, portions of certain municipalities are in the Watershed while the rest of the same municipality is outside of the Watershed. Table II-1 (on the following page) presents population statistics for the municipalities comprising the Watershed, omitting the very small portions of both Tredyffrin Township in Chester County at the top of the Watershed and a small portion of Lower Merion Township in Montgomery County. It is important to note here that these statistics are for entire municipalities. In some cases, sizable portions of a municipality extend beyond the Darby Creek Watershed boundary. As a result, these statistics over-count or overestimate the true Watershed counts. In the case of Philadelphia, US Census tract boundaries were used to establish Watershed population. Thirty-three (33) census tracts were included and aggregated to determine Philadelphia's Watershed population. Again, because portions of these census tracts extend beyond Watershed boundaries, these statistics also overcount to some extent.

Notable from the table are the sheer size of the population numbers. Declines notwithstanding, Philadelphia population tops the list at 155,447 persons (probably closer to about 140,000 persons if the extra-Watershed census tract portions are removed). Upper Darby Township has approximately 80,000 persons, with Haverford Township at nearly 50,000, Radnor and Ridley Townships 30,000 or more, and Marple and Springfield Townships have approximately 25,000 people living in the Watershed. At the same time, another reality emerges from the table; the large number of relatively small municipalities that can be found in the Watershed, such as Colwyn, East Lansdowne, Morton, Rutledge and Millbourne Boroughs (the last of which was home to only 810 persons in 2000). Though very small in total population and physical size, these boroughs reflect the historical high-density development of parts of the Watershed. In each case, development initially gathered around significant industrial and commercial uses, with residential development filling their political boundaries. Although there undoubtedly are advantages in having so many small municipalities comprise a Watershed, there is a clear downside: It is not easy to coordinate the efforts of so many different sets of municipal officials, planning commissions, zoning ordinances, land development ordinances, and comprehensive plans. Ideally, these would all be coordinated to achieve the maximum beneficial effect in the Watershed. However, the reality is that each municipality has its own officials, commissions, ordinances and plans. Some municipalities have staffs dedicated to these issues and more substantial budgets. Others have smaller budgets and face more significant constraints in addressing these matters. This reality is a significant challenge in striving toward the goals of this Plan.

Table II-1 Census Population Statistics for the Watershed Municipalities

Darby Creek Watershed Population Trends and Projections
(U.S. Census and Delaware Valley Regional Planning Commission)

Darby Watershed Municipalities	1990 Population	2000 Population	1990-2000 Change	2025 Projection
Aldan	4,549	4,313	-236	4,240
Clifton Heights	7,111	6,779	-332	6,160
Collingdale	9,175	8,664	-511	7,690
Colwyn	2,613	2,453	-160	2,110
Darby Boro	11,140	10,299	-841	9,300
Darby Twp.	10,955	9,622	-1,333	8,960
East Lansdowne	2,691	2,586	-105	2,220
Easttown Twp.	9,570	10,270	700	9,950
Folcroft	7,506	6,978	-528	6,330
Glenolden	7,260	7,476	216	6,370
Haverford	49,848	48,498	-1,350	48,040
Lansdowne	11,712	11,044	-668	9,890
Marple	23,123	23,737	614	23,110
Millbourne	831	943	112	830
Morton	2,851	2,715	-136	2,950
Narberth Boro	4,278	4,233	-45	4,100
Newtown	11,366	11,700	334	11,880
Norwood	6,162	5,985	-177	5,820
Philadelphia*	166,143	155,447	-10,696	n/a
Prospect Park	6,764	6,594	-170	6,200
Radnor	28,703	30,878	2,175	30,640
Ridley	31,169	30,791	-378	27,530
Ridley Park	7,592	7,196	-396	6,870
Rutledge	843	860	17	750
Sharon Hill	5,771	5,468	-303	4,830
Springfield	24,160	23,677	-483	22,320
Tinicum	4,440	4,353	-87	4,140
Upper Darby Twp.	81,177	81,821	644	69,300
Yeadon	11,980	11,762	-218	10,470
Delaware County	547,651	550,864	3,218	540,460

** data for Philadelphia in this table is based on the 33 Philadelphia Census Tracts which lie at least partially in the Darby Creek Watershed*

Another trend that is noticeable in the population table is the decline in total population from 1990 to 2000. The populations reported for the Philadelphia census tracts declined by almost 11,000 persons. Darby Borough, Darby Township, Lansdowne Borough, and Haverford Township all lost significant population, near and some exceeding 1,000 persons. Many of the other smaller municipalities in the lower and middle portions of the Watershed also lost population, with smaller losses pro-rated on smaller sizes and population bases. These declines reflect a variety of population dynamics, including an aging population with increases in deaths, a reduction in average household size reflecting reduction in births, out-migration in general and of young people in particular and decline of employment opportunities, among others. These population losses were balanced to some extent by modest population increases in the upper Watershed municipalities, such as Marple, Newtown, Radnor and Easttown Townships. However, population growth in these municipalities was not large. In many ways, the population story of the Darby Creek Watershed is reflected in that of Delaware County as a whole, where total County population remained nearly static, 1990 to 2000, obscuring the significant decreases occurring in the older, eastern municipalities being balanced by the growth still occurring in the outer municipalities. Perhaps the most surprising municipality was Upper Darby Township, where the population increased from 81,177 in 1990 to 81,821 in 2000. This is contrary to the general trend, in which middle and lower Watershed municipalities have experienced a decline in population.

Population Projections in the Watershed

Population projections are provided in Table II-1. These projections were developed by the Delaware Valley Regional Planning Commission ("***DVRPC***") for their Year 2025 regional planning activities. They are the official projections used by DVRPC for transportation and other regional planning purposes and have been adopted by DVRPC as well as by its constituent counties, including Delaware County. Almost without exception, these projections demonstrate a very real continuation of the trends of population decline in Watershed municipalities. In fact, the population declines have been extended to municipalities such as Radnor, Marple, and Easttown Townships, which are also projected to lose small numbers of people. On the other hand, much larger declines are projected for some of the larger municipalities in the middle and lower portions of the Watershed. For example, the projected decline for Upper Darby Township is from 81,821 in 2000 to 69,300 in 2025, a loss of over 12,000 persons. Though not nearly as large in an absolute sense, losses are also relatively large in Ridley and Springfield Townships, Yeadon and Lansdowne Boroughs, as well as the other middle and lower Watershed municipalities. Again, these losses can be explained by factors such as an aging population with increases in deaths, a reduction in average household size reflecting reduction in births, out-migration in general and of young people in particular, decline of employment opportunities, and other trends.

It should be noted that the Philadelphia portion of the Watershed is omitted from these projections. Although DVRPC prepares population data for the City in total, projections are not available for the more detailed census tracts. Given the substantial decline in these 33 census

tracts between 1990 and 2000, it is likely that this decline will continue into 2025 as is projected for the City as a whole (these particular tracts are not characterized as a particular growth area or zone of intensive redevelopment efforts which would likely increase population growth).

Decline in population need not necessarily be negative, especially when the population base is so large as is the case in many areas of the Darby Creek Watershed. The modest declines in Radnor, Marple or Easttown Townships in particular may be understood as balance or stasis in the community's development. Unfortunately, in most cases of decline in middle and lower Watershed municipalities, population declines are in fact reflective of overall economic decline and a variety of negative forces impinging upon these Watershed communities, and very much at odds with the concept of balance.

Population Density in the Watershed

Another important aspect of population is population density, especially in this Watershed where population density is so great. Table II-2 (on the following page) indicates persons per square mile, a more useful measure of development intensity than simple population counts, based on the 2000 US Census. Densities range from the 5-digit levels of the City of Philadelphia, Upper Darby Township, Darby Borough, Millbourne Borough, Clifton Heights Borough, and East Lansdowne Borough to the greatly reduced density in Newtown Township (1,157 persons per square mile), Easttown Township (1,805), Radnor Township (2,233) and Marple Township (2,276), where the densities are literally only one-tenth to one-fifth as high as in the middle and lower Watershed municipalities. Not surprisingly, density in the City of Philadelphia is nearly twice as great as that of any other municipality. At the same time, even in the least dense portions of the Watershed, such as the Radnor and Easttown, the densities are reasonably high. As a general matter, the Darby Creek Watershed is a highly developed, relatively urbanized area.

High population densities are not necessarily a negative concept in terms of overall planning and watershed management. To the contrary, some low-density areas can be developed in a manner that are harmful to the watershed. Moreover, clustering development, which results in a higher density, may be desirable to preserve more open space. However, because higher density development has typically not been undertaken in an environmentally sensitive manner, high density has historically come at a high environmental cost. Such is often the case in the Darby Creek Watershed. At the same time, it is clear that, if these environmental impacts were to be effectively mitigated and if watershed values were to be restored, much of the dense development existing in middle and lower Watershed municipalities with its mixture of uses bears stark resemblance to the new urbanism/neo-traditional patterns (high-density, clustered, concentrated, mixed uses) which are being touted as cutting-edge by planners farther out in suburbs and exurbs, where rural watersheds are being rapidly developed with low density development at alarming rates. It remains a cruel irony that older, dense development patterns in the Darby Creek Watershed are being abandoned by people moving further away from the City of Philadelphia into relatively more pristine watersheds only a few miles away, with the resulting suburban sprawl rapidly consuming other watersheds.

Table II-2 Population Density in the Darby Creek Watershed Municipalities

Darby Creek Watershed Population Density
(U.S. Census 2000)

Darby Watershed Municipalities	Persons/Square Mile
Aldan	7,310
Clifton Heights	10,934
Collingdale	9,959
Colwyn	9,812
Darby Boro	12,715
Darby Twp.	5,867
East Lansdowne	12,314
Easttown Twp.	1,805
Folcroft	5,057
Glenolden	8,693
Haverford	4,874
Lansdowne	9,203
Marple	2,226
Millbourne	13,471
Morton	7,542
Narberth Boro	10,583
Newtown	1,157
Norwood	7,389
Philadelphia*	24,138
Prospect Park	9,033
Radnor	2,233
Ridley	5,944
Ridley Park	6,919
Rutledge	5,733
Sharon Hill	7,101
Springfield	3,764
Tinicum	787
Upper Darby Twp.	10,738
Yeadon	7,351

** data for Philadelphia in this table is based on the 33 Philadelphia Census Tracts which lie at least partially in the Darby Creek Watershed, and had a total population of 155,447 in an area of 6.44 square miles*

Age Characteristics in the Watershed

Table II-3 provides information relating to age, with two categories, 17 and under and over 65, highlighted, using 2000 US Census data. These two categories are especially relevant in terms of this Plan, especially in terms of addressing special recreational needs and opportunities. Though absolute numbers are of interest, of particular interest are the percentage calculations and where these percentages depart significantly from the County averages, especially in the municipalities with the larger base populations. Conventional wisdom is that larger young populations increase the demand for active recreational areas and larger older populations increase the demand for more passive recreational needs. Additionally, greater concentrations of an older population can have socioeconomic constraints, such as larger portions of the population on fixed incomes and with special financial limitations.

Table II-3 Age Characteristics of the Darby Creek Watershed

Darby Creek Watershed Demographic Characteristics: Age
(U.S. Census 2000)

Darby Watershed Municipalities	Age 0-17	(% of Total)	Age Over 65	(% of Total)
Aldan	982	22.8	684	15.9
Clifton Heights	1,748	25.8	1,009	14.9
Collingdale	2,477	26.0	1,127	13.0
Colwyn	814	33.2	241	9.8
Darby Boro	2,731	26.5	1,402	13.6
Darby Twp.	2,525	26.1	1,693	17.6
East Lansdowne	667	25.8	362	14.0
Easttown Twp.	2,260	25.9	1,821	17.7
Folcroft	1,872	26.8	935	13.4
Glenolden	1,781	23.8	1,103	14.8
Haverford	12,097	24.9	8,471	17.5
Lansdowne	2,535	23.0	1,537	13.9
Marple	5,178	21.8	5,234	22.0
Millbourne	222	23.5	70	7.4
Morton	628	23.1	418	15.4
Narberth Boro	944	22.3	537	12.7
Newtown	2,704	232.1	2,564	21.9
Norwood	1,574	26.3	717	12.0
Philadelphia*	44,251	28.4	21,440	13.8
Prospect Park	1,689	25.6	910	13.8
Radnor	6,012	19.5	4,143	13.4
Ridley	7,506	24.4	5,290	17.2
Ridley Park	1,542	21.4	1,397	19.4
Rutledge	261	30.3	99	11.5
Sharon Hill	1,523	27.8	693	12.7
Springfield	5,680	24.0	4,815	20.3
Tinicum	1,014	23.3	670	15.4
Upper Darby Twp.	20,635	25.2	11,201	13.7
Yeadon	2,876	24.4	1,814	15.4
Delaware County		24.7		9.5

** data for Philadelphia in this table is based on the 33 Philadelphia Census Tracts which lie at least partially in the Darby Creek Watershed*

Perhaps most telling is the over 65 category. Watershed municipalities are significantly older than Delaware County at large with 9.5 percent of its total population in the over 65-age group. Curiously, the large municipalities at the top of Watershed, such as Radnor, Newtown, Marple Haverford and Springfield Townships, have remarkably large percentages in this over 65 age group (13.4 percent, 21.9 percent, 22.0 percent, 17.5 percent, and 20.3 percent respectively). Moving downstream, the percentages in the over 65 age group remain much higher than the Delaware County average, with Upper Darby Township at 13.7 percent having 11,201 persons in this category alone. Especially large percentages are also found in Ridley and Darby Townships but the percentages are uniformly large in virtually all of these middle and lower Watersheds municipalities. Curiously, although the absolute number of the aged in Philadelphia is large (21,440 for these 33 census tracts; the Plan for West Philadelphia reports an especially large population of elderly in the Wynnefield neighborhood), the percentage of 13.8 percent is not

especially large. In sum, the Darby Creek Watershed has an older population than Delaware County and the region as a whole.

