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Sewickley Creek Watershed Assessment, Restoration and Implementation Plan

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### I. Introduction

#### **Overview**

Natural resource extraction-related industries have played a key role in the rapid growth of Southwestern Pennsylvania. Coal mining in Pennsylvania began during the 1700's and by the mid 1800's, coal was the primary energy source fueling the growth of Western Pennsylvania's steel industry. The coal industry reached its peak production in the early 1900's. As technology advanced and the work became less labor intensive and more efficient, employment in the industry began to decline. Competition from other energy sources replaced coal as the primary fuel in many industries and the demand for coal fell. Although coal was redirected for use in the electricity industry, many mines closed as reserves were depleted, leaving the Pennsylvania landscape and its waterways stained by its legacy of inadequate environmental regulation.



Sewickley Creek main stem within the Upper Sewickley subwatershed.

The story of Sewickley Creek, scarred by the effects of past coal mining activities, is a familiar one that is shared by many other watersheds in Southwestern Pennsylvania. Water polluted with metals and acid from flooded abandoned coal mines drains into the stream and stains its waters orange as it flows through backyards, towns, and farmlands alike. As a result of inadequate or non-existent treatment facilities, the stream is also polluted by sewage from rural residences and communities. Poor agricultural practices add additional nutrients. Coal waste piles, remnants from the heyday of

coal mining, when environmental regulation was practically non-existent, continue to shed tons of sediment into the stream. Aquatic life throughout the watershed has been significantly degraded by metals, acid, sediment and excessive nutrients. Many segments of the creek do not meet their designated use under Pa. Code, Title 25, Chapter 93, Water Quality Standards. Although some water quality improvements have been made over the past several decades, there is still much work to be done to improve the quality of water and life within the Sewickley Creek watershed.

In 1992 an industrious group of local citizens decided to assert a positive influence within their environment and their watershed, forming the local non-profit, Sewickley Creek Watershed Association (SCWA). The initial interest of the group was to focus on abandoned mine drainage (AMD) remediation, which is the main source of pollution in the watershed. Their mission is to "promote the conservation of natural resources, monitor and improve water quality, and advocate wise land-use practices in the Sewickley Creek watershed." As the group grew to include a greater diversity of people, they realized the importance of taking a more holistic approach to their watershed community. With that in mind, and as part of its mission, the SCWA decided to formulate a long-range plan for the watershed through the Pennsylvania Department of

Conservation and Natural Resources (DCNR) Rivers Conservation Program. Using the DCNR planning process, they developed the Sewickley Creek Watershed Conservation Plan. This plan identified the environmental, cultural, and socio-economic characteristics within the watershed. From there it identified related issues and concerns and developed management options to address those concerns.

Since its inception, the SCWA has implemented a number of notable projects including AMD remediation projects, stream bank stabilization projects, rails to trails expansions, beautification projects, and the development of a biotic study area at the Westmoreland County Community College. Examples of future projects that the group would like to implement include enhancement of environmental education programs and recreational opportunities, as well as additional stream bank stabilization projects and additional AMD treatment. The group hopes to expand its efforts by having a multi-focused approach, creating new partnerships, increasing membership, and adding paid staff.

The Sewickley Creek Watershed Assessment, Restoration, and Implementation Plan was developed as a key component of an effort to address the pollution problems that currently affect Sewickley Creek and its tributaries. SCWA, in cooperation with numerous partners, created this plan to provide users with valuable information that will help to guide future restoration and implementation activities within the watershed. This assessment project is part of the group's continuing efforts to improve the Sewickley Creek watershed.

The SCWA contracted with Western Pennsylvania Conservancy (WPC) to gather available data, perform the field assessment, monitor AMD sites, and develop the implementation plan. In addition, WPC has provided technical assistance to SCWA on matters outside the specific scope of the Sewickley Creek Watershed Assessment, Restoration, and Implementation Plan.

The restoration of the Sewickley Creek watershed presents many challenges and users of this plan should understand that the recommendations identified within are based on the best information on restoration technologies available at the time of tis creation. Due to the evolving techniques and technologies used in watershed restoration, changing priorities of the government agency programs, and the availability of various funding sources used in restoration activities, a periodic review and updating of the plan is highly recommended.

As a result of this assessment being funded through the Pennsylvania Department of Environmental Protection, Bureau of Watershed Management's Section 319 Non-Point Source Pollution Program, the study is also developed to consider requirements of the U.S. Environmental Protection Agency (EPA) Section 319 program.

### **Public Information and Participation**

Long-term local support is necessary if the Sewickley Creek watershed is to be restored and SCWA has made every effort to create the partnerships necessary to sustain current and future restoration efforts. SCWA has teamed up with local citizens, non-profit groups, local and county government, and state and federal government agencies to strengthen this support.

SCWA typically holds monthly meetings, encouraging all of their partners and interested local citizens to attend, assuring an open line of communication within the community. During this assessment, the watershed association asked WPC to provide regular updates on the progress of the assessment and to provide articles for their newsletter on progress. In addition, as the assessment proceeded, initiating personal contact with landowners to gain their support was a priority.

### **Assessment Methodology**



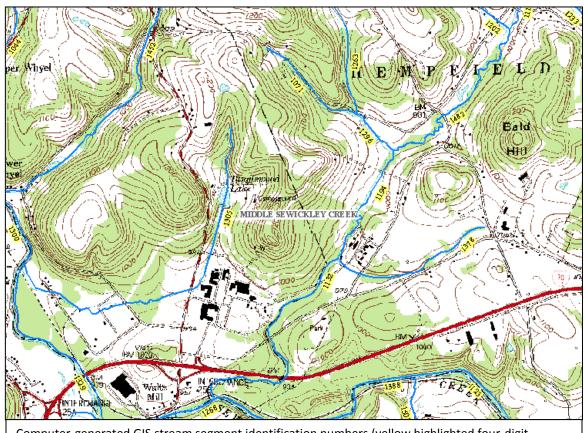
Sewickley Creek watershed assessment display and watershed activity at the 2010 Saint Vincent's Earth Day.

One of the most important factors in the development of the assessment, restoration, and implementation plan is the proper balancing of time, effort, and funding necessary to meet the goal of the plan. Within each suggested method there are limits to the type and amount of information that can be gathered, based on the goals, objectives, priorities, and the level of funding available for its development. The goals and objectives themselves are driven by different and sometimes competing priorities, established first by the organization for which the plan is developed and secondly, but often just as importantly, the funding source, which usually carries its own requirements or priorities.

The comprehensive assessment approach taken for Sewickley Creek under this study was primarily based on the desires of SCWA and cooperating partners to fulfill the requirements of an EPA approved Watershed Implementation Plan (WIP).

To fully assess the physical condition of the watershed, the stream channels and adjoining streamside areas (riparian zones) of all stream segments within Sewickley Creek as listed by the Pennsylvania Department of Environmental Protection 305b Report were assessed. A stream segment is considered to be a reach of stream bracketed by the intersection with an adjoining tributary or tributaries. The length of stream segments varies, depending on the distance between intersecting tributaries. Some sections are long, while others could be quite short.

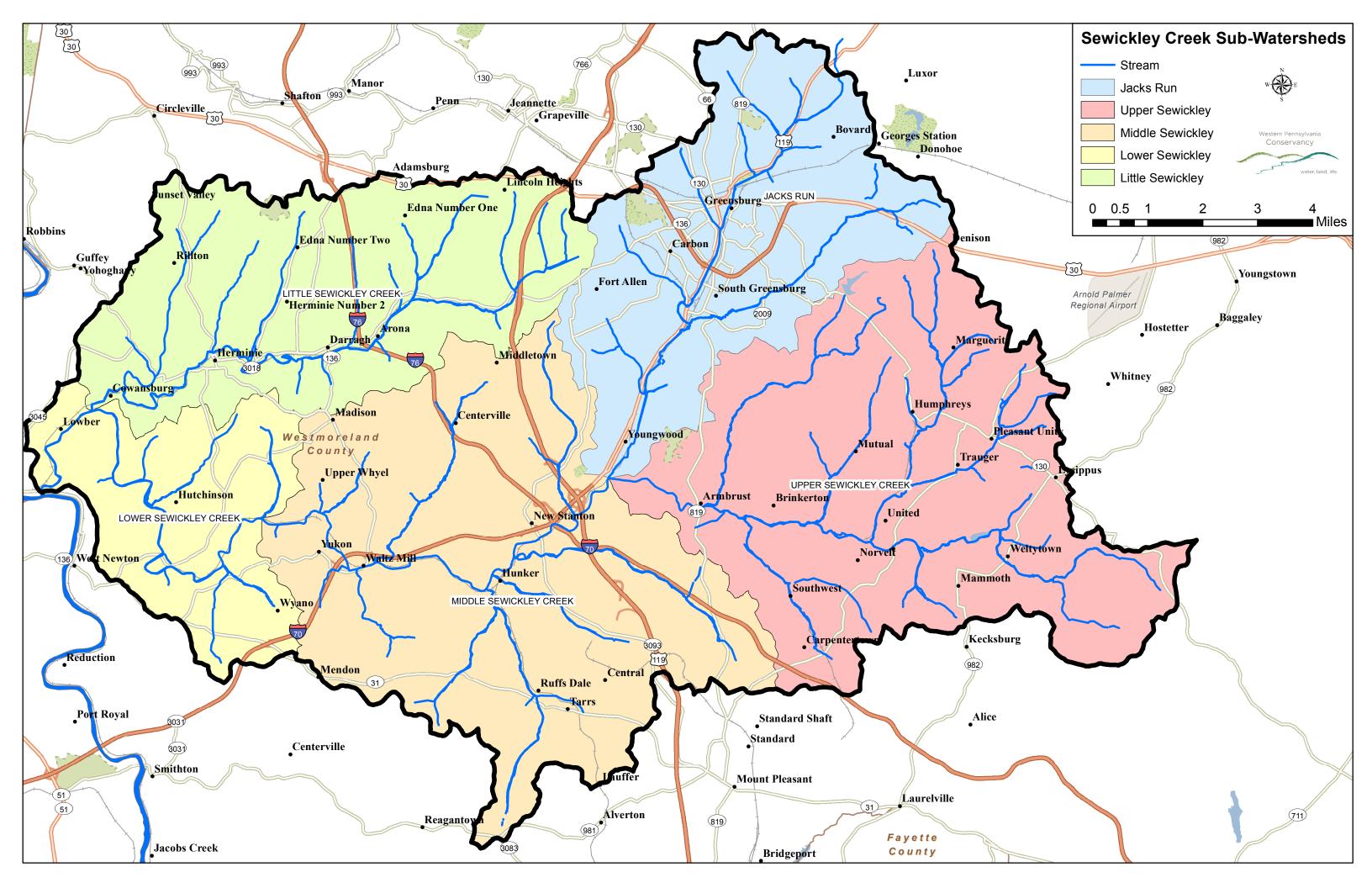
All of the 305b stream segments of the watershed were given a computer-generated four digit GIS identification number, which relates directly to the 305b Report stream segment ID number. The GIS numbers are non-sequential due to the nature of their computer generation. However, order was kept by filing the score sheets for each tributary in sequence they were assessed, usually from the mouth to the headwaters.



Computer-generated GIS stream segment identification numbers (yellow highlighted four-digit number) projected on topographic maps to assist with data collection and storage during the assessment.

In order to assist in maintaining order of the collected data, the Sewickley Creek watershed was broken into five sub-watersheds for the purpose of this assessment. They are, starting at the headwaters and working downstream:

- Upper Sewickley
- Jack's Run
- Middle Sewickley
- Little Sewickley
- Lower Sewickley



It was necessary to have a consistent way to compare stream segments and quantify conditions within and among them. As such, a modified version of the EPA Rapid Bioassessment Protocol for Streams and Wadeable Rivers was used during the development of the Sewickley Creek Watershed Assessment, Restoration, and Implementation Plan. The EPA protocol assigns a numeric value to ten different stream characteristics, or "assessment elements," in order to evaluate the overall stream quality. The assigned assessment scores range from zero to twenty, twenty being the highest in quality, and are based on specific conditions associated with each assessment element. An example of the assessment sheets that were used in the field can be found in Chapter VIII. Each of the ten individual assessment scores for each segment was totaled and averaged to yield an overall visual assessment score. This average score was then broken into four quality ranking categories:

• Optimal: Average score ranging 16-20

• Suboptimal: Average score ranging 11-15

• Marginal: Average score ranging 6-10

• Poor: Average score ranging 0-5

Using these four categories as a reference, a GIS-based map was developed to identify the quality rating of each stream segment for the entire watershed and is included within the report.

In conjunction with the visual assessment work, ten individual AMD locations were identified for detailed monitoring. AMD discharge monitoring sites were selected based on the amount of pollution they produce and the effect on the stream caused by the individual discharge. In general, those with the largest flows and impacts to the stream were chosen for monitoring.

Monitoring included chemical as well as flow data for each site. AMD water samples were collected as grab samples and then transported to Skyview Laboratory in Jennerstown, Pa. Samples were tested in the lab for pH, hot acidity, alkalinity, total suspended solids (TSS), total iron, total aluminum, total manganese, and total sulfates. Flow-measuring devices were installed by SCWA partners and volunteers on AMD sites where possible and included notched weirs or collection pipes that were measured using a bucket and stop watch to determine flow. AMD flow measurements, along with associated water quality sampling, were performed on a monthly basis for roughly one year.

To help identify on which side of the stream pollution sources are located, a designation of "river right" or "river left" is used. This is the standard practice that is used by the American Canoe Association when describing locations on a stream. It is very important to understand that these directions are given in relationship to the observer always facing "downstream." In this way, the directional references of north, south, east, and west directions are minimized as streams are constantly shifting the direction in which they flow.

In addition to monitoring 10 AMD discharges, 11 stream locations on Sewickley Creek and its tributaries were also sampled. Flow measurements and chemical samples were taken to establish in-stream pollution loads. Flow measurements were performed to determine the volume of water per unit of time that is flowing through a stream segment. By measuring flow volume and collecting a chemical sample at the same time, the total "load" of each in-stream pollutant analyzed can be determined.

Measuring stream flow relies on an area-velocity method to determine the volume of water flowing through a gaging station per unit time. The method requires that for each monitoring location a cross-section area and water velocity be measured. The flow of a stream location or station can be calculated when the cross-sectional area (square feet) is multiplied by velocity (ft/second) of the flowing water, thus the discharge units are in terms of cubic feet per second (ft<sup>3</sup>/sec). Generally, the cross-section at a particular monitoring station is divided into incremental cross sections or rectangles. Incremental cross-sections are established by stretching a tape measure perpendicularly across the stream (from water edge to water edge) and determining an incremental distance (width) that will yield a minimum of 12 divisions. For example, if a stream was 12 feet wide, then there would be 12 one-foot divisions. In practice, each incremental division (12 for this study) with a calculated width is measured for depth and has a velocity measurement associated with it. Establishing the width of an incremental division at a gaging station is an important aspect of stream flow measurement, and although the same stations will be repeatedly measured, changing water levels in the stream channel can result in a change of the incremental width. Therefore, at each gaging event the stream width is measured and the incremental cross section calculated at each monitoring event.

By monitoring various points of the stream for AMD impacts throughout the watershed, average pollution loads were established for stream segments being affected by abandoned mine drainage. These measured pollution loads are useful in comparing pollution loads developed through computer-generated models used to develop the total maximum daily load (TMDL) for Sewickley Creek. A discussion of the results is presented within the study.

#### **SCWA Restoration Priorities**

The SCWA's priorities are to:

- Assess the Sewickley Creek watershed to identify sources of pollution causing impairments to water quality.
- Develop and implement restoration plans for major pollution sources affecting water quality.
- Identify all AMD locations and abandoned mine areas directly affecting the quality of the stream.
- Identify resources that will assist SCWA in meeting water quality improvement goals.
- Monitor changes in water quality and stream biology as restoration efforts proceed.

- Educate the public about the mission of SCWA, its ongoing involvement in restoration activities, and the importance of conserving the watershed's unique natural and cultural assets through sound land-use practices.
- Improve water quality enough to ultimately remove all impaired stream segments from Pennsylvania's Integrated Waters List.

### **II. Watershed Description**

#### **Overview**

The Sewickley Creek watershed is located in the southwestern region of Pennsylvania in central Westmoreland County. The watershed drains into the northward flowing Youghiogheny River which, in turn, drains into the Monongahela River shortly before it joins with the Allegheny River in Pittsburgh to form the Ohio River.

The headwaters of Sewickley Creek begin as a series of springs that form Welty Run on Chestnut Ridge, above the community of Welty Town. Sewickley Creek's main stem begins north of Pleasant Unity and joins with Welty Run in Norvelt. From there it flows in a west-southwest direction through the communities of Youngwood, New Stanton, Hunker, Yukon, and Lowber, to its confluence with the Youghiogheny River at Gratztown just north of West Newton.

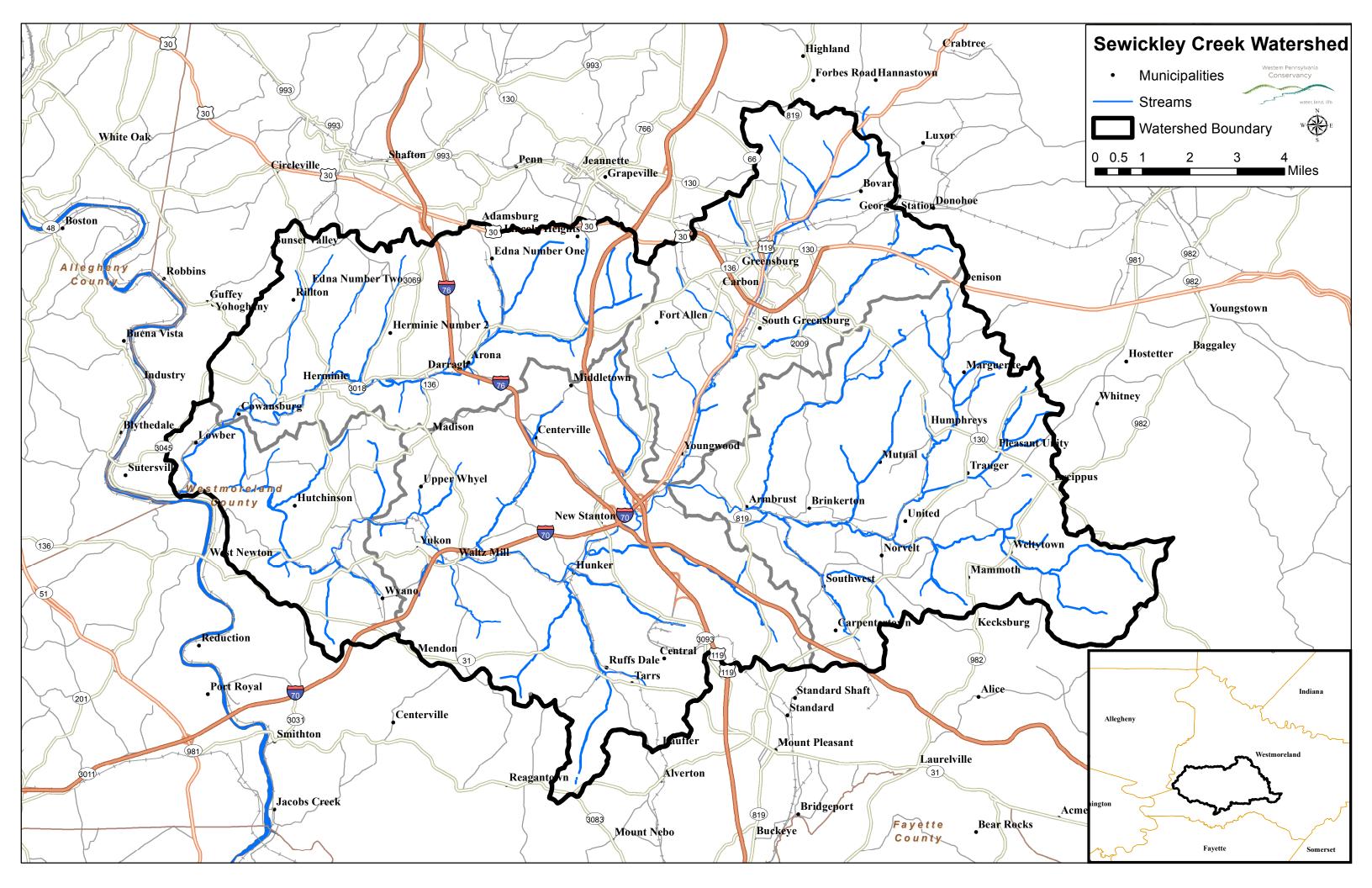
The temperate climate of the Sewickley Creek watershed has an average annual mean temperature of 50 degrees Fahrenheit and an average annual precipitation of 40-44 inches (weather.com/Scarlift, 1971).

The Sewickley Creek watershed is comprised of 19 named tributaries, numerous unnamed tributaries, and main stem Sewickley Creek, which flows approximately 30 miles (47 km) in length. The named sub-watersheds range in size from 1.64 square miles to 30.8 square miles. The largest tributaries to Sewickley Creek are Little Sewickley Creek (30.8 square mile drainage), which enters Sewickley Creek at Cowansburg near its mouth, and Jacks Run (28.6 square mile drainage) which joins the main stem at Youngwood. The entire Sewickley Creek watershed drains 168 square miles.

In 1994, the Sewickley Creek Watershed Conservation Plan reported that over 85% of the land use within the Sewickley Creek watershed fell into the categories of either agricultural operations or forestland. A vast majority of non-rural land use such as urban residential, non-rural mixed use, and industry occur within and adjacent to the city of Greensburg and, to some extent, along the Route 30 and Route 119 corridors. Rural residential and/or mining uses are significant in a few townships such as Mt. Pleasant, South Huntingdon, and Unity.

### Geography

Main stem Sewickley and its tributaries dissect the hills into a dendritic or branching (similar to tree roots) drainage pattern. Two physiographic sections partition the Sewickley Creek watershed. The majority of the land consists of gently rolling hillsides with an increasingly mountainous terrain rising towards the eastern boundary. The rounded hills and open valleys characterize the Pittsburgh Low Plateau section, while the broad ridges and valleys of the extreme eastern portion lie within the Allegheny Mountain Section of the Appalachian Plateau. The underlying rock of these sections is comprised mainly of sandstone, siltstone, shale,



limestone, and coal. Elevations range from approximately 2,180 feet above sea level in the eastern portion of the watershed to 764 feet at the confluence of Sewickley Creek and the Youghiogheny River.

### Geology

The Appalachian Plateau Physiographic Province of Pennsylvania is the geological locality of the Sewickley Creek watershed. The Appalachian Plateau covers the greatest extent of any physiographic province in Pennsylvania, extending from Greene and Somerset Counties in



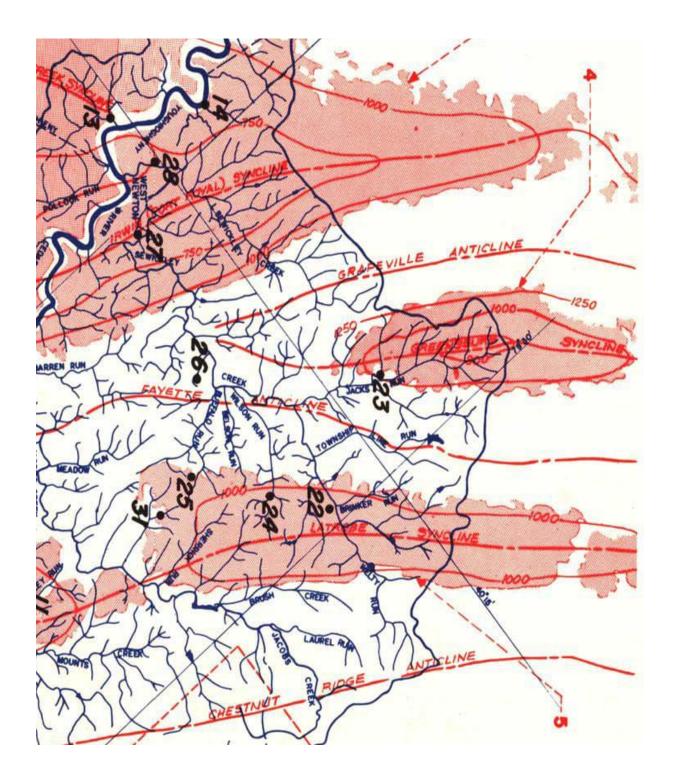
the southwest to Erie County in the northwest and to Wayne and Pike Counties in the northeast. Although the Plateau is a highland area, it has been deeply dissected by stream systems, creating a landscape of deep valleys and rolling hills [Pennsylvania Department of Conservation and Natural Resources (DCNR), 1996].

Chestnut Ridge borders the Allegheny Mountain Section of the watershed in the eastern extreme of the watershed. This physiographic section is made up of

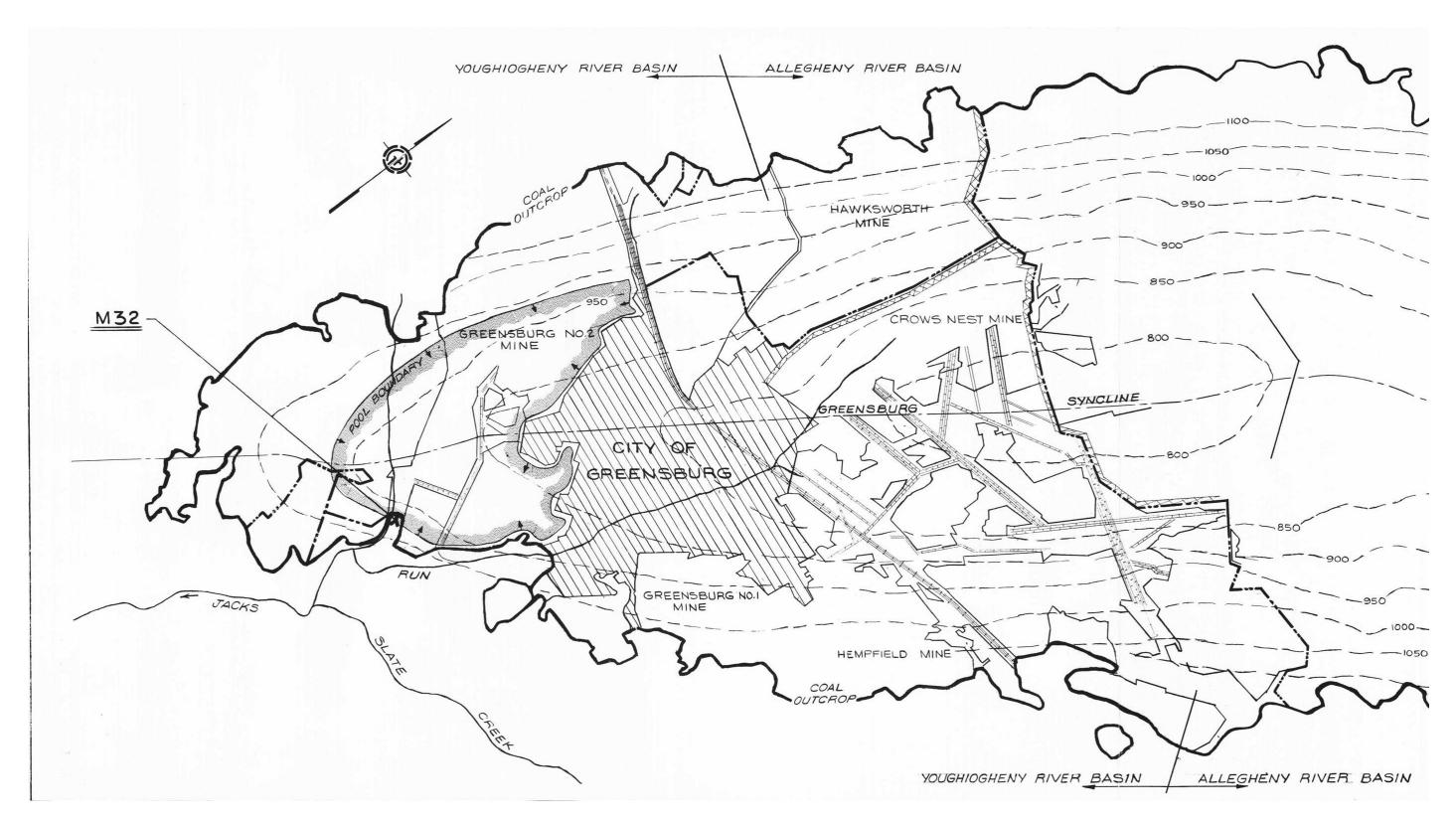
broad ridges separated by broad valleys (DCNR/Pa. Geologic Survey, 1996). Rocks within this section are comprised mainly of shale, siltstone, sandstone and conglomerate, some limestone, and coal.

Perhaps the most significant geological features within the Sewickley Creek watershed are the synclinal basins. These structural basins are particularly significant because of the major coal seams within them. The major structural features within the watershed include the Latrobe Syncline, Greensburg Syncline, Irwin (Port Royal) Syncline, and the Fayette Anticline [Pennsylvania Department of Environmental Resources (DER), 1971]. All of the geologic structures associated with the watershed comprise the Monongahela Group, which contains the Pittsburgh Coal Seam. The Pittsburgh Coal Seam is the thickest coal seam within the synclinal basins and was extensively mined. Presently, all underground mining of the seam has ceased and all the mines are abandoned and flooded.

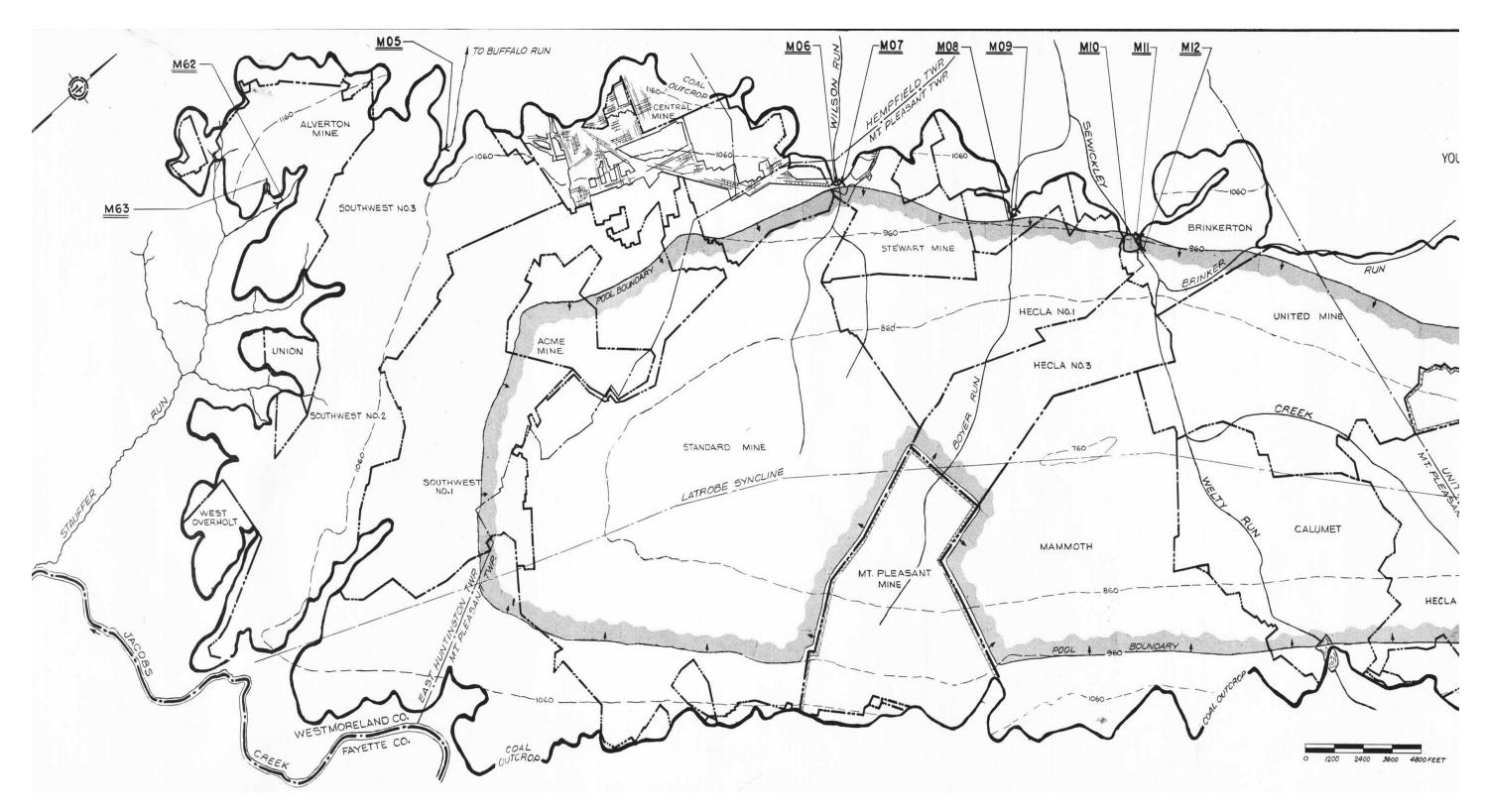
The Irwin (Port Royal) Syncline is located in the northwestern portion of the watershed near Little Sewickley Creek and is comprised primarily of Monongahela Group structural components, with additional portions of the Washington Group scattered throughout the structure above the Monongahela Group. Beginning in the 1860's, the Irwin (Port Royal) syncline was the most intensively mined syncline in the region. The outcrop line of the Pittsburgh Coal Seam in the syncline (where the coal structure rises to meet the surface) encompasses approximately 150 square miles. Approximately two thirds of this area drains to the main stem of the Youghiogheny River and Sewickley Creek. The exposed coal seam near the mouth of Sewickley Creek is the



This map, clipped from the PA DER Scarlift Report for the Youghiogheny, shows the three geologic synclines that underlie the Sewickley Creek watershed and is presented here only as a reference. The areas shaded areas show the extents of the Pittsburgh Coal Seam with relation to the synclinal basins. These areas were heavily deep mined, abandoned and are now flooded. Most major AMD discharges drain from points along the edge of the syncline where the coal "outcrops" to the surface. The numbers refer to figures in the Scarlift Report.



Greensburg Syncline Map – PA DER Scarlift Report – Youghiogheny River 1971



Latrobe Syncline Map – PA DER Scarlift Report – Youghiogheny River 1971



Irwin Syncline Map – PA DER Scarlift Report – Youghiogheny River 1971

lowest outcrop in the syncline basin and mine drainages from the syncline are mostly in this vicinity [Pennsylvania Department of Environmental Resources (DER), 1971].

The Greensburg Syncline, which also contains a portion of the Pittsburgh Coal Seam, is located, as its name suggests, near the city of Greensburg and mostly within the Jacks Run sub basin in the northeastern part of the watershed. Surface strata are primarily the Monongahela group, and the outcrop line of the Pittsburgh Coal Seam encompasses 26.5 square miles. Pittsburgh Coal outcrops at elevation 950 to 1300 ft. and is deepest at elevation 750 in the center of the basin [Pennsylvania Department of Environmental Resources (DER), 1971]. In the past several decades, water quality in Jacks Run has declined due to a substantial amount of mine drainage discharging from a drift opening in the Pittsburgh coal outcrop within the Greensburg Syncline basin.

The Latrobe Syncline is located in the southeastern portion of the watershed near Brinker Run and Welty Run. Surface strata are almost entirely Monongahela Group [Pennsylvania Department of Environmental Resources (DER), 1971]. The outcrop line of the Pittsburgh Coal Seam encompasses approximately 75 sq. miles within the syncline. The Pittsburgh Coal Seam within this syncline is 7 feet thick near Mammoth and 8 feet thick near Mt. Pleasant. The Redstone Seam, located within the Brinkerton area and partially located within the Latrobe Syncline, has also been extensively strip-mined. The northern half of the basin drains to Loyalhanna Creek of the Allegheny River and the southern half drains to Sewickley Creek and Stauffer Run (Jacobs Creek) of the Youghiogheny River system [Pennsylvania Department of Environmental Resources (DER), 1971].

#### **Soil Characteristics**

The consideration of soil types and associations is important when determining the best particular land-use activity for a specific area, keeping in mind that certain land uses are not always suitable for a specific soil type. Soil associations are comprised of two to three major soil types along with a few minor types. Local variations in characteristics and types occur as a result of relief, depth to bedrock, slope, and drainage quality. Descriptions of the soil associations located within the Sewickley Creek watershed are as follows:

- The Dormont-Guernesy-Culleoka soil association consists of soils that are formed in materials weathered from predominantly calcareous shale and limestone. These soils are typically found on rolling summits, shoulders, and side slopes.
- The Gilpin-Warton-Ernest soil association is formed in materials weathered from acid shale, siltstone residuum, and colluvium. These soils are generally found on undulating ridge tops and hilly to steep slopes.
- The Upshur-Gilpin-Vandergrift soil association is comprised of soils formed in colluvium and residual materials weathered from red clay and shale and are found on ridges and hill slopes in intermountain valleys. This association is particularly susceptible to landslides.

- The Laidig-Buchanan-Hazleton association is formed in colluvium and residual materials weathered from sandstone, siltstone, and shale. This association is generally found on ridge tops and on the upper to middle side slopes of mountains.
- The Monongahela-Weinbach soil association is formed in materials weathered dominantly from old stream and river alluvium, and is commonly found on smooth to rolling summits, shoulders, terraces, and side slopes.
- The Meckesville-Keck Kill soil association is formed in colluvium and residual materials weathered from red shale, siltstone, and sandstone. Soils are steep and well drained from the upper part of mountains and ridges.

### **Water Quality Standards**

The Chapter 93 Water Quality Standards of the Pennsylvania Code, Title 25, Department of Environmental Protection reports protected water uses, statewide water uses, and the water quality standards that protect water uses. The headwaters of Sewickley Creek, including the Welty Run tributary system, are classified as a High Quality Cold Water Fishery (HQ CWF) to just below the town of United. From this point to its confluence with the Youghiogheny River, Sewickley Creek is designated as a Warm Water Fishery (WWF).

#### **Watershed Impairments**

Sewickley Creek watershed is affected by a variety of point and non-point source pollutants including:

- AMD pollution and sediment from past coal mining
- Increased nutrient and sediment loads from poor agriculture practices
- Sewage contamination from failing or non-existent septic systems
- Uncontrolled stormwater drainage
- Sediment from dirt and gravel road runoff
- Erosion issues from poor streamside vegetation management
- Flooding from urban channelization
- Acid deposition at the headwaters of the watershed

Of all of these impairments, AMD is the most prevalent. Evidence of past mining activities is present throughout the watershed, from rural areas to those more urbanized. Although both surface and underground mining has taken place, abandoned underground mines have had the largest effect on water quality in Sewickley Creek. AMD discharging from underground mines accounts for the majority of water pollution within the watershed. The largest discharges flow at rates of over 1,000 gallons per minute and sometimes several thousands. Also associated with abandoned underground coal mines is erosion from mine spoil piles, the waste product of coal mining and processing. Often these piles were located near streams, and because many are un-vegetated due to the material they are made of, they can easily erode into

waterways. Surface mining has also caused water pollution problems in some instances. Of particular note are those developed before modern day mining regulations required pollution controls. Often these older surface mines create AMD high in acid and aluminum, which are particularly harmful to aquatic life. Thankfully, there are far fewer water quality problems created by poorly reclaimed surface mines than underground mines in Sewickley Creek.

Agricultural practices in some areas of the watershed add nutrients and sediment loads to the streams as well. Some stream segments are directly accessible by cattle, which can trample streambanks and expose the water to animal waste. Direct runoff from barnyards can also impair receiving streams with the same pollution sources. Runoff from agricultural fields can enter waterways when little or no streamside vegetation is present to act as a buffer.

Other sources of non-point source pollution also affect areas of the watershed. Poorly functioning or non-existent septic systems, uncontrolled stormwater, sediment from dirt and gravel roads, poor forest harvesting practices, and poor streamside vegetation cover all affect the watershed. Several stream segments have severe erosion and sedimentation problems related to land-use activities in the more residential areas of the watershed. Acid deposition affects the watershed's streams with little buffering capacity. However, none are as widespread or destructive as the problem caused by abandoned underground coal mines and their associated AMD.

Extraction of natural gas has also been common throughout many areas within the Sewickley Creek watershed, and has led to some erosion and sediment problems. With the increased production of gas from deep shale deposits using hydraulic fracturing (fracking) pollution issues associated with those activities is also a concern. Sediment from well pad construction and pipeline installation can be significant issues if erosion and sediment controls are either improperly installed or not installed at all. Surface pills of toxic materials during truck transfer or accidents at well pads, improper waste disposal, and migration of methane into water sources are causes for concern.

### **Studies of Sewickley Creek**

Previous studies have identified AMD pollution problems throughout the Sewickley Creek watershed. Two examples are the DER's 1971 Operation Scarlift Report and a 1999 collaborative study by the United States Geological Survey (USGS), the U.S. Department of Energy (USDOE) and the National Energy Technology Lab (NETL) - Water-Quality Conditions During Low Flow in the Lower Youghiogheny River Basin, Pennsylvania, October 5-7, 1998.

The Operation Scarlift Report found fourteen major discharge sources of AMD within the boundaries of the watershed, citing eleven abandoned mine sites responsible for the discharges. According to this report, at the time, Sewickley Creek was considered to be the most polluted

sub-basin within the Youghiogheny River watershed with the main stem of Sewickley Creek contributing more acidity and iron than any other Youghiogheny River tributary. Additionally, the report found that the tributaries of Little Sewickley Creek and Township Line Run also were polluted by AMD but to a lesser degree. Over the years, many of the mine discharges that produced acid water have turned net alkaline due to flooding of the mines and other naturally occurring processes. However, pollution from metals, primarily iron, still pollute Sewickley Creek and many of its tributaries.

The USGS/USDOE/NETL study was a geophysical investigation of the Lower Youghiogheny River, which includes Sewickley Creek. It used airborne remote sensing to identify water pollution sources using infrared and electromagnetic conductivity sensing equipment suspended from a helicopter, which flew regular transects of the entire Sewickley Creek watershed. Ground-truthing of remote sensing data identified AMD sources. In addition, a water quality synopsis of the Lower Youghiogheny River watershed was performed. From the data collected, it was determined that 60% of the AMD pollution load within the Youghiogheny River came from abandoned coal mines in the river's tributaries and that 44% of that load came from Sewickley Creek. It was also found that 40% of the pollution load in the Youghiogheny River came from artesian flow directly into the river from abandoned underground mines.

Because of the many underground mines were located within Sewickley Creek, the watershed also contains numerous areas associated with those mines that contain abandoned piles of mine waste, or "gob" piles of various sizes. Because these large un-vegetated mine waste piles often contain acid bearing rock, they sometimes serve as additional pollution sources to Sewickley Creek. In addition to acidic runoff during rainstorms, they also produce sediment as they erode over time. Evidence of this erosion can be seen within the substrate of numerous stream segments throughout the watershed. However, over the many years since the underground mines ceased operation, many of the mine spoil piles have been "reprocessed" to remove the coal that was discarded along with the waste rock because of old inefficient mining practices. Once the coal was removed, the reprocessed waste piles were then "reclaimed" by covering them with soil and planting them with grasses, significantly reducing their ability to pollute. *Project Gob* Pile was a study completed in 2001 by the Western Pennsylvania Coalition for Abandoned Mine Reclamation (WPCAMR) to evaluate the feasibility of removing, reprocessing, or reclaiming the remaining coal waste piles in Westmoreland County. It identified 42 gob piles of various sizes throughout Sewickley Creek. Today, some of those mine waste piles have been addressed but the many that remain very likely contain low amounts of usable coal, which make them unlikely candidates for reprocessing or removal. Those remaining will likely be reclaimed over time as funding becomes available to address them or market conditions change to make them more valuable to reprocess and reclaim.

#### Restoration

Restoration efforts for improving water quality within the Sewickley Creek watershed should focus on reducing the variety of impacts affecting the watershed. The implementation of restoration efforts should lead to an improvement in water quality, which would in turn lead to the removal of impaired stream segments from the integrated waters list. A potential for increased recreational activities and marketability for residential and industrial areas could follow. Current restoration efforts include several active and passive AMD treatment systems as well as enrollment of private land in the Conservation Reserve Enhancement Program (CREP) to install stream bank fencing on farmland.

Recreation, which is becoming an increasingly valuable economic resource, could become a major source of revenue within the region once degraded areas within the watershed are addressed and water quality improves. Much of the streamside land remains wooded and riparian conditions and in-stream habitat is generally of good quality throughout most of the watershed. Restoration of degraded stream water quality would likely lead to higher recreational use for recreational fishing and other activities. An abandoned railroad traverses some of Sewickley Creek and could be developed as a rail trail and serve as another recreational resource.

#### **III. Problem Identification**

#### Overview

The Sewickley Creek watershed is impaired by several types of non-point source (NPS) pollution. NPS gets its name from the way that the pollution is produced and/or how it is transported to waterways. NPS pollution is usually created over a broad area and often pollutes in the same manner, emanating from many individual sources within that area. Within the city of Greensburg and its surrounding suburbs, for example, a significant portion of the area is paved with asphalt or concrete and used as parking for multiple businesses. When vehicles park on the paved areas, oil, grease, gas, and other various toxic fluids leak from these vehicles and collect on the pavement. Then, during a rain event, these fluids are washed from all of the paved surfaces and transported to the drainage ways that eventually lead to nearby streams. The resultant dirty runoff water is NPS pollution that comes from a broad area and reaches the stream from many sources that can collectively have substantial negative impacts on the stream.

NPS pollution is usually classified under the general categories of silviculture (forestry-related), agriculture, nutrients, roads, highways and bridges, urban areas (low impact development) - stormwater and construction runoff, resource extraction, atmospheric deposition, and hydro-modification and habitat alteration. Over the years, a variety of "best management practices" (BMPs) have been developed to address NPS stemming from these various sources. A good source of information on NPS pollution and the methods of managing its impacts can be found on the U.S. Environmental Protection Agency website and that of the Pennsylvania Department of Environmental Protection, Bureau of Conservation and Restoration.

#### **Nutrient Pollution**

Nutrient pollution is the presence of unnaturally high concentrations of nutrients, primarily nitrogen and phosphorous, in surface or groundwater. Sources of nutrient pollution include:

- Agricultural runoff from fields, pastures, feedlots, and barnyards
- Discharges from septic tanks
- Faulty leech fields and sewage treatment systems
- Atmospheric deposition from combustion sources such as coal and oil-fired power plants
- Urban runoff
- Runoff from golf courses



Nutrient pollution from faulty septic systems is a potential source of excessive phosphorus to streams.

Nutrient pollution can cause excessive algal growth which then causes oxygen depletion which can then, in more extreme cases, lead to fish kills. The main source of nitrogen pollution is atmospheric deposition, with agriculture being the second leading source. The chief source of phosphorous pollution comes from agricultural activities with septic discharges contributing to the next greatest proportion.

Each of the five subwatersheds of Sewickley Creek show signs of having nutrient pollution concerns. Evidence of faulty septic systems at rural homes as well as broken wastewater lines in communities was present throughout the watershed.

A more detailed study of the nutrient pollution problems within the entire watershed should be conducted. One of the difficulties with identifying nutrient pollution sources in the watershed is the AMD problem, which can mask a nutrient pollution problem by overwhelming it. Once some of the AMD-impacted stream segments are addressed, it is likely that nutrient pollution concerns will become more apparent. Identifying these areas prior to AMD cleanup is very difficult and is beyond the scope of this study.

### Agriculture

Farmland is an important resource for the Sewickley Creek watershed community. Agriculture is the predominate land use type in the area, covering 46% or roughly 77 square miles of the 168 square miles of the entire watershed.



Unrestricted livestock access to streams can cause sedimentation, erosion, and nutrient pollution.

Agriculture in and of itself is not categorized as a source of NPS pollution, but there are operations that use poor management practices when cultivating crops and livestock. Potential agricultural pollution can come from operations of any size. This includes the small farmette with a few random livestock animals (including horses) to the large, several hundred cow dairy operation. Pollution can come from these operations in the form of sediment and nutrients captured in runoff from cropland and pastures. Poorly planned tillage practices on cropland, such as plowing without consideration to land contours and drainage, can lead to erosion of excessive amounts of sediment during rain events. Similarly, grazing livestock

with unrestricted access to streams can also increase sediment and erosion issues. As the animals travel to the streams to drink, they trample the stream bank and graze stabilizing vegetation, making banks vulnerable to storm events. Manure and fertilizer can be a source of nutrient pollution as well. Applying manure, chemical fertilizers, and lime to fields and pastures at higher rates than what soils and crops can absorb leaves the excess nutrients free to be carried away with runoff to near-by waterways. The installation of agriculture subsurface "tile" drainage is

also a conduit for excess agricultural nutrients to enter streams. Tile drainage installed in crop fields can be a useful tool to allow agriculture operations earlier access to fields in the spring and after a rain but, unfortunately, these systems of shallow, perforated pipe are often installed to transform small headwater tributaries and wetlands from their natural state into more cropland. There are many negative effects to utilizing tile drainage in this manner. This type of drainage becomes a more likely source for nutrient runoff because the water that would typically percolate slowly through the substrate now has a solid pathway. This type of drainage also eliminates habitat for aquatic life as well as valuable flooding buffers.

Agriculture operations are prevalent throughout the watershed. Many of these operations were found to employ best management practices (BMP) on their operations. Some of these BMPs include:



Subsurface "tile" drainage installed to "control" the flow of headwater tributaries alter stream character and act as a conduit for nutrients to enter waterways.

- Stream bank fencing to control livestock access to streams
- Riparian buffer plantings to protect stream banks in both pastures and crop land
- Implementation of nutrient management plans to regulate the amount of manure and fertilizer added to fields
  - Stabilized stream crossings
  - Stabilized spring developments

Despite these BMPs in place on many operations within the watershed, there are still large operations and small farmettes in each of the subwatersheds on which poor management choices can be seen taking place.

Specific operations are not cited in this plan, however, planning with the Westmoreland Conservation District should begin with approaching landowners about implementing BMPs. Part of this outreach should include ways in which to assist these operations with installing the suggested BMPs.

#### Urban Areas - Low Impact Development, Stormwater Runoff, and Construction

Under normal, unaltered conditions, a stream will operate within a state of equilibrium or "balance" that has been established during the formation of the stream over a very long period of time. This balance will remain even during times of natural storm events. If this balance is upset by outside forces such as the activities of humans that increase the amount of stormwater runoff, the stream will try to return to its natural state of balance by altering its character. Man-made changes may include:

• Widening of the stream channel

- Sleuthing of outside bends
- Down cutting of the streambed itself

Under normal, balanced conditions, streams will erode their banks naturally but not excessively. These and other man-made changes, however, affect the stream banks by forcing them to erode at a much higher rate than normal. Aside from sedimentation and erosion pollution, stormwater runoff is the major contributor of bio-hazardous bacteria entering the stream from manure lots and faulty sewage systems that are flooded during storm events.



The watershed's topography pattern of headwater steep slopes and multiple valleys makes stormwater flooding issues a prevalent and repeating occurrence in multiple communities throughout the watershed. Water velocities can become quite high during periods of very high flow and many areas of the watershed show signs of flood damage. Most of the flooding disturbance is located in areas where streams are parallel to roadways or where a stream has been altered by a bridge and at the end of a channelized section.

Closely related to stormwater runoff is stream bank stabilization. Stream bank failure often takes place when stormwater is released to a stream too quickly. This commonly occurs around construction sites and urban areas where the ground around a stream has lost its ability to absorb the stormwater and/or slow the water's entrance to the main stream channel. This rush of stormwater can quickly overwhelm the balance of a stream and its ability to dissipate the energy created by surging waters during high flows.

During accelerated stream bank erosion, excess sediment is deposited into the stream which can degrade habitat for aquatic animals and build up in low gradient areas, creating sediment dams that exacerbate flooding problems. Additionally, eroding banks can eventually encroach on structures located too close to the stream channel and compromise their integrity.

Construction and stream hydrologic/habitat modification appear to impact the watershed primarily in the most urbanized areas of the watershed. Greensburg is the largest urban area of the watershed and is the area that is most associated with these types of pollution. The Greensburg area is drained by the Jacks Run and Slate Creek sub-watersheds. As discussed previously in the introduction of this section, pollution is generated on paved surfaces and is washed into streams during periods of rain or snow melt. Some stream and tributary sections



Jack's Run, a subwatershed of Sewickley Creek, is enclosed within concrete channels in multiple sections throughout its drainage.

have been channelized with solid, usually concrete structures, for flood control to protect homes and businesses that have been built within the flood plain. Although these structures control water during periods of high flow, they are detrimental to natural stream conditions and functions. It is highly unlikely, though, that these concrete lined sections will be returned to their natural stream conditions so, for this assessment, these areas are solely noted as impacted sources.

The watershed is transected by several large highways including the Pennsylvania Turnpike and an additional toll road. The path in which these highways were built inevitably



Highway construction can have direct sediment impacts to streams when proper erosion and sediment plans are not followed.

changed and altered the natural channel of multiple streams and tributaries of the watershed. In addition, construction work done along these highways can lead to additional sediment and runoff entering waterways.

Many of Pennsylvania's urban areas have ordinances that include stormwater management. Management includes the regulation of the size of culverts and ditches through which runoff water travels. It also includes the installation of slow draining catch basins to limit the amount of stormwater that enters waterways during a storm event. Another requirement is the use of pervious materials for sidewalks and parking lots in order to allow direct absorption of surface water.

### Roads, Highways, and Bridges - Dirt and Gravel Roads and Abandoned Railroad Lines

Access to many of the more rural areas within the watershed is by way of dirt and gravel roads.

Additionally, maintenance and access roads to the numerous gas wells are also constructed of dirt and gravel roads. By design, these types of roads hold the potential to pollute streams through erosion and sediment collected in runoff. In 1997, when the gas tax legislation was amended, Pennsylvania enacted the Dirt and Gravel Roads Program (DGRP). This innovative effort funds



A headwater tributary of the North Fork of Sewickley has eroded its bank and travels along a paralleling mining site access road for several hundred feet before entering back into its original channel.

environmentally sound maintenance of unpaved roadway sections identified as sources of dust and sediment pollution through Section 9106 of the Pa. Vehicle Code (PACD website).

The DGRP is a cooperative effort between local township municipalities and the conservation districts. The program assists a township in identifying problem roads and implementing BMPs that reduce or eliminate sediment from runoff.



An abandoned railroad line can be seen at the confluence of Sewickley Creek and Welty Run.

In addition to the many dirt and gravel roads, historic railroad lines also interlace the watershed, often paralleling Sewickley Creek and its major tributaries. These lines were the primary transportation system to move coal and coke from sites within the watershed to Pittsburgh and rail placement along waterways allowed for easier transfer of materials to barges. With the decline of the coal industry, the railways have been gradually abandoned over the decades. These abandoned railways have had the metal rails and most of the wooden ties removed from the foundation bed and have been left

alone to be reclaimed by the environment. Most of the lines now sit vacant with shrubs taking advantage of the unused space. In some areas, the paralleling streams are encroaching on the rail beds and eroding them away. The underlying structural composition of the rail beds makes them susceptible to erosion.

Both dirt and gravel roads and abandoned railroad lines are sources of sediment pollution throughout the watershed. Due to the rural nature of these areas, they are also utilized by all-terrain vehicles (ATVs), which can exacerbate erosion issues.

#### **Illegal Dump Sites**

Another occurrence in the remote areas of the watershed, including headwater streambeds, rural hillsides, back roads, and old coal mines, is the unauthorized and illegal dumping of garbage and/or debris. These dump sites are often littered with old tires, appliances, furniture, and other random bulky items that people no longer want. These sites seem to perpetuate themselves over time and with continued use can cause a variety of environmental and health problems such as chemical intrusion, erosion, and aesthetic concerns.



#### **Silviculture**

Forests provide a variety of resources and services to the watershed including:

- Timber production
- Wildlife habitat
- Water filtration
- Ground stabilization
- Landscape aesthetics
- Recreation
- Employment through management and harvesting

With forestland being the second most abundant land use type (as listed in the Sewickley Creek Watershed Conservation Plan) at just under forty percent and second to agriculture, the timber industry plays a significant role within the watershed. Log removal involves the use of



equipment that requires the construction of numerous roads and staging areas for storage and loading. Excessive erosion and sediment can be generated if roads and staging areas are not properly constructed using BMPs.

Logging operations also often necessitate the crossing of streams. To assure minimal impacts, the construction of stabilized stream crossings is necessary. Proper construction of these crossings is critical in limiting erosion and sediment loss as well as protecting in-stream habitats. Logging roads should be constructed in a manner that limits erosion. Erosion problems can be limited by utilizing techniques that follow the natural land contours and prevent water from flowing long distances down steep slopes. They can additionally be limited with the frequent use of road cross drains including water bars, dips, or culverts.

### **Acid Deposition**

Acid precipitation NPS affects all of Pennsylvania and results in streams and waterways that are much more acidic than normal. Parts of Welty Run in the upper Sewickley Creek subwatershed display characteristics of acid deposition.

The following information, obtained from the website of the Pennsylvania Fish and Boat Commission, is an excellent description of this airborne pollution source.

Note: The following is a text-only file of a Fish and Boat Commission publication that includes graphics and a map. Contact the PFBC if you would like a free copy of the complete publication.



### **Acid Precipitation**

Pennsylvania is blessed with thousands of miles of freshwater streams ranging from high mountain headwater tributaries to the slower moving lowland varieties. All are affected to some degree by acid deposition. The purpose of this brochure is to acquaint the reader with the causes, effects and the need to reduce its effect on our aquatic environment. "The creek is a symbol of our greatest resource; as the creek flows, so flows mankind."

During the past couple of decades, thousands of scientific reports have documented the serious effects of acid deposition in North America and Europe. The control of the air pollutants that cause acid rain and deposition has become a battle cry for conservation-minded citizens in many industrialized countries. Because Pennsylvania waters receive the highest amount of acid deposition of any state in the nation, the Pennsylvania Fish and Boat Commission is particularly concerned about this problem.

Acid deposition is primarily the result of human-made emissions from burning fossil fuel, automotive exhausts and other industrial processes, which emit sulfur dioxide ( $SO_2$ ) and nitrogen oxide ( $NO_x$ ) gases. These pollutants are transported in the atmosphere, chemically transformed, and deposited either as wet deposition (such as rain, sleet or snow) or in the form of sulfuric and nitric acids, or as dry deposition in the form of sulfate and nitrate particles. This deposition has been shown to have adverse effects on streams, lakes, forests, buildings, drinking water and human health.

Pennsylvania receives the most acid deposition of any state in the nation because, in addition to being the third highest producer of the gases that cause acid deposition, we are also located downwind from the highest concentration of air pollution emitters. Monitoring stations located throughout the Commonwealth reveal that the pH of our rainfall averages an incredible 4.0 to 4.1, which is many times more acidic than unpolluted rain.

Different areas of the state may respond differently to acid deposition, depending on the region's natural ability to "buffer" or neutralize the incoming acidity. This ability of a body of water to neutralize acids is called its "acid neutralizing capacity," and depends on the dissolved mineral content in the water, which, in turn, depends on the composition of the soils and bedrock in the watershed. If sandstone or igneous rocks such as granite or basalt primarily underlie the watershed, then the streams and lakes in the region will have low acid-neutralizing capacity. If soils and waters of an area continually receive acid deposition, their neutralizing capacity will decrease. With little or no neutralizing capacity, the water will gradually acidify and fish and other aquatic life forms will be adversely affected.

The acid-neutralizing capacity of a waterway is measured by a test called alkalinity, which can be expressed as milligrams per liter (mg/I), or parts per million (ppm) of calcium carbonate. According to international standards, streams and lakes are considered vulnerable to acid deposition if base flow alkalinity values are 10 mg/l or less. These waters are especially susceptible to effects of the continued influx of atmospheric acids. Using this criterion, about one-third of the 4,800+ miles of stocked trout streams in Pennsylvania are considered vulnerable. These streams are indicated on the accompanying map and county lists. In addition to the stocked trout streams on the map, there are even more miles of unstocked waters throughout the Commonwealth that are vulnerable to acid deposition. Some of these vulnerable waters in Pennsylvania are lakes, but most are high-quality small, mountain streams that support naturally reproducing trout populations.

What is the effect of acidification on vulnerable streams and lakes? As a waterway becomes acidified, algae and rooted aquatic plants die off, reducing the available food supply for aquatic insects and fish. Healthy aquatic insect communities are replaced by acid-tolerant individuals, which are not as desirable or abundant a food supply for higher organisms such as certain species of fish. More tolerant fish species may begin to replace the original populations, or the fish may disappear entirely from a waterway.

Fish populations can also be directly affected in several ways. Acidity can stress a fish's basic body function, because it upsets the fish's ability to regulate its blood chemistry. Toxic metals, such as aluminum, can be leached from the soils and delivered to the lakes and streams by acidic rainfall. For example, small amounts of dissolved aluminum can cause mortality in fish by damaging their gills and decreasing sodium in their bloodstream. Finally, fish eggs and fry are very susceptible to high acidity and toxic metals. Partial or entire year classes can perish, leaving older, more resistant individuals to maintain a remnant population.

Over the years, the Fish and Boat Commission has been forced to change many of its stocking patterns on streams receiving increased acidity from acid deposition. In the beginning stages of acidification, it might be possible to change a stocking pattern simply by using a different species of fish. For example, one pattern change may be to change from the stocking of acid-sensitive rainbow trout to the more acid-tolerant brook trout. Another strategy is to change stocking schedules, so that the sensitive fish are not stocked preseason, when the heavy spring rains and winter snowmelt increase the acid and aluminum content of the streams.

Finally, the Fish and Boat Commission may be forced to discontinue stocking altogether when even the brook trout cannot live in the acid runoff. A review of the stocking records in Pennsylvania indicates that since the late 1950s, more than 90 streams have been subject to trout stocking management changes as a result of increasing acidity. Since 1969, the Fish and Boat Commission has had to remove

18 waterways from the trout-stocking list, because of degraded water quality caused by increasing acidity and toxic aluminum.

Currently Fish and Boat Commission managers test water samples from known vulnerable streams every year during March and April. To make future management decisions, fisheries management personnel have also conducted studies on the chemical characteristics and survivability of trout stocked in sensitive water.

Numerous government and university studies have also been conducted in Pennsylvania. Studies conducted by the U.S. Environmental Protection Agency indicate that the Pocono lakes region is the second most negatively affected lakes region in the country. A Lehigh University study determined that out of 160 lakes in the Pocono region for which there were data, 70 percent were sensitive to acid deposition and 8 percent were already acidified. Scientists from the Pennsylvania State University and from California University of Pennsylvania conducted many watershed studies on the Laurel Hill Ridge, which contains the majority of the natural trout streams in southwestern Pennsylvania. One of their studies revealed that 10 of the 61 watershed samples were fishless and concluded "26 percent of the headwater streams on the Laurel Hill are severely impacted by acidification episodes." The National Academy of Science has stated that protection or recovery would occur on 80 percent of the nation's affected waters if sulfate deposition were reduced to 17 kg/ha/year (15 pounds/acre/year). In Pennsylvania, sulfate deposition ranges from 25 to 45 kg/ha/year (23 to 41 pounds/acre/year), so a reduction of approximately 50 percent would be required.

The Pennsylvania Fish and Boat Commission have actively sought legislation to control acid deposition since 1978. Our 1986 "Policy on Acid Precipitation" urged the federal and state governments to reduce SO2 and NOx emissions by 50 percent. After 13 years of study, deliberation and hearings, Congress approved the Clean Air Act Amendments of 1990. Many provisions including acid deposition were new to the Clean Air Act. One of the goals of the acid deposition provision is to reduce annual SO2 emissions by 10 million tons/year from the 1980 emission levels and cap the annual utility SO2 emission rate at approximately 8.9 million tons by the year 2010. Another important goal of the provision is to reduce annual NOx levels by two million tons from the 1980 levels, but unfortunately no caps were put in place. The Congressional findings and passage of the Clean Air Act Amendments were historic in a sense that the long debate about the cause and effect of acid rain was ended.

The Pennsylvania Fish and Boat Commission was pleased that Congress finally passed the necessary legislation that will hopefully end the acid rain crisis. Scientists are optimistic that the 1990 Amendments will benefit Pennsylvania's affected waterways. A National Acid Precipitation Assessment Program (NAPAP) report speculates that because the major emission sources are located along the Ohio River Valley, Pennsylvania should experience a reduction of SO2

emissions by greater than 50 percent and a SO2 deposition rate of less than 17 kg/ha/year. Although NAPAP will continue to monitor deposition rates and test water quality, we will not know the final results of the Clean Air Act Amendments until the year 2010.

The passage of the 1990 Amendments is a credit to all the concerned anglers, citizens and scientists who took the time to voice their opinions for cleaner air. However, our work is not done. Attempts will continuously be made to weaken the current legislation. We all must remind our Congressional leaders that acid deposition is still a major concern and that complete enforcement of the 1990 regulations is a must. We can also do our part to limit air pollution by conserving energy, promoting mass transit and supporting strict automobile emission inspections. Future generations of Pennsylvanians are counting on us to protect, conserve and enhance the water resources of our state.

#### **Acid Activity**

Many people not familiar with chemistry have a hard time understanding the pH scale. The scale represents the potential hydrogen ion activity of a water environment and therefore its relative corroding action. Although the scale contains 15 numbers (0 to 14), the acid activity at a pH of 7 and above is not very significant. Numbers below a pH of 7 represent increased acid activity and potential harm to the environment. Most organisms live in environments where the pH ranges between 6 and 9. At pH levels below 4.5, the acid activity is too toxic for most organisms to survive.

A pH number is a negative logarithm, so the number is a decimal part of a whole number. A change from one whole pH number to another represents a tenfold increase or decrease in the acid potential of a water environment. The chart above shows several ways to present the concept of acid potential (pH) and some pH levels for common liquids in our environment. [Note: Chart is omitted in this "text only" version.]

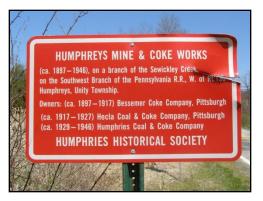
Although all Pennsylvania waters receive acid deposition, the locations of the most vulnerable streams are directly related to the geology and physical features of the state. By comparing the larger map above with the smaller one to the right, it becomes apparent that most of our vulnerable streams are located in the sandstone mountainous regions of Pennsylvania. [Note: Maps are omitted in this "text only" version.]

As mentioned at the start of this section, some portions of Sewickley Creek show depressed pH levels and elevated aluminum levels. The areas in which these characteristics are observed have had very limited or no mining done nearby, leading to the conclusion that the low pH levels and the high aluminum levels in these areas are a result of acid precipitation. Some

stream segments within Welty Run draining Chestnut Ridge are suspected to be impaired by acid rain impacts.

#### **Resource Extraction**

Resource extraction is the development of minerals such as coal, limestone, sand, shale, gravel, oil, and/or natural gases from underground sources for commercial use. Primary methods of recovering these minerals include surface and subsurface mining as well as the drilling of shallow and deep wells. Strip mining, quarrying, open-pit mining, and mountain top removal are examples of surface mining techniques used to reach these underground mineral resources. With these methods, the overlaying land surface and bedrock is removed to provide access to the minerals. Subsurface or underground mining utilizes the digging of tunnels or shafts into the earth's surface to access and remove the minerals. Longwall, room and pillar, drift, slope, and shaft mining are all examples of underground mining techniques.



Gas well drilling differs slightly in technique depending on the depth of targeted natural gas, but involves boring and casing a hole drilled into the ground several hundred to thousands of feet then capturing and extracting the encased gas. The surface pad needed for any well drilling ranges in size from 4-6 acres.

Erosion and sedimentation, forest fragmentation, and water pollution from abandoned and active mining and drilling sites are all impacts associated with resource

extraction activities.

The Sewickley Creek watershed is host to multiple types of resource extraction. Some of these types of extraction include surface and subsurface coal mining and shallow and deep Marcellus Shale gas drilling. Impairment from mining-related resource extraction has been identified as the number one NPS pollution problem of the area. Evidence of coal mining was observed in almost every community throughout the watershed. Examples of this evidence included large, several thousand ton refuse or "boney" piles sitting within the riparian zone of the streams, reclaimed strip mining sites, and historic coke ovens dotting the landscape. Additionally, both shallow and deep gas wells are also prevalent in the watershed in both the rural and urban areas.

### **Abandoned Mine Drainage**

The most prevalent pollution problem within the Sewickley Creek watershed stems from past resource extraction.

Abandoned mine drainage (AMD) is a term given to water that has been polluted due to mining activities. A mineral called pyrite, which is often contained between coal and shale seam layers, produces sulfuric acid through a series of complex chemical reactions when it is exposed

to oxygen and water. Under normal and undisturbed ground conditions, little or no chemical reactions occur. After mining, whether surface or underground mining, the pyrite layer is exposed to oxygen and water at which point the chemical reaction that forms AMD begins.

Depending on the chemical makeup of the rock layers, highly acidic water can be produced. The acidic water often leaches toxic metals from the rock layers it migrates through, carrying them suspended in solution until it reaches stream water of more neutral pH. As these metals drop out of solution, they often discolor the waterway or streambed and become deposited in the stream channel.