In terms of the 17 and under category, the Delaware County average is 24.7 percent. Most of the Watershed municipalities appear to be relatively close to this County average. There are no clear patterns detectable in any portion of the Watershed. For example, the very suburban Radnor, where we might expect an especially large group of youth, offers the smallest percentage in the Watershed, only 19.5 percent, with the dense Colwyn Borough offering the highest percentage of youth at 33.2 percent. The other large municipalities in the middle and lower Watershed also have large percentages in the 17 and under category (Upper Darby Township at 25.2 percent, Yeadon Borough at 24.4 percent, Ridley Township at 24.4 percent, Springfield Township at 24.0 percent, Haverford Township at 24.9 percent, and Darby Borough at 26.5 percent). Perhaps the most interesting statistic is the very large 28.4 percent for Philadelphia, yielding 44,251 individuals; in combination with the aged count, Philadelphia emerges as a focus of youth. In sum, at the same time that there are many elderly, there are many children in the Watershed.

Income Characteristics

Table II-4 (on the following page) provides data on median household income, based on the 1990 US Census. Although the absolute values of the median household income numbers will be off (i.e., the 1990 figures will be lower due to cost of living increases between 1990 and 2000), many of the important relationships in Watershed municipalities will be evident in this 1990 data. For example, not surprisingly, Radnor, Newtown, Springfield, Haverford and Marple Townships have the highest median incomes ($51,762, $49,713, $49,541, $48,210, and $47,917 respectively, all of which form a fairly tight cluster). At the other end of the spectrum are Millbourne Borough, Philadelphia, Darby Borough, Sharon Hill Borough, Colwyn Borough, Clifton Heights Borough, and Darby Township ($21,759, $24,603, $26,705, $30,351, $30,482, $30,587, $30, 734 respectively). These municipalities, as well as a considerable number of additional middle and lower Watershed municipalities (Upper Darby and Ridley Townships, for example), all have median household incomes which are significantly below the Delaware County median and the Delaware County median is relatively low in contrast to the region at large.

Table II-4 Income Characteristics of the Darby Creek Watershed

Darby Creek Watershed Income Statistics
(U.S. Census 1990)

Darby Watershed Municipalities	1989 Median Household Income
Aldan	$ 40,453.00
Clifton Heights	$ 30,587.00
Collingdale	$ 31,853.00
Colwyn	$ 30,482.00
Darby Boro	$ 26,705.00
Darby Twp.	$ 30,734.00
East Lansdowne	$ 31,321.00
Easttown Twp.	$ 66,723.00
Folcroft	$ 35,292.00
Glenolden	$ 31,796.00
Haverford	$ 48,210.00
Lansdowne	$ 35,795.00
Marple	$ 47,917.00
Millbourne	$ 21,759.00
Morton	$ 33,600.00
Narberth Boro	$ 41,823.00
Newtown	$ 49,713.00
Norwood	$ 37,113.00
Philadelphia*	$ 24,603.00
Prospect Park	$ 33,886.00
Radnor	$ 51,762.00
Ridley	$ 34,810.00
Ridley Park	$ 36,529.00
Rutledge	$ 40,208.00
Sharon Hill	$ 30,351.00
Springfield	$ 49,541.00
Tinicum	$ 32,390.00
Upper Darby Twp.	$ 32,356.00
Yeadon	$ 35,951.00
Delaware County	$ 37,337.00

** This figure applies to the entire City of Philadelphia; available data was insufficient to provide a median household income specific to the 33 Philadelphia Census Tracts which lie at least partially in the Darby Creek Watershed*

Unfortunately, the Philadelphia income is the median for the entire City. It was not statistically possible to average or merge the different median values for the 33 census tracts in a meaningful way; it should be noted that many of the median values for the individual census tracts were below the $24,000 level. The Plan for West Philadelphia reports that income data for the West Philadelphia portion of the City (see discussion of this Plan below) indicates a relative loss of ground, when compared with the total City. According to census figures, between 1960 and 1990, the median family income for West Philadelphia decreased from 92% of the citywide median family income to 86%. The Plan for West Philadelphia also reports that almost one in five West Philadelphia residents lived below the Federal poverty line as of 1990.

Although the absolute range of median household incomes, from Radnor's at $51,762 to Millbourne's at $21,759, may not seem to be all that great a gap (Radnor is more than double

that of Millbourne), the nature of statistics and of the computation of medians serves to reduce and normalize contrast. In fact, the Watershed range for median income is quite dramatic. Incomes in municipalities at the top of the Watershed are generally higher than incomes in municipalities in middle and lower Watershed municipalities.

Housing Profile

Housing Units in the Watershed

Housing units in Watershed municipalities can be expected to reflect population statistics largely, at least in terms of gross counts and densities. Table II-5 (on the following page) provides counts of units in both 1990 and 2000, based on the US Census. Because the population in Watershed municipalities is high, the number of housing units should also be expected to be high. However, some variation is introduced into this relationship because of differences in average household size. Change in housing unit counts is interesting and demonstrates both a loss in existing housing units due to fire, demolitions, and other sources of loss as well as development and re-development activity. Municipalities with the largest housing unit absolute increases during the decade included Easttown, Marple, Ridley, Newtown, and Upper Darby Townships, with Springfield, Haverford and Radnor Townships next in line. Ridley and Upper Darby Townships are surprises, demonstrating that development and re-development is occurring to some extent in middle and lower Watershed municipalities. At the same time, the absolute number of units involved in any of these municipalities must be fully appreciated, especially when understood as the cumulative total of dwelling units gained over a 10-year period (1,561 unit increase on a 1990 total base of 144,691 dwelling units in the Darby Creek municipalities). For example, although Radnor is included in the list above, only 151 dwelling units were added during the entire decade, which is a very small number especially when viewed in terms of the total number of dwelling units in these largely populated and developed municipalities (a very important point in municipalities such as Upper Darby Township with 34,322 dwelling units, increasing only by about 20 units per year in the last decade). It should be noted that total dwelling units for all of Delaware County increased by only 5,954 units on a 1990 base of 211,024 units, a very small increase over 10 years, with development in the more rural municipalities being offset by losses in the City of Chester and other older high density communities.

Almost as many municipalities lost total dwelling units as gained total dwelling units in the Watershed, with Philadelphia, Collingdale Borough, Darby Township, Darby Borough, Yeadon Borough, and Prospect Park Borough experiencing the greatest losses in dwelling units. The large loss of 1,055 units in Philadelphia reflects its large population decline, although decline also undoubtedly resulted from reduction in average household size as well. Losses occurred generally in the middle and lower Watershed municipalities and though totaling only 1,648 dwelling units out of a total of 371,901 units in 1990 (again, with the exception of Philadelphia, all statistics are for total municipalities, as opposed to Watershed portions of these municipalities), these net losses still indicate a lack of strength in the real estate market in the

Watershed and are a reflection of overall socioeconomic weaknesses in portions of the Darby Creek Watershed.

Table II-5 Housing Data in the Darby Creek Watershed Municipalities

Darby Creek Watershed Housing Data
(U.S. Census 2000)

Darby Watershed Municipalities	1990 Housing Units	2000 Housing Units	1990-2000 Unit change	% Owner Occupied
Aldan	1,816	1,817	1	73.3
Clifton Heights	2,836	2,883	47	60.5
Collingdale	3,483	3,404	-79	65.9
Colwyn	970	954	-16	60.0
Darby Boro	4,042	3,999	-43	54.1
Darby Twp.	3,941	3,868	-73	75.5
East Lansdowne	999	1,012	13	62.9
Easttown Twp.	3,491	3,862	371	85.4
Folcroft	2,623	2,629	6	74.8
Glenolden	3,055	3,198	143	61.5
Haverford	18,210	18,378	168	83.8
Lansdowne	5,115	4,999	-116	60.5
Marple	8,433	8,797	364	82.1
Millbourne	418	420	2	23.6
Morton	1,219	1,209	-10	52.1
Narberth Boro	2,044	1,904	-140	60.3
Newtown	4,433	4,690	257	78.4
Norwood	2,267	2,363	96	72.2
Philadelphia*	68,288	67,233	-1,055	66.1
Prospect Park	2,712	2,683	-29	59.2
Radnor	10,580	10,731	151	61.0
Ridley	12,276	12,544	268	73.3
Ridley Park	3,152	3,167	15	63.6
Rutledge	326	305	-21	82.6
Sharon Hill	2,251	2,246	-5	67.9
Springfield	8,604	8,800	196	90.4
Tinicum	1,796	1,876	80	64.0
Upper Darby Twp.	34,115	34,322	207	59.1
Yeadon	5,019	4,958	-61	59.4
Delaware County	211,024	216,978	5954	68.4

** data for Philadelphia in this table is based on the 33 Philadelphia Census Tracts which lie at least partially in the Darby Creek Watershed*

Table II-5 also provides data on residency status, namely percentage of dwelling units, which are owner occupied. Owner-occupancy historically has been viewed as a positive factor in community development. Delaware County's 2000 owner occupancy rate is at 68.4 percent, in contrast to the higher rates for Springfield, Easttown, Haverford, Marple, and Newtown Townships (90.4 %, 85.4%, 83.8 %, 82.1 %, and 78.4 % respectively). Radnor runs contrary to the trend with a 61. 0% owner occupancy rate. While this may seem inconsistent with the perception of Radnor being one of the most upscale residential communities in the County (as well as the region and state), it can be explained by the large number of older high-density apartment complexes, which have been developed along Lancaster Avenue, as well as the dormitories and student housing at Villanova University. Owner occupancy tends to decline as one moves down the Watershed (though Millbourne Borough stands out with a 23.6% owner-occupancy rate), with most of these municipalities in the 50 and 60 percentile ranges, which is

well below the Delaware County average. The Philadelphia census tracts are at a reasonably high 66.1 %.

Development Activity in the Watershed

Table II-6 (on the following page) includes a tally of dwelling units proposed for development or re-development in Watershed municipalities (Philadelphia data for these census tracts was not available at this time, though is discussed in more detail below). This data has been compiled from records at the Delaware County Planning Department ("***DCPD***") and other sources and includes all developments, which have been formally submitted to DCPD for review, regardless of the outcome of the review; developments may or may not have been constructed to date; if not already constructed, they may be constructed in the future. Developments include only residential units and exclude non-residential development. As with recent development statistics from the US Census, this data suggests a predominance of development activity in the upper portions of the Watershed, with Newtown Township being the focus of development (959 dwelling units), followed by Marple, Springfield, Easttown, and Radnor Townships. A total of 2,323 units were reviewed for Watershed municipalities (excepting Philadelphia), almost half of which were in Newtown Township alone (81.6% were in the four municipalities listed above). Darby Township, Ridley Township, and Upper Darby Townships also had residential activity, though had less than 100 units in each case, during this five-year period. Many of the middle and lower Watershed municipalities had either no residential proposals or a very small numbers of residential proposals (often less than 10 units), indicating a very low level of demand for new construction over the five-year period. There were 13,163 units reviewed during this period for all Delaware County municipalities, which is relatively fewer than those of the other suburban counties in the region.

In Philadelphia, data as presented in the Plan for West Philadelphia indicate that the pace of residential construction has slowed. That appears to be true of all types of new land development in this part of the City, although re-development projects using some form of public re-development assistance were more prevalent.