Several portions of the Sewickley Creek watershed exhibit the orange coloration that is indicative of AMD impairment.

Metal precipitation in AMD is highly dependent on pH. At very low pH, AMD-polluted water can look clear and clean because the metals are completely dissolved in the water. As a general rule, as water pH rises and acidity decreases, the metals will begin to precipitate. At a 4.5 pH, aluminum will usually begin to precipitate from AMD and will impart a white cast to the water or rocks that it comes in contact with. Approaching pH 6, iron begins to precipitate and will color the water or stain the stream bed orange. This orange color is the signature characteristic associated with a stream that is impaired with AMD.

Miles of stream in the Sewickley Creek watershed display the tell-tale orange coloration of AMD and can be seen in both residential as well as forested areas. The Operation Scarlift Report, a major effort by the Pennsylvania Department of Environmental Resources (DER-1971), found fourteen major sources of AMD within the watershed, citing eleven abandoned mine sites responsible for the discharges.

### Impairment of Water Quality and Aquatic Life

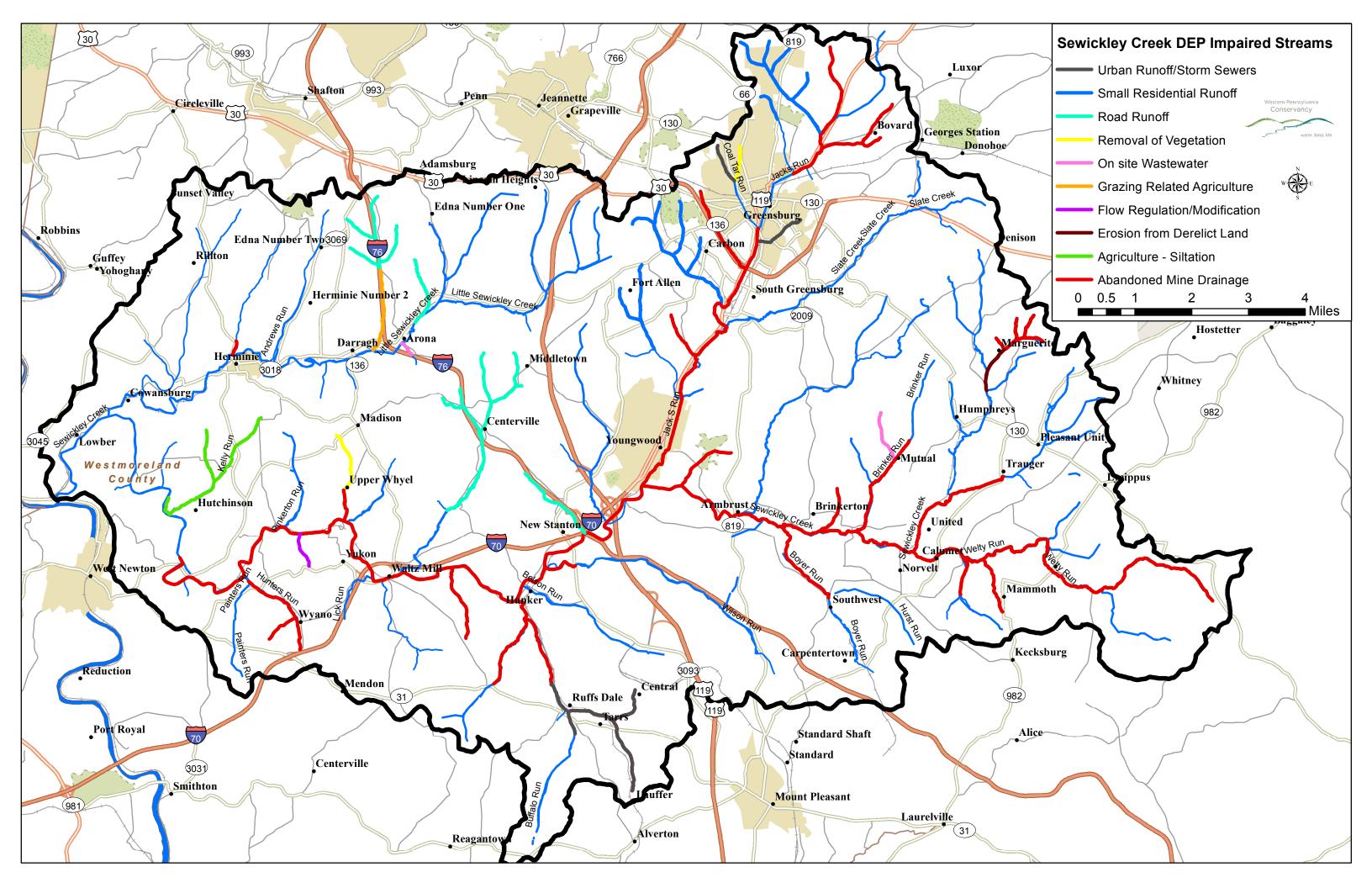
NPS pollution has the most profound impact on the plant and animal life that live within the streams. AMD, sedimentation and nutrients are the main pollution sources affecting life in the streams of Sewickley Creek watershed, often causing them to be devoid or diminished of fish and other aquatic life diversity. The primary pollutants from AMD are metals (usually iron, aluminum, and manganese) and acidity. Pennsylvania established in-stream water quality standards for iron, aluminum, and manganese, which are published in the Pennsylvania Code, Chapter 93 Water Quality Standards. Many stream segments within Sewickley Creek do not

meet water quality standards because of elevated metals. In the vast majority of those instances, water draining from abandoned coal mines is the source of the impairment.

When metals from abandoned coal mines enter the stream they have different effects on aquatic life, depending on their nature. Aluminum is usually associated with acidic discharges and has a profound effect on aquatic macroinvertebrates and fish. Aluminum will coat the gills of these animals and prevent them from extracting oxygen from the water, causing them to die. Iron, the metal that is usually associated with AMD pollution, settles to the bottom of streams, coating the substrate and severely degrading the habitat in which many aquatic organisms live. Manganese, a metal that looks black when it precipitates in the stream also can coat the stream substrate if present in very high concentrations, though it is rare in Sewickley Creek.

Sedimentation impairs the stream by settling to the bottom of streams and severely degrading the habitat in which aquatic organisms live. It essentially smothers the bottom of the stream, limiting the types and numbers of organisms that can inhabit the stream bottom, or its biodiversity. When fewer types of aquatic animals are present, the entire food chain of the stream is disrupted and only those animals and plants that can survive in such conditions are present.

Nutrients, from human and animal waste, fertilizers, and from the atmosphere can have significant impacts on aquatic life. The main two nutrients affecting streams are nitrogen and phosphorous. As on land, nutrients within a stream cause the plants to grow. This can lead to low levels of oxygen as the plants use up the oxygen within the water. When dissolved oxygen levels are low, aquatic organisms that require higher levels of oxygen are no longer able to survive and perish. The plants can also affect the habitat of the steam by coating the rocks and substrate and affecting the places where organisms live. Similar to sedimentation, this causes fewer types of aquatic animals to be present within the stream and degrades the entire food chain.



### **IV. Problem Definition**

#### Overview

This section addresses the specific abandoned mine drainage (AMD) problems found during the assessment. This assessment attempts to identify as many of the problem sites as possible, but assumes it does not capture them all.

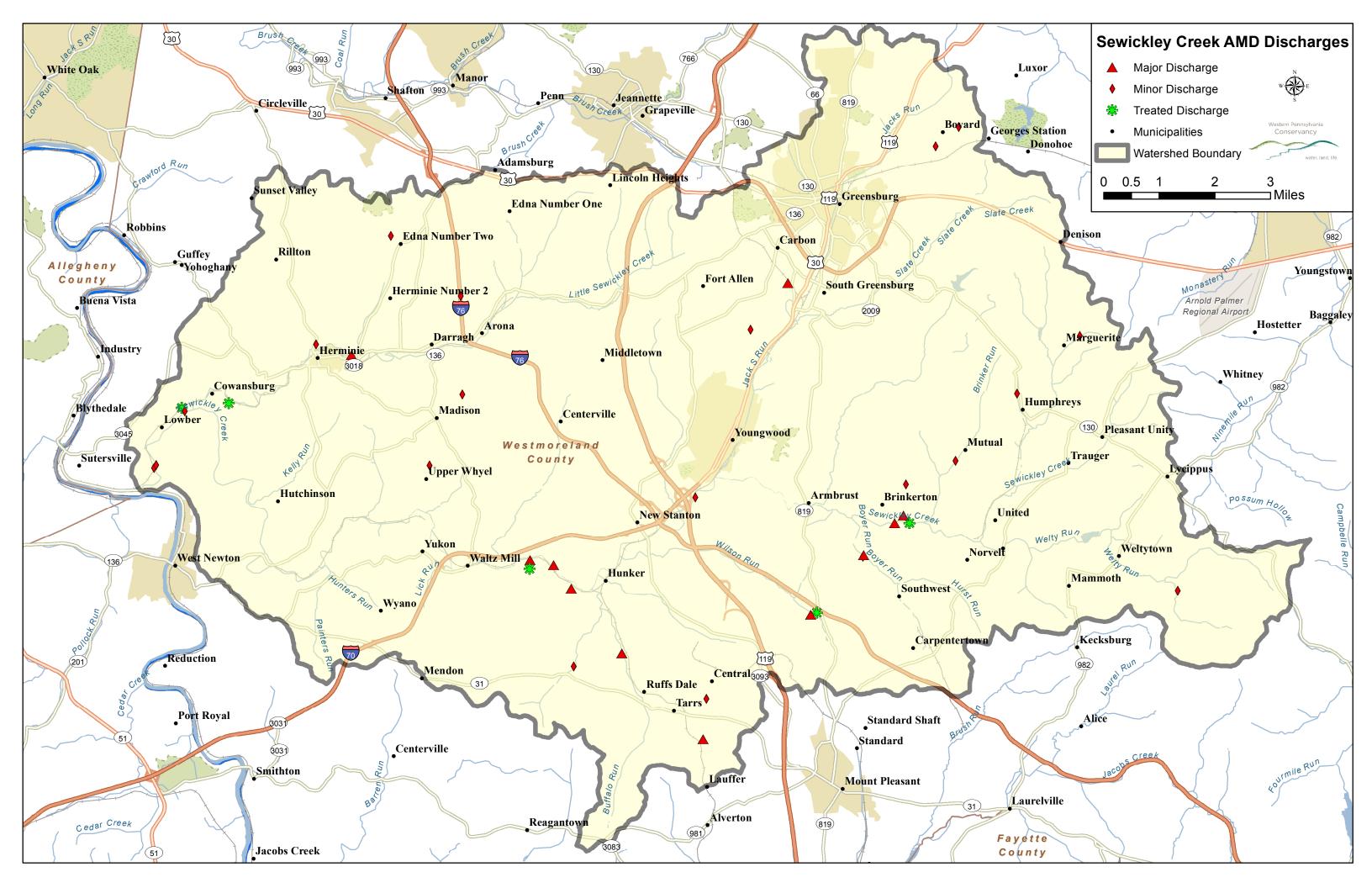
Because AMD is the main cause of impairment on most degraded stream segments, descriptions of the discharge locations are identified by sub-watershed and the stream segment initially affected. Because of the nature of coal mining, pinpointing the exact site of the pollution source sometimes proves difficult, due to the fact that the AMD can occur over large and diffuse areas. When a specific AMD source is identified, GPS is used to record the source. The location of the source is also listed under the segment GIS ID.

### **Upper Sewickley**

AMD site	GIS ID	Sub-basin	Type	Ranking	Notes
		Upper			Iron AMD discharge located at
Welty Run	1328	Sewickley	AMD	Minor	lower end of section
		Upper		Major	AMD treated partially with
Brinkerton 1	1040	Sewickley	AMD	Treated	wetland. Insufficient area
		Upper			Large AMD south of current
Brinkerton 2	1040	Sewickley	AMD	Major	system
Brinkerton		Upper			Drainage from surface mine area
Acid Trib	1151	Sewickley	AMD	Minor	– diffuse area
Brinkerton		Upper			Discharge from mine tunnels
Acid Seep	1040	Sewickley	AMD	Major	likely connected to surface mines
		Upper			Low pH Iron AMD found outside
Humphreys	1496	Sewickley	AMD	Minor	Humphreys
Boyer Run					
AMD right		Upper			
bank	1288	Sewickley	AMD	Minor	Iron AMD
Boyer Run		Upper			
AMD left bank	1288	Sewickley	AMD	Major	Iron AMD on pasture side
Marguerite		Upper			
Small AMD	1596	Sewickley	AMD	Minor	Near Marguerite
AMD Brinker		Upper			
Run	1211	Sewickley	AMD	Minor	AMD below Mutual

### Welty Run

The Upper Sewickley Creek sub-watershed contains several AMD discharges, three being ranked as major pollution sources, while several others were considered as minor. Welty Run, designated as a High Quality Cold Water Fishery (HQ-CWF), has the highest elevation of the watershed, beginning as springs on Chestnut Ridge. Some surface mining has occurred within the headwaters on Chestnut Ridge, but no distinct discharges that impair the stream were



located in the headwaters area. However, it is assumed that the surface mines are affecting groundwater negatively. During assessment, pH readings within the stream would fall and rise as springs, seeps, and base flow would enter the stream. In addition, sporadic signs of aluminum coating on stream substrate would appear and then abate, indicating groundwater of low pH entering the stream. The geology of Chestnut Ridge is such that it does not possess a great deal of acid neutralizing potential. With its geology, the older reclaimed surface mines, and acid precipitation providing additional low pH water to the headwaters area, it is understandable that aluminum is being leached out of the rocks and soils and is sometimes seen on the substrate of the stream.

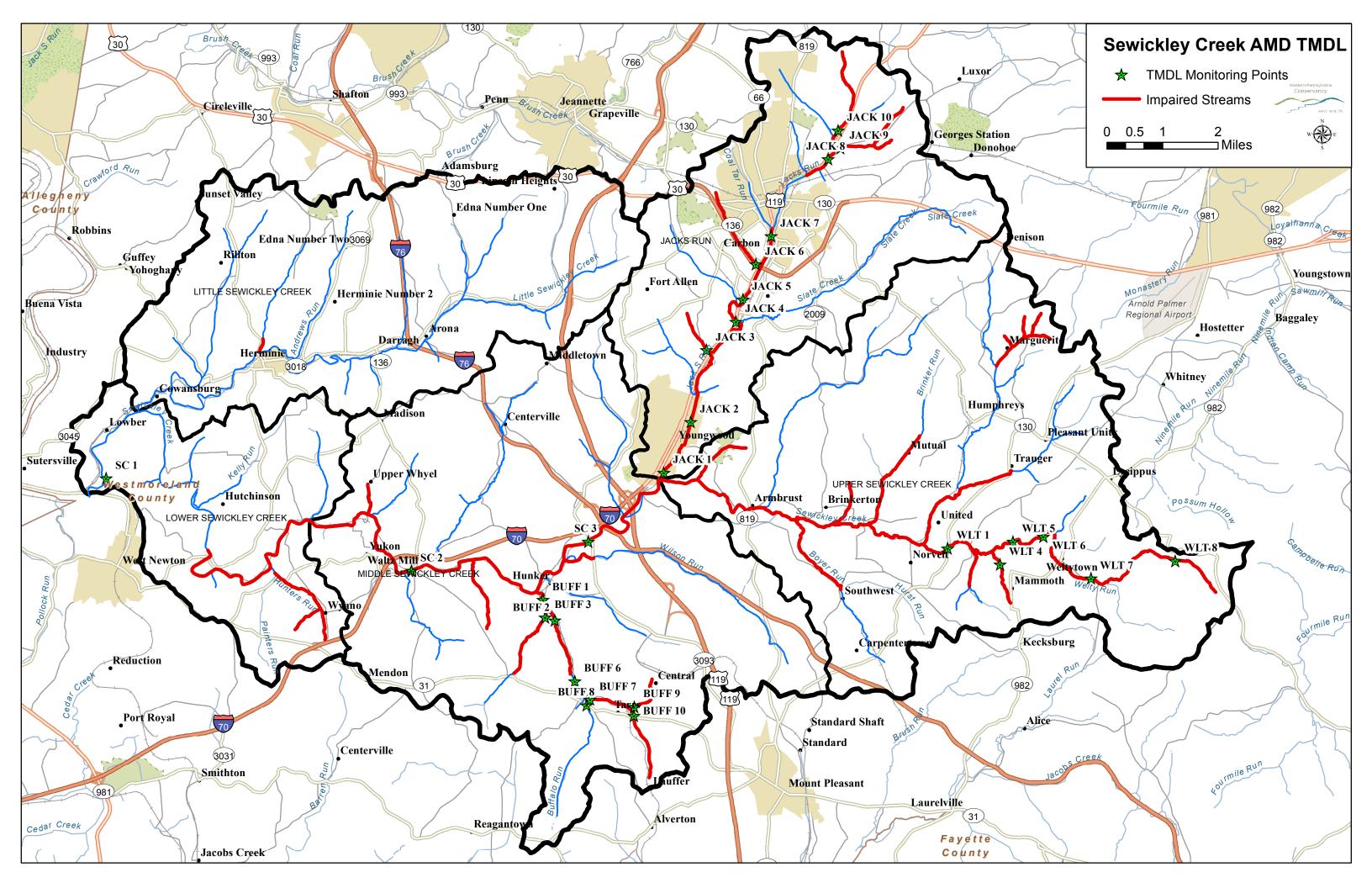
Welty Run has a notable iron discharge along the southernmost headwater tributary as it flows at the base of Chestnut Ridge, near Welty Town. However, the discharge is net alkaline and the flow is not large enough to significantly affect the stream. As the water in Welty Run mixes with the other tributaries, all signs of the metals disappear by the time the flow reaches Mammoth Lake, just downstream of Welty Town.

Below Mammoth Lake to the confluence with the main stem of Sewickley Creek some AMD was identified flowing from a tributary that flows along a large coal waste pile from the abandoned Mammoth Mine. Other areas along the stream were identified as being additional sites of former coal waste piles (near Calumet) that have been reprocessed and reclaimed. These areas, though reclaimed, were still eroding some coal waste into the stream when adjacent to it and likely are leaching some pollution. Alkalinity in Welty Run was sufficient enough to neutralize any acidity entering into the stream. Immediately below Mammoth Lake the stream was channelized and straightened on what appears to be an old strip mining operation. This has created a very unstable channel with high vertical banks and numerous erosion areas causing sedimentation to the stream.

In addition to the problems caused by mining in the watershed, numerous stream segments, mostly those associated with older small mining communities, were observed being degraded by raw sewage. As the assessment was being written, some areas affected by sewage were being address by the construction of a new sewage treatment plant. Also during the assessment in 2009, Western Pennsylvania Conservancy took part in an assessment of bacteria pollution on the upper Sewickley Creek, upstream of the confluence of Welty Run and Sewickley Creek. As a result of the monitoring, the upper Sewickley Creek was designated as impaired in 2011 by bacteria and does not meet its designated use for recreation. A subsequent TMDL will be developed for this section of the stream.

### **Sewickley Creek AMD TMDL**

In 2009, DEP completed an AMD TMDL for the Sewickley Creek watershed. The AMD TMDL used a statistical method to determine allowable in-stream concentrations to meet water quality standards for metals and pH at various monitoring locations on the stream reaches of interest. They then did a mass balance of the pollution loads, based on annual flows, as the pollutants pass through the watershed. The loads at the monitoring points are for all the watershed area above the sampling point, so the monitoring points downstream include those from above. From water samples taken at the selected monitoring points, the model (Monte



Carlo) calculated the allowable concentration of pollutant, or load allocation, to meet water quality standards 99% of the time at each sampling location (on waters designated as other than High Quality or Exceptional Value) and determined the required load reduction in the pollutant to meet that standard.

Applicable Water Quality Criteria for WWF Stream Segments								
Parameter	Criterion Value (mg/L)	Total Dissolved/Recoverable						
Aluminum (Al)	0.75	Total Recoverable						
Iron (Fe)	1.5	Total Recoverable						
Manganese (Mn)	1	Total Recoverable						
pH*	6.0 - 9.0	N/A						

<sup>\*</sup>The pH values shown will be used when applicable. In the case of freestone streams with little or no buffering capacity, the TMDL endpoint for pH will be the natural background water quality

For High Quality or Exceptional value waters, the allocation and reductions were based on water-quality criteria of an unimpaired segment of the TMDL water or the 95th percentile of a reference Water Quality Network (WQN) stream. (For further details about how the AMD TMDL for Sewickley Creek was determined, please review the Sewickley Creek TMDL at: <a href="http://www.dep.state.pa.us/dep/deputate/watermgt/wqp/wqstandards/tmdl/SewickleyCreekFinalTMDL.pdf">http://www.dep.state.pa.us/dep/deputate/watermgt/wqp/wqstandards/tmdl/SewickleyCreekFinalTMDL.pdf</a>)

The upper Sewickley Creek from the confluence of Brinker Run to the headwaters are classified as High Quality Cold Water Fishery. Therefore, the TMDL used a Water Quality Network stream as a reference stream to establish load allocations and reductions (WQN865 on McLaughlin Creek (SWP16E) is used as the reference water).

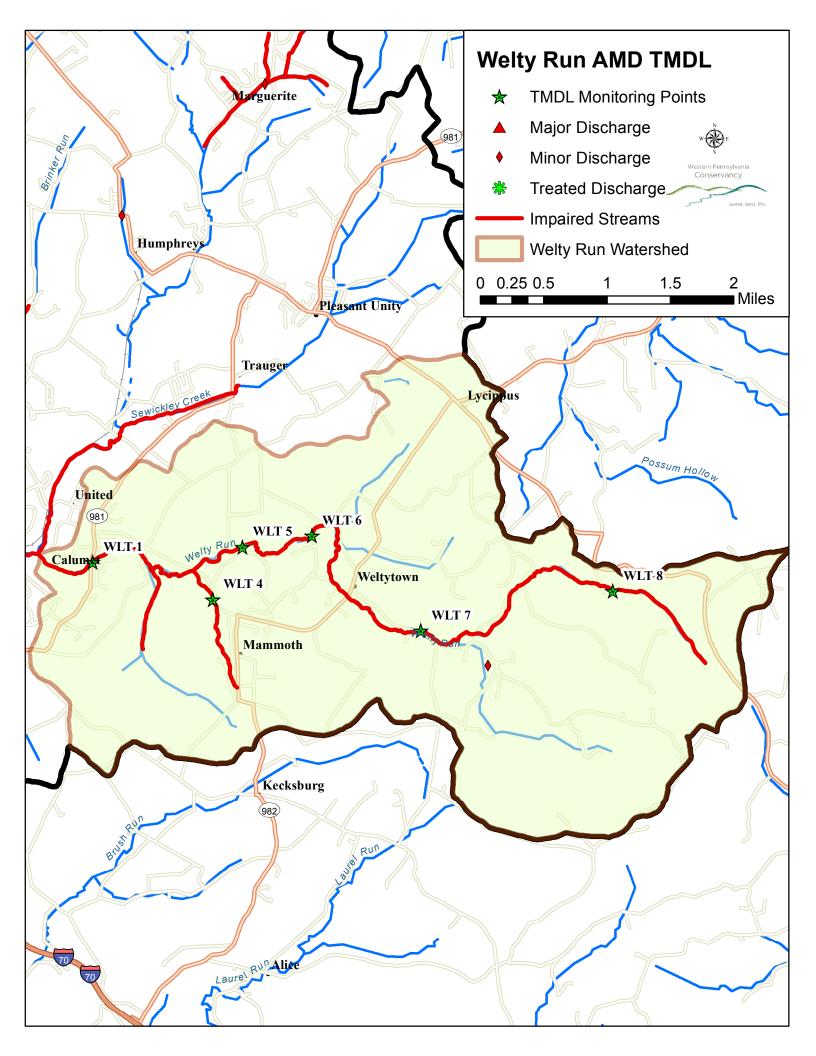
Reference McLaughlin Creek Criteria					
Parameter	Criterion Value				
Aluminum (Al)	0.0783 mg/L				
Iron (Fe)	0.247 mg/L				
Manganese (Mn)	1.0 mg/L				
Area	8 square miles				
Alkalinity	50 mg/L				

### **Welty Run AMD TMDL**

For Welty Run, the AMD TMDL monitored 6 stations within the sub-basin and established TMDL criteria for each location. The following table shows the pollution loads and load reductions established for Welty Run. Because the assessment did not consider the pollution to Welty Run as major factors to the pollution loads of Sewickley Creek in comparison to others

further downstream with much higher pollution load rates, all sources were considered as minor sources. It is recommended Welty Run be targeted once other major sources are addressed.

Parameter	Existing load (lbs/day)	TMDL Allowable Load (lbs/day)	WLA (lbs/day)	LA (lbs/day)	NPS Load Reduction (lbs/day)	NPS % Reduction
	WE	LTY8 - Welty	Run near h	eadwaters		
Aluminum (lbs/day)	3.47	0.14	-	0.14	3.33	96%
Iron (lbs/day)	1.35	1.35	-	1.35	NA	NA
Manganese (lbs/day)	0.23	0.23	-	0.23	NA	NA
Acidity (lbs/day)	-74.41	-74.41	-	-74.41	NA	NA
	WELTY7	' - Welty Run	1/2 mile eas	t of Weltyto	wn	
Aluminum (lbs/day)	14.98	1.2	-	0.92	10.45*	90%*
Iron (lbs/day)	11.68	2.34	-	1.21	9.34*	80%*
Manganese (lbs/day)	3.22	3.22	-	3.22	NA	NA
Acidity (lbs/day)	1143.39	-1143.39	-	- 1143.39	NA	NA
	WELTY6	- Welty Run	upstream of	Mammoth L	ake	
Aluminum (lbs/day)	18.19	5.82	-	5.82	0*	0%
Iron (lbs/day)	10.92	10.92	-	10.92	NA	NA
Manganese (lbs/day)	2.67	2.67	-	2.67	NA	NA
Acidity (lbs/day)	3917.39	-3917.39	-	3917.39	NA	NA
	LTY5 - Wel	ty Run 1/2 mi	le downstrea	am of Mamn	noth Lake	
Aluminum (lbs/day)	19.27	6.17	-	6.17	0.73*	11%*
Iron (lbs/day)	11.56	11.56	-	11.56	NA	NA
Manganese (lbs/day)	6.94	6.94	-	6.94	NA	NA
Acidity (lbs/day)	1753.59	-1753.59	-	1753.59	NA	NA
WELTY4 - Unn	amed tribut	ary to Welty I	Run 1/2 mile	northeast of	f village of M	ammoth
Aluminum (lbs/day)	1.15	0.37	-	0.37	0.78*	69%*
Iron (lbs/day)	0.69	0.69	-	0.69	NA	NA
Manganese (lbs/day)	0.91	0.91	-	0.91	NA	NA
Acidity (lbs/day)	-655.8	-655.8	-	-655.8	NA	NA
., .	WELT	ΓΥ1 - Welty F	Run at bridge	in Calumet		
Aluminum (lbs/day)	25.06	8.02	-	8.02	3.16*	29%*
Iron (lbs/day)	48.06	6.73	-	6.73	41.33*	86%*
Manganese (lbs/day)	65.29	16.32	-	16.32	48.97*	75%*
Acidity (lbs/day)	-	-7198.62		-	NA	NA



7198.62 7198.62

NA-not applicable

\*Takes into account load reductions from upstream sources

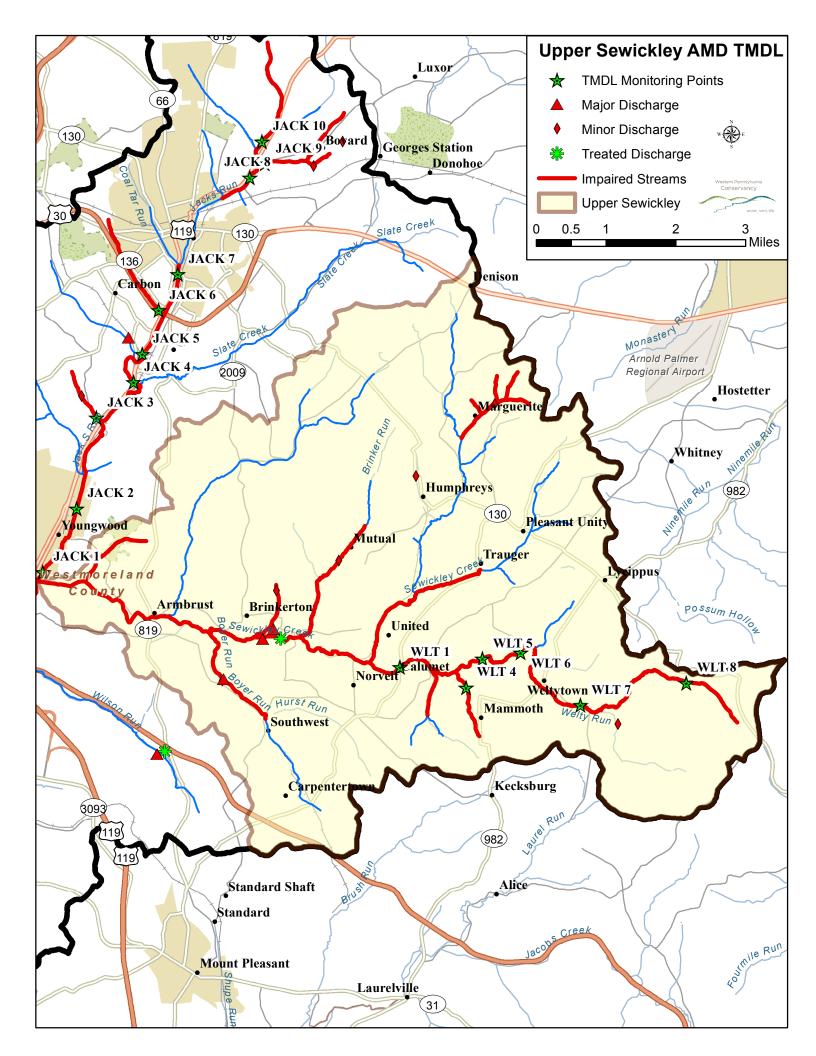
Upper Sewickley Creek Main Stem

The headwaters of the Sewickley Creek main stem begin north of the town of Pleasant Unity, east of the old mining community of Marguerite. As with most of the Sewickley Creek watershed, former small mining communities are present throughout the headwaters area. Near Marguerite, a small acid discharge was observed negatively affecting an unnamed tributary near a reclaimed boney pile. The flow of the discharge was small enough that after a short distance the discharge was apparently neutralized by the alkalinity in the stream. Some aluminum staining could be observed in the stream. Because of the short term effects, the discharge was considered to be minor. It does add to the aluminum load of the stream within these upper reaches.

More small coal mining communities are located along the main stem headwaters of Sewickley Creek and its tributaries upstream of confluence with Welty Run, United and Trauger being the largest. These areas also contain mine spoil piles, most of which have been reprocessed and reclaimed, but as on Welty Run, some remnants do remain. The main stem of Sewickley Creek meets Welty Run just north of Norvelt. Downstream of Norvelt, Brinker Run enters from the north. Brinker Run is also somewhat impacted by AMD. It drains past the old mining community of Mutual, which is likely the source of the AMD. However, no distinct major discharges were identified and this area is considered a minor source of AMD.

Just downstream of the confluence of Brinker Run and Sewickley Creek is the location of the first major discharges to enter Sewickley Creek, near the community of Brinkerton, another former coal mining community. There are three major discharges in the Brinkerton area and it is at this point Sewickley Creek becomes significantly impaired by AMD. There are a few other minor discharges in the Brinkerton area but none have the significant impacts on the stream as do the large discharges from the underground mines. The major discharges are believed to be draining water from the Brinkerton, Hecla #1 and #3 mines, Mammoth, United, and Calumet mines. For this study, the discharges at Brinkerton are identified as Brinkerton1, Brinkerton 2, and Brinkerton 3. Brinkerton 1 & 2 are large alkaline discharges, #1 being on the river-right side of the stream, and #2 nearby on river-left (directions refer to facing downstream). Brinkerton 3 is a much smaller acid discharge which is believed to draining from mine tunnels leading to a drier portion of the Brinkerton mine that has also been surface mined up gradient of the discharge, perhaps on the Redstone coal seam above the deep mine workings.

The majority of the Brinkerton 1 discharges are being partially treated by a passive wetland treatment system. The system was designed to maximize the available area on site. Adjacent good quality wetlands limited the space to treat the discharge to approximately 7 acres, significantly smaller than necessary for completely passive treatment. The system was designed as a semi-passive system, with a Maelstrom Oxidizer ® installed at the head of the wetland to provide active oxidization of the AMD discharge through the use of two large blowers and a patented air delivery system. At the time of the assessment, electrical power was not yet available for the blowers so the system was only being aerated passively. Also, at high flows, the



mine discharge overwhelms the system's ability to flow all of the discharge water through the system's piping and a significant portion is bypassed around the system. Plans were being developed to address the situation. Until the treatment system is fully functional, it will be difficult to determine if additional treatment will be necessary.

Brinkerton 2 is another large net alkaline discharge (approximately 1,500 gpm) that presently is not being treated. It is approximately half the flow of Brinkerton 1 and contains roughly half the iron content. A study was done by Hedin Environmental through a Trout Unlimited Technical Assistance Grant to evaluate whether the discharge water could be transferred elsewhere, since little room exists between the discharge location and Sewickley Creek. Options included moving the discharge across the stream to the present treatment system for Brinkerton 1 and combining the treatment, moving the discharge downstream to an area more suitable for treatment, pumping the discharge to nearby areas suitable for treatment, and raising the level of the discharge and treating it at a higher elevation on nearby property. It is clear that treating the Brinkerton 2 discharge will be challenging due to its location. However, projects similar to those described in the study have been done elsewhere and some could be feasible. It's clear that without treating Brinkerton 2, Sewickley Creek will continue to be polluted downstream of the discharge.

Brinkerton 3, the acid discharge, was not being treated at the time of the assessment. Presently the discharge is routed around the Brinkerton 1 discharge into an unnamed tributary that is also polluted with AMD. It is likely this discharge will be channeled into the Brinkerton 1 treatment system, where the excess alkalinity of the large discharge should neutralize the acidity and the capacity of the system will help collect its metals.

### Boyer Run

Downstream of the Brinkerton area, the next major discharges to impact the watershed come from two sources on Boyer Run. From past sampling, the Boyer Run discharges were net alkaline and had high levels of iron. For this assessment, landowner permission to monitor the discharges could not be obtained so only stream samples were taken. This allowed for a total pollution load to be calculated but does not gather the necessary information to properly calculate cost estimates for treatment of the discharge.

### TMDL for Upper Sewickley Creek

As previously mentioned, TMDLs were established for Upper Sewickley Creek on Welty Run by the AMD TMDL Study. All other TMDL's for Sewickley Creek were established lower in the watershed within other assessment sub-basins and will be addressed in those sections.

#### **Jacks Run**

Jacks Run begins just north of the city of Greensburg and flows in a southwesterly direction until its confluence with Sewickley Creek in Youngwood. Jacks Run and its main tributary, Slate Creek, are both heavily influenced by the city of Greensburg and its suburbs. Jacks Run is impacted somewhat by AMD in its headwaters north of the city near Bovard, but the stream is

able to assimilate the discharge rather quickly and fish are present in the stream before it reaches Greensburg. Jacks Run's major AMD pollution source occurs in South Greensburg, where a large untreated discharge from the Greensburg Syncline and the Greensburg #2 mine enters the stream. There is a large un-reclaimed mine spoil pile near the discharge as well. Several other minor discharges were identified in Jacks Run upstream of the major discharge and a few downstream as well. Because of the size of the discharge and the apparent impacts, only the major discharge was monitored for this assessment.

AMD site G	IS ID S	ub-basin	Type	Ranking	Notes
------------	---------	----------	------	---------	-------

					1
Greensburg	1410	Jack's	AMD	Major	Discharge is just upstream from
Mine#2 AMD		Run			boney pile
Coke Oven	1159	Jack's	AMD	minor	AMD on right bank emerging from
AMD		Run			coke ovens and hill side
King's AMD	1179	Jack's	AMD	minor	Small low pH aluminum seep
		Run			
Bovard AMD	1155	Jack's	AMD	minor	Low pH aluminum seep
East		Run			
Bovard AMD	1155	Jack's	AMD	minor	Low pH aluminum seep
South		Run			
Mouth of Jack's	1423	Jack's	In-		
Run		Run	Stream		
Above Big	1434	Jack's	In-		
AMD		Run	Stream		
Below Big	1159	Jack's	In-		
AMD		Run	Stream		
Above 1216	1517	Jack's	In-		
Bovard AMDs		Run	Stream		
Below 1216	1065	Jack's	In-		
Bovard AMDs		Run	Stream		

### **Jacks Run AMD TMDL**

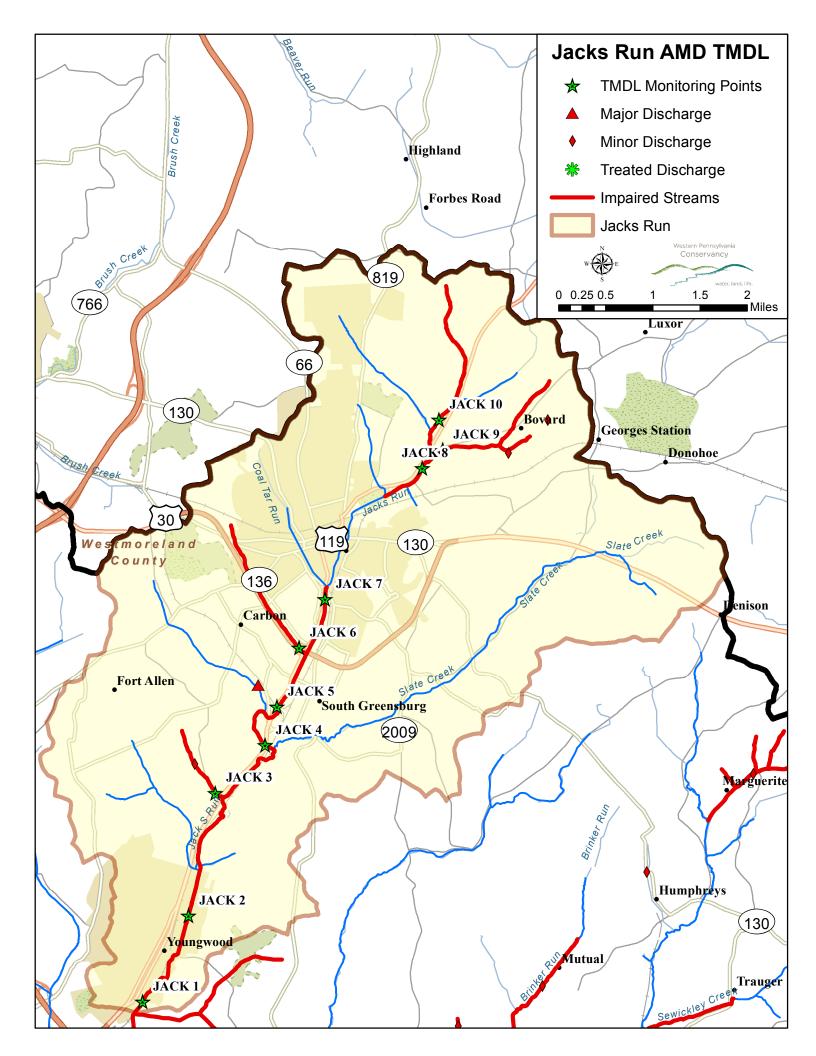
TMDLs were established for 10 monitoring locations by the DEP AMD TMDL Study.

Parameter	Existing load (lbs/day)	TMDL Allowabl e Load (lbs/day)	WLA (lbs/day)	LA (lbs/day)	NPS Load Reduction (lbs/day)	NPS % Reduction				
JACK	JACK10 - Unnamed tributary to Jacks Run upstream of Greensburg									
Aluminum (lbs/day)	7.9	3.87	0.28	3.59	4.03	51%				
Iron (lbs/day)	6.79	5.64	1.13	4.51	1.15	17%				
Manganese (lbs/day)	1.03	1.03	0.75	0.28	NA	NA				
Acidity (lbs/day)	-2888.05	-2888.05	-	-2888.05	NA	NA				

JACK	9 - Unnamed	l tributary	to Jacks Ru	ın upstre	am of Gre	ensburg	
Aluminum	43.11	2.59	0.28	2	2.31	40.52	94%
(lbs/day) Iron (lbs/day)	47.7	6.2	1.13	5	5.07	41.5	87%
Manganese	25.22	3.03	0.75		2.28	22.19	88%
(lbs/day)							
Acidity (lbs/day)	-112.83	-112.83	un upstream		12.83	NA	NA
Aluminum (lbs/d		- jacks Ki 29.6	un upsuean 7.7	0.56	7.14	0*	0%*
,	• /		22.3	2.26	20.04	0*	0%*
Iron (lbs/day)		9.73	10.1		20.0 <del>4</del> 8.6	0*	0%*
Manganese (lbs/d	• .	7.29		1.5		~	
Acidity (lbs/day		17.97	-5517.97	- 	-5517.97	NA	NA
A 1 (11/-)			downstream			15 20*	400/ *
Aluminum (lbs/d	-	3.17	15.95	1.13	14.82	15.32*	49%*
Iron (lbs/day)		2.24	24.08	4.5	19.58	10.73*	31%*
Manganese (lbs/c	•	5.09	15.09	3	12.09	NA	NA
Acidity (lbs/day	•	88.88 GW 6	-8588.88	-	-8588.88	NA	NA
			ellers Run n	ear mout		4.04	100/
Aluminum (lbs/d	• /	1.45	2.54	-	2.54	1.91	43%
Iron (lbs/day)		2.17	2.17	0.75	1.42	NA	NA
Manganese (lbs/c	•	0.42	0.42	0.38	0.04	NA	NA
Acidity (lbs/da	<b>,</b>	59.57	-1359.57	-	-1359.57	NA	NA
			n downstrea				
Aluminum (lbs/d	• /	6.87	26.73	1.13	25.6	0*	0%*
Iron (lbs/day)		7.08	37.08	4.5	32.58	NA	NA
Manganese (lbs/d	• .	3.14	13.14	3	10.14	NA	NA
Acidity (lbs/day			-1101.31	-	-11101.3	NA	NA
	JACK4	- Jacks Ri	un upstrean	of Slate			
Aluminum (lbs/d	lay) 10	3.88	44.67	1.13	43.54	29.07*	40%*
Iron (lbs/day)	17	15.67	85.78	4.5	81.28	1629.89*	95%*
Manganese (lbs/d	lay) 9	7.62	71.26	3	68.26	26.36*	27%*
Acidity (lbs/day	y) -68	09.46	-6809.46	-	-6809.46	NA	NA
JAC	K3 - Unnam	ed tributar	y to Jacks I	Run in So	outh Green	isburg	
Aluminum (lbs/d	lay)	2.28	1.21	-	1.21	1.07	47%
Iron (lbs/day)	1	071	1.71	-	1.71	NA	NA
Manganese (lbs/c	lay)	2.08	1.27	-	1.27	0.81	39%
Acidity (lbs/da	y) -2	11.07	-211.07	-	-211.07	NA	NA
	JA	CK2 - Jac	ks Run in Y	oungwo	od	·	
Aluminum (lbs/d	lay) 1:	53.08	64.29	1.13	63.16	28.51*	31%*
Iron (lbs/day)	8	1.75	259.76	4.5	255.26	0*	0%*
Manganese (lbs/c	lay) 9	6.67	96.67	3	93.97	NA	NA
Acidity (lbs/da	y) -1	4214	-14214.01		-14214	NA	NA
		JACK1	Jacks Run a	t mouth			
Aluminum (lbs/d	lay) 10	7.27	59	1.13	57.87	0*	0%*
Iron (lbs/day)	32	20.49	185.89	4.5	181.39	0*	0%*
Manganese (lbs/c	lay) 7	8.06	78.06	3	75.06	NA	NA
Acidity (lbs/day	y) -15		-15394.56		-15394.6	NA	NA

NA-not applicable

<sup>\*</sup>Takes into account load reductions from upstream sources



This study monitored one major AMD discharge within Jacks Run, the Greensburg Mine#2 discharge- DMP-JR1. The other pollution sources identified by the TMDL upstream of the major discharge were considered minor because of much smaller flows and apparent smaller impacts to the stream. It is recommended that areas identified on Jacks Run by the TMDL be addressed after the major discharge. TMDL monitoring points JACK3 and JACK 4 will identify pollution load reductions from addressing the major discharge DMP-JR1

### Middle Sewickley Creek

For this study, Middle Sewickley Creek was identified as the watershed from the confluence of Jack Run and Sewickley Creek in Youngwood to the confluence of Pinkerton Run with Sewickley Creek, approximately 2 miles downstream from Yukon. Major named tributaries include Wilson Run, Belson Run, Buffalo Run, and Lick Run. Several other modest-sized unnamed tributaries also enter the stream in this section.

AMD site GIS ID Sub-basin Type Ranking Notes

Small Acid seep	1099	Middle	AMD	Minor	Main stem left side
by church		Sewickley			
Wilson Run 1	1134	Middle	AMD	Treated	Wilson Run at Rt. 819 and
AMD		Sewickley			Turnpike intersection
Wilson Run 2	1134	Middle	AMD	Major	Wilson Run at Rt 819 and
AMD		Sewickley			Turnpike intersection
Buffalo Run Big	1443	Middle	AMD	Major	Buffalo Run
AMD		Sewickley			
Acid above	1526	Middle	AMD	Major	Buffalo Run
RuffsDale		Sewickley			
AMD by bus	1033	Middle	AMD	Minor	Buffalo Run
garage		Sewickley			
AMD by trailer	1207	Middle	AMD	Minor	Buffalo Run
park		Sewickley			
Soberdash 1 Acid	1123	Middle	AMD	Major	Mainstem left on hillside
		Sewickley			below quarry near boney pile
Soberdash 2	1123	Middle	AMD	Major	Mainstem on right opposite
Alkaline		Sewickley			boney pile
Soberdash 3	1503	Middle	AMD	Major	AMD near mouth of Small
		Sewickley			UNT 1503
Upper Whyel	1044	Middle	AMD	minor	Off Yukon Road
AMD		Sewickley			
Top of Mid	1099	Middle	In-		below New Stanton
Sewickley		Sewickley	Stream		
Bottom of Mid	1388	Middle	In-		Above Waltz Mills by nursery
Sewickley		Sewickley	Stream		
Buffalo Run	1343	Middle	In-		Buffalo Run near mouth
Mouth		Sewickley	Stream		

### Middle Sewickley Creek AMD TMDLs

The TMDL for Middle Sewickley were concentrated in the Buffalo Run watershed. Eight monitoring locations were identified throughout the watershed. An additional TMDL monitoring point is located on the main stem of Sewickley Creek, SC3. This assessment focused its monitoring on the major AMD pollution source, identified as DMP-BUF1, with SMP-BUF1 corresponding to TMDL point BUFF1. SMP-SC3 corresponds to TMDL - SC3 and will similarly monitor load reductions within the main stem of Sewickley Creek. SMP-SC3 also will also identify load reductions from the three Soberdash discharges identified in this assessment as minor sources.

Parameter	Existing load (lbs/day)	TMDL Allowable Load (lbs/day)	WLA (lbs/day)	LA (lbs/day)	NPS Load Reduction (lbs/day)	NPS % Reductio n			
BUFF10 - U	Jnnamed tril	outary to Buff	alo Run dow	nstream of	Route 31 in T	arrs			
Aluminum (lbs/day)	133.55	5.34	0.56	4.78	128.16	96%			
Iron (lbs/day)	93.89	8.45	2.26	6.19	85.44	91%			
Manganese (lbs/day)	18.71	8.42	1.5	6.92	10.29	55%			
Acidity (lbs/day)	1276.84	6.38	-	6.38	1270.46	99.50%			
	- Unnamed	tributary to B	uffalo Run n	ear mouth in	n Snydertown				
Aluminum (lbs/day)	71.98	0.72	-	0.72	71.26	99%			
Iron (lbs/day)	17.49	1.4	-	1.4	16.09	92%			
Manganese (lbs/day)	27.26	0.82	-	0.82	26.44	97%			
Acidity (lbs/day)	-625.27	-625.27	-	-625.27	NA	NA			
E	BUFF8 - Buffalo Run at Route 31 bridge near Ruffs Dale								
Aluminum (lbs/day)	7.13	5.99	0.28	5.71	1.14	16%			
Iron (lbs/day)	14.17	13.32	1.13	12.19	0.85	6%			
Manganese (lbs/day)	2.95	2.95	0.75	2.2	NA	NA			
Acidity (lbs/day)	-1693.56	-1693.56	-	-1693.56	NA	NA			
	Unnamed to	ributary to Bu	ffalo Run at	T688 bridge	e in Ruffs Dal	e			
Aluminum (lbs/day)	142.48	7.12	0.56	6.56	0*	0%*			
Iron (lbs/day)	65.08	12.36	2.26	10.1	0*	0%*			
Manganese (lbs/day)	27.61	12.97	1.5	11.47	0*	0%*			
Acidity (lbs/day)	717.37	78.91		78.91	0*	0%*			
BUFF	6 - Buffalo	Run at SR308	89 bridge dov	wnstream of	Ruffs Dale				
Aluminum (lbs/day)	116.44	13.97	1.13	12.84	0*	0%*			
Iron (lbs/day)	67.43	24.95	4.5	20.45	0*	0%*			
Manganese (lbs/day)	38.85	24.48	3	21.48	0*	0%*			
Acidity (lbs/day)	-933	-933	-	-933	NA	NA			

BUFF3 -	BUFF3 - Unnamed tributary to Buffalo Run (Thomson Run) off of T678							
Aluminum (lbs/day)	43.95	2.2	0.28	1	.92	41.75	95%	
Iron (lbs/day)	10.27	5.34	4.13	4	.21	4.93	48%	
Manganese (lbs/day)	24.48	3.52	0.75	2	.77	19.96	85%	
Acidity (lbs/day)	459.87	32.19	-	32	2.19 4	27.68	93%	
	В	UFF2 - Buff	alo Run at T	678 Bri	dge			
Aluminum (lbs/c	lay)	65.19	13.04	1.13	11.91	0*	0%*	
Iron (lbs/day)	)	704.88	35.24	4.5	30.74	627.16*	95%*	
Manganese (lbs/d	day)	58.49	26.9	3	23.9	17.22*	39%*	
Acidity (lbs/da	y)	-249.73	-249.73	-	-249.73	NA	NA	
	BUFF1 -	Buffalo Run	at SR3089	bridge n	ear Hunker	,		
Aluminum (lbs/c	lay)	70.62	19.77	1.13	1.13 18.64		0%*	
Iron (lbs/day)	)	626.29	50.1	4.5	45.6	0*	0%*	
Manganese (lbs/d	day)	72.88	33.52	3	30.52	0*	0%*	
Acidity (lbs/da	y)	-856.52	-856.52	-	-856.52	NA	NA	
	SC2 - Se	wickley Cre	ek downstre	am of B	uffalo Run			
Aluminum (lbs/c	lay)	639.93	364.76	7.39	357.37	62.61	15%*	
Iron (lbs/day)	)	1370.64	712.73	33.69	679.04	72.72	10%*	
Manganese (lbs/d	day)	393.28	393.28	19.68	373.6	NA	NA	
Acidity (lbs/da	y)	-74055.3	-74055.3	-	-74055.3	NA	NA	

NA-not applicable

#### Wilson Run

Wilson Run begins two miles north of Mt. Pleasant and flows in a northwesterly direction, roughly paralleling the Pennsylvania Turnpike, until its confluence with Sewickley Creek near New Stanton. Two major net alkaline discharges, Wilson Run 1 and Wilson Run 2, enter the stream near its junction with the turnpike and impair the stream for most of its length. Oddly, Wilson Run is not identified in state GIS layers as being impaired for much of its reach. Wilson Run 1 is believed to emanate from the Standard and Stewart mines near Mt. Pleasant and Wilson Run 2 is believed to come from the Central Mine in Central. A large wetland area downstream of the discharges and adjacent to the turnpike is influenced by mine drainage and it is difficult to determine if additional mine water is entering Wilson Run from polluted groundwater within the wetland.

Sewickley Creek Watershed Association has been actively involved in restoration efforts on Wilson Run since its beginnings. A number of efforts with a variety of agencies and organizations have been developed at the Wilson Run 1 site, including a number of experimental projects to pretreat the mine water with aeration to speed the settling of iron. In the recent past, a two acre pond, into which the mine discharge flows, was cleaned of its iron sludge and reconfigured to improve detention. Additionally, a Maelstrom Oxidizer was installed at the head of the discharge into the pond to oxygenate the water. Although the aeration has improved treatment at high flows, iron continues to enter Wilson Run from WR1 due to the limited size of

<sup>\*</sup>Takes into account load reductions from upstream sources

the pond and its lack of enough detention time to reduce the iron to acceptable levels. It is recommended that additional wetland treatment areas be developed for the Wilson Run 1 treatment system to reduce iron to acceptable water quality standards.

The Wilson Run 2 discharge enters Wilson just downstream from that of the Wilson Run 1 treatment system outflow. This discharge has been especially difficult to measure flows on because the discharge pipe enters the stream under water. No efforts have been made to address this significant discharge into Wilson Run to date. However, without addressing the discharge in some way, it is unlikely the stream will meet its designated use and any load reduction goals when established.

#### Buffalo Run

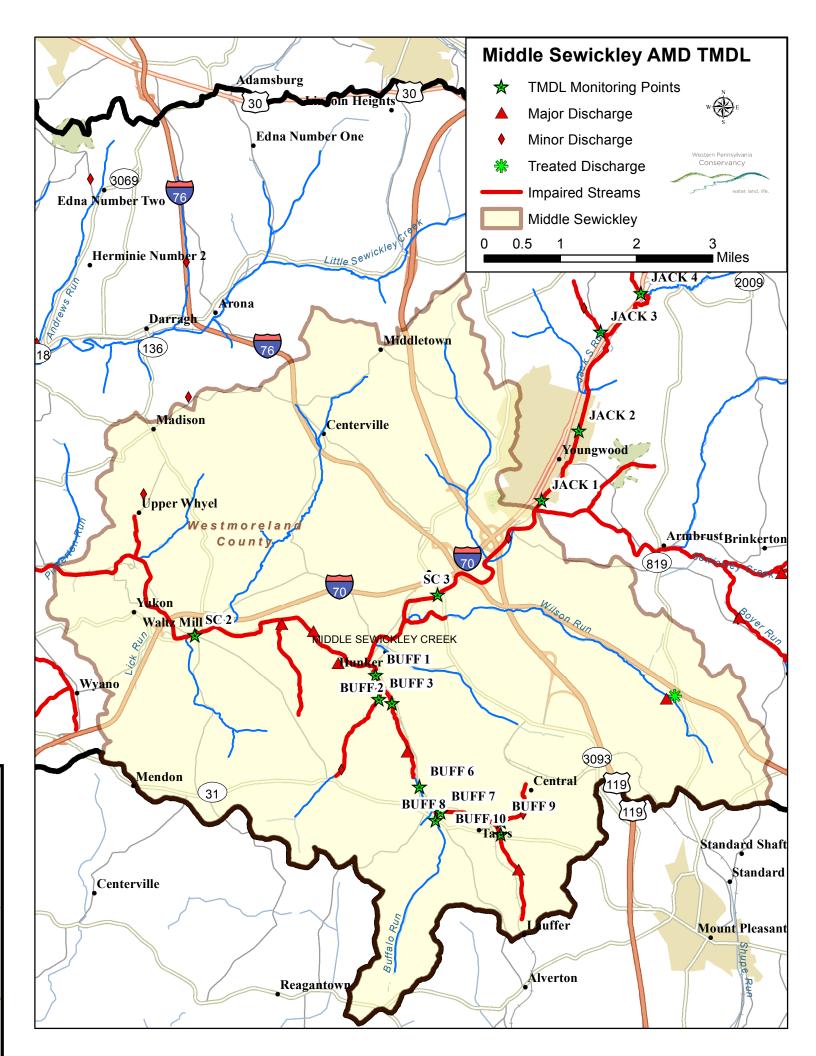
The headwaters of Buffalo Run begin near the communities of Tarrs and Ruffs Dale, in East Huntingdon Township, south of PA Route 31. Several minor AMD discharges enter Buffalo Run and contribute to its pollution load in the headwaters. The stream is able to assimilate the pollution from these minor discharges. However, one major net acidic discharge located downstream of Ruffs Dale is the most significant to enter the stream and seriously degrades water quality and habitat. When this discharge enters Buffalo Run, the substrate becomes smothered in oxide and it remains that way for its entire length. Additionally, another unnamed tributary which flows adjacent to Potoka Mine Road is impaired by a few acidic discharges and enters Buffalo Creek downstream of the large discharge. This tributary will likely need addressed to remove Buffalo Run from the impaired list completely but the difficulty in addressing the individual discharges were beyond the scope of this study. It is recommended that a more detailed study of the tributary be undertaken to determine the best course of action sometime in the future.

### Sewickley Creek below Buffalo Run

Slightly downstream of the mouth of Buffalo Run, Sewickley Creek is impacted by three major discharges. Collectively for this study they are known as the Soberdash discharges. One of the major discharges is net alkaline and two are acidic, one being highly acidic but with a much smaller flow. A very large mine spoil pile is also located in this segment of stream and has been the target of numerous efforts to address the pollution coming from the pile, none of which have been successful.

Soberdash 1 is the highly acidic discharge and it emanates from an abandoned deep mine. Immediately above the discharge is a new rock quarry, believed to be serving the Marcellus Shale industry. The discharge flows untreated from the mine, down a steep bank, and then into a large wetland area adjacent to the mine spoil. It then flows directly into the main stem of Sewickley Creek untreated.

Soberdash 2 is a large, untreated net acidic discharge from a bore hole into an abandoned underground mine. The discharge flows from the borehole, through a 60° V-notch weir, into a mine spoil area where a wetland has been created by the discharge and then into an unnamed tributary, which immediately flows into the main stem of Sewickley Creek. Presently there is



also an active treatment system operated by the Eastern Associated Coal Corporation and called the Delmont Water Treatment Plant adjacent to Soberdash 2. Its discharged water flows into the same unnamed tributary as Soberdash 2. Soberdash 2 has been ranked as a high priority site for restoration by this study.

Soberdash 3 is a large untreated net alkaline discharge from an underground mine located on the opposite side of Sewickley Creek from the large spoil pile. It flows into a wetland area, created by the discharge, before flowing into the Sewickley Creek main stem. It too is has been identified as a priority for restoration.

### **Lower Sewickley Creek**

For this study, the Lower Sewickley Creek is considered all the water entering the Sewickley Creek main stem from the confluence of Pinkerton Run to the confluence of Sewickley Creek with the Youghiogheny River. Named tributaries in this section include Pinkerton Run, Hunters Run, Painters Run and Kelly Run. Little Sewickley Creek also enters Sewickley Creek in the Lower Sewickley. However, it was designated as a separate sub basin for this study.

AMD site	GIS ID	Sub-basin	Type	Ranking	Notes
Acid seep	1016	Lower Sewickley	AMD	minor	At lower end of section
Lowber	1016	Lower Sewickley	AMD	Treated	Marchand Mine passive treatment system
Left bank AMD by	1511	Lower	AMD	minor	Iron discharge from hillside
Lowber		Sewickley			
Left bank AMD by	1016	Lower	AMD	minor	Iron discharge from hillside
pasture		Sewickley			
Hillside below	1016	Lower	AMD	minor	acid seep from hill above
Lowber		Sewickley			Lowber Rd
Mouth of	1016	Lower	In-		
Sewickley Creek		Sewickley	Stream		

There is one large net alkaline AMD discharge (1,600 gpm) located within the area of the watershed designated as the Lower Sewickley Creek, adjacent to the old mining community of Lowber. This discharge is presently being successfully treated by a large passive treatment system through the efforts of Sewickley Creek Watershed Association and numerous partners. The treatment system removes nearly all of the iron from the discharge (usually around 1 mg/L remains in the discharge) before it is released into Sewickley Creek. In addition, the treatment system was designed to recover the iron oxide that is produced during treatment. After removal and preliminary drying, the iron oxide sludge is sold to a pigment manufacturer for further processing into pigments for a variety of uses. The discharge was not sampled as part of this study but is being monitored under an agreement with Hedin Environmental, Inc. and Iron Oxide Recovery.

### Lower Sewickley Creek AMD TMDL

There is one TMDL monitoring location within the Lower Sewickley Creek, SC1, which is at the mouth of Sewickley Creek. SC1 corresponds well with this assessment's monitoring point SMP-SC1, which is located approximately ½ mile above the mouth of Sewickley Creek.

Parameter	Existing load (lbs/day)	TMDL Allowable Load (lbs/day)	WLA (lbs/day)	LA (lbs/day)	NPS Load Reduction (lbs/day)	NPS % Reduction
SC1	- Sewickley	Creek at con	fluence with	Youghiogh	eny River	
Aluminum (lbs/day)	643.49	456.88	6.12	450.76	0*	0%*
Iron (lbs/day)	1669.61	500.88	23.32	477.56	510.82	49%*
Manganese (lbs/day)	576.83	576.83	10.09	566.74	NA	NA
Acidity (lbs/day)	-125285	-125285	-	-125285	NA	NA

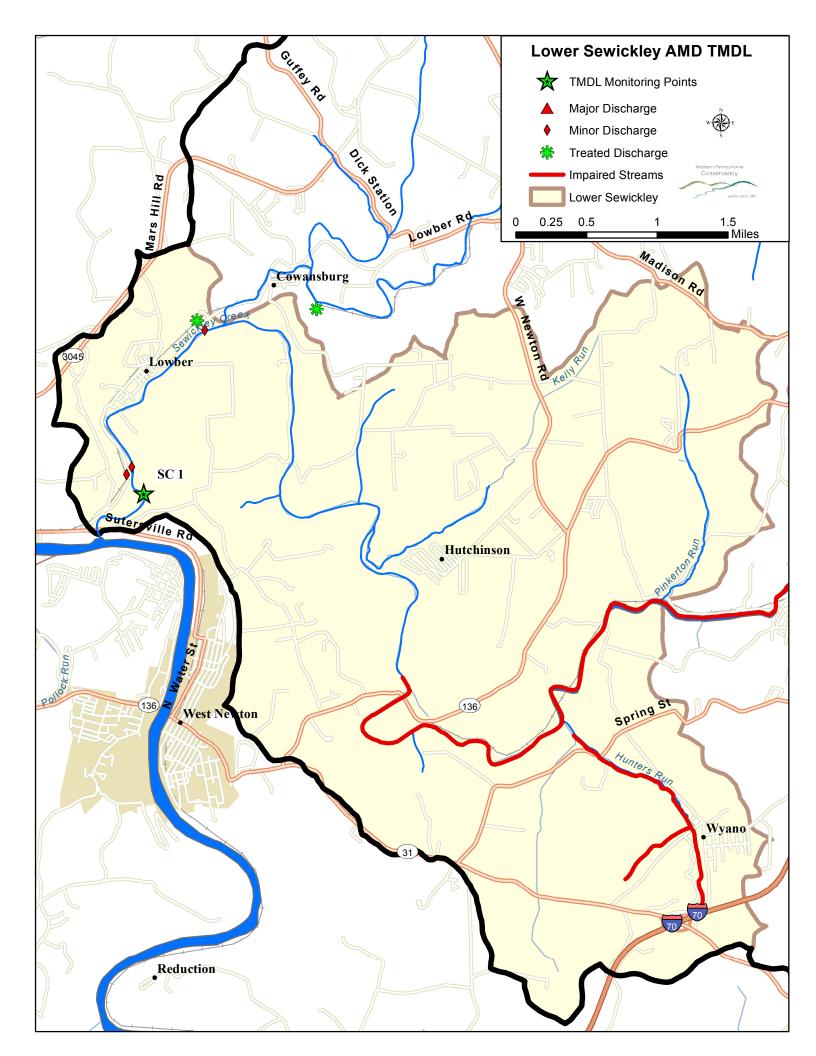
NA-not applicable

### **Little Sewickley Creek**

Little Sewickley Creek is the largest sub-basin of Sewickley Creek. The headwaters begin in southwest Greensburg and the main stem of the stream flows in a westerly direction through the communities of Arona, Darraugh, Herminie and Cowansburg before its confluence with Sewickley near Lowber, Sewickley Township. Route 30 roughly defines the northern border of Little Sewickley Creek west of Greensburg. Within the watershed are two named streams, Andrews Run and Herminie Run.

AMD site	GIS ID	Sub-basin	Type	Ranking	Notes
Keystone Mine Discharge	1058	Little Sewickley	AMD	major	Andrews Run, trib to Little Sewickley, discharge very close to mouth
Andrews Run small seeps	1429	Little Sewickley	AMD	Minor	
BP Discharge AMD	1426	Little Sewickley	AMD	minor	
Turn Pike AMD	1217	Little Sewickley	AMD	minor	Little Sewickley, UNT
Treated Wetland	1217	Little Sewickley	AMD	Treated	Hutchinson Mine Discharge upstream of Cowansburg
Madison Tributary AMD	1502	Little Sewickley	AMD	minor	
Mouth of Little Sewickley	1463	Little Sewickley	In- Stream		

<sup>\*</sup>Takes into account load reductions from upstream sources



Within Little Sewickley Creek are several untreated minor discharges and one large discharge that is presently being treated with a passive wetland treatment system under an agreement with Consolidated Coal Company. Several smaller discharges are located in the vicinity of the Pennsylvania Turnpike as it traverses the Little Sewickley Creek watershed. Near the old mining towns of Edna No. 1 and Edna No. 2 are several minor seeps apparently associated with the old mining operations located there. A series of acidic seeps along the Pennsylvania Turnpike north of Arona pollute an unnamed tributary to the stream with high levels of aluminum. The tributary is also heavily impaired by agriculture practices just to the south of the discharges on the west side of the turnpike. There are two minor AMD discharges near the town of Herminie, both of which have been studied by Hedin Environmental to identify treatment possibilities. One discharge flows at approximately 100 gpm at its highest and another, which emanates from what appears to be an abandoned mine air shaft that is about 300 gpm at its highest flow. This discharge is near a reclaimed boney pile just outside Herminie. Although the discharge flows at a high rate periodically, it is intermittent, ceasing to flow during dry periods. During the periods of high discharge rates and average stream flow, iron staining can be observed in Little Sewickley Creek nearly to its mouth.

As Little Sewickley Creek nears Cowensburg and its confluence with Sewickley Creek, a large passively-treated abandoned mine discharge drains into a created wetland before flowing to the stream. The discharge emanates from the now closed Hutchinson Mine, previously operated by Consolidated Coal Company. The wetland does a good job of removing most of the iron from the discharge. Some iron does escape the treatment system, but the stream quickly assimilates its impacts. Some additional measures to improve retention time within the wetland may improve the treatment efficiencies of the system.

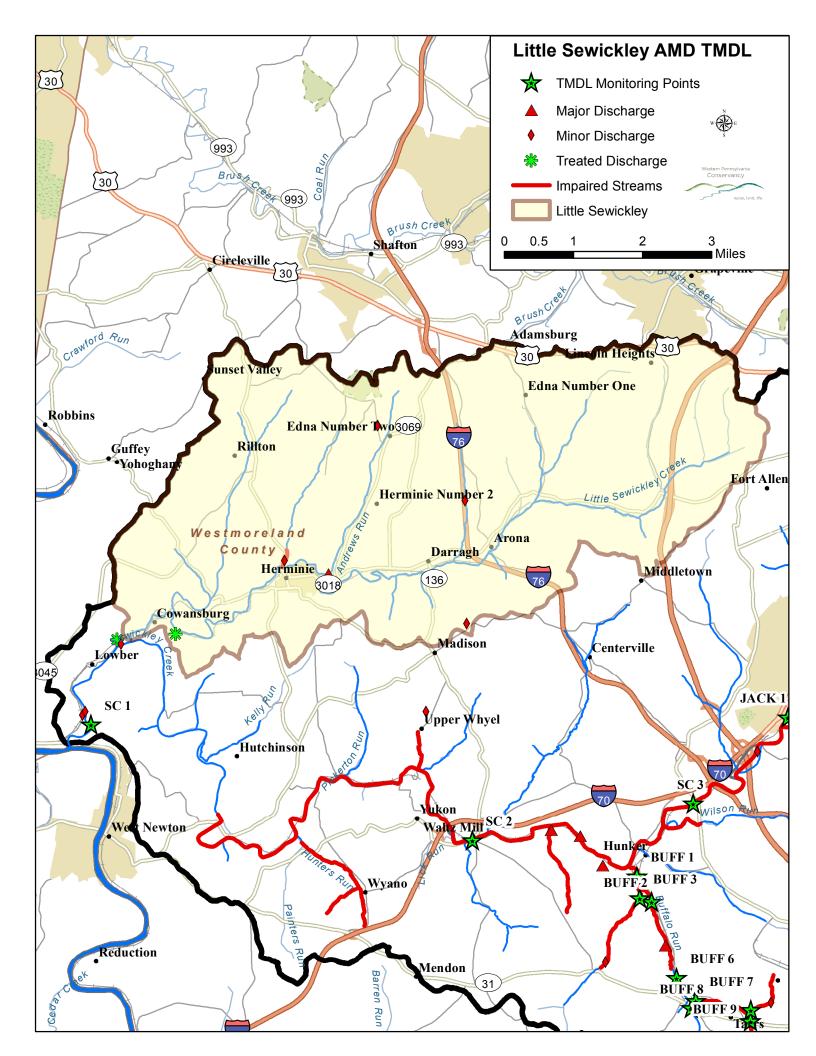
### Little Sewickley Creek AMD TMDL

No AMD TMDL was developed for Little Sewickley Creek. Any pollution load from Little Sewickley Creek is captured in the TMDL monitoring point at the mouth of Sewickley Creek, SC1.

Parameter	Existing load (lbs/day)	TMDL Allowable Load (lbs/day)	WLA (lbs/day)	LA (lbs/day)	NPS Load Reduction (lbs/day)	NPS % Reduction			
SC1	SC1 - Sewickley Creek at confluence with Youghiogheny River								
Aluminum (lbs/day)	643.49	456.88	6.12	450.76	0*	0%*			
Iron (lbs/day)	1669.61	500.88	23.32	477.56	510.82	49%*			
Manganese (lbs/day)	576.83	576.83	10.09	566.74	NA	NA			
Acidity (lbs/day)	-125285	-125285	-	-125285	NA	NA			

NA-not applicable

<sup>\*</sup>Takes into account load reductions from upstream sources



### V. Priorities for Restoration

#### Overview

A successful approach to the restoration of an impaired watershed is to establish a set of priorities for the necessary improvements. Typically, restoration priorities first determine which sites are causing the most impairment to the watershed based on pollution loads. Most often, in AMD impaired watersheds, pollution load has been used as a key factor in determining priority. Metal or acid concentration levels in an AMD discharge alone should not be used as a sole priority indicator in themselves. Flow must also be considered. The volume of flow must be coupled with the amount of pollutant in the water to determine the total amounts of pollution being produced by a discharge, usually measured in pounds per day. Flow is determined by using techniques that will assure reasonably accurate measurement. Common examples of ways to measure the flow of a discharge are by using a weir (such as a V-notch or rectangular style), a flume, capturing a discharge in a pipe to measure flow by means of a bucket and stopwatch, or using a flow meter if the discharge is very large. Once a flow measurement is matched with the amount of pollutant in the water, a total load of pollutant in pounds per day can be calculated. The assessment team utilized these basic methods while collecting AMD data in the Sewickley Creek watershed.

AMD impact is not the only factor that can play a role in determining a final restoration prioritization scheme. Other influences may include (but are not limited to):

- Site conditions
- Landowner cooperation
- Site location and accessibility
- Cost of treatment (both initial and long term)
- Ease of construction
- Likelihood of success
- Expected environmental results
- Operation and maintenance requirements
- Funding availability
- Re-mining potential
- Local priorities and support

As stated above, the initial prioritization for Sewickley Creek is based on pollution load and then refined based on other factors. Flexibility is the key to successful restoration efforts. Often the worst discharges cannot be tackled immediately so other circumstances help to determine what can be done, where it can be done, and in what order.

In the case of the Sewickley Creek watershed, some restoration efforts were done prior to the undertakings of the watershed assessment. SCWA, through a collaborative effort of

numerous partners, was able to obtain funding to design and build three AMD treatment systems. The Wilson Run, Brinkerton, and Lowber systems were all projects of necessity, good planning, opportunity, timing, and funding.

#### Wilson Run

The Wilson Run treatment system (Wilson Run 1) was the first effort by SCWA to address the AMD pollution in the Sewickley Creek Watershed. Two major discharges pollute Wilson Run for its entire length and therefor the stream was a priority for restoration. Wilson Run 1, which is a net alkaline discharge and flows at an average of approximately 1,200 gpm, was the site of many years of research on the treatment of AMD through enhanced aeration of the mine water. Research was conducted in cooperation with the former U.S. Bureau of Mines and other agencies, organizations, and individuals. The site was selected because of its easy access, cooperation from the landowner, and access to electrical power. Although the aeration devices used in the research efforts were effective in oxidizing the AMD, all required significant maintenance because of clogging with iron oxide and were abandoned.

In 2007 a treatment system was constructed by reconfiguring an existing pond for a settling basin. Site and funding constraints limited the size of the treatment system and to improve oxidization and iron precipitation a different type of aeration system called a Maelstrom Oxidizer ® that reduces maintenance requirements was installed. Although the aeration improves treatment at higher flows, the size of the pond is too small to allow for proper precipitation of the iron in the AMD. In order to successfully treat the discharge, the treatment system must be enlarged and should include wetland at the end of the system. SCWA continues to explore options to improve the treatment system efficiency.

A second discharge also enters Wilson Run the site (Wilson Run 2). It is particularly difficult in that the discharge enters the stream under water, preventing accurate flows from being determined. SCWA continues to develop strategies for addressing this second discharge. Without treating the second discharge, restoration of Wilson Run will not happen.

#### Brinkerton

Brinkerton is the site of SCWA's second AMD treatment system (Brinkerton 1). The Brinkerton 1 discharge is the largest in the watershed flowing upwards of 4,000 gpm at high flow. It is the first major discharge to enter Sewickley Creek and significantly impairs the stream. Two other major discharges enter Sewickley Creek there as well. Both as of this assessment were not being treated. Since this discharge is the largest in the watershed and is the first to enter the stream it has been a top priority for SCWA since its inception.

In 2006, after many years of planning and investigation, SCWA procured enough funding from a variety of sources to build a treatment system for Brinkerton 1. Because of site constraints, the treatment system is undersized for its flow, based on passive AMD design

criteria. Three large settling basins were constructed using techniques to maximize treatment area and detention time. No wetland was incorporated into the treatment system, again because of site constraints. In order to improve treatment efficiency, a Maelstrom Oxidizer was placed at the inflow of the system. As of this assessment, power for the two blowers had not been installed but SCWA was actively working toward that goal. The system has not been able to reduce iron levels to discharge standards due to a number of factors, including oxidation, and SWCA continues to pursue ways to increase its treatment efficiency.

#### Lowber

The Lowber discharge, from the abandoned Marchand Mine, is the largest discharge in lower Sewickley Creek. The discharge flows at an average of about 1,800 gpm. It enters the stream approximately one mile from the confluence with the Youghiogheny River. For over fifty years, the Lowber discharge polluted Sewickley Creek and miles of the Youghiogheny River. Because of its impacts to the stream and the river, the Lowber discharge was a high priority for restoration. After many years of planning and assessment, in 2006 SCWA completed a passive AMD treatment system for the Lowber discharge. The treatment system consists of 6 settling ponds and a large wetland. Since its construction, the system has consistently reduced the iron in the discharge from 75 mg/L to about 2 mg/L. The system was designed to expedite the removal of the iron oxide sludge that collects in the system for use as a marketable byproduct. Once removed, the sludge is recycled and processed into a material usable as pigment for paints, stains, and other products.

As has been stated earlier, previous studies had identified many of the major AMD pollution sources within the watershed and established restoration priorities. Examples of these studies include the Scarlift Report as well as TMDL studies. The following information details these studies and how restoration priorities were listed as a result.

### **Scarlift Report Priorities**

The first prioritization of AMD problems in Sewickley Creek was conducted during the Scarlift Report project study for the Youghiogheny River basin in 1971. Problem areas were prioritized based on the following:

- Relative acid load
- Cost of reclamation
- Relative benefit to the receiving stream
- Effectiveness of the proposed reclamation measures
- Possibility of future mining activity in the area

Reclamation focused primarily on low cost passive AMD treatment projects. At the time, the thought was that by flooding underground mine pools, AMD pollution would be reduced. Many

restoration projects focused on installing mine seals at the entrances of the mines in order to flood them. The listed project costs were fairly low because this technique was relatively simple. Subsequent studies have found that this technique was only partially successful, depending on many factors. Though diminished somewhat, the pollution from these discharges has continued for decades

The Scarlift Report lists 14 major sources of AMD in the Sewickley Creek watershed. It reports that the watershed had 43 miles of streams polluted with coal mine drainage with a net acidic load of 50,580 pounds per day and a projected abatement cost totaling \$790,000. The report considers Sewickley Creek as the most polluted sub-basin within the Youghiogheny River watershed, contributing more acidity and iron than any other tributary.

A remediation prioritization list was recommended by the Scarlift Report for the Sewickley Creek watershed. The 14 discharges were listed under seven priority areas beginning with Buffalo Run, followed by the Marchand (Lowber) discharge, then Jacks Run, Brinkerton, Fayette Anticline (near Hunker), Hutchison, and Wilson Run discharges. The following table lists the discharges in addition to their loading.

Scarlift Study findings for Sewickley Creek Watershed

Bearing	Scarlift Study Priorities										
Duionitu	Awaa	Scarlift	Lagation	Load, lbs per day							
Priority	Area	Discharge No.	Location	Net Acid	Iron	Sulfate					
Ţ	Buffalo Run	M05	Buffalo Run	6,600	680	4300					
I	Dullaio Kuli	M52	Fayette Anticline	40	20	50					
II	Marchand (Lowber)	M14	Sewickley Creek	12,000	5,170	28,000					
III	Jack's Run	M32	Jack's Run	7,200	1,260	9,500					
		M12	Sewickley Creek	8,400	6,000	26,800					
	D. dallari	M11	Sewickley Creek	1,640	140	2,100					
IV	Brinkerton	M10	Sewickley Creek	(-)3,000	1,600	7,000					
	Overflow	M19	Boyer Run	(-)1,400	260	2,800					
		M08	Boyer Run	200	40	500					
V	F A	M51	Sewickley Creek	3,500	480	6,500					
V	Fayette Anticline	M50	Sewickley Creek	23,200	300	9,900					
VI	Hutchinson	M13	Sewickley Creek	11,000	2,990	49,600					
	Wilson Run	M07	Wilson Run	(-)450	30	1,600					
VII	Wilson Run	M06	Wilson Run	(-)580	640	8,400					

The reports completed throughout the coal fields of Pennsylvania under Operation Scarlift serve as excellent resources for the restoration work that continues today. The reports often include information that would be difficult to gather today and having it in a concise report is of great value. However, in the many years that have passed since the reports were completed, conditions have changed considerably within Sewickley Creek, and the chemistry of the mine discharges has changed as well. Many of the discharges listed in the chart above are no longer acidic and are now net alkaline. This is generally believed to have been caused by the mines being flooded and

the neutralization of acidic water by limestone in the geologic formation associated with the coal. In addition, some of the discharges identified are presently being treated.

### **Total Maximum Daily Load (TMDL) Study Priorities**

In 2009, an AMD Total Maximum Daily Load (TMDL) report was prepared for Sewickley Creek by the Pennsylvania Department of Environmental Protections for the streams in the watershed impaired by mine drainage. It was noted that a separate TMDL study to address siltation would be done at a later date. The TMDL addresses the three primary metals that are associated with AMD; iron, manganese, and aluminum, plus pH. The results of the TMDL report present a summary table of 27 sampled locations scattered throughout the watershed, showing the existing and allowable load for that site in addition to the NPS percent pollution reduction needed to meet the allowable load. For each site farther downstream, the values take in account load reductions from upstream sources and the over-all end result of the report shows that at the sampling point at the confluence of Sewickley Creek and the Youghiogheny River, there is a NPS percent reduction need of 49% for iron and a 0% reduction needed for aluminum.

Parameter WELTY8 - V	Existing Load (lbs/day) Velty Run nea	TMDL Allowable Load (lbs/day) r headwaters	WLA (lbs/day)	LA (lbs/day)	NPS Load Reduction (lbs/day)	NPS % Reduction
Aluminum (lbs/day)	3.47	0.14	-	0.14	3.33	96%
Iron (lbs/day)	1.35	1.35	-	1.35	NA	NA
Manganese (lbs/day)	0.23	0.23	1	0.23	NA	NA
Acidity (lbs/day)	-74.41	-74.41	-	-74.41	NA	NA
WELTY7 – V	Velty Run ½ n	nile east of Welt	ytown			
Aluminum (lbs/day)	14.98	1.20	-	0.92	10.45*	90%*
Iron (lbs/day)	11.68	2.34	-	1.21	9.34*	80%*
Manganese (lbs/day)	3.22	3.22	-	3.22	NA	NA
Acidity (lbs/day)	-1143.39	-1143.39	-	-1143.39	NA	NA
WELTY6 – V	Velty Run ups	tream of Mamn	noth Lake			
Aluminum (lbs/day)	18.19	5.82	-	5.82	0*	0%*
Iron (lbs/day)	10.92	10.92	-	10.92	NA	NA

	1					
Manganese (lbs/day)	2.67	2.67	-	2.67	NA	NA
Acidity (lbs/day)	-3917.39	-3917.39	-	-3917.39	NA	NA
WELTY5 – V	Velty Run ½ n	nile downstrean	n of Mammoth	Lake		
Aluminum (lbs/day)	19.27	6.17	-	6.17	0.73*	11%*
Iron (lbs/day)	11.56	11.56	-	11.56	NA	NA
Manganese (lbs/day)	6.94	6.94	-	6.94	NA	NA
Acidity (lbs/day)	-1753.59	-1753.59	-	-1753.59	NA	NA
WELTY4 – U	I <mark>nnamed trib</mark> u	itary to Welty F	Run ½ mile nor	theast of village o	f Mammoth	
Aluminum (lbs/day)	1.15	0.37	-	0.37	0.78*	69%*
Iron (lbs/day)	0.69	0.69	-	0.69	NA	NA
Manganese (lbs/day)	0.91	0.91	-	0.91	NA	NA
Acidity (lbs/day)	-655.80	-655.80	-	-655.80	NA	NA
WELTY1 – V	Velty Run at b	ridge in Calum	et			
Aluminum (lbs/day)	25.06	8.02	-	8.02	3.16*	29%*
Iron (lbs/day)	48.06	6.73	-	6.73	41.33*	86%*
Manganese (lbs/day)	65.29	16.32	-	16.32	48.97*	75%*
Acidity (lbs/day)	-7198.62	-7198.62	-	-7198.62	NA	NA
JACK10 – Ui	nnamed tribut	ary to Jacks Ru	ın upstream of	Greensburg		
Aluminum (lbs/day)	7.90	3.87	0.28	3.59	4.03	51%
Iron (lbs/day)	6.79	5.64	1.13	4.51	1.15	17%
Manganese (lbs/day)	1.03	1.03	0.75	0.28	NA	NA
Acidity (lbs/day)	-2888.05	-2888.05	-	-2888.05	NA	NA
	named tributa	ry to Jacks Run	upstream of (	Greensburg		
Aluminum (lbs/day)	43.11	2.59	0.28	2.31	40.52	94%
Iron (lbs/day)	47.70	6.20	1.13	5.07	41.50	87%
Manganese (lbs/day)	25.22	3.03	0.75	2.28	22.19	88%
Acidity (lbs/day)	-112.83	-112.83	-	-112.83	NA	NA
IACKS Inc		0.00	•			

JACK8 – Jacks Run upstream of Greensburg

Aluminum	20.60	7.70	0.56	7.14	0*	0%*
(lbs/day)	29.60	7.70	0.56	7.14		
Iron (lbs/day)	29.73	22.30	2.26	20.04	0*	0%*
Manganese (lbs/day)	27.29	10.10	1.50	8.60	0*	0%*
Acidity (lbs/day)	-5517.97	-5517.97	-	-5517.97	NA	NA
	ks Run downs	tream of Coal T	ar Run			
Aluminum (lbs/day)	53.17	15.95	1.13	14.82	15.32*	49%*
Iron (lbs/day)	42.24	24.08	4.50	19.58	10.73*	31%*
Manganese (lbs/day)	15.09	15.09	3.00	12.09	NA	NA
Acidity (lbs/day)	-8588.88	-8588.88	-	-8588.88	NA	NA
	lers Run near	mouth				
Aluminum (lbs/day)	4.45	2.54	-	2.54	1.91	43%
Iron (lbs/day)	2.17	2.17	0.75	1.42	NA	NA
Manganese (lbs/day)	0.42	0.42	0.38	0.04	NA	NA
Acidity (lbs/day)	-1359.57	-1359.57	-	-1359.57	NA	NA
	ks Run downs	tream of Zellers	Run			
Aluminum (lbs/day)	56.87	26.73	1.13	25.60	0*	0%*
Iron (lbs/day)	37.08	37.08	4.50	32.58	NA	NA
Manganese (lbs/day)	13.14	13.14	3.00	10.14	NA	NA
Acidity (lbs/day)	-11101.31	-11101.31		-11101.31	NA	NA
	ks Run upstre	am of Slate Cre	ek			
Aluminum (lbs/day)	103.88	44.67	1.13	43.54	29.07*	40%*
Iron (lbs/day)	1715.67	85.78	4.50	81.28	1629.89*	95%*
Manganese (lbs/day)	97.62	71.26	3.00	68.26	26.36*	27%*
Acidity (lbs/day)	-6809.46	-6809.46	-	-6809.46	NA	NA
	named tributa	ry to Jacks Run	in South Gree	nsburg		
Aluminum (lbs/day)	2.28	1.21	-	1.21	1.07	47%
Iron (lbs/day)	1.71	1.71	-	1.71	NA	NA
Manganese (lbs/day)	2.08	1.27	-	1.27	0.81	39%

Acidity	-211.07	-211.07		-211.07	NA	NA
(lbs/day)	ks Run in You	ingwood	-			
Aluminum		Ü	1.12	62.16	20.51*	210/ \$
(lbs/day)	153.08	64.29	1.13	63.16	28.51*	31%*
Iron (lbs/day)	811.75	259.76	4.50	255.26	0*	0%*
Manganese (lbs/day)	96.67	96.67	3.00	93.97	NA	NA
Acidity (lbs/day)	-14214.01	-14214.01		-14214.01	NA	NA
	ks Run at mou	ıth				
Aluminum (lbs/day)	107.27	59.00	1.13	57.87	0*	0%*
Iron (lbs/day)	320.49	185.89	4.50	181.39	0*	0%*
Manganese (lbs/day)	78.06	78.06	3.00	75.06	NA	NA
Acidity (lbs/day)	-15394.56	-15394.56		-15394.56	NA	NA
	ley Creek dow	nstream of Jacl	ks Run			
Aluminum (lbs/day)	317.07	155.36	1.13	154.23	113.44	43%
Iron (lbs/day)	255.73	255.73	4.50	251.23	NA	NA
Manganese (lbs/day)	57.71	57.71	3.00	54.71	NA	NA
Acidity (lbs/day)	-74418.25	-74418.25		-74418.25	NA	NA
	named tribut	ary to Buffalo R	un downstrean	n of Route 31 in	Tarrs	
Aluminum (lbs/day)	133.55	5.34	0.56	4.78	128.16	96%
Iron (lbs/day)	93.89	8.45	2.26	6.19	85.44	91%
Manganese (lbs/day)	18.71	8.42	1.50	6.92	10.29	55%
Acidity (lbs/day)	1276.84	6.38	-	6.38	1270.46	99.5%
	amed tributa	ry to Buffalo Ru	n near mouth i	in Snydertown		1
Aluminum (lbs/day)	71.98	0.72	-	0.72	71.26	99%
Iron (lbs/day)	17.49	1.40	-	1.40	16.09	92%
Manganese (lbs/day)	27.26	0.82	-	0.82	26.44	97%
Acidity (lbs/day)	-625.27	-625.27	-	-625.27	NA	NA
	falo Run at Ro	oute 31 bridge n	ear Ruffs Dale			
Aluminum (lbs/day)	7.13	5.99	0.28	5.71	1.14	16%
Iron	14.17	13.32	1.13	12.19	0.85	6%

(lbs/day)									
Manganese (lbs/day)	2.95	2.95	0.75	2.20	NA	NA			
Acidity (lbs/day)	-1693.56	-1693.56	-	-1693.56	NA	NA			
BUFF7 – Uni	BUFF7 – Unnamed tributary to Buffalo Run at T688 bridge in Ruffs Dale								
Aluminum (lbs/day)	142.48	7.12	0.56	6.56	0*	0%*			
Iron (lbs/day)	65.08	12.36	2.26	10.10	0*	0%*			
Manganese (lbs/day)	27.61	12.97	1.50	11.47	0*	0%*			
Acidity (lbs/day)	717.37	78.91	-	78.91	0*	0%*			
	falo Run at SI	R3089 bridge do	wnstream of R	uffs Dale					
Aluminum (lbs/day)	116.44	13.97	1.13	12.84	0*	0%*			
Iron (lbs/day)	67.43	24.95	4.50	20.45	0*	0%*			
Manganese (lbs/day)	38.85	24.48	3.00	21.48	0*	0%*			
Acidity (lbs/day)	-933.00	-933.00	-	-933.00	NA	NA			
	named tributa	ry to Buffalo Ru	ın (Thompson l	Run) off of T678					
Aluminum (lbs/day)	43.95	2.20	0.28	1.92	41.75	95%			
Iron (lbs/day)	10.27	5.34	1.13	4.21	4.93	48%			
Manganese (lbs/day)	24.48	3.52	0.75	2.77	19.96	85%			
Acidity (lbs/day)	459.87	32.19	-	32.19	427.68	93%			
	falo Run at To	78 bridge	T						
Aluminum (lbs/day)	65.19	13.04	1.13	11.91	0*	0%*			
Iron (lbs/day)	704.88	35.24	4.50	30.74	627.16*	95%*			
Manganese (lbs/day)	58.49	26.90	3.00	23.90	17.22*	39%*			
Acidity (lbs/day)	-249.73	-249.73	-	-249.73	NA	NA			
	talo Kun at SI	R3089 bridge ne	ar Hunker						
Aluminum (lbs/day)	70.62	19.77	1.13	18.64	0*	0%*			
Iron (lbs/day)	626.29	50.10	4.50	45.60	0*	0%*			
Manganese (lbs/day)	72.88	33.52	3.00	30.52	0*	0%*			
Acidity (lbs/day)	-856.52	-856.52	-	-856.52	NA	NA			
SC2 – Sewickley Creek downstream of Buffalo Run									

Aluminum (lbs/day)	639.93	364.76	7.39 (6.26+1.13)	357.37	62.61*	15%*
Iron (lbs/day)	1370.64	712.73	33.69 (29.19+4.50)	679.04	72.72*	10%*
Manganese (lbs/day)	393.28	393.28	19.68 (16.68+3.00)	373.60	NA	NA
Acidity (lbs/day)	-74055.30	-74055.30		-74055.30	NA	NA
SC1 – Sewick	ley Creek at c	onfluence with	Youghiogheny F	River		
Aluminum (lbs/day)	643.49	456.88	6.12 (4.99+1.13)	450.76	0*	0%*
Iron (lbs/day)	1669.61	500.88	23.32(18.82 +4.50)	477.56	510.82*	49%*
Manganese( lbs/day)	576.83	576.83	10.09 (7.09+3.00)	566.74	NA	NA
Acidity (lbs/day)	-125285.00	-125285.00	-	-125285.00	NA	NA

NA = not applicable

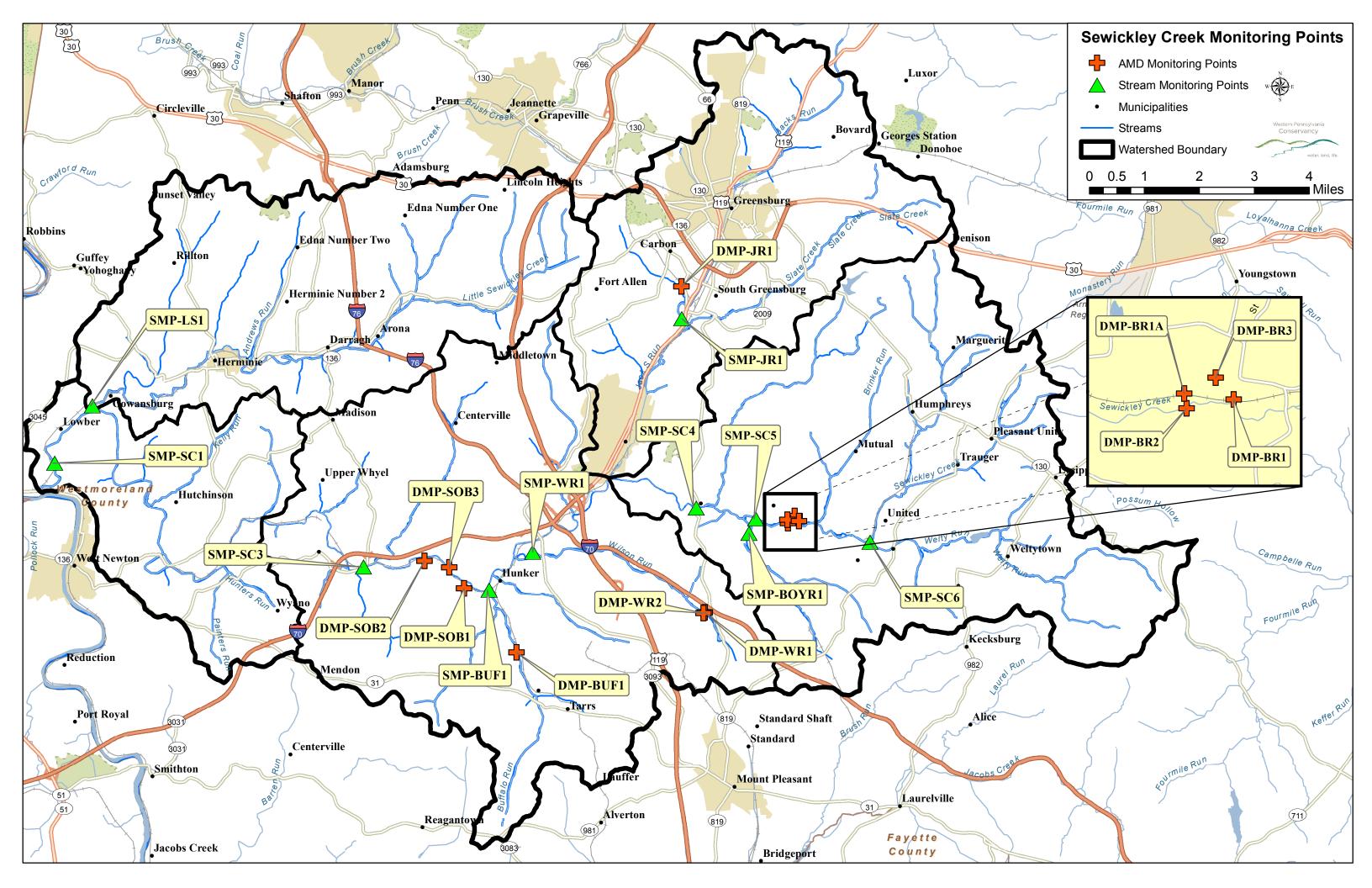
#### **Sewickley Creek Watershed Association Assessment Priorities**

As mentioned previously, the best approach to the restoration of an impaired watershed is to establish a set of priorities for the necessary work. Usually, restoration priorities first determine which sites are causing the most impairment to the watershed based on pollution load. With AMD impaired watershed, water chemistry of the mine discharges plays an important role as well. If a discharge is acidic and contains aluminum, it may degrade a stream even if the pollution load from the discharge is not as high as other discharges. This is because aluminum is very toxic to aquatic life. For this study, chemistry and flow were used to determine pollution load for the top 10 discharges in the watershed.

Many other factors can play a role in determining a final restoration prioritization scheme. These factors may include site conditions, landowner cooperation, site location or access to the site, cost of treatment (both initial and long term), ease of construction, likelihood of success, expected environmental results, operation and maintenance requirements, funding availability, remining potential, local priorities and support, and many other. Often the initial prioritization is based on pollution load and then is refined based on the other factors. Flexibility is the key to successful restoration efforts. Often the worst discharges cannot be tackled immediately so other factors help determine what to do and when.

In the case of Sewickley Creek, the watershed association tried to address its AMD problems by cooperating with agencies and organizations familiar with treatment and restoration techniques. It focused on two areas in the watershed, the upper and lower, in order to gain support for restoration efforts throughout the watershed. The discharges they focused on were

<sup>\*</sup> Takes into account load reductions from upstream sources. Waste loads in italics are reserved for future mining operations.



major contributors of pollution to the watershed. For this study, the prioritization has been refined to compare pollution loading of metals and including the various other factors as described above. In most instances, the largest pollution load was iron associated with discharges from abandoned underground coal mines.

#### **Subwatershed Priorities**

The priority restoration sites were also categorized according to the assessment designated sub-watershed into which they drained.

### **Upper Sewickley Creek**

Within the upper Sewickley Creek, the priorities for restoration are the major untreated discharges and the enhancement of the present treatment system.

### 1. Brinkerton 1 Discharge\* (DMP-BR1)

				Alka-			Alum-	Manga	Fe	Al	Mn	Acidity	Alkalinity
Sample		Flow	pН	linity	Acidity	Iron	inum	nese	Loading	Loading	Loading	Loading	Loading
ID		GPM	Lab	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day
Combinat	ion												
DMP-BR	1A&Overf	low											
	Average	2708.0	6.3	91.5	-16.0	24.8	0.3	1.0	807.2	9.7	32.6	-520.8	2978.3

All values represent short-term averages for samples taken during the monitoring period of the assessment.

### 2. Brinkerton 2 Discharge (DMP-BR2)

Sample ID		Flow GPM	pH Lab	Alka- linity mg/L	Acidity mg/L	Iron mg/L	Alum- inum mg/L	Manga nese mg/L	Fe Loading lbs/day	Al Loading lbs/day	Mn Loading lbs/day	•	Alkalinity Loading lbs/day
DMP-BR2	2												
	Average	1157.9	6.4	217.0	-125.0	16.7	0.2	0.2	232.4	2.8	17.0	-1739.7	3020.1

All values represent short-term averages for samples taken during the monitoring period of the assessment.

#### 3. Brinkerton 3 Discharge (DMP-BR3)

Sample ID		Flow GPM	pH Lab	Alka- linity mg/L	Acidity mg/L	Iron mg/L	Alum- inum mg/L	Manga nese mg/L	Fe Loading lbs/day	Al Loading lbs/day	Mn Loading lbs/day	•	Alkalinity Loading lbs/day
DMP-BR3	3												
	Average	215.3	4.7	2.0	91.0	31.3	0.3	2.6	80.8	0.8	6.7	236.4	6.0

<sup>\*</sup>This data represents a combined average from two separate flows, BR1A and BR1 bypass overflow

All values represent short-term averages for samples taken during the monitoring period of the assessment.

### 4. Boyer Run Discharge\* (SMP-BOYR1)

Two mine discharges enter Boyer Run from what is believed to be the abandoned Hecla #1 mine. Because landowner permission could not be obtained to sample the Boyer Run Discharges, a stream sample and flow measurement were taken downstream of the discharges to establish a pollution load within the stream. By using this method, the true pollution load attributed to the discharges could not be measured. Loadings are based on the amount of metal remaining within the water at the monitoring location and does not account for the amount of metals precipitated within the stream bed. Based on observation of the stream bed, the amount of metals precipitating prior to the monitoring point on Boyer Run could be substantial.

### **Instream monitoring point SMP-BOYR1**

Sample ID		Flow GPM	pH Lab	Alka- linity mg/L	Acidity mg/L	Iron mg/L	Alum- inum mg/L	Manga nese mg/L	Fe Loading lbs/day	Al Loading lbs/day	Mn Loading lbs/day		Alkalinity Loading lbs/day
Stream Sa	mple												
SMP-BOY	YR1												
	Average	2109	7.2	188.9	-94.6	2.6	0	0.2	65	0.5	4.4	-2397	47866.3

All values represent short-term averages for samples taken during the monitoring period of the assessment.

#### **Jacks Run**

Within the Jacks Run Sub-basin, the priority for restoration is the Greensburg #2 Mine discharge – DMP-JR1.

#### 1. Greensburg #2 Mine Discharge (DMP-JR1)

Sample ID		Flow GPM	pH Lab	Alka- linity mg/L	Acidity mg/L	Iron mg/L	Alum- inum mg/L	Manga nese mg/L	Fe Loading lbs/day	Al Loading lbs/day	Mn Loading lbs/day	•	Alkalinity Loading lbs/day
DMP-JR1													
	Average	1219.4	5.6	40.0	14.0	37.3	0.1	1.3	400.4	0.8	18.5	200.3	581.4

All values represent short-term averages for samples taken during the monitoring period of the assessment.

### Middle Sewickley Creek

Within the Middle Sewickley Creek sub-basin are 6 priority mine discharges for restoration. Three flow directly into the main stem of Sewickley Creek, two flow into Wilson Run, and one flows into Buffalo Run. The priorities were chosen based on their metals loading and in the case of the Soberdash 1 discharge, DMP-SOB1, its acid load.

### 1. Buffalo Run Discharge (DMP-BUF1)

				Alka-			Alum-	Manga	Fe	Al	Mn	Acidity	Alkalinity
Sample		Flow	pН	linity	Acidity	Iron	inum	nese	Loading	Loading	Loading	Loading	Loading
ID		GPM	Lab	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day
DMP-BUI	F1												
	Average	440.8	5.8	62.0	46.0	60.5	0.8	5.4	320.7	4.4	28.6	242.0	330.3

All values represent short-term averages for samples taken during the monitoring period of the assessment.

### 2. Acid Pool Borehole Discharge (DMP-SOB2)

				Alka-			Alum-	Manga	Fe	Al	Mn	Acidity	Alkalinity
Sample		Flow	pН	linity	Acidity	Iron	inum	nese	Loading	Loading	Loading	Loading	Loading
ID		GPM	Lab	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day
DMP-SOI	B2												
	Average	220.5	4.3	0.0	343.0	95.6	2.3	9.0	253.3	6.0	24.0	908.3	0.8

All values represent short-term averages for samples taken during the monitoring period of the assessment.

### 3. Wilson Run 2 Discharge (DMP-WR2)

				Alka-			Alum-	Manga	Fe	Al	Mn	Acidity	Alkalinity
Sample		Flow	pН	linity	Acidity	Iron	inum	nese	Loading	Loading	Loading	Loading	Loading
ID		GPM	Lab	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day
DMP-WR	2												
	Average	1017.4	6.3	149.0	-0.6	17.1	0.1	0.4	208.5	1.4	4.9	-778.6	1826.3

All values represent short-term averages for samples taken during the monitoring period of the assessment.

### 4. Soberdash 3 Discharge (DMP-SOB3)

				Alka-			Alum-	Manga	Fe	Al	Mn	Acidity	Alkalinity
Sample		Flow	pН	linity	Acidity	Iron	inum	nese	Loading	Loading	Loading	Loading	Loading
ID		GPM	Lab	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day
DMP-SOI	B3												
	Average	180.5	6.6	154.0	-39.0	7.9	0.2	1.0	17.1	0.4	21.8	-85.3	333.3

All values represent short-term averages for samples taken during the monitoring period of the assessment.

### 5. Wilson Run 1 Discharge (DMP-WR1)

				Alka-			Alum-	Manga-	Fe	Al	Mn	Acidity	Alkalinity
Sample		Flow	pН	linity	Acidity	Iron	inum	nese	Loading	Loading	Loading	Loading	Loading
ID		GPM	Lab	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day
DMP-WR	1												
	Average	1163.2	6.6	191.0	-97.0	8.4	0.0	0.6	73.4	0.2	7.9	-1351.5	2668.8

All values represent short-term averages for samples taken during the monitoring period of the assessment.

### 6. Soberdash Acid Discharge (DMP-SOB1)

Sample ID		Flow GPM	pH Lab	Alka- linity mg/L	Acidity mg/L	Iron mg/L	Alum- inum mg/L	Manga nese mg/L	Fe Loading lbs/day	Al Loading lbs/day	Mn Loading lbs/day	•	Alkalinity Loading lbs/day
DMP-SOI	31												
	Average	21.5	3.9	0.0	282.0	25.3	1.1	6.1	6.5	0.3	1.6	73.0	0.0

All values represent short-term averages for samples taken during the monitoring period of the assessment.

### **Lower Sewickley Creek**

Within the lower Sewickley Creek, all remaining AMD sources were considered minor discharges and therefor ranked as low priorities for restoration. However, the discharges do provide some pollution loading to Sewickley Creek. The priority rankings for Lower Sewickley Creek are based on best professional judgment because none of the discharges were sampled or flow measurements taken to establish loading. Based on observation, the following minor discharges are listed by priority.

- 1. Acid seep from the hillside above Lowber Road just downstream of monitoring point SMP, SC1.
- 2. Second acid seep from the hillside adjacent the seep mentioned above.
- 3. Iron seep from the left bank near the pasture upstream of the Lowber treatment system
- 4. Iron seep from left stream bank adjacent to the Lowber treatment system.

### **Little Sewickley Creek**

Little Sewickley Creek is a major tributary of Sewickley Creek and although several discharges were identified within the watershed, none were ranked as a major discharge, based on apparent impacts to the stream. Priority rankings given here should be undertaken after the major discharges are addressed or if special circumstances lend themselves to raising the priority of a Little Sewickley Creek discharge. Priority rankings for Little Sewickley Creek are based on best professional judgment because none of the discharges were sampled monthly as part of this assessment. Based on observation, the following minor discharges are listed by priority.

- 1. AMD discharge to Andrews Run, flowing from an air shaft of the abandoned Keystone Coal mine, located just upstream to the confluence with Little Sewickley Creek.
- 2. AMD piped discharge located behind the BP station on Herminie-Irwin Road.
- 3. Acid discharge to an unnamed tributary to Little Sewickley Creek adjacent to the PA Turnpike north of New Stanton.
- 4. Hutchinson Mine passive wetland treatment system (upgrades to improve detention time).
- 5. AMD discharge to an unnamed tributary draining from the community of Madison.

#### **Technical and Financial Assistance Needs**

#### **Estimates of Remediation Costs**

Estimates of costs to construct treatment systems are given for the top ten priority sites for restoration. The sites are listed under the sub-basin that they affect. Because all ten priority sites were considered treatable by passive means, costs estimates were developed only for passive treatment systems. Cost estimates for the treatment of the major sources of AMD within the Sewickley Creek watershed were developed using AMD Treat, a computer application which estimates the costs of constructing, operating, and maintaining either passive or active AMD treatment systems. AMD Treat was cooperatively developed by the Pennsylvania DEP, West Virginia DEP, the U.S. Geological Survey, and the U.S. Office of Surface Mining Regulation and Enforcement.

Estimated costs for the treatment of minor pollution sources were not made at the time of this study. Development and implementation of restoration projects on lower priority pollution sources are encouraged should favorable circumstances develop and funding becomes available for those sites. Any reduction in pollution load will have a positive impact on overall water quality within Sewickley Creek, and should be encouraged. Priorities should be reevaluated and revised as restoration proceeds.

## **Jacks Run Priorities – System Type/Estimated Costs**

	Jacks Run AM	D Projects - Est	imated AMD Tr	eatment Costs	
Monitoring Site	Treatment Type	System Type	Estimated Cost of Construction	Operation, Maintenance, and Replacement*	Land Reclamation**
DMP-JR1	Passive	Anoxic Limestone Drain, Settling basin, Wetland	\$358,848	\$350,000	Moderate

<sup>\*20</sup>yr life - Includes one-time replacement

<sup>\*\*</sup>Land reclamation not included in cost estimation

## **Upper Sewickley Creek Priorities – System Type/Estimated Costs**

	Upper Sewickley Creek AMD Projects - Estimated AMD Treatment Costs									
Monitoring Site	Treatment Type	System Type	Estimated Cost of Construction	Operation, Maintenance, and Replacement*	Land Reclamation**					
DMP-BR1	Passive	Present Treatment System Modifications	\$70,400	\$284,660	N/A					
DMP-BR2	Passive	Settling Basin, Wetland	\$663,932	\$213,660	NA					
DMP-BR3	Passive	Anoxic Limestone Drain - present settling ponds	\$66,769	\$26,060***	N/A					
DMP-BOYR1  AMD discha	Passive arge not monitored for	Settling Basin, wetland or this study								

<sup>\*20</sup>yr life - Includes one-time replacement and iron sludge removal

<sup>\*\*</sup>Land reclamation not included in cost estimation

<sup>\*\*\*</sup> Primary O&M included in DMP-BR1 costs

## Middle Sewickley Creek Priorities – System Type/Estimated Costs

Middle Sewickley Creek AMD Projects - Estimated AMD Treatment Costs									
Monitoring Site	Treatment Type	System Type	Estimated Cost of Construction	Operation, Maintenance, and Replacement*	Land Reclamation**				
DMP-BUF1	Passive	Anoxic Limestone Drain, Settling Pond, Wetland	\$770,960	\$801,780	N/A				
DMP-SOB2	Passive	Anoxic Limestone Drain, Settling Pond, Wetland	\$711,875	\$727,360	Minimal**				
DMP-WR2	Passive	Settling Pond, Wetland	\$1,013,431	\$912,680	N/A				
DMP-SOB3	Passive	Aerobic Wetland	\$125,275	\$177,240	N/A				
DMP-WR1	Passive	Aerobic Wetland	\$341,893	\$217,560	N/A				
DMP-SOB1	Passive	Anoxic Limestone Drain, Settling Pond, Wetland	\$173,152	\$168,940	Moderate**				

<sup>\*20</sup>yr life - Includes one-time replacement and iron sludge removal

<sup>\*\*</sup>Land reclamation not included in cost estimation

### **Funding and Support Sources**

No restoration/implementation funding was totally secured for any of the identified priority sites in any of the sub-basins at the time of the completion of the assessment report. To fully implement the priority recommendations with this plan, numerous funding sources will likely need to be utilized. Additional in-kind support from SCWA, Westmoreland Conservation District, Western PA Conservancy, various municipalities and other cooperating groups and agencies may be available.

Additional sources of funding and support for restoration efforts associated with the priority sites have been identified and include:

- EPA Non-point source pollution funding, targeted watershed grants, state revolving funds, Brownfields Initiative, and environmental education grants
- OSM Appalachian Clean Streams Initiative, summer internships, and Title IV AML programs
- PADEP Growing Greener Environmental Stewardship/Watershed Protection and Technical Assistance Grant (TAG) program
- PADEP Greensburg District Mining Office technical assistance and support
- PADEP Bureau of Abandoned Mine Reclamation technical assistance and financial support
- PADEP Bureau of Dams & Waterways Engineering technical assistance with permitting and wetlands issues
- PADEP Bureau of Mining and Reclamation through reclamation planning
- PA Department of Conservation and Natural Resources financial support
- PA Department of Community and Economic Development financial support
- Western Pennsylvania Conservancy technical assistance
- USDA Natural Resources Conservation Service PL-566 Watershed Protection and Flood Prevention Act - funding and technical services center assistance Penn's Corner Resource Conservation and Development Area - technical assistance and support
- Penn's Corner Charitable Trust financial support
- Westmoreland Conservation District technical support and monitoring
- Mt. Pleasant Township in-kind construction assistance
- Mt. Pleasant Township Municipal Authority monitoring & site access
- Foundation for PA Watersheds financial support
- Western Pennsylvania Coalition for Abandoned Mine Reclamation technical and financial support
- PA Fish and Boat Commission technical assistance
- PA Trout Unlimited technical assistance
- Mining Industry support through cooperative remining and other initiatives
- Private Industry support through cooperative financial and technology initiatives

### VI. Implementation Schedule and Milestones

#### **Overview**

Implementation of the restoration priorities is dependent upon many factors. A primary factor will be the support of the landowner of the property on which the restoration activities will take place. Initial contacts have been made with most of the property owners of the priority sites and most have been initially supportive of implementing restoration activities. With landowners of priority sites that are opposed to cooperating with restoration goals, careful deliberations should be developed to persuade them to reconsider their position.

As implementation details increase, including details about the type and size of the proposed treatment systems, landowners may raise concerns and questions about installation and development. A primary concern of landowners is in regards to the issues of liability when it comes to having a treatment system on their property. In response to these concerns, it is explained to landowners that Pennsylvania has initiated a "Good Samaritan" statute which protects cooperative landowners from a number of liability issues. This law is expected to be referenced extensively as restoration activities progress throughout Sewickley Creek Watershed.

One of the goals of this assessment is to raise the priority for restoration of Sewickley Creek within Pennsylvania's Bureau of Abandoned Mine Reclamation and have that bureau begin restoration efforts though their program. Because restoration activities will likely be implemented by SCWA, state agencies, and perhaps industry concurrently, reclamation projects will be spread throughout the watershed. A strictly regimented implementation schedule will be very difficult to initiate and follow. Planning an implementation schedule by sub-basins and based on the assessment priorities should help to make restoration activities more manageable. The implementation schedule must be flexible enough to account for variability in funding priorities and availability, agency priorities, market conditions, and SCWA and partnership management capabilities.

Funding is a major factor in implementing restoration activities. As previously stated, there are many different sources of support available to fund restoration efforts. As priority projects are developed, individual funding sources should be evaluated for their appropriateness to each project. Every effort should be made to use a variety of funding sources in order to provide for matching funds, which are always viewed favorably when requesting grant monies.

As a solely volunteer run organization, the SCWA may find it a challenge to administer multiple projects simultaneously, mostly due to the large budgets associated with each project. With the goal of implementing one project every three to four years, SCWA will likely find they are managing several projects concurrently, as restoration projects are typically multi-year undertakings. Careful consideration should be made by SCWA to evaluate how much effort will be required to manage multiple projects and plan accordingly. Additional consideration should

also be given to how implemented projects will be managed on-site to assure work is performed as designed. SCWA may find it necessary to partner with additional organizations to serve as fiscal sponsors and on-site managers.

The implementation of the schedule must be flexible enough to account for variability in landowner cooperation and concern, funding priorities and availability, agency priorities, market conditions affecting industry efforts, and SCWA and partner management capabilities.

Based on the subwatershed approach and their priorities for restoration, the following implementation schedule should result in measurable pollution load reductions of metals within the individual subwatersheds and to Sewickley Creek itself.

### Implementation Schedule for the Upper Sewickley Creek

### **Upper Sewickley Creek Sub-basin**

Upper Sewickley Creek Sub-basin Implementation Schedule

Droject	Implam	ntation	Milestone	
Protect	imbleme	entation	ivillestone	es.

		J	1			
Priority Site	Responsible Party	Preliminary Planning	Design Phase	Build Phase	Monitoring Phase	
Brinkerton 1 DMP-BR1	SCWA	Spring/Summer 2013	Fall/Winter 2013	2014/2015	2016	
Brinkerton 2 DMP-BR2	SCWA	2016	2017	2018/2019	2019	
Brinkerton 3 DMP-BR3	SCWA	Spring/Summer 2013	Fall/Winter 2013	2014/2015	2015	
Boyer Run 1 BOYR1*	DEP	2019	2020	2021	2022	

<sup>\*</sup>With landowner permission

#### **Jacks Run Sub-basin**

Jacks Sub-basin Implementation Schedule

#### **Project Implementation Milestones**

Priority Site	Responsible	Preliminary	Design	Build	Monitoring
	Party	Planning	Phase	Phase	Phase
Greensburg Mine #2 DMP-JR1	SCWA	2023	2024	2024/2025	2025

## Middle Sewickley Creek Sub-basin

Middle Sewickley Creek Sub-basin Implementation Schedule

Project Implementation Milestones

		110	jeet implement	thon wineston	Co
Priority Site	Responsible Party	Preliminary Planning	Design Phase	Build Phase	Monitoring Phase
Buffalo Run DMP-BUF1	SCWA	2018/2019	Fall/Winter 2019	2020/2021	2021
Soberdash 2 DMP-SOB2	DEP	2021	2022	2023/2024	2024
Wilson Run 2 DMP-WR2	SCWA	2020/2021	Fall/Winter 2021	2022/2023	2023
Soberdash 3 DMP-SOB3	SCWA	2022	2023	2023/2024	2024
Wilson Run 1 DMP-WR1	SCWA	2020/2021	Fall/Winter 2021	2022/2023	2023
Soberdash 1 DMP-SOB1	DEP	2023	2024	2025	2026

### VII. Load Reduction and Water Quality Evaluation

#### Overview

The primary objective of the monitoring activities of this report is to measure and assess the pollution loading from the identified AMD sources found during the assessment in order to generate a restoration plan that prioritizes restoration activities where they provide the greatest environmental benefit weighed against the cost of installing and maintaining an appropriate treatment system.

The main objective of the restoration-monitoring plan is to measure and assess changes in water quality, based on required TMDL load reductions within Sewickley Creek and its impaired sub-basins, as restoration projects are implemented and then progress long-term. Water quality and monitoring criteria established in the QA/QC plan for measuring pollution loads for this assessment should, at a minimum, be maintained for future monitoring. Because in-stream monitoring points for the assessment were established based on identifying impacts to the main stem of Sewickley Creek and within its sub-basins, those established points will also serve well for future restoration work. In addition to the established monitoring points, other monitoring points may also be required to better measure load reductions from the implementation of individual restoration projects.

Often, when treating AMD using passive methods, monitoring points are also established within the treatment system itself in order to measure the functionality of the individual treatment system components. Such monitoring protocol will be established for each treatment system constructed.

Depending on the location of the restoration project, varying numbers of instream monitoring locations will be necessary to properly determine load reductions. The number and locations of monitoring points will be established during the process of developing a restoration project. Each project will, at a minimum, establish an upstream and downstream monitoring point on the effected tributary and also a point or points on the next larger receiving stream or streams, depending on expected environmental results. A final point should also be established

near the mouth of Sewickley Creek, and perhaps additional points along the main stem, to assess overall load reductions to the stream system. When possible, the monitoring locations established by this assessment or the TMDL study should be used during any future water quality monitoring. Doing so will help quantify long-term load reductions over time at consistent locations.



Using a predictive model in association with the EPA-certified monitoring plan originally developed for the assessment should provide sufficient accuracy and precision within the monitoring program to assure the quality of data while allowing for adaptations to the program over time. In addition, because projects will likely be implemented on a sub-basin approach, but also be part of an overall watershed restoration program, an adaptive management approach should be used to allow the focus of the restoration work within the watershed to shift as load reductions are achieved and biologic conditions improve.

### **Determining Success**

Success of restoration efforts should be quantified by both chemical and biological monitoring performed in-stream at selected monitoring points based on the location of the implementation projects.

Either instream numeric load reduction or biological trigger points could be established to indicate success and when it would be appropriate to shift focus to other area of impairments within the system. Such an approach should maximize restoration efforts by focusing activities where they will provide the most benefit.

Water chemistry data will clearly indicate load reductions. The goal for chemical sampling should be to achieve water quality standards set forth in the Pennsylvania Code for each pollutant. For Sewickley Creek, two different criteria are established. The upper Sewickley Creek, upstream of Brinker Run, is a high quality cold water fishery (HQ-CWF). Downstream of Brinker Run, the remainder of the Sewickley Creek watershed is classified as a warm water fishery (WWF). As discussed in Chapter IV, the upper Sewickley Creek uses water quality criteria established by its reference stream, McLaughlin Creek, as its goal. The remainder of the watershed uses the WWF standard established in Pennsylvania Code as its goal. None the less, it may be unrealistic or unnecessary to meet these standards in order to prove success at restoring a stream segment to the point at which it supports its designated use. Biologic conditions should also be considered when quantifying water quality improvements in conjunction with the chemical data to help determine whether restoration efforts are successful.

The quality of the biological health of stream will often prove a better indicator of the true condition of a segment because macroinvertebrates and fish will often repopulate a stream and indicate a quality biodiversity prior to its meeting in-stream chemical standards.

The frequency and location of monitoring will vary depending on its purpose. In stream chemical and biological monitoring should be performed a minimum of every two years once

restoration efforts have begun. Monitoring location points should be determined by the location of the BMPs that are being implemented. When possible, monitoring points established during this assessment should be used.

Should future monitoring efforts indicate that environmental improvements are not occurring as expected, then a reevaluation of the assessment, restoration, and implementation plan should be conducted and adjustments made to improve the plan and garner beneficial results. Adjustments may include, but are not limited to:

- The reprioritization of projects to better insure positive results
- Alteration of the previously implemented projects to make them more efficient
- Implementation of additional projects
- Installation of new technologies or techniques
- Reconsideration of the established TMDL, which may be incorrect and need revision

A long-term commitment to a monitoring program from the Sewickley Creek Watershed Association and its partners will assure that beneficial environmental results will be recorded over time. Assistance and financial support for the monitoring program should be sought from local, state, federal and private sources.

### **Overall Program Objectives**

A key component of long-term success toward restoring impaired watersheds is to build local support for restoration efforts. One way to strengthen local support is through the implementation of restoration projects, and by actively creating public relations "success stories" related to those projects. SCWA has been very active in providing information about their activities by publishing information in their newsletter, local news media, displaying information in local businesses, and attending local events that are related to their watershed work. It is expected that such activities will continue and increase as implementation work proceeds.

Measuring local buy-in can be accomplished in many ways, including the number of articles regarding watershed activities appearing in news print, newsletters produced, new members joining the group, new partners supporting their efforts, new sponsors for group activities, public or government agencies actively engaged in watershed group related work, number of promotional events held, and others. It will be important for SCWA to keep an accurate record of such accomplishments in order to show success beyond environmental pollution reduction. Doing so will assure long-term support for their watershed work.

#### **TMDLs and Expected Load Reductions**

Measuring pollution load reductions will be a key component to indicating progress toward the goals established by the TMDL. Using the data gathered during the TMDL study and

this assessment should provide a sound baseline for measuring progress. Because the Sewickley Creek AMD TMDL relied on modeling to establish flows and pollution load calculations, it will be important that those calculations are eventually compared to actual in-stream flow and pollution load measurements. This study performed in-stream measurements but the locations were chosen primarily to measure pollution loads in stream segments affected by the major AMD discharges. For instance, no monitoring points were established on Welty Run because no major discharges were discovered affecting the watershed. Periodic reviews of stream monitoring locations should be performed and adjustments made to the monitoring plan to assure the load reductions are captured properly and data is relevant to ongoing restoration efforts.

Performing water quality testing at site-specific implementation projects will provide accurate load reduction measurements for individual pollution sources, while in-stream monitoring at established or new monitoring points will measure load reductions to the overall system.

Based on the restoration priorities established for the watershed's sub-basins and the suggested treatment type, the following load reductions can be expected. Again, all load reductions are based on the pollution loads measured during this assessment rather than those developed through the TMDL process.

			]	mplementa	ation and Load	Reduction				
W/S Name	Site ID	BMP Action Treatment Type	Units	Goal Amounts	Implemented Amount # of Units	Pollutant ID	Total Load Reduction Target	Load Reduction Achieved	Unit (lbs/day)	% Load Reducttion Achieved
Upper Sewickley	DMP-BR1	AMD Passive Treatment	Functioning System	1	1					
						Iron	923	116.3	lbs/day	12.6
						Aluminum	10.7	1	lbs/day	0.09
						Manganese	49.1	16.5	lbs/day	33.6
Upper Sewickley	DMP-BR2	AMD Passive Treatment	Functioning System	1	0					
						Iron	232.4	0	lbs/day	0
						Aluminum	2.8	0	lbs/day	0
						Manganese	17	0	lbs/day	0
Upper Sewickley	DMP-BR3	AMD Passive Treatment	Functioning System	1	0					
						Iron	80.8	0	lbs/day	0
						Aluminum	0.8	0	lbs/day	0
						Manganese	6.7	0	lbs/day	0
						Acidity	236.4	0	lbs/day	0
Upper Sewickley	SMP- BOYR1*	AMD Passive Treatment	Functioning System	1	0					
						Iron	65	0	lbs/day	0
						Aluminum	0.5	0	lbs/day	0
	* stream mon	itoring station	1			Manganese	4.4	0	lbs/day	0

Implementation and Load Reduction										
W/S Name	Site ID	BMP Action Treatment Type	Units	Goal Amounts # of Units	Implemented Amount # of Units	Pollutant ID	Total Load Reduction Target	Load Reduction Achieved	Unit (lbs/day)	% Load Reducttion Achieved
Jacks Run	DMP-JR1	AMD Passive Treatment	Functioning System	1	0					
						Iron	400.4	0	lbs/day	0
						Aluminum	0.8	0	lbs/day	0
						Manganese	18.5	0	lbs/day	0
						Acidity	200.3	0	lbs/day	0

W/S Name	Site ID	BMP Action Treatment Type	Units	Goal Amounts # of Units	Implemented Amount # of Units	Pollutant ID	Total Load Reduction Target	Load Reduction Achieved	Unit (lbs/day)	% Load Reducttion Achieved
Middle Sewickley	DMP-BUF1	AMD Passive Treatment	Functioning System	1	0					
						Iron	320.7	0	lbs/day	0
						Aluminum	4.4	0	lbs/day	0
						Manganese	28.6	0	lbs/day	0
						Acidity	242	0	lbs/day	0
Middle Sewickley	DMP-SOB1	AMD Passive Treatment	Functioning System	1	0					
						Iron	6.5	0	lbs/day	0
						Aluminum	0.3	0	lbs/day	0
						Manganese	1.6	0	lbs/day	0
						Acidity	73	0	lbs/day	0
Middle Sewickley	DMP-SOB2	AMD Passive Treatment	Functioning System	1	0					
						Iron	253.3	0	lbs/day	0
						Aluminum	6	0	lbs/day	0
						Manganese	24	0	lbs/day	0
						Acidity	908.3	0	lbs/day	0
Middle Sewickley	DMP-SOB3	AMD Passive Treatment	Functioning System	1	0					
						Iron	17.1	0	lbs/day	0
						Aluminum	0.4	0	lbs/day	0
						Manganese	21.8	0	lbs/day	0
Middle Sewickley	DMP-WR1	AMD Passive Treatment	Functioning System	1	0					
						Iron	73.4	0	lbs/day	0
						Aluminum	0.2	0	lbs/day	0
						Manganese	7.9	0	lbs/day	0
Middle Sewickley	DMP-WR2	AMD Passive Treatment	Functioning System	1	0					
						Iron	208.7	0	lbs/day	0
						Aluminum	1.4	0	lbs/day	0
						Manganese	4.9	0	lbs/day	0

#### VIII. Visual Assessment

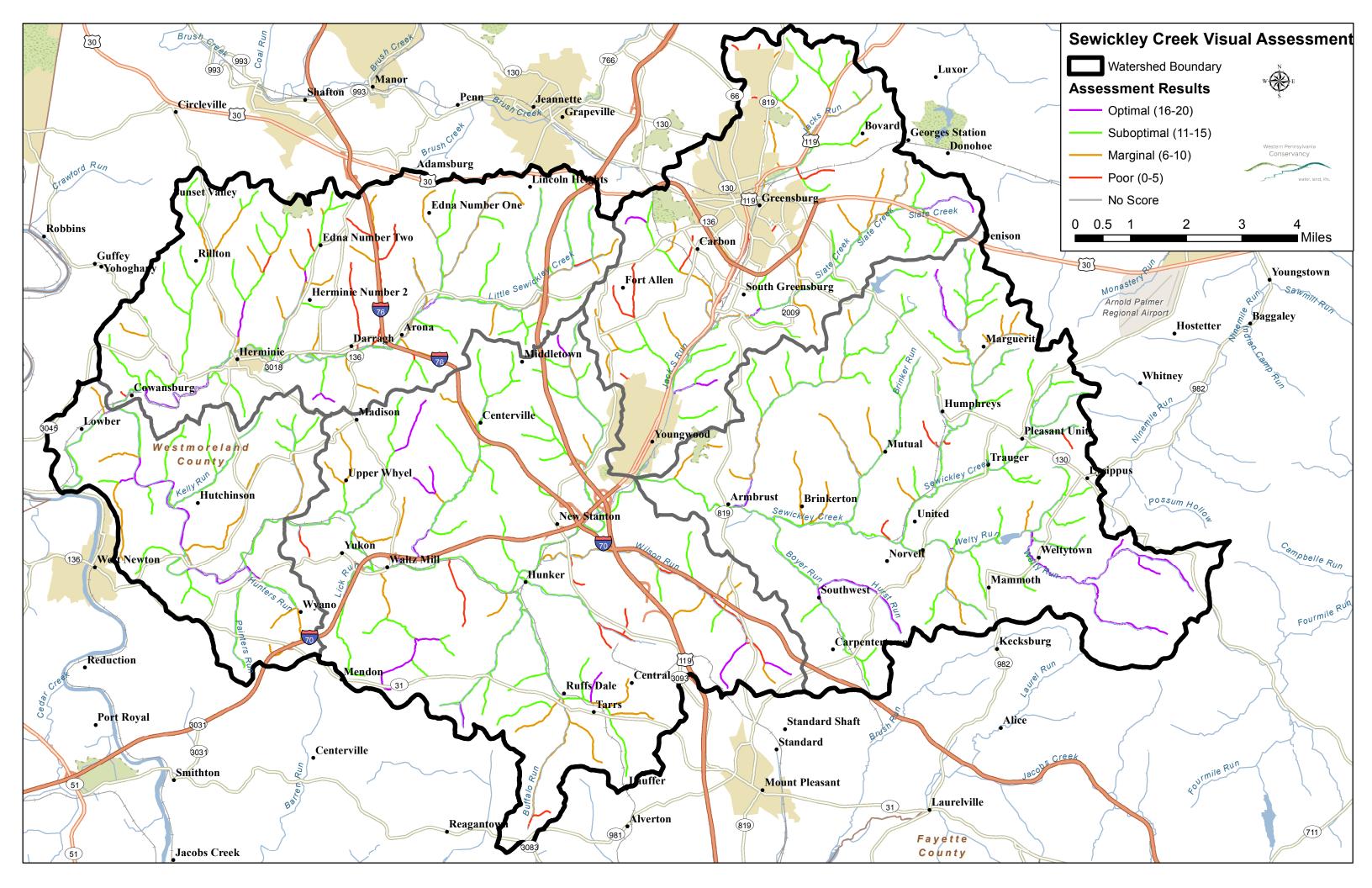
#### Overview

As part of the overall watershed assessment, a visual assessment of the in-stream and riparian conditions of all waterways of Sewickley Creek was performed. Data collected during the visual assessment was based on a modified version of the Environmental Protection Agency's (EPA) Rapid Bio-Assessment Protocol, which quantifies the conditions of the watershed's streams and develops an appropriate ranking. Data for the watershed was compiled into the five sub-watersheds to allow for better management. As discussed in chapter I, streams segments were assigned computer-generated numbers, which are linked to the DEP GIS statewide database. Sewickley Creek numbers assigned from this database are three digits. To assist with WPC data entry, these three digit numbers were arbitrarily assigned a number 1 to the beginning of the number to create a four digit number. WPC then developed maps of the sub-watersheds with the stream segments pre-assigned with this four-digit number. A stream segment is determined by the point at which a stream is joined with another tributary. Segment lengths varied depending on where another tributary joined with the segment under investigation. Each segment, regardless of length, was evaluated with the same criteria.

Stream segments were scored on the integrity of the habitat and physical condition of the stream segment, including both instream and riparian areas. Habitat evaluation included ten parameters: Epifaunal substrate/available cover, embeddedness, velocity/depth regimes, sediment deposition, channel flow status, channel alteration, frequency of riffles (or bends), bank stability, vegetative cover, and riparian vegetative zone width. Physical characterization included weather conditions, location and observed problems, stream type, watershed features, riparian vegetation, in stream features, large woody debris, aquatic vegetation, water quality, and sediment/substrate – including organic and inorganic components. In many instances, the size of the stream segment was physically too small to properly characterize the segment using the detailed assessment form. For those segments, a "short form" of the standard assessment data sheet was developed and used to score the segment. Examples of field data sheets are included at the end of this chapter.

The end result of the assessment process provides a ranking of each segment of the watershed into one of four categories based on a scale of one to twenty. The highest ranking category lists the segment in an excellent or optimal condition, followed by a good or sub-optimal condition, then a fair or marginal ranking, and lastly, a poor score.

Outcomes of the visual assessment indicate that the overall physical characteristics of the watershed's in-stream and riparian area conditions are relatively good. Some significant problem areas exist, particularly on Jack's Run, where there are significant anthropogenic impacts from business, homes, and roads. The primary sources of the AMD problems identified in the subwatersheds were previously identified in Chapter IV – Problem Definition.



### **Upper Sewickley Sub-Watershed**

Sewickley Creek Main Stem



The main stem of Sewickley Creek headwaters start above Pleasant Unity and generally flows through farm land and rural yards. Some segments flow through active pastures and cropland, while others flow through patchy forestland and mowed yards. Several old coal mining communities are located within the upper Sewickley Creek area and remnants of a time of weaker environmental regulations, such as mine spoil piles and inadequate sewage treatment, remain. An

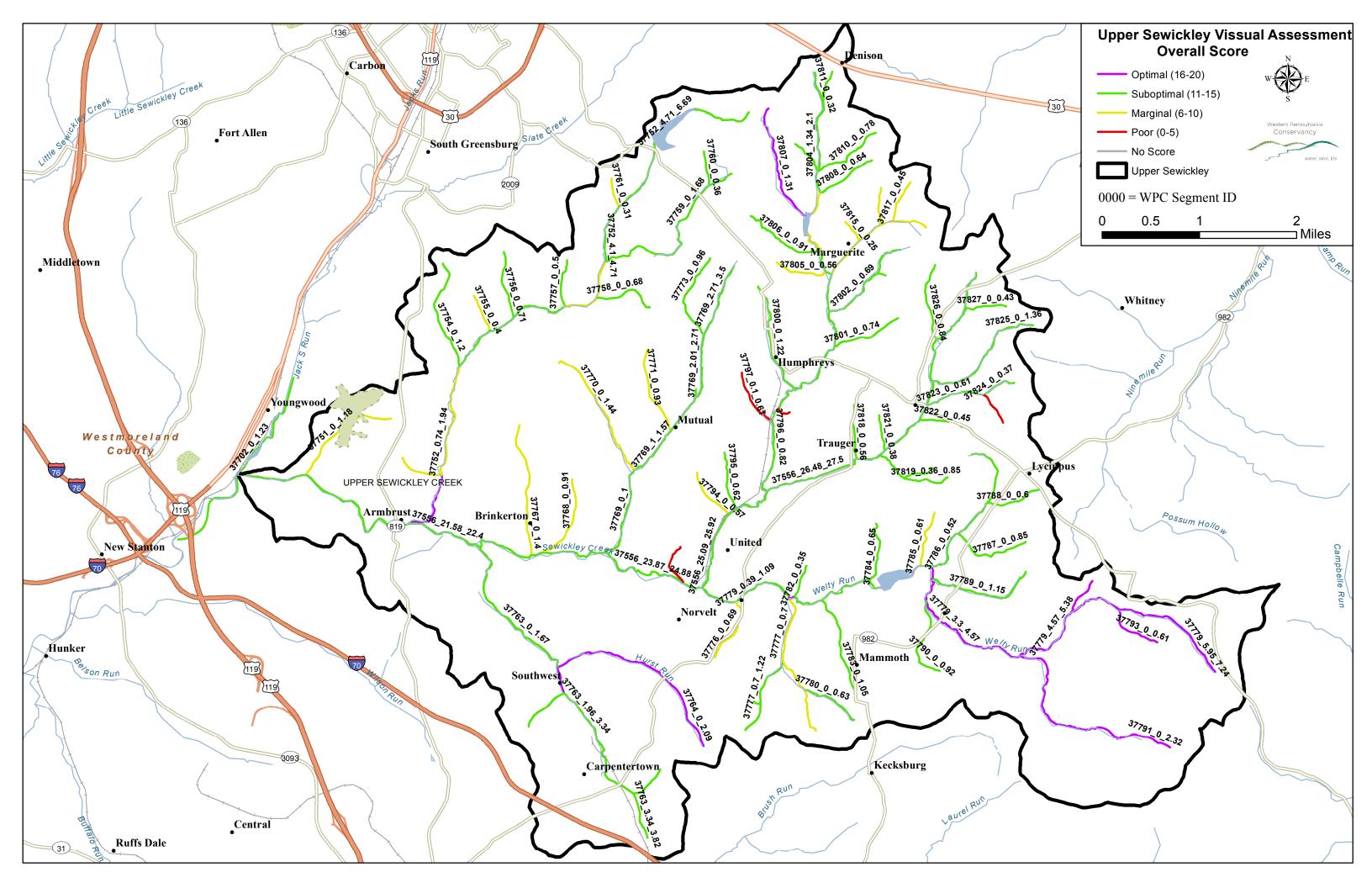
abandoned railroad bed crosses the waterway several times and follows the general meander of the stream from well above its confluence with Welty Run down to the town of Armbrust and beyond. As the main stem Sewickley flows from United to Armbrust, the stream gradient diminishes somewhat as it flows into flatter land and its speed slows down, creating a more sinuous channel with deeper, slower pools. Wetlands become more prevalent in this area. This is also the area where the first major impacts from AMD significantly impair the stream, near the small community of Brinkerton. Further downstream in the community of Youngwood the main stem meets Jacks Run, which defines the downstream extent of the upper Sewickley Creek as defined by this assessment.