It should also be noted that at this point, most of the developable sites in upper Watershed municipalities have already been developed, so development activity in the current decade may actually drop significantly in this part of the Watershed as well.

Table II-6 Development Activity in the Darby Creek Watershed

Darby Creek Watershed Housing Data
(U.S. Census and Delaware County Planing Department)

Darby Watershed Municipalities	1990 Median Housing Value	Proposed Housing Units, 1995-2000
Aldan	n/a*	1
Clifton Heights	$ 113,300.00	9
Collingdale	$ 85,900.00	0
Colwyn	$ 72,300.00	0
Darby Boro	$ 57,400.00	9
Darby Twp.	$ 48,100.00	92
East Lansdowne	$ 81,100.00	0
Easttown Twp.	$ 262,400.00	232
Folcroft	$ 74,900.00	0
Glenolden	$ 90,400.00	8
Haverford	$ 148,700.00	52
Lansdowne	$ 106,500.00	3
Marple	$ 164,200.00	319
Millbourne	$ 69,500.00	0
Morton	$ 103,300.00	12
Narberth Boro	$ 166,200.00	1
Newtown	$ 185,700.00	959
Norwood	$ 89,400.00	9
Philadelphia	$ 49,400.00	n/a*
Prospect Park	$ 92,100.00	21
Radnor	$ 266,700.00	204
Ridley	$ 103,000.00	85
Ridley Park	$ 115,600.00	12
Rutledge	$ 126,800.00	0
Sharon Hill	$ 73,400.00	3
Springfield	$ 152,400.00	226
Tinicum	$ 83,400.00	9
Upper Darby Twp.	$ 92,600.00	57
Yeadon	$ 79,300.00	0
Delaware County	$ 113,200.00	13,163

** "n/a" is used where data was not available; this does not necessarily mean that the value is zero*

Housing Values in the Watershed

Median values of housing units for Watershed municipalities are also given in Table II-6, again based on 1990 US Census due to the lack of availability of 2000 US Census data. As with household income data, the numbers can be expected to be uniformly low, in contrast to 2001 housing values; nevertheless, many if not most of the relationships in housing values existing today should be reflected in the older data as well.

This housing value data follows the trends apparent in median household income, though the trends are considerably more pronounced. While thinking about the housing values mentioned in this paragraph, keep in mind that these numbers are medians and that this information is more than ten years' old. Median values range from Radnor's extremely high $266,700 and Easttown's $262,400 to Darby Borough's $48,100, which is dramatically lower than the County median and only 18.0 percent of the Radnor value. Philadelphia's value at $49,400 is comparably low; however, further distorting this number is the fact that this value is the median

value for the entire City, averaging values for Society High and Chestnut Hill with those of North Philadelphia and South Philadelphia, which are considerably different. This gap in median housing values is very important in terms of describing the Watershed and its many differences. Other upper Watershed municipalities also have higher median housing values with Newtown Township at $185,700, Narberth Borough at $166,200, Marple Township at $164,200, Springfield Township at $152,400, and Haverford Township at $148,700, all well above the Delaware County median value at $113,200. There is then a dramatic drop in housing values to a level clustering roughly around $100,000 (Ridley Park Borough at $115,600, Aldan Borough at $113,300, Lansdowne Borough at $106,500, Morton Borough at $103,300, Ridley Township at $103,000, Upper Darby Township at $92,600, Prospect Park Borough at $92,100, and Glenolden Borough at $90,400) with the remaining municipalities considerably below that level.

Some additional detailed housing value data can be gleaned from the Plan for West Philadelphia, which highlights the substantial variation in housing values even within the City portion of the Watershed. For example, the Plan reports that housing values for the row homes of the Cobbs Creek neighborhood averaged between $20,000 and $30,000 in 1990, versus the median sales prices of Green Hill Farms at over $150,000. In general, however, values have been losing ground in West Philadelphia neighborhoods, when compared with the remainder of the City. Vacancy data also indicate an increase in housing stock vacancies, again when compared with the remainder of the City.

Total Assessed Valuation and Municipal Millages in the Watershed

Table II-7 (on the following page) is based on median housing value data and further reinforces the trends apparent in housing. Obviously, a municipality's total assessed valuation is a very good measure of its fiscal health and overall economic health. In Pennsylvania, where so much of the taxing authority and revenue potential is linked to the real estate tax, total assessed valuation is particularly important, especially where projects that require local revenues are concerned.

Table II-7 demonstrates an enormous range in total assessed values (i.e., the aggregate of the assessed values for all properties within the municipality). Although total assessments will be greater for larger municipalities, the variations that emerge from the data go well beyond variation in municipal size. For example, Radnor Township (13.8 square miles) has the highest valuation in the Watershed at $3,322,408,519 (10.6 % of all of Delaware County, even though Radnor Township is only one of the County's 49 municipalities). Haverford Township ($3,053,167,386) is a close second; though with only 10.0 square miles, Haverford is actually more valuable on a unit area basis. Marple Township ($1,787,774,175), Springfield Township ($1,688,465,909), Ridley Township ($1,417,999,088) and Newtown Township ($1,318,580,739) are next in a relatively close grouping, though again; Marple and Newtown are about twice the size of Ridley and Springfield. Curiously, there is then an enormous gap in assessments, down to Tinicum Township ($619,764,150), Yeadon Borough ($403,169,395) and Lansdowne Borough ($403,180,222). Most municipalities fall in the less than $400,000,000 category, with four less than $100,000,000 (Millbourne Borough at $21,561,630). The point here is that trying

to maintain a full range of municipal functions with such limited resources poses a tremendous challenge. Greatly complicating matters is the fact that the municipalities with the least resources typically are the ones with the greatest needs and expenses.

Table II-7 Housing Value and Millage Rates in the Darby Creek Watershed Municipalities

Darby Creek Watershed Municipality Assessed Values and Millage Rates (2000)

Darby Watershed Municipalities	Total Assessed Value 2001	Mun. Millage	Total Millage
Aldan	$ 172,811,030	3.91	32.20
Clifton Heights	$ 232,950,021	5.46	30.40
Collingdale	$ 234,108,184	5.53	30.20
Colwyn	$ 49,697,930	12.00	40.30
Darby Boro	$ 238,662,432	9.58	37.90
Darby Twp.	$ 327,681,640	5.69	30.30
East Lansdowne	$ 67,924,960	6.70	35.00
Folcroft	$ 268,863,230	4.64	29.30
Glenolden	$ 283,569,410	4.90	31.10
Haverford	$ 3,053,167,386	3.98	22.00
Lansdowne	$ 403,180,122	6.77	35.10
Marple	$ 1,787,774,175	2.44	16.60
Millbourne	$ 21,561,630	11.05	36.00
Morton	$ 129,231,090	4.65	24.10
Newtown	$ 1,318,580,739	1.63	15.80
Norwood	$ 218,302,530	5.85	32.10
Prospect Park	$ 253,799,240	5.04	31.30
Radnor	$ 3,322,408,519	2.55	22.30
Ridley	$ 1,417,999,088	4.34	27.20
Ridley Park	$ 378,093,900	4.12	27.00
Rutledge	$ 34,975,290	3.33	30.50
Sharon Hill	$ 196,570,580	5.56	30.20
Springfield	$ 1,688,465,909	3.70	23.20
Tinicum	$ 619,764,150	2.65	28.90
Upper Darby Twp.	$ 2,975,890,422	7.30	32.20
Yeadon	$ 403,169,395	6.60	34.90
Delaware County	$ 31,438,769,130	n/a*	n/a*

** "n/a" is used where data was not available or not applicable*

Table II-7 also presents data relating to municipal tax bills and millage rates in Watershed municipalities (Delaware County only). The municipal millage rate is given, indicating the amount of tax revenue raised from the real estate tax for municipal use only (other revenue sources are allowed); the total millage rate is given as well, indicating the constant County millage rate of 3.802 mills, plus a variable rate of school district millage, which is usually much higher. Theoretically, these millage rates are levied on an assessed value which has been determined by the County and which is reflective of market values. However, the accuracy and fairness of this process has been questioned by some critics. The relationship between assessed value and market value warrants further study. Many critics of this system have alleged the existence of all types of biases across Watershed municipalities. Whether or not that is the case, the municipal millages and total millages indicate that millages decrease dramatically in the Upper Watershed communities, with total millage for Newtown at 15.8, Marple at 16.6, Haverford at 22.0, Radnor at 22.3, and Springfield at 23.2. Contrast these rates with 40.3 for

Colwyn, 37.9 for the Darby Borough, 36.0 for Millbourne, 35.0 for East Lansdowne, 35.1 for Lansdowne, and 34.9 for Yeadon. In sum, both municipal and school district budgets are extremely hard pressed to provide adequate levels of service where service needs are greatest, given the tremendous disparity in real estate assessed values and the heavy reliance on the real estate tax to support budgets.

C. Land Use and Transportation

Historical Development Trends

As discussed in the Cultural Resources section of this Plan, development trends in the Darby Creek Watershed have radiated both outward, east to west, from the City of Philadelphia as well as upward, south to north, from the Delaware River and upstream. Some of the earliest settlements in the United States occurred in the lower portions of the Watershed, including the Swedish Cabin in Upper Darby Township and the Morton Homestead in Prospect Park Borough. As these early colonial settlements continued, developments also followed, especially along the trails and the roadways that emerged.

Transportation Facilities

As a densely developed watershed, the Darby Creek Watershed has many different transportation facilities. Most of the highways have been in place for many years. Only the two Interstate highways are relatively recent, with the highly controversial Blue Route (I-476), completed in the early 1990's, being the most significant new highway in the Watershed. In fact, notwithstanding decades of planning, the impacts of Blue Route development are still being evaluated.

Figure II-1 Interstate 476, the "Blue Route", is a Major Transportation Feature in the Darby Creek Watershed

Major highways include Interstate 476 (the Blue Route, Figure II-1), US 30, US 1 (Media Bypass) and Baltimore Pike, US 13 (Chester Pike) and Interstate 95 at the bottom of the Watershed (Figure II-2, on the following page). All of these highways are important regional arteries and carry a significant percentages of non-local or non-Watershed focused traffic through the Watershed. All of these roadways suffer from significant congestion.

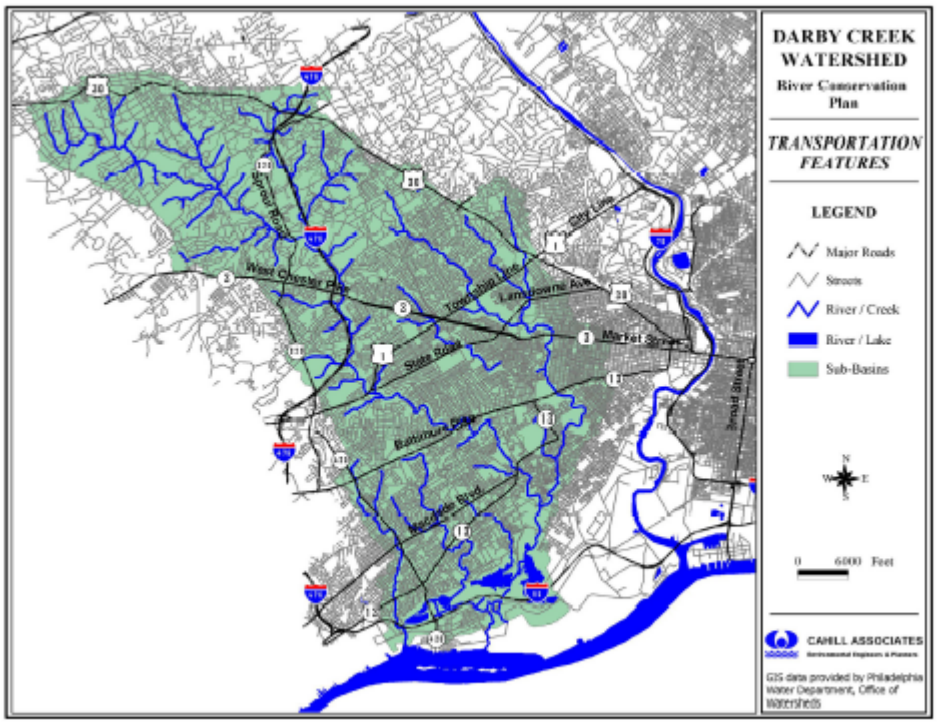


Figure II-2 Major highways and local roads within the Darby Creek Watershed

Additionally, major state routes in the Watershed include PA 3, 320, 420, and 252, which carry more local traffic than the Interstate highways. However, these state highways are also seriously congested in many areas. There are also many different state roads/legislative routes such as MacDade Boulevard, Lawrence Road, Springfield Road, and many others, which carry heavy traffic loads in the Watershed.