Welty Run



The upper sections of Welty Run are fast flowing mountainous tributaries with significant gradient changes. They are primarily surrounded by forest and have healthy, continuous cover and shading. Once reaching Kecksburg Sportsmen's Road near Welty Town, the gradient lessens and land use becomes more residential with some agricultural and pasture land, but a vegetative cover is still maintained. There are several dams of various sizes along Welty Run, including the one that creates

Mammoth Lake. Along with faulty septic problems and impacts associated with coal mining, erosion and sediment concerns are prevalent in the lower portion of the watershed. This portion of Welty Run also contains numerous farms. An old coke oven site is situated below Mammoth Lake along with an old rail line that parallels the stream until it meets Sewickley Creek in Norvelt. It is in the stretch of stream below Mammoth Lake that it was straightened and is now causing significant erosion. A large un-reclaimed boney pile is located along a tributary to Welty



Run near the old mining community of Mammoth. Unnamed tributaries also drain to Welty Run from the former mining community of Calumet and United, and portions of Norvelt.

#### North Fork

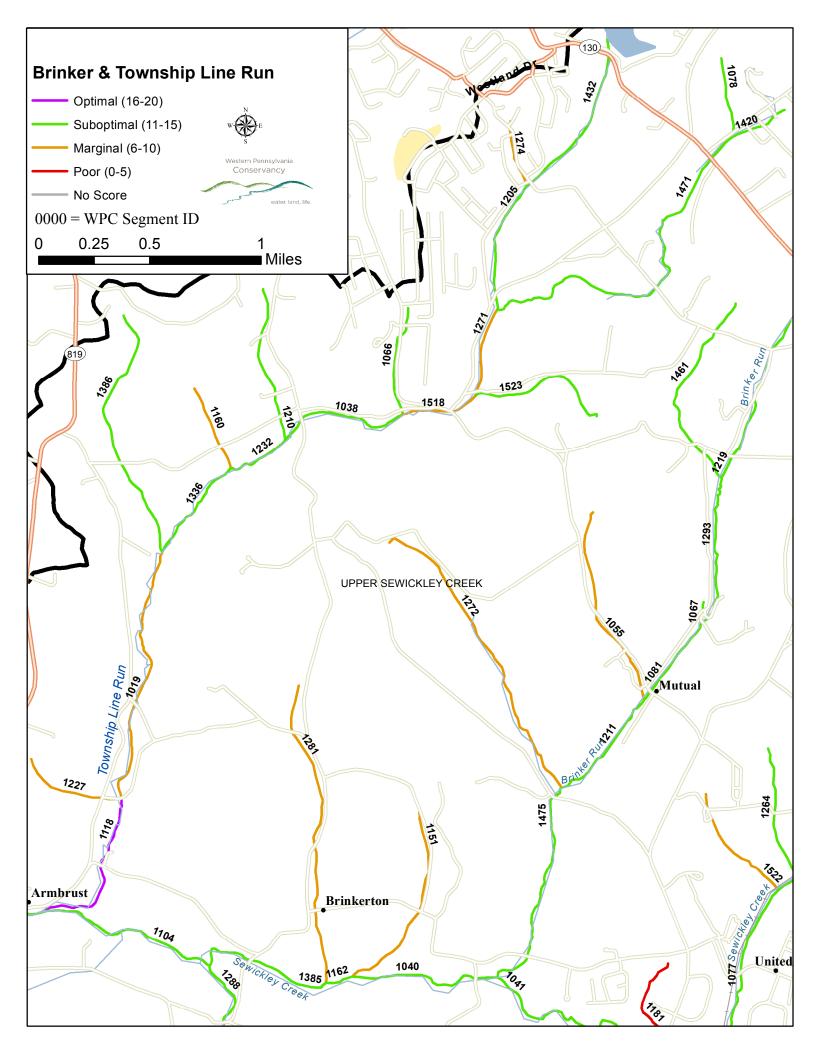
The North Fork tributary of Sewickley Creek joins with the main headwaters between the towns of Trauger and United. This stream has a variety of impacts, which range from active agricultural operations, expanding residential areas, and AMD impairments, and lead to a ranking in the sub-optimal to marginal categories. From the mouth, which is located within a naturally succeeding, over-grown pasture, the stream travels northward under an old railroad line and following several back roads before reaching active pasture and crop land. As it flows through the pasture, the stream is paralleled by a large wetland before reaching newly buffered property that has been enrolled in CREP. As the stream snakes its way through a healthy, well established buffer, it is joined by a tributary flowing out of Humphreys that is severely6 impacted by AMD. Additionally, just upstream of this juncture is the effluent of a local waste water treatment plant. As the North Fork continues up toward Marguerite, it is met with more active agriculture and pasture land as well as small clusters of rural communities with evidence of failing septic systems. The high gradient headwater tributaries flow down the hills from the expanding community of Denison where Route 30 allows for a quick commute into Greensburg or Latrobe. Significant erosion issues are evident along the section that was formerly part of the Marguerite reservoir. More AMD appears in the little tributaries above Marguerite as well. The majority of the stream has an open or semi-open canopy, however there are several fragmented portions of the tributary that are well buffered and have favorable aspects.

#### Brinker Run

Brinker Run joins with main stem Sewickley Creek just downstream from the town of United. Prior to its juncture with the main stem, the lowland area in which Brinker Run flows becomes a wetland which channels under a two lane road and an old railroad bed. Moving upstream, Brinker Run starts to pick up gradient and passes through a well forested buffer before entering property owned by the Greensburg Sportsmen Association. The tributaries that form Brinker Run surround the rural town of Mutual. Around Mutual, the streams flow through active farm land, past an old mining site, and several coke ovens. The majority of Brinker run has erosion and sedimentation issues which can be credited to the steep slopes of the headwaters as well as residential mowing. The stream is additionally affected by AMD with evidence of iron sediment from Mutual down.

### Boyer Run

The multi-tributary system that makes up Boyer Run includes the stream segment known as Hurst Run which sits northwest of Norvelt and joins with Boyer Run in Hecla. The waters of Boyer Run above Hecla are in relatively good shape. Limited active farm land and spotty



residential areas are present, spread out along the banks. There are, however, significant amounts of knotweed present in the riparian zone and the stream is parallel and intersected by an old railroad line. Sedimentation issues start to arise as the stream flows out of Hecla toward the main stem of Sewickley Creek. In addition to soil sedimentation, the stream is impacted by two large AMD sites which add iron sediment.

#### Township Line Run

Township Line Run (TLR) is the last significant tributary system of the Upper Sewickley sub-watershed. It enters main stem Sewickley Creek before it is joined by Jacks Run to form the Middle Sewickley Creek sub-watershed. The headwater tributaries of TLR start in an expanding residential area with multiple culverts for driveways and main roads as well as mowed and manicured stream banks. The stream is also dammed to create the large Unity Reservoir. Active agriculture and pasture land also flank the stream in multiple areas before the stream travels into a well buffered area and then into a golf course. Beyond the golf course are more active agriculture and pasture lands and then the TLR passes through a nursery before entering the main stem. Sediment and erosion issues are prevalent throughout the tributary. Despite that, there are sections in good condition that even provide enough habitat for one of Pennsylvania's snake species of special concern, the *Regina septernvittata*, commonly known as a Queen Snake, as listed by the Pa. Fish and Boat Commission and the Natural Heritage Program.

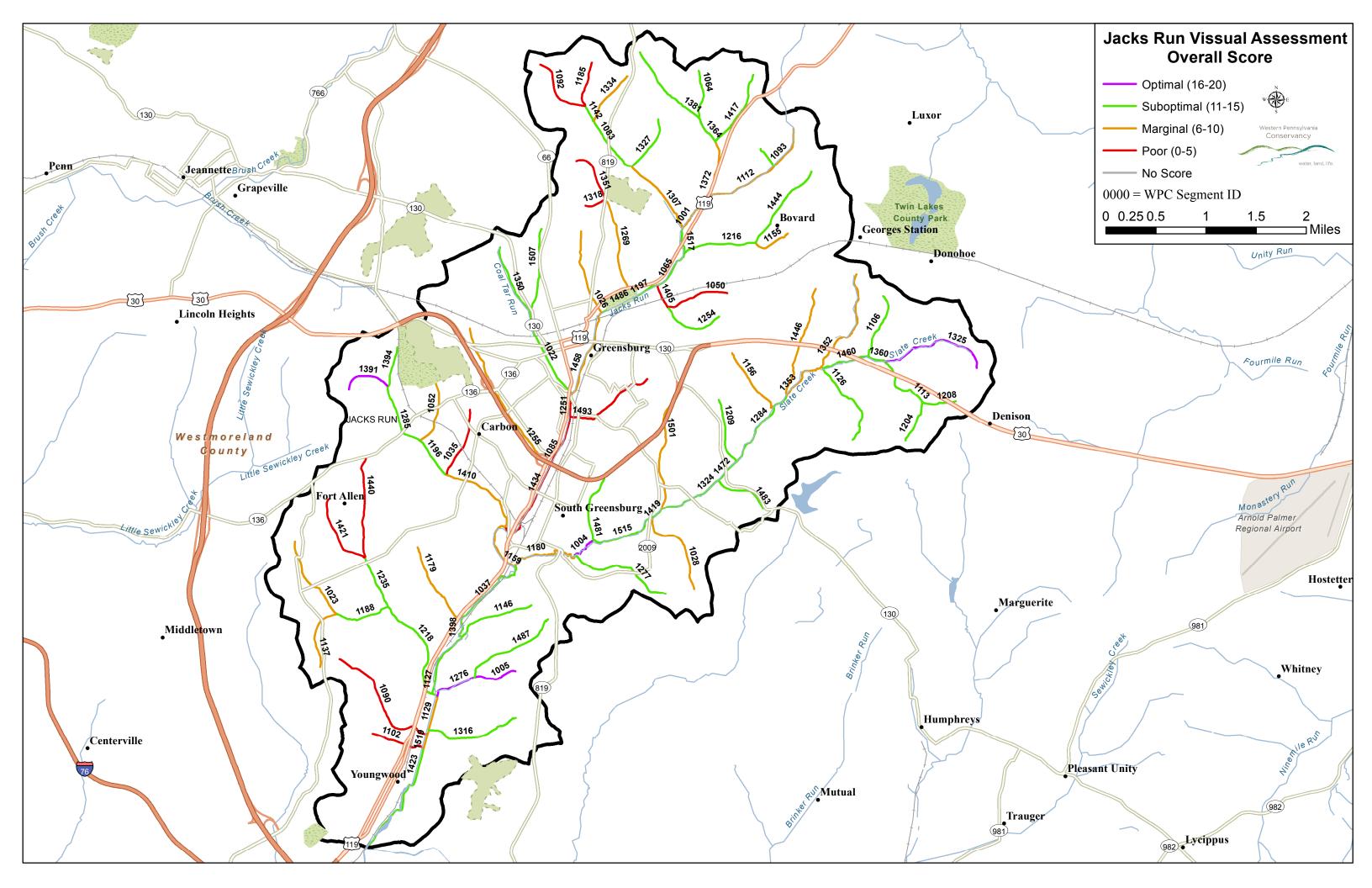
### **Jacks Run Sub-Watershed**

Jacks Run

Jacks Run watershed is greatly affected by human impacts in addition to AMD. The headwaters of Jacks Run start northeast of Greensburg, converge in the heart of the city, and then flow in a southerly direction through Youngwood before joining with Sewickley Creek main stem. Many of the small headwater tributaries begin unrestricted in agriculture and forested land and end as continuously piped and culverted streams as they travel through residential and commercial areas. Channelization continues as Jacks Run grows in width and flows through the developed urban areas of Greensburg. This unnatural stream condition gets a slight reprieve after it leaves Greensburg. It is short lived, however, as channelization occurs again through the commercial area of Youngwood. It then flows through a large forested wetland area before joining Sewickley Creek.

#### Slate Creek

Slate Creek is the only named tributary system of the Jack's Run sub-watershed. It has many of the same human impact as Jacks Run does as well as serving as the drainage source for the Route 30 business district of Greensburg. This drainage includes acres of impervious parking



areas for the Westmoreland Mall and surrounding businesses. Slate Creek also flows through a large residential area within Greensburg where the stream has been significantly impacted by urban runoff, channelization, culverts, and mowing.

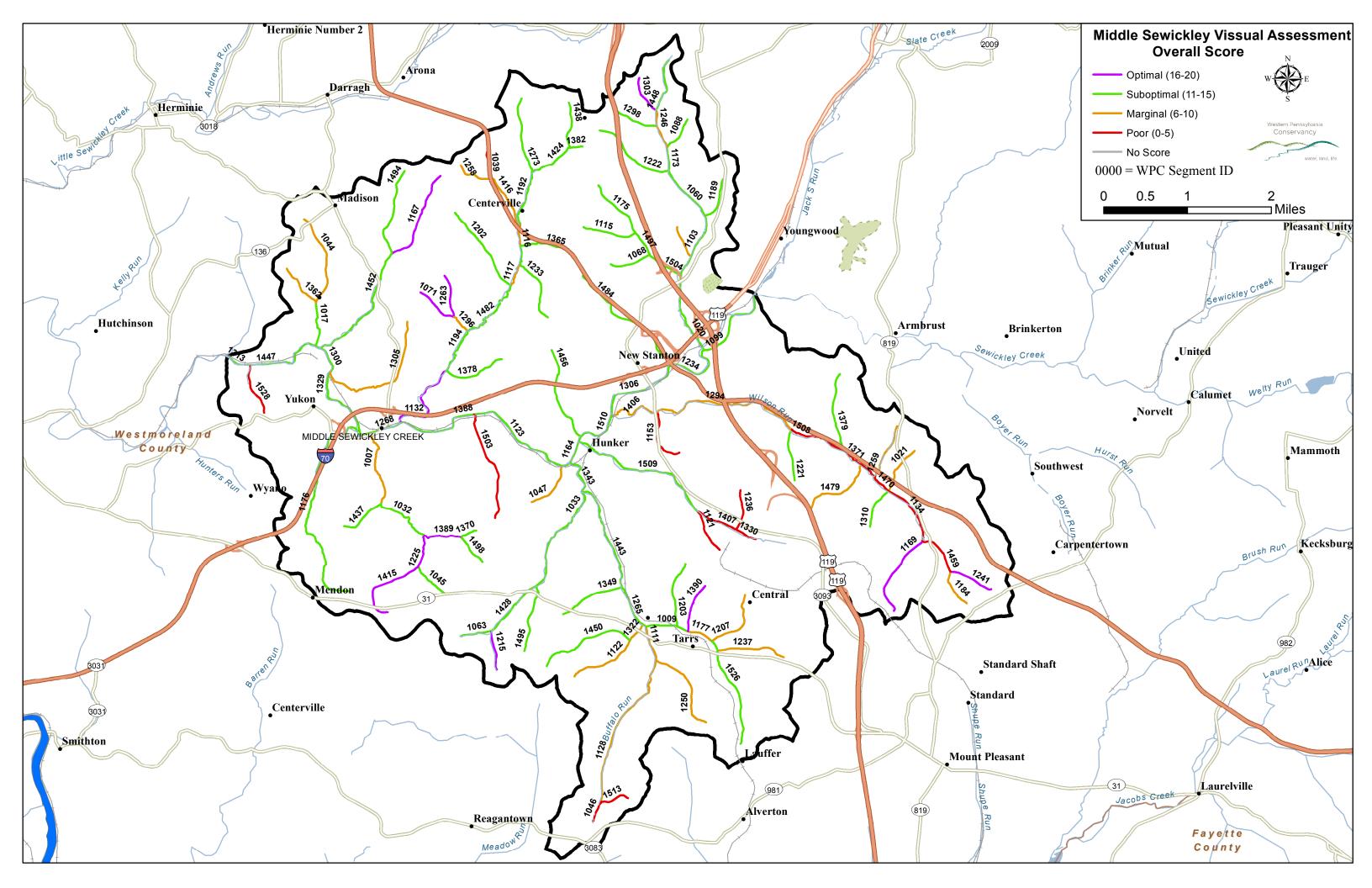
#### **Middle Sewickley Sub-Watershed**

Sewickley Creek Main Stem

The middle portion of the main stem of Sewickley Creek flows from the confluence of Jacks Run, just above New Stanton, down through Hunker, to just past Yukon. This portion of the stream has several larger named tributaries as well as nearly a dozen un-named tributaries (UNT) which range from small, single streams to larger, multi-tributary systems.

Downstream of Jacks Run, the first of these larger UNTs joining Sewickley Creek main stem runs in a southerly direction, draining the rolling valleys between Youngwood and New Stanton. The confluence of this tributary is just below the Route 66 and 119 interchange. For the most part, the tributaries of this system are well buffered and in fair condition. Route 66 cuts across the stream in multiple locations, leaving portions of the stream channeled under the highway or diverted into a new direction. There are rural homes dotted throughout the drainage and some active pastureland in addition to a large RV park and campground that maintains a very groomed and cleared riparian zone. A positive influence on the system is a number of wetlands that were installed as a result of the Route 66 interchange.

The next of the larger UNTs begins just north of Middletown Road between the Turnpike and Route 66 and flows in a southwesterly direction towards Waltz Mill. This tributary system travels through a variety of land uses. The headwaters are dotted with dozens of rural homes as well as patches of well forested buffers. They are also intersected several times by the Pennsylvania Turnpike. Making its way down the valley, the UNT is met with more homes and active pasture and cropland in addition to Pa. Game Commission Property. The stream flows through the grounds of Westinghouse before going under I-70 near Waltz Mill and into an excellent riparian zone. It then joins with main stem of Sewickley south of I70. Draining the land between these two large systems are two single-channel tributaries. The first is rather long and hugs the western edge of the PA Turnpike while collecting most of the drainage water from New Stanton. This stream has a mix of farm land, residential, and commercial properties which contain significant, impervious parking areas. The water quality in the upper part of the stream is in fair condition but drops dramatically as it nears New Stanton due to an old waste water drainage system which has been damaged and is draining directly into the stream. The next tributary downstream joins with main stem Sewickley Creek on the opposite bank from the town of Hunker, just up from the mouth of Belson Run. This is an intermittent stream with high, flashy flows due to drainage from I-70, which is causing sediment issues.



As main stem Sewickley bends around the town of Yukon, there are three UNT's draining from the north that join with it in close succession. When heading downstream, the first is a single-channel intermittent stream draining the valley that sits northwest of the Waltz Mill Westinghouse Plant. There is a KOA campground above Westinghouse with a pond called Tanglewood Lake built directly from the stream. During the dry seasons, the pond adds to the stream's periodic flow. Before the stream joins with the main stem it flows through a large brownfield area that shows signs of small AMD seeps and then through a little community that has the channel mowed or piped. The next tributary system is in fair condition with a few homes and a small amount of agriculture. Sediment issues are apparent at the confluence with Sewickley Creek where there are large sediment bars forming in the main channel. The third tributary system in the series drains the area below the community of Madison and flows northward through both Upper and Lower Whyel before joining Sewickley Creek. Above Upper Whyel, the stream flows past a large mining spoil pile where the water pH is very acidic. There is evidence around Upper Whyel of faulty septic systems as well as AMD issues.

#### Wilson Run

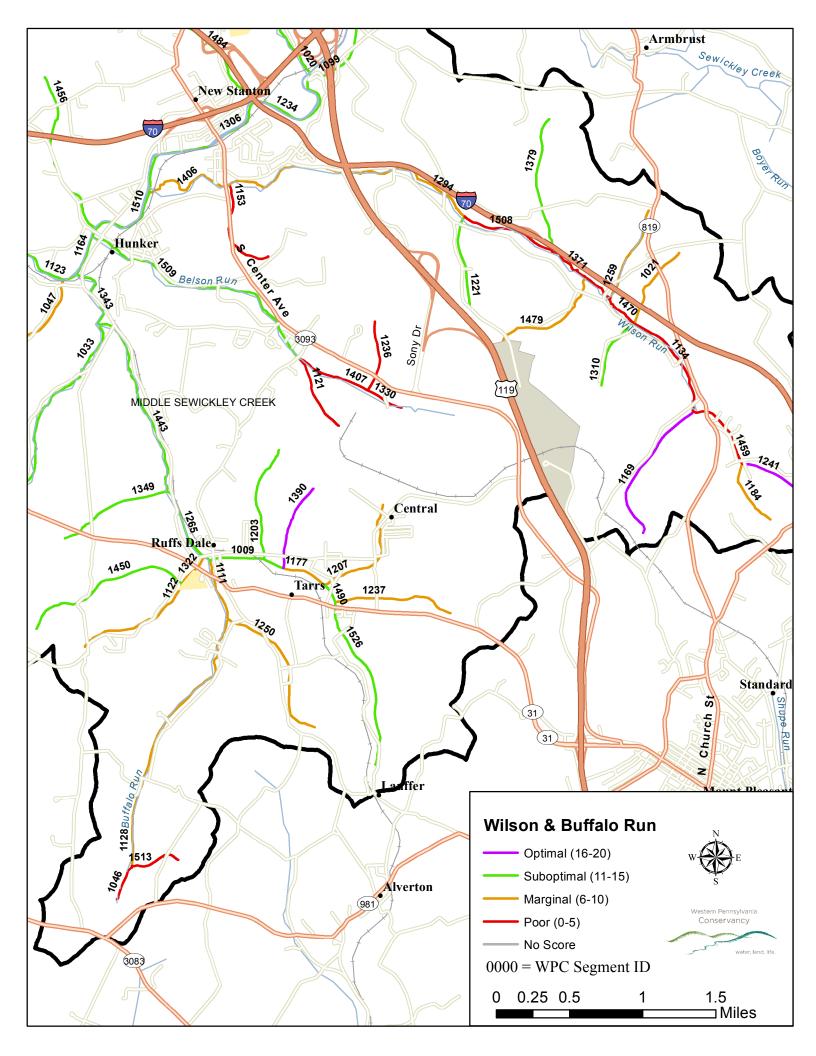
The headwaters for Wilson Run are found between the PA Turnpike and PA Route 981 near St. Johns Union Church. It parallels the Pennsylvania Turnpike for most of its length, crossing underneath Route 119 near New Stanton. The confluence with Sewickley Creek occurs just south of the town of New Stanton but north of the town of Hunker. Wilson Run has nine unnamed tributaries that empty into it before its confluence with Sewickley Creek. There two large AMD discharges that impair Wilson Run which enter the stream just south of the Turnpike. One of the discharges is being treated and can be seen as a large orange pond near the junction of Route 819 and the Turnpike. The other discharge enters the stream just downstream of the outflow of the treatment system and pollutes the stream with a large amount of iron being discharged. The length of Wilson Run passes through many residential areas and a few farms, but the majority of the reach runs through brushy, forested areas. Near its mouth, the stream passes near an industrial zone before entering Sewickley Creek.

#### Belson Run

Belson Run is a small but lengthy tributary system that starts below the Sony plant and swiftly flows down and through the town of Hunker. There are residential areas scattered along the entire reach but there are also portions of the stream that are well buffered. This stream is crossed and culverted many times for driveways and flows under an active railroad line.

### Buffalo Run

Buffalo Run is a multiple tributary system that drains the hills surrounding Tarrs and Ruffs Dale. In addition to the sewage issues from the multiple rural communities in the area, Buffalo Run is affected by several different AMD sites that are high in both iron and aluminum



and low in pH. Several farms are also located in the headwaters area, some which affect the stream. Thompson Run, part of the Buffalo Run system, joins the stream a short distance up from the mouth and is also affected by AMD.

Lick Run

Lick Run is a long tributary that starts below the small town of Mendon off of Route 30 and flows in a northerly direction, parallel to and under Route 70 twice, before joining with main stem Sewickley Creek below Waltz Mill. The upper half of the stream is in great condition with good cover and a vegetated buffer. The lower portion shows evidence of erosion issues, intersects active pasture land, and has mowed residential yards. The poor condition of the lower half brings the overall rating of the stream to marginal.

### **Little Sewickley Sub-Watershed**

Little Sewickley Main Stem

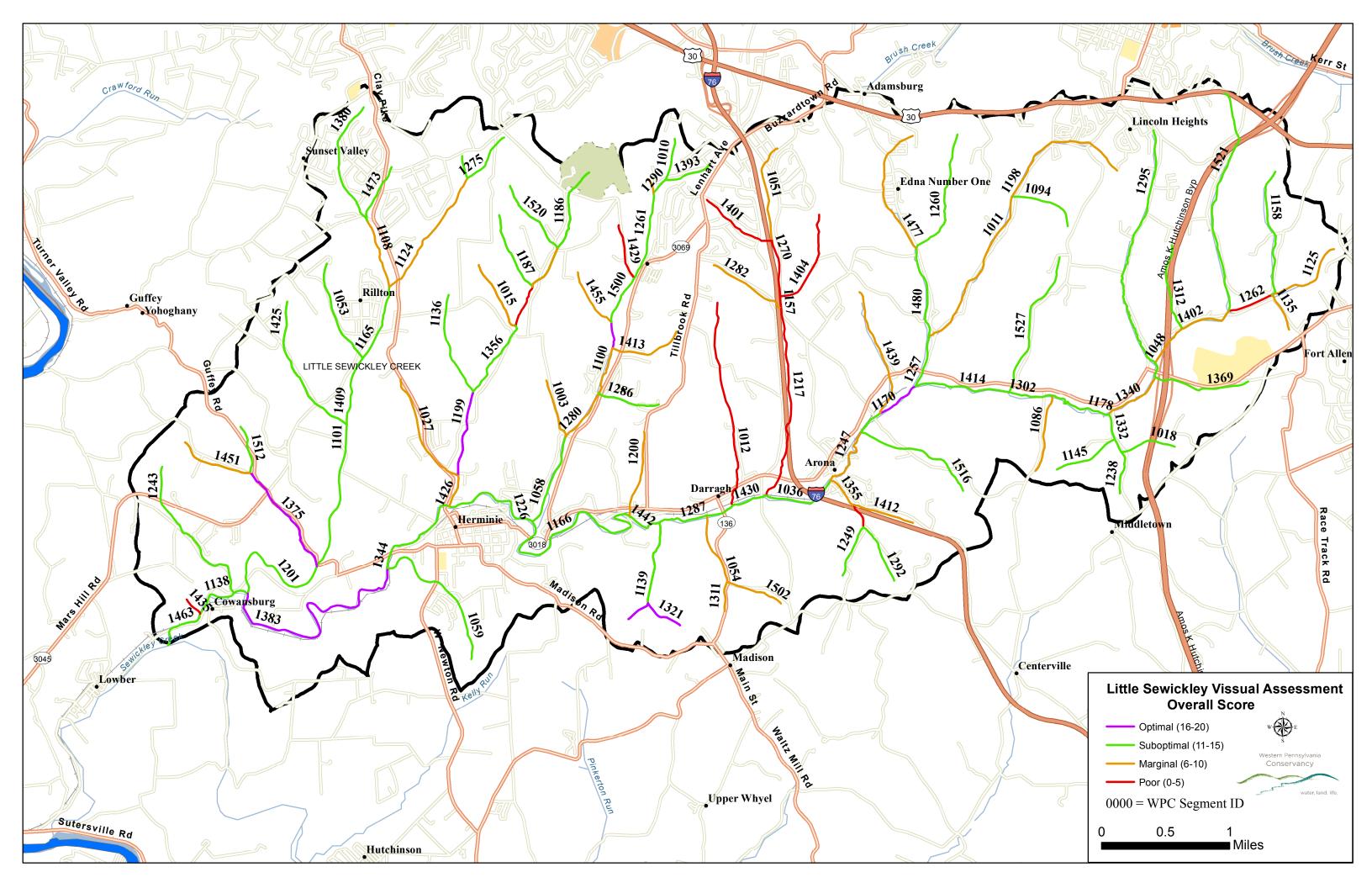


Little Sewickley Creek drains the northwestern portion of the Sewickley Creek watershed with the headwaters starting just west of Route 66 and north of Hempfield High School. The stream follows a southwesterly path through the community of Arona and meanders around the town of Herminie before joining with main of stem Sewickley Creek just outside the town of Lowber. Agricultural land and rural homes as well as urban sprawl all contribute to the drainage of this sub-watershed.

There is only one named tributary system of Little Sewickley. There are, however, over twenty fingers, both single streams and multi-tributary systems, that branch off of Little Sewickley.

Starting at the headwaters, these smaller tributaries are impacted by Route 66, Greensburg shopping plazas, and Hempfield township drainage through the installation of large stormwater retention basins, culverts, and channelized streambeds. The headwater streams have a significant gradient but quickly transition to flatter land which sets the conditions up for flash flooding events.

Main stem Sewickley Creek, as it flows from its underpass of Route 66 to Arona, parallels an old rail road grade. There are several tributary systems joining the main stem along this section from both the north and south. None of these systems appears to be contributing any pollution of great significance to the watershed. This section, although mostly undeveloped, contains a large amount of garbage (mostly tires) scattered both in the stream and along the banks. A significant tributary system paralleling the turnpike shows signs of human impacts through extensive channelization and stream bank modification.



From Herminie to the confluence with Sewickley, Little Sewickley is joined by a few single tributary systems and one large tributary system. The large system drains the expanding communities of Sunset Valley and Rillton.

#### Andrews Run

Andrews Run flows in a southerly direction and meets Sewickley Creek on the eastern side of Herminie. The tributary system drains the communities of Wendel, Edna No. 2, and Herminie No. 2, as well as the surrounding farm land. (The number 2 relates to the coal mines that were associated with these communities. Coal companies would sometimes designate a second mine and the company town associated with it as "No. 2".). Small iron seeps, associated with the mining in the area, appear throughout the system, although nothing of great significance is present until the last 100 feet of the stream, where a significant AMD discharge can be seen. Bank stability, riparian zone vegetation, and width were consistently listed as weak elements of the system.

#### **Lower Sewickley Sub-Watershed**

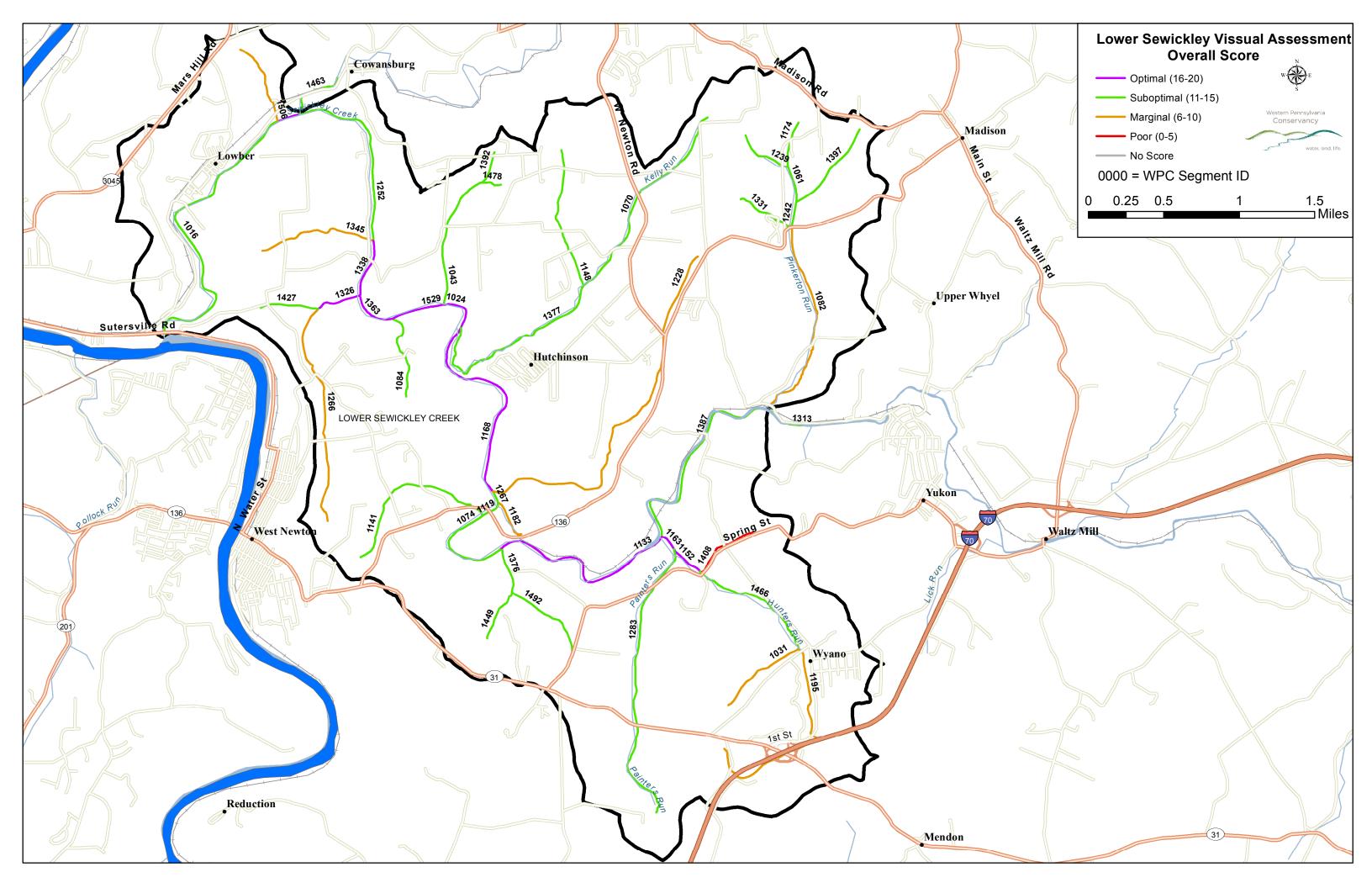
Sewickley Creek Main Stem

The main stem of Sewickley snakes its way across the Lower Sewickley Creek subwatershed, draining farm land around the communities of Hutchinson, Mill Grove, and Lowber. There are a handful of un-named tributaries along with several named tributaries in this subwatershed. Most of the tributaries have a significant gradient change and are dotted with bedrock waterfalls. This sub-watershed has relatively little AMD in the upper portion; however there are multiple sources of AMD in the very last section of the watershed. A passive AMD treatment system has been installed above the town of Lowber to address the largest of these sources.

There are also signs of natural gas drilling, including several Marcellus shale well sites, which use hydraulic fracturing to extract gas from the shale formation. A historic icon that crosses main stem Sewickley Creek between Pinkerton and Hunters Run in the top portion of the watershed is the Bells Mills covered bridge, built in 1850. The connectivity of the stream to its flood plain has been limited due to an old rail-line paralleling the main channel for more than half its length.



In the upper portions of the sub-watershed, Sewickley Creek main stem gently makes a gradient change and occasional bedrock formations can be seen.



#### Pinkerton Run

The Pinkerton Run Tributary system flows from the north and enters the main stem Sewickley at the top of the Lower Sewickley Sub-watershed. The headwaters of this system fan out in all directions around multiple farms. The land draining into the streams is a mix of forest and active crop land. For the most part, Pinkerton Run is well buffered but there is a section of the stream that flows through a heavily used animal concentration and feeding area.



#### Hunters Run



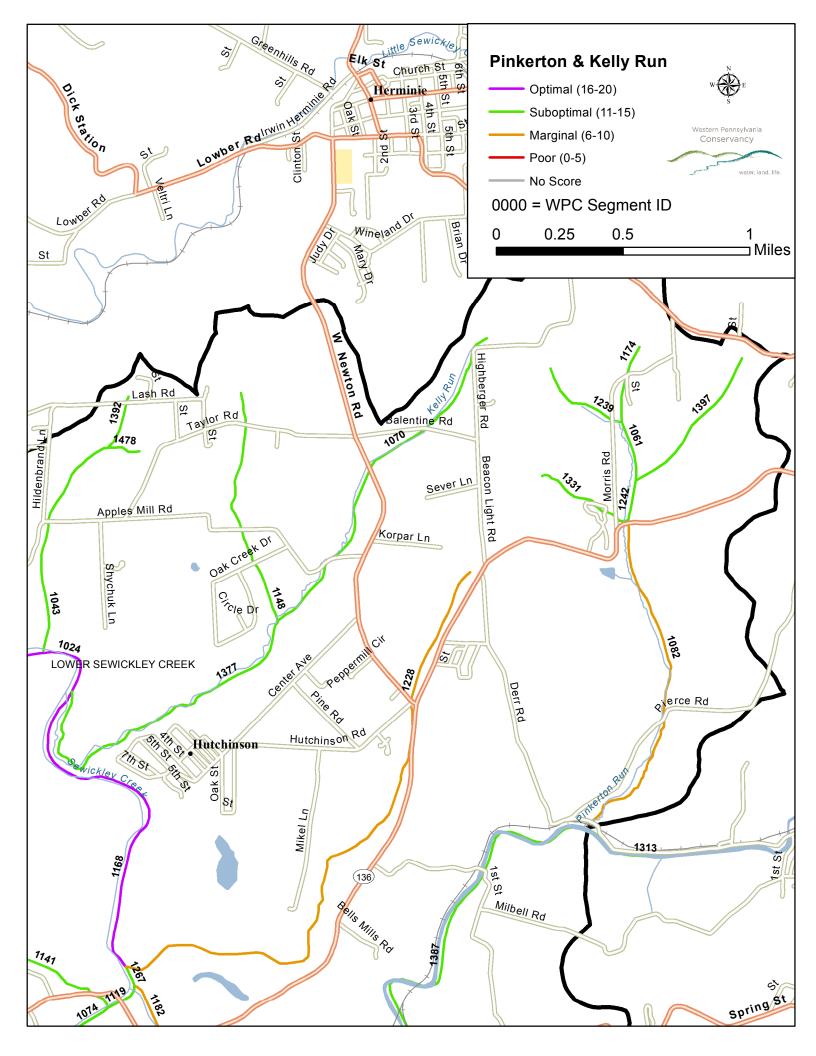
The Hunters Run tributary system drains the small community of Wyano. The headwaters start above the Interstate 70/ Route 31 interchange, which affects its flow pattern through multiple culverts and channel alteration. The tributaries also drain around a strip mining site although there does not appear to be any sign of AMD along the streams. Streams also flow through active pasture land. Panther's Run is a named single stream that drains the surrounding

agricultural land before joining Hunters Run closer to its mouth.

#### Kellys Run

The headwater streams of Kellys Run are a pair of small, intermittent streams that start in cleared, active cropland then merge to flow through a well buffered valley. The lower portion of Kellys Run is well buffered with a bedrock bottom and waterfalls. Problems with the tributary include a fissure in the bedrock where the stream totally disappears and leaves an empty streambed for several hundred yards before re-emerging. Several old dams and a culvert for a rail line also are located on this tributary.





## HABITAT ASSESSMENT FIELD DATA SHEET – LOW GRADIENT STREAMS (FRONT)

STREAM NAME		GIS ID #		
SEGMENT ID		STREAM CLASS		
LATLONG		RIVER BASIN Sewickley Creek		
STORET # N/A		AGENCY Western Pennsylvania Conservancy		
INVESTIGATORS				
FORM COMPLETED BY	DA	TE	REASON FOR SURVEY	
	TIN	ME AM PM	Sewickley Creek Visual Assessment	

	Condition Category						
Habitat Parameter	Optimal	Suboptimal	Marginal	Poor			
1. Epifaunal Substrate/Available Cover	Greater than 70% (50% for low gradient streams) of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% (30-50% for low gradient streams) mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% (10-30% for low gradient streams) mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% (10% for low gradient streams) stable habitat; lack of habitat is obvious; substrate unstable or lacking.			
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0			
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or submerged vegetation.			
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0			
3. Pool Variability	Even mix of large- shallow, large-deep, small-shallow, small- deep pools present.	Majority of pools large- deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.			
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0			
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.			
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0			
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.			
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0			

## HABITAT ASSESSMENT FIELD DATA SHEET – LOW GRADIENT STREAMS (BACK)

Habitat Parameter	Condition Category					
	Optimal	Suboptimal	Marginal	Poor		
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.		
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0		
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.		
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0		
8. Bank Stability (score each bank)  Note: determine left or right side by facing downstream	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.		
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0		
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0		
9. Vegetative Protection (score each bank)  Note: determine left or right side by facing downstream	More than 90% of the streambank surfaces and immediate riparian zones covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.		
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0		
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0		
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear- cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.		
SCORE(LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0		
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0		

Total	Score	
и опят	2000	

### HABITAT ASSESSMENT SCORE SHEET LOW GRADIENT STREAM

STREAM NAME		SEGMENT ID		
GIS ID #		STREAM CLASS		
LAT LONG		RIVER BASIN Sewickley Creek		
STORET # N/A		AGENCY Western Pennsylvania Conservancy		
INVESTIGATORS				
FORM COMPLETED BY	DATE		REASON FOR SURVEY	
	TIME AM PM		Sewickley Creek Visual Assessment	

Habitat Parameter	Score	Explanation of Score Given (Complete especially for poor rating)
1. Epifaunal Substrate /Available Cover		
2. Pool Substrate Characterization		
3. Pool Variability		
4. Sediment Deposition		
5. Channel Flow Status		
6. Channel Alteration		
7. Channel Sinuosity		
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream	Total of LB & RB	(LB) (RB)
9. Vegetative Protection (score each bank) Note: determine left or right	Total of LB & RB	(LB) (RB)
side by facing downstream  10. Riparian Vegetative	Total of LB & RB	(LB)
Zone Width (score each bank riparian zone)		(RB)
Total Score		Add all scores and divide by the number of scores given.

# PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME		SEGMENT	ID	
GIS ID #		STREAM C	LASS	
LATLON	IG	RIVER BAS	sın Sewickley (	Creek
STORET # N/A		AGENCY	Western Penns	sylvania Conservancy
INVESTIGATORS				
FORM COMPLETED BY		DATE		REASON FOR SURVEY
		TIME	AM PM	Sewickley Creek Visual Assessment
WEATHER CONDITIONS	Now	n) nittent)	Past 24 hours  ☐ [ 25% ☐ [ 50% ☐ ← 75% ☐ [ 100%	Has there been a heavy rain in the last 7 days?  Yes No  Air Temperature F  Other
SITE LOCATION/MAP	Draw a map of the site and inc	dicate the area	s sampled (or attach	a photograph)
Suspected causes of observed problem(s):				
Recommendation(s):				
STREAM CHARACTERIZATION	Stream Subsystem Perennial Intermitten  Stream Origin Glacial Non-glacial montane Swamp and bog	Spring-fed Mixture of o		Stream Type Coldwater Warmwater  Catchment Areami² (Determined by GIS)

WATERSHED FEATURES (with in 30 meter buff	fer)	Predominant Surro  Forest% Field/Pasture _ Agricultural _ Open space (i.e.	%% c., parks/golf courses)		No evidence Some potential Obvious sources			
		Wetland 9	% ( Rural or \	Irhan)	□ None □ Minimal □ Moderate □ Heavy an)  Flood Damage Potential			
		Other	%		High Medium Low	☐ None		
RIPARIAN VEGETATION (18 meter buffer)		Indicate the domina ☐ Trees ☐ Sh	ant type and record the rubs Grasses		esent minant species present:			
INSTREAM		A) Estimated Reach	Lengthft (GIS	(S)	gh Water Markft			
FEATURES		B) Estimated Stream	n Widthft (Fiel	ld Est )	oportion of Reach Represented b	y Stream Morphology		
		Sampling Reach Ar	eaft² (A * B)		pes	y Stream Morphology		
		Surface Velocity			Riffle%   Run	%		
		☐ Slow ☐ Mode	rate  Fast		Channelized Yes No			
		Canopy Cover			Dam Present			
			stly open stly shaded	Cui	lverts Present  Yes No			
LARGE WOODY DEBRIS		☐ Significant	☐ Minimal ☐ No	one				
AQUATIC VEGETATION		Indicate the domina ☐ Rooted emergent (Cattails, Horsetan			sent ing ☐ Free floating (Duck weed, water hyacin	nth)		
		☐ Floating Algae	Attached Algae  ntous) (resemble high	☐ None	true roots)			
			resent	•	,	natic vegetation %		
WATER OHALIEN			ce pH					
WATER QUALITY (During visual			(list ra		or Surface Oils ick □ Sheen □ Globs □ Fle one □ Other			
assessment use pH and conductivity meters to take reading.)		Turbidity (if not me	easured) htly turbid	Overa	Overall Water Quality  Excellent Good Fair Poor			
		Opaque Stair	ned			or		
		☐ Opaque ☐ Stair  Water Odors ☐ Normal/None ☐	ned Other  Sewage Petrole Fishy Other_	 If a fa qualit	air to poor ranking, what is the p ty impact? griculture  AMD  Sewage	orimary source of water		
SEDIMENT/ SUBSTRATE		Water Odors Normal/None Chemical  Not Applicable Odors	ned	If a fa qualitum	ty impact? griculture	orimary source of water  Development		
SUBSTRATE  (Applicable only when investigator disturbs sediment in pool or of		□ Opaque    □ Stain      ₩ater Odors     □ Normal/None    □ Chemical      □ Not Applicable	Sewage Petrole Fishy Other	um ☐ Ag  Depoi ☐ Si ☐ Ro  Looki	ty impact? griculture	Development		
SUBSTRATE  (Applicable only when investigator disturbs		Water Odors Normal/None Chemical  Not Applicable  Odors Normal Sec Chemical An Other Oils	Sewage Petrole Fishy Other	If a fa quality	ty impact? griculture	Development		
SUBSTRATE  (Applicable only when investigator disturbs sediment in pool or ot depositional area)	her	Water Odors Normal/None Chemical  Not Applicable Odors Normal Chemical An Other Other Sligt  SUBSTRATE COMP	sewage Petrole Fishy Other  wage Petroleum aerobic None	Um	ty impact? griculture	Development  Sand y embedded,		
(Applicable only when investigator disturbs sediment in pool or of depositional area)	her	Opaque	Sewage Petrole Fishy Other  wage Petroleum aerobic None  Moderate Prof	If a fa quality  Depoi  SI  Re  Looki are the Year	ty impact? griculture	Development  Sand  y embedded,  ONENTS 100%)  % Composition in		
SUBSTRATE  (Applicable only when investigator disturbs sediment in pool or ot depositional area)  INORGA  Substrate Type	her	Water Odors Normal/None Chemical  Not Applicable Odors Normal Chemical An Other Other Sligt  SUBSTRATE COMP	Sewage Petrole Fishy Other  wage Petroleum aerobic None  Moderate Prof	Um	ty impact? griculture	Development  Sand  y embedded,  ONENTS 100%)		
SUBSTRATE  (Applicable only when investigator disturbs sediment in pool or of depositional area)  INORGA  Substrate Type  Bedrock	ANIC S	Opaque	Sewage Petrole Fishy Other  wage Petroleum aerobic None  Moderate Prof	If a fa quality  Depoi  SI  Re  Looki are the Year	ty impact? griculture	Development  Sand  y embedded,  ONENTS 100%)  % Composition in		
SUBSTRATE  (Applicable only when investigator disturbs sediment in pool or ot depositional area)  INORGA  Substrate Type	NIC S (sho	Opaque	Sewage Petrole Fishy Other  wage Petroleum aerobic None  Moderate Prof	If a fa qualitum	ty impact? griculture	Development  Sand  y embedded,  ONENTS 100%)  % Composition in		
SUBSTRATE  (Applicable only when investigator disturbs sediment in pool or of depositional area)  INORGA  Substrate Type  Bedrock  Boulder	NIC (sho)	Water Odors Normal/None Chemical  Not Applicable Odors Normal Sev Chemical An Other Oils Absent Sligh  SUBSTRATE COMP uld add up to 100%) Diameter	Sewage Petrole Fishy Other  wage Petroleum aerobic None  Moderate Prof	If a fa qualitum	ty impact? griculture	Development  Sand  y embedded,  ONENTS 100%)  % Composition in		
SUBSTRATE  (Applicable only when investigator disturbs sediment in pool or of depositional area)  INORGA  Substrate Type  Bedrock  Boulder  Cobble  Gravel	NIC 8 (sho)     > 25     64-2   2-64	Water Odors Normal/None Chemical  Not Applicable Odors Normal Sev Chemical An Other Oils Absent Sligh  SUBSTRATE COMPuld add up to 100%) Diameter  66 mm (10")	Sewage Petrole Fishy Other  wage Petroleum aerobic None  Moderate Prof	If a fa quality and the property of the proper	ty impact? griculture	Development  Sand  y embedded,  ONENTS 100%)  % Composition in		
SUBSTRATE  (Applicable only when investigator disturbs sediment in pool or of depositional area)  INORGA  Substrate Type  Bedrock  Boulder  Cobble	> 25 64-2 0.06	Opaque	Sewage Petrole Fishy Other  wage Petroleum aerobic None  Moderate Prof	If a fa quality and the property of the proper	ty impact? griculture	Development  Sand  y embedded,  ONENTS 100%)  % Composition in		

### **EPA Score Sheet Summaries**

Parameters to be evaluated in sampling reach: (#'s 1-5)

#### 1 EPIFAUNAL SUBSTRATE/AVAILABLE COVER

high and low gradient streams Includes the relative quantity and variety of natural structures in the stream, such as cobble (riffles), large rocks, fallen trees, logs and branches, and undercut banks, available as refugia, feeding, or sites for spawning and nursery functions of aquatic macrofauna. A wide variety and/or abundance of submerged structures in the stream provides macroinvertebrates and fish with a large number of niches, thus increasing habitat diversity. As variety and abundance of cover decreases, habitat structure becomes monotonous, diversity decreases, and the potential for recovery following disturbance decreases. Riffles and runs are critical for maintaining a variety and abundance of insects in most high-gradient streams and serving as spawning and feeding refugia for certain fish. The extent and quality of the riffle is an important factor in the support of a healthy biological condition in high-gradient streams. Riffles and runs offer a diversity of habitat through variety of particle size, and, in many small high-gradient streams, will provide the most stable habitat. Snags and submerged logs are among the most productive habitat structure for macroinvertebrate colonization and fish refugia in low-gradient streams. However, "new fall" will not yet be suitable for colonization.

#### 2a EMBEDDEDNESS

high gradient streams Refers to the extent to which rocks (gravel, cobble, and boulders) and snags are covered or sunken into the silt, sand, or mud of the stream bottom. Generally, as rocks become embedded, the surface area available to macroinvertebrates and fish (shelter, spawning, and egg incubation) is decreased. Embeddedness is a result of large-scale sediment movement and deposition, and is a parameter evaluated in the riffles and runs of high-gradient streams. The rating of this parameter may be variable depending on where the observations are taken. To avoid confusion with sediment deposition (another habitat parameter), observations of embeddedness should be taken in the upstream and central portions of riffles and cobble substrate areas.

#### 2b POOL SUBSTRATE CHARACTERIZATION

low gradient streams Evaluates the type and condition of bottom substrates found in pools. Firmer sediment types (e.g., gravel, sand) and rooted aquatic plants support a wider variety of organisms than a pool substrate dominated by mud or bedrock and no plants. In addition, a stream that has a uniform substrate in its pools will support far fewer types of organisms than a stream that has a variety of substrate types.

#### 3a VELOCITY/DEPTH COMBINATIONS

high gradient streams Patterns of velocity and depth are included for high-gradient streams under this parameter as an important feature of habitat diversity. The best streams in most high-gradient regions will have all 4 patterns present: (1) slow-deep, (2) slow-shallow, (3) fast-deep, and (4) fast-shallow. The general guidelines are 0.5 m depth to separate shallow from deep, and 0.3 m/sec to separate fast from slow. The occurrence of these 4 patterns relates to the stream's ability to provide and maintain a stable aquatic environment.

#### **3b POOL VARIABILITY**

low gradient streams Rates the overall mixture of pool types found in streams, according to size and depth. The 4 basic types of pools are large-shallow, large-deep, small-shallow, and small-deep. A stream with many pool types will support a wide variety of aquatic species. Rivers with low sinuosity (few bends) and monotonous pool characteristics do not have sufficient quantities and types of habitat to support a diverse aquatic community. General guidelines are any pool dimension (i.e., length, width, oblique) greater than half the cross-section of the stream for separating large from small and 1 m depth separating shallow and deep.

#### 4 SEDIMENT DEPOSITION

high and low gradient streams Measures the amount of sediment that has accumulated in pools and the changes that have occurred to the stream bottom as a result of deposition. Deposition occurs from large-scale movement of sediment. Sediment deposition may cause the formation of islands, point bars (areas of increased deposition usually at the beginning of a meander that increase in size as the channel is diverted toward the outer bank) or shoals, or result in the filling of runs and pools. Usually deposition is evident in areas that are obstructed by natural or manmade debris and areas where the stream flow decreases, such as bends. High levels of sediment deposition are symptoms of an unstable and continually changing environment that becomes unsuitable for many organisms.

#### **5 CHANNEL FLOW STATUS**

high and low gradient streams. The degree to which the channel is filled with water. The flow status will change as the channel enlarges (e.g., aggrading stream beds with actively widening channels) or as flow decreases as a result of dams and other obstructions, diversions for irrigation, or drought. When water does not cover much of the streambed, the amount of suitable substrate for aquatic organisms is limited. In high-gradient streams, riffles and cobble substrate are exposed; in low-gradient streams, the decrease in water level exposes logs and snags, thereby reducing the areas of good habitat. Channel flow is especially useful for interpreting biological condition under abnormal or lowered flow conditions. This parameter becomes important when more than one biological index period is used for surveys or the timing of sampling is inconsistent among sites or annual periodicity.

### Parameters to be evaluated broader than sampling reach: (#'s 6-10)

#### **6 CHANNEL ALTERATION**

high and low gradient streams Is a measure of large-scale changes in the shape of the stream channel. Many streams in urban and agricultural areas have been straightened, deepened, or diverted into concrete channels, often for flood control or irrigation purposes. Such streams have far fewer natural habitats for fish, macroinvertebrates, and plants than do naturally meandering streams. Channel alteration is present when artificial embankments, riprap, and other forms of artificial bank stabilization or structures are present; when the stream is very straight for significant distances; when dams and bridges are present; and when other such changes have occurred. Scouring is often associated with channel alteration.

#### 7a FREQUENCY OF RIFFLES (OR BENDS)

high gradient streams Is a way to measure the sequence of riffles and thus the heterogeneity occurring in a stream. Riffles are a source of high-quality habitat and diverse fauna, therefore, an increased frequency of occurrence greatly enhances the diversity of the stream community. For high gradient streams where distinct riffles are uncommon, a run/bend ratio can be used as a measure of meandering or sinuosity (see 7b). A high degree of sinuosity provides for diverse habitat and fauna, and the stream is better able to handle surges when the stream fluctuates as a result of storms. The absorption of this energy by bends protects the stream from excessive erosion and flooding and provides refugia for benthic invertebrates and fish during storm events. To gain an appreciation of this parameter in some streams, a longer segment or reach than that designated for sampling should be incorporated into the evaluation. In some situations, this parameter may be rated from viewing accurate topographical maps. The "sequencing" pattern of the stream morphology is important in rating this parameter. In headwaters, riffles are usually continuous and the presence of cascades or boulders provides a form of sinuosity and enhances the structure of the stream. A stable channel is one that does not exhibit progressive changes in slope, shape, or dimensions, although short-term variations may occur during floods (Gordon et al. 1992).

#### **7b CHANNEL SINUOSITY**

low gradient streams Evaluates the meandering or sinuosity of the stream. A high degree of sinuosity provides for diverse habitat and fauna, and the stream is better able to handle surges when the stream fluctuates as a result of storms. The absorption of this energy by bends protects the stream from excessive erosion and flooding and provides refugia for benthic invertebrates and fish during storm events. To gain an appreciation of this parameter in low gradient streams, a longer segment or reach than that designated for sampling may be incorporated into the evaluation. In some situations, this parameter may be rated from viewing accurate topographical maps. The "sequencing" pattern of the stream morphology is important in rating this parameter. In "oxbow" streams of coastal areas and deltas, meanders are highly exaggerated and transient. Natural conditions in these streams are shifting channels and bends, and alteration is usually in the form of flow regulation and diversion. A stable channel is one that does not exhibit progressive changes in slope, shape, or dimensions, although short-term variations may occur during floods (Gordon et al. 1992).

#### 8 BANK STABILITY (condition of banks)

high and low gradient streams Measures whether the stream banks are eroded (or have the potential for erosion). Steep banks are more likely to collapse and suffer from erosion than are gently sloping banks, and are therefore considered to be unstable. Signs of erosion include crumbling, unvegetated banks, exposed tree roots, and exposed soil. Eroded banks indicate a problem of sediment movement and deposition, and suggest a scarcity of cover and organic input to streams. Each bank is evaluated separately and the cumulative score (right and left) is used for this parameter.

#### 9 BANK VEGETATIVE PROTECTION

high and low gradient streams Measures the amount of vegetative protection afforded to the stream bank and the near-stream portion of the riparian zone. The root systems of plants growing on stream banks help hold soil in place, thereby reducing the amount of erosion that is likely to occur. This parameter supplies information on the ability of the bank to resist erosion as well as some additional information on the uptake of nutrients by the plants, the control of instream scouring, and stream shading. Banks that have full, natural plant growth are better for fish and macroinvertebrates than are banks without vegetative protection or those shored up with concrete or riprap. This parameter is made more effective by defining the native vegetation for the region and stream type (i.e., shrubs, trees, etc.). In some regions, the introduction of exotics has virtually replaced all native vegetation. The value of exotic vegetation to the quality of the habitat structure and contribution to the stream ecosystem must be considered in this parameter. In areas of high grazing pressure from livestock or where residential and urban development activities disrupt the riparian zone, the growth of a natural plant community is impeded and can extend to the bank vegetative protection zone. Each bank is evaluated separately and the cumulative score (right and left) is used for this parameter.

#### 10 RIPARIAN VEGETATIVE ZONE WIDTH

high and low gradient streams Measures the width of natural vegetation from the edge of the stream bank out through the riparian zone. The vegetative zone serves as a buffer to pollutants entering a stream from runoff, controls erosion, and provides habitat and nutrient input into the stream. A relatively undisturbed riparian zone supports a robust stream system; narrow riparian zones occur when roads, parking lots, fields, lawns, bare soil, rocks, or buildings are near the stream bank. Residential developments, urban centers, golf courses, and rangeland are the common causes of anthropogenic degradation of the riparian zone. Conversely, the presence of "old field" (i.e., a previously developed field not currently in use), paths, and walkways in an otherwise undisturbed riparian zone may be judged to be inconsequential to altering the riparian zone and may be given relatively high scores. For variable size streams, the specified width of a desirable riparian zone may also be variable and may be best determined by some multiple of stream width (e.g., 4 x wetted stream width). Each bank is evaluated separately and the cumulative score (right and left) is used for this parameter.

## HABITAT ASSESSMENT FIELD DATA SHEET – HIGH GRADIENT STREAMS (FRONT)

STREAM NAME		GIS ID #			
SEGMENT ID		STREAM CLASS	S		
LATLONG		RIVER BASIN Sewick	RIVER BASIN Sewickley Creek		
STORET # N/A		ennsylvania Conservancy			
INVESTIGATORS					
FORM COMPLETED BY	DATE		REASON FOR SURVEY		
	TIME AM PM		Sewickley Creek Visual Assessment		

	Condition Category						
Habitat Parameter	Optimal	Suboptimal	Marginal	Poor			
1. Epifaunal Substrate & Available Cover	Greater than 70% (50% for low gradient streams) of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% (30-50% for low gradient streams) mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% (10-30% for low gradient streams) mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% (10% for low gradient streams) stable habitat; lack of habitat is obvious; substrate unstable or lacking.			
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0			
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25- 50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.			
SCORE	20 19 18 17 16	15 14 13 12 11	11 10 9 8 7 6 5 4 3 2				
3. Velocity/ Depth Regimes	All 4 velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (slow is <0.3 m/s, deep is >0.5 m).	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).			
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0			
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.			
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0			
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.			
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0			

## HABITAT ASSESSMENT FIELD DATA SHEET – HIGH GRADIENT STREAMS (BACK)

Habitat Parameter		Condition (	Category	
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank)  Note: determine left or right side by facing downstream	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank)  Note: determine left or right side by facing downstream	More than 90% of the streambank surfaces and immediate riparian zones covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.  Left Bank 10 9	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear- cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE (LB) SCORE (RB)	Left Bank 10 9  Right Bank 10 9	8 7 6 8 7 6	5 4 3 5 4 3	2 1 0 2 1 0

Tot	al Sc	ore		

### HABITAT ASSESSMENT SCORE SHEET HIGH GRADIENT STREAM

STREAM NAME		SEGMENT ID	
GIS ID #		STREAM CLASS	
LAT LONG		RIVER BASIN Sewick	ley Creek
STORET # N/A		AGENCY Western P	ennsylvania Conservancy
INVESTIGATORS			
FORM COMPLETED BY	DA	ГЕ	REASON FOR SURVEY
	TIN	ME AM PM	Sewickley Creek Visual Assessment

Habitat Parameter	Score	Explanation of Score Given (Complete especially for poor rating)
Epifaunal Substrate     /Available Cover		
2. Embeddedness		
3. Velocity/ Depth Regimes		
4. Sediment Deposition		
5. Channel Flow Status		
6. Channel Alteration		
7. Frequency of Riffles (or bends)		
8. Bank Stability (score each bank)	Total of LB & RB	(LB)
Note: determine left or right side by facing downstream		(RB)
9. Vegetative Protection	Total of LB & RB	(LB)
(score each bank)  Note: determine left or right side by facing downstream		(RB)
10. Riparian Vegetative Zone Width	Total of LB & RB	(LB)
(score each bank riparian zone)		(RB)
Total Score		Add all scores and divide by the number of scores given.