Rail and bus facilities are notable in the Watershed (Figure II-3, on the following page). The Watershed's distinguished transportation history has its historic hub at the 69th Street Terminal in Upper Darby Township, where the subway-elevated rail system from the City ends and connections can be made to two major trolley routes as well as a high-speed light rail running toward the upper end of the Watershed. In addition, bus connections to and from the City can be made at the Terminal. At other locations in the Watershed, the SEPTA Regional Rail Lines (Figure II-3) cut through the landscape. These lines include the R-5 which runs through the northern portion of the Watershed (stops in Wayne, St. Davids, Radnor, Villanova), the R-3

which runs to Media/Elwyn (stops in Fernwood, Lansdowne, Gladstone, Clifton-Aldan, Primos, Secane, Morton), and the R-2 which parallels the main AMTRAK line south (stops in Darby, Curtis Park, Sharon Hill, Folcroft, Glenolden, Norwood, Prospect Park, Ridley Park, and Crum Lynne).

Several runways of the Philadelphia International Airport (the "***Airport***") also veer into the Watershed at its downstream southern terminus. Airport-related development is beginning to extend along I-95 in a southerly direction within the Tinicum Township. Given the desirability of airport locations, it is likely that future airport-related development will continue.

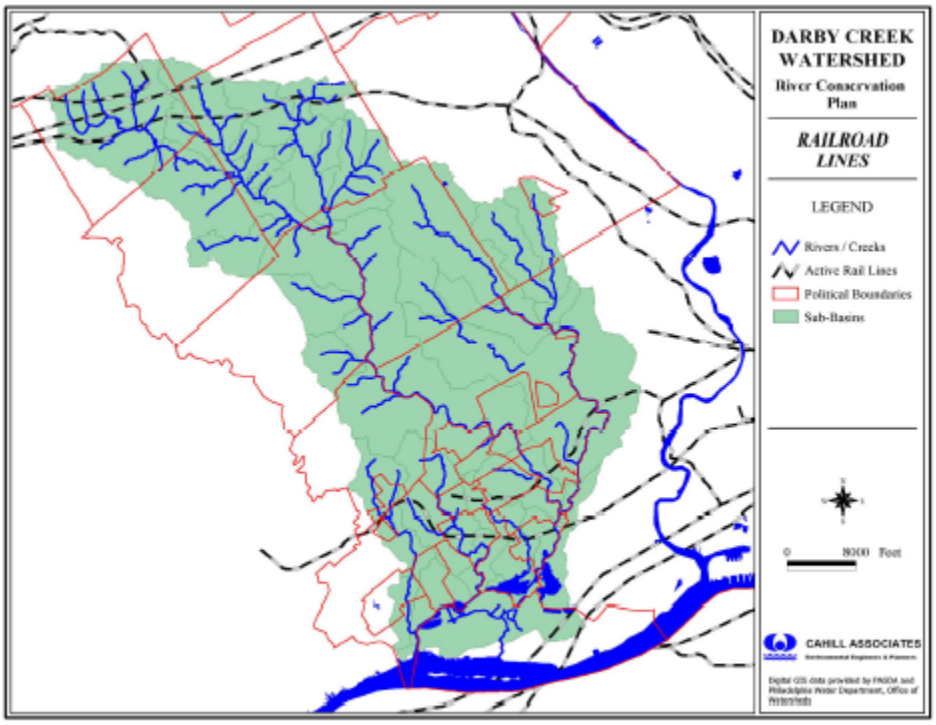


Figure II-3 Railroad lines within the Darby Creek Watershed

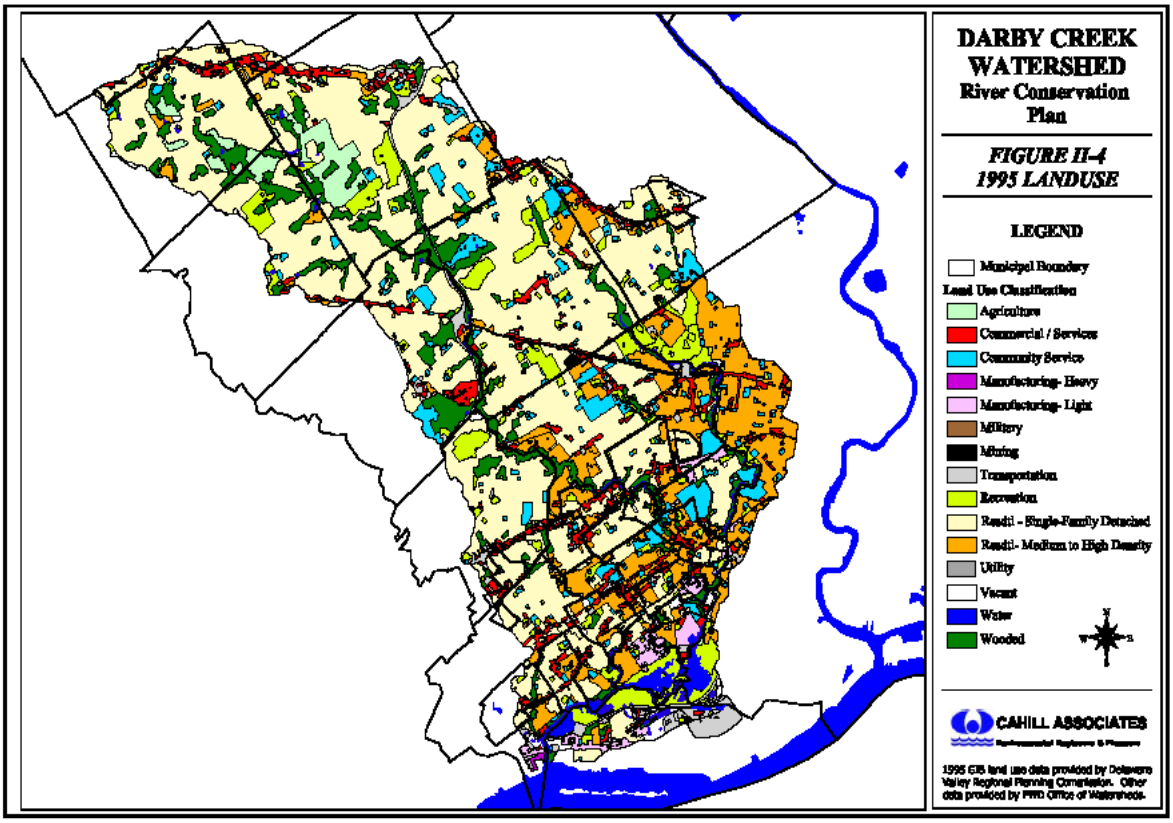
Major Sources of Employment

Historically, major sources of employment for Watershed residents have been the City of Philadelphia and the industrialized waterfront of Delaware County, from the City of Chester down to Marcus Hook Borough, where manufacturing, refinery, and other heavy industry has been located (also extending up the Watershed into Folcroft Borough and other lower Watershed municipalities). A considerable number of manufacturing firms, making all types of products, also existed within the Watershed itself. Commercial centers such as the 69th Street Terminal complex in Upper Darby around the 1920's, in conjunction with transportation system developments (see above), providing many service sector jobs. Neighborhood and regional commercial strips proliferated along highways such as old US 1 (Baltimore Pike) and PA 3

(West Chester Pike). Increased suburban development after World War II were accompanied by the development of additional commercial centers in places like Lawrence Park and St. Davids'. In time, these newer commercial developments often drained the vibrancy from older employment and commercial centers farther south in the Watershed. More recently, the completion of the Blue Route has led to the development of new commercial centers and renovation of existing ones like Springfield Mall and redevelopment of the historic tower at the Baldwin Locomotive Works in Eddystone Borough. While the effects of the Blue Route have probably been most pronounced so far in the northern portions of the Watershed, some commercial redevelopment and job growth has also been occurring in the southern portions of the Watershed.

In the last half of the 20th century, the employment base in the Watershed has declined considerably. Jobs have moved up the Watershed; far fewer jobs exist in the lower portions of the Watershed than existed there in the past. Many industrial companies that employed numerous people along the Delaware River waterfront closed their doors. More recently, farther upstream, the growth of suburban office parks has resulted in more job creation in these areas.

Most recently, the construction of the Blue Route (I-476) has served as a stimulus for economic growth. Interchanges in the Watershed at Lancaster Avenue (US 30), West Chester Pike (PA 3) and US 1 are serving as magnets for new commercial development and job growth.



Existing Land Use Patterns

Existing land use data, prepared and analyzed by the Delaware Valley Regional Planning Commission ("***DVRPC***"), is presented in Figure II-4. DVRPC's classification of different land uses has been based on its interpretation of 1995 aerial photographs. While DVRPC uses standard land use categories, some description of their methodology may be helpful. For example, "Low Density Residential" includes all single-family detached dwelling units, even on small lots (in some parts of the Watershed that density could increase to 4 to 6 units per acre). "High Density" includes all other categories, from single-family attached units (townhouses) to apartments. "Community Service" includes hospitals, government buildings, churches, schools, and cemeteries. "Transportation" includes parking lots. However, streets in residential subdivisions are categorized as "Residential". "Utility" includes power generation, transmission lines, and all types of transmission towers, water and wastewater treatment, and landfills. "Recreation" includes parks, playgrounds, amusement parks, resorts and camps, golf courses, and public assembly areas (i.e., both public and private facilities). "Wooded" includes those areas with a continuous tree canopy or solid tree cover, natural lands, marshes, and swamps. However, this category does not include hedgerows or wooded areas related to residences or other uses. "Vacant" includes land that is not Wooded, not Agriculture, and not categorized as any other use. Because parcel boundaries were not used to classify uses in this process, clearly some error has been introduced in the classification. For example, it is likely that some Wooded

areas are in fact included in parcels, which are active developed land uses and therefore should be understood as part of these uses. A variety of other similar confusions may exist. However, the overall picture presented by this data is useful for this Plan.

Table II-8 DVRPC Land Use Categories within the Darby Creek Watershed

Land Use Categories and Area for the Entire Darby Creek Watershed

DVRPC Land Use Category	Area, sq ft.	Area, acres	Area, sq. mi.	Percentage of watershed
Agriculture	44646247	1025	2	2.1%
Commercial /services	120335737	2763	4	5.6%
Community service	117458983	2696	4	5.5%
Manufacturing-heavy	1306500	30	0	0.1%
Manufacturing-light	28978065	665	1	1.3%
Military	248419	6	0	0.0%
Mining	1264390	29	0	0.1%
Parking-commercial/services	32561861	748	1	1.5%
Parking-community service	7931592	182	0	0.4%
Parking-manufacturing	4254792	98	0	0.2%
Parking-military	63206	1	0	<1%
Parking-multi family housing	2694444	62	0	0.1%
Parking-recreation	1044268	24	0	0.0%
Parking-transportation	1177366	27	0	0.1%
Parking-utility	97723	2	0	<1%
Recreation	166344433	3819	6	7.7%
Residential-multi family	107122381	2459	4	5.0%
Residential-row homes	170336456	3910	6	7.9%
Residential-single family detached	1042440460	23931	37	48.4%
Transportation	44041186	1011	2	2.0%
Utility	5291236	121	0	0.2%
Vacant	20969582	481	1	1.0%
Water	31479724	723	1	1.5%
Wooded	200051128	4593	7	9.3%

Land use for the Darby Creek Watershed is given in Table II-8 using twenty-four (24) land use categories as developed by the DVRPC. Due to the overwhelming amount of data resulting from recording this many categories across thirty-one (31) municipalities, the land use data has been grouped into the Upper, Middle, and Lower sections of the Watershed as shown in Table II-9. Data for each municipality is available in Appendix B. There is no great significance to be accorded these Upper-Middle-Lower groupings other than the groupings provide a simplified way to perceive and compare land use patterns and the changes in land use patterns as one moves from the bottom or mouth of the Watershed to the top or headwaters. It should also be noted that although the major variable being used for the grouping process was intensity/density of land uses, liberties were taken in several instances (note that because of the intensity of land use in Philadelphia, the City was logically included in the Lower Watershed grouping). Municipalities included in these groupings are as follows:

Table II-9 Watershed Municipalities by Sub-Region

Upper	Middle	Lower
Easttown	Aldan	Collingdale
Tredyffrin	Clifton Heights	Colwyn
Lower Merion	Darby Bor.	Darby Twp.
Narberth	East Lansdowne	Folcroft
Radnor	Lansdowne	Glenolden
Haverford	Millbourne	Norwood
Marple	Morton	Philadelphia
Newtown	Springfield	Prospect Park
	Upper Darby	Ridley
	Yeadon	Ridley Park
		Rutledge
		Sharon Hill
		Tinicum

Based on Table II-10 data (on the following page), Residential land use, divided into Low and High categories, varies dramatically across the Watershed. Low Density ranges from a very high 61.8 percent in the Upper Watershed to only 19.8 percent in the Lower Watershed, averaging out to a very high 48.4 percent for the Watershed in total. High Density conversely varies from a very low 3.6 percent in the Upper to ten times that or 30.1 percent in the Lower Watershed, for a Watershed total of 12.9 percent. Recreation acreages, including all public and private uses, are modest across the board. However, there is a modest increase from 4.7 percent to 5.8 percent from the Lower to the Upper Watershed. Utility acreage is extremely insignificant. Water is straightforward with the large acreage in the Lower Watershed largely explained by the extensive open water areas related to the Tinicum National Wildlife Refuge.

In terms of the more intensive land uses, Commercial/Services occupy a considerable area of the Lower Watershed, as well as the Middle and Upper Watersheds. The amount of acreage in this category is larger for the upper Watershed, even though on a percentage basis, it is lower than in the lower Watershed communities. This trend can be explained to some extent by the large corporate parks in Radnor as well as the Wayne Business District and other commercial and office development, which is proliferating along Blue Route interchanges and along major Watershed arteries. In the Montgomery County portion of the upper Watershed, there is the densely commercialized Ardmore business district as well as the Narberth shopping area. This is the heart of the area known as the "Main Line", extending from Merion, Narberth, Wynnewood, Ardmore, Haverford, Bryn Mawr, Rosemont, Villanova, St. Davids, and Wayne (the originally defining rail line approximately followed the ridgeline and therefore the Watershed boundary, as does Lancaster Avenue/US 30; the exact Watershed boundary actually moves north and south to some extent), which remains a very vibrant zone much in demand; and where intensification of all land uses is likely. Community Services (see below) are surprisingly similar in absolute and percent ranges to Commercial Services. Manufacturing-Heavy is virtually nonexistent in any portions of the Watershed with Manufacturing Light a substantial presence in the Lower Watershed and less so in the Middle Watershed communities. Military and Mining are virtually nonexistent. Transportation has considerable acreage in all parts of the Watershed, though

relatively more is present in the Lower Watershed where major rights-of-way for I-95 and other highways increase the numbers.

Table II-10 Land Use Area by Watershed Subregion

Land Use Area for the Darby Creek Watershed Subregions, in Acres

CATEGORY	UPPER	MIDDLE	LOWER	TOTAL
Agriculture	1016	---	9	1025
Commercial/Services	1133	759	870	2763
Community Service	1266	734	697	2696
Manufacturing-Heavy	---	---	30	30
Manufacturing-Light	---	116	550	665
Military	---	---	6	6
Mining	29	0	---	29
Transportation	809	85	590	1484
Recreation	1504	515	1800	3819
Single Family Detached	16139	5250	2542	23931
Medium to High Density Resd.	939	1560	3871	6370
Utility	15	36	71	121
Vacant	57	41	384	481
Water	46	47	631	723
Wooded	3172	966	455	4593
TOTAL	26123	10107	12505	48736

Community Service is distributed throughout the Watershed. This includes public and private schools, colleges and universities, and other institutions. There are some larger "Community Service" uses located in the Upper Watershed, such as the large Haverford College campus, Villanova University, Eastern University, Cabrini College, Valley Forge Military Academy, as well as notable institutions such as Lankenau Hospital, Eastern Theological Seminary, St Charles Seminary, Friends Central School, and a host of others all located along City Line Avenue.

Three land use categories, Vacant, Wooded, and Agriculture, are of special interest. These categories are often associated with designation of vacant developable land as an indication of future development potential. However, Agriculture can also be viewed as an active use of the land (i.e., not undeveloped as is sometimes assumed). Complicating the question of future development potential in this Watershed case is also the question of re-development, which can and is occurring through demolition and intensification of land uses at previously developed sites. Though statistics are difficult to generate, it may well be that because the strength of the market for so many different uses is so strong in the Upper Watershed municipalities, such as at Blue Route interchanges, re-development has greater potential here than in the Lower Watershed municipalities, even though uses are often older and in greater need of re-development from a variety of perspectives. In so many areas, uses may be either actually abandoned or very marginally active, with existing sites substantially underutilized. In many cases, site contamination may be a problem or at least perceived as a problem. Though Pennsylvania has some of the nation's most effective award-winning brownfields re-development programs, these programs have not provided incentives adequate to generate developer interest. It is not clear that this situation will change in the foreseeable future.

Looking at the data in Table II-10, Vacant land is almost nonexistent in both the Upper and Middle Watersheds. This is not surprising. The large offering in the lower Watershed (384 acres) is surprising and .appears to be an error, based on special analysis conducted for this Plan. In fact, much of these 1,031 acres happens to be the John Heinz National Wildlife Refuge (a better categorization would have been either Recreation or Community Service). Additionally, some of the lands that were classified as Vacant in the Lower municipalities are likely brownfields, where development constraints can be considerable. . Though a classification of Vacant implies a site that can be readily developed, in reality, brownfields typically suffer from significant environmental contamination problems and are harder to lure new development. This situation may be especially problematic in the Lower municipalities such as the Folcroft Borough area where a considerable amount of demolition and structural removal has created sites that appear to be vacant, but which have numerous constraints that would need to be resolved before redevelopment can occur. In fact, it may be that there is relatively little vacant developable land remaining in the Lower Watershed which has not already been developed and which is not characterized by contamination problems and/or significant environmental constraints.

Agriculture is also virtually nonexistent in the Watershed, although there remains over 1,000 acres in the Upper Watershed. Finally, the Wooded category shows an increase from the Lower to Upper Watershed. Although Wooded values and percentages are not large, they are larger than one might expect in this densely developed Watershed, with much of the Wooded polygons following stream valleys where significant environmental constraints such as floodplains are also delineated (i.e., it would be ill-advised to equate Wooded with Vacant developable land in many cases). Vegetated portions of the John Heinz National Wildlife Refuge have been mapped as Wooded, artificially increasing the amount of land characterized as Wooded in the Lower Watershed.

Developable Land is shown in Figure II-5 (on the following page), including all that land area as classified by the DVRPC into the following land use categories: Vacant, Wooded, Agriculture. These categories can be roughly construed as lands that are not already developed and that therefore can be reasonably developed without special difficulty (i.e., demolition and re-development), though certainly subject to the caveats discussed above.

Table II-11presents additional data which translates land uses into levels

Table II-11 Municipal Acreage and Impervious Acreage in the Darby Creek Watershed

Percentage of Impervious Acres Based on Land Use Categories for the Darby Creek Watershed Municipalities

Municipality	Percentage of Municipality Located Within Watershed	Percentage of Imperviousness PWD calc*	Impervious Area Within Watershed, (Acres)
UPPER			
EASTTOWN	70%	21.3%	781
HAVERFORD	100%	34.3%	2197
LOWER MERION	16%	36.7%	897
MARPLE	45%	30.2%	923
NARBERTH	85%	44.4%	119
NEWTOWN	40%	21.7%	563
RADNOR	82%	25.0%	1801
TREDYFFRIN	4%	42.1%	231
MIDDLE			
ALDAN	100%	43.0%	164
CLIFTON HEIGHTS	100%	54.4%	217
DARBY BORO	100%	51.3%	268
EAST LANSDOWNE	100%	56.3%	74
LANSDOWNE	100%	47.2%	356
MILLBOURNE	100%	52.3%	23
MORTON	95%	44.1%	97
SPRINGFIELD	62%	31.3%	779
UPPER DARBY TWP	100%	45.6%	2296
YEADON	100%	35.9%	370
LOWER			
COLLINGDALE	100%	46.5%	257
COLWYN	100%	57.3%	94
DARBY TWP.	100%	51.2%	470
FOLCROFT	100%	75.3%	679
GLENOLDEN	100%	43.3%	271
NORWOOD	100%	55.7%	295
PHILADELPHIA	5%	55.8%	2299
PROSPECT PARK	100%	53.3%	256
RIDLEY	41%	48.0%	661
RIDLEY PARK	43%	44.5%	131
RUTLEDGE	76%	39.1%	26
SHARON HILL	100%	50.0%	244
TINICUM	30%	54.9%	931

* *Source: PWD, Technical Memorandum #2*

of imperviousness, an especially important factor when understanding overall watershed health and more specific water quality and water quantity issues. Using assumed levels of imperviousness for different land uses, which have been used by the Philadelphia Water Department in its studies as well as many other agencies, land uses have been translated into impervious acreages (again, these are not actual measurements of impervious area). Imperviousness ranges from 51.4 percent in the Lower Watershed to 44.6 percent in the Middle to 28.8 percent in the Upper Watershed. Even assuming that these numbers are approximate values and may be somewhat high or low, the numbers overall are extremely high and are further testament to the extremely high level of development that exists throughout the Watershed. Even in Radnor and Haverford Townships in the Upper Watershed, their percentages of impervious cover are 25.0% and 34.3%, respectively. It should be noted that the Act 167 study will contain an analysis of actual current land uses and associated impervious cover and will address this issue in more depth.

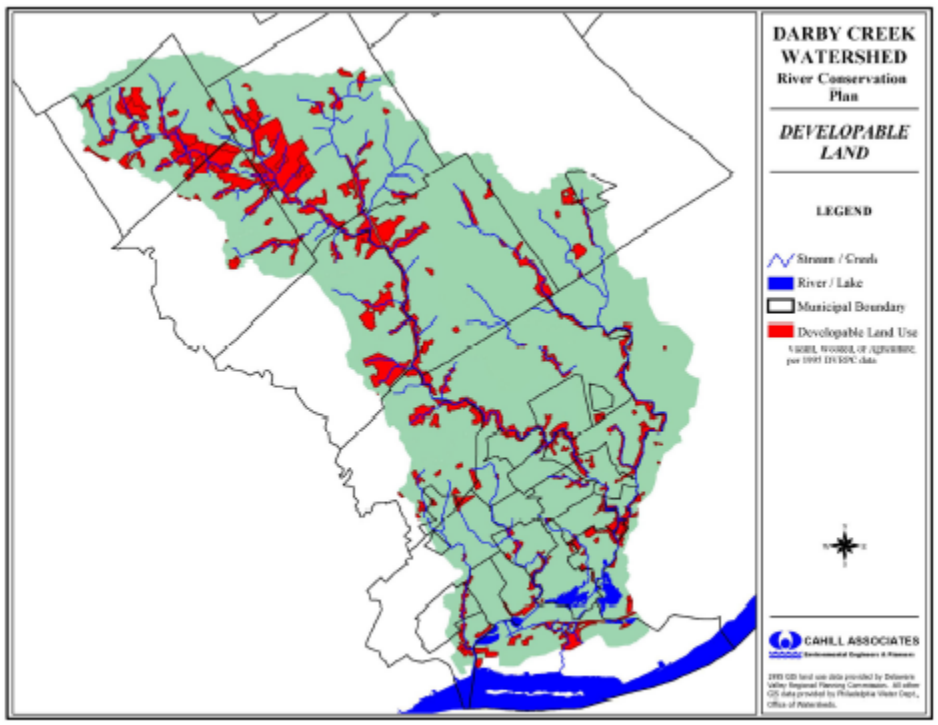


Figure II-5 Developable Land in the Darby Creek Watershed, (1995 Land Use, DVRPC)

City of Philadelphia

The Philadelphia portion of the Watershed (Cobbs Creek) is a special case in terms of land use patterns, notwithstanding the fact that it has been grouped somewhat artificially into the Lower Watershed category. Land use patterns changes tremendously as one moves from the downstream to the upstream portions of the City. For example, in the lower portions are commercial and industrial uses, increasingly related to airport-focused activity, as well as the John Heinz National Wildlife Refuge and the relatively newer residential neighborhoods of Eastwick. As one move upstream and into the general area of West Philadelphia, densities and urban challenges increase. In stark contrast to this high density and impervious mix of older residential and commercial areas is the Cobbs Creek Park and adjacent Morris Park (all part of the Fairmount Park system) all of which provides a substantial green belt through the City, paralleling the Cobbs Creek Parkway. Moving farther upstream in the City, the nature of the residential and commercial development changes significantly around the Overbrook area, as well as the more affluent and lower density neighborhoods adjacent to City Line Avenue. City neighborhoods which are at least partially located in the Watershed include: Wynnefield, Overbrook, Overbrook Park, Overbrook Farms, Green Hill Farms, Haddington, and Cobbs Creek.