### SHORT FIELD DATA SHEET

STREAM NAME (UNT name etc.)		SEGMENT II (Which of the 5	Sub-Watersheds)	
GIS ID #		STREAM CL	ASS	
LATLO		RIVER BASIN	N Sewickley	Creek
STORET # N/A		AGENCY V	Vestern Penn	sylvania Conservancy
INVESTIGATORS				
FORM COMPLETED BY	7	DATE	AM PM	REASON FOR SURVEY Sewickley Creek Visual Assessment
WEATHER CONDITIONS		dy rain) intermittent) over (circle %)	Past 24 hours  ☐ [ 25% ☐ [ 50% ☐ ← 75% ☐ [ 100%	Has there been a heavy rain in the last 7 days?  Yes No  Air Temperature F  Other
STREAM SUMMARY	Stream Width:  Description of land use a	nd riparian zone	·	of erosion issues:
	Forest% Field/Pasture% Agricultural9 Open space (i.e., par Commercial/Industr Residential% Wetland% Other  Are the buffers: Good,  Canopy Cover: Open	rks/golf courses) ial% (Rural or%  Fair, Poor  ppen chaded	_ Urban)	
FIELD ESTIMATED SCORE		~ Sub-Optin	nal (Good) ~ N	Marginal (Fair) ~ Poor
	20 19, 18, 17, 16	~ 15, 14, 1.	3, 12, 11 ~	10, 9, 8, 7, 6 ~ 5, 4, 3, 2, 1

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																								gravel/sediment			multiple gravel sa	nd fills most of char				LB- mostly bed steep slopes	rock LB-b	nks had	LB- majority was forested area. RB and homes affer	oad Lober		AMD discharges: RB- stream at 40.23641
Abandon	oned Mine				100% d	ud		Warm			Type of other Obv	vious	mixed	Mostly			Attached brown/g	igre 7.7- Norn	nal/No					called cobble substrate through	larger substrate embedden in pools		sediment bars an islands, build up i	nd but lots of pinc in points not becaus	ch old bridge and o se of in addition to b	newer good pat Lober speed o	tern of riffles ut at entire	buffers. RB- mu activity eroding	Itiple RB-but high invas	ve 50%	25% intact Knor affects pasture as	eed also we close to	multiple AMD discharges. Mix old field residential and agriculture. Several decommissione and also active rail and road crossings just up from mouth. Lots of sediment and knotwe	ed crossings 40.235285, 79.77370 eed seen. AMD left bank pH 7.4
								ring-fed water 40 S	5 0 5 0		Type of other pote	urces Moderate Low 7 ome ential	Trees hardwoods 60	Moderate Shaded Mostly	30 40 30	0 0 0	Minimal Algae en scum Attached	m 8.2 Clear i	a Other Fair AME	J N/A S	ı0 20 30	5 15 5 0	0 0 10	entire substrate 10	0 riffles runs	18 0 all present gr	ood 8 pools	15 low flow	13 rt. Paralleled	1 by 16 0 s	ction 7 3	10 banks			3 9 stream			bank 40.236
Sewickley Creek Y Attaining/A Trib 37630 To	/Attaining: . Aquat	atic Life 37556_4.62_4.9			12:40 PM No clear/su				50 20 0 0	0 0 0	landuse sou Sor Type of other pote	urces Minimal Low 7 ome rential	Trees hardwoods 45	Moderate Shaded	60 20 20	0 0 0	Minimal Algae green	n 100 8.6 Clear i	a None Good	N/A 15	,0 20 5	5 5 0 9	0 0 15	13	0	19 0	16	19	19	18 0	8 9	17	7 9 LB	field 7	9 16 LB- Fie	16.8 Optimal (16-	20) pacture field on left bank cliffs on right bank, minimal erocion farm at top with rienced pasture gas wells all around houses on right bank for lower half, stream drops into old mine opening in stream bed, was attempted to be filled in pact co.	
Hunters Run U Unass Trib 37618 To	ssessed		0.62 UNT to hunters ru		100% d	and .		-	55 0 0 0	0 10 0 0	So	urces None Low ome	0	Mostly Op		0 0 0		Clear r	e None	N/A 0	0 0 0	0 0 0 0	0 0 0	0	0	0 0		0	0	0 0	0 0	0	0 0	0	0 10	7.0 Marginal (6-	4.0) with twp, stream is dry where should join main channel Most road culverts flows through active pacture, ag land active pacture land paved road o unpopulated florest land, weak buffers at top, very narrow at the low widens out at the!	opens into
Sewickley Creek U Unass	ssessed	37618_0_0.92	0.92 UNT sewickley mai	AT, TS, MT 6/17/1	11:30 am Yes cove	rain (steady rain) Ye	s 67 Perennial S	ring-fed 35 40	10 15 0 0	0 10 0 0	So	ential urces None Low ome	6	Mostly Shaded	0 0 0	0 0 0		8.4 Clear i	e None Fair	N/A 0	0 0 0	0 0 0 0	0 0 0	0	0	0 0		0	0	0 0	0 0	0	0 0	0	0 10	14.0 Suboptimal (1	1-15) multiple tiers of bedrock waterfalls  some forest with different buffer some sections mowed on RB up to stream mostly th	
Pinkerton Run U Unass	ssessed	37631_1.55_1.8	0.25 UNT lower sewickli	TS, JR 6/23/1	10:30 am Yes 25% cloud	cover (intermittent) Ye	s 80 Perennial S	ring-fed 25 30	80 15 0 0	0 30 0 0	So	ential urces None Low ome	4	Mostly Op	en 0 0 0	0 0 0		7.9 Clear i	e None Fair	N/A 0	0 0 0	0 0 0 0	0 0 0	0	0	0 0		0	0	0 0	0 0	0	0 0	0	0 12	12.0 Suboptimal (1	1-15) bsckuards with some active ag	
Kelly Run U Unass	ssessed	37620_1.41_2.87	1.46 UNT lower sewickle	JR, CL, TS, AT 6/23/1	12:55 pm Yes 50% cloud	cover rain (steady rain) Ye	s 85 Perennial S	ring-fed 10 0	0 70 0 0	0 20 0 0	Type of other pote landuse sou So	ential urces None Low ome	4	Mostly Op	en 0 0 0	0 0 0		7.9- Non 8.0 Clear i	e None Fair	N/A 0	0 0 0	0 0 0 0	0 0 0	0	0	0 0		0	0	0 0	0 0	0	0 0	0	0 10	13.0 Suboptimal (1		sewage and nutrien
Abandon Sewickley Creek N Drainage/M	oned Mine 'Metals:1996 Aquat	natic Life 37556 6.56 7.26	0.70 main stem lower sewi	ey MK 4/14/1	2:00 PM No clear/su	showers my (intermittent) Ye	s 65 Perennial S	Coldwa ring-fed ter 25 40	10 25 7 0	0 2 1 0	Type of other pote landuse sou Soi	ential urces Minimal Low 1 ome	Trees hardwoods 45	Mostly Moderate Shaded	50 30 20	0 0 0	Attached Minimal Algae green	n 80 8.9 Clear Che	emical None Fair Seway	age N/A 30	45 10 5	5 5 0 0	0 0 14	13	0	18 0	13 heavy sedloads	18	18	18 0	9 8		8 7 banks u	rstable in	RB-commercial 4 12 removed old rail	e mowing 15.6 Suboptimal (1	stream primarly runs through pasture and field, road runs parallel in the distance, vego	cause of signifi setation
Pinkerton Run U Unass	ssessed	37631_0_1.4	1.40 unt to lower sewick	MK, RH 4/9/1	3:20 AM No cove	ud 75% cloud cover Ye	s 44 Perennial S	Coldwa ring-fed ter 15 40	10 30 5 0	0 1 0 0	Type of other pote landuse sou	ential urces None Low nme	4	Moderate Mostly Op	en 40 45 15	0 0 0	Attached Minimal Algae green	Norm n 70 8.2 Turbid r	a/No Agricul se None Fair e	itur N/A 15	5 25 15	10 15 15 2	0 0 0 13	3	heavy sediment from 0 pasture areas	13 0 no deep poo	brough on by farm ols 3 stream	up- 14	13	12 0	2 2	both banks cow 4 access to stre	have pasture fi	ids on both	LB- road and pasts 3 5 and pasture so	R8-road forest 8.9 Marginal (f		ents (fecal runoff from pasture, a stream t
Trib 37617 To Sewickley Creek U Unass	ssessed	37617_0_0.61	0.61 UNT lower sewickli	TS, AT, MT 6/17/1	100% cl 12:30 pm Yes cove	ud rain (steady rain) Ye	s 67 Perennial S	ring-fed 35 10	10 35 0 0	0 15 0 5	gas wells sou Sou	ential urces None Low	4	Mostly Op	en 0 0 0	0 0 0		Non 8.2 Clear r	mal/No ne None Fair	N/A 0	0 0 0	0 0 0 0	0 0 0	0	0	0 0		0	0	0 0	0 0	0	0 0	0	0 12	12.0 Suboptimal (1	rural residents ag land, intermittened stream, sediment, forested buffer at bottom, n marcellus well pad, bit of algae fast flowing	near-by
Abandon Sewickley Creek N Drainage/N	oned Mine 'Metals:1996 Aquat	uatic Life 37556_6.41_6.56	0.14 sewickley main	RH, MK 4/21/1	No		Perennial S	ring-fed 0 0	0 0 0 0	0 0 0	Type of other pote landuse sou	ential urces None Low	0		0 0 0	0 0 0		Norn Clear r	mal/No ne None	N/A 0	0 0 0	0 0 0 0	0 0 0	0	0	0 0		0	0	0 0	0 0	0	0 0	0	0 12	15.6 Suboptimal (1	1-15) pH is high excessive algae	
Abandon Sewickley Creek N Drainage/N	oned Mine Metals:1996 Aquat	natic Life 37556_7.26_8.6	1.34 main stem lower sewi	ey MK 4/14/1	1:00 PM No clear/su	showers my (intermittent) Ye	s 65 Perennial S	Coldwa ring-fed ter 45 20	20 15 10 0	0 0 0 10	unclaimed mine pote lad sou	ome ential urces Moderate Low 1	Trees hardwoods 45	Mostly Moderate Shaded	50 25 25	0 0 0	Attached None Algae green	n 80 8.4 Clear Che	emical None Good	N/A 15	50 20 5	5 5 0 0	0 0 0 14	13	0	18 0	13	18	19	18 0	9 9	18	9 8	9	7 16	16.4 Optimal (16-	several small ledges, sewage treatment plant water more algaer in the section, streamsi 20) near end of sections 2 to 3 feet moved yards, active ag land, sportsmens club property, wooded areas and fields, moved	ide ledge sewage and s
Trib 37624 To Sewickley Creek U Unass	ssessed	37624_0_1.19	1.19 UNT to sewickley	6/18/2 AT, TS 10	9.51 AM Yes clear/su	my 100% cloud cover No	o 64 Perennial S	ring-fed 10 15	15 40 0 0	0 35 0 0	Type of other pote landuse sou	ome iential urces None Low	4	Mostly Op	en 0 0 0	0 0 0		8 - Norn 8.3 Clear i	al/No ne None Fair	N/A 0	0 0 0	0 0 0 0	0 0 0	0	0	0 0	12	0	0	0 0	0 0	0	0 0	0	0 12	11.0 Suboptimal (1	show some erosion, some areas missing buffers, multiple culverts covered portionintermit	tyard areas ittened, pH
Trib 37621 To Kelly Run U Unass	ssessed	37621 0 0.95	0.95 UNT to kelly run	TS, AT, CL, JR 6/23/1	12:55 AM Yes 50% cloud	showers cover (intermittent) Ye	s 85 Perennial S	ring-fed 10 35	85 20 0 0	0 15 10 0	Type of other pote landuse sou	ome iential urces None Low	4	Mostly Shaded	0 0 0	0 0 0		7.4- Norn 8.2 Clear ii	.al/No ne None Fair	N/A 0	0 0 0	0 0 0 0	0 0 0	0	0	0 0		0	0	0 0	0 0	0	0 0	0	0 12	12.0 Suboptimal (1	top of stream in wet swampy area, active agriculture intermittened pasture land. P.J. shyc 1-15) in drainage, Marellus well going in on farm area, a few rad culverts	chuck farm
Hunters Run U Unass	ssessed	37627 0.12 0.35	0.23 Hunters Run	AT, TS 6/2/1	100% cl 3:00 pm Yes cove	ud showers (intermittent) Ye	s 80 Perennial S	ring-fed 80 0	0 0 0 0	0 20 0 0	Type of other pote landuse sou	ome iential urces None Low	7		0 0 0	0 0 0		Norm 8.2 Clear in	ial/No ne None	N/A 0	0 0 0	0 0 0 0	0 0 0	0	0	0 0		0	0	0 0	0 0	0	0 0	0	0 14	16.0 Optimal (16	Garden @ beginning where 1408 pops out in pipe. Forested for most of section. Weird, scented pipe. Bedrock for days. A few fish. Great cover.	sewage-
lunters Run U Unass	d	27627 0 0 12	0.12 Hunters Run	6/2/20 AT. TS 0	100% d	ud showers	s 80 Perennial Si				Sor Type of other pote	ome rential			0 0 0			Norm 8.3 Clear ii	.sal/No	N/A 0	0 0 0				0		12			0 0	0 0	0	0 0		0 18	16.0 Optimal II		not Course
owickley Creek Y Attaining/A		37027.0.0.12	1.43 sewickley creek		11:41 AM No clear/su			Coldwa			So Type of other pote landuse sou	ome ential		Mostly			Attached	Norm	mal/No			5 5 0 5									10 9		knotwe	d on both		17.3 Optimal (16	20) Forested for entire stretch. Tons of bedrock. Mild sediment issues. Ag at a distance. Gree remote section below nt 136, stable stream banks throughout, excessive algae through o Hutchison treated plant located within segment, various species of native wild flowers, t	out, AMD- trillium in sewage, nutrient, and
b 37633 To		atic Life 3/556_4.9_6.33				showers	s 60 Perennial S	ring-fed ter su si	s0 20 10 0		Sor Type of other pote	urces None None I ome iential	rees hardwoods 55	Moderate Shaded	50 25 25	0 0 0	Minimal Agae green	Norn	mal/No	N/A Zi				15	U	19 0	16	19	19	19 0			8 8 b		8 18		bottom in grazed pastyre yard mowed weedy grass filled channil very top is forested, culve	
kerton Run U Unass 3 37623 To			0.31 UNT lower sewickli			showers		-			landuse sou So Type of other pote	urces None Low ome rential	2	Mostly	en 0 0 0			7.3 Clear I	mal/No	N/A 0	0 0 0	0 0 0 0	0 0 0	0	0	0 0		0	0	0 0	0 0	0	0 0	0	0 12	11.0 Suboptimal (1	1-15) stream wa slow and intermittened, agriculture and residential and RR influences stream actively grazed, travel under railroad through oulvert. Grazed and stomped in stream by	n greatly y animals,
ickley Creek U Unass	ssessed	37623 0 0.28	0.28 UNT lower sewickle	CLTS, AT, JR 6/23/1	1:30 pm Yes 25% cloud 10:00	cover (intermittent) Ye	s 85 Perennial S	ring-fed 20 50	50 20 0 0	0 10 0 0	landuse sou Sor Type of other pote	urces None Low ome ential	2	Shaded Mostly	0 0 0	0 0 0		7.4 Clear I	e None Poor	N/A 0	0 0 0	0 0 0 0	0 0 0	0	0	0 0	8	0	0	0 0	0 0	0	0 0	0	0 10	9.0 Marginal (6-	.10) small very little flow head waters begin in ag and rural areas, middle section greatly altered by route 70, pars railroad bad alone wwano.sis sediment and embeddedness. saw fish. small amount of AM	allels old dD sepage
iters Run U Unass	ssessed	37627 1.24 2.72	1.48 hunters run	TS, AT, MK 7/2/1	am' Yes 25% cloud	cover 25% cloud cover No	o 75 Perennial S	ring-fed 10 0	0 5 35 0	0 50 0 0	So	urces None Low ome	4	Shaded	0 0 0	0 0 0		8-8.2 Clear 1	a None	N/A 0	0 0 0	0 0 0 0	0 0 0	swa a few fish, but		0 0	4 and no and hour and color	0	0 multiple culver		0 0	0	0 0		0 10	7.0 Marginal (6-	<ul> <li>iong trib with multiple landusses, some active ag land, lower portion in flood plain and o</li> </ul>	none with
Kley Creek U Unass	ssessed	37622_0_2.52	2.52 UNT lower sewickli	AT, CL 6/23/1	11:07 am No 50% cloud	cover rain) Ye	s 85 Perennial S	ring-fed water 10 20	20 20 0 0		So	urces Minimal Low Grome	rasses 4	Slow Shaded	30 50 20	1 0 1	None	8.1 Clear Sev	age None Fair Sewa	ee N/A 25	5 10 10	25 25 0 0	0 0 9	narrow and silty 9	0 silt in bedrock	11 0 pool	10 silted shut	11 other areas dr	at dry ways plus ry 11 culverts	9 0 very	ew riffles 8 8	16 stable	6 6 st	ubs 5	5 10 trees	10.8 Marginal (6-	.10) thistle and wettle, crosses under old RR bed just before entering sewickley	stream smelled of s
rton Run U Unass	ssessed	37631_1.8_2.18	0.38 UNT lower sewickle	TS, JR 6/23/1	11:00 am Yes 50% cloud	showers cover (intermittent) Ye	s 80 Perennial S	ring-fed 40 50	50 0 0 0	0 10 0 0	So	ential urces None Low ome	4	Mostly Op	en 0 0 0	0 0 0		7.5 Clear i	e None Fair	N/A 0	0 0 0	0 0 0 0	0 0 0	0	0	0 0	10	0	0	0 0	0 0	0	0 0	0	0 12	11.0 Suboptimal (1		
erton Run U Unass	ssessed	37631_1.4_1.55	0.15 UNT lower sewckie	TS, JR 6/23/1	10:30 am Yes 25% cloud	showers cover (intermittent) Ye	s 80 Perennial S	ring-fed 10 0	0 50 0 0	0 40 0 0	Type of other pote landuse sou	ential urces None Low	5	Mostly Shaded	0 0 0	0 0 0		8.0 Clear r	mai/No ne None Good	N/A 0	0 0 0	0 0 0 0	0 0 0	0	0	0 0	12	0	0	0 0	0 0		0 0		0 12 both-some area	13.0 Suboptimal (1	red. On the left bank, active ag right bank but decent buffer, some sediment isssues cub beginning	verted at
ickley Creek Y Attaining/A	/Attaining: . Aquat	natic Life 37556 2.33 3.58	1.25 lower sewickley	AT, TS 4/2/1	10:48 AM No 25% cloud	cover clear/sunny Ye	s 55 Perennial S	Warm ring-fed water 25 10	10 40 0 0	0 25 0 0	Type of other pote landuse sou	ome iential urces Minimal Low 1	mixed frees hardwoods 120	Moderate Mostly Op	en 30 40 30	0 0 0	Attached Minimal Algae green	8.7- Norm	sal/No Agrico ne None Good i	ultur a N/A 10	15 50 10	10 5 0 0	0 0 16	mix of habitat 16	0 riffles looked good	18 0 all the sam	not terribke son e 15 areas had new ba		road close near		hroughout 7 7	both- both ba hawe high and 14 areas	llow good o	versome	then others are fi being plowed ar 5 10 roads	actively r paved 15.6 Suboptimal	1-15) section has lots of Ag. Activity. Fishermen suggested to stop stocking nin-native trout	. Pleasel lots of
37614 To ickley Creek U Unass			1.51 UNT sewickley mai		100% cl 2:00 pm Yes cove	ud rain (steady rain) Ye	s 67 Perennial Si	rine-fed 15 30	80 15 0 0	0 35 0 5	Sor pote nursery sou	ome ential urces None Low	5	Mostly Oo	en 0 0 0			Norm 8-8-2 Clear	mal/No ne None Poor	N/A 0				0	0			0	0	0 0	0 0		0 0		0 10	10.0 Marsinal (6	smaller UNT coming into it, very long section with multiple residential issue, some mow multiple culverts and driveways, stablized by each land owner, lots of mowed yards din -10)	ved yards rectly to
Abandon ickley Creek N Drainage/N	oned Mine	ortic 18to 27555 6 22 6 41	0.08 main stem lower sewi	ou BH MW 4/21/1	12:079M No deaday	unu eleceleuneu Vo	c 60 Bossonial S	Coldwa	0 25 25 0	35 0 0	Type of other pote	ome ential	Trees hardwoods 60	Mostly Medicate Shaded	60 20 20	0 0 0	Attached Noon Alexa gross	Norm	nal/No	N/A EO	15 25 4	2 2 0	. 0 0 15	42	0	16 0	16	10	16	17 0	9 9	19	7 7		6 12	15.6 Suboptimal (1		sewage nutrients se
ters Run U Unass			1.94 painteres run					Warm	80 25 10 0		Obv	vious urces Minimal Low G		Mostly	35 35 30			8.2- Norn 8.4 Clear			0 0 0				0		10	0		0 0	0 0		0 0		0 12	12.8 Suboptimal (1	crossed by turkey town rd, bridge out due to road washout random houses trying to impro landowners trying to improve landscape through hebicide not really working some sewa	ove stream
Abandon		37556_10.07_10.	0.33 main stem sewickley of		100% d	ud		Coldwa ring-fed ter 70 0	0 0 0 0	0 0 30	Obv road sou	vious urces Minimal Low 1		Mostly Moderate Shaded	10 70 20	0 0 0	Attached Minimal Algae green	Norm	al/No ne None Fair AN	ID N/A 0	10 60 15	5 5 5 1	0 0 0 15		0	16 0	17	17	16	lacking	a sufficient int of riffles 7 7		9 8		5 14 RB - road adjacer		road runs adjacent to stream on right bank. Lacking good riffle section. AMD and water	clarity is
37614 To ickley Creek U Unass	ssessed	37614_0_0.3	0.30 UNT Sewickley ma	AT, TS, MT 6/17/1	100% cl 1:48 pm Yes cove	ud rain (steady rain) Ye	s 67 Perennial S	ring-fed 95 0	0 5 0 0	0 0 0	Type of other pote landuse sou	ome ential urces None Low	7	Mostly Shaded	0 0 0			Norn	mal/No ne None Excellent	N/A 0	0 0 0	0 0 0 0	0 0 0	0	0	0 0	10	0	0	0 0	0 0	0	0 0	0	0 18	16.0 Optimal (16-	forested well buffered on both sides, ag land at the top but no where near the stream, mu 20) bedrock barriers, lots of sedment on the top of bedrock	ultiple large
U Unass	ssessed	64935_0_0.41	0.41 UNT lower sewickle	TS, JR 6/23/1	10:30 am Yes 25% cloud	showers cover (intermittent) Ye	s 80 Perennial S	ring-fed 15 40	0 0 0	0 45 0 0	Type of other pote landuse sou	ome rential urces None Low	2	Mostly Op	en 0 0 0	0 0 0		Norn 7.5 Clear ii	mal/No ne None Fair	N/A 0	0 0 0	0 0 0 0	0 0 0	0	0	0 0		0	0	0 0	0 0	0	0 0	0	0 12	12.0 Suboptimal (1	mowed yard at bottom, few trees near stream at top culverted caused it to widen, soe re 1-15) Weedy channel where buffer missing	esidential.
								Warm			Sor Type of other pote	ome ential Mediu					Attached brown	n Nern	nal/No					good cobble lacking a little canopy to			not too much					LB- low banks, stable has some	knot LB-goo	but knot	Both-some por	ns good	flows through AG. Land some residential good forest on hillside first on left bank then on a	right, road
vickley Creek Y Attaining/A b 37613 To	/Attaining: . Aquat	natic Life 37556_3.58_3.96	0.38 sewickley main	AT, TS 4/21/1	1:45 PM No 25% cloud	cover clear/sunny Ye	s 68 Perennial S	ring-fed water 45 0	0 30 0 0	0 25 0 0	So	ential Mediu urces Minimal m T ome	Trees decid 0	Moderate Mostly Op	en 0 0 0	0 0 0	Attached brown Minimal Algae green	n 8.8 Clear i	a None	N/A 10	15 50 10	10 5 0 0	0 0 16	protect habitat 16	0 not terribly embedded	18 0 good variet	ty 18 sediment	18 bank to bank	15 large bridg	ge 18 0 very	frequent 9 9	18 weed	8 7 weed/RE	knot weed 6	6 12 some b	16.4 Optimal (16	20) follows bottom then bridge crosses upper section active horse pacture, active Ag. Land two separate active pastures (horses:	
ewickley Creek U Unass	ssessed	37613_0_0.8	0.80 sewickley UNT	AT, TS 4/21/1	1:00 PM Yes 25% cloud	cover clear/sunny Ye	s 67 Perennial S	ring-fed 0 40	10 50 0 0	0 10 0 0	landuse sou	ential urces None Low ome	3	Open	0 0 0	0 0 0		8.5 Clear I	e None Fair	N/A 0	0 0 0	0 0 0 0	0 0 0	0	0	0 0	12	0	0	0 0	0 0	0	0 0	0	0 10	8.0 Marginal (6	10) had some tree cover but not forested, seems that it is filled at start. Shows signs of sedim	mentation.
wickley Creek Y Attaining/A	/Attaining: . Aquat	uatic Life 37556_3.96_4.27	0.31 sewickley main	RH, MK 4/21/1	1:35 AM No clear/su	nty clear/sunny Ye	s 60 Perennial S	ring-fed ter 0 0	0 0 0 0	0 0 0	landuse sou So	ential urces Minimal Low 7 ome	Trees hardwoods 40	Moderate Shaded	25 25 50	0 0 0	Attached Minimal Algae green	n 100 9.1 Clear i	e None Good	N/A 60	20 5 5	5 5 0 9	0 0 14	13	0	18 0 more pool	16	19	19	18 0	9 9	18	8 8	8	7 15	16.6 Optimal (16	begins in small wetland pasture not actively grazed growing up into forest if landowner co	ontinues to
ib 37625 To wickley Creek U Unass	ssessed	37625_0_0.3	0.30 UNT sewickley mai	AT, TS 6/18/	11:40 am Yes clear/su	ny 100% cloud cover No	o 72 Perennial S	ring-fed 5 60	50 20 0 0	5 5 5	powerline pote crossing sou	ential urces None Low	6		0 0 0	0 0 0		8.1- Norn 8.2 Clear r	mal/No ne None Good	N/A 0	0 0 0	0 0 0 0	0 0 0	0	0	0 0		0	0	0 0	0 0	0	0 0	0	0 12	15.0 Suboptimal (1	allow, residents is a farmstead with dairy cows upland away from stream, road drive hroug 1-15) stabilized, major portion of bottom of stream is bedroc	stream dissappears
Celly Run U Unass	ssessed	37620 0 1.41	1.41 lower sewickley	MK, NP, MT 6/18/1	11:40 No clear/su	ny 50% cloud cover Ye	s 75 Perennial S	Coldwa ring-fed ter 10 20	20 50 5 0	0 15 0 0	Type of other pote landuse sou	ome vential urces Minimal Low 1	Trees hardwoods 10	Moderate Shaded	0 0 0	0 1 0	Attached Minimal Algae green	Slightly Norm	ial/No ne None Good	N/A 40	25 20 5	5 5 0 0	0 0 18	16	0	17 0	14	11	14	17 0	9 8	17	8 9	9	9 18	15.9 Suboptimal (1	1-15)	40.23118 W 79.72777; 40.22890 W 79.732 79.73495; co
Abandon ckley Creek N Drainage/N	oned Mine	natic Life 37556 8.6 10 n7	1.47 Sweickley Main	MK 4/14/1	12:00 pm No dear/or	my 25% cloud cover No	o 60 Perennial S	Coldwa ring-fed ter SS 24	20 20 0 n	0 5 0 0	So Type of other pote landuse one	ome rential urces Minimal Low <sup>1</sup>	Trees hardwoods Sn	Mostly Moderate Sharket	25 50 25	0 0 0	Attached Minimal Algae preen	Slightly Norm	al/No Agrici ne None Fair	altur a N/A 3	15 65 17	5 5 0 4	0 14 0	13		18 0	13	18	18	16 0	8 8		8 8		5 12	15.4 Suboptimal (1	section below bells mill bridge, mine algae water quality looks better, hunters run down str aleae then above sewage treatment plant water smell, nice bedrock waterfall bit of aleae	tream more
b 37618 To vickley Creek U Unass		37619 0.02 + **	0.22 UNT sewickley main	AT TS MIT CARN	100% d	ud 25% cloud course V-	c 67 Bossonial C	rine,fed 0 2	25 70 0 0		Sor Type of other pote landuse sou	ome rential urces None Low	30	Mostly			gee green	Norm 82 Oper 1	sal/No	N/A O	0 0 0					0 0	12	0		0 0	0 0		0 0		0 12	12.0 Suboptimal (1	starts in dairy pasture and runs through ag fields has trees directly next to trib., goes th	hrough a
37632 To						showers					Sor Type of other note	ome rential	3	Snaded Mostly				Norm	mal/No	N/A U							12	-										
inkerton Run U Unass nb 37629 To		37632_0_0.65	0.65 UNT lower sewickle	TS, JR 6/23/1	10:30 am Yes 50% cloud	cover (intermittent) Ye showers	s 80 Perennial S	ring-ted 30 25	25 0 0 0	u 45 0 0	landuse sou Sor Type of other pote	urces None Low ome rential	2	Shaded Mostly				Norn	ne None Fair mal/No		0 0 0					0 0		0	0	0 0	0 0		0 0		0 12		1-15) forested buffers, red area, yards but not mowed to stream, field and pasture further mostly shaded only due to culverts. Cow pasture. Culverted. Comes out in ponds. Mowed abused. Very little water except in ponds. No channel for most of reach. Actively grazed. P.	d, grazed,
unters Run U Unass b 37615 Of		37629 0 0.46	0.46 UNT to Hunters Ru	AT, TS 0	2:21 pm Yes 75% cloud 100% cl	cover (intermittent) Ye	s 80 Perennial S		50 25 0 0	0 15 0 0	landuse sou Soi pote	urces None Low ome ential	0	Shaded Mostly		0 0 0		7.9 Clear i	ne None				0 0 0		0	0 0		0	0	0 0	0 0		0 0		0 4	5.0 Poor (0-5	culvert directly to stream; sediment and erosion near culvert erosion from active ag fields, active ag fields a few est shallow wells roads and rural homes, Jower section really good - a lot of sediment, upper-	tablished
ewickley Creek U Unass Frib 37626 Of	ssessed							ring-fed 40 0			So	ome	5		0 0 0			Norm	mai/No ne None Good mai/No				0 0 0		0	0 0	10	0	0	0 0	0 0	0	0 0	0	0 12	14.0 Suboptimal (1	1-15) grassy pasture land and fields, not heavily grazed, gas well small wetland area forested in pasture	
wickley Creek U Unass								ring-fed 5 80							en 0 0 0			8.2 Clear i					0 0 0			0 0		0	0	0 0	0 0		0 0		0 12 LB - road huge:	11.0 Suboptimal (1	1-15) forest, active pasture but not heavily grazed, culvert	
tle Sewickley Creek Y Attaining/A					11:55			Warm			Sor	ome ential		Mostly			Attached brown	n 8.2 - Slightly Norn	nal/No					just barely acceptable	some areas close to 50% surrounded in			some areas chan	long stablized so	ection lats. 3 good	iffies weak	LB - banks some high, RB - stab	what lized LB - good	vegetation,	ts - road huge: stretch field on o road, RB - old ro	r side of ine and	stream flows along road for entire section, quarry upland on rught bank, residential, bridge of the section of the sec	Quarry - water cloudy n ge, and old cloudy when it dump
Creek Y Attaining/A	/Attaining: . Aquat	satic Life 37557_0_0.42	0.42 little sewickley ma	AT, TS 4/21/1	AM No 25% cloud	cover clear/sunny Ye	s 60 Perennial S	ring-fed water 35 0 Warm	0 50 0 0	0 10 0 5	Quarry sou Sor pote	urces Minimal None 7 ome rential	Trees mixed decid 0	Moderate Shaded Mostly	35 35 30 40 40 20	1 0 0	None Algae green	n 80 8.4 Turbid r 7.8- Norm 7.9 Clear r	e None Fair Sewar nal/No	ge N/A 5	.0 50 15	5 15 0 0	0 0 16	as optimal 11 wery patchy stable	0 riffles heavy sediment	16 0 not a lot of fast	t deep 10 lots of sed bars pools absent	15 not full	12 bridges one culvert m	15 0 I	ends 7 7 d riffles 7 7	14 with gabion ba moderately stab	slats 7 8 RB-v invasive le but MFR,	getated 2 knotweed not bad	7 9 quarry in dista wide zone not as r			in of reach source of cloudyn
Hunters Run U Unass Trib 37619 Of	ssessed							Warm ring-fed water 5 85			Sor	ome											0 0 7	areas mostly silty 5	5 throughout	12 0 3 of 4 dece	nt 4 continous sed ba	ar 10 less then 25% fi	ull 14 channelize							11.1 Suboptimal (1		
ewickley Creek U Unass	ssessed							ring-fed 10 15			So	ome	0	Mortis	0 0 0			Clear I	mal/No ne None Fair mal/No	N/A 0	0 0 0	0 0 0 0	0 0 0	0	0	0 0		0	0	0 0	0 0	0	0 0	0	0 12	13.0 Suboptimal (1	1-15) small UNT starts in woodland area has narrow tree buffer headwaters near turkeytown starts in forested then to ag land. Some sed but pretty goo small wetland at confluence with 1449, has culvert for farm access, hay land near stream	od cover,
iewickley Creek U Unass								ring-fed 30 15			Sor	ome	4		0 0 0			8.2 Clear I		N/A 0	0 0 0	0 0 0 0	0 0 0	0	0	0 0		0	0	0 0	0 0	0	0 0	0	0 12	13.0 Suboptimal (1	1-15) small workship at community with 1-449, has current for larm action, hay aim one stream 1-15) year plus da 1-15) year plus plus plus plus plus plus plus plus	us Lober
Trib 63941 To Sewickley Creek Y Attaining/A	Attaining: . Aquat	natic Life 63941_0_0.57	0.57 unt to little sewickl	AT, TS 8/3/1	9:45 am Yes cove	50% cloud cover No	a 80 Perennial S	ring-fed 70 0	0 0 0 0	0 5 25 0	ype of other pote landuse sou	rential urces None Low	5	Mostly Shaded	0 0 0	0 0 0		Norn Clear r	mal/No ne None Good	N/A 0	0 0 0	0 0 0 0	0 0 0	0	0	0 0		0	0	0 0	0 0		0 0		0 8	10.0 Marginal (6-		onzeo and
Abandon iewickley Creek N Drainage/M	oned Mine 'Metals:2002 Aquat	natic Life 37556_2.18_2.33	0.15 sewickley main	AT, TS 4/21/1	12:15 PM No 25% cloud	cover clear/sunny Ye	s 60 Perennial S	Warm ring-fed water 50 0	0 0 0 0	0 0 50	Obv mine spoil sou	vious urces Minimal None 1	mixed Trees hardwoods 100	Mostly Moderate Shaded	40 40 20	0 0 0	Attached green Minimal Algae brown	n Slightly Norm	al/No ne None Fair Ab	AD N/A 20	10 40 10	5 15 0 0	0 0 18	good variety 17	0 less than 25%	18 0 all 4 preser	nt 15 some sed bars	some gravel barn 16 chennel	s in 19 no change	riffles e 18 0 s	good short action 9 9		y bed LB- good and RB- good 9 8 kno		LB- too steep to l by humans/ ii 6 16 recovering for		very steep slope on left bank, lost of trillium and some dutchman's brecher flowers, little 20) adding cloudiness to water, short segment	sewickley AMD discharge
																		Norm		N/A 30						19 0					9 9					16.9 Optimal (16-	numerous low bedrock ledges, knotweed and multifloration rose on banks esp. right, gas	

GG (D) W Rain T AFT Fig. Pa Com. In Wild Stromble  PC NAME ATTANUSE PROBLEM! USE, SEGD WPC Longth Strombleme low Date Time Sheet Weathlow Wast24th's days mp SirSuboys StrOfgin StrTigen Forest at Ag d Open Res and Other OTtigen NYS Encoder Regardin List 4th Velocity CastCover Riffin Run Pool Channel Game Culverts LWO A  Some Ton STSTATO Ton STSTATO Ton OTTITUTE or Reserved.	OwarAW  Species Portion pH Turbidity WhOdors WebOil Q, Impac Sediment Bedrock Bolder Cobble Gravel Sand Sit Clay Dientus of Mari Epifaunal  NormacNin	PootSu Velo Dp SedO ChFlo Espl1 Embed b Espl2 th Pool,Var Espl3 ep Espl4 a	uSt Freqik Tot Brids Tot Brid, Sta Vight Expl5 ChanAlt Expl6 f ChanSin Expl7 BankStl BankStl B Expl8 ol.	Yegif* Totalis. of Eupth Riplyingt Riplyingt Tot-Rip-Ving Eupth one Steffank pond at handwaters, field/plasters at top route in bloot in holder and double, culmented at top and bettom for a long steech. Spring flows in about mid-way across from road, does not affect
Tris 37516 To Tris 27516 To Tr	7.5 Clear ne None Fair N/A 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0		0 0 12 9.0 Marginal(6-10) pH (6.8 pH)
The 37581 To 1010 Andrews Run Y Attaining/Attaining . Aquatic Life 37581 0.14 0.47 0.33 UNT Titls sewickley Cs, AT 5/13/10 9:35 AM Yes cover (intermittent) Yes 60 Perennial Spring-fled 40 0 0 0 60 0 Incides sources None Low 3 Should 0 0 0 0 0 8	7.3 Clear ne None Good N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0		0 0 12 14.0 Suboptimal (11-15) surrounded by urban areas, but not close to UNT yet. Stream is small and has mod/sit issues
Trib 37599 CF UNIS Servicibley UNIS Servicibley 11/13/2 11/13/	duid.  mend, filmentine  filme	sw fids, some places not much save exod habitat 15 0 embeddeness 13 0 lactine riffles 12 slieht 11	lists of culverts and crossings with containing the same areas bad on orbitalities of containing the containing	active agriculture and moved profit or both why few trace, but fields not extensive profit fields, residences, and crossings. Areas with low banks and others with what a department of the control of th
Tria 37588 To Little Seniolity  1012 Crosk V Attaining/Attaining: Aquatic Life 37588 0.1.64 1.64 Little Seniolity Rt. TS 3/80/10 100PM Yes Clear/Journey No 60 Perential Springfield 35 30 0 0 35 0 0 Lindow sources Know Low	Normal/No 7.8 Clear ne None N/A 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0	0 0 0 0 0 0	unable to score abacd on only seeing limited portions of stree. Landowner on upper end of stream on right side of most did not use un to enter the preservit, Updated 51/31/31/0 froud bottom channel
TIGN 3773-207 TOWN V Allanding/Attaining - Aquatic Life 37972 0.6.57 0.8.7 UNT TS, CL 5/74/20 11:30 Yes Color/burney to 80 Presental Spring-Med 30 40 0 0 30 0 Indicate Successive Rose Low 3 Month/Open 0 0 0 0 0	Normal/No 8.2 Clear ne None N/A 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	
Trial 37666 CF   Some	Normal/No 7.9 Clear ne None N/A 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 12 11.0 Suboptimal (11.15) Multiple suberts, culterfiel a loter wave used at headwaters does not not at Confinence with major
Tria 37570 CF Little Selecking Type of citizen Against Life 37570 0.039 0.93 UNT 8L, AT 10 11:30 pm Yes Clear/sunny Clear/sunny No 76 Perennial Spring-feed 10 10 0 5 0 75 0 0 landsus sources None Low 4 Month Open 0 0 0 0 0	Normal/No 8.1 Clear ne None N/A 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0	0 0 0 0 0 0	Multiplic culvents, culvented a large way, pool at hardwarters, drop culvent at confluence with main  UNT. Road is close to bank. Moweel(culvented healws). Recreationally mowed, any shaded areas due  0 0 5 10.0 Mangical [5-10]
		sediment deposited from eroding banks		
		that are up otheram, several large sediment burs, especially where overhapping dot train bridge used.	ONE BRIDGE AND OLD lists - major	
Little Sewickley 1100 1001x Could Colebas Type of either Mostly Attaining / Attaining / Attaining / Aquatic Life 37557 74 799 0.59 Ittle sewickley RH, MK 3/25/10 AM No cover 1001x Could cover No 45 Perennial Spring-feed for 85 10 0 1 0 2 2 0 landscan No evidence Moderate Low Trees hardwoods 15 Slow Shaded 20 40 40 0 0 0 Minimal 10 2 2 0 landscan No evidence Moderate Low Trees hardwoods 15 Slow Shaded 20 40 40 0 0 0 Minimal 10 2 2 0 landscan No evidence Moderate Low Trees hardwoods 15 Slow Shaded 20 40 40 0 0 0 Minimal 10 2 2 0 landscan No evidence Moderate Low Trees hardwoods 15 Slow Shaded 20 40 40 0 0 0 Minimal 10 2 2 0 landscan No evidence Moderate Low Trees hardwoods 15 Slow Shaded 20 40 40 0 0 0 Minimal 10 2 2 0 landscan No evidence Moderate Low Trees hardwoods 15 Slow Shaded 20 40 40 0 0 0 Minimal 10 2 2 0 landscan No evidence Moderate Low Trees hardwoods 15 Slow Shaded 20 40 40 0 0 0 Minimal 10 2 2 0 landscan No evidence Moderate Low Trees hardwoods 15 Slow Shaded 20 40 40 0 0 0 Minimal 10 2 2 0 landscan No evidence Moderate Low Trees hardwoods 15 Slow Shaded 20 40 40 0 0 0 Minimal 10 2 2 0 landscan No evidence Moderate Low Trees hardwoods 15 Slow Shaded 20 40 40 0 0 0 Minimal 10 2 2 0 landscan No evidence Moderate Low Trees hardwoods 15 Slow Shaded 20 40 40 0 0 0 Minimal 10 2 2 2 0 landscan No evidence Moderate Low Trees hardwoods 15 Slow Shaded 20 40 40 0 0 0 Minimal 10 2 2 2 0 landscan No evidence Moderate Low Trees hardwoods 15 Slow Shaded 20 40 40 0 0 0 Minimal 10 2 2 2 0 landscan No evidence Moderate Low Trees hardwoods 15 Slow Shaded 20 40 40 0 0 0 Minimal 10 2 2 2 0 landscan No evidence Moderate Low Trees hardwoods 15 Slow Shaded 20 40 40 0 0 0 Minimal 10 2 2 2 0 landscan No evidence Moderate Low Trees hardwoods 15 Slow Shaded 20 40 40 0 0 0 Minimal 10 2 2 2 0 landscan No evidence Moderate Low Trees hardwoods 15 Slow Shaded 20 40 40 0 0 0 Minimal 10 2 2 2 0 landscan No evidence Moderate Low Trees hardwoods 15 Slow Shaded 20 40 40 0 0 0 Minimal 10 2 2 2 0 landscan No evidence Moderate Low Trees ha		overhanging old train bridge used vegitation 16 0 17 0 12 to be 13	TRANSPORT   Tran	8 9 9 18 14.5 Suboptimal (11-15) inalline obstructs Rood plain and up or ream hand use - stabilization work on expoling stream banks.
	coontail,	iddence of flooding  all lats of adment  riffle areas quite  lots of sediment build movement 8 0 embedded 13 0 5 up in straight tunnel 13	Nac High erocion Rec 66 built over 7 stream 10 0 fairly straight section 5 5 10 Gods 6	had willows and lower portion had come no zone just the tresc here \$ section flows under Re 66 via two large culeert tunnels. Evidence of Infelir Rouding at both ends of \$ moving \$ 5 \$ 10 and there 10.0 Marginal [5-10] both tunnels. Saw RGs and a queen coale, minimal lors sediment in small zera.
1948 V Administration C. Aquatic Cells 88 0.44 Ltms Semiconistation (prior training 1 to 2 3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	en 40 x.0 Cxor ne kone   N/A 0 50 10 20 10 50 0 0 0 0 20 10 0 0 0 10 0 0 10 0 0 10 0 0 0	movement 8 0 embedded 13 0 5 up in straight tunnel 13	7 STANDAM 20 U TRANY STREET SACTION 5 5 20 T0000S 6	sediment from Lumpiles construction, headwaster marchilland area, not natural chamelisation into culvent undergroung new miles laround with catch la Euronal with catch lasters all arounds files catch scales all arounds files catch.
To 31554.07  Units Secretary  1003 Code V Attaining/Attaining . Aquantic Life 37564.0.0.88 0.88 UNIT Risk sewickley Ti, IR 6/4/10 1105 im Yes Cower (Intermethent) Yes 75 Perential Spring-field 50 0 10 0 40 0 Indices Success Notes Low 4 Month/Open 0 0 0 0 To 37586	Normal/No 8.2 Clear ne None Fair N/A 0 0 0 0 0 0 0 0 0 0			green house and witner year criterian to protect aff at top but fulfire disturbed by sever fine moved  0 0 0 12 110 Suboptimal (11-15) years resident in the many moved years at bottom driveway and read-culvett
Trib 37586 To Littles Sensitive  Littles Sensitive  11054 Orack Y Attaining (Attaining . Aquantic Life 37586 0.057 0.57 It this sensitivity TS, RH 3/21/10 9:30 AM Nes Clear/Journey Vise 37 Permential Spring-field 15 40 0.30 0.25 0.0 landars sources None Low 3 Open 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Normal/No 3.0 Clasr ne None Fair N/A 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0		trib starts in rural area and flows through backquests with great cut to basis. Enters colvent under industrial business paring lotteninging as a little for rest of reach. Loweph and AMO intening from 0 0 0 6 8.0 Masginal [6-10] on the start of the sta
				LB- barets being LB- overall L/s of chrosin with moved, RB- sever problems vary good when hirt, general problems vary good when hirt, general problems vary good when hirt, sevenge and severall prince of the problems construction.
Some 100K doubt showers Warm Type of bother potential 1058 Andrews Run Y Attaining/Attaining . Aquatic Life 37575 0.073 0.73 UNT Etts wenickley AT,TS,CL,RH 5/13/10 1-40 PM No cover (internitizent) Vis 68 Perennial Spring-fed water 45 25 0 0 0 30 0 0 Undoor sources Minimal Low Trees 5 Moderate 30 25 35 0 0 1 nt		nice LVMC, cobbbe sosent iron sodiment in last 2001 feet 12 0 somewhat embedded 17 0 all pressent 11 new sed bars 15	small embedded small embedded areas of the sed bars effected 14 plant new ziream 16 0 bend. 8 8 16 for both 7	The problems both control of the problems of t
Tria 37548 To	P	ond and lake affects ream habbt ag fisid		pond and lake areas:  pond lakes and fields wreck  at forest at top then through active fields and active ag, Stopped in farm pond, coverted under
Lithis Senicistry Coles Type of either potential Mediu 1059 Creak Y Attaining/Attaining: Aqualic Life 37568; 0.123 1.23 UNT little sewickley TS, IR 6/R/10 2.05 pm No 25% cloud cover 25% cloud cover Ves 72 Perennial Spring-fled ter 30 30 20 0 15 5 0 Tandose Sources Minimal in Grasses 3 Slow 30 30 40 0 1 1 Minimal 1/6 37493 To Source Sour	Slightly Normal/No Agricultur 8.4 Turbid ne None Fair e N/A 0 5 25 25 20 25 0 0 0 11	sed affect at top varys due to pon plus some sed at top drops bottoe guard 13 0 lake 16 0 all present 13 out in lake bottom 15	would be better fills most of channel 10 lake and pond affect 13 0 without take and pond 8 8 16 stable 6	moved field also zone, better at very top and several matts and stopped in crab apple baller gaing through more forested entering fittle moved 3 3 6 bottom 13.8 Suboptimal (11-15) several matts and stopped in crab apple baller paining through more forested entering fittle several move
Lithis Senicibly Tipe of earthur potential Mostly 1086 Grank Y Attaining/Attaining: Aqualic Life 37669 0.652 UNIT to Lithis Senicibley MM, RH 9 2:00 p Yes cover 75% cloud cover No 60 Perennial Spring-field 45 0 0 0 55 0 Tandous sources Nome Low 1.5 Shaded 0 0 0 0 0 Ting 37600 Cdr Some	Normal/No	0 0 0 0 0	0 0 0 0 0	0 0 12 7.0 Marginal (5-10) Dry channel, residential and forested, Peed underground near botton.  coule of homes near mouth, area about the researcation forest, very dense underbrush. Cisis
Little Sewickley Tipe of other potential Mostly 1094 Creek Y Attaining/Attaining: Aquatic Life 37600_0.056 0.55 UNTTO Little Sewickley AT, TS 9 10.45 a Yes cover 100% cloud cover No 50 Perennial Spring-field 75 0 15 0 10 0 Inches sources Koree Low 3 Shaded 0 0 0 0 0 Some Time of entire Controlled	Normal/No.  8.1 Clear no None N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0	0 0 0 0 0	
1100 Andrews Rum V Attaining/Attaining . Aquatic Life 27575 1.17 1.55 0.38 UNT PH,TS 3/31/1/0 2:30 Viss Char/suriny Char/suriny Viss 65 Perential Spring-field 40 10 0 0 50 0 Unional sources Notine Low 3 Mostly Open 0 0 0 0 0 Teb 375-50 To Some  Little Selection Type of other potential mixed Mostly A	8.0 Clear ne None Fair N/A 0 0 0 0 0 0 0 0 0 0 0 green Normal/No	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 12 0 road culverted infrequent eroded	
1101 Orak Y Attaining/Attaining Aquatic Life 37560 1.05 2.22 1.17 UNT little sweickley IR, TS 6(R)/10 1.00 pm No 25% cloud cover Yes 70 Perennial Spring-field liter 75 10 0 0 15 0 Vandazia sources Minimal Low Trees hardwoods 6 Moderate Shaded 35 35 30 0 0 1 Minimal Trib 37560 To		good collable and much better then few new softment few and softment few and softment few and softment few and few and few and few and few and few and few arts of stream that	doesn/Et quite fill lake affects	swapp lies affects pool zone or both data.  forested savege line affects pouls not been dead, codeble bedded less soit then sevenge line affects pouls not been dead, codeble bedded less soit then sevenge line affects nomewhat 15.5 Suboptimal (11-15) laiveng, not good table line program or good been reported and the connect data laids. Connect out of laids table line program or good been reported and the connect data laids. Connect out of laids table line program or good been reported and the connect data laids. Connect out of laids table line program or good table line program or good and the connect data laids. Connect out of laids table line program or good and the connect data laids. Connect out of laids table line program or good and the connect data laids. Connect out of laids table line program or good and the connect data laids. Connect out of laids table line program or good and the connect data laids. Connect out of laids table line program or good and the connect data laids. Connect out of laids table line program or good and the connect data laids. Connect out of laids table line program or good and the connect data laids. Connect out of laids table line program or good and the connect data laids. Connect out of laids table line program or good and the connect data laids. Connect out of laids table line program or good and the connect data laids. Connect out of laids table line program or good and table line program or good and the connect data laids. Connect out of laids table line program or good and table line
Little SewColky Coldwar Type of other putertial marshy 1108 Evek Y Attaining/Attaining: . Aqualic Uni 37560_338_3.94 0.55 UNT little sewColkey TS, R 6,R/10 10.45 am No 25% closed cover Ves 68 Perennial Spring-fied for 20 0 0 60 0 20 Websel sources Minimal Low Grasses grasses 0 Slow Open 10 20 70 1 1 0 Minimal	Normal/No Developm a	ent in Like are good embedded even when all present when not beginning, sed drops bles supports fish 10 o not in lake 16 0 in Take 9 out in Take 13	channel when not in everything, stabilised before take some take 4 after take 8 0 no riffles in take 7 8 15 erosion on left bank 5 stream had natural	before bias and officer around bias daily but not great into forest area for last the of section. Many greas and ducks on bias people fishing said it was  5 okay 4 4 8 before and after 10.5 Manginal (6-10) stocked with trout, saw small fish when trib begins seed some erosion at beginning of trib.
Some  100% Closud doowers Norm  1009 Andrews Num Y Attaining/Attaining . Aquatic UN 37575 1.55 1.76 0.21 UNT Enth swelckley AT, CL 5/13/10 1.220 PM No cover (Intermittent) Yes 60 Perennial Spring-Fed water 45 0 0 0 1.5 4.0 Landsus sources Minimal None Shrinds woody thick 5 Moderate Shaded 40 40 20 0 0 0.11  100 37545 CV On the Control of the Control	Normal/No d 7.6 Clear ne None Good N/A 0 0 5 40 10 45 0 0 0 15	sediment bars and sediment build- sight build up in build up in all present to a all present to 2 obstructions 14 observations 14 obstructions	flow waste water gipeline parallel no bends and riffles LB-slight erosion	L3- cleaned sightly to picce  both have registation was exact awaiter preferred. See well await was exact waster treatment was not through. Several sediment building coming from upstroum / better  9 present 8 to 18 grewin 15:0 Optimal (15-20) AMD seepages innice evident. Could see fish present in stream. buffers (padment guards along made)
Tito 3755 CT Some Little-Searchity Some Little-Searchity Type of dather potential Type of dather potential Type of dather potential Type of dather potential Some Little String-Find Type of dather potential Little Charles Y Attaining/Attaining . Aquatic Life 37565.0 1.08 1.08 UNT enviroNey Ts. IR 5,R/10 1.145 am No 25% cloud cover 25% cloud cover Yes 68 Perennial Spring-field 20 30 30 10 0 10 0 Indicate sources None Low 5 Month/Open 0 0 0 0 Tito 3754010 Some	Normal/No 8.1 Clear ne None Fair N/A O O O O O O O O O O O	0 0 0 0 0	0 0 0 0 0 0	Tows through some remota agland and fields, bottom haz res. Culvaried under road their under 0 0 10 100 Marginal (5-1) Forest on one high or commercial wall first and confluence with 1108 Forest on one skip, fielding on the town, five plang have develore, the plang have develore, the plang have develored to could have a first control to the confluence with 1108 Forest on one skip, fielding on the town, five plang have develored to could have a first control to the under Forest on one skip, fielding on the town, five plang have develored to could have a first control to the skip of the country of
Little Senickley Little Senickley Little Senickley Little Senickley Main Showers Warm Type of other potential 1125 Creak Y Attaining/Attaining . Aqualic Life 37610,039_103 0.64 Headwarders AT, TS 9/74/09 100p Yes 75% Cloud cover (intermittent) Yes 72 Perennial Spring-fled water 30 20 20 10 0 20 0 Indicase sources Name Low 3 Month/Open 0 0 0 0 0 Teles 3761.04 Creak Some	Normal/No 7.9 Clear ne None N/A 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0	0 0 0 0 14 0	area for power lines, ag in two sections, come adminst: shows up more downstream, erosion mild,  0 0 0 12 10.0 Marginal (6-10) Residential area, runs along road at bottom, very small stream, mowed to edge in yands,
Little Sevicibley Type of other potential Mostly  100% Cloud Showers Warm Type of other potential Mostly  1135 Owak Y Attaining/Mitaining . Aqualic Life 37611 0.32 0.32 UNT10 Little Sevicibley AT, TS 9/74/09 11:20 a Yes cover (Internitient) Yes 70 Perennial Spring-fled water 5 0 0 5 0 90 0 Indicase sources Name Low 3 Shuded 0 0 0 0 0  Title 378721 CV  Some	Normal/No 8.0 Clear ne None N/A 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	Chaevelland, some inon seeps, multiple culvents, good cobble, small, seasonal, moved yends,  0 0 0 8 6.0 Marginal (6-10) Chaevelland, some inon seeps, multiple culvents, good cobble, small, seasonal, moved yends,
THE PLANT OF THE PROPERTY OF T	Normal/No 2.5 Cisar ne None N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 some sed bars	0 0 0 0 0 0	Unimbed access due to posting, Nazdwaters had evidential. Lower portion nural fields. Lower portion 13.0 Suboptimal (11-45) has good coverage just not a lot of trees.
Little Senickey Some Some Some Some Some Some Some Some	brown Slightly Normal/No Agricultur u	wer part of section deposited at  other control of section of  other control of  oth	road bridge old railroads bridge Lone mild erodon	L - not bud good wig 8.  some invaries, some ling-was dended ling-was read of a collection of the coll
1138 Crask Y Attaining/Attaining Aquatic Life 37537 0.42 0.79 0.37 little swelckley main 15, AT, MT 6/17/10 955 AM No cover 29% Cloud cover Yos 68 Perennial Spring-field water 35 5 0 0 0 40 0.20 mining Courses Newly Low Trees mixed 40 Moderate Shaded 35 35 30 0 0 0 Mininal Final Spring-field Source Sou	green 8.2 Turbid ne None Good e N/A 10 15 40 15 10 10 0 0 0 14    Normal/No	pretty-nice 15 0 decent section 17 0 extent 11 bends 15	some cannel exposed 14 follows rail line 17 0 good riffles 6 4 10 8- bad high wall 8	7 areas 6 6 12 L-railroad-bad, R-road, mine 14.0 Suboptimal (11-15) stone quarry mine. Erosion scrars down stream  flows through pasture field, but has some tree cover and a few houses in the distance, powerline
1139 Creak Y Attaining/Attaining - Aquatic Life 37584 0.05 0.65 UNT little sewickiny Ts, R 5/470 12:00 pm Tes 25% Cloud Cover (intermittent) Vec 78 Perennial Spring-field 20 80 0 0 0 0 0 landrase sources Nove Low 4 Modify Open 0 0 0 0 0 Testing Sources Nove Low 5 Sources Sources Sources Sources Sources Sources Nove Low 9 Attaining/Attaining - Aquatic Life 37585 0.02 0.20 UNT TS, R 0 12:10 Ves 25% Cool Cover (intermittent) Ves 78 Perennial Spring-field 100 0 0 0 0 0 0 notions sources Nove Low 0 Shaded 0 0 0 0 0 0 0	8.2 Clear ne None Fair N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0		0 0 12 120 Suboptimal (11-15) crossing  0 0 18 160 Optimal (16-20) Seksholds forwards away Most much around.
1140 Creak Y Attaining/Attaining . Aquatic Life 37585 0.02 0.20 UNT TS, R 0 1210 Yes 25% Cloud cover (intermittent) Yes 78 Perennial Spring-field 1.00 0 0 0 0 0 landanae sources None Low 0 Shaded 0 0 0 0 0 This 787300 To Complexity Storm Pleasy Warm Tipe of charm Tipe of the Potential Sources None Low 4 Month/Open 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Clear ne None N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0	0 0 0 0 0 12 0	VERY short section, read culvent, grass cut up to basis on one side, good buffer on other, culvent, 0 0 0 12 13.0 Suboptimal (11-15) undercut basis
Tris 31955 Of Some Some Utilis Search Some 11/20/0 109% Could Tippe of other protected Microsy	7.8 Clear ne None N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			0 0 12 13.0 Suboptimal (13-15) on not too much encoin, small stream left slow by papelle, lower and flood plain, some bornes near by, small parties near box not right on a research, provided the stream slow, shaded by shrube, small parties near but not right on a research, before group odd or stream slow, shaded by shrube, small parties near but not right on a research parties of the stream remonths.
1145 Orask V Attaining/Attaining - Aquaric Life 37605 0.033 0.53 UNT to Little Serviciney AT, TS 9 10-45 a Yes cover 100% count over No 55 Perennial Spring-field 50 25 0 0 15 0 Indicates countries Nove Low 3 Shaded 0 0 0 0 0 This 19338 TS	N.1 Cistar ne Noble N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0		0 0 1 4 3.0 Poor (0-5) active parties agriculture and turnspla good by turnsplane concept, the mediate of by
To 3 7812 Of  The 3 7812 Of  Units Sevicity  Type of other potential  Mostly  1158 Orak Y Attaining/Attaining . Aqualic Unit 37612 0.101 1.01 UNT to Unit is Sevicity PR, BN 9/24/09 12.15 p Yes 75% Cloud cover cash   Yes 70 Perennial Spring-fled water 90 1.0 0 0 0 0 incloses sources None Low 3 Shoulde 0 0 0 0 0 0	Normal/No 7.4 Citar ne None N/A 0 0 0 0 0 0 0 0 0	0 0 0 0 0	0 0 0 0	0 0 16 150 Subordinal H1.55 Cultural marks are find harder to a market world harder to a market
Trib 37560 To LIURS Sensicisty  1165 Orak V Attaining/Attaining . Aquantic Life 37560 2.77 3.38 0.61 UNT Brits wankfollow 6/6/20 12:05 pm No 25% cloud cover 25% cloud cover Vs 68 Perennial Spring-field for 20 0 0 30 0 50 0 linears sources Known Low Grases york grases 5 Moderate Month/Open 30 35 35 0 0 1 Minimal	Normal/No Divelopm Brown 8.1 Clast no Nova Fair and NA A A A	ots of sediment no fine sediment deposites at obstructions, great cover 11 0 surrounding gravel 16 0 all present 10 contrictions, breads 14	sewage pipe line crosses at alters some channel channel some some trees right-	Intributions and houses at top distributions and process are also and process
185 UNIX 1 AURITRIQUIARING. Applict Live 37590 2.77 .258 U.S. UNI RILL MERICARY SQUIL 12.55 pm no 255-0.000 Liver from 5 for Proferring Springer on 2.0 U 30 U 30 U 30 U 1 Minister South Scott	Brown 6.1 Clear for norm Fair etc. N/A U 20 13 30 20 20 23 U U U 20	had islands with ome section great plants on them,	exposed at sed ball 15 terremark coverts 15 to misse not bad a 7 15 somme embosin.  The model crossings,  and channelsed by the protected by lots of the sea, 88-high the sed water lines.	by years to 3 & 7 years and sociences 12.2 years are sociences controllers on two learns at top weet or paperer are structure period or controllers on the paperer are structure and the structure of the paperer are structure and the structure of the paperer are structure and the structure are structured and the structured are structured as a structure are structured as a structure
1166 Creek V Attaining/Attaining: Aquatic UNe 37557-4.5.6.22 1.72 Ittle sewickley creek main AT, IR 5/21/10 AM No 75% cloud cover clear/junny Ves 65 Perennial Spring-fed water 45 15 5 10 0 25 0 0 Tandous Sources Minimal None Trees hardwoods 35 Moderate Shaded 35 35 30 1 0 0 rst  Sonne  Little Sewickley  Little Sewickley  Attaining/Attaining: Aquatic UNe 37557-4.5.6.22 1.72 Ittle sewickley-creek main AT, IR 5/21/10 AM No 75% cloud cover clear/junny Ves 65 Perennial Sonne  Little Sewickley  Attaining Attaining Control of Con	6.9 Clear ne None Good N/A 0 5 30 15 25 25 0 0 0 13 0  Normal/No	sediment 8 0 show-embeddedness 19 0 had good mix of all 9 obstructions 16	through out 13 installed 18 0 good riffles 8 7 15 banks and bare spots 8	6 bank edge 8 5 13 business on this side 13.8 Suboptimal (11-15) part year restment kine placed within part year along lower portion upstream
1170 Creek Y Attaining/Attaining . Aquatic Life 37557,875,911 0.35 Little Sewickley Main MK, RH 9 2.28a No clear/sunny 100% cloud cover No 58 Perennial Spring-fled water 35 50 10 5 0 0 0 Tandous sources Minimal Low Trees hardwoods 25 Moderate Shaded 33 33 33 0 0 0 Minimal	Green 40 8.6 Clear ne None Good N/A 0 20 30 30 5 15 0 0 0 16	18 0 18 0 14 much sediment bars everywhere. Opopotes at	18 16 0 8 8 16 9 18-some bad erosion, 88-way erosted high	
Some Little Sewickley Little Creek Y Attaining/Attaining: Aquatic Life 37557,079,091 0.12 sewickley Ti, 8H 5/21/10 1:50 PM No cover clear/junny Ves 75 Perennial Spring-fled water 65 10 0 0 0 25 0 0 landous sources Heavy Low Trees hard 45 Moderate Shaded 35 30 35 0 0 0 Minimal	Normal/No 8.1 Clear ne None Good N/A 0 10 50 15 10 15 0 0 0 1 10	much sediment Deposites at obstructions and covers habitat 11 0 relatively embedded 17 0 all present 6 bends 9	RE-very ercobed high sed bars cause channel to be not full 13 two older bridges 16 0 riffles good 5 2 7 erosion 5	LB- not wireful but LB. In for forestal stars (right or
		Riffles totally embedded in some	100 yard section near and of stream section	
Little Senicistry 37557_10.2_10.7 11/20/0 100% closed Warm Type of other potential Type of other potential Warm Type of other potential Warm Type of other potential Warm Type of other potential Control of the Control		Some cover and areas, other areas are sed bars - shallow woodly debris 7 0 okay 18 0 8 riffles 11	some areas narrow strigifishtened. Can see erosion patches on flows 12 old channel w/ bends 11 0 shallow diffles 4 4 8 both sides- high banks 8	good flood plain buffer with scrion of stream has the water affected by people, however the small portion of a house has been 8 8 16 trees and shrubs 12.0 Suboptimal (11-15) straightened. Lots of sediment from spatnersm.
THE PLANT OF THE P	Normal/No 7.9 Clear ne None N/A 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0	0 0 0 0 0 0	0 0 12 12.0 Suboptimal (11-15) Urban sprawl, forested areas, mowed jurids, some culverts.
Units Seasoksiay Attaining/Mataining . Aquants Life 17573 0.64 0.64 UNT Ts, Cs. S/MU/10 10.25 is the charpluring charging find 40 10 0 5 0 45 0 times sources flower 2 Monthly Open 0 0 0 0 10 10 10 10 10 10 10 10 10 10 1	Normal/No 8.2 Clear ne None N/A 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0	0 0 0 0 0 0	pH varies due to wasrewater plant effluent @ 7.0 pH, trailer park, horse pastures, residential and
Uttlis Sensicially 1.118 Crosk V Attaining (Attaining . Aquantic Life 37999 1.13 2.5 1.15 UNT To Little Sensicially 1198 Crosk V Attaining (Attaining . Aquantic Life 37999 1.33 2.5 1.15 UNT To Little Sensicially 120 C or 0 0 5 Personal Spring And 15 20 0 0 55 0 10 Gas Wells courses Nove Low 4 Month Opens 0 0 0 0 0	Normal/No	0 0 0 0 0	0 0 0 0 0 0	ome wooded area, bit of file being dumped along road-disks, has file, some wooded areas but 0 0 0 10 Marginal (6-10) morat, per by homes and affected by plene of file, place is are in the but of
Trb 37590 To Some				
This 37540 To  Units Searching  This Searching  Type of other  Typ	Normal/No	0 0 0 0	0 0 0 0 0 12 0	some sediment in channel when above ground. Farm pond and field / pasture at head waters,
Tria 37540 750 Tria 37540 750 Tria 37540 750 750 750 750 750 750 750 750 750 75	1.1 Clear ne Nove Good N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	top good but ag	0 0 0 0 0	work waster crossing multiples cross dispersion between conjugation and conjug
Trib 37540 To  Ultris Senicidity  199	Normal/No 8.1 Clear ne Nove Good N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	toogood but ag 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 form after channel once of although the control of the c	0 0 16 140 Opinion (16-10) opi
This 37540 To  Units Seniolisty  1097 Creat: Y Attaining/Attaining: Aquatic Life 37549,016,034 0.68 UNT Ents sewickley RLAT 5/78/10 1154 am Yes: Cover Clear/jumny No 76 Perennial Spring-field 40 30 15 0 0 15 0 0 landsome sources: None Low 10 Shaded 0 0 0 0 0  This 37343 To  Units Seniolisty  1200 Creat: Y Attaining/Attaining: Aquatic Life 37583 0.69 0.69 Units Seniolisty  1150 Topic of the Attaining/Attaining: Aquatic Life 37583 0.69 0.69 Units Seniolisty  Provided to 30 0 0 30 0 landsome sources: None Low 50 Shaded 0 0 0 0 0  This 37540 To		top good but ag 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 C Channel for channel ponds other find or channel filted for most underground for good except from good not many	O 15 15 15 Optional (16-12) and money order, large geographic bear most, the water fail trained in consequence of the consequen
TIGN 27549 TO SOME SALES OF TIGN 27549 TO SOME SALES SALES OF TIGN 27549 TO SOME SALES SALES OF TIGN 27549 TO SOME	### B1. Clear ne None Good N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	toggod hat ag 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 C C Formulator clasmed populs, share titled or usual populs, share titled or usual populs and the state of usual population of the state of the s	O 15 15 15 Optional (16-20)  O 10 15 15 15 Optional (16-20)  O 10 10 15 15 Optional (16-20)  O 10 10 10 15 Optional (16-20)  O 10 10 10 10 10 10 10 10 10 10 10 10 10
To 17:50 To 10:50 To 17:50 To 10:50 To	B.1 Clear   Normal/No	top good but ag 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	torm after classed pools after this or under classed part of the control of the control of the classed pools after this or underground by and the class of the cl	0 15 15 150 Option (15-52) and innoved yords, rise geographic feeting, the same settlement is closed with less grown for. If water 1st turbul some settlement is closed with less grown for. If water 1st turbul some settlement is closed with less grown for. If water 1st turbul some settlement is closed with less grown for. If water 1st
To 37540 75 50 100 100 100 100 100 100 100 100 100	## Normal/No Normal/No Normal	tog good but ag 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	torm after during the channel point otherwhile or underground the channel filted for most, where the direction of the channel point otherwhile or underground the underground	of the first protection and protection and simple contraction and si
To 37540 75 125 125 125 125 125 125 125 125 125 12	### AMO dine  ##	to good but ag  grader are in middle  writch shaller  surface shall  surface shaller  surface shall  surfa	torm after durinost productions trained or pool, otherwised or part of the second of template constitutions in super constitutions constitutions in super constitutions constitutions in super constitutions constitution	of the first back for market and principles of the market and principles of the first back for market and principles of the market and principles of the first back for market and principles of the market and principles of the first back for market and principles of the market and princ
TO 3756 10 10 10 10 10 10 10 10 10 10 10 10 10	### AMO dine  ### AMO dine  ### AMO Dine  ### AMO N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	tog good but ag 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	tom after during the channel production that the during the channel production that the during the channel production that the during the channel production to the channel production to the channel production that the channel	of the first before from any and plant principles and principles a
TO 375-197-197-197-197-197-197-197-197-197-197	### AMO dine   Signify apper   50   75   Todal Sense   Now   Fair   AMO   N/A   0   0   0   0   0   0   0   0   0	to good but ag  grader are in middle  writch shaller  surface shall  surface shaller  surface shall  surfa	tom after during the channel pendicitibre tiled or successful tiled for rock part of the channel pendicitibre tiled or successful tiled or success	por language from the body from supplications considerable from the body
TO 375-197-197-197-197-197-197-197-197-197-197	### AMO dine  ### AMO dine  ### AMO Dine  ### AMO N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	to good but ag  grader are in middle  writch shaller  surface shall  surface shaller  surface shall  surfa	tom after during the channel pendicitibre tiled or successful tiled for rock part of the channel pendicitibre tiled or successful tiled or success	of the following state of the control of the contro
TO 375-197-197-197-197-197-197-197-197-197-197	### 10   1.1   Clear   Micromal/No   Signify	to good but ag  grader are in middle  writch shaller  surface shall  surface shaller  surface shall  surfa	tom after during the channel pendicitibre tiled or successful tiled for rock part of the channel pendicitibre tiled or successful tiled or success	of the first form to make the first form and road pick pands.  The first first form one agentation for the move agentation for the first form and road pick pands.  The first first first form one agentation for the move agentation for the first fi
199 Cut 1 Applications	### 10 CEAN *** NOTIFICATION OF THE PROOF FOR AMO N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	top good but ag 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	tom after during the channel pendicitibre tiled or successful tiled for rock part of the channel pendicitibre tiled or successful tiled or success	Service of the contraction and plants and production of the contraction and plants and p
To 3730FT 1319 TO CAR	### 10 CEAN *** NOTIFICATION OF THE PROOF FOR AMO N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	top good but ag 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Chained filted for most part description of the marker channel position statistic field or part description or the channel position of the channel pos	Service of the contraction and more of the contraction and
Top 31340 From 1500 From 1	## Proof of the Control of the Contr	top good but ag 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Chained filter for most part of 22 sections 14 0 form section 8 8 8 16 good not many part of 24 sections 14 0 form section 8 8 8 16 good not many the account hamples account	Secretary of the contraction and secretary of the contraction from the contraction of the
Tay	### 11 Coar Normal/No ### 21 Coar Normal/No ### 22 Coar Normal/No ### 22 Todals Normal/No ***Coar Normal	top good but ag 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Counted fixed for most part of most after channel part of most after related or part of most after channel part of most after cha	Section 1
TATION STATE	## AMO MINE   September   Sept	top good but ag	Counted fixed for most part of most after channel part of most after related or part of most aft	Section 1
TATIONS V ANALYSIS SERVICE SER	## Suppose	top good but ag	Counted filted for most part of most after claimed in product after filted or including part of most after filted part of	Section 1
TATIONS V ANALYSIS SERVICE SER	### State   Secretaria   Secret	top good but ag	Chained filted for most part of 22 in the chained in process and dispensal and chained in part of the chained in process and dispensal and chained entire for most of the chained in process and dispensal and chained entire for most of the chained in process and dispensal and chained entire for most of the chained in process and dispensal and chained entire for most and chained e	Secretary of the control of the cont
1 September 1 Sept	### State   Secretaria   Secret	top good but ag goalser are middle granters in middle wards habited ware	Chained filter for most part of 22 interest in the chained in part of the chained in the chai	Service of the control of the contro
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	### State   St	top good but ag goalser are middle granters in middle wards habited ware	Chained filted for most part of the matter channel part of the matter chann	Service of the control of the contro
1 September 1 Sept	### State   St	top good tot ag   0	Counted filted for most part of most after channel part of most after channel part of most of most after channel part of most of most after channel part of most of mo	Selection of the control of the cont
**************************************	Second Column   Second Colum	top good but ag	Counted filted for most part of most after channel part of most after filted or consistent supple constitution is speed response of most of the most o	in the state of th
	Second Column   Second Colum	top good but ag	Counted filted for most part of the matter channel part of the matter chann	Service of the control of the contro
*** *** *** *** *** *** *** *** *** **	Second Column   Second Colum	top good but ag	Counted filted for most processed and state field of control filter for most processed and state field of control filter for most processed and state field of control filter for most processed and state field of control filter filter for most processed and state filter for most processed and state filter filt	Marie
	Second Column   Second Colum	The property but ago   0	Chaired little for most processed of the matter channel processed of the matter channel grand of most processed of the matter channel grand of the matter channel grand of the matter channels and channels under constitution of support of the matter channels and channels under grand or grand	Mathematical Process   10
See Level 1 and 1	Signature   Sign	The property below as a content of the property of the prope	Channel filted for most process and content patter of the pattern	
**************************************	Signature   Sign	top good but ag	Channel filted for most produced and the filted or most part of the state of the st	
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State   Stat	Part   Column   Part   Column   Part   Column   Part   P	The property of the property	Channel filted for most process construction in register content place content of the part of the content of part of the content of the conte	
State   Stat	Part   Column   Part   Column   Part   Column   Part   P	The property of the property	Counted filted for most of part of the marker of counted gard or most of part of the marker of counted gard or most of part of the marker of counted c	
State   Stat	Secondary   Seco	top good but ag	Counted fitted for most part of the property o	1
State   Stat	Part   Column   Part   Column   Part   Column   Part   Column   Part   Column   Part	top good but ag	Channel filter for most processes and sections and substitute for most pattern and active sections of the substitute for most pattern and active sections and substitute for most pattern and active sections for most pattern and active sections for most pattern and active sections and substitute sequence on substitute sequence	1
State   Stat	Secondary   Seco	top good but ag	Channel fixed for most process and substitute of the state of the stat	Part
State   Stat	Part   Column   Part   Column   Part   Column   Part   Column   Part   Column   Part	top good but ag	Caused little for most   20   1	
Street Control   Stre	Part	top good but ag	Columnic filter for most   1	
State   Stat	Part   Column   Part   Column   Part   Column   Part   Column   Part   Column   Part	top good but ag	Columnic little for most   1	
State   Stat	Part	top good but ag	Comment   Comm	
March   Marc	Part	top good but ag	Comment   Part   Comment	1
Second	Part	top good but ag	Common of the form and produce of the produce of	
Ministry		top good but age granters in middle granters in mid	Common of the form and produce of the produce of	
March   Marc		top good but age granters in middle granters in mid	Camera of the first of the control	
Minus   Minu		The proof had by a particular middle and a particular middle and a particular had been provided and an appearance of the proof of the p	Claused fine for man   Clause   Claus	
		The proof had by a particular middle and a particular middle and a particular had been provided and an appearance of the proof of the p	Claused fine for man   Clause   Claus	
March   Marc		The proof had again and an analysis of the proof of the proof had again and an analysis of the proof of the p	Camera   Final Property   Camera   Ca	Part
March   Marc		The proof but against the service of	Part	
A STATE   ST		The proof had again and an analysis of the proof of the proof had again and an analysis of the proof of the p	Part	

i07 To vickley zk Y	Attaining/Attaining: . Aq	uatic Life 37607 0 0.77 (	77 UNT Lower Sewickle	v RH. BN 9/	1/09 1:30 p Yes	stor	n (heavy ain) Yes	Perennial Spri	Warm e-fed water 6	0 10 0	0 0 70	Typ	Some of other potential induse sources !	e Low	3	Most' Shad	z)y sed 0 0 0	0 0 1			7.9	Normal/No Clear ne Nor	None Fair	N/A 0				0 0	0	0				0	0	0 0		0 0		0 0	0	0 12		13.0 Suboptimal (11-1)	15) Culverts are fish barries, some erosion, possible channelization in future.		
61 Of vickley	Attaining/Attaining: . Aq			6)	201 0 10:10 am Yes	100% cloud s	owers	Perennial Spri			0 0 20	Тур	Some of other potential induse sources	e Low	4		sed 0 0 0	0 0 (	0 0			Normal/No Clear ne Nor		N/A 0	0 0		0 0 0	0 0	0	0	0 0	0		0		0 0		0 0		0 0		0 16		16.0 Optimal (16-20)	Forested area, follows road closely on left bank, but there is a buffer. A Few houses an	nd fields on	Some sediment,
60 To vickley	Attaining/Attaining: . Aq										0 0 50	Тур	Some of other potential	e Inw	5	Mostly	zły śed 0 0 0	0 0 0				Normal/No Clear ne Nor		N/A 0	0 0	0 0 0	0 0 0	0 0	0	0	0 0			0	0	0 0		0 0		0 0		0 16		15.0 Suboptimal (11-1)	very residential area but stream has a nice forested/shrubby buffer at least 25 yards to culverted under road at bottom flows through wetland area small orange seeps with or	throughout	
wirkley			-					-	Warm					-	mixed				Significa	brown a Finating green	_	Sightly Normal/No							ots of debris and				sediment shows up at	some areas doesnA	looks good	railtrail			LB- rail trail weak at some point, RB-							narallek left	
Y	Attaining/Attaining: . Aq	uatic Life 37557_0.91_2.89	98 Little sewickley main	n AT, JR 5/	1/10 1:50 PM No	75% cloud cover cle	r/sunny Yes	Perennial Spri	g-fed water 7	5 0	0 0 10	15 0 I	of other Obvious induse sources M	nal None Trees	hardwoods 50	Fast Shaded	sed 40 40 20	.0 0	0 nt	Algae scum	5 8.1	Turbid ne No	ane Good AMC	N/A 15	10 50	10 5 10	0 0 0	0 16	stable habitat 16	0 riffles are pretty go	d 20 0 w	was very good 15	AMD 1	16 flow bank to bank			plenty of riffles	6 8 14	good banks	8 8 lacked	regetation 9	8 17	both - great trees	16.7 Optimal (16-20)	3,/4 section very little human activity huge wetland left side lower quarter old rail trail p bank for majority of reach urban sprawl area, lots of residents stream follows road on right bank atdistance of 50		AME
tun Y	Attaining/Attaining: . Aq	uatic Life 37582_0_0.38 0	38 UNT little sewickley	TS, RH 5,	8/10 9:30 am Yes	100% cloud s cover (into	owers mittent) Yes (	Perennial Spri	g-fed 4	0 0	0 0 60	0 0 I	of other potential induse sources	e Low	2	Mostir Shade	z)y led 0 0 0	0 0 0	J 0		7.9	Normal/No Clear ne Ni	ione Fair	N/A 0	0 0	0 0 0	0 0 0	0 0	0	0	0 0	0		0	0	0 0		0 0 12		0 0	0	0 12		12.0 Suboptimal (11-1	one yard mowed up to banks at beginning. Path moves near stream but not weed wacks	ked on banks,	
ickley k U	Unassessed	37592_0_0.62	62 unt to turnpike trib	AT, CR 3/	5/10 2:00 PM Yes	100% cloud stor cover	n (heavy ain) Yes (	Perennial Spri	g-fed (	0 0	8 0 90	2 0 I	of other potential induse sources	e Low	3	Mostly (	Open 0 0 0	0 0 0	J 0		7.9	Normal/No Clear ne Nr	ione Poor	N/A 0	0 0	0 0 0	0 0 0	0 0	0	0	0 0	0		0	0	0 0		0 0		0 0	0	0 4		5.0 Poor (0-5)	majior residential enroachment altered by turnpike at bottom, minimal erosion due culverted for 2/3 of its length, lots of debris, smells bad, old silt fences Mostly mowed fields, looks like old (inactive) pasture land, high banks, few trees, ero		
Ckley	Attaining/Attaining: . Aq	37557_11.68_12. uatic Life 11 (	43 Little Sewickley Mai	RH, TS, AT, n BN 9/	1/09 9:26 a Yes	100% cloud stor cover	n (heavy ain) Yes (	Perennial Spri	Warm g-fed water (	50 0	0 0 45	5 0 I	of other potential induse sources !	e Low	4	Oper	an 0 0 0	0 0 0	, 0		8.0	Normal/No Clear ne Nor	ione	N/A 0	0 0	0 0 0	0 0 0	0 0	0	0	0 0	0		0	0	0 0		0 0 10		0 0	0	0 10		11.0 Suboptimal (11-1	buffer. saw fish, mostly muddy bottom, needs trees. Spoke with residents along stream	n, Verna and	
																																														prob	Spoke with V problems. S
dey Y	Attaining/Attaining: . Aq	37557_11.68_12. untic Life 11 (	43 Little Sewickley Mai	RH, TS, AT,	I/09 9:26 am Yes	100% cloud stor	n (heavy	Perennial Spri			0 0 45	Тур	Some of other potential induse sources			-	m 0 0 0					Normal/No		***					0							0 0		0 0		0 0		0 10		11.0 Marginal (6-10)	Mostly mowed fields, looks like old/inactive pasture land, high banks, few trees, erosion	2 years a n, tiny buffer. drainag	rapped last ears ago. To ainage. See
or dey U	Unassessed		80 unt to turnpike trib					Perennial Spri			0 0 5		Some	e tow			m 0 0 0				2.2	Normal/No Clear ne Nor		N/A 0					0		0 0					0 0		0 0 12		0 0		0 12		3.0 Poor (0-5)	mostly active as. Rotational corn/hav, minimal erosion due to open canopy, culverted	at bottom,	
													Some	e LOW	3	Open	0 0 0	, , ,			2.3	Cear in No.	A 700	N/A U									some new bars less						left-forest and rip rap	left- not l	t bad effected		left- would be better if wasn.	nÆt			
Of	Attaining/Attaining: . Aq	uatic Life 37560_2.22_2.77 (	55 UNT little sewickley	TS, JR 6	/10 12:15 pm No	25% cloud cover 25% i	oud cover Yes	Perennial Spri	g-fed ter 5	0 0	0 0 50	0 0 1	Same	nal m Trees	mixed 0 9	Moderate Mostly O	Open 35 35 30	10 1 0	1 Minimal	. Algae brown	8.1	Clear ne No	one Fair ent	m N/A 0	5 25	25 20 25	0 0 0	0 10	habitat 13	good amount of to 0 sediment	e 17 0 :	all present 11	upstream 1	reaches both bank 16 mostly	s 15 sewage pipi	e affects 15 0	not bad god riffles	8 7 15	stabilizes banks right- erosion areas in yards	8 6 yards	:mowed 7	4 11	road close	and 13.7 Suboptimal (11-1)	lots of residential truck parking lot right beside turn pike, culverted underground stab-	balized with	
		uatic Life 37594_0_0.48 0			10:10 0/10 AM Yes					0 0	5 0 95		Some	e Low	5	Open	an 0 0 0	0 0 0	. 0		8.0	Clear ne No	one Fair	N/A 0	0 0	0 0 0	0 0 0	0 0	0	0	0 0	0		0	0	0 0		0 0		0 0	0	0 4		7.0 Marginal (6-10)	cobble riparian rip-rap by turn pike almost no riparian zone sed imentary. Embedded, ph due to sewage from houses. residential area lots of yards moving to bank cultevated pipe enters stirikyl, some tre		
To un Y	Attaining/Attaining: . Aq	uatic Life 37578_0_0.59 (	59 UNT little sewickley	TS, RH 5,	8/10 11:35 am Yes	cover (inte	owers mittent) Yes i	Perennial Spri	g-fed 0	0 0	0 0 100	0 0 L	of other potential induse sources !	e Low	3	Mostly O	Open 0 0 0	0 0 0	. 0		7.7	Clear ne No	ane Poor	N/A 0	0 0	0 0 0	0 0 0	0 0	0	0	0 0	0		0	0	0 0		0 0		0 0	0	0 10		10.0 Marginal (6-10)	respensive area loss of yards moving to baric cuttevated pipe enters strinyl, some tre opportions not many gas pipline follows newly dug ditch where pipe goes to creek the	ees along en under	
ley	Attaining/Attaining: . Ag			AT, MK, TS, 1:	10/2 19 2:45 PM No	100% cloud		Perennial Spri	Warm		5 0 25	Тур	Some of other potential			Most	Зly			Attached Brown		Normal/No							ood Cobble-some	Riffles still somewh					old railroad trail paralleb gas lines an	s stream, nd trails			Slips on left, healing over. High walls on	field	tion of mowed d, mostly		Good buffer - rail trail, res an commerical affects the stream	eam .	Forested at first, then field/pacture, Lots of algae, can't find a reason for elevated pH let follows for entire stretch, road not far off-route 136. Gas line crosses stream and four v	rvels, rail trail wheeler trail	
Y	Attaining/Attaining: . Aq	uatic Life 37557_9.11_9.86 (	75 Little Sewickley Mai	n RH	19 2:45 PM No	cover 100%	loud cover No !	Perennial Spri	g-fed water 2	5 40 0	5 0 25	5 0 I	nduse sources Mo	ate Low Shrubs	woody 18 F	idoderate Shaded	1 40 20 40	3 0 0	0 Minimal	Algae Scum	100 8.9	Clear ne Nor	ne Fair Unknow	ın N/A 5	5 30	30 25 10	0 0 0	0 16	woody debris 14	0 embedded	18 0 All	Il four present 11	Sed bards present 1	13	15 cros	s 17 0		6 6 12	right.	8 8 forest/		6 13		14.0 Suboptimal (11-1)	15) adds to sed loading		
Py Y					1/10 2:40 PM No				Coldwa			Тур	Some of other potential			Most	зly		Significa 0 1 nt	a Attached		Normal/No Clear ne Nor						lo ar	ts of LWD newfall nd good amiunt of				some new bar formation 1		old bridj	ge at			left - high banks right high erosion potential	growt covered b	ot much plant wth right - I by vegitation		left - field pasture with smal stretch of trees for buffer rigil sewage treatment plant yan	ieht -	erosion along this stretch field pasture on left bank and forested on rightsediment fi embedded lots of newfall accumulated in areas of large sediment bars sewage treatmen	nt on right at	
	Attaining/Attaining: . Aq				V10 2:40 PM No 201 0 10:50 am Yes							Tue	Some set out of		hardwoods 18 f					Algae brown	8.1	Clear ne Nor Normal/No	ne Good	N/A 15	10 15	30 15 15		0 14	existing LWD 9	0 embedded in rifflik	i 15 0 laci	King slow deep 7	formation 1	16 fills channel	15 beginn	ing 16 0	good amount of riffle	6 5 11	during floods				trimmed within 10ft of ftreat		Stream had a very low flow. Res & Forest at top, active fields/pasture w/ cows at botton		agricultu
	Attaining/Attaining: . Aq							Perennial Spri			0 0 30	Typ	Some of other potential	e Low	3		Open 0 0 0				8.0	Clear ne No Normal/No	AND THE STREET	N/A 0	0 0	0 0 0	0 0 0	0 0	0	0	0 0	0		0	0	0 0		0 0		0 0		0 12		12.0 Suboptimal (11-1)	stream had very low flow res. At top active field pasture with cows at bottom. Yards cut	t up to stream	
	Attaining/Attaining: . Aqu Abandoned Mine				11:55					0 30 10	0 0 30	Тур	Some of other potential	e Low	3	Mostly Or	Open 0 0 0	, 0 0	0		8.0	Clear ne No Normal/No	,ne Fair	N/A 0	0 0	0 0 0	0 0 0	0 0	0	0	0 0	0		0	0	0 0		0 0		0 0		0 12		12.0 Suboptimal (11-1)	<ul> <li>some ag</li> <li>residential areas some commercial very channalized AMD discharge at bottom iron sta</li> </ul>		
	Drainage/Metals:2004 Aqu Attaining/Attaining: . Aqu							Perennial Spri		0 0	5 0 95		nduse sources   Some of other potential induse sources	e Low	5	Mostly Or Most	pen 0 0 0 tly	, 0 0	0		8.2	Clear ne No Normal/No	.ne Poor	N/A 0	0 0	0 0 0	0 0 0	0 0	0	0	0 0	0		0	0	0 0		0 0		0 0		0 10		7.0 Marginal (6-10)	UNT follows close to road, huge issue from road, also has minimal spoil at driveways, m seeps both iron and AL some swams areas, stream intermitten, some shading from cul-	nultiple AMD	
Y	Attaining/Attaining: . Aq	uatic Life 37580_0_0.44 (	44 UNT little sewickley	CL, AT 5)	I/10 AM Yes	cover (inte	mittent) Yes i	Perennial Spri	g-fed 1	5 0 0	0 15 60	10 0 I	nduse sources l	e Low	3	Shaded	ed 0 0 0	, 0 0	0		7.6	Normal/No Clear ne Nor	.ne Poor	N/A 0	0 0	0 0 0	0 0 0	0 0	0	0	0 0	0	,	0	0	0 0		0 0	left - patches of		ass in pasture	0 8		5.0 Poor (0-5)	lots of trash AMD localized.		
													Some																	some embeddedm	S		new bar formations		actice bri	dee at			erosion at pasture edge for most of stretch, right -	and field:	ds cropped to s edge, right - effects steep		left - good at first then pastu for rest of reach, right - road distance railroad bed follow	d at	at beginning sig. trib enters from left does not change streams ph. Active pasture on n	most of left	
y y	Attaining/Attaining: . Aq	uatic Life 37557_7.12_7.4 (	28 Little Sewickley	RH, TS 3/	0/10 12:37 PM No	clear/sunny 50%	oud cover Yes !	Perennial Spri	Coldwa g-fed ter (	0 0	0 0 0	0 0 I	of other potential induse sources Mi Some	Mediu rate m Trees	hardwoods 15 F	Mosth Moderate Shade	d 40 20 4	40 1 0	1 Minimal	Attached Green/Bro i Algae wn	8.0	Normal/No Clear ne Nr	one Good	N/A 0	5 15	60 10 10	0 0 0	0 14	new fall present 13	obviovs at obstructions	17 0	all present 10	deposites at obstructions 1	17 water fills channel	beginning at 13 bridge in a	and old middle 16 0	riffles frequent	4 4 8	sections of steep high banks unstable	banks	s with little agitation 3	5 8	for good portion residents ar	and 12.0 Suboptimal (11-1)	bank. Fence just outside of stream. Right bank follows roadwith some forest resider industrial (trucking) inbetween road and stream. Trib #1012 ent	ential and ag. Ru	ig. Runoff er
Y	Attaining/Attaining: . Aq	uatic Life 37558_0_0.16 0	16	AT, TS 4	1/10 12:00 Yes	75% cloud cover cle	r/sunny Yes	Perennial Spri	g-fed 0	0 0	0 0 0	0 100	potential quarry sources I Some	e Low	3	Mostly Shade	z)y led 0 0 0	0 0 0	. 0		NA.	Normal/No Clear ne Nor	one Poor	N/A 0	0 0	0 0 0	0 0 0	0 0	0	0	0 0	0		0	0	0 0		0 0		0 0	0	0 6		3.0 Poor (0-5)	industrial, farmland, wetland, abandoned strip mine, gass wells, pond in upper section, a	a few homes,	
y	Attaining/Attaining: . Aq	uatic Life 37597_0_1.04	04 unt little sewickley	RH, MK 3/	5/10 9:57 AM Yes	75% cloud cover cle	r/sunny No 4	Perennial Spri	g-fed 5	5 33 0	2 0 5	5 0 L	of other potential induse sources !	e Low	2	Mostly Shade	zły śed 0 0 0	0 0 0	, 0		8.1	Normal/No Clear ne Nor	one Fair	N/A 0	0 0	0 0 0	0 0 0	0 0	0	0	0 0	0		0	0	0 0		0 0		0 0	0	0 4		9.0 Marginal (6-10)	heavy drain cutting at upper end, excessive amounts of sediments. Slight iron staining, g	gas well (GPS	
Y									Coldwa				Some of other potential						Significa	ra Attached		Normal/No	Agrio	ur										minimal amount		each with	riffles and bends		(LB) some erosion	bank for I	g fields up to r large portion		(LB) ag fields up to stream or section of good foprested hi side (RB) little to no ripariar	hill ian	boarder ag fields on right and left stream banks. Residentical at bottom, forested hillsid	de o left bank agricultu	culture an
,	Attaining/Attaining: . Aq			RH, TS 3;	1/10 12:50 PM No	clear/sunny cle 100% cloud s	r/sunny Yes ! owers	Perennial Spri			0 0 15	Тур	of other potential induse sources ! Some of other potential	e None Grasses	non-native 20 f	Moderate Mostly Or Most	Open 40 30 30 z)y	0 1 0	0 nt	Algae brown	40 8.1	Clear ne Nor Normal/No	une Good e	N/A 5	15 20	10 25 25		0 14	new fall present 0	12 minor embeddedn	ss 16 0 :	all present 9 s	some new deposition 1	17 exposed	14 ripra	p 16 0	present	5 5 10	(RB) same	4 3 of reach	(RB) same 3	1 4	zone due to ag fields	11.9 Suboptimal (11-1)	<ol> <li>in middle. Some eroded areas and sedimend throughout</li> <li>Dry Channel, water held in 2 ponds at nursey/compost site business thing. Would othe</li> </ol>		
r Y	Attaining/Attaining: . Aq				10:22 am Yes		mittent) Yes	Perennial Spri	g-fed 7	5 0 0	15 0 10	0 0 Tun	nduse sources Some	e Low	0	Shaded	d 0 0 0	J 0 0	0		n/a	Clear ne Nor Normal/No	and .	N/A 0	0 0	0 0 0	0 0 0	0 0	0	0	0 0	0	1	0	0	0 0		0 0		0 0	0	0 12		10.0 Marginal (6-10)	0) through forested/residential area.		
, v	Attaining/Attaining: . Aq							Perennial Spri		5 0 0	15 0 10		Some	e Low	2	Shader	led 0 0 0	J 0 0	0			Clear ne No	and .	N/A 0	0 0	0 0 0	0 0 0	0 0	0	0	0 0	0	1	0	0	0 0		0 0		0 0	0	0 10		10.0 Marginal (6-10)	dry channel water help in ponds at nursery compost site flows through forest and resid	idential area	
	Attaining/Attaining: . Aq	uatic Life 37579_0_0.49 (	49 UNT little sewickley	CL, AT 5,	8/10 12:50 PM Yes	cover (inte	mittent) Yes	Perennial Spri	g-fed (	100 0	0 0 0	0 0 1		e Low	3	Open	m 0 0 0	J 0 0	0		8.0	Clear ne No	une Fair	N/A 0	0 0	0 0 0	0 0 0	0 0	0	0	0 0	0	1	0	0	0 0		0 0		0 0	0	0 10	I.B., mad buggs for entir	10.0 Marginal (6-10)	O) old pasture not in use anymore, no canopy cover present, natural flow allows	ed	
ey v	Attaining/Attaining: . Aq	uatic Life 37557_0_0.42 (	47 little sewirklev mair	AT TS 4	11:55 L/10 AM No	25% cloud cover cle	r/cunnu Vac i	Perennial Sori	Warm e.fed water 3	5 0 50	0 0 10	0 5	Some potential Juarry sources M	nal None Trees	nived decid 0 I	Most Moderate Shari	Ny sort 35 35	30 1 7	0 None	Attached brown	80 83	Slightly Normal/No Turbid no Nov	None Fair Saw	o N/A 5	10 50	15 5 15		jus 0 15	t barely acceptable as optimal 11	some areas close t 50% surrounded i 0 riffles	16 0 nota	a int of fact deen 10	Ints of sed bars 1	some areas channe 15 not full	long stablize of gabion b 12 bridg	aslats. 3	good riffles weak bends	7 7 14	LB - banks somewhat high, RB - stablized with gahinn hadats	LB - good	od vegetation,		LB - road huges for entire stretchfield on other side of road, RB - old rail line and many in distance at ton	d	stream flows along road for entire section, quarry upland on rught bank, residential, bri train bridge cross plus another bridge, stablised by gabion baskets near road for a porti	Quarry - ridge, and old cloud tion of reach sou	doudy who
of ey	Attaining/Attaining: . Aq				/10 10:35 am Yes			Barranial Sad	a fod 1		0 0 40	Тур	Some of other potential induse sources		2	Mortic	Open 0 0 0					Normal/No Clear ne Nor	tions Dir	N/A 0						0				0				0 0		0 0		0 12	4	11.0 Suboptimal (11-1	mowed yard at top then wetland area at bottom some small sections of forest. "al's Yar		
Y	Attaining / Attaining An				5/10 11:30 a Yes			Perennial Spri			0 0 15	Тур	Some of other potential	e Low			m 0 0 0					Normal/No Clear ne Nor	tions	N/A 0			0 0 0							0		0 0		0 0		0 0		0 10		10.0 Marsinal (6-10)	Forested at a distance, but cleared and newly planted with grasses and trees right alo channel. Weird residence at bottom. Muck waist deep. Tall grasses. Very slow flowing	ong stream g. Sity grey	
		untic Life 37569 1.92 2.29 (			5/10 10:30 am Yes	,	r/sunny No	Perennial Cod			0 0 20	Тур	Some of other potential	e Low	4	Mostly	z)y led 0 0 0					Normal/No Clear ne Nor	None Grant	N/A A	0 0			0 0		0	0 0			0		0 0		0 0		0 0		0 14		13.0 Suboptimal (11-1)		nt bank	
,		untic Life 37569 1.92 2.29 (				clear/sunnu rin	r/sunny No	Perennial Cod	e-fed s		0 0 45	Тур	Some of other potential induse sources I	e Low	4		m 0 0 0				87	Normal/No Clear no *	None Prov	N/A A	0 0			0 0		0	0 0			0		0 0		0 0				0 10		10.0 Marginal (6-10)	silty grey muck turbid nearly inaccessable, forested at distance but cleared and newly		
	Attaining/Attaining: . Aqu				10.60	clear/sunny 1000c	loud cover No	Perennial Cod	Warm	5 10 n	20 0 25	Two	of other Ohvious	nal Low Trees	4		Open 20 60 20			Attached Access	100 70	Opaque Source N	None Fair Com	e N/A	0 15	20 20 40		0 6		0	12 0			10	12	12 0		7 7 14		7 7		4 8		10.0 Marginal (6-10)			
o N	Attaining/Attaining: . Aqu			11	18/0				Warm			Two	Some of other notential						0 1 Minimal	Attached at Alexe er	100 70	Normal/No Turbid no N	None Grant	N/A A	0 10	20 20 20	0 20 0 0	0 14	11	0	14 0	17		15	13	15 0		5 5 10		4 4		4 8		12.0 Suboptimal (11-1)			
													Some																	slight build up in	•		sediment bars build		may have effected by	been	straight in pasture	10			-		LB-some residential, buffler good but no canopy cover/ Ri	ler .	posted property was able to walk into top and bottom but not far, seems to be old past	ture allowing cod	dimeet >-
	Attaining/Attaining: . Aq																					Normal/No Clear ne Nor								0 riffles	14 0 la	lacking pools 12	up on edges 1	16 no concetrated flor	w 17 pasture qu	ad trail 17 0	area		slight erosion on both	1-0-1		7 13	buffer good no canopy	14.9 Suboptimal (11-1)	15) to grow back (possibly mowed occasionally)	annewed senime	.em Bál
o ey	Attaining/Attaining: . Aq	natic life 37586 0 57 4 07	46 Brin countries	TC DU T	10:35	rlear/sunr=	r/cunny Vor	Perencial Cod	Coldwa	5 0 0	0 0 **	10 C Typ	of other Obvious	nal low Tone	hanflunnife 3	Most Moderate Shirt	3y int 40 20	30 0 1	Significa	a Floating filamento	J 10 3"	Normal/No	None Brow **	N/A ^	0 0	20 An		0 ° CI	round LWD. But 0 obbie and boulder habitat	gravel particles alm	st no	o deep portion	pools absent due to	water mostly filling	g several old c	ulverts at	down hill	8 8 **	Left - only small areas of erosion Right -	neft - k present right -	at bottom multiflora	8 47	left - nice forested area right road and houses but at distance most of channel	100 Marriage 4	entire trib AMD, AMD seeps through old mine enterance at source slightly above stream on map largh amount of sediment follows road at a distance top neart gasswell. Large I bottom, Wetlands at bottom. Powerlines cross abandoned hou		A
or ley	Attaining/Attaining: . Aqu Attaining/Attaining: . Aqu				201 0 10:30 am Yes		owers	Perennial Spri					of other notential	e Low			Den 0 0 0			-spec 5	n 23	Normal/No Clear ne Nor	- rose AMID						naotat s				3	o comme	a sotto	20 0	www.dill	0 0	www.communical	0 0		0 12	ARREST HOSE OF STREET	13.0 Subootimal (11-1)	Lots of posted signs- one says "Wildlife Refuge" See pictures. Fields, Farmland, and For	rested area.	An So
To Y In the second seco	Attaining/Attaining: . Aqu  Attaining/Attaining: . Aqu						manufficial Yes				0 0 10						Open 0 0 0 zły śed 0 0 0					Normal/No Clear ne Nor		nyn 0					0			-						0 0		0 0					15) Culverted under road. Cows fenced out of stream. heavy residential near top, little ag, couple gass wells, open and mowed at bottom. E 15) moving there are trees over stream giving shade, has some erosion and sediment	Even with	Si
10					5/10 AM Yes								nduse sources   Some of other potential induse sources		4		sed 0 0 0 z)y sed 0 0 0					Normal/No		N/A 0					0	-		0		-		0 0						0 12					
ley	Attaining/Attaining: . Aq					clear/sunny cle 100% cloud s	r/sunny No i	Perennial Spri	g-fed 5 Warm	0 0	0 0 50		nduse sources   Some of other potential induse sources		2							Clear ne Nor Normal/No Clear ne Nor		N/A 0	0 0	0 0 0	0 0 0	0 0	0	0	0 0	0	1	0	0	0 0		0 0		0 0		0 12			15) Newer Development and some forested area. Some mowing. Not terrible. Some cc. Some res, near road, multiple culverts, under Rt 66, altered at top by Rt 66, Big precreationally mowed, Lowe's drains to this unt, saw fish, many yards mowed to edge.	culverts. portion e of stream,	
To day				1:	I/09 10:26 a Yes	cover (into	mittent) Yes	Perennial Spri	g-fed water 1 Warm	0 50 0	0 0 40		Somo		3		Open 0 0 0			Attached		Clear ne Nor Normal/No Clear ne Nor		N/A 0	0 0	0 0 0	0 0 0	0 0	0	0	0 0	0	1	0	0	0 0		0 0		0 0		0 12		13.0 Suboptimal (11-1)	15) many driveway culverts		
w	Attaining/Attaining: . Aq	uatic Life 37602_0_1.18 :	18 UNT to Little Sewickle	IV MK.RH	1:07 p No	100% cloud cover 75% i	oud cover No 6	Perennial Spri	g-fed water 9	5 0 0	0 0 5	0 0 1	nduse sources Ma	rate I nw Trees	tantwoods 5 I	Moderate Shady	ad 0 0 1	0 0 0	∠ 1 Minima/	at Aliese green	60 77	Clear ne N	anne	N/A 5	0 50	35 5 5	0 0 0	0 13	16	0	12 0	13	1	13	18	17 0		7 7 14		9 9		9 18		15.0 Suboptimal (11-1)	art.		

GS_ID_IW Wust Wast2-Bir Com_1 FC NAME ATTANUSE PROBLEMS USE. SEGIO WPC Length Strinkame inv Date Time Sheet Now S. Rein7days AirTemp StrSaboys StrOngin StrTigge Forest. Fix Fix Aq. nd Open. Res	Wetcland Clrir OType NPS Englision Flood Rigardan List StretWidth y CanCover Riffle Run Pool Channel Type of Sonce	Dams Culverts LWO AquaVkg Species Portion pH TurbiRy WbrOdos WbrOil Q Impac Sediment Bedrack E	Don't Much Mu FodSu PodSu FodSu Sit Clay us d Mari Epitaunal Expts Embed b Expt2	Pool Officed Tot Bank Sta Velo Dpth Var Expl3 SeChop Expl4 ta Expl5 Chankit Expl6 FreqNf Charloin Expl7 BankStt BankStR b Expl8 Velo Dpth Var	TotaSc: Vogfrost: Equid9 RipVeigd: RipVeigd Tot-Rip-Veig Egy01.0 one Scribinis Notes  mowerd, but not grazed fields scribe/(horst), not mowerd to blank but open, panaleles 81 139 through
1001 Jack Run U Usscansold 37702 756 836 0.4 Jack Run AV, PR 7/R/09 11303 Vis Sunty Ny No 71 Perential Spring-fed 20 60 20 0 0 0 10 10 10 10 10 10 10 10 10 10 10	Type of Some other gotential	Normal/N	0 0 0 0 0 0 0 0 0 0 0 0		0 0 0 0 30 Marginal (6-10) lettle bit of forest, some bank ension, poor buffers
1002 Side Creek U Urassessed 37714.352.369 0.2 Side Run 65, Mm 6/23/69 1045 Ves Centry Coser Ves 70 Perential Spring-fiel 20 0 0 0 0 0 0 0 0 10 10 10 10 10 10 10 1	Type of Some other potential	Normal/N			0 0 0 0 0 12 Suboptimal (01-15) monthy-residental, Lil poor rigarian, RR has trib entending that has terrolle order, poor buffers  0 0 0 0 0 16 Optimal (05-20) monthy-residental below Pritt Greenshurg campus
100% storm Trib 37710 To Unitseasond 37710 0.44 0.88 0.4 han AT,MM 6/12/09 10.45 a Vis cover rain) Yes 70 Perential Spring-flad 50 35 0 0 15	Type of Some	Normal/N	0 0 0 0 0 0 0 0 0 0 0		0 0 0 0 Suffers are fair. Good  16 Optimal (16-20) overgrown fields, some CREP, good buffer, runs over from Overly property, field area overgrown  Buffers are fair. Good
1014         Jacks Run         U Unassessed         377/02 1.77 1.82         0.1         Main         AT         12/01/09         2.00         Yes         Pevrennial Spring-fied water         5         0         0         90         0	Type of Some other potential 0 0 landsus sources None Low 30 Mostly Open 0 0 0 Type of Some	Normal/N   0   0   7.3   Clear one None   N/A   0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Buffers are fair. Good segatation, and we are various with the segatation and the segatat
doud (heavy Warm 1002 Coal TarRun U Urassessed 37734 0, 0.96 1.0 Jack's Run BP, MK 6/76/09 10:391 Ns 500 Storm 100% Storm	other potential Moder Moothy O Bandosis sources None High Grasses 6 ate Shaded 25 25 50 1 Type of Some	0 1 Minimal None 7.8 Clear one None Good N/A 0	0 15 50 25 10 0 0 0 0 8 10 0	bushed in 12 0 12 15 4 plans 14 0 9 9 18	8 8 6 6 12 12 Subaptimal (11-15) stream buried for 80% of length
Trib 37790 O' UNIT bus kit's Could Pleavy 1033 Jack Ben U Unacessed 37707,056,144 0.9 Ren MK, CB 6/12/09 2:30 p Yes cover rain) Yes 65 Perential Spring-fed 0 90 0 0 10 Trib 37796 To Jack's Ren Clearly Clear/Junn	O bindows Sources None Low 4 Shaded 0 0 0	Normal/N	0 0 0 0 0 0 0 0 0 0 0 0 0		0 0 0 0 9 Marginal (6-50) field, moved lawns, decent riparian zone, sediment losses, fair buffers
1026 Jacks Run U Unassessed 37736 0.087 0.9 UNT AV, MK 6/25/89 3:30 p Ves sunny ny Ves 90 Perennial Spring-fied 0 0 0 5 0 95 75% d'houvers Très 37717 To	0 0 landuse sources None Low 3 Mostly-Open 0 0 0 0 Type of Some other potential Mostly	Normal/N			0 0 0 0 6 Marginal (5-81) mostly residental, underground in some areas, poor buffer-yeards
100% store	Time of Some		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 10 Marginal (5-10) residental, decent rigaries zone at bottom, through back taxes at top, few culvers, fair buffers
Trib 37728 To UNIT to Jack's AT_MM, Good Peany Warm 1035 Jack Run U Unusessad 37728_088_16 0.7 Run 3G 6/15/09 9:40 a No cover rain) Yes 65 Perential Spring-Red water 0 5 0 15 0 80	other potential Moder 0 0 landuce sources Moderate Medium Grasses 3 ate Open 25 75 0 1	Slightly Normal/N Developm 0 1 None None 8.3 Turbid one None Poor ent N/A 0	is can stand comment 0 0 33 33 34 0 0 0 0 2 pollution 5 0 bottom	one regime, totally d by 3 0 dominated by pipers 5 15 3 abreved 5 0 6 6 12 human	50% 3 3 cultents 1 1 2 terrible 6 Poor (0.5) multiple culvents, small trits, invasive plant IRe surrounding area urban, residental
	rype or other Obvious of Moder Mozily O O Banduse sources Heavy High Shrubs knotweed 25 ate Shaded 25 50 25 1 Trone of Some	0 1 Minimal None 7.2 Stained Sewage Sheen Poor AMID N/A 0	0 50 30 10 10 0 0 0 0 12 10 0	Channels	flows parallel for ind-trail and RR line, come residentel, a bot of linotewedl, ending bunks-much sediment issues, AMM, sewage treatment plant 5 4 4 4 8 11 Suboptimal (11-15) sediment, channelsed near Greater Greensburg sewage plant discharge
Trib 37740 Of Jack Run AT, CE, clear Clear/Lun 1550 Jack Run U Unassessed 37740 0, 0.54 0.6 UNT SG 6/23/09 1:45 p Ves centry ny Yes 75 Perential Spring-fed 0 0 80 20 0 shows	other potential Mostly 0 0 landssi sources None Low 5 Shaded 0 0 0 0	0 1 8.3 Clear one None N/A 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	top 3/4 commercial-culverted, bottom 1/4 in driving range, -noverd, no treez; poor buffers, lots of 0 0 0 0 3 Poor (0.5) ension at driving range
rs (inter cain Trib 37730 Of UNT to Juck's AT, MeN, mittine (standy 1052 Jackis Am U Unaccessed 37730 O 1.03 1.0 Am 56 6/16/09 11553 Vs 11 cain) Vs 68 Perennial Spring-fed 10 0 0 20 20 50	Type of Some other potential 0 b Indiscus Sources None Low Modily Open 0 0 0		0 0 0 0 0 0 0 0 0 0		residental- golf courses at headwaters, small "Yoursety", small 2-3 ft stream, lots of culverting.  0 0 0 0 8 Marginal (5-10) mowed-golfs  mowed-golfs
	Type of Some coher potential 0 0 bandsian stources None Low 3 Shaded 0 0 0 0	Normal/N	0 0 0 0 0 0 0 0 0 0 0		lower 1/4 active parture, upper 3/4 established forest, good buffer, candylithy trib (more gravel 0 0 0 0 0 13 Suboptimal (11-15) abovel, expected behinds.
150% storm Lick's Run Good (Navy Warm	Type of Some other potential Moder Mostly	Slightly Normal/N	some areas diay, not has lots of niffie quite	maca erosio at clot big road	wassa through loss of wagesta o
1055 Jacks Run U Unspecsed 37702 7.27 7.71 0.4 UNT AT, CB 6/76/09 11:45 a to cover rain) Vis 65 Perennial Spring-find water 15 70 10 0 0 5 100% storm 100% storm Could Pleasy Warm 10431743 To 10431 Aug 11:45 0.6 Jack's Run BP, MK 6/76/09 2:30 P to cover rain) Vis 75 Perennial Spring-find water 0 30 10 0 0 60	0 0 Induse sources Moderate Low Shrubs 15 ate Shaded 35 35 30 0 Typed Some other potential Moder Modely Model Modely 0 0 Indused sources None Low Grasses 4 ate Shaded 40 40 20 0	Attached Normal/N Agricultur	5 15 30 25 25 0 0 0 0 11 sediment 8 0 embedded	17 0 11 some sediment bars 15 14 culvert 16 0 6 6 12 range	8 8 rl 3 3 6 zone now wider than 10-15 ft 12 Suboptimal (11-15) section near-bread store and closed down driving range enables the sub-distinct and sub-distinc
1085 20CK Rm U Uliscisciscul 31/45 U32 1.44 U3 20CK Rm Br, MK 6/20/09 2.30 P No Other End) 166 75 Pretential Spring-Rob Walter U 50 10 U 60 Tob 37743 To Ulisciscul 37743 0.02 1.43 0.5 Jack's Rm AV, PR 7/8/09 11:00 11:00 150 Sunny ny No 71 Pretential Spring-Rob U 10 0 0 60 30	U U GINOSIA SOUTES NODE LOW GIZEGES 4 2.0 STAGON 40 40 20 0 Type of Some other potential 0 0 Individual Sources None Low 5 Modify Open 0 0 0 0	Normal/N	0 0 0 0 0 0 0 0 0 0 0 0 0	8 0 10 14 15 10 0 / / 14 0 0 0 0 0 0 0 0 0 0	7 7 5 7 12 0
	Type of Some	Name of the Control o		bank completely completely	
1085 Jacks Run U Ulsassesad 37702 5.01 5.53 0.5 Jack's Run AV, MK 6/Z5/09 2.40 p No suriny ny Yes 85 Perenhal Spring-fled water 0 0 0 100 0 0	other potential Moder 0 0 landuse sources None High Shrubs knotweed 25 ate Open 10 90 0 1	Attached Norma(N Developm 1 1 None Algae green 100 8.0 Clear one None Fair ent N/A 0	0 0 0 0 0 0 0 0 0 0 0	2 0 10 10 10 0 d 0 10 10 20 e straight 8156	0 0 0 0 4 Poor (0-5) completely channelized-flows through comm/red, downtown Greendowry development all covered,
50% dowers Code (Intermitt Warm 1089 Jacks Run U Unassessed 37702,137,141 0.0 Jack's Run AV, AT 6,9(99 2:30 p. No cover ext) Yes 80 Perential Spring-fled water 0 0 0 75 25 0	Type of Some other potential O O landuse sources None None Shrubs knotweed 20 ate Open 10 90 0 1	Attached green Normal/N 0 0 None Algae fuzzy 50 7.2 Turbid one None Poor AMD N/A 0	overhanging long, veg gives little straight, 10 20 30 20 20 0 0 0 7 cover 10 0 shallow	with roads potential pot	but by isochawe 7 d 1 1 2 roads on both sides 10 Marginal (6-10) section from post office center and Fivestone complex AMD and channelization
Tick 37704 To UNIT to Such's Good Pleavy 1000 Jacks Run U Uniscessed 37704 0.1.29 1.3 Run MK, CB 6/12/09 2.45 p Yes cover rain) Yes 65 Perennial Spring-fled 0 50 0 0 50 75%	sypt of source of the potential of the p	Normal/N     0 1   7.6   Clear one None   N/A 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 S Poor (IDS) starts in field, builed most of the way, culverted, res areas, possible sewage sources, poor buffers
Trib 37746 OF UNIT to back's BP_MK, Coded 37546 OF UNIT to back's BP_MK, Coded 37546 OF OF The Code Code No 75 Perential Spring-fed water 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	other potential         0         bindsus sources         None         0         <		0 0 0 0 0 0 0 0 0 0 0 0		0 0 0 0 5 Poor (0.5) Hoodwaters of Jack's Run, UNIDERGROUND, colvert  word distrit, bits of colverts, traits in ag field, runs seet to road by rearreds, recent period, lots of
Ti6.37747 To Good (New York Ti6.37747 To Good (New York Ti6.37747 To Good (New York Ti6.37747 To	0 0 bandss Sources None Low 1 MostlyOpen 0 0 0 0	Attached NormaijN 0 1 Algue 8.1 Clear one Norse N/A 0			0 0 0 0 8 Marginal (6-50) alignat, top buffers oliay, but rest poor Buffers are poor. 2/3 of stream
Trib 37763 To UNT to Jack's Worm 1102 Jacks Run U Unassessed 37763 0.055 0.6 Run AT 12/81/09 12:45 Yes Perennial Spring-Red water 0 0 0 70 0 30 dowers	rppr us zome other potential 0 0 landure sources None Low 3 Shaded 0 0 0 1 Type of Some		0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	is a cultert and the top portion is in year's with moved lawns:  Stream bed only open a short distance at head and then culterted from where is passe under rt 119  O O O O and five trees. 5 Poor (0.5)  and large commercial area to where it joins lack's flux.
Tito 37725 To 1106 Start Creat U Unicosecued 37725 0.0.57 0.7 State Num MK, CB 6/19/09 2.45 p Yes survive ent) Yes 70 Perential Spring-feed 70 30 0 0 0 0 100% Start Creat U Unicosecued 37725 0.0.57 0.7 State Num MK, CB 6/19/09 2.45 p Yes survive ent) Yes 70 Perential Spring-feed 70 30 0 0 0 0 100% Starts	ryprior some other potential O O bindow Sources Mone Low 6 Shaded 0 O O Type of Some	0 0 7.4 Clear one None N/A 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 11 Subaptimal (11-15) good buffers
Trb.37747 0; Jack's Ren Good Pleavy  1112 Jack Sen U Ukscossood 37747 0 0.78 0.8 UNT AT, Cts 6/56/09 2:58 p Yes cover rain) Yes 75 Perennial Spring-fied 5 40 5 0 50  Trb.37724 To State Creek Caler 55% Cloud Colleva	other potential 0 la Indique sources None Low 2 Mootly Open 0 0 0 Type of Some other potential miled Moder Mostly	0 0 7.9 Clear one None N/A 0 Normal/N	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	russ through moved yeard, down past riding arous then come fields, small amount of force, beer but force and the past of the past riding arous the come fields, small amount of force, beer but force and the past of the past
1113 Slare-Creek U Unusessad 37726 0.6:83 0.6 UNT AV, PM 6/23/09 10:45 No suriny cover Yes 70 Perential Spring-fed ter 30 0 0 40 30 0	0 0 landuse sources Minimal Low Trees hardwoods 6 ate Shaded 40 40 20 0	0 1 Minimal None 8.01 Citar one None Good N/A 0	5 40 40 10 5 0 0 0 0 13 15 0	17 0 16 20 channel 11 culvers 15 0 7 8 15 steep nouni several upts	7 8 5 5 10 width 14 Suboprimal(11-15) area down for the sub-sub-sub-sub-sub-sub-sub-sub-sub-sub-
Trib 37723 To State Creek Clear   59% Cloud Coldwar Coldwar   1126 State Creek U Unaccessed 37723 0 0.52 0.9 UNT AV, PR 6/23/09 11.20 a No sunity cover Yes 80 Perential Spring-fied for 20 0 0 0 80	other Obvious mixed Moder Mostly  0 banduse sources None Medium Trees hardwoods 3 ate Shaded 40 40 20 1 Tipe of	0 1 Minimal None 7.9 Clear one None N/A 0	Bot at coper, Navay 2	Converts. Street  12 0 New pools 11 Newy at lower 15 12 at upper 10 0 impact 7 7 34 areas	heavy res 5 5 impacts 4 4 8 good up top, very poor in res 12 Suboptimal (11-15) AMD discharge near upper end by pond, not wall chammelization around AMD seep
Close/fum Warm 1127 Jacks Run U Unassessed 37702_1.12_2.5 0.7 Jack's Run AV, MK 6/25/89 1100a No currly ny Yes 75 Perennial Spring-fed water 70 0 0 30 0 0	other Ohious mised Moder Mocity O bindiss sources Minimal Medium Trees bardwoods 30 ate Shaded 25 50 25 1	Normal/N Normal	10 75 10 5 0 0 0 0 0 15 10 0	16 0 11 16 11 14 0 8 8 16	Channelized near RR15cds 7 7 8 5 13 (RB) 14 Suboptimal (13-15) parallel to rail trail and RR line, increwed all covered.
50% showers Colorenti U Unissessed 27702,141,177 0.4 lack's fun AV, AT 6/9/69 2:30 p. No. Cover ent) Yes 80 Perential Spring-fed water 0 0 0 75 25 0	Type of Some other potential O Bindows sources None None Shrubs Instrumed 20 ate Open 10 90 0 1	Attached green   Normal/N   0   None Algae 1uzy 50 7.2 Turbid one None Poor AMD N/A 0	overhanging long, long long to 10 20 30 20 0 0 0 0 7 coer 10 0 shallow	straight straight inte with reads straight and potent s doministed by run 15 This section 15 4 sides 4 0 run only 9 9 12 existing	covered, but by Notobase 7 7 d 1 1 2 roads on both sides 10 Marginal (6-10) section from poot office center and Firestone complex AMD and channelization
100% storm Trb 37760 Of UNT to Jack's Coud Pleasy 1137 Jacks Run U Unassessed 37768 0 0.66 0.7 Run MK, Cb 5/12/99 2:30 p Vis cover rain Vis 65 Perennial Spring-fed 0 100 0 0 0 1.1076. crizin	Type of Some ether potential Mostly 0 0 landuse sources None Low 6 Shaded 0 0 0 0 Type of Some	Norma /N   0 0 7.7 Clear one None N/A 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 7 Marginal (5-10) modify patture, culvertated under road, open access for cattle
Trib 37743 To  10037743 To  1142 Lock from U Unicosecued 37743 1.43 1.62 0.2 Lock's from MK, 8P 6/26/09 2:30 p. No. cover (rain) Yes 75 Perential Spring-fled water 0 30 10 0 0 60  1007 Storm  1007 Storm	other potential Moder Mootly O Dandous Sources None Low Grasses 4 zie Shaded 40 40 20 0 Type of Some	Attached Normal/N Agricultur 0 1 Minimal Algae green Clear one None Fair e N/A 0	0 30 20 10 10 30 0 0 0 7 8 0	8 0 10 14 15 10 0 7 7 14	7 7 5 7 12 11 Suboptimal (11-15) handwaters-foreched lands to nural hornes w. moued yetin, pond near bottom, praeum channelland
1146 Jackshin U Ulassessed 37712 0.081 0.8 Num AT, MH 6/12/09 1:30 p Yes cover rain) Yes 70 Perennial Spring-fled 60 0 0 0 40 150% storm 769-37742 Of Jackshin U Ulassessed 37712 0.081 0.8 Num AT, MH 6/12/09 1:30 p Yes cover rain) Yes 70 Perennial Spring-fled 60 0 0 0 40 150% storm 150%	O bindows Sources   Modify   O bindows Sources None Low 4 Shaded 0 0 0 0		0 0 0 0 0 0 0 0 0 0 0 0		around pont, mad & driveway coloret, sund discretificity settering trib, bet buffers, good where 0 0 0 0 0 12 Suboptimal (IS-15)  residential and open space-ball field, the full first point, stream shows aluminoum evidence N
Tils 3774 CDF JACK Shi. Codd Plack Shi. Codd P	O   Indicated   Mostaly   Mostaly   Mostaly   O   O   Indicated   Mostaly   O   O   O   O   O   O   O   O   O	NormaliN			0 0 0 9 Marginal (6-30) 43.51258 W 79.50565 (24) 24
1159 Jacks Run U Uniscessard 37702 3-51.4.1 0.6 Jack's Run AV, PR 6/72/09 2-15.9 Yes suriny cover Yes 80 Perennial Spring-fed 0 0 0 20 80	Type of Some other potential	Normal/N	0 0 0 0 0 0 0 0 0 0 0 0		goas under Route 119 and old RR bridge, flows behind baseball findigious and residential area; AMO 0 0 0 0 5 Manerical (6.10) Immorts cream a marthy over hiffers AMO
100% storm Trib 37713 To UNT to Jack's Loud   Pleasy 1179   Jacks Run U Unosessed 37713 0 0.87 0.9 Run AT,MH 6/12/09 200p Yes cover rain) Yes 70 Perennial Spring-fed 0 25 0 25 0 50	Type of Some other potential Mostly 0 0 0 Industry 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Normal/N   0 1 7.7 Clear one None N/A 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 flood scour	0 0 0 0 0 0 0 0	lower sections columned through commercial arises, recover of titles fulfar in middle, deletar top,  filing in Nursery sparking it, title, the fortherende, poor farther, on on pit table, White Aluminum  0 0 0 0 10 Marginal (6-10) Society Scholarsy 5.1 at source GPS 40.28891, 79.57 sediment  some
Clear   50%-Cloud Wurm 1150 State-Crook U Unaccessed 37714 0.08 0.8 State Crook AV, PB 6/23/09 2-40 p No suntry cover Vis 80 Perennial Springeds water 20 0 0 20 0 60	Type of Some other potential of Mostly O binducia sources Moderate Low Trees mised decid 20 Slow Shadad 20 60 20 0	Normal/N Developm	stream bottom		cover, montly isochiese 7 7 d 8 6 14 mowed close to circum on RB 10 Marginal (6-10) 6(12-vegetation inocical down and sed-montro on basis sediment
1805   Sufficient U Unicassisted   37744 U.S. U.S. Sufficient Avy, Pr. 0/22/07   Z-40 p. no. staffly concerns 80 Pretninal spring-rise leater 20 0 0.20 to 175%   Tob 37744 To.   Tob 37744 To.   UNIT to 24074   Colum 275% Colum 175% Colum 17	Type of   Some   Other   potential	Normal/N	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 5 Payr (0.5) UNDERGROUND PRES
100% storm Trb 37/07 Of 1004 (Reavy Warm 1188 Jacks Run U Unassessed 37/07 0 0.55 0.6 Jack's Run CB, MK 6.12.09 10:30 a No cover rain) Yes 65 Pevennial Spring-Red water 10 15 0 0 0 75	Type of Some other potential mised Moder Mostly 0 0 landuse sources Minimal None Trees hardwoods 8 ate Shaded 50 40 10 0	Attached Slightly Normal/N 0 0 Minimal Algae brown 40 7.5 Turbid one None Good N/A 0	0 50 10 5 25 0 0 0 0 14 14 0	18 0 9 15 18 18 0 8 8 16 stable	9 9 9 10 19 16 Suboptimal (11-15) too half
dowe for Fig. 27710 of 1987 to 1987 and 1987 to 1987 t	Type of Some	Scotod Novembr Desiron	lower half butter coverage than	ed by grants 10p, vs	has moved grass, but that:  half section has vegetation cover, dhaded, upper half cleaned and moved, parallels walking trail, fish
Tib.37739.0f UNT to backs AT,MH, mitten (beavy Warm 1396 Jacks Run U Unicosessed 37725_0_0.45 0.5 Run 56 6/15/09 10.40a No 1) rain) Yes 65 Perential Spring-fied water 5 0 0 25 50 20	other potential Moder Moder Moder 0 0 binduse sources Minimal Low Grasses 5 zte Mostly-Open 40 40 20 1	0 1 Minimal emergent 10 8.2 Clear one None Fair ent N/A 0	upper (minimal 0 5 75 10 10 0 0 0 0 13 cover at top) 8 0	18 0 14 18 12 12 0 9 9 18 botton	
					but that:  a 1
100% torum Jack's Run chost Piesey Warm	Type of Some other potential small woody Moder Mostly	Attached greenfore Normal/N		ellon elektrica, espisioni bit elektrica de la constanta de la	some moving to be the the the the the the the the the th
100% starm 1977 Jacks Run U Unassessed 37702,701 7.27 0.3 UNT AT, CB 6/76/09 9.35 a No cover rain) Yes 70 Perennial Spring-fied water 5 15 0 80 0  Trib 37735 To Safe Creek U Unassessed 37702,051,16 0.4 UNT AV, PE 6/21/09 9.40 a Yes surity cover Yes 70 Perennial Spring-fied 20 0 0 0 80	Type of Some other potential on small woody Moder Modify 0 0 backers sources Minimal Low Shobs shribs 14 ize Shelad 35 35 30 1 the potential Modify 0 0 backers sources Note Low 3 Shade 0 0 0 0		0 15 15 25 25 0 0 0 0 14 sediment 12 0	ellon elektrica, espisioni bit elektrica de la constanta de la	some moving is attrict,  attrict  control  contr
	Type of   Some	0 0 8.12 Clear one None N/A 0	0 15 35 25 25 0 0 0 0 14 sadiment 12 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ellon elektrica, espisioni bit elektrica de la constanta de la	some moving in a rank, but other control of the property of th
Tile 37775 To 10-37775 To 10-3	Type of   Some	0 0 8.12 Coar Normal/N More N/A 0 0 1 7.9 Clar one Nonal/N Normal N/A 0 0 1 7.7 Coar one Normal N/A 0	0 15 35 25 25 0 0 0 0 14 sadiment 12 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ellon elektrica, espisioni bit elektrica de la constanta de la	some moving status,  other other syntax  of growth  of
This 3772 ED Sout Creek U Unaccessed 37726_0.63_1.06 0.4 UNT AV, PR 6/23/09 9:40.9 to Charl Stretched  TO 3772 FO Start Creek U Unaccessed 37726_0.63_1.06 0.4 UNT AV, PR 6/23/09 10.00 Sea Creek U Unaccessed 37725_0.0.55 0.4 UNT AV, PR 6/23/09 10.00 to Sea Creek U Unaccessed 37727_0.0.55 0.4 UNT AV, PR 6/23/09 10.00 To Sea Creek U Unaccessed 37727_0.0.55 0.4 UNT AV, PR 6/23/09 10.00 To Sea Creek U Unaccessed 37727_0.0.55 0.4 UNT SEA	Type of Some         Monty           0 bar patential         Monty           1 Type of Some         Shaded 0 0 0 0           0 Type of Some         Monty           0 Debase sources None Low         4 Shaded 0 0 0           0 Under Sources None Low         4 Shaded 0 0 0           0 Debase Sources None Low         4 Shaded 0 0 0	0 0 8.12 Coar Normal Normal N/A 0 0 0 1 7.9 Coar Normal Normal N/A 0 0 0 1 7.7 Coar Normal Normal N/A 0 0 0 0 6.6 0 Coar Normal N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 15 35 25 25 0 0 0 0 14 sediment 12 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ellon elektrica, espisioni bit elektrica de la constanta de la	some  more mark mark mark mark mark mark mark mark
1204 Size Code U Unassessed 3775_0.81_106 0.4 SRT AV, 76 5/21/09 9.40 y to surfly Code Vs 70 Personal Spring-field 20 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Type of Some   Monty   Monty	Second   S		ellon elektrica, espisioni bit elektrica de la constanta de la	some models of the control of the co
104 5164 Cent U Unassessed 37726_06.3_1.06 0.4 SNT AV, 76 6/23_09 94.0 s closely Concerve Vs 70 Personal Spring-field 20 0 0 0 0 0 0 0 10 10 10 10 10 10 10 10	Type of   Some	Normal  Normal   Normal  Nor		ellon elektrica, espisioni bit elektrica de la constanta de la	some moving status.  conter syrica  sy
184 7516 5 U Usassessed 37746_08.1_06 0 4 Set Core U Usassessed 37746_08.1_10 0 4 Set Core U Set Co	Type of   Some	Normal N	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Simple   S	some mode of the control of the cont
Tile   1777   Tile	Type of Some	Section   Sect	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	State	some mode of the control of the cont
Tile   1777   Tile	Type of Some	Section   Sect	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	State	some formation by and from moving up to stream, 12* conversion by park from moving up to stream, 12* conversion by park from moving up to stream, 12* conversion by park from moving up to stream, 12* conversion by park from moving up to stream, 12* conversion by park from moving up to stream, 12* conversion by park from moving up to stream, 12* conversion by park from moving up to stream, 12* conversion by park from moving up to stream, 12* conversion description with report above, new housing development with report solo, other real and, good shoding above.    O
Tile   1777   Tile	Type of Some	Section   Sect	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	State	some mode of the control of the cont
Tile   1777   Tile	Type of Some	Note	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Second Content	some formation by and from moving up to stream, 12* conference and support and
100 150 150 150 150 150 150 150 150 150	Type of Some	Second   S	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Second   S	some formation by park from moving up to stream, 12* convergence with large operation of the control above, now housing development with exposed sol, other real rate, good hading above, 2-charters, rate papering by with field and Humane scorier control plant water from development with reposed sol, other real rate, good hading above, 2-charters, rate papering park larger movine (feed above, 12* parkets); and papering parking park larger movine from above present parking park larger movine from above present parking parki
Tell	Type of Some	Second   S	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Second Content	some formation by park from moving up to stream, 12* cuber, 12* cu
1204 158 SEASCHEAR U Universided 17728_08_11_60 0 2 SEASCHEAR U UNIV	Type of Some	Second   Control   Contr	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Second Column   Second Colum	some format above, now housing development with report sol, other making development with support sol, other making developm
1204 158 SEASCHEAR U Universided 17728_08_11_60 0 2 SEASCHEAR U UNIV	Type of Some	Section   Sect	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Second Column	some format above, now housing development with a good solding above, and a second flowing by your field and features according to stream. 12* Counters, 12*
100 150 150 150 150 150 150 150 150 150	Type of   Some	Second   S	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Second Column   Second Colum	state with the control of the contro
100 100 100 100 100 100 100 100 100 100	Type of Some	Second   S	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Second Column   Second Colum	state of the control
Table   Tabl	Type of Some	Second   S	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Second Column   Second Colum	The content of the co
Total 1774   Tot	Type of Some	Second   S	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Second   S	Second   Control   Contr
124 13772 PATE NO. 10 10 10 10 10 10 10 10 10 10 10 10 10	Type of Some   Type	Second   S	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Second   S	The content of the co
124 1977 1970 1977 1977 1977 1977 1977 1977	Type of Some   Type	Second   S	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Second   S	The content of the
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Trib 37741 To 1444 Jacks Run U Trib 37722 To 1446 Slate Creek U	Unassessed Unassessed	37741_0.74_1.66 (	0.9 Jack's Run AT, Slate Creek AT, 1.2 UNT S		clear/ clear/sun Yes sunny ny		Perennial Spring-fed Perennial Spring-fed	20 40 20 0	0 0 0		Type of Some	il None La il None La	ow ow	3	Mostly		0 0 0			DRY Clear No. 8.1 Clear	mal/N				0 0 0 0			0 0		0 0	0		0		0 0				0 0			11 Suboptim 6 Margini	forested mail (11-15)	or 14 bits of mound york, agent 34 some home, little partiers i, vergreem fields, some of, for buffers had at button, good at tags this liding-but looks as though it, gets high flows after atoms:  at top, commercial-middel all culturality libotions, reters cultural under Burlington store, fair buffers about at top, culturality abouttons.	
1458 Jacks Run U	Unassessed	37702_5.77_6.66	0.9 Jack's Run AV,	MK 6/25/09 2:50 p	clear/ clear/sun No sunny ny	Yes 85	Perennial Spring-fed wa	arm ater 0 0	0 50 0	50 0	other potentia 0 landuse source Type of Some	I Minimal Me	dium Shrubs	inotweed 25	Moder ate Open	15 85	0 1 1	1 None	Attached Algae green 100	No 10 8.3 Clear	mal/N one None Fair	Developm ent N/A	0 0 5	75 10	10 0 0	0	2	6 0		8 0	12	2	has moments of e		4 0	few 9	9 18	e 2	some	2	4	7 Margina	nal (6-10)	still channelized, knotweed, few trees, res/industrial, underground by Offut Field	urban development
1460 Slate Creek U	Unassessed	37714_4.2_4.69	0.5 Slate Run GS,	MH 6/23/09 9:45 a	clear/ 25% cloud No sunny cover	Yes 65	Perennial Spring-fed wa	arm ater 50 20	0 10 0	20 0	other potentia 0 landuse source Type of Some	Minimal Mer	dium	8-10		35 35	30 0 0	1 Minimal	None	8.1 Clear	mal/N one None Good	N/A	0 10 40	30 10	10 0 0	0 0	15	16 0		18 0	7	lots of sediment bars	majority has issuent	es 14 culverts	18 0	8	8 16	7	residenta 8 I 7	7	few spots 14 residental/comme	cial 13 Suboptim	mal (11-15)	located near Route 30, culverted, forest/residental, few drainage UNT's	sediment issues, road drainage
1472 Slate Creek U	Unassessed	37714_2.56_2.81	0.3 Slate Creek MH	GS 6/23/09 12:00 p	clear/ 25% cloud Yes sunny cover 100%	Yes 70	Perennial Spring-fed	25 0	0 0 0	75 0	Type of Some	None Li	Ow	12	Mostly Shaded	0 0	0 0 0	0		7.8 Clear		N/A	0 0 0	0 0	0 0 0	0 0	0	0 0		0 0	0		0	0	0 0	0	0 0	0	0 0	0	0	13 Suboptim		active channelization, lots of res, no culverts, fair buffers	1472
Trib 37716 To 1481 Slate Creek U	Unassessed	37716_0_0.67	UNT to Slate 0.7 Creek AV,	PR 6/19/09 10:00 A	cloud 50% cloud Yes cover cover	Yes 70	Perennial Spring-fed	40 0	0 0 0	40 20	Type of Some	None Li	Ow	5	Mostly Open	0 0	0 0 0	0		8.05 Clear		N/A	0 0 0	0 0	0 0 0	0 0	0	0 0		0 0	0		0	0	0 0	0	0 0	0	0 0	0	0	13 Suboptim	nal (11-15)	waters in residental, scrub/brush some forest, good cover and shading, ends in wetland, fari buffers, sediment moved from recent heavy rains	
Trib 37719 To 1483 Slate Creek U	Unassessed	37719_0_0.58	Slate Creek 0.6 UNT AV,	PR 6/23/09 1:45 p	clear/ 50% cloud Yes sunny cover	Yes 75	Perennial Spring-fed	50 0	0 0 0	50 0		None H	igh	3	Mostly Shaded	0 0	0 0 0	0		8.1 Clear	mal/N one None	N/A	0 0 0	0 0	0 0 0	0 0	0	0 0		0 0	0		0	0	0 0	0	0 0	0	0 0	0	0	12 Suboptim		in forest, ends in res housing development. High flood damage potential at lower end. Fair buffers- forest good, res fair	
1486 Jacks Rum U	Unassessed	37702_6.66_7.01 (	0.4 Jack's Run AV,	MK 6/25/09 3:00 ρ	clear/ clear/sun No sunny ny	Yes 85	War Perennial Spring-fed wa	arm ater 0 0	0 10 80	10 0	Type of Some other potenti 0 landuse source		dium Shrubs	inotweed 15	Moder ate Mostly Open	25 40	35 1 1	1 None	Attached Algae green	Slightly No 8.1 Turbid	mal/N one None Fair	Developm ent N/A	0 0 35	20 25	20 0 0 (	0	11	6 6		13 0	8		15	past 14 alteration	10 0	8	8 16	some erosion in park 7	6 5 good vegetatio n for most,	2	7 mowed up to bank	(RB) 11 Suboptim	mai (11-15) fi	flows through Lynch Field Park, some shade, past habitat projects (SCWA), knotweed	development & mowing
Trib 37711 Of 1487 Jacks Run U	Unassessed	37711_0_1.01	UNT to Jack's 1.0 Run AT,	MH 6/12/09 11:15 a	100% storm cloud (heavy No cover rain)	Yes 70	We Perennial Spring-fed we	arm ater 50 25	0 0 0	25 0	Type of Some other potentia 0 landuse source		one Trees I	mixed ardwoods 5	Moder Mostly ate Shaded	45 35	30 0 0	1 None	None	Slightly No 7.7 Turbid	mal/N one None Good	N/A	0 0 10	30 30	30 0 0 (	0 0	sediment issues 15 from road	14 (		18 0	12	2 patchy sediment bars	doesn't fill enti 14 channel in plac		18 0	6	6 12	d road w. riprap 7	al mowed 7 areas 7	3	10 road represents ban	k (RB) 14 Suboptim	nal (11-15) culvert	rts (several), several new homes built (middle of reach), road parallels almost entire section	sediment issues from rural roads and culverts
Trib 37733 To 1493 Jacks Run U	Unassessed	37733_0_0.94 (	Jack's Run 0.9 UNT AV,	MK 6/25/09 3:15 p	clear/ clear/sun Yes sunny ny 50% showers	Yes 90	Perennial Spring-fed	0 0	0 25 0	75 0	Type of Some other potentia 0 landuse source Type of Some	I None Li	OW	10	Open	0 0	0 1 1	1		8.0 Clear	mal/N one None	N/A	0 0 0	0 0	0 0 0	0 0	0	0 0		0 0	0		0	0	0 0	0	0 0	0	0 0	0	0	3 Poor	sediment	ental/some commercial, channelized near mouth w/ Jack's Run; channel flow status-heavy nt & debris deposits in non-concrete channel (headwaters); stream barely flowing b/c debris; concrete channels & dam; mowed to bank in res areas; poor buff	
Trib 37718 To 1501 Slate Creek U	Unassessed	37718_0_1.11	1.1 Slate Run MK	CB 6/19/09 12:00 p	cloud (intermitt Yes cover ent) 100% storm	Yes 65	Perennial Spring-fed	0 0	0 0 0	100 0	other potentia 0 landuse source Type of Some		Ow	7	Mostly Shaded	0 0	0 0 0	1		7.6 Clear	mal/N one None	N/A	0 0 0	0 0	0 0 0	0	0	0 0		0 0	0		0	0	0 0	0	0 0	0	0 0	0	0	7 Margin	nal (6-10) heavily	By channelized, erosion issues, residental area, culverted-piped underground, poor buffers	
Trib 37735 To 1507 Coal Tar Run U	Unassessed	37735_0_0.83	0.8 Jack's Run BP,	MK 6/26/09 11:00 a	cloud (heavy Yes cover rain)	Yes 75	Perennial Spring-fed	0 5	0 0 0	95 0	other potentia 0 landuse source Type of Some	None Li	Ow	3	Mostly Shaded	0 0	0 0 0	0		8.0 Clear	mal/N one None	N/A	0 0 0	0 0	0 0 0	0 0	0 mostly	0 0		0 0	0		0	0	0 0	0	0 0	0 some	0 0	0	0	7 Suboptim	nal (11-15)	poor buffers, piped underground 1/4 mile	
1515 Slate Creek U	Unassessed	37714_1.08_1.77	0.7 Slate Run GS,	MH 6/23/09 2:45 ρ	clear/ 25% cloud No sunny cover	Yes 80	Perennial Spring-fed wa	arm ater 40 0	0 60 0	0 0	other potentia 0 landuse source Type of Some	Moderate Lo	ow Grasses	17	Moder Mostly ate Shaded	30 30	40 0 0	0 Minimal	None		one None Good	N/A	0 0 35	25 20	20 0 0 0	0 0	groomed in 12 upper	12 0		17 0	11	significant deposition	15	Pitt- 15 Greensburg	17 0	8	8 16	man- made 6	upper 6 poor 6	6	12 see above	14 Suboptim	mal (11-15) UPG	G campus, plus residental in upper section, lower section mostly forested, trimmed banks	development
1517 Jacks Run U	Unassessed	37702_7.71_7.96	0.3 Jack's Run AV,	PR 7/8/09 11:20 a	clear/ clear/sun Yes sunny ny	No 71	Perennial Spring-fed	0 0	55 0 0	45 0	other potentii 0 landuse source		Ow	8	Mostly Shaded	0 0	0 0 0	0		No 8.18 Clear	mal/N one None	N/A	0 0 0	0 0	0 0 0	0	0	0 0		0 0	0		0	0	0 0	0	0 0	0	0 0 all	0	0	15 Suboptim	nal (11-15) flows	s under Rt 119, some res/ag (corn), residences on one side, very short section, fair buffers	
1519 Jacks Run U	Unassessed	37702_1.23_1.37 (	0.1 Jack's Run AV,	AT 6/9/09 2:30 p	50% showers cloud (intermitt No cover ent)	Yes 80	Perennial Spring-fed wa	arm ater 0 0	0 75 25	0 0	Type of Some other potential of landuse source		one Shrubs	inotweed 20	Moder ate Open	10 90	0 i 0	0 None	Attached green Algae fuzzy 50	No 7.2 Turbid	mai/N one None Poor	AMD N/A	0 10 20	30 20	20 0 0 (	0 0	overhanging weg gives little 7 cover	10 6	long, straight, d shallow	5 0 dor	ominated by run 15	sediment issues below 5 this section	16	straight with roads on both 4 sides	stra 4 0 n	ight and n only 9	9 18	little potenti al for erosion 7	covered, but by knotwee 7 d 1	1	2 roads on both sid	es 10 Margina	nal (6-10)	section from post office center and Firestone complex	AMD and channelization