Land Ownership (Public and Private)

The vast majority of lands within the Watershed are privately owned. Additional discussion of public lands is provided in the Plan's discussion of Recreation (Section VI). Public lands tend to be recreational lands, which increase as one moves upstream through the Watershed. Historically, the older communities have provided less in the way of public recreational and open space area than the more recently developed communities for a variety of reasons have. A major exception to this, at least in several important respects, would be the City of Philadelphia and its Fairmount Park system, including the very significant Cobbs Creek Park and related Morris Park areas, which provides a significant greenway in the midst of densely developed neighborhoods, buffering Cobbs Creek and its tributaries. There are the very significant public recreational facilities such as the "The Willows" and "Skunk Hollow" in Radnor Township and Sharp's Woods Nature Preserve in Easttown Township. Additionally, there are significant masses of private institutional open space; the largest is probably the several hundred acres of Haverford College (which straddles the boundaries between Lower Merion and Haverford Townships, in Montgomery and Delaware Counties), as well as large institutional uses adjacent to City Line Avenue. Although there is often intensive development associated with these uses, at the same time they also provide masses of undisturbed open space, wonderful scenic vistas, and undisturbed zones of wooded habitat. Some institutions provide exceptional recreational amenities; for example, Haverford College's campus is an arboretum, and provides public access to its perimeter nature trail.

Some open lands, such as the Waterloo Mills Preserve, are not publicly owned per se, but are owned by organizations such as the Brandywine Conservancy and function to some extent as public open space, although complete public access is not provided. Ultimately, the Brandywine Conservancy intends to further develop this Preserve as a special environmental education center where limited public access will be provided. Other open lands include large land holdings related to the Ardrossan Estate (Scott Family Farm), primarily in Radnor Township, where major portions of the estate have been protected by conservation easements and by limited development (mini-estates). Some of this land remains in agriculture use (leased to farmers), just about the last remaining agriculture in the Watershed. Not all of the Ardrossan Estate has been protected. A few other parcels in the Watershed are protected privately through the use of conservation easements.

Haverford State Hospital

Since the closure of the nearly 200-acre Haverford State Hospital facility some years ago in Haverford Township, this site probably constitutes the most important land use issue in the Watershed. The site is centrally located in the Watershed and boasts one of the largest--if not the largest--remaining masses of natural vegetation remaining in this heavily developed Watershed. The site was recently conveyed Haverford Township. Although there has been a considerable amount of development already at the site related to its institutional use, there remains a considerable amount of area that is relatively undisturbed and wooded.

Environmentally, the ideal re-use of the Haverford State Hospital site would be conversion to its natural Watershed landscape and vegetative cover. Such a re-use, necessitating extensive building demolition and removal, was rejected in favor of other proposals that involve a fair amount of private development with some public uses. As a result, considerable additional development can be anticipated at the site. Given the importance of this property in the Watershed, DCVA has attempted, both individually and working together with other organizations, to try to ensure that any redevelopment of this site is done in a manner that respects the Watershed.

John Heinz National Wildlife Refuge

The largest single public land holding in the Watershed is the approximately 1,200-acre John Heinz National Wildlife Refuge, most of which lies within the Watershed. The Refuge is located in both Delaware County and Philadelphia County. Given the subtlety of the drainage patterns in this part of the Watershed, coupled with extensive alteration of these patterns to date, it is difficulty to determine this with any precision. The Refuge, which is owned by the U.S. government, is of relatively recent origin (see more detailed discussion in Section VI). Most other public holdings, with the exception of road and highway rights-of-way, are recreational facilities of one sort or another and are discussed elsewhere in this document.

Land Use Planning: Comprehensive Planning, Zoning, and Subdivision/Land Development Regulations

The development of private land is managed through several public land use planning processes: comprehensive plans, municipal zoning ordinances and subdivision and land development ordinances. All Watershed municipalities have zoning ordinances, which generally regulate how land may be used (e.g., for industrial, commercial or residential development), how intensely or densely it may be developed (e.g., single family dwellings on one acre tracts or high-rise apartment buildings); and general site dimensions (e.g., how far from a property line any building must be set back). Some zoning ordinances also permit planned unit developments, where buildings may be clustered together more closely than generally permitted in order to preserve more open space on the property. While some municipalities in the Watershed have regularly amended their zoning ordinances to address important issues, others have been slower to adopt changes. Most municipalities in the Watershed also have subdivision and land development ordinances, which provide specific details regarding the development process as well as detailed requirements for developing a site. Any municipality in Delaware County that does not have its own subdivision ordinance may use the County's subdivision and land development ordinance. Appendix C provides an inventory of these many different ordinances. The inventory in Appendix C is also evaluative and quickly assesses the extent to which a municipality's plans and regulations are consistent with the overall recommendations of this Plan. Areas that need improvement are highlighted.

Discussing land use planning efforts throughout the Watershed is a difficult task for a number of reasons. First, comprehensive planning and land use planning is most directly accomplished on the municipal level in Pennsylvania. While each county also has a planning department and

commission, these agencies only make recommendations to each of the municipalities, each of which has the final decisionmaking power. The second factor that makes land use planning for the Watershed difficult is that municipal jurisdictions do not neatly follow the natural boundaries of the Watershed. That is, portions of certain municipalities lie within the Watershed while the balance of the same municipality is outside of the Watershed. This is true for each of Marple, Newtown, Springfield and Ridley Township. A third factor results from a constitutional requirement that each municipality provide for a full array of land uses. For example, each municipality must zone some of its land for high-density residential use. Otherwise, the property owner may succeed in a legal claim that the municipality denied the property owner's constitutional rights by not allowing a particular type of property use. While spreading every type of land use over a larger area, like a county, would seem to allow for more rational land use planning, the legal reality is that each of the 31 municipalities must provide for every type of land use -- conceptually, this requirement would seem to create less than ideal land use patterns. For example, instead of concentrating certain industrial uses in an area of the county, each municipality might have such uses.

In addition to these structural problems, the content of some of these land use planning ordinances reveal weaknesses in terms of optimal Watershed land use planning and conservation. That is, many of the zoning and subdivision ordinances do not address the many inter-related issues that are important to the Watershed. They do not provide protection for the stream system, the floodplains, riparian zones, and related wetlands, which link the many Watershed neighborhoods. While many municipal ordinances provide certain protections for floodplains and wetlands, others do not. However, to the extent that any municipality's ordinances have any weakness, that municipality has the power (by itself) to take positive steps to promote Watershed conservation by amending its zoning and subdivision and land development ordinances. Some municipalities are making progress in this area and are working to develop innovative plans with better regulations and overall management programs. Unfortunately, this trend seems to be limited to the upper portions of the Watershed. However, there is no reason that good Watershed conservation practices should be limited to those municipalities.

One innovative program that warrants consideration is a transfer of development rights program ("***TDR***"). A TDR program has the following features: (a) one property owner agrees to certain restrictions on the development of its property; (b) in return, this property owner gets certain development rights which can be transferred or sold to another property owner, (c) the second property owner uses the TDRs to build more than it otherwise would have been permitted to under the applicable zoning and land use ordinances. The benefit of a TDR program would be that certain environmentally sensitive properties could be preserved without development, while the "development rights" would be transferred to a more appropriate location (e.g., one that is already developed or one that could better accommodate more intense development based on existing infrastructure). Establishing a TDR program would take a fair amount of legal work. However, it may be a useful planning tool for the Watershed.

City of Philadelphia Planning

The Philadelphia City Planning Commission published the Plan for West Philadelphia in 1994. Although the study area designated as West Philadelphia in this Plan includes a considerable area beyond the Watershed (it extends to the Schuylkill River on the east and excludes portions of Southwest Philadelphia that are within the Watershed), this Plan is significant in terms of establishing a vision for this very important portion of the Watershed. Its goals include, but are not limited to:

- Maintain and Revitalize West Philadelphia Neighborhoods
- Expand and Strengthen the Diverse Economic Base that Exists in West Philadelphia
- Accommodate the Growth of Institutions
- Plan for Quality and Compatibility of New Construction
- Create a More Attractive Urban Environment in the Neighborhoods and Public Areas
- Promote Programs that Encourage a Healthy Lifestyle
- Provide Improved Recreation Opportunities

The Plan recommends the renewal of commercial properties along the Market and 52nd Street commercial corridors in order to reinforce the Cobbs Creek, Haddington, Carroll Park, and Overbrook neighborhoods. Projects include refurbishing the Market-Frankford Elevated structure, improved lighting, and general upgrading of the streetscape, facilitated through home and business improvement loans and grants, plus strategically located new development projects. The City Line area (Wynnefield Heights and Wynnefield) is targeted for historic preservation programming, improved zoning initiatives, and traffic flow projects. Area-wide recommendations generally define a Neighborhood Conservation Strategy, including housing rehabilitation especially of vacant housing stock which are problem properties, special programs to assist seniors in home maintenance projects, imposition of special development controls such as along the 63rd Street corridor, projects in the Cobbs Creek Park (several now completed), and selected site improvement projects. Specific projects have been identified and listed for the Cobbs Creek, Haddington, Carroll Park, and Overbrook neighborhoods as well as for the neighborhoods comprising the City Line area (Overbrook Park, Green Hill Farms, Overbrook Farms, and Wynnefield). The City of Philadelphia has a distinguished tradition of planning. The detailed and comprehensive Plan for West Philadelphia embodies this impressive record and, difficult challenges notwithstanding, sets forth a program of action to conserve this important urban area and move it forward.

Special Philadelphia Planning: The Fairmount Park System's Natural Lands Restoration and Environmental Education Program ("*NLREEP*"). Although Fairmount Park, which includes both Cobbs Creek Park and Morris Park , has undertaken system-wide comprehensive park master planning in the past (notably the 1983 comprehensive planning undertaken by Wallace Roberts and Todd), the NLREEP effort, initiated in 1996 through a $26.6 million grant from the William Penn Foundation, has been by far the most significant effort. NLREEP

includes a series of interrelated activities which encompass restoration of vegetation and streams, trail repair and improvement, construction of environmental education centers, development of education and volunteer restoration programs, securing additional adjacent lands which are undeveloped, and protecting programs for Watershed protection beyond park boundaries. Some of the City's foremost experts, such as scientists at the Academy of Natural Sciences, were contracted to perform related planning work. The planning process started with identification of goals, compilation of existing data on park conditions, taking of biological specimens, development of field survey protocols, survey implementation, development of a database for historical and assessment data, plus a Geographic Information System. While the primary goal of this process has been the development of recommendations for restoration to be done as part of the 5-year NLREEP program, it is anticipated that this plan will provide the basis for ongoing restoration and maintenance activities in the natural lands of the park system. (NLREEP, p. I-4) NLREEP is a highly significant endeavor that warrants attention. Although its focus area is not the Darby Creek Watershed, many of the lessons learned from NLREEP may be applicable in some way to the Watershed.

In addition to this Fairmount Park-wide program, specific park plans have been developed. One example is the Cobbs Creek Master Plan, prepared in 1999 (the "***Cobbs Creek Plan***"). The Cobbs Creek Plan recommends that 68 high priority sites be restored in Cobbs Creek Park. These sites are located throughout the Park, including Morris Park (wetland creation, control of invasive plants, and forest replanting on high quality floodplain and sloping hillsides), Cobbs Creek Golf Course (bank stabilization, invasive control, replanting and trash removal), the 63rd Street Area (removal/modification of Millbourne Dam, channel modification and bank stabilization, wetland enhancement, trash removal, invasive control, and replanting). Additional recommendations include: (a) wetland creation and improvement of flood plain forests is recommended in the area around the stable, which will house a new environmental education center, (b) coordination with the Philadelphia Water Department to control erosion, which has exposed a sewer line south of Marshall Road, (c) restoration projects to control water runoff, and repair gullies and slopes around Whitby Avenue, (d) invasive control, replanting, repair of gullies and eroded slopes, and wetland enlargement in the area north and south of 65th Street, which contains a variety of woods, tributaries, wetlands and flood plain habitats, and (e) at the southern end of the park, removal or modification of the dam above Woodland Avenue. In addition to these projects, control of invasive vegetation, especially Japanese knotweed, is recommended along much of the banks of Cobbs Creek. Vehicle use, including "all-terrain vehicles" ("***ATVs***"), motorcycles and cars, and associated dumping of trash, are major problems in much of the park. Control of vehicular access is vital to enhancing the park. Trail erosion, which is a problem in many areas of the park, is another topic addressed in the Cobbs Creek Plan. In addition to the activities at specific sites, general recommendations are made for the entire park in order to help control runoff on slopes and in tributaries, improve the border between the designed and natural lands, and reduce the potential for invasion by exotic plants. (Cobbs Creek Plan, p. II-6). The Cobbs Creek Plan is discussed further in Sections IV, V and VI.