GS_ID_IN ATTANUS Com_in Nied SemiNi SemiNi In Date Time Sheet Worthow NiedZehrs days mp SoSubosy SanDrigh SarTige Forst as Ag d Open Ris and Othr OType NPS Erosion Flood Rigarian List ath Velocity CarCover Raffin Ri	Overall Overall Collects (VID Aquaving Species Portion pH Turbidity WithOdass WithOld Q Impac Sediment Bedanck Bedanc Cobble Grawl Sand Sit Clay Denthas of Mark Epitawal Equil Enthald b Equil 9 Pool Vair Equil 49 Equil 3 Equil Chandit Equil 9 Chandit 9 C	TotalSc - RipVegl. RipVegl. Tot.Rip-Veg Exgl10 on Strikels Notes Caus Ric
Some Trib 37797 CI*  1005 Shewiddey Creak U Unssessed 37797 0.1 0.61 0.51 Sewiddey, North Fork AV, AT, Pk 9 10.45 Yes clear/burny clear/burny Ves 55 Penennial Spring-fed 0 0 99 0 0 1 0 0 Undose sources None Low 2 0 (	Normal/No 0 0 Clear no None N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 4 S.O Poor (D-5) Sad little trib. Ag. field mowed to stream, no cover, completely exposed
Some Some Some Some Some Some Some Some	Normal/No 0 0 0 7.8 Clear no None N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	old grading fields; and current dainy grazing, some moderate bank erosion, open pacture w.o fencing 0 0 4 13.0 Suboptimal (11-15) #1 upper end, poor buffers
Some Trio 37796 To  1013 Sweddilly Clinik U Uncassased 37796 3.62 3.99 0.37 Sweddilly (North Fork) AT, CB 5/12/09 2:10 p Vis cliar/pumy 75% Cloud coner Vis 65 Perennial Spring-field 25 0 5 0 70 0 Undus sources None Low 3 Mostly Open 0 (	Normal/No 0 0 7.4 Clear no Norm N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 4 10.0 Marginal (6-10) residental/commercial, poor buffers
Township Line AT, CB, CS, Warm Some AT, CB, CS, Warm Township Line AT, CB, CS, Warm Tipped other potential for the processor of the processor	Norma(No: 0 0 8.4 Clear no Norm N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	openly grazed by lexitod, bain's best down, trimmed bains, no streambain fencing, substancial  O 0 8 7.0 Marginal (6-10) encision issues, AG, golf course, ne and grazing pasture
16:17746 D. Colons (2014) Colo		7 7 14 14.1 Suboptimal (11-15)
Tile 37427 D. Caleboa Tipped other patential 1995 (Caleboa Tipped other 1995 (Caleboa Tipped other patential 1995 (Caleboa Tipped other patential 1995 (Caleboa Tipped other 1995 (Caleboa Tipped oth	No. Transfer No. 1	Ag/westland; flows from westland at Komener farm (NPC assisted with streambank floridng), good veg 0 0 14 51.4 Suboptimal (11-15) buffer, stream full of vegetation.
Till 1797-875 . Till 1797-875	Attached Normana/No.  0 0 Minimal Julipe Brown 100 E1 Clear no Norma NA 0 0 55 20 10 15 0 0 0 17 and dozenisth. 23 0 18 18 18 16 bridge-present 27 0 5 5 10 section 7 7	8 8 16 15.6 Suboptimal (11-15)
168 2796 D. College Trial 27976 D. College Tr	Namana/No. 0 0	Good buffers, but banks high 0 0 12 from trouble-up-dream 15.0 Suboptimal (11-15) Small segment on posted land. Buffered well and CREP near by One driveway bridge.
Tomothy Libe 104 - Type of Chair - Special - Type of Chair - Type of Chair - Type of Chair - Special - Type of Chair - Type of Cha	Natural/No. 0 0 S.S. Clear in Notes N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 4 15.0 Suboptimal (11-15) groomed, golf course, substantial cobble, culverts
9755_31.8 [2]. Pr. CQ, Mr. Shower Noon Type of Chart production mind Monity 1040 Sewidably Chark U Unascessed 27 G 9 Sewidahy Main AT \$15550 11093 No clear/jumy (incentating 1 Vs. 60 Prevented Spring-thd water 60 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$30(1) four-al/life 0 0 0 Minimal Notes 6.3 Todas no Notes NA 0 0 10 30 30 0 0 0 0 1 inventations 12 0 18 0 15 17 18 15 0 8 8 15 8 8 9	9 7 16 wetlands close 15.4 Suboptimal (11.45) section parallels Brinkerton treatment sys
3755_3187_24. Pr.CL_AT. observer. Name Types of their presentation produced mined Monthly 104.5 Sewidolity Claude U. Unassessed Bit 101. Sewidolity Vision Mind 51/15/09 103/09 No. clear/Jumy (Generalized) Vis. 60 Prevented Spring-field water 75 0 0 0 0 25 0 Induses ancrease Mindmal Nove Trees Industries Disabet 25 5	Spylica 7.3- 38/01/n bornal/No. 0 0 ot Nove 8.7 Todds en kone Good N/A 0 0 10 30 30 0 0 0 17 6 0 18 0 6 bitsufundement box 15 19 18 0 8 8 15 9 9	9 9 18 great buffer 15.1 Suboptimal (13.15) section from United to Brinkerton, troot stocked, section parallels old RR, lots of wetlands work on sediment issues above section
mixed  Abandoned Mine MK, AT, AV, 103/5/20 9:3:0:00 Caldwa Type of other potential with some Mostly  MINE AT AVI 103/5/20 9:3:0:00 Caldwa Type of other potential with some Mostly	convicted Ballia Clark	Big Waterfall site N405eg 12.340' W795eg 26.702' and small waterfall N405eg 12.560' W795eg
1042 Welty-Run N Dialogo/pht1996 Aquaticulte 37779;33:457 1.27 Welty BN 09 AM No dear/journey clear/journey No 35 Intermittent Spring-feld ter 76 2 2 0 0 10 0 0 Ineduse sources Minimal Low Trees pine 18 Fast Shaded 80 1	6.2- Nooma(No: Start of 1 1 1 Minimal None 7.4 Clear ne None 5 15 60 15 5 0 8 0 17 19 0 20 0 19 19 16 section in channel and 19 0 9 9 18 8 8	buffer good in some spots and 26.911" Took some pictures. At open grate bridge there is a sign marked: Sewickley Sports Assoc. 7 7 14 patchy in others 17.7 Optimal (16-20) Game Refuge.
Tils 1741 LDT Colleges 1751 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Normal/No 0 0 72 Clear ne None N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 12 15.0 Suboptimal (11-15) fair rigarian zone- but potential to be mowed, rustic homes
169,3777 15 To Transport To Tra	7.7- Normal/No. 0 1 8.5 Cear no Norm N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Tows part trailer park, pand present, res and some forest near old strip mine and coke overs, trailer  10 0 10 Marginal (6-10) park sewage treatment system w. sewage odor; big fish barrier w, confluence w. Brinker Run
1956 Boyer Run U Unscissed 3778-1,1-67,1-25 0.29 Boyer Run AT, CE 47/4/9 1:30 p. No (elementary GNA Could cover Vis. 65 Personnial Spring-fine wider 20 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Normal/Normal Name	well buffered, mostly running through forest, little moved lawn at top, obort section starting above  8 8 16 17.4 Optimal (16-20) Hisca VFG down to Sportment's Club  Buffers are fair. Portions:
Some Trib 37778 DT Trib 37778 DT 1057 With Flut U Unicosessed 37778, 0.4, 0.827 0.47 Upper Swinkley UNIT AV, CB, MM 7/23/09 3:30 p Yis 50% Good cover (retermittent) Yes 75 Penential Spring-field ter 25 75 0 0 0 0 0 landside sources None Low 3 Shaded 0 (	Normal/No. 0 0 8.1 Clear no None N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	planted in CREP for a couple of year. Active parame around 9 year. Active parame around 10 0 12 yound 90 Marginal (6-10) botton (pagin film)
Some	7.2. Normal/No. 0 0 0 7.3 Clear ne Nose N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	pacture below (Glala's farm), res above, buffer good (not mowed), good shading above, fair buffer,
T/lb.37757 To Some	Normal/lito	very small UNIT, 6ry at top, stream affected by read/housing development, flows on steep slope,
Tols 17772 To. pio fotade Truss of Trus	Normal No.	
Some 1769 37796 To 04/17/0 Type of other potential	0 0 0 7.4 Clase no None N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 14 14.0 Suboptimal (13-53) Thous from a cro-sized point, culient present, decent buffer, very thort section, good buffer  pH is 6.1 immediately with VMD trib and Sewage treatment plant discharge enters and 7.6 about a
Ton 37794 to 1974 to 1	Normal/lito	9 9 18 good forest cover 15.6 Suboptimal (11-15) 1/4 mile down stream from here.
1072 Welty-Run U Unassessed 37784-0-0.65 0.65 Welty-Run AT 9 2-15 Yes clear/furny 50%-cloud-cover No 40 intermittent Spring-Red 0 0 0 0 0 landsse sources None Low 0 intermittent Spring-Red 5 0 0 0 0 0 landsse sources None Low	0 0 0 Clast ne Nome N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 8 13.0 Subopoinnal (11-15) Small UNT which is dry and has narrow buffer. Runs through Ag, Fields and pasture.
1755_36.0] 2.6 June 1755_36.0] 2.6 Seniciting Called Unconsensation Conference of the Conference of th	8.0- Normal/No Apricultur bad substrate, Rithe 0 0 1 Minimal Norne 8.2 Clear ne Norne Fair e N/A 0 0 10 30 30 30 0 0 0 5 cobble 5 0 bottom/allone/level 18 0 10 deposition bars 18 15 culvent 16 0 5 4 9 high bankst-billing in 6 6	5 5 10 old fields 11.8 Suboptimal (11.15) near old parture field; otherwise good shape, tack of cobble in lower portion could use riparian planting in upper section
Abandoned Mine 02/17/2 Coldwa Type of other potential Hardwood Mocally 1075 Welty Run N DesinapplyH1996 Aquatic Util 37779 A.57,5.38 0.81 Welty Run AT, MX 009 1.00 No 50% doud cover 75% cloud cover No 35 Intermittent Spring-Red ter 75 5 0 0 0.0 0 Indicase ourses Minimal Low Trees mis 10 Faut Shadad 80 1 Sone	Attached brown/gre Noomsa/Noo stream weaves under 5.00 of 1 Minimal Algoe en 10 6.9 Clear ne Noom N/A 0 15 70 10 5 0 90 5 0 18 19 0 20 0 18 18 18 nod several fines 18 0 9 8 17 10 10	9 9 18 18.4 Optimal (16-20) Erosion site off of township road, N 40deg 12.163*W75deg 25.702*
Trib 37760 Of	Attached 7.2- Normal/No old rectoration 1 1 1 Minimal Algae 8.3 Clear no Norm Good N/A 0 0 40 20 20 20 0 0 0 13 13 0 18 0 13 17 14 project 17 0 7 7 14 8 8	reclamation area/wetlands right bank at bridge UNT 2.0, restoration project section in Unihed, fandowner 5 5 10 impact rigarian zone 14.5 Suboptimal (11-15) questions about rest, project rection in Unihed, fandowner restoration debris, strip mine area
Some	0 0 0 12 Chart NAM 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 10 15.0 Suboptimal (11-15) mostly residental/groomed banks, res drainage at bottom (genters), culverts
Some	Noomal/No 0 0 DRY Clear no Noons N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 8 10.0 Marginal (6-10) Dry trib, residental/wetland area, very small, no trees, open, fair buffers
Trib 37796 To Trip 37796 To Tigo of Chiefe U Unaccessed 37796 3.47 3.62 0.15 Sewickley (north fork) AT, CB 5/12/09 2:10 P Vis clear/conney 75% Cloud conner Viss 65 Personnial Spring-field 25 0 0 5 0 70 0 0 landsise sources None Low 3 Mostly-Open 0 (	Normal/No 0 0 7.4 Clear no Norm N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 4 10.0 Marginal (6-10) poor buffer, residental/commercial area
	brown, gene, and genen	
Some	green Attached Edimentous Normay/No. Attached Edimentous Normay/No. O 1 Nove Algae s 30 7.5 Turbid ne Nore Fair AMO N/A 0 0 0 0 0 0 0 0 11 habitat 8 0 very embedded 13 0 good mix of types 11 15 goes to both banks 14 birlige 13 0 decent amount 7 7 14 some high 8 8 and cover	good distance at top-narrows 7 7 14 at bottom 13.0 Suboptimal (11-15) section next to strip mine, AMD seep 7.5 (prange), other seeps entering along road, other seep 6.9
Sone Trib 37864 07 Coldwa Type of color potential of the process of the process of the potential of the pote	Attached brownlyke Normal/No. ensoin Riseas, facility ton reservoir 0 0 0 None Algie en 8.5 Clear ne None Good N/A 0 0 20 20 20 40 0 0 0 10 stream 9 0 embedded 8 0 2 of 4 10 high sadiment totals 15 13 13 0 3 3 6 draining 9 9	3 3 6 area in pacture has force 10.8 Marginal (6-10) lower half of drained reservoir, bottom half in pacture, reservoir dam opened in section
33754, 36.75. 39. 69.72+10. 50mg	higher bands and some desemble to the same desemble	and talk scattered through
37555, 28.75_29. 03/15/0 chowers Cabhau Type of chart potential mixed Mockly 1091 Swiddley Crask U Unscessed 2 0.44 Swiddley Hashkesters AT, 8P, AV 9 9:50 No Clear/Jumny (Intermittent) Ves 40 Perential Spring-field ter 85 5 5 0 0 5 0 banduse courses Minimal Low Trees hardwoods 5 Moderate Shaded 38 3 Tife 37777 To. Moderate Shaded 38 3 Tife 37777 To.	Attracted green Sightly Normal/No conclusion in Clavertic IDS encice and more type good veg cover or no clavertic IDS encice and more good veg cover or no claver from no clavertic IDS encice and purpose good veg cover or no claver in IDS encice IDS enci	qual trails cuttered through 7 7 14 out, but large portion has traces 12.2 Suboptimal (11-5) where the property of the propert
This 37777 To 1006 Coloud 1006 Coloud 1006 Coloud 1006 Coloud 1006 Coloud 1006 Coloud 1006 Willy Run U Unaccessed 37777 0.0 7 0.70 UNT Welty Run AT, TS 4/13/10 118 PM Yes cover 75% Coloud cover No 50 Perennial Spring-Red 25 10 0 0 0 15 50 mine land sources None Low 5 Shaded 0 ( Spring Television 1006 Colours No. 1006 Colours No	Normal/No. 0 0 7.9 Clear Pasons N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	This dry last 1/4 because culvented and water needs to come up \$5 inches before exiting pipe. Mined  0 0 8 0.0 Marginal (6-10) land has affected channel and stream.
Trib 37819 To October: Type of orthor potential 1098 Smitchig Creek U Unaccessed 37819 0 0.36 Smitchig Main UNIT AV, 8P, AT 3/31/09 2.15 p Vas Char/Junny (Intermittent) Yes 55 Pensenial Spring-Red 0 50 50 0 0 0 0 banduse sources None Low 0 in Control Con	Normal/No 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 14 13.0 Suboptimal (11-35) 1457 and 1331 flow into 1098; originate from Wight farm-CMEP buffer with streambank fencing
Abandoned Mone 37556, 1834-19.  1099 SmikSkly Creek N Drakogy Michael: 1996 Aquatic Life 41. 1.07 Med SmikSkly Creek RH, MK 41/1/10 9-30 AM No clear/junny Charlysony No 50 Penennial Spring-field water 35. 0 0 30 20 15 0 0 includes sources Minimal Low Trees hardwoods 45 Moderate Shaded 20 7	Brown Normal/No wry NETA LIND, AND wry NETA LIND, AND goes under Indjinary, RR bed Normewed and impacts from invasi 1 0 Norme Norme Japan 7.A Turbid ne Norme Fair AND N/A 0 10 65 17 3 3 2 2 0 9 and ment fauses 17 0 AND sate/latt 14 0 slow/deep 17 some bar formation 19 13 Rh bed 6 0 mostly run 8 8 16 writed adjans 8 grants sit and menaling	impacts from roads and main stem sewicking, beneath r. 66 and turropile, parallel in alread track, 42 2552 -79 58972 small 4 4 8 railway 13.5 Suboptimal (11-15) AMD treatment
Sone Abandoned Mine 37556, 21.58, 22. 100% Cloud showers Warm Type of bother potential large woodly Mostly 1104 SevicKly Clouk N Chaileago Markst:196 Aquatic-Life 4 0.82 Sevickin/ Main AT, MM, AV 6/4/09 10.20 a. No. cover (intermettent) Yes 60 Perennial Spring-flod water 10 0 0 85 0 5 0 0 landsas sources Moderate Mone Shradus 20 Moderate Shaded 20 4	suffrent caucing  Attached 7.D. Normal/No  O 1 Minimal Alpse green 20 7.2 Turbid no Norm Fair AMO N/A 0 0 40 10 20 30 0 0 0 15 sit issues for habitat 10 0 be miseded 18 0 8 is pook 18 18 12 0 8 8 16 naturally high banks 9 up high	flows through nursery, near RR line, culverts present, small ponds in zero, sediment and riparkan 5 5 10 grounded by mowers 14.3 Suboptimal (11-15) 2004 lisses, good canaly cover above, more open in beer portions AMO, sediment
Some This 37766 To  1105 Boyer Plan U Unicasessed 37766 0 0.39 Boyer Plan UNT CB, AT 6/3/09 10 30 a Yes (intermittent) 50% cloud cower Yes 70 Personnial Spring-field 0 75 10 0 5 10 0 Uniclose sources None Low 3 Monthly Open 0 (	Noma(No 0 0 0 \$7 Clear no Nome N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	some ag-active pasture w. cow access for drinking, culverted by road, typical small ag UNT, fair 0 0 8 12.0 Suboptimal (11-15) buffers
Some 37556_293_296 GS/31/ID showers Cobbas Type of bother potential small hard Mootly 1110 Sewickly Creek U Unsassand 8 0.48 sewickly headwaters AV, 8P, AT 9 9:30 No clear/pumy (intermettent) Ves 35 Personnial Spring-field for 10 45 45 0 0 0 0 Unitodae sources Minimal Low Strucks woods 5 Moderates Shaded 40 4	furry Attached green B.D. Sightly Normal/No but not much off 2  0 0 1 Minimal Algae algae 80 8.1 Turbol no Norms N/A 0 0 60 20 10 10 0 0 0 15 habitat 13 0 16 0 14 sightly mucky 18 25 benine 16 0 6 8 14 Mitbank wrobed 6 6	some good trees and dhrubs, 14 14 28 but not very wide 14.8 Suboptimal (11-15)
Some pasture	Attached brown/gre Normal/No: 0 0 0 Minimal Aligne on 75 8.5 Clear no None Good N/A 0 5 60 15 10 10 0 0 0 17 15 0 18 0 15 16 13 stabilization 15 0 6 6 12 current highway/180, 7 7	7 4 11 current highway (RB) 14.6 Suboptimal (11-15) section follows old RB bod, has some channel stabilization by landowner
Township Line Township Line Wilson Type of other Township Line Wilson Type of other Township Line Wilson Type of other Township Line Type of other Township Line Type of other Township Line Type of other Type of other Township Line Type of other Township Line Type of other Type of o	8.1- Norma/No. 0 0 1 None None 8.4 Clear ne None Good N/A 0 0 60 20 10 10 0 0 0 15 17 0 18 0 15 18 17 18 0 8 8 15 8 8	7 6 13 ag fields 16.5 Optimal (16-20) starts in ag, ends in nursery
Some Alandoned Mine Alandoned Mine Alandoned Mine AT, MA, EP, 19,70(2) Coldwa Type of other potential mixed Moostly 1120 Welthy Run N Dinings/pH:1596 Aquatic UN 3779 0 339 0.39 Welty Run AV 9 1:30 No 75% Could cover clear/pumy No 32 Perennial Spring-field for 75 0 0 0 25 0 0 landsize sources Minimal Low Trees hardwoods 25 Moderate Shaded 30 5	Significa Attached brown/ger 8.4- 0 0 0 nt Alipse on 100 8.5 Clear Sewage Notes N/A 0 5 20 25 25 25 0 30 0 0 16 7 0 17 0 5 bars 10 17 14 0 6 6 12 7 7	9 9 18 13.0 Suboptimal (I1-15) section below Calumet to mouth of Welty, affected by sweage from 1465
Trib 37821 To Stowers Codewa Trans of other Codewa Trans o	Attached black Normal/No. 0 0 1 Algae sigue 8.5 Clear ne None N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	black algoe (potential sewage); decent cover, but rigarian zone limited; handwaters in ag field, flows  10 10 110 Suboportmal (11-15) through ne area with moves to lawns:
Some     Tries 27820 OF	Normal/No. 0 0 Clear ne Nose N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 12 13.0 Subopatimal (11-15) 1457 and 1331 flow into 107Kp originate from Wight Earn-CREP buffer with streambank fencing
Title 3 7808 Of Giddwa Trea of other control	Normal/No. 0 0 8.2 Clear ne Nose N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 12 11.0 Suboptimal (I1-15) small section of torsam good, most affected by road
Some Trips of colors Trips of colors Trips of colors	Normal/No.  8.0 Clear ne None N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 10 13.0 Subaptimal (11-15) fair buffers (Sportry)
Some Small woody	One colleger stratum in a colleger stratum i	zone patchy and not very wide.
3755_2732_28. 2015. Observed to this control of the	1 0 1 Minimal Algae en 10 8.4 Claar ne None N/A 0 0 40 30 15 15 0 0 0 0 15 cover 15 0 10 0 all-present 10 in pools 15 reaches both banks 10 wants to recander 13 0 altered 6 6 12 both sides ended 8 8 buffer	Attends by I/R massive 5 5 10 wettand being filled in: 13.5 Suboptimal (11-15)
	comp areas, wall	
TIGO 1779G TO TIGO 1879G O DE 2022 Sewickley-North Fork AT, RAI, PR 9 1030 No clear/burny clear/burny Vec 50 Personnial Spring-field 5 60 15 0 0 0 blockues ources. Moderate Low Shrubs & Moderate ModelyOpen 25 5	som assess with Attached brown/gre 8.1. Sighth, Normal/No Apricultur encion due to heavy sedementation, encion due to heavy sedementation, 0 0 1 Norne Alpie en 100 8.4 Turbid en Other e N/A 0 0 0 60 20 20 0 0 0 10 large graining partour 7 0 lass of sedement 16 0 10 13 15 15 0 5 5 10 levestack access 6 6 meets.	most areas very opin, new 3 3 6 CREP growing 11.4 Suboptimal (11-15) active cow partum, much of Infb in no trespassing area
	Attached brownigne 8.1- Sighthy Normal/No. Agricultur heavy-admentation, erosion due to the construction, or the construction of the construction	most areas very open, new  CBF growing 11.4 Suboptimal (11-15) active cow patture, much of trib in no bropassing area  residental, AMID tradment, posture, did strip mine, acid water choses up in upper section (bouses).  Residental, AMID tradment, posture, did strip mine, acid water choses up in upper section (bouses).  Residental, AMID tradment, posture, did strip mine, acid water choses up in upper section (bouses).
1/6 17796 15 150 Sewiday Crait U Unaccessed 37796 0,822 GB2 Sewiday North Fork A T, AF, PE, A.  AF, PE, C.  151 Sewiday Crait U Unaccessed 37796 0,822 GB2 Sewiday North Fork A T, AF, PE, C.  152 Sewiday North Fork A T, AF, PE, C.  153 Sewiday Crait Unaccessed 37796 0,910 GB UNT Sewiday North Fork A T, AF, PE, C.  154 Sewiday Crait Unaccessed 37796 0,910 GB UNT Sewiday North Fork A T, AF, PE, C.  155 Sewiday Crait Unaccessed 37796 0,910 GB UNT Sewiday North Fork A T, AF, PE, C.  156 Sewiday Crait Cra	Attached brownlyge 8.1- Sighty, Normal/No. Apricatur encion due to covered, but other color due to covered, but other color e N/A 0 0 0 60 20 0 0 0 0 10 baye grazing peature 7 0 lats of sediment 16 0 10 13 15 15 0 5 5 10 feedbackess 6 6 bares	residental, AMD treatment, pasture, old strip mine, acid water shows up in upper section (houses),
Trig 27796 To 10 Unaccessed 17796 Q.0.82 0.82 Sewickley-Morth Fork AT, AC, PR. S 10.30 No clear/jumny Ves 50 Personial Spring-field 5 60 35 0 0 0 0 0 Indicate Sources Moderate Low Shrabs. 8 Moderate Modely-Open 25 5 Moderate Moderate Modely-Open 25 5 Moderate Mode	Attached brawilgre 8.1 - Sighty, Normal/No. Apricatur heavy admentation, encolon due to covered, but other 0 1 Normal Nor	Co     Marginal [6-10]     Marginal [6-10
Tig 37796 To 150 Sewickley Creak U Unscessed 17796 Q. 0.22 0.82 Sewickley-North Fork AT, AV, PR 9 10.30 No Clear/Jumy Ves 50 Perennial Spring-field 5 60 35 0 0 0 0 0 microse Surveys Moderate Low Strings Moderate Low Str	Attached Enoughge 8.1- Sightly, Normal/Nov. Applicative without providing and the control of the	ecolerata, AMD trautment, pasture, old strip mine, acid water shows up in upper section (houses), per generation of fundaments  arrange is got Course on conference, buffering post grouns, conne shading grosses and thinds one of the strip post of the course of conference buffering post grouns, conne shading grosses and thinds one of the strip post of the course of conference buffering post ground pos
Trial 1779   Tri	Attached browlighe \$1.5 Sightly, Normal/None Agricultur 0 0 1 None Aligne en 100 RA Trickel in a Coher e N/A 0 0 0 60 20 20 0 0 0 10 bags graineg partners 15 0 10 11 15 15 15 0 5 10 Neescha cross 6 Cowers, but celled a complete service of the control of the con	Column at Details of the Section of Section and Section of Section and Section of S
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Trig 1779   Trig	Attracted browning with the leaving with a state of browning with the leaving with a state of the leaving with the leaving wi	residential, AND treatment, padrum, and fing prints, and many residential, AND treatment, padrum, and fing prints, and many residential, and treatment and any of supper section Phoses().  13.0 Subgetted (11-15)  13.0 Subgetted (11-15)  24.0 Marginal (6-10)  25.0 Subgetted (11-15)  26.0 Subgetted (11-15)  27.0 Subgett
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13	Trib 37791 To 8 Welty Run U Un	nassessed	37791_0_2.32	03/13/0 n AT, MK 9 2:00 No	clear/sunny 50% cloud cover No 40	Coldwa Intermittent Spring-fed ter 95	0 0 0 0 3 0 2 0	Some potential Old strip mines sources Moderate i	mixed hard Low Trees woods 8 F	ast Shaded 65 15 20 1	Significa Attached green 1 1 nt Algae moss	4.2- Normal/No 50 6.2 Clear ne None	0 50	40 5 3 2 0 90	0 0 19	some sediment 17 0 of trib	in top 20 0	18		some culverts, dams, pond/lake, and channels by ho 20 0	s s :	Some erosion on both 16 sides by logging 10 10	9 9 18	18.2 Optima	1 (16-20)	
13	Trib 37818 To 5 Sewickley Creek U Un	nassessed	37818 0_0.56	waters) AV, BP, AT 3/31/09 12:45 p Yes	showers clear/sunny (intermittent) Yes 50	Coldwa Perennial Spring-fed ter 0	0 0 0 0 0 0 0	Type of other potential landuse sources None I	Low	0 0 0 0	0 0	Slightly Normal/No 8.1 Turbid ne None	N/A 0 0	0 0 0 0 0	0 0 0	0 0	0 0	0	0 0	0 0	0 0	0 0 0	0 0 10	11.0 Suboptin	nal (11-15) headwaters in ag field, turbid but no algae, some shrubs, field/pasture and some residential	
13	Township Line 6 Run U Un	nassessed	37752_1.94_2.43	oper) GS, MH 6/2/09 1:30 p Yes	75% cloud cover 50% cloud cover Yes 60	Perennial Spring-fed water 0		Type of other potential landuse sources None !	Low 6-7 ft	Mostly Shaded 0 0 0 0		Normal/No 8.4 Clear ne None	N/A 0 0	0 0 0 0 0	0 0 0	0 0	0 0	0	0 0	0 0	0 0	0 0	0 0 14	15.0 Suboptin	completely surrounded by golf course; high grass protects stream, some wooded area with mix hal (11-15) hardwood; abundant cobble and above average cover-minimal erosion	od .
13	Trib 37825 To 7 Sewickley Creek U Un	nassessed	37825_0_1.36	03/31/0 waters AV, BA, AT 9 10:50 No	showers clear/sunny (intermittent) Yes 40	Coldwa Perennial Spring-fed ter 0	70 20 0 0 10 0 0	Type of other potential landuse sources Minimal I Some	Low Shrubs woodyshrubs 3 Moo	erate Mostly Open 30 60 10 0	Attached brown/gre 0 1 None Algae en		N/A 0 0	5 65 15 15 0 0	0 0 11	12 0 much siltatio	ion 11 0 3 of the	4 14	18 fills the entire channel 12	culverts, alteration from crop fields above 10 0	vert few 7 7	14 mostly stable 8 8 gras	es and shrubs 5 5 10	lots of Ag fields active and over grown with some shrubs 12.8 Suboptin	nal (11-15) Long section with ag all around it	
13	Trib 37798 Of 1 Sewickley Creek U Un	nassessed	37798_0_0.05 0.05 Sewickley, No.	04/17/0 th Fork AV, AT, PR 9 10:45 Yes	clear/sunny clear/sunny Yes 55	Perennial Spring-fed 0	0 99 0 0 1 0 0	Type of other potential landuse sources None i Some	Low 2	0 0 0 0	0 0	Normal/No Clear ne None	N/A 0 0	0 0 0 0 0	0 0 0	0 0	0 0	0	0 0	0 0	0 0		0 0 4			d
13	Trib 37801 Of 2 Sewickley Creek U Un	nassessed	37801_0_0.74	04/17/0 Fork UNT AV, PR, AT 9 1:00 No	clear/sunny clear/sunny Yes 65	Perennial Spring-fed 10		Type of other potential landuse sources Minimal I Some	Low Shrubs 3 Moo			20 0.4 Cell 16 16016	N/A 0 0	40 35 5 20 0 0	0 0 16 dece	nt 14 0 some what emb	sedded 16 0 many typ	nes 16	17 fills chanel 14	next to road, multiple culvers 14 0	7 7 :	14 some erosion 8 8 deci	nt bank cover 6 6 12	overgrown shrubs, but no mature trees next to road 14.9 Suboptin		
13		nassessed	37777_0.7_1.22	JNT AT, AV 6/9/09 10:30 a Yes	100% cloud showers cover (intermittent) Yes 75	Perennial Spring-fed 15		Type of other potential landuse sources None I Some	Low 3	Mostly Shaded 0 0 0 0	0 0	8.0- Normal/No 8.2 Clear ne None	N/A 0 0	0 0 0 0 0	0 0 0	0 0	0 0	0	0 0	0 0	0 0	0 0	0 0 12	13.0 Suboptin	streams in golf course not overly mowed, buffers good for golf course, some shading; grasses a shall (11-15)	nd
13	Trib 37822 To 7 Sewickley Creek U Un	nassessed	37822_0_0.45	y AV, BP, AT 3/31/09 11:30 A Yes	showers clear/sunny (intermittent) Yes 40	Perennial Spring-fed 0	0 0 0 0 0 0 0	Type of other potential landuse sources None I Some	Low 1-2 ft	0 0 0 0	0 0	Normal/No Clear ne None	N/A 0 0	0 0 0 0 0	0 0 0	0 0	0 0	0	0 0	0 0	0 0	0 0 0	0 0 12	13.0 Suboptin	all (11-15) flows through old nursery stock, decent veg cover, pand below	
13	8 Sewickley Creek U Un Trib 37796 To	nassessed	37556_24.88_25. 09 0.21 Sewickley F	Tain AT, MH 5.13.09 1:00 p No	clear/sunny clear/sunny Yes 60	Coldwa Perennial Spring-fed ter 95	0 0 0 0 5 0 0	Type of other potential landuse sources Minimal N	mixed None Trees hardwood 30	Shaded 20 60 20 0		Slightly Normal/No 7.6 Turbid ne None Good	N/A 0 0	20 30 20 30 0 0	0 0 15	11 0	18 0	11	16 18	17 0	7 7	14 9 9	9 9 18	15.6 Suboptin	nal (11-15) good buffer/good cover, developments above section, restoration project  Buri's next to naser's market, saw lots of fish. At very end of section waste water treatment plan	
13		nassessed	37796_1.28_1.97		clear/sunny clear/sunny Yes 65	Perennial Spring-fed 50	25 0 25 0 0 0 0	Type of other Obvious landuse sources Moderate ! Some Type of other potential	mixed Low Trees hardwoods 15 Moo	Mostly lerate Shaded 40 40 20 0		6.1- Normal/No 50 8.4 Clear ne None	N/A 0 5	60 10 5 20 0 0	0 0 18 fish pre	is there, sent 17 0	18 0	some sediment build- 15 up	stream not always to 15 both sides 17	18 0	5 5	10 highly eroded banks 8 8	7 7 14	lacking trees near top of reach 15.8 Suboptin		rts
13	6 Welty Run N Drains	age/pH:1996 Aquatic L	ife 37779 2.77 2.9 0.13 Welty R:	AT, BN, MK, 03/5/20 n AV 09 1:30 No	clear/sunny clear/sunny No 45	Intermittent Spring-fed ter 5	0 45 0 45 5 0 0	landuse sources None I Some	Low Trees and shrubs 20 Mos	erate Mostly Open 5 90 5 0	Attached blue/gree 0 0 None Algae n.algae	100 7.8 Clear ne None	N/A 0 0	95 5 0 0 0 5	0 0 10	14 0	9 0	14	16 16	5 0	8 8 :	16 9 9	5 5 10	12.8 Suboptin	Small segment just before Mammoth Yark. Has some trees on both side but narrow zone. Bailt al (11-15) close and road on other side.  pasture on one side, ag field on other; runs through wooded pasture (CREP-Zeglin farm) erosio	
13	7 Welty Run U Un	nassessed	37778_0_0.4 0.40 Upper Sewickl	y UNT AV, CB, MH 7/23/09 3:00 p Yes	50% cloud cover (intermittent) Yes 75	Perennial Spring-fed 0	60 40 0 0 0 0 0	Type of other potential landuse sources None i	Low 5	Shaded 0 0 0 0	0 0	8.0 Clear ne None	N/A 0 0	0 0 0 0 0	0 0 0	0 0	0 0	0	0 0	0 0 bridges, channelized	0 0	0 0	0 0 8	10.0 Margin	pasture on one stue, ag nead on ocher; runs chrough wocode pasture (ocher-zagini army erosic al (6-10)	1
13	Trib 37804 Of 8 Sewickley Creek U Un	nassessed	37804_1.11_1.34	th Fork) AT, CB 5/12/09 10:45 a No	clear/sunny 75% cloud cover Yes 55	Coldwa Perennial Spring-fed ter 5	5 0 0 0 90 0 0	Type of other potential landuse sources Minimal !	grass and Low Grasses knotweed 5 Moo	erate Mostly Open 20 60 20 1	Attached brown/gre 0 1 None Algae en	Normal/No 75% 8.6 Clear ne None Good	N/A 0 3	30 15 10 42 0 0	high concern 0 0 10 silt, channe	tration of most cobbi elization 9 0 embedded-ove	le r 50% 13 0	sediment buildup in 11 pools	16 13	in yards and along roads 8 0	limited riffles and bends 8 8 :	a lot o 16 5 5 native	f mowing, non- species present 2 3 5	limited trees, heavy mowing 11.1 Suboptin	nal (11-15) short section, moved up to streambank headwaters in end review and residental housing plan flows through Westmoreland Co. Com-	
13	Trib 37751 To 3 Sewickley Creek U Un	nassessed	37751_0_1.18	ckley AV, AT, MH 6/4/09 2:45 p Yes	100% cloud showers cover (intermittent) Yes 65	Perennial Spring-fed 5	0 0 40 40 15 0 0	Type of other potential landuse sources None !	Low 3	Mostly Open 0 0 0 0	0 0	7.2- Normal/No 7.5 Clear ne None	N/A 0 0	0 0 0 0 0	0 0 0 not fence	0 0	0 0	0	0 0	0 0	0 0	0 0	0 0 6	10.0 Margin	headwaters in golf course and residental housing plan, flows through Westmoreland Co. Come College-mowed up to streambank at college and golf course, riprap along golf course-stabilizati poor buffers	n;
13	Trib 37804 Of 4 Sewickley Creek U Un	nassessed	37804 0.06 0.32 0.26 Sewickley (nor	th fork) AT, MH 5/13/09 9:00 a No	clear/sunny clear/sunny Yes 55	Coldwa Perennial Spring-fed ter 0	95 0 0 0 5 0 0	Type of other potential landuse sources Minimal N Some	None Grasses pasture grass 5 Moo	erate Open 20 60 20 0	Attached brown/gre 0 0 None Algae en	Normal/No 75 8.5 Clear ne None Good	N/A 0 0	50 20 10 20 0 0	enough to h 0 0 11 habit	ave good lat 13 0	13 0	14	18 13	13 0	9 9 :	18 9 9	3 3 6	fence out of pasture and regrowing 13.0 Subopting	hal (11-15) section recently fenced from cows, just needs time to grow.	
13	Trib 37786 To 4 Welty Run U Un	nassessed	37786_0.96_1.67	AV, AT,Mik, 03/20/0 T BP 9 9:15 No	75% cloud cover clear/sunny No 35	Coldwa Perennial Spring-fed ter 90	0 0 0 0 10 0 0	Type of other potential landuse sources Minimal I Some	mixed woody Low Shrubs shrubs 4 Moo	Mostly erate Shaded 45 45 10 0	Attached Brown/gre 0 0 Minimal Algae en fuzzy	Normal/No 100 7.2 Clear ne None	N/A 0 0	25 10 15 50 0 5	35 0 8	8 0	10 0	7	15 18	17 0	8 8 :	16 9 9	8 8 16	13.3 Suboptin	nal (\$1.45)	
	Trib 37754 To	idoned Mine je/Metals:1996 Aquatic L	37556_22.4_23.0 ife 5 0.65 Sewickley P	PR, CB, AT, Tain MH 5/15/09 1:50 p No	showers clear/sunny (intermittent) Yes 60	Warm Perennial Spring-fed water 95	0 0 0 0 5 0 0	Type of other potential landuse sources Moderate N Some	mixed None Trees hardwoods 25 Moo	erate Shaded 20 40 40 0	Attached green 0 1 Minimal Algae algae		MD N/A 0 0	10 30 30 30 0 0	0 0 16	13 0	15 0	10	17 15	18 0	6 6	12 8 8	9 9 18	15.0 Suboptin		upstream AMD and sedimentation
13		nassessed	37754_0_1.2 1.20 UNT to Township	Line Run AT, CB 6/2/09 2:00 p Yes	75% cloud cover clear/sunny Yes 75	Perennial Spring-fed 0	40 40 0 20 0 0 0	Type of other potential landuse sources None ! Some	Low 4	Shaded 0 0 0 0	0 0	Normal/No 7.9 Clear ne None	N/A 0 0	0 0 0 0 0	0 0 0	0 0	0 0	0	0 0	0 0	0 0	0 0	0 0 12	14.0 Suboptin	unplanted ag fields at top, overgown fields and then golf course, fair buffers-entire reach har hal (11-15) buffers but not wide, great shrub cover, narrow riparian zone	
13	Trib 37804 Of 5 Sewickley Creek U Un Trib 37796 To	nassessed	37804_2.1_2.43	th Fork) AT, CB 5/11/09 10:30a Yes	clear/sunny 75% cloud cover Yes 50	Coldwa Perennial Spring-fed ter 40	0 0 0 0 60 0 0	Type of other potential landuse sources None ! Some	Low	Mostly Shaded 0 0 0 0	0 0	Normal/No 7.2 Clear ne None	N/A 0 0	0 0 0 0 0		0 0 iron coating a		0	0 0	0 0	0 0		0 0 21	15.0 Suboptin	all (11-15) similar to section 1049- some homes but good cover.	
13		nassessed	37796_3.21_3.47	th Fork) AT, CB 5/12/09 2:15 p No	clear/sunny 75% cloud cover Yes 65	Coldwa Perennial Spring-fed ter 0		Type of other potential landuse sources None i Some	non-native Low Grasses grasses 5 Mod	erate Mostly Open 20 60 20 1	Attached 0 1 None Algae green	Slightly Normal/No 80 6.9 Turbid ne None Poor A	MD N/A 0 0	60 10 5 25 0 0	iron coat 0 0 9 habit	ing on erosion creatat 11 0 sediment	tte : 13 0	12	11 intermittent at top 11	channelized while mined 8 0	6 6	12 6 6	ihrubs, lots non- native 2 2 4	lots of clearing 10.3 Margin	al (6-10) evidence of clearing (mining), old coke oven residuals, parallels old RR bed	
13		nassessed	37806_0_0.91	th fork) AT, CB 5/12/09 1:30 p Yes	clear/sunny 75% cloud cover Yes 65	Perennial Spring-fed 0	0 0 0 0 0 0	Type of other potential landuse sources None i Some Type of other potential	Low 4	Shaded 0 0 0 0	0 0	Normal/No 8.1 Clear ne None Normal/No	N/A 0 0	0 0 0 0 0 0	0 0 0	0 0	0 0	0	0 0	0 0	0 0	0 0	0 0 10	13.0 Suboptin	nal (11-15) small ag portion near mouth, no fence with cows, fair buffers, mostly good minus pasture sections.	on
14	0 Sewickley Creek U Un Trib 37804 Of	nassessed	37823 0_0.61	waters) AV, BP, AT 3/31/09 11:30 a Yes	clear/sunny (intermittent) Yes 40	Perennial Spring-fed 0	0 0 0 0 0 0 0	landuse sources None I Some	Low	0 0 0 0	0 0	7.8 Clear ne None 7.2- Normal/No	N/A 0 0	0 0 0 0 0 0	0 0 0	0 0	0 0	0 completely offer	0 0	0 0	0 0	0 0	0 0 12	11.0 Subopting 2016 is there but narrow w.	aal (11-15) ag fields, wetland above	
14	3 Sewickley Creek U Un Trib 37759 To	nassessed	37804_1.34_2.1	th Fork) AT, CB 5/12/09 9:45 a No	clear/sunny 75% cloud cover Yes 50	Perennial Spring-fed ter 30	0 0 0 0 70 0 0	landuse sources Minimal I Some	Low Trees mixed decid 8 ft F	ast Shaded 40 40 20 1		8.2 Clear ne None	N/A 0 5	70 15 0 10 0 0	0 0 17	17 0	18 0	15 culverts	16 15	changes from culverts 18 0	8 8 :	16 8 8	6 6 12	good trees and canopy 15.8 Suboptin	nal (11-15) housing dev on most but not much direct mowing mostly residental, a lot of groomed banks, minimal erosion issues (some gabian baskets), UNIT j	
14	Township Line 0 Run U Un	nassessed	37759_1.68_1.95	oper GS, MH 6/2/09 10:00 a Yes	clear/sunny (intermittent) Yes 60	Perennial Spring-fed 0	0 0 0 0 0 0	Type of other potential landuse sources None i	Low 3	Mostly Shaded 0 0 0 0	0 0	Normal/No 8.3 Clear ne None	N/A 0 0	0 0 0 0 0	0 0 0	0 0	0 0	0	0 0	0 0	0 0	0 0	0 0 8	13.0 Suboptin	mousy residents, a socio grotino curres, minima ercision nobles porme geldan disserso, uni si sal (11-15)  8.4, few sediment bars, very little cobble/mosthy sit, culverts; fair buffers	
14	Aban 2 Welty Run N Draina	idoned Mine age/pH:1996 Aquatic L	ife 37779_5.38_5.95 0.57 Welty Ro	02/17/2 n AT, MK 009 1:00 No	50% cloud cover 75% cloud cover No 35	Coldwa Perennial Spring-fed ter 95	0 3 0 0 2 0 0	Some Type of other potential landuse sources Minimal N	deciduous None Trees mix 10 F	ast Shaded 80 10 10 0	brown and Significa Attached green on 0 0 nt Algae rocks	Normal/No 10 6.9 Clear ne None	N/A 0 0	15 70 10 5 0 95	5 0 19	19 0	20 0	19	19 18	18 0	9 10 :	19 10 10	9 9 18	18.9 Optima	1 (16-20)	
					showers	Warm		Some	Mediu knotweed,		is so,				upper secti	ion bad,		sediment buildup in		upper 1/3 channelized though		lackin	g trees in upper	lower reach better zone width, upper reach roads on both	2/3 stream normal channel, bike trail on both sides, upper 1/3 channelized (industrial park), ro	nd
	3 Jacks Run U Un Trib 37787 Of	nassessed	37702_0_1.23	outh AT, AV 6/9/09 2:10 p No AT, AV, BP, 03/20/0	75% cloud cover (intermittent) Yes 80	Perennial Spring-fed water 10 Coldwa		Some Type of other potential	m Shrubs woodyshrubs 20 Moo	erate Mostly Open 30 40 30 1  Mostly	0 1 Minimal None AMD	7.4 Turbid ne None Poor A Normal/No	MD N/A 0 15	35 20 20 10 0 0	0 0 11 lower AMD:	sediment 12 0 sediment ba	ars 13 0	10 bends and pools	15 some bottom exposed 9	channelized though industrial park 10 0	8 8 :		on, shaded by inotweed 4 4 8	sides 11.4 Suboptin  Buffers are good. Forested and	all (11-15) parallels stream, water has AMD iron staining and sediment issues Headwaters start in pasture of Friendship Farms, then go to a good forested buffer down to residents and horse farmette and ends in active beef pasture. Livestock have access to trib in lov	AMD
14	1 Welty Run U Un Township Line	nassessed	37787_0_0.85	Run MK 9 10:15 Yes	75% cloud cover clear/sunny No 40	Perennial Spring-fed ter 25 Warm	25 25 0 0 25 0 0	landuse sources None i Some Type of other potential	Low 4	Shaded 0 0 0 0 Mostly	0 0	Clear ne None 7.8- Normal/No	N/A 0 0	0 0 0 0 0	0 0 0	0 0	0 0	0	0 0	0 0 upper reservoir and	0 0	0 0 some instability in	0 0 18	mostly protected. 15.0 Suboptin	all (11-15) portion, but not in headwaters.	
14	2 Run U Un Trib 37810 Of	nassessed	37752 4.71 6.69 1.98 Township Lin	e Run AT, Cb 6/2/09 10:55 a No	50% cloud cover clear/sunny Yes 70	Perennial Spring-fed water 50 Coldwa	0 0 0 0 35 15 0	landuse sources Minimal I Some Type of other potential	Low Trees mixed decid 4 Moo	erate Shaded 40 40 30 1	1 1 Minimal None	8.2 Clear ne None Good 8.3 Slightly Normal/No 8.8 Turbid ne None	N/A 0 0	10 40 10 40 0 0	0 0 16	15 0	18 0	12 reservoir	18 10	culverted 18 0	7 7 :	14 housing areas 8 8	6 6 12	affected by housing 14.9 Subopting	al (11-15) community reservoir section, queen snake seen	lots of large developments
14	3 Sewickley Creek U Un Trib 37823 To	nassessed	37810_0_0.78	th Fork) AT, CB 5/12/09 1:00 p Yes	clear/sunny 75% cloud cover Yes 60 showers	Perennial Spring-fed ter 25 Coldwa		landuse sources None i Some Type of other potential	Low 4ft	Mostly Open 0 0 0 0		Normal/No	N/A 0 0	0 0 0 0 0	0 0 0	0 0	0 0	0	0 0	0 0	0 0	0 0	0 0 12	12.0 Suboptir	stream has been "tiled"- no flow through ag fields, but "5 ft wide above fields at culvert and go	bd
14	6 Sewickley Creek U Un Trib 37809 Of	nassessed		waters) AV, BP, AT 3/31/09 11:30 a Yes		Intermittent Spring-fed ter 0	0 0 0 0 0 0	landuse sources None I Some Type of other potential	Low	0 0 0 1		7.8 Clear ne None Normal/No	N/A 0 0	0 0 0 0 0	0 0 0	0 0	0 0	0	0 0	0 0	0 0	0 0	0 0 2	5.0 Poo	(0.5) cover	
	Trib 37782 To	nassessed		th Fork) AT, CB 5/12/09 10:30 a Yes 12/02/0	100% cloud	Coldwa		landuse sources None i Some Type of other potential	Low 2 ft	Mostly Open 0 0 0 0  Mostly		7.6 Clear ne None Normal/No Agri	N/A 0 0	0 0 0 0 0	0 0 0	0 0	0 0	0	0 0	0 0	0 0		0 0 8	Buffers are Good. CREP buffer two years old and growing in	Trib flows through Ag land and active beef farm, but is newly protected by CREP. It's the Overly F sampled by WPC. Stream creates two large ponds by farmstead. Score should increase as buff	arm or
	S Welty Run U Un	nassessed adoned Mine	37782_0_0.35		cover 50% cloud cover Yes 35 100% cloud showers	Perennial Spring-fed ter 15 Warm		landuse sources None i Some Type of other potential	Low 5	Shaded 0 0 0 0 Mostly	Attached	7.9 Clear ne None Normal/No	e N/A 0 0	0 0 0 0 0 0	0 0 0 w/o AMD v	0 0 would be	0 0	0	0 0	0 0	0 0		0 0 16 te trees and	well. 13.0 Suboptin	al (11-15) grows in.  If on Arbrust to College, AMD issues, rails to trails near stream, road next to stream	
14		p/Metals:1996 Aquatic L	ife S8 1.46 Sewickle	y AV, AT, MH 6/4/09 2:15 p No	cover (intermittent) Yes 65	Perennial Spring-fed water 10		Some	Low Trees mixed decid 20 Moo	erate Shaded 35 45 20 0		7.5 Turbid ne None Fair A	MD N/A 0 10	40 10 20 20 0 0	0 0 15 excell	ent 14 0	18 0	section crossed by quad trail this is	18 15	culverts 15 0	8 8 :	LB -high with active		LB - great trees and wide / RB -	ral (11-15) from Arbrust to College, AMD issues, rails to trails near stream, road next to stream	AMD
14	Aban 4 Welty Run N Draina Trib 37819 To	idoned Mine age/pH:1996 Aquatic L	ife 37779_1.09_1.16 0.06 Welty Ro	n AT, TS 4/13/10 12:30 PM No	100% cloud cover 25% cloud cover No 50	Coldwa Perennial Spring-fed ter 100	0 0 0 0 0 0 0	Some	None Trees mixed hard 13 Mod	ierate Shaded 40 40 20 0	Attached brown O O Minimal Algae slimy	60 8.3 Turbid ne None Good	icultur e N/A 0 5	60 15 10 5 10 0	0 0 16 good co	lightly embedd obble 15 0 riffles	sed in 15 0 weak in po	causing sediment ooks 15 erosion	18 good flow 19	no change 19 0	good riffles 5 9 :	erosion / RB - nice LB - s 14 and low 7 9	ime grass / RB - eally good 10 9 19	field beyond buffers from mining 17.8 Optima	l (16-20) had several wood ducks on section	some sediment issues most likely from pasture just up stream
14	7 Sewickley Creek U Un	nassessed	37819_0.36_0.85	n UNT AT, AV, BP 3/31/09 2:15 p Yes	showers clear/sunny (intermittent) Yes 55	Perennial Spring-fed 0		landuse sources None I Some	Low	0 0 0 0		Normal/No Clear ne None	N/A 0 0	0 0 0 0 0	0 0 0	0 0	0 0	0	0 0	0 0	0 0	0 0	0 0 12	13.0 Suboptin	nal (11-15) 1457 and 1131 flow into 1098; originate from Wigle farm-CREP buffer with streambank fencir	
14	Trib 37773 To 1 Brinker Run U Un Trib 37797 Of	nassessed	37773_0_0.96 0.96 UNT to Brink		rain (steady rain) 100% cloud cover Yes 60	Perennial Spring-fed 10		Type of other potential landuse sources None ! Some	Low 3	Mostly Shaded 0 0 0 0	0 0	7.9- Normal/No 8.0 Clear ne None	N/A 0 0	0 0 0 0 0 0	0 0 0	0 0	0 0	0	0 0	0 0	0 0	0 0	0 0 12	12.0 Suboptin	headwaters in ag pasture/field, flows through more ag/pasture, trees buffering, narrow buffe following stream length	
14	2 Sewickley Creek U Un	nassessed	37797_0_0.1 0.10 Sewickley, Nor	04/17/0 ht Fork AV, AT, PR 9 10:45 Yes	clear/sunny clear/sunny Yes 55	Perennial Spring-fed 0	0 99 0 0 1 0 0	Type of other potential landuse sources None i	Low 2	0 0 0 0	0 0	Normal/No Clear ne None	N/A 0 0	0 0 0 0 0	0 0 0	0 0	0 0	0	0 0	0 0	0 0	0 0	0 0 4	5.0 Poo	(0-5) Sad little trib. Ag. field mowed to stream, no cover, completely exposed	
14	Trib 37793 To	nacceccert	37793 0 0.61 0.61 Web-th	02/17/2 1:00:00 n AT MK 009 PM No	S0% cloud cover 75% cloud cover No. 35	Coldwa		Some Type of other potential landuce course Minimal N	mixed hard woods, oaks None Trees beerh 6 F	oct Shaded 90 5 5 0	brown and Significa Attached green on  O on Alexandria	Normal/No 2 49 Clear ne None	N/A 0 70	20 5 3 2 0 0	0 0 19	19 0	20 0	19	19 19	18 0	10 10	20 10 10	10 10 20	19.3 Ontimo	115.20	
14	Trib 37776 To 5 Welty Run U Un	nassessed	37775 0 0.69 0.69 UNT Welty	Run AT TS 4/13/10 3/30 PM Yes	showers (intermittent) 25% cloud cover No. 50	Personnial Spring-fed 10	0 0 10 0 80 0 0	Some Type of other potential	low 4	Modity Onen 0 0 0 0	0 0	8.9 - Normal/No 9.1 Clear ne None	N/A 0 0	0 0 0 0 0	0 0 0	0 0	0 0	0	0 0	0 0	0 0	0 0 0	0 0 12	0.0 Margin	Residential area flows through housing, road right next to it, smells like sewage at mouth. Yuci al (6-10) looking, powerlines cross, several culvents, high banks. Sewage removal needs improved at botte	y en
	Trib 37804 Of 7 Sewickley Creek U Un	naccecced	37804.0.0.06 0.06 Sewickiev Inco	0 fork) AT MH 5/13/09 9:00 a No	clear/gunny clear/gunny Vec 55	Coldwa Perennial Spring-ford for 0	95 0 0 0 5 0 0	Some Type of other potential landuse source Minimal N	None Gracces nachine gracs 5 Minr	erate Onen 20 60 20 0	Attached brown/gre	Normal/No 75 85 Clear ne None Good	N/A 0 0	50 20 10 20 0 0	not fence enough to h 0 0 11 habit	ed long	13 0	14	18 13	13 0	9 9		3 3 6	fence out of pasture and	section recently fenced from cows, just needs time to grow. This section was scored the same: sal (11-15) section #1374 due to change of UNT #1206 entry point to North Fork.	
	Trib 37788 Of	nassessed	37788_0_0.6 0.60 Welty Run	AV, BP, MK, 03/20/0 JNT AT 9 10:00 No	75% cloud cover clear/sunny No 40	Coldwa Perennial Sorine-fed ter 0	70 0 0 0 30 0 0	Some Type of other potential landuse sources Minimal II	over grown Low Grasses pasture 2 Moo	Mostly lerate Shaded 50 50 0 0	Attached brown/gre 0 1 None Algae en	Normal/No 35 8.0 Clear ne None	N/A 0 0	25 15 20 40 0 0		12 0	8 0	14	17 16	16 0	6 6 :		5 5 10			
		idoned Mine			showers	Warm		Some	mixed woody						lots of graw sediment is:	el bars & sues, w/o		sediment buildup				knotweed covering both banks. little	id ver cover-	big mowed fields and ag up to edge, road following stream.	typical backyards/ag/industrial, good cover, little bit of mowing, most knotweed seen yet, som	
	Trib 37759 To Township Line	x/Metals:1996 Aquatic L	37556_19.41_20. ife 12 0.71 Sewickley (u	oper) AV, AT 6/9/09 12:15 p No	75% cloud cover (intermittent) Yes 80 showers	Perennial Spring-fed water 15 Warm	10 15 10 0 20 0 0	Type of other potential landuse sources Minimal I Some Type of other potential	veg & Low Shrubs knotweed 25 Moo	erate Shaded 30 40 30 0 Mostly	0 0 Minimal Algae green Sienifica Attached	7.3- Normal/No 25 7.4 Turbid ne None Poor A Sliehtly Normal/No		40 20 20 20 0 0			18 0 all preser	nt 9 everywhere	19 18	17 0	8 8 :	16 erosion 9 9 kno	weed & trees 5 5 10	but good cover with trees 14.3 Suboptin	all (11-15) erosion and sediment issues culverts, pond in middle, beef farm in top of reach joined with wetlands, no streambank fencing	AMD
14	1 Run U Un	nassessed	37759_0_1.68	oper GS, MH 6/2/09 11:15 a No	clear/sunny (intermittent) Yes 60	Perennial Spring-fed water 85 Coldwa	5 0 0 0 5 5 0	landuse sources Minimal I Some Type of other potential	Low Trees mixed decid 5 Mod	erate Shaded 40 40 20 0 Mostly	0 1 nt Algae Attached	Slightly Normal/No 8.1 Turbid ne None Good 7.5- Normal/No	N/A 0 5	50 10 15 10 0 0	0 0 18 w/o AMD v	15 0 would be	15 0	13	15 13	18 0	8 9	8000	8 8 16 veg cover and ns. many trees		nal (11-15) farm, 85% active riparian zone, minimal res	beef farm accomplaned with mild bank erosion
14	5 Brinker Run U Un Aban	nassessed adoned Mine	37769_0_1 1.00 Brinker R		rain) 100% cloud cover Yes 60	Perennial Spring-fed ter 65	0 5 0 0 10 20 0	landuse sources Minimal I Some Type of other potential	Low Trees decid forest 10 Mod	erate Shaded 40 30 30 0	Attached O 1 Minimal Algae green	80 8.0 Turbid ne None Poor A Normal/No		20 30 20 30 0 0		score 11 0 very embedd	ded 18 0 all preser	nt 12 some sediment bars	15 fills channel 15	old RR line 18 0				excellent except for roads 15.8 Suboptin	all (11-15)  Sections above  Welty Run was damed to form Mammoth Lake. No score given for this section due to critera for	AMD issues
14	6 Welty Run N Draina	age/pH:1996 Aquatic L	ife 37779_2.26_2.77 0.51 Welty Run (Mame	noth Lake) AT, MK No	showers	Perennial Spring-fed 0 Warm	0 0 0 0 0 0 0	landuse sources None i Some Type of other potential	Low 0	0 0 0 0 Mostly	0 0 cattails Rooted and 0 1 Minimal emergent grasses	Clear ne None 7.9- Sightly Normal/No	N/A 0 0	0 0 0 0 0	0 0 0	0 0	0 0	0	0 0	0 0 few culverts and	0 0	high hanks falling in			being different that for streams section with high amout of knotweed, runs through res area, moderate velocity until bottom with	ere
14	5 Boyer Run U Un	nassessed	37763_1.96_3.34 1.38 Boyer Ru	n AT, CB 6/3/09 12:30 ρ No	(intermittent) 50% cloud cover Yes 65 showers	Perennial Spring-fed water 20 Coldwa	70 0 0 0 5 5 0	landuse sources Moderate i Some Type of other potential	Low Shrubs 7 Mod	erate Shaded 35 35 30 1  Mostly			N/A 0 0	15 20 15 30 20 0	0 0 14 affected by:	sediment 11 0 lots of sedim	ent 18 0	14 grassy islands	17 14	bridges 16 0	6 6	12 spoil 8 8	grasses 5 5 10	not wide, but trees present 14.2 Suboptin	al (11-15) it slows and has high sediment buildup pasture on left side, runs through forest for upper 3/4, good buffers, one culvert, sediment issu	erosion, sediment issues
	8 Welty Run U Un	nassessed	37780_0_0.63		50% cloud cover (intermittent) Yes 75 showers		40 20 0 0 5 0 0	Some	Low 3 shrubs and	Mostly Shaded 0 0 0 0 Mostly		Normal/No 8.0 Clear ne None Normal/No	N/A 0 0	0 0 0 0 0	0 0 0	0 0 some sedime issuess, but no	0 0 ent ot in	0	0 0	0 0	0 0		0 0 14	12.0 Suboptin  LB good width, RB mowed up		
14	9 Sewickley Creek U Un	nassessed	5 0.25 Sewickley Hea	03/31/0 lwaters AT, BP, AV 9 1:45 No	clear/sunny (intermittent) Yes 55	Perennial Spring-fed ter 25	25 15 0 0 35 0 0	landuse sources Minimal I	Low Shrubs sometrees 10 Mod	erate Shaded 35 40 25 0	Attached brown/gre 0 0 Minimal Algae en			55 5 20 20 0 0		issuses, but no 14 0 riffles ediment embedded due		12 lots of sediment, large	17 16	upper 1/4 straightened and				LB good width, RB mowed up to stream edge 14.5 Suboptin LB-railroad ed and mining area near stream bed/ Rb-power	al (11-15)  straightened channel at top of section by farm landowner and dredged if permitted. Below straightened section huge sediment bars. Nice wetlands and wernal poinds all along right bank	
14		idoned Mine age/pH:1996 Aquatic L	ife 37779_1.16_1.5 0.34 welty ru	AT, TS 4/13/10 1:55 PM No	100% cloud cover 25% cloud cover No 50	Coldwa Perennial Spring-fed ter 50	20 0 0 0 0 10 20	potential mine land sources Minimal N	None Trees hard woods 0 Si	Mostly ow Shaded 30 35 35 1		Slightly Normal/No Agri 8.1 Turbid ne None Fair	icultur e N/A 0 0	40 15 15 25 5 0	wash during 0 0 9 and uns	glicoding and straighter table 10 0 upstream	ning missing fast		substrate often 12 exposed 11	dredged within past 5	niffles absent in altered area 6 7 :	LB-some high banks/ of streat  RB-relatively low 6 6 streat	ssing upper 1/4 am/ RB- rest of m is very good 5 8 13	near stream bed/Rb-power line and 11.2 Suboptin	nal (11-15) riparian area. Right bank ripARIAN AREA HAS OLD RAIL BED AND MINE LAN	sediment issues from farm up stream
14	Trib 37800 Of 6 Sewickley Creek U Un	nassessed	37800_0_1.22	04/17/0 Fork UNT AT, AV, PR 9 11:30 No	clear/sunny clear/sunny Yes 50	Coldwa Perennial Spring-fed ter 15	25 15 0 0 40 0 5	Obvious Commercial sources Minimal I Some	Low Shrubs S Moo	Mostly erate Shaded 25 50 25 0	Attached 0 1 Minimal Algae green	2.8- Slightly Normal/No 75 6.5 Turbid ne Other	N/A 0 0	15 25 30 30 0 0	0 0 17	Embedded with 8 0 iron and sedin	AMD ment 16 0	14 some bars in areas	16 14	several bridges and culverts 14 0	8 8 :	16 8 8	6 6 12	14.3 Suboptin	This section is highly impacted by AMD. The souce is just below the 130 bridge by Humphreys nat (11-15) N40.25126 W79.47968. AMD is 2.8, stream above bride is 6.5.	
15	Trib 37799 Of S Sewickley Creek U Un	nassessed	37799_0_0.15 0.15 Sewickley, Nov	04/17/0 th Fork AT, AV, PR 9 10:30 Yes	clear/sunny clear/sunny Yes 50	Perennial Spring-fed 0	0 100 0 0 0 0 0	Type of other potential landuse sources None i Some	Low	0 0 0 0	0 0	Normal/No Clear ne None	N/A 0 0	0 0 0 0 0	0 0 0	0 0	0 0	0	0 0	0 0	0 0	0 0	0 0 4	5.0 Poo		
15		nassessed	37816 0 0.41 0.41 Sewickley (Nor	th Fork) AT, CB 5/12/09 2:10 p Yes	clear/sunny 75% cloud cover Yes 65	Perennial Spring-fed 50	0 0 0 0 50 0 0	Type of other potential landuse sources None i Some	Low 2	Mostly Shaded 0 0 0 0	0 0	3.1- Normal/No 5.4 Clear ne None	N/A 0 0	0 0 0 0 0	0 0 0	0 0	0 0	0	0 0	0 0	0 0	0 0 0	0 0 4	8.0 Margin	rural, residental, forested, 1/3 stream culverted, poor buffers (culverts), AMID, UNT entering ab houses	ove
15		nassessed	37752_3.34_3.69	oper GS, MH 6/2/09 12:30 p Yes	showers 75% cloud cover (intermittent) Yes 60	Coldwa Perennial Spring-fed ter 0	0 0 0 0 100 0 0	Type of other potential landuse sources None i Some	Low 6	Mostly Open 0 0 0 0	0 0	Normal/No 8.5 Clear ne None	N/A 0 0	0 0 0 0 0	0 0 0	0 0	0 0	0	0 0	0 0	0 0	0 0	0 0 4	10.0 Margin	al (6-10) mostly trimmed, very little canopy cover, culverts, poor buffers	
15		nassessed	37794_0_0.57	fain AT, MH 5/13/09 11:25 a Yes	50% cloud cover clear/sunny Yes 55	Perennial Spring-fed 0	400 40 10 0 10 0 0	Type of other potential landuse sources None i Some	Low 2	Open 0 0 0 0	0 0	Normal/No DRY Clear ne None	N/A 0 0	0 0 0 0 0	0 0 0	0 0	0 0	0	0 0	0 0	0 0	0 0	0 0 4	10.0 Margin		
15		nassessed	37758_0_0.68	Line Run AT, CB 6/2/09 12:00 p Yes	75% cloud cover clear/sunny Yes 70	Perennial Spring-fed 5	40 45 0 0 10 0 0	Type of other potential landuse sources None I Some		Mostly Shaded 0 0 0 0		Normal/No 8.0 Clear ne None	N/A 0 0	0 0 0 0 0	0 0 0	0 0	0 0	0	0 0	0 0	0 0	0 0 0	0 0 12	13.0 Suboptin		
15	Trib 37765 To 4 Boyer Run U Un	nassessed	37765_0_0.52		showers (intermittent) 50% cloud cover Yes 65	Perennial Spring-fed 40	0 0 0 0 60 0 0	Some		Mostly Shaded 0 0 0 0		Normal/No 7.9 Clear ne None	N/A 0 0	0 0 0 0 0	0 0 0	0 0	0 0	0	0 0	0 0	0 0	0 0 0	0 0 6	11.0 Suboptin	cut lawns, overgrown fields, runs through recidental area, small area in forest, fair buffers-half g half (11-15)	200,
15	5 Sewickley Creek U Un	nassessed	37556_25.92_26. 02 0.09 Sewickely f	Tain AT, MH 5/13/09 12:30 p No	clear/sunny clear/sunny Yes 60	Coldwa Perennial Spring-fed ter 10	0 0 0 0 40 20 30	recraimed mine potential land sources Moderate !	Low Shrubs woodyshrubs 25 Moo	Mostly lerate Shaded 40 40 20 1	Attached 1 1 Minimal Algae	7.2- Normal/No 8.3 Clear ne None Good	N/A 0 0	40 20 20 20 0 0	0 0 13	13 0	18 0	13	17 14	old restoration project 17 0	7 7	14 8 8	5 5 10	reclamation area/wetlands impact riparian zone 14.5 Suboptin	, val (11.15)	restoration debris, strip mine area

GIS_ID_W ATTANUS PC NAME E PROBLEM1 Trib 37643 To	Rain? Auf a Stripp Fid Pa Com_In Wed!  USE. SEGD_WPC Length Strimburne Inv Date Time Sheet Wastflow Wastflow of Stripp Fid Pa Com_In Wed!  USE SEGD_WPC Length Strimburne Inv Date Time Sheet Wastflow Wastflow String Stripping to Stripping Fid Pa Com_In Wed!  ONLY Time Sheet Wastflow Wastflow Stripping Stri	NOTH WOODLY CarCourt RITIE Run Pool Channel Dans Callerts UNIO Aquiving Species Por	Owerd to pit Turbidity WhOddos WhOTA WIL Impac Sediment Bedrock Bolder Cobble Gravel Sand Six Cay Dectrus and Must Epito Normal/N	Poolsis VMS_Sp Self Self Self Self Self Self Self Self	Officult Frequi Eyel a Eyel Churkt Eyel f Church Eyel'		Totalic very Software from the formal photosymptotic processing processing personal processing personal personal processing personal personal processing personal per
1007 Sewickley Creek U Unassessed Trib 37670 To	09/220 showers Vision Type of other potential 1974 10 0.05 0.05 UNIT to Middle Sewickley AT, TS 9 2:30 P Yes 50% Cloud cover (intermittent) No 75 Perennial Spring fled water 50 2.5 0 0 0.25 0 0 indices sources None Low 2.5 Some grass-residential, 1974 0.037 0.37 8uffaio Non 8 84, AT 8/12/09 1:10 No 75% Cloud cover Yes 72 Perennial Spring fled water 10 0 0 5 0 85 0 0 indices sources Minimal High Grasses one choice in the contraction of the contrac	0 Mostly Open 0 0 0 0 0 0 Attached	Normal/N 7.5 Clas one None N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Residential and mowed yards affect	0 0 0 mowed tight, leeps stream affected by	mowing and homes	0 10 10.0 Margical (5-10) of water.
1009 Buffalo Run U Unassessed  Trib 37635 To  1017 Sewickley Creek U Unassessed	37/170 0.0.17 0.37 Buffaio Run BN, AT 8/13/09 1.10 p No 75% Cloud cover 25% Column Vex 72 Premental Spring field water 10 0 0 5 0 85 0 Indices sources Minimal High Grasses some shrubs 1 Some Some Shrubs 1 Some Shrubs 1 Some Shrubs 1 Spring field Field Spring Field Field Field Spring Field Fie	8 Moderate Mocely Open 35 45 20 1 0 1 None Algae blue green 8 Mocely 5 Shaded 0 0 0 0 0	0 6.2-6.6 Turbud one None Fair Sewage N/A 0 5 40 30 15 10 0 0 0 0 1  Normal/N 5.0-6.2 Clear one None N/A 0 0 0 0 0 0 0 0 0 0 0		sed bars present 17 channel light 11 homes, bridges, etc/ 14 0	7 6 13 affect stability 6 6 yards 3	3 6 homes, yards, nibracks, etc. 12.0 Suboptimul (13-55) Stream follows bosyroad, Chamerished and stabilised along roads, house scattered throughout, backyon-blower breas, come aware, proc, others well bent of brothesed, water quality affected by AMO between the come aware proc, other well bent of brothesed, water quality affected by AMO between the come aware proc, other well bent of brothesed, water quality affected by AMO between the come aware proc.
Trib 37692 To 1020 Sewidskey Creek U Unaccessed	Showers 37692 0.098 0.58 Sewishey Middle UNT AT, MV, CTIS 772/09 1.28 p. No (intermittent) 50N cloud cover Yes 68 Persential Spring field 50 0 5 20 0 25 0 0 banduse No evidence Minimal Low Trees mixed direct 1	Mootly Stated 35 35 30 1 0 1 Minimal Attached 0 Moderate Shaded 35 35 30 1 0 1 Minimal Algae 1	Normal/N 5 8.4 Cker one None N/A 10 10 60 10 10 0 0 0 0 1	many fish and crayfish 18 violate 16 0 riffles good 18 0 all present 13 o	substrate exposed in occasional bar buildup 15 some areas 10 at least 40% altered 17 0	affected by a LB pacture and RB stabilization from veg roadway and both 7 7 14 or culvert 6 6 affected by culverts 6	shere the roads and patture are present growing pool, 5 12 Coulent so roay 54.5 Suboptimel (11.55) concrete roctagatior cuber with buffles
Trib 37688 To 1021 Wilson Run U Unassessed Trib 37643 To	Some  37588 0.0.5 0.50 Wilson Nur UNT AV, PR 8/05/09 1.08 p Yes Clear/Junny Clear/Junny Yes 75 Penential Spring-Red 0 100 0 0 0 0 landace sources None Low  Some  37588 0.0.5 0.50 Wilson Nur UNT AV, PR 8/05/09 1.08 p Yes Clear/Junny Clear/Junny Yes 75 Penential Spring-Red  37588 0.0.5 0.50 Wilson Nur UNT AV, PR 8/05/09 1.08 p Yes Clear/Junny Clear/Junny Yes 75 Penential Spring-Red  37588 0.0.5 0.50 Wilson Nur UNT AV, PR 8/05/09 1.08 p Yes Clear/Junny Clear/Junny Yes 75 Penential Spring-Red  37688 0.0.5 0.50 Wilson Nur UNT AV, PR 8/05/09 1.08 p Yes Clear/Junny Clear/Junny Yes 75 Penential Spring-Red  37688 0.0.5 0.50 Wilson Nur UNT AV, PR 8/05/09 1.08 p Yes Clear/Junny Clear/Junny Yes 75 Penential Spring-Red  37688 0.0.5 0.50 Wilson Nur UNT AV, PR 8/05/09 1.08 p Yes Clear/Junny Clear/Junny Yes 75 Penential Spring-Red  37688 0.0.5 0.50 Wilson Nur UNT AV, PR 8/05/09 1.08 p Yes Clear/Junny Clear/Junny Yes 75 Penential Spring-Red  37688 0.0.5 0.50 Wilson Nur UNT AV, PR 8/05/09 1.08 p Yes Clear/Junny Clear/Junny Yes 75 Penential Spring-Red  37768 0.0.5 0.0.5 0.0.5 0.0.5 0.0.0 0.0 0.0 0	Mostly Open 0 0 0 0 1	Normal/N 7.7 Cierr one None N/A 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0	0 0 0	0 0 0 0	0 10 5.0 Marginal (6-10) 12 to discover of the control of the cont
103 2 Sewidoly Creek U Unassessed Trib 37663 To 1033 Buffalo Run U Unassessed		2 Moody 2 Shaded 0 0 0 0 0 Attached 1 Slow Shaded 0 0 0 0 1 Minimal Algae	Theometry (Notice Good N/A 0 10 50 10 5 25 0 0 0 0 1 5 5 5 10 0 0 0 1 5 5 5 1 1 1 1	16         not terrible         10         0         lots         13         0         lower gradient         6         a           9         poor overall         3         0         most of reach         10         0         poor variety         11	subministrat behalts may scroer Reginer with required to some reacher of curviverStand of contrictions losts 5 rails 14 some reacher 13 0 some bars 17 good overall 12 Sculverts 12 0 little sinuoidity	6 6 12 7 8 7 8 7 15 worse on hill 8 8 good overall 7	6 13 diream does to raced 12.0 Suboptimul (12.1 Suboptimu
Trib 37655 Of 1039 Sewickley Creek U Unassessed Trib 37637 Of	100% cloud Type of other patential from con- 37655, 067, 1.01 0.34 Middle Sweickley UNT AV, CB 7/12/09 1040a Yes cover 50% cloud cover No 70 Penential Spring-field 0 20 0 60 0 20 0 landruse survivaries Mone Low : Some	truction- P Open 0 0 0 0 0	no visitor- Normal/N diverted Clear one None N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0	0 0 0	0 0 0 0 0 0	den seizen, jugel into lieuzione dicht, completilier in lemzente deuerli (para) in under deuerli).  0 4 4 8 Peor (9-5)  n a scozia jet in unplace contraction, politich mysike und seize in which increase in the device contraction handwaters in ag, middle seizen for breach frame, breach our auf god pile area, bower serzion frança) community of goder Whylel, areas goder great years. All service frame, but cannels. All breach frame, but contract great mysike service, Mark Despert frame, but cannels. All breach frame, but contract great mysike service, Mark Despert frame, but cannels. All breach frame places are serviced in the service of the servi
1044 Sewickley Creek U Unassessed  Trib 37645 Of  1045 Sewickley Creek U Unassessed	# showers   Warm   Type of cather potential   Warm   Warm   Type of cather potential   Warm   Warm   Type of cather potential   Warm   Warm	Mostly Shaded 0 0 0 0 0  Mostly Shaded 0 0 0 0 0	3.6-7.2 Clear one None N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0 0 0		0 10 10.0 Marginal [5-10] mid section mar gook, No openic AMD locures.  score based on diseased on diseased and appearance, Channel Pt, Nobesidenters in partners, flow under fit 31  0 0 12.0 Suboptimal (11-55) in line good recented buffer.
1046 Buffalo Run U Unassessed Trib 37661 To	Some  37662_475_5.01 0.26 Leighty-Hollow 5G, G5 N/13(70 1:10 p Yes 50%-Cloud cover V5%-Cloud cover V6 75 Perennial Spring-had water 0 50 50 0 0 0 0 landsac sources Nove Low 2  Some  37662_475_5.01 0.26 Leighty-Hollow 5G, G5 N/13(70 1:10 p Yes 50%-Cloud cover V6 75 Perennial Spring-had water 0 50 50 0 0 0 0 landsac sources Nove Low 2  Some	: Open 0 0 0 0 0	Normal(N 7.7 Clear one None N/A 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0	0 0 0	0 0 0 0 0	0 4 3.0 Poor (0.5) Large dairy operation with no stream bank finding, mostly pacture.
Trib 37661 To  1047 Sewickley Creek U Unassessed  Trib 37692 To  1060 Sewickley Creek U Unassessed	37651 0.042 0.62 Wilson Rus UNT PR, 50 8/07/09 11:05a Yes. Char/turney Char/turney Yes 74 Perential Saring had 90 0 0 0 0 10 bill ballings assures. None Low 1 37661 0.042 0.05 Warm 1980 1990 1990 1990 1990 1990 1990 1990	Mostly Shaded 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Storma(N)		0 0 0 0		0 6 10.0 Marginal (6-10) one colvent end a barrier, paralles road for majority.  Buffers are fac Lets of open 0 0 feet and serval bursh buffers: 11.0 Suboptimal (13-15) Couple of colvents, ag feets and pastner burst, plus some repitiential.
Trib 37665 Of 1063 Buffalo Run U Unassessed	STEEL LET LET UN REQUISE LEQUICITY 2 LES TON CONSEQUENTLY ENGINEENT WITH THE PERSONNEL STREET WARM STEEL TO SEE TON TO SEE THE PERSONNEL CONTROL OF THE PERSONNEL CONTROL O	Mostly Shaded 0 0 0 0 1	Normali Normal		0 0 0		U topor or townstream of the state of the st
Trib 37694 Of 1058 Sewickley Creek U Unassessed Trib 37650 Of	37694 0.65 0.50 Middle Senickley At, AV, CTG 779/09 10:502 Yes Glar/Junny Clar/Junny Yes 70 Perential Spring field 15 55 20 0 10 10 Indexes Sources Nove Low 2 1 Middle Senickley (NOS) Sources Nove Low 2 2 States (Nose Low 2	Mostly : Shaded 0 0 0 0 0	Normal/N	0 0 0 0	0 0 0		0 0 12.0 Subaptimal (11-15) old fields, forested, come residential, good buffers, no read access, channel below home  Couglé d'invesery culvets, most part untsoched through forest, good buffers, part of Thickathy Hun
1071 Sewickley Creek U Unassessed  1076 Wilson Run U Unassessed	Middle SeekSkey (Mall) 24 AT 7/30/09 11:16 ver. 75% Color Conv rein) 1 ver. 75 Penential Spring fed 90 0 0 0 10 0 to the security None Low 1 1760 0.24 0.75 Color Conv rein) 1 ver. 75 Penential Spring fed 90 0 0 0 10 0 to the security None Low 1 1760 0.24 0.75 Penential Spring fed 45 0 0 0 0 10 65 0 to the security None Low 1 1760 0.25 Ver. 0.25 Ver	Shaded 0 0 0 0 0 0 Moonly Shaded 0 0 0 0 1	7.7 Ciciar one None N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0 0 0		0 16 17.0 Optimal (16-20) Game Fairs-high deer fence at top, good cover and shading, video surveillance  AMIO Toward Lower End, CIFS-00.19598 (-) 100, 19.53580, one cubert, thream parallels Fry Hollow  6 5.0 Foor (16-5)  Mind Red
Trib 37699 Of 1088 Sewickley Creek U Unassessed	Some 37699 0.43 0.43 Sevickhy Main UNT AV, PR 7/R/09 1:55 p Yes Glear/bunny Clear/bunny No 75 Penenikal Spring-fad 0 0 0 0 0 landose sources None Low : Some Some	Mostly Shaded 0 0 0 0 1	Normal/N 7.52 Clear one Note N/A 0 0 0 0 0 0 0 0 0 0 0		0 0 0	0 0 0 0 0	0 14 13.0 Suboptimal (15.55) headwaters in forest, ends in field, 2 culverts. Good buffers
Trib 37696 Of 1095 Sewickley Creek U Unassessed Abandoned Mine	37056_0.39 0.39 Middle Sewickley AT, CTIS 7/R/09 2:18 p Yes 25% Good cover Clear/turnry Yes 73 Penential Spring-field 15 45 0.25 0.15 0 backers sources Rose Low 27556_00.00 0.00 0.00 0.00 0.00 0.00 0.00 0.	: Mostly Open 0 0 0 0 1  Attached fuzzy brown	Normal   No.   N	0 0 0 0 0 MMCroffinger	O O major highway bridges and abutments selective	0 0 0 0 0 lots of negative  RR bed incoveed and impacts from invasive	B 10.0 Marginal (6-10)  B 10.0
1099 Sewickley Creek N Drainage/Metals:1996 A Trib 37692 To	quartic Life 41 1.07 Sewickley Middle AV, AT, CTG 7/2/09 11:15's No cover 50N cloud cover Yes 72 Perennial Spring-fled water 10 0 0 25 10 55 0 Tanduse sources Minimal Low Shrubs shrubs 4 Some Type of other potential	0 Moderate Mostly Open 40 40 20 0 0 Minimal Algae filamentous 5	0 7.6-7.9 Turbid one None Fair AMO N/A 0 20 40 10 10 20 0 0 0 1  Norma/N	12 Impacts 8 0 AMD sed/slit 18 0 11	some bar formation 19 14 RR bed 18 0	9 9 18 vertical edgeas 7 7 plants 4	3 7 against 13 9 Suboptima (11-15) soverprown field, For Davin Accomptions, page 13 per jack 13 per ja
1103 Sewickley Creek U Unassessed  1111 Buffalo Run U Unassessed	37692_126_179 0.53 Middle Sewickley AT, CTIS 7/8/09 2:01.9 Yez 25% doud cover clear/furney Yes 73 Penential Spring-field 5 40 0.15 25 15 0 and case sources knows Low 5 come 7 page of other potential 5 come	i Mostly Open 0 0 0 0 0 Mostly I Shaded 0 0 0 0 0	B.3-8.4 Clear one None N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 7 0 0 0 0		0 0 0		0 0 11.0 Schoptimal (13-51) welfandig/pools/welfand area; park owner inquired about from improvement/it be brushy welfandig/pools/welfand area; park owner inquired about from improvement/it brushy welfandig and in the read of the fire by the residence states, which but comes from till section 1109, stly, this sheat also includes the titry reach between 1111 and 0 10 5.0 Marginal (6-10)
Trib 37695 Of 1115 Sewickley Creek U Unassessed Trib 37648 To	Some 37695 0.65 0.65 Middle-Sewickley AV, AT, CTG 7/9(09 11:30» Yes clear/punny Clear/punny Yes 78 Penential Spring-fled 20 60 0 0 20 0 tandruse sources None Low : Some Some Some Some Some Some Some Some	ModSy Open 0 0 0 0 0	Normal/N 8.4 Clear one None N/A 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0	0 0 0	0 0 0 0 0	0 10 13.0 Schlopfinal (11-55) some pacture (Barraci), vertiand area of stream, fair buffers
1116   Sewickley Creek   U	17648.324.3.49 0.25 Middle Sewickley (NRT AV, CB. 7/17/99 12:20 Proc. cover rain (Istady rain) No. 70 Perential Saring field 0.20 6.0 20 0.0 0 between sourcess Nove Low 7.8 (August 1998) No. 70 Perential Saring field 0.20 6.0 20 0.0 0 between sourcess Nove Low 7.8 (August 1998) No. 70 Perential Saring field 0.20 6.0 20 0.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Noboley	R1 Clear one Nones   None   No	0 0 0 0 0 0 0 0 5 lack of habitat 11 0 10 0 few soods 12	0 0 concrete slab- on banks, 1 concrete some bars 17 11 bridge 6 0	lower end mowed to	8 10.0 Marginal (6-10) good from the morphis bridge contraction, large culters and desertions, characteristic fair-fair, some encision and ded issues from construction?    Interest of Supply res and
Trib 37678 To 1121 Belson Run U Unassessed	Some Shower's 19678 0.055 0.55 Beloon Run UNT CR, Mh 7/22/09 12:00 p Yes 75K-doud cower (intermittent) Yes 75 Penential Spring-fed 0 0 1:00 0 0 Dandose sources Kone Low 4 Some 4	Mostly 5 Shaded 0 0 0 0 0		0 0 0 0	0 0 0		commercial-runs parallel between two roads, decent buffers on lower half cuberted in middle,  0 6 5.0 Poor (0.5) starts in retention pount. Hear Sony Technology center
Trib 37668 To 1122 Buffalo Run U Unaccessed Abandoned Mine	Majer   Maje	Modify Open 0 0 0 0 0 0 Minimal None  Modify 0 Moderate Shaded 20 65 15 0 0 0 Minimal None	7.74.1 Char one Rose N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0	0 0 dirt on right bank some now bar pilet up to create a	(I R) assertes by home (I R) home siles and	buffers are goot. List of: 0 4 rigaries zone from most. 10.0 Marginal (6-10) Some Agrabing section and stream hugs road for most of reach. Reads adds a lot of sediment. Better control of road drainage. ((8) industrial lated our induses.
1123 Sewickley Creek N Drainage/Metals:1996 A 1128 Buffalo Run U Unassessed	Warm Type of other Obvious lawers and	0 Moderate Shaded 20 65 15 0 0 0 Minimal None	7.6 Turbid one None Fair AMO N/A 0 15 65 10 5 2 3 15 0 0 1 Slightly Norma/N 7.7 Turbid one None Fair e N/A 0 10 30 30 0 30 0 0 0 0 6	16         0         16         17         0         15           9         Not much habitat         10         0         60% embedded         12         0         missing some regimes         14         n	channeslare mostly straight, many		8 11 rigardan zone 4.3 Schopfmer (11-55) Boom Piliro no both riske, more so on in bit Mt. AMO on right, fict of introduced AMO / Fix AMO 2 bridge, 1 colver, 3 foot, grazing pasters for 550 years, foot of res, large daily opporation in 4 mostly res and agrantures 9.0 Marginal (6-10) 4 mostly res and agrantures 9.0 Marginal (6-10)
Trib 37648 To 1132 Sewickley Creek U Unassessed Trib 37682 To	Visum Type of other potential 37648_0_1.13	Significa Staded 0 0 0 0 0 ont None	Normal N   Excele		Large sed bars some areas not bank multiple highway present 16 to bank, but still good. 15 culverts 18 0		Took some pictures at month, section fines past Westing House and under 1-70, some sit and  9 18 17.0 Optimal (16-20) emotion
Trib 37692 To 1153 Wilson Run U Unassessed	37692 0.07 0.70 5G, PR 8/07/09 10:15s Yes clear/turnry clear/turnry Yes 72 Persential Spring-fed 0 60 40 0 0 0 technic counces. None Low :	t Mostly Open 0 0 0 0 1	E.2 Clear dies Norse N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0 0 0 o some deposition on	(LB) field cut up to (LB) some erosion and bank and has invasive	0 6 S.D. Poor (D.S.) Dry at upper end (near born,) 1 colvent, not a barrier, active grazing for lower, active crops for upper
Abandoned Mine 1164 Sewickley Creek N Drainage/Metals:1996 A Trib 37640 Of	Some 100% cloud showers Type of other potential	0 Moderate Shaded 20 65 15 0 0 0  Moderate Shaded 20 65 15 0 0	Normal(N	16 16 0 17 0 15	banks and on dirt on bank made to sediment bars 16 14 be a levi 15 0 not quibe ideal		8.81 field ment to industrial 7 11 section limits rigarian zone 14.5 Suboptimal (11-15) industrial on both sides with more fields on left decording bank and more forest on right bank AMO / fix AMO
1167 Sewickley Creek U Unassessed  Trib 37689 To  1169 Wilson Run U Unassessed	37640, 0.1.19 1.19 Middle Sweckley (NRT 8H, AT, TS 9,09(69 11.30 a Yes cover (intermittent) Yes 65 Personal Spring field 80 10 0 0 10 0 isochoos sources None Low Some Some Type of control 1 Ty	Shaded 0 0 0 0 0 0 0 Moothy :	2.3.7.4 Clear one None N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0 0 0	0 0 0 0 0 0	0 12 15.0 Optimal (15-20) Some residential, rural homes, couple culverts, deer farm within divinage but not on top of stream.  One culvert, starts in grond, goes behind gas well compensor station.
Trib 37692 To 1173 Sewickley Creek U Unassessed Trib 37693 Of	Some Type of other contental	i Moctly Open 0 0 0 0 0	Norma(N) 7.29 Clear no None N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0 0 0		0 0 11.0 Suboptimal (11-55) some forest, mostly field, one culvert, tair buffers mostly fivest, some pasture (small area active. harmad, small res, good buffer- mostly very good
1175 Sewickley Creek U Unassessed	37693_078_1.54 0.76 Middle Sewickley AT, CTIS 7/8/09 2.57 p Yes 25% cloud cover clear/furney Yes 75 Penential Spring-fied 50 40 0 0 10 0 Tanduse Sources None Low 3 Source showers Warm Type of other potential	: Shaded 0 0 0 0 1  Mootly Attached	8.2 Citar one None N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	"40% of stream lower end has some	crosses under RT 70	upper portion bank ok, lower portion has high banks with bare half of stream ok, but	0 0 12.0 Suboptimal (13.55) some with bisa cover, but still there; made parallels stream and has ownerd culterts  part of stream in parture or stream deloked by Rt 70, upper section in good shape, tower section poor with a git insidental,
1176 Lick Run U Unassessed	37642 0 273 273 Lick Run R4, MK 9/22/09 230 p No 75% cloud cover (intermittent) No 75 Persential Spring-fled water 60 20 0 5 0 15 0 Earduse Sources None Low Trees mixed hard it	I Moderate Shaded 40 40 20 1 0 1 Minimal Algae	7.8 Turbid one None Good N/A 1 0 80 5 4 10 0 0 0 0 1	some habitat there, but lots of AMD and Most sediment seems	17 12 twice 18 0 old culverting and long section in center	6 6 12 soil 5 5 other 1/2 not 5 some areas mowed for lawns, others	5 10 movely-parts 14.0 Suboptimal (11.15) cattle in parture, yearls moved up to basise, direase bank feeding.  Some tones, to take affected by a feeding section rouse balled lumber year! Culevated for 100 yeards in middle. AMO updateam and sewage
Trib 37670 To 1177 Buffalo Run U Unaccessed Trib 37690 To 1184 Wilson Run U Unaccessed	17670.052.031 0.31 Buffaib Rus AZ, BM 09 2:30 pm No 255 doud cover 1255 doud cover 196 75 Penential Spring the several Spring the S	Moderate Mootly Open 25 50 25 1 0 1 Minimal Algae GREEN	Signify Sensign None Fair age N/A 0 0 15 45 20 20 0 0 0 0 1 Normal/N	8 populations. 13 0 downstream 13 0 11	Random sed bars 16 Reaches both banks 11 vacaripped insure 12 0	6 6 12 Fair, a little high 3 3 weedcated. 2	by rathroad on left and building section most behind bumber yard. Calverted for 100 yards in middle AMO upstream and sweeps section most behind bumber yard. Calverted for 100 yards in middle AMO upstream and sweeps section most behind bumber yard. Calverted for 100 yards in middle AMO upstream and sweeps section most behind bumber yard. Calverted for 100 yards in middle AMO upstream and sweeps section most behind bumber yard. Calverted for 100 yards in middle AMO upstream and sweeps section most behind bumber yard. Calverted for 100 yards in middle AMO upstream and sweeps section.
Trib 37697 Of 1189 Sewickley Creek U Unassessed	Some 5 one 17 ppr of other patental 37697 0.052 0.52 Middle Sewickley (ANT AT, AV, CTIS 7/2/09 2.25 p. Yes (intermittent) 50N cloud cover Yes 68 Personnial Spring-field 25 0 0 0 75 0 Indefine Sources None Low 2	Mootly 0 0 0 0 0		0 0 0 0 0	0 0 0		monthy residental, mowed yords, small forested section, chream originates from pond, some areas: ber and mowed to chream, other regulated heavily toxes in or save provide shake beyond forested 0 0 11.0 Suboptimal (12-155) section high amount of sident and the section area for confirmment on the confirmment men.
1190 Sewickley Creek U Unassessed	37556_15.9_15.9 7 007 Mod Swinkley Creek RM, MK 4/1/10 3:30 PM No Glest/lummy Cales/lummy No 60 Personnial Spring-had ter 20 40 0 0 40 0 landece sources Minimal Low Grasse non-native 5	0 Moderate Moothy Open 0 0 0 1 0 1 Minimal None	Normal/N 7.6 Turbid one None Fair AMO N/A 0 15 65 10 5 2 3 15 0 0 1		some deposition on bank and bar formation 16 14 bridge affect channel 15 0 not quite ideal	(LB) some erosion (LB) knotweed (RB) 7 7 14 (RB) same 7 4 grass cut up to bank 7	(I.B) Instrumed and grass is cut too draw to built, Sirdige (IB) too draw to built, Sirdige (IB) 4 11 grass cut up to board, Middle (IB) 4.5 Suboptimal (11.55) short section only about 75 yards at most, bridge runs over it AMO / In AMO
Trib 37648 To 1192 Sewickley Creek U Unaccessed Trib 37648 To	Soms 100% cloud 37648 3.49 4.18 0.69 Middle Sweickley AV, CB 7/17/09 1055 a Yes cover 50% cloud cover Yes 70 Perential Spring fed 40 0 0 0 60 0 Institute countries Norse Low 6 Middle Sweickley	Mostly 8 Shaded 0 0 0 0 1 Booted	Norma(N	0 0 0 0 0 0 not as good in not as good in not as good in not see you be fit	0 0 0 damin nachura sesa	0 0 0 0 0 0 0 Night horses companied in nacture serting	0 12 33.0 Subaptimal (1.5) to subaptimal (1.5)
1194 Sewickley Creek U Unassessed  Trib 37652 Of  1202 Sewickley Creek U Unassessed	37648_113_1.74 0.61 MMB) AV, AT 7/90(09 1232p No 75% cloud cover raile) Yes 80 Persential Spring-fled 1ser 10 35 10 35 0 10 0 Isadesea sources Moderate Low Strubs 1 Sorrie Moderate Low Strubs 1 Sorrie	5 Moderate Mootly Open 35 40 25 1 1 1 Minimal emergent cattails  Mootly I Shaded 0 0 0 0 0	7.8-7.9 Turbid one None Good N/A 0 0 50 0 0 0 0 0 0 0 1 Normal/N 7.5-7.7 Clair one None N/A 0 0 0 0 0 0 0 0 0 0 0	15 other areas good 15 0 somewhat embedded 18 0 14 0 0 0 0 0 0 0 0	some sed bars 16 11 backing up 16 0 nice onbows in sec		5 10 without 33.7 Subaptimal (13-5) trained to determine substrate composition  starts in force, mun through small horse parkure, mowell sight through yards, minnows in stream,  0 8 13.0 Subaptimal (13-5) water good appearance, for inferince young out, for their received to all of innover
Trib 37671 Of 1203 Buffalo Run U Unassessed	Some	0 0 0 0 0	Normal(N 7.5 Clear one None N/A 0 0 0 0 0 0 0 0 0 0 0 0		0 0 0	0 0 0 0 0	Residential name modul, with aggregatively reviewed bases up to the Costeta a small good about 100 feet before entirely made light trainer parks well for Sie mack value of better Sie part 27.  12 15 0 Suboptimal (11-15)  with Daffield and forecasts, come road columns, Some buff Residential Throughout cont. Auditiple columns and columns, Some buff Residential Throughout cont. Auditiple columns and columns, Some buff Residential Throughout cont. Auditiple columns and columns, Some buff Residential Throughout cont. Auditiple columns and columns, Some buff Residential Throughout cont. Auditiple columns and columns, Some buff Residential Throughout cont. Auditiple columns and columns, Some buff Residential Throughout cont. Auditiple columns and columns, Some buff Residential Throughout cont. Auditiple columns and columns are some some some some some some some som
Trib 37673 Of 1207 Buffalo Run U Unassessed Trib 37666 Of	17773 0 0.82 0.82 Buffalo Run UNT AT, TS 0 1100 um 'ee 75% Good come from the formatted 'ee 81 Penenial Spring Red 0 0 0 25 5 70 0 indexe sources Rose Low 4 Figure 1 100 um 'ee 75% Good come from the figure 1 100 um 'ee 75% Good come 7 5% Good co	Month/Open 0 0 0 0 0 0 0 0 1			0 0 0		Complex of top. Frequently moved channel, five-special to facilities can be frequently moved channel, five-special to facilities can be moved aware, but yards have trees, AMD give belower to facilities pract. From, one is a fact.  0 15 12 0 Outland 155-201 Freeded based with its few Homes at the tipe. Posture laid of does by.
1215 Buffalo Run U Unaccessed  Trib 37683 To  1221 Wilson Run U Unaccessed	37665_0 GAY GAY BUTTAN RALUNI AL, IRN 8/12/09 12:30 P 106 75h Cloud clower	: Shaded U U U U U  Mostly : Shaded U U U U U 1	- Clair die Note N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0 0 0	0 0 0 0 0 0	
Trib 37698 Of 1222 Sewickley Creek U Unassessed	AN, PRIAT (07/08/D)  AN, PRIAT (07/08/D)  No To Personial Spring-Red water 60 0 0 0 30 10 landware contracts Knone Low :  Some	Moody Shaded 0 0 0 0 1	Nooma(N)	0 0 0 0 0 0 0 lots of embeddedness,	0 0 0	0 0 0 0 0 0	Areas of writinds, around RG. Parable Dayor 51 and way typ of section crossed by RG. En New 0 14 Buffers are good. 55.0 Suboptimal (11-15) are several driveway culvers in upper section. Some residential but other parts nicely buffered.
Trib 37645 Of 1225 Sewickley Creek U Unassessed Trib 37653 Of	rail(standy showers Warm Type of other potential mixed 37645_0_0.39 0.39 UNT to Middle Sewickley AT, T5 9/22/09 1:11 p No cain  (intermittent) No 70 Perential Spring-fled water 100 0 0 0 0 0 to betwee sources Minimal None Trees harwood 1 Some Type of other potential	0 Moderate Shaded 35 35 30 0 0 o et None	Norma(N		sediment obvious in low water levels, no all sections of stream 14 rain 20 Normall 19 0		10 20 16.0 Optimal (16-20) Very remote section, nicely forested, lots of sediment in channel, perhaps from ag and res above.
1233 Sewickley Creek U Unassessed  Abandoned Mine 1234 Sewickley Creek N Drainage/Metals:1996 A	37553_0_0.8 0.80 Middle Sewickley (APT 8P, PR 7/30/09 10:40 à 10: 75% Goud cover Chesr/Jumny Vec 75 Persental Soring-fied 10 80 0 0 10 0 Earduse iourcies None Low 1 37556_7758_18	Modify Open 0 0 0 0 0 0   Minimal None	7.23 Clase one None NA 0 0 0 0 0 0 0 0 0 0 0 0 0 0 7 1 1 1 1 1	lacking six ammounts	older channelization mostly run less th	am (L)- grass cut up to	0 0 12.0 Suboptimu(11.55) month horse patter with some formated strendse and one house, poor buffers  [1,3-residential (R)-residential (R)-res
Trib 37679 To 1236 Belson Run U Unassessed	Shows Showers Type of other potential 37679_0_0.49 0.49 Belcon Nut UNT CB_MH 7/24/09 12:30p Yes 75% Goud over (intermittent) Yes 75 Persential Spring-fed 0 0 100 0 0 0 landuse sources More Low 2 Some	Mocify 0 0 1 0 0	Normal/N   DRY Clear one None   N/A   0   0   0   0   0   0   0   0   0	0 0 0 0 0	0 0 0		0 4 5.0 Peor (9.5)  sums into industrial factory, feronal is, chameland, dry  Said little 14th, lets 4 years at bottom, Lewland, Ecooglish 14th, Little elevation Land for rain along
Trib 37674 Of 1237 Buffalo Run U Unassessed	\$42,001 showers  37674_0_0.84 0.84 Buffalo Rus UNT AT, TS 0 11:50 an Yes 75% cloud cover (intermittent) Yes 81 Perennial Spring-field 0 25 10 15 0 40 10 induces sources None 2 Source  Type of other potential	Mostly Cpen 0 0 0 0 0 0 Mostly I Shaded 0 0 0 0 0 1	Normal(N 6.8 Turbid one None N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0	0 0 0		Cream: Tucky, nosty, jusk part. Turkst, wordy, channel. Carbage catement throughout water. Mix  0 6 6.0 Marginal (6-10) or frice cover to ready, ready bad.
1241 Wilson Run U Unassessed Trib 37692 To 1246 Sewickley Creek U Unassessed	37881 5.37 5.91 0.54 William Rut LINT AU, PR 8,006/09 9.51 a Yes Cear/humny Cear/humny Yes 6.7 Penential Spring-Red 15 5 0 0 35 5 isochose sources None Low 5 come	Shaded 0 0 0 0 1   Mootly   Shaded 0 0 0 0 0	\$2 Gair one None N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0	0 0 0		0 12 15.0 Optimal (16-20) westland at upper end, pasture and op below with mixed ene, one culvent under gas well road.  0 0 10.0 Marginal (6-10) residental with moving up to chrownshard, poor buffers
Trib 37675 To 1250 Buffalo Run U Unassessed Trib 37656 Of	Visam   Type of other   Visam   Visa	t Mootly Open 0 0 0 0 0 0 Mootly Open 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Noomal/N 7-A1 Clear no None N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0	0 0 0	0 0 0 0 0 0	So the before of brooking age and multition ones immunified grassmutterli rook and then project on     So Manginui (6-10) cohor roise of roads. Stream is played through 4-10 per, underground for about 1000 years.  some field, money, little resp, chammal is absoluted, cort much repairs amon, even tumples construction;
1258 Sewickley Creek U Unassessed  Trib 37686 To  1259 Wilson Run U Unassessed	1765 6 0.46 0.46 Middle Sewickley (NT AV, CE 7/17/09 10:50 Vec Cover 50% Cloud cover No 70 Penential Spring field 0 40 0 40 0 20 0 Indicate sources Nove Low  7766 6 0.67 0.67 William Nut UNT AV, PE 8/04/09 1:00 Vec Cover Central Spring field 15 75 0 0 0 10 0 Indicate Sources Nove Low  3768 6 0.67 0.67 William Nut UNT AV, PE 8/04/09 1:00 Vec Cover/Lownry Clear/Junny Vec 75 Penential Spring field 15 75 0 0 0 10 0 Indicate Sources Nove Low 3	Modify O 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1	DRY Clear one None N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 7 7.8 Normal/N 7.3 Clear one None N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0 0 0		0 10 9.0 Marginul (6-10) Tair Duffers  Neodwaters in pond, passes through another pond, one culvert, pix well pumping station nearby, goodwater through another ponds, to make the register.
Trib 37651 Of 1263 Sewickley Creek U Unassessed	Some  Middle Sewickley (Waltz Storm (Nazwy 17651 0.032 0.52 MBI) AV, AT 7/30/09 11.20 a Yes 75% Good cover care) Yes 75 Perennial Spring-fled 80 20 0 0 0 0 landose sources None Low :  Some  Type of other potential Soring Fled Some Some	Shaded 0 0 0 0 0 0	Normal/N 7.8 Clear one Note N/A 0 0 0 0 0 0 0 0 0 0 0		0 0 0	0 0 0 0 0	0 14 16.0 Optimal (16-20) open at top, forest at bottom, also part of Thickethy flow Game Farm, good buffers
1265 Buffalo Run U Unassessed  Abandoned Mine 1268 Sewickley Creek N Drainage/Metals:1996 A	17662_181_237 0.54 Buffalo Nun GS, 50 8/13/09 9:52 a Ver. 75% cloud cover '25% cloud cover 'Ver 65 Persential Springs feed 65 10 0 5 0.20 0 instead sources None Low 1 17662_181_51.0 100% Clouds 17566_184_1.1 200% Clouds 100% Clouds 10	Moonly         0         0         0         0         0         Attached         Attached         Moonly         Attached         S         Moonly         Moonly         Attached         S         Moderate         Shaded         25         65         10         0         0         Minimal         Algae         green         1         Right         By Research         10         0         0         Minimal         Algae         green         1         Right         Right         10         0         0         Minimal         Algae         Right         10         0	6.57 Clear one Nones N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0		Stream has trees for building for first at lower full, document councils delli Daile, With a daminium to 12.0 is Suboptimul (11.5) has greamer, full-vict dor prient, scientific insteam, emboded and antient deposition.  3 If a contract of the contract of
Trib 37648 To 1273 Sewickley Creek U Unassessed	Some  Coldeius Type of other potential  37648-4.18.5.1 0.92 Middle Sewickley AV, AT, CTS 7/8/09 2:15 p Yes clear/turny clear/turny Yes 77 Intermittent Spring-feed ter 20 30 0 0 0 50 0 Landuse sources None Low :	Mostly I Shaded 0 0 0 0 0	.   Niormai N   7.5-8.0 Clear one None   N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0	0 0 0		nsidertal encreachment or both banks, sightly covered in herbaceus growth, some cover and 0 0 12.0 Suboptimal (11-15) shade, like well is some areas, drawnflanky, some areas mowed close, fair buffers
1294 Wilson Run U Unassessed Trib 37650 Of	Trigo of Colors   Trigo of C	Moderate MoothyOpen 20 60 20 0 0 Minimal emergent	Sightly, Normal/N 7.664.05 Turbid one None Poor AMO N/A 0 0 20 20 10 50 0 0 0 1 Normal/N Normal/N	wettand habitat near  11 top 9 0 embedded in areas 12 0 mostly run + wettand 16	15 fairly well filled 12 8 bridges total 12 0 nun	thy heavy in cortain 6 6 12 residential areas 6 6 poor in areas 4	lower crops and yards, mmed up pond area and mowed, part of Thicketty Run Game Farm, Hunger
1296 Sewickley Creek U Unaccessed  Trib 37700 Of 1298 Sewickley Creek U Unaccessed	37650 0.024 0.24 M89] AV, AT 7/30(09 11:12*a Yee 75% Good cover call) Yee 75 Persental Soring-field 0 25 25 0 0 50 0 isochoos sources Score Low 5 50ml Type of Schim Particular Soring Score 17/200 0.056 0.	i Mostly Open 0 0 0 0 0 0 Mostly 5 Shaded 0 0 0 0 0 0	7.5 Clear can's Notes N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0 0 0	0 0 0 0 0	0 0 10.0 Marginul (6-10) Garden- crops grown by Game Commission Gor't test prac, swarrey pond 0 0 12.0 Suboptimal (11-15) starts in forest and flows into ros area, fair bufflers
	Some			good cover and banks, habitat chaked		LB- had pretty good LB- fairly stable, lower banks but covered in knot weed/ RB-yard knot weed/ RB-long moved to bank at	UI-Tonophinin forest RB
Abandoned Mine  1300 Sewickley Creek N Drainage/Metals:1996 A  Trib 37701 Of  1303 Sewickley Creek U Unassessed	Some Type of other potential	Mostly 0 Moderate Shaded 35 35 30 0 0 0 Minimal None Mostly I Shaded 0 0 0 0 0 1	Normal/N   Norm Fair AMO N/A 0 10 30 25 20 15 0 0 0 0 1	woth AMD and still embedded with all present nice	no obvious bars 17 looks good 19 no changes 17 0 bends	portion of lower end no plants for 6 5 11 section mowed lown 8 6 portion, knot weed 8	torscited III dide, lower portion 7 15 moved pard 15.4 Suboptimal (11.15) right bank had nice geological formations moved yards very end of section lend wed on both banks upditream AMD
1303 Sewickley Creek U Unassessed  Trib 37641 To  1305 Sewickley Creek U Unassessed	Some Type of other potential	Shaded 0 0 0 0 1  Mostly Open 0 0 0 0 0	7.19 Gas* one None N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0	0 0 0		0 14 5.0 Optimal (16-20) Those through boten and come rea, crosses under read-one cubert, good buffers famili URI, intermedia, melion cure, process under read-one cubert, good buffers famili URI, intermedia, melion cure, Proceedia product, crops, Visteria bosc carriago, from the complex product carrier interpretable dissiplanced, cross-service product carriers in complex product carriers in
Abandon of Mine 1306 Sewickley Creek N Drainage/Metals:1996 A Trib 37687 To	Some	Modify 5 Moderate Shaded 50 40 10 1 0 Minimal None	Normal(N Fair AMO N/A 0 10 40 25 15 5 10 0 0 1 N/A 0 10 40 25 15 5 10 0 0 1 Normal(N N N N N N N N N N N N N N N N N N N	16 16 0 16 0 14	some new bar not quite ideal mo formation 16 16 11 0 run	8 8 16 8 8 3	buffer zone (RB) road-induces 3 6 buffer zone 14.3 Suboptimal (11.15) buser end of New Stanton, residential commercial zerasi AMD and channelization / fix AMD Forest, sizes for wholifer influent "on culoret fillow into AMD cond below (11.34), sadment y
1310 Wilson Run U Unassessed Abandoned Mine 1313 Sewickley Creek N Drainage/Metals:1996 A	Some	I Shaded 0 0 0 0 1 Moothy Attached 0 Moothy 0 1 Attached 0 Moderate Shaded 10 70 20 0 0 Minimal Algae green 1	6.7 Cisur one None N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 15 16 0 16 0 17	0 0 0 lacking a cufficie 17 15 8 0 ammount of riffi	at .	0 12 13.0 Suboptimu (11-15) botton. road runs all-point to direase on right beat language post of the section. AND and water clarity is 5 14 RB -road adjacent to direase 15.0 Suboptimu (11-15) better. Less affected by AND. Altromodyl large young optimizer forest AND
Trib 37668 To 1322 Buffalo Run U Unassessed Abandoned Mine	Type of other potential Type of other type of other Obvious Nortaceo	Modfy Open 0 0 0 0 0 0 Modfy	Normal/N   Normal/N   N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0 0 0 0 0 come spdiment looks like dirt was deposition banks and glied up on right bank		Ag at top, cragifit open rusals by ball fields and Elem. 5-dood at 40.1748 7.6.61377, lower section 0 0 10.0 Marginal (6-10) homes moved to stream side, milroux.  (8E) eductrial area limits.
Abandoned Mine  1323 Sewickley Creek N Drainage/Metals:1996 A	370%_D3_12.5.  guartic UR 63 0.11 Mid Sevicidiny Creek 4/1/10 340 No clear/jumny No 60 Penential Spring-fed 40 30 0.25 0 5 0 induse sources. Minimal Low us Instituted 5  Some	Moderate Shaded 20 65 15 0 0 Minimal	7.8 Turbid one Fair AMO N/A 0 15 65 10 5 2 3 15 0 0 1	16 16 0 17 0 15  lots of AMDin sediment doe moving	sediment bars 16 14 to create a levi 15 0 not quite ideal	LB- banks very high LB-would have better some erosion/ RB-vet score if vesetation	en judi palabatid as as limbs.  4 II (pulsar incree well) 14.7 Subaptima (15.5) but of frentweed and industrial on right decorating bank. AMO / Fix AMO  18-upper not bad lower has roudy at start of section, train track next to right bank for 1/4 of section, Ag active pasture on lower
Abandoned Mine 1329 Sewickley Creek N Drainage/Metals:1996 A	37556_1273_12. 1041 1056.cool strom (beavy Warm Type of other potential agustic Life 63 0.90 sewickley main AT, TS 4/9/10 AM No cover oii) Yes 45 Perential Spring-fled water 50 0.25 0.0 Inchicae Sources Moderate Low Trees decid. 4 Source Strowers  1 Type of other potential	Mootly Significa O Slow Shaded 20 50 30 1 0 0 nt None	Normaj(N) 7,7:7.9 Turbid one None Fair AMO N/A 0 5 20 25 25 25 0 0 0 0 1 Normaj(N)	was not choked out water allows it to s 14 by AMD 8 0 settle 12 0 fact shallow missing 8	sed around all woody bridge, railroad sediment strong, debris 17 bank to bank 13 against right bank 13 0 riffles	on trees good in other was less knot weed 5 5 10 areas 5 5 more native/ RB-same 4	partury (14-9-pain tracks affect portion of left bank fenced to streams degle-house. All bower end old rail road bridge is causing very 6 10 score 11.5 Suboptimal (11-15) large log jain and flooding problems AMO sediment from up stream orange staining
1330 Belson Run U Unaccessed  Trib 37648 To  1333 Sewickley Creek U Unaccessed		: Micatly Open 0 0 0 0 0 1  Macatly Shaded 0 0 0 0 0 0	DRY Clear one None N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0 0 0		0 4 2.0 Poor (0-5) Runs abong road, usual dish abong road, culserted once in middle, month years correspo, dry 0 10 15.0 Subaptimal (15.15) grazing, forest, ag, offeren crossing built exit of concrete sides, the buffers
Trib 37670 To 1339 Buffalo Run U Unassessed Abandoned Mine	Some Warm Free of other constrain mis hard	Modrity Attached I Moderate Shaded 35 35 30 0 0 1 Minimal Algae blue-green Modrity covered in	Signity Normal/N: 5.74.2 Turbid one None Fair AMO N/A 0 0 45 20 20 10 0 0 0 1 Signity	14 Lets of sediment 12 0 25-50% 17 0 9	lots of sand 13 flows well 17 12 0 few areas not using multiple crossines by	and over riese to	4 11 many parids 33.0 Suboptimal (13.5)  Acc on both sides wy moused partic close to discuss, less of garbage in stream, good overhead cower, Addit operations And operations And operations of parity wilds, read is close to  Buttland Non section where it connects to Section Analysis or in water (very caregif from somewhere
1343 Buffalo Bun N Drainage/Metals:1996 Ar Trib 37692 To 1347 Sewickley Creek U Unassessed	quate Life 37462 0.0 5 0.50 Buffale Nun AT, 66 8/07/09 30:00 No Clear/humpy Clear/humpy Yes 70 Penential Spring-Red Water 50 0 0 25 0 25 0 0 Indices Survives Minimal None Trees words. 1  37692 2.78 1.67 0.29 Sewickley Minim AV, PR 7/N/09 1.45 Yes Clear/humpy No 75 Penential Spring-Red 10 80 0 0 0 10 10 Indices Sources None Low	Moodly   Covered in	7.1-7.5 Turbid Other None Peor AMO N/A 5 20 50 10 5 5 5 0 0 0 0 0	8 AMO Hurts Habitat 10 0 Iron in Riffles 18 0 13 0 0 0 0 0 0 0	few sed bars 15 whole channel 12 roads and rr 18 0 good bends	7 6 13 some slipping 9 9 stream 7	6 13 stream 13.8 Suboptimal (13.45) upptream.
Trib 37692 To 1348 Sewidsky Creek U Unaccessed Trib 37667 To	Some 37692_0.98_1.36_0.28 Middle-Sewickley AT_CTIS 7/R/09_2.24 Yes_25%-Good-cover_clear/tunnny Yes_73 Penential Spring-fled 0 25 0 0.25 0.50 0 Isabuse sources Nove Low	i Mostly Open 0 0 0 0 0 0 Mostly		0 0 0 0 0	0 0 0		en el d'amagement (Fix Den Arru), Reveel and sprayed, trans lote a sette d'amagement per un el de de la companio del companio del companio de la companio del com
1349 Buffalo Run U Unassessed	17667 0.079 0.79 UNT Buffalo Run AT, 65 8(07/09 1:15p Yes Glear/burney Clear/burney Yes 75 Penential Spring-field 70 0.25 0 5 0 technology Score 1.55 Scor	Mostly (	7.2-7.3 Clear one Notes N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0 0 0		0 0 12.0 Suboptima (11-15) right next to drawn, mostly shaded but when in ag. v. oper, oilly at top and get better at bottom  Buffers are good. Well tree-ed and resident not detection  Very short section in town of Ruff 10 bits. Homes near by, but this section well buffered. PH: Sheet
1359 Buffalo Run U Unaccesced  Trib 37636 Of 1362 Sewickley Creek U Unaccesced	05,5617 08/120 11:00 CS,5617 08/120 11:00 Warm Type of other potential 176/22:117.2-41 0.04 Buffalo Run 12(2)(19) 9 MM Yez 75% cloud cover rain (bits day rain ) Yes 65 Penential Saring due water 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Modify  Shaded 0 0 0 0 0 0  S ModifyOpen 0 0 0 0 0 0	7.0 Clear one Notes N/A 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0	0 0 0		and residents not descript on a contract of descript on a contract on a contract of descript on a contract on a contract of descript on a contract on a contra
Trib 37654 Of 1365 Sewickley Creek U Unassessed	Some  Coldina  Type of other potential  37654 0 0.62 0.62 Middle Swickley UNT 8P, PR 7/50(99 10:30 a No 75% doud cover clear/furnry Ves 74 Penential Spring-fed toer 30 0 50 20 0 0 0 Landuse sources Minimal Low Trees	Mostly Attached Shaded 40 40 20 0 0 1 None Algae	Slightly Normul/N Agricultur 7.76 Turbid one None Fair e N/A 0 5 5 25 30 35 0 0 0 0 1	11 narrow strip of cover 14 0 12 0 few pools 12	did not fill available sand bars present 14 channel 14 1 culvert 13 0		7 14 13.3 Suboptimal (13.55) one cubert with water diversing over cubert, heavy road cond on right
Trib 37647 Of 1370 Sewickley Creek U Unassessed Trib 37649 Of 1378 Sewickley Creek U Unassessed	An instant of the present of the pre	! Mostly Open 0 0 0 0 0  Mostly I Slow Shaded 40 40 20 1 0 1 None Algae	Norma(N) Norma(N) No N	0 0 0 0 0 0 a few coverhanging 12 banks 10 0 10 10 little variety 13	0 0 0 0 0 at top several few decodes 15 10 culvers 2 at bottom 13 0		0 0 12.0 Suboptimal (15.15) Dhy channel, small/hofu scriou, better buffer at bottom. Top has some partium land and crops.  2 pools at start, sweet columns it start, sheet water case that bottom; thory hell, pain peak, and  2 pools at start, sweet columns it start, sheet water name at bottom; thory hell, pain peak, and  2 pools at start, sweet columns it start, sheet water name at bottom; thory hell, pain peak, and  2 pools at start, sweet columns it start, sheet water for suborns.
Trib 37684 To 1379 Wilson Run U Unassessed	Some 37684 0 0.95 0.95 William Rui UNT AV, PR 8/04/09 12:53 P Yes Clear/Lurony Clear/Lurony Yes 75 Personnial Spring-field 30 70 0 0 0 0 Indicas sources Mone Low 2 Some 7	Slow Shaded 40 40 20 1 0 1 None Algae  Attached  Mostly Open 0 0 0 0 0 1 Algae brown/green	8.05 Turbid one None Fair e N/A 0 0 0 20 35 35 10 0 0 0 1  Normal/N 7.7 Clear one None N/A 0 0 0 0 0 0 0 0 0 0 0				7 14 moving on small sections 13.0 Suboptime (15.15) points in glazare throughout.  One cubert, headwards in agif forces, must fromply conflicts, trowns/green aligns, goes under turnship.  13.0 Suboptime (15.15)
Trib 37658 CF 1382 Sewickley Creek U Unassessed  Abandoned Mine 1388 Sewickley Creek N Drainage/Metalist:1996 A	17658 0.014 0.14   Sewickele/Modifie AT, W/CTG 779/09 2-45 p Yes Cear/Junney Ves 80 Persential Spring fad 15 0 0 0 85 0 Indicate Sources Nove Low 1 77955_13.1_1.45   2007. Collected State Planey Collected	Mostly   Shaded 0 0 0 0 0 0   Attached	Norma(N	0 0 0 0 0	0 0 0		0 0 12.0 Subaptimal (13-15) way don't section, 2 homes with youth, some forest above, way small, wetland exactly, fail further.  Mit stacks on right banks remote section, train bridge crosses, mostly van through out, free word tribs.  Mit stacks on right banks remote section, train bridge crosses, mostly van through out, free word tribs.  Mit stacks on right banks remote section, train bridge crosses, mostly van through out, free word tribs.
1388 Sewickley Creek N Drainage/Metals:1996 A Trib 37643 To 1389 Sewickley Creek U Unassessed	quartic Life 2 1.02 main sewickley PH, MK 4/H/20 10:40 No cover civil "Yes 45 Perential Spring field ser 83 5 0 10 0 2 0 Earthcas sources Moderate Low Trees bardwoods 4 5.0me Table (State Particular) Trees Surfavoods 4 5.0me Table (State Particul	5 Moderate Shaded 5 85 10 0 0 0 Minimal Algae green	6.6 Turbid Other Nove Fair AMO N/A 0 5 70 10 5 5 5 0 0 1  Normal/N A/A Clear one Nove N/A 0 0 0 0 0 0 0 0 0 0 0	14 15 0 15 0 17 0 0 0 0 0 0 0	18 17 0 10 0 0 0 0		7 15 15.6 Suboptimu (11-15) on right basin not on map, montains INIS- Small polarage aroung 34 of may down this to LEB. AAMD, NV /fix AAMD up-drawn of "chamma, seasoning size," so present to be all forestrated land, 1 of the size of t

											·																												Some res near mouth and main road culvert. A little active ae, a few sas wells and dirt roads. L	
Trib 37672 Of 1390 Buffalo Run U	Unassessed	37672_0_0.6 0.60	Buffalo Run UNT	8/13/20 AT, BN 09 1:3	30 pm Yes 25% cloud cover	er 25% cloud cover Yes	75 Perennial Spring-fe	led 75	5 0 0	10 0 10 gasw	Some	e Low	4		0 0 0	0 0 0		7.3	Normal/N Clear one None	N/A 0	0 0	0 0 0	0 0 0	0 0	0 0	0	0	0	0	0		0	0 0 0	0	0 0	0 0	16	16.0 Optimal (16-2	3/4 forested. Trees shade entire reach. Enters main buffalo run just east of Vincent lane, a pri	
1406 Wilson Run U	Unassessed	37681_0_0.7 0.70	Wilson Run	PR, SG 8/07/09 10	0:35 a Yes clear/sunny	clear/sunny Yes	74 Perennial Spring-fe	led 0	0 65 0	35 0 0 land	f other potential duse sources Non Some	e Low	8	Mostly Shaded	0 0 0	0 0 0	Attached Algae Brown	8.04	Normal/N Clear one None	N/A 0	0 0	0 0 0	0 0 0	0 0	0 0		0	0	0	0		0	0 0 0	0	0 0	0 0	6	9.0 Marginal (6-1		
1407 Belson Run U	Unassessed	37677_1.79_2.31 0.52	Belson Run UNT	MH, Cb 7/22/09 12	2:00 p Yes 75% cloud cover	showers or (intermittent) Yes	75 Perennial Spring-fe	led 0	0 100 0		f other potential duse sources Non	e Low	2	Mostly Oper	0 0 0	0 0 0		8.3	Normal/N Clear one None	N/A 0	0 0	0 0 0	0 0 0	0 0	0 0		0	0	0	0		0	0 0 0	0	0 0	0 0	4	2.0 Poor (0-5)	bottom 7/8 stream dry, parallels road, starts out of retention pond, culverted multiple times, beside Sony Technology center, poor buffers, ditch along road only water at very top	runs
1411 Sewickley Creek N	Abandoned Mine Drainage/Metals:19	96 Aquatic Life 8 0.08	sewickley main	AT, TS 4/9/10	11:45 100% cloud AM Yes cover		45 Perennial Spring-fe	led 0	0 0 50		f other potential duse sources Non	e Low	40		0 0 0	0 0 0		7.9	Normal/N Clear one None Goo	1 N/A 0	0 0	0 0 0	0 0 0	0 0	0 0		0	0	0	0		0	0 0 0	0	0 0	0 0	10	13.0 Suboptimal (11	open space park/ball field and parking on LB. right bank is all residential. Mature trees but not 15) wide. Large sediment bar just past mouth UNT 1452	very
Trib 37646 Of 1415 Sewickley Creek U	Unassessed	37646 0 1.02 1.02	UNT to Middle Sewickley	AT, TS 9/22/09 12	rain (steady 2:39 p No rain)	showers (intermittent) No	70 Perennial Spring-fe	Warm led water 80	5 5 0		Some If other potential Stuse sources Minir	nal None Trees	mix hard woods 8	Mostly Moderate Shaded	40 40 20	0 0 1	Significa nt None	6.1-7.4	Normal/N Clear one None Goo	I Sewage N/A 5	5 65	5 5 15	0 0 0	0 17 great habita	t for most 16 0	some silt 1	8 0	15 some bar form		water levels due to no rain 15	couple culverts 1	8 0	9 8 1	17	8 8	8 8	16	16.0 Optimal (16-2	Headwaters by Yough Schools, top in bean field, at school-small wastewater treatment system  poor pH of 3.0, sediment from Ag and roads.	n w/
Trib 37655 Of 1416 Sewickley Creek U	Unaversed	27555 0 0 67 0 67	Middle Souicklow IINT	AV. CB 7/17/09 11	100% cloud	50% cloud cours No.	70 Perennial Spring-fe	two a	0 0 10 0	Type of 90 0 land	Some of other potential	o low		0000	0 0 0			81	Normal/N	N/A 0					0 0	,							0 0 0		0 0	0 0		7.0 Marginal (6-1	flows behind houses, mowed up to bank in most places, grass clippines and aleae in stream.	oily
Trib 37657 Of	Unaccessed						80 Perennial Spring-fe		5 0 0 0	Type of	Some f other potential	· LUW	,	Mostly	0 0 0			82	Normal/N																			12.0 Suboptimal (11	parallels road, some scattered residental, some mowing, many culverts, veg cover on banks,	
1424 Sewickley Creek U Trib 37663 To	Unassessed							Warm		Type of	fuse sources Non Some if other potential	e Low	3	Mostly					Normal/N	N/A 0					0 0		0	0	0	0		0	0 0 0		0 0	0 0			Excavation co. bus garage near bottom, rest runs through meadows, trees near some rural ho	mes,
1428 Buffalo Run U Trib 37644 Of	Unassessed	37663_1.36_2.14 0.78	Buffalo Run UNT	AT, BN 8/13/09 12		er 25% cloud cover Yes showers	70 Perennial Spring-fe	Ved water 50 3	0 0 10 0		fuse sources Non Some if other potential	e Low	4	Shaded	0 0 0	0 0 0		7.7	Clear one None	N/A 0	0 0	0 0 0	0 0 0	0 0	0 0		0	0	0	0	1	0	0 0 0	0	0 0	0 0	14	14.0 Suboptimal (11	<ol> <li>buffer intact, runs near road at mouth, pasture land close to it.</li> <li>Forest and field/pacture, has gaswell road culvert, teeny little stream, probably gets sediment</li> </ol>	from
1437 Sewickley Creek U	Unassessed	37644_0_0.56 0.56	UNT to Middle Sewickley	AT, TS 9/22/09 2:			72 Perennial Spring-fe	led water 85 1	5 0 0 0	0 0 0 land	fuse sources Non Some	e Low	2	Shaded	0 0 0	0 0 0		n/a	Clear one None	N/A 0	0 0	0 0 0	0 0 0	0 0	0 0	0	0	0	0	0		0	0 0 0	0	0 0	0 0	0	12.0 Suboptimal (11	15) gaswell road.	TO THE STATE OF TH
1438 Sewickley Creek U	Unassessed	37657_0.58_1.15 0.57	Sewickley Middle	AT, AV, CTIS 7/9/09 2:	:50 p Yes clear/sunny	clear/sunny Yes	80 Perennial Spring-fe	led 65 2	0 0 0 0	15 0 0 land		e Low	3	Shaded	0 0 0	0 0 0	blue/green	8.2	Normal/N Clear one None	N/A 0	0 0	0 0 0	0 0 0	0 0	0 0		0 0	0	0	0		0	0 0 0	0	0 0	0 0	8	13.0 Suboptimal (11	15) starts in a pond, travels through overgown field, some res, dog warning signs (DiNardio), fair b	
1443 Buffalo Run N	Abandoned Mine Drainage/Metals:19	e 996 Aquatic Life 37662_0.5_1.83 1.33	Buffalo Run	AT, GS 8/07/09 12	2:15 p No clear/sunny	clear/sunny Yes	75 Perennial Spring-fe	Warm led water 80	5 0 5 0		fother Obvious duse sources Minir	Mediu m nal m Trees	ixed hard wood 15	Mostly Moderate Shaded	35 35 30	0 0 0	Attached and red Minimal Algae filimentars	s 30 6.9-7.1	Slightly Turbid Other Sheen Poo	AMD N/A 5	10 60	10 5 5	5 0 0	0 8 AM	0 10 0	Iron in riffles 1	7 0	15 couple be	ars 16	14	few road bridge 1	3 0	7 8 1	15	8 8 few yards mowes	1 7 7	14 road still close somet'	mes 14.0 Suboptimal (11	section has large iron AMD discharge, above iron water seems to have aluminum issues, buffal 15)	o run AMD, Weir-able
1447 Sewickley Creek N	Abandoned Mine Drainage/Metals:19	e 996 Aquatic Life 37556 10.4 11.3 0.90		AT TS 4/9/10 2:4	100% cloud 47 PM No cover	storm (heavy	45 Perennial Spring.fe	Warm		35 0 20 miner	Obvious refuse sources Minir	nal Insu Trees e	mix hard woods sergroons 35	Mostly Moderate Sharled	35 35 30		Attached		Slightly Normal/N			20 40 40		good cobi 0 16 deb	ble and	some sed in riffles 1		letv 15 some sed not 1			two bridges old mill channel, and long straight section by road 1	upper half good		LB-good banks lots of knotweed / RB-	both-vegetation 7 7 throughout knotwe		LB- lots of trees/ RB- road	ad very 14.7 Suboptimal (11	15) neat old mill on right bank. Shallow sections with slick bottom	large gob pile on both sides at start of section
Trib 37692 To						,		-		Type of	Some of other potential		ergreens 33	Mostly	33 35 30		Million Ague brown green	an 80 7.9	Normal/N	1 Man 14 1	0 101 30	30 10 10				some sed in nines 2	9 0 gootsen	nety 15 some sed not	terrible 18 b	MIR ID DAIR 10									headwaters in ag field, goes through res/parallels road, 3 culverts, good shading past farm, m	
1448 Sewickley Creek U Trib 37669 Of	Unassessed	37692_3.26_3.92 0.66	Middle Sewickley UNT	AV, PR 7/8/09 1:	:15 p Yes clear/sunny	clear/sunny No	74 Perennial Spring-fe	led 40 3	0 0 0 0	30 0 0 land	duse sources Non Some if other potential	e Low	3	Shaded	0 0 0	0 0 1		7.88	Clear one None Normal/N	N/A 0	0 0	0 0 0	0 0 0	0 0	0 0		0	0	0	0	1	0	0 0 0	0	0 0	0 0	8	13.0 Suboptimal (11	15) up to bank by houses Active pasture near top with tree cover, active ag fields at bottom, past with tree, ag has but	Ter
1450 Buffalo Run U	Unassessed	37669 0 1.2 1.20	UNT to Buffalo Run	AT, GS 8/07/09 2:	:00 p Yes clear/sunny	clear/sunny Yes	77 Perennial Spring-fe	20 2	0 40 0 0	20 0 0 land	duse sources Non Some finther notential	e Low	3	Mostly Oper	0 0 0	0 0 0		7.7-7.8	Clear one None	N/A 0	0 0	0 0 0	0 0 0	0 0	0 0	6	0	0	0	0	1	0	0 0 0	0	0 0	0 0	0	11.0 Suboptimal (11	<ol> <li>(grass), when forest, good looking</li> <li>Paralled by rural road, not affecting riparian zone, upper section stepper stream, lower</li> </ol>	Active Ag
1452 Sewickley Creek U	Unassessed	37638_0_1.54 1.54	Middle Sewickley UNT	AT, TS 9/03/09 2:	::30 p Yes clear/sunny	clear/sunny No	75 Perennial Spring-fe	led 25 5	0 0 0 0	25 0 0 land	duse sources Non Some	e Low	5	Shaded	0 0 0	0 0 0		7.7-7.9	Clear one None	N/A 0	0 0	0 0 0	0 0 0	0 0	0 0		0	0	0	0		0	0 0 0	0	0 0	0 0	12	14.0 Suboptimal (11	15) meadow/wetland, saw fish.	
Trib 37680 To 1456 Sewickley Creek U	Unassessed	37680_0_1.18 1.18	Middle Sewickley UNT	BP, PR 7/30/09 2:	::10 p No 75% cloud cover	er clear/sunny Yes	78 Perennial Spring-fe	Coldwa led ter 40 5	5 0 0 0	5 0 0 land	f other potential duse sources Minir Some	nal Low Trees	4	Slow Shaded	40 40 20	1 0 1	Minimal	7.78-7.91	Normal/N Clear one Slick Fai	Developm ent N/A 0	0 15	35 25 25	0 0 0	0 14 some types	available 13 0	heavy in areas 1	2 0 few pond	nds 14 limited			several culverts, long culvert under turnpike 3	L 0 very straight	7 6 1	steep hiliside erosion 13 at top (RB)	8 8 good cover	6 6	12 field and roads buff	er 13.4 Suboptimal (11		
1459 Wilson Run U	Unassessed	37681_4.83_5.37 0.54	Wilson Run	AV, PR 8/06/09 10	0:10 a Yes clear/sunny	clear/sunny Yes	70 Perennial Spring-fe	led 5	0 0 0	95 0 0 land	f other potential duse sources Non Some	e Low	3	Open	0 0 0	1 0 1	Attached Algae brown	8.1	Normal/N Clear one None	N/A 0	0 0	0 0 0	0 0 0	0 0	0 0		0 0	0	0	0		0	0 0 0	0	0 0	0 0	6	5.0 Poor (0-5)	residential, heavily mowed, 10 culverts (under driveways,) some sections channelized with la stone and concrete, some forest below.	uße
1470 Wilson Run U	Unassessed	37681_3.79_4.04 0.25	Wilson Run UNT	AV, PR 8/06/09 11	1:00 a Yes clear/sunny	clear/sunny Yes	71 Perennial Spring-fe	led 0	0 0 0	0 100 0 land	f other potential duse sources Non	e Low	6	Open	0 0 0	0 0 0		6.4	Normal/N Clear one None	AMD N/A 0	0 0	0 0 0	0 0 0	0 0	0 0		0	0	0	0		0	0 0 0	0	0 0	0 0	0	5.0 Poor (0-5)	wetland, AMD impact starts just above in section 1134	
Trib 37685 To 1479 Wilson Run U	Unassessed	37685_0_0.95 0.95	Wilson Run	AV, PR 8/06/09	Yes clear/sunny	clear/sunny Yes	70 Perennial Spring-fe	led 20 7	0 0 0 0	10 0 0 land	f other potential duse sources Non	e Low	3	Mostly Oper	0 0 0	0 0 1		7.5	Normal/N Clear one None	N/A 0	0 0	0 0 0	0 0 0	0 0	0 0		0	0	0	0		0	0 0 0	0	0 0	0 0	0	10.0 Marginal (6-1		
Trib 37648 To 1482 Sewickley Creek U	Unassessed	37648_1.74_2.7 0.96	Middle Sewickley (Waltz Mill)	AV, AT 7/30/09 11	121a No 75% cloud cover	storm (heavy er rain) Yes	75 Perennial Spring-fe	led 5 2	5 20 0 0	Type of 45 5 0 land	Some of other potential duse sources Minir	nal Low Shrubs wo	ody shrubs 10	Mostly Moderate Shaded	35 40 25	0 0 1	Rooted Minimal emergent cattails	7.8	Normal/N Turbid one None Goo	I N/A 0	0 0	0 0 0	0 0 0	mowing at t 0 15 somev	op affects what 15 0	1	8 0	16	17	15	bridge 1	7 0	7 7 1	14 some erosion	upper half some cli 6 6 mowed yards	368 5 5	10 some ag, mowing after	t zone 14.0 Suboptimal (11	upper section res mowing, overgown meadow/field at bottom, wetland pond near bottom, v buffered lower half, UNT flowing into 40.22723 -79.64482; water too turbid to determine sub composition	vell- strate
													ixture of											sewage im high				island sedin	ment cubic	strate evident	highway stabilization			stabilized with rip rap	vegetation throughout, not always native, not	-1			culvert feeding into stream (40,22082 -79.50472) pH 8.1 iron deposition 8.4. foul odor and s	900au
Trib 37691 To 1484 Sewickley Creek Y	Attaining/Attaining	: . Aquatic Life 37691_0_1.58 1.58	Middle Sewickley UNT	AT, AV, CTIS 7/9/09 12	2.54 p No clear/sunny	clear/sunny Yes	81 Perennial Spring-fe	Warm led water 0 2	0 15 50 0	Type of 15 0 0 land	fother Obvious duse sources Mode	Herbaceo tre	es, shrubs,	Moderate Mostly Oper	40 40 20	1 0 1	Attached green None Algae filamentous	ıs 80 8.1-8.4	Slightly Turbid Sewage Other Poo	Sewage N/A 0	10 40	20 20 10	0 0 0	sedimenta	tion, but	some sed issues 5	0 missing some r	deposition in regimes 13 after culve	areas more	often than not-	issues, shoring, tiling	infrequent riffles, st 0 present	ii 7 7 5	and shoring, but	categories 7 7 represented