Delaware County and Regional Planning

As mentioned above, the counties also have planning departments and commissions, staffed with professional planners. As most of the Watershed is located in Delaware County, this section will focus on the work of the Delaware County Planning Department ("***DCPD***"). DCPD is organized in different divisions, including land use planning, environmental planning, historic preservation planning, transportation planning, and comprehensive planning. Each division focuses on different activities with some functions and projects involving the coordinated activity of several divisions. The land use planning division reviews all proposals for re-zoning, amendments to zoning maps and ordinances, as well as plans to subdivide and develop individual properties. The DCPD staff reviews the plans and makes recommendations to the Delaware County Planning Commission ("***DCPC***"). The DCPC reviews all applications at public hearings and votes to make a recommendation for each application. These recommendations are forwarded to the municipalities, which have final decisionmaking authority.

The environmental division of DCPD focuses on many Watershed issues. Among them are the preparation of the Act 167 Stormwater Management Plan for the Darby Creek and the Act 537 Sewage Facilities Plan Update. These plans have been described above and are discussed further detailed in the sections that follow. The DCPD has also begun to update the County's comprehensive plan. Its historic preservation division has been especially active in preservation planning and provides staff assistance to the Delaware County Heritage Commission and to the Brandywine Battlefield Task Force. The transportation division provides a variety of transportation planning services.

The Delaware Valley Regional Planning Commission ("***DVRPC***") is the designated regional planning commission (the Metropolitan Planning Organization or MPO) which encompasses the Darby Creek Watershed. DVRPC is currently preparing a new comprehensive plan for the region, generally promoting conservation of existing communities and minimization of sprawl. While DVRPC's plan will be important, it is likely to focus more generally on the region. As mentioned above, many of the activities required to achieve the goals of this Plan will require much more localized efforts at the municipal and neighborhood level.

The Special Role of Environmental Advisory Councils

This Plan directs considerable attention to the municipal level of government. Many of the recommendations in Section 7 either directly or indirectly involve municipal government actions, either by the elected governing body, the planning commission, or some other arm of municipal government. However, it is not realistic to believe that municipal governments, by themselves, will be able to undertake all of these recommendations, particularly at a time when many municipalities are already overwhelmed by mounting responsibilities, with municipal officials searching for ways to trim budgets, and limit responsibilities, rather than expand them.

One answer to this problem can be the municipal environmental advisory council or "***EAC***". In 1973, the State of Pennsylvania passed Act 148, which allows a municipality or group of municipalities to establish an EAC by ordinance. EACs are intended to advise the elected

officials, the municipal planning commission, and other relevant boards on matters relating to natural resources and their conservation, protection, management, promotion, and use. Unfortunately, only a few municipalities in the Watershed (e.g., Radnor, Haverford, Marple, and Lower Merion Townships) have established EACs. The creation of an EAC can be very useful in spearheading the municipal-level recommendations being made in this Plan. EAC activities typically include the development of natural resource inventories, park and recreation system improvements, and development plan reviews, in addition to a variety of special studies and reports. A challenging agenda for any EAC, new or old, would be to undertake to implement the multiple recommendations directed toward municipalities made in this Plan -- in fact, this Plan has benefited from the review by several EACs, including those in each of the municipality's mentioned above.

The Pennsylvania Environmental Council (215-563-0250) has established the EAC Network, which will explain how to establish an EAC, how to organize its efforts, and how to start to take the critical steps toward implementing the goals of the EAC.

Private Land Management and Private Land Stewardship for Watershed Conservation

In addition to the conventional public acquisition and purchase of lands for overall conservation and recreation purposes, lands may be set aside through private mechanisms, including outright donation, donation of conservation easement, partial donation (bargain sales), and other mechanisms other than the straightforward fee simple transfer of title. Unfortunately, very little land in the Darby Creek Watershed has been privately set aside for conservation. Typically, a private land trust organization such as the Brandywine Conservancy or Natural Lands Trust manage these conservation interests in some manner, although local municipal land trusts can be created. If there has been a donation involved with possible Federal tax credit/benefit being provided to the donor, the land trust organization typically is required to inspect whatever has been donated to make sure that the public interest is being maintained (note that public interest does not equate to public access, according to the law; typically donated conservation easements do not include rights of public access). Any municipality or group interested in pursuing these innovative programs should consult legal counsel with experience in real estate as well as federal taxation.

Probably the most significant focus of private conservation in the Watershed is Waterloo Mills, a large estate recently donated to the Brandywine Conservancy by the Haas Family. This conservation area in both Easttown and Newtown Townships was donated outright (fee simple) rather than by donation of conservation easement. The area overlaps with the Waterloo Mills National Historic District. The Brandywine Conservancy is currently developing a facility plan and program for Waterloo Mills; public access is not guaranteed though is likely to be provided for specialized uses such as education. A few other private conservation areas, including donated conservation easements, do exist in the Watershed, though typically in the upper Watershed municipalities.

There are a variety of mechanisms or techniques, which can be applied creatively to accomplish watershed conservation objectives privately, without public or municipal outlay of funds or without municipal regulatory action of some sort. These mechanisms include, but are not limited to:

- **Conservation Easements:** A conservation easement transfers certain rights for use of a property, such as the right to develop and subdivide the property, while allowing the original property owner to retain ownership and occupancy of the property. A conservation easement may be donated or purchased, though usually are donated in exchange for Federal tax deductions (possibly also reduced local real estate taxes) as well as for an overall conservation intent.
- **Bargain Sales:** A conventional fee simple transfer of a property though accomplished at significant reduction of fair market value, as determined by a fair and equitable appraisal process. Owners bargain-selling to a government may enjoy some direct financial reward from the purchase, but may also enjoy a Federally recognized donation which can be used to offset the significant taxes due upon the sale of real property that has appreciated significantly (i.e., not only are the capital gains from the transaction substantially reduced, but the donation further offsets the taxes due).
- **Limited Development:** Property owners intentionally reduce a development program for a program well below the maximum-zoned density allowed by the respective zoning ordinance, in order to maximize conservation values at the property. An wonderful example of this concept in the Watershed is the Ardrossan I and II developments in Radnor Township, part of the Montgomery Scott Estate. Working with the Brandywine Conservancy, the Scott Family devised a program of mini-estates, each in excess of 10 acres, with structures carefully placed to be screened from viewpoints and with other environmental management controls imposed. Ironically, rather than lower values, this limited development approach has come to be viewed as extremely beneficial and desirable from the market's perspective (i.e., by purchasers), with values and prices inflating tremendously. Some experts would argue that there might be more money to be made from limited development, than from conventional development!
- **Open Space/Conservation Development:** Also called clustering, a conventional subdivision plan with large lots (e.g., 1 or 2 acres) is allowed to be tightly concentrated on considerably smaller lots (e.g., .5 to .25º acre), thereby allowing large portions of the site to remain undeveloped, undisturbed. If the cluster is properly and thoroughly developed, this open space area will be deed restricted or could be conveyed in some manner to a local conservation organization or the municipality itself, depending upon the context. PADCNR's Growing Greener program further advocates the strategic linking of these zones of open space, development by development, so that greenways are created. Because this open space being protected clearly should include, though not be limited to, sensitive zones such as floodplains,

riparian areas, and wetlands, ideally a greenway eventually is created which protects the stream system. The important objective in clustering is to make sure that open spaces being provided are meaningful and not simply isolated and residual pockets of land where environmental functions have been substantially impacted and depleted.

- **Estate Planning:** In many instances, property owners have held properties for many years and are subject to substantial federal and state taxes through the estate taxation process. Poor estate planning often results in heirs having to sell off the family farm or subdivide it, all of which would not have been necessary if estate planning had been undertaken. The sheer act of proper and effective estate planning, utilizing some of the tools described above, can produce results that are financially more beneficial to the heirs and achieve many conservation objectives. Of course, some heirs decide to maximize the value of their estate by selling large undeveloped properties to developers for the highest price.

There are still properties remaining in the Watershed where some of these tools could be used. Any person, company or nonprofit group interested in these tools should retain experienced legal counsel to ensure that they are structured properly.

D. Critical Areas in the Watershed

Until the 1970s, when environmental disasters like that at Love Canal were highly publicized, most people were less aware of and less concerned about chemical wastes and how these chemicals affect public health and the environment. On properties where such chemical production and handling practices occurred, the result unfortunately has too often come to be a legacy of abandoned hazardous waste sites, such as abandoned warehouses and landfills. The US Environmental Protection Agency ("***USEPA***") directs many federally funded programs that inventory, evaluate, and mitigate the adverse effects of these hazardous waste sites. Of most importance for the Darby Creek Watershed is the Superfund program, technically including both the National Priorities List (NPL), and the Toxic Release Inventory (TRI) program.

Superfund Program

Citizen concern over the extent of unregulated hazardous waste sites prompted Congress to establish the Superfund Program in 1980; this program is intended to locate, investigate, and remediate (i.e., clean up) the worst inactive hazardous waste sites nationwide. The USEPA administers the Superfund program in cooperation with individual states and tribal governments. Once a site is discovered and USEPA is notified, the site is entered into the Comprehensive Environmental Response, Compensation, and Liability Information System ("***CERCLIS***") Database, which contains information on hazardous waste sites, site inspections, preliminary assessments, and remediation of hazardous waste sites. A limited-scope, Preliminary Assessment is performed on every CERCLIS site to determine the nature of the threat to human health and the environment. If the threat is deemed to be serious, a Site Inspection is performed to determine what hazardous substances are present at a site and what substances have been

and/or are currently being released into the environment. Information from the Preliminary Assessment and/or Site Inspection is used to calculate a Hazard Ranking System score. The HRS system is the main mechanism USEPA uses to list sites on the NPL. Sites with an HRS score of 28.50 or greater are eligible for listing on the NPL.

Table II-12 CERCLIS Sites in the Darby Creek Watershed, (EPA 2001)

LABEL	EPA SITE ID	SITE NAME	STREET ADDRESS
1	PA0000379689	ROUTE 30 & E.CONESTOGA RD.DIESEL SPILL E.R	TAYLOR GIFTS, 355 E. CONESTOGA ROAD
2	PASFN0305403	HAVERTOWN RESIDENTIAL OIL SPILL	105 ROCKLAND ROAD
3	PASFN0305548	UPPER DARBY H.S. MERCURY SPILL	501 LANSDOWNE AVENUE
4	PASFN0305585	HILLTOP RESIDENTIAL LAB SITE	7110 HILLTOP
5	PA0002326480	HORTEN STREET SITE	234 HORTEN STREET
6	PASFN0305546	HOFFMAN PARK SITE	SCOTTDALE ROAD
7	PA0002349090	SECANE OIL SPILL	2339 SECANE RD.
8	PA0002195253	BIG MARTY TRANSFORMER ER	MAIN AND POWELL STREETS
9	PAD981736747	LANSDOWNE SITE #2	LANSDOWNE AVE
10	PASFN0305551	WINDSOR STREET OIL SPILL E.R.	5441 WINDSOR STREET
11	PA0001909522	OIL TANK LINES, INC.	2 INDUSTRIAL DRIVE
12	PA0002374395	MARITANK OIL SPILL	67TH STREET AT SCHUYLKILL RIVER
13	PAD987332848	70TH AND KINGSESSIN TRAILER	70TH AND KINGSESSIN BLVD.
14	PAD980693162	CLEARVIEW LANDFILL	83RD & BLIST AVE
15	PA6143515447	TINICUM NATIONAL ENVIRONMENTAL CTR	OFF DARBY CREEK

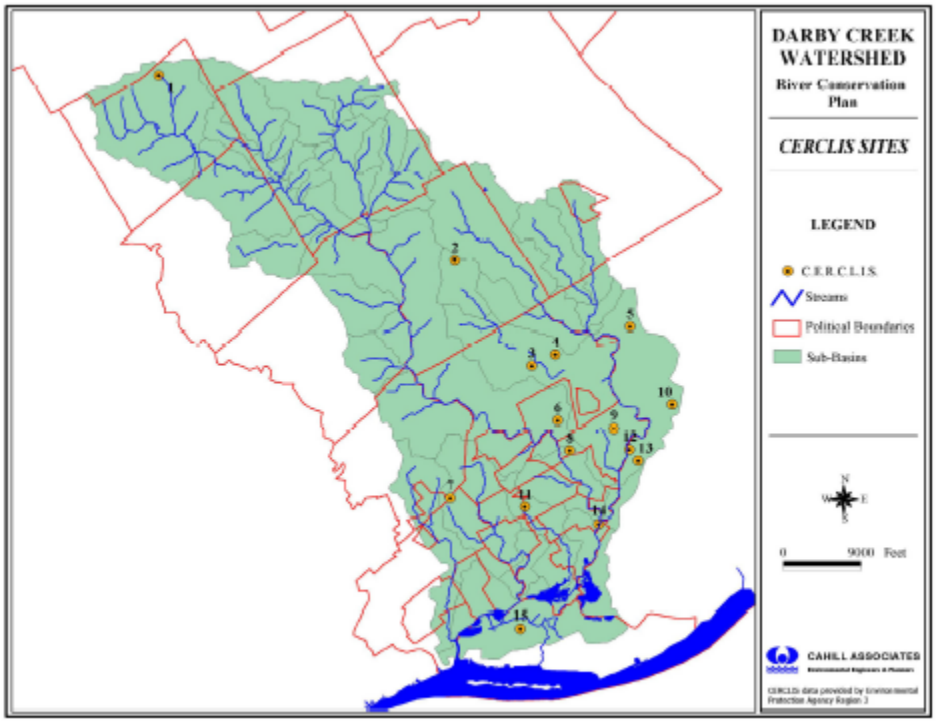


Figure II-6 EPA identified CERCLIS sites in the Darby Creek Watershed

Approximately 15 CERCLIS and 4 Superfund sites are listed in the Darby Creek Watershed (Figure II-6 and Table II-12 above and Figure II-7 on the following page), primarily located in the lower, more industrial portion of the Watershed. The newest Superfund site in the Watershed is located on a 2-mile stretch of the Darby Creek and includes six contiguous properties. From north to south, they include the Clearview Landfill, the Industrial Drive Properties, the Sun Oil Darby Creek Tank Farm, the former Delaware County Sewage Treatment Plant, the former Delaware County Incinerator, and the Folcroft Landfill and Annex. From the early 1950s to the late 1970s, the above properties disposed of sewage sludge, municipal waste, refinery waste, ash residue, and other hazardous substances into the air, water, and ground environment. Both the Austin Avenue Radiation Site and the Lansdowne Radiation Site have received remedial action to restore the sites, while the Havertown PCP Site is currently in the final phase of remediation. (EPA Envirofacts Data Warehouse,"http://www.epa.gov/enviro/index_java.html"; www.epa.gov/enviro/index_java.html"). In sum, although the Darby Creek Watershed has had its share of environmental pollution, the good news is that three out of four Superfund sites have been remediated and restored. Most recently, the Lower Darby Creek Area (LDCA) was officially put on the NPL list.

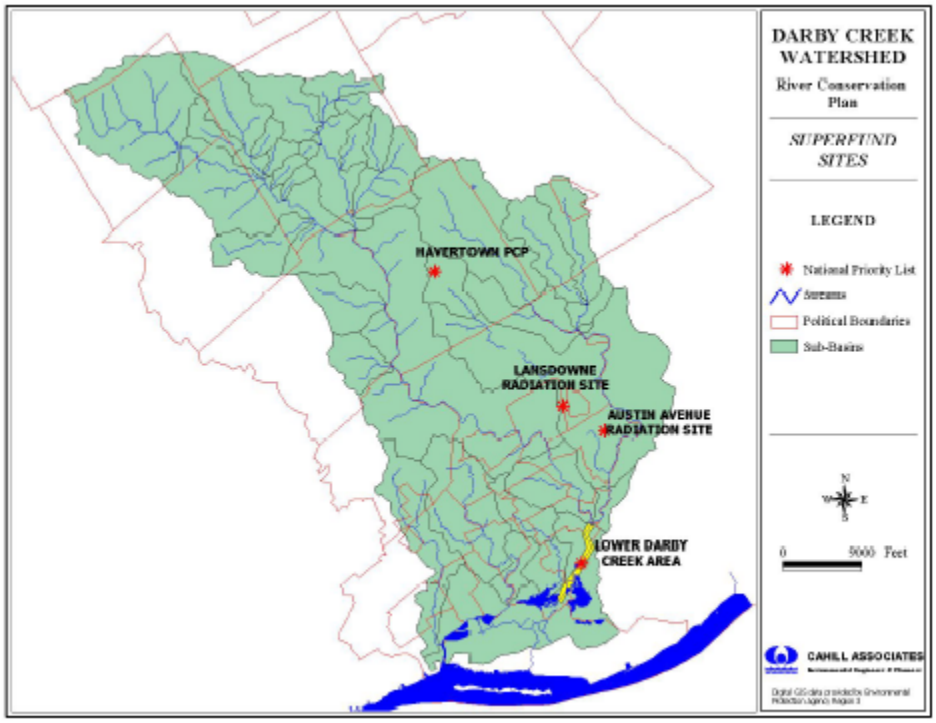


Figure II-7 USEPA identified Superfund sites in the Darby Creek Watershed

Toxic Release Inventory

Currently over 600 chemicals nationally have been determined to be toxic, and certain industries must report to USEPA if they use or handle these chemicals. Two federal statutes, Section 313

of the Emergency Planning and Community Right-To-Know Act and Section 6607 of the Pollution Prevention Act, mandate that a publicly accessible toxic chemical database be developed and maintained by US EPA. This database, the Toxic Release Inventory (TRI), maintains information concerning waste management activities and the release of toxic chemicals by facilities that manufacture, process, or otherwise use them (Figure II-8 and Table II-13, each on the following page). Manufacturer facilities are required to report the locations and quantities of chemicals to both state and local governments. Approximately 13 TRI facilities are located in the Darby Creek Watershed, again with the majority of the sites located south of Route 3 in the lower portion of the study area (EPA, TRI Query Form, http://www.epa.gov/enviro/html/tris/tris_query.html; www.epa.gov/enviro/html/tris/tris_query.html).

Table II-13 Toxic Release Inventory (TRI) sites in the Darby Watershed (EPA 2001)

LABEL	TRI ID	FACILITY ID	FACILITY NAME	STREET ADDRESS	CITY
1	19010CHMLL996RA	PAD987325321	CHEMALLOY CO. INC.	996 RAILROAD AVE.	BRYN MAWR
2	19008THDMRPOBOX	PAD987325552	EDMAR ABRASIVE CO.	1107 SUSSEX BLVD.	BROOMALL
3	19008MCHNS400RE	PAD987352507	M. COHEN & SONS INC.	400 REED RD.	BROOMALL
4	19091FRNKLUSRTE	PAD002487247	FRANKLIN MINT	U.S. RTE. 1	MEDIA
5	19032CRKND500KA	PAD987380714	CORK IND. INC.	500 KAISER DR.	FOLCROFT
6	19018BCHNNPENNJ	PAD002351450	BUCHAN IND.	415 S. PENN ST.	CLIFTON HEIGHTS
7	19018LTTNSMARPL	PAD987320185	CLIFTON PRECISION	MARPLE AT BROADWAY AVE.	CLIFTON HEIGHTS
8	19050JLNBS300EB	PAD002325777	JULIAN B. SLEVIN CO. INC.	300 E. BALTIMORE AVE.	LANSDOWNE
9	19050HYDRL520CO	PAD002281907	HYDROL CHEMICAL CO.	520 COMMERCE DR.	YEADON
10	19023SNTRY237MI	PAD002480002	SENTRY PAINT TECH. INC.	237 MILL ST.	DARBY
11	19032THBLL1640D	PAD987325222	BULLEN COS.	1640 DELMAR DR.	FOLCROFT
12	19032MZRCH1830C	PAD002313294	BASF CORP.	1830 COLUMBIA AVE.	FOLCROFT
13	19029SSCHM48POW	PAD987380128	ESSCHEM CO.	48 POWHATTAN AVE.	ESSINGTON

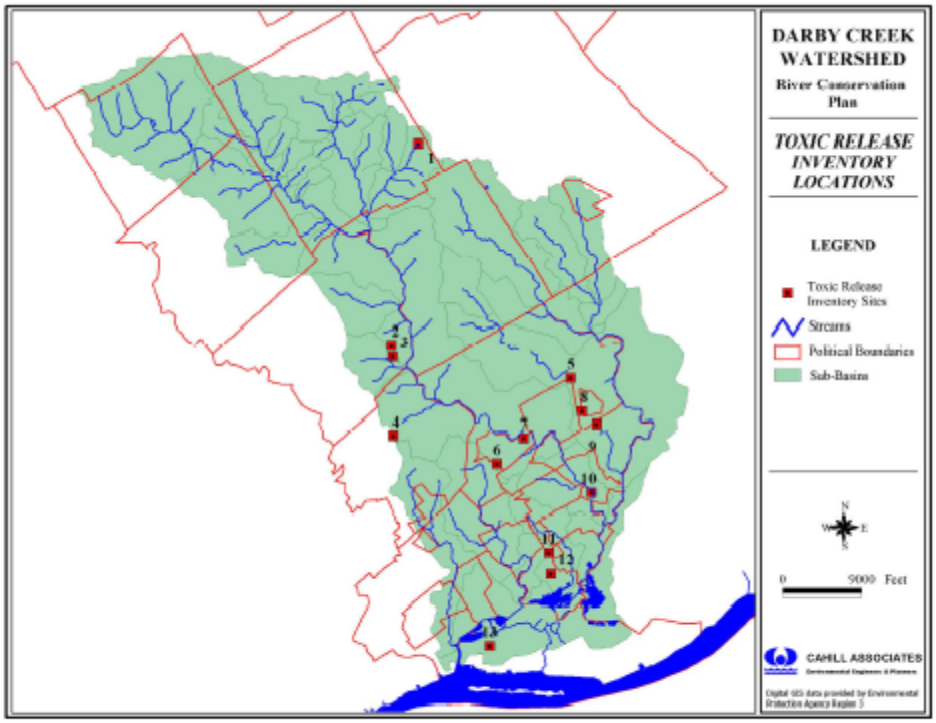


Figure II-8 Toxic Release Inventory (TRI) sites in the Watershed (EPA 2001)

Quarries, Abandoned Mines, and Landfills

The PADEP has developed a comprehensive environmental compliance online information reporting system to provide public access to facility information ("http://www.dep.state.pa.us/efacts/" http://www.dep.state.pa.us/efacts/). For residents interested in permitted activities and compliance information of facilities in their neighborhood, the DEP eFACTS system is a user-friendly source of public information, searchable by geographic location. Both eFACTS and DEP officials were consulted in order to inventory the quarry, mining, and landfill resources of the watershed.

No actively functioning (permitted) quarries or mines are located within the Darby Creek Watershed (Consultant, Discussions with PADEP). Though many local quarries historically supplied the watershed region with Wissahickon schist for early construction activities, most quarries in the watershed are currently inactive and/or closed. An economically beneficial alternative for the empty quarry is to function as a reclamation site whereby certain, nontoxic substances are buried in the empty hole in the ground. This activity, if unregulated, can lead to dangerous and harmful effects on groundwater if the quarry is close to the watertable. PADEP Bureau of Waste Management permits and inspects only those cleanfills that are potential threats to water resources.

Llanerch Reclamation Quarry, located in Haverford Township near Route 3 and Township Line Road, is one such former quarry turned clean-fill in the watershed inspected regularly by PADEP. Llanerch Reclamation Quarry currently accepts construction residue such as brick, block, stone, concrete, old asphalt, and dirt for disposal. According to eFACTS, Llanerch Quarry has been a repeat violator, with violations issued in 9 out of 19 inspections since 1997. The Llanerch Reclamation Quarry sits near the headwaters of Naylor's Run, in a critical location for influencing water quality and quantity effects.

It is important to downstream residents and watershed community members that permitted waste management activities are regularly inspected, and dumpers are held accountable for any degradation to the watershed system. Unfortunately, many permitted dumpers get away with their illegal activities because inspectors are uninformed or unaware of the reality of the situation. In addition, many illicit and illegal dumping activities are occurring throughout the watershed, usually in the floodplain. Groups like DCVA, as organized stakeholders in the watershed, should play the role of watchdog whereby complaints are filtered through a special Dumping Task Force group, which takes action and lodges the complaint (both locally with the municipality, and federally with PA DEP) and follows up with the compliance actions. A combination of regulation and community awareness will be the most influential method to combat dumpers in the Darby Creek Watershed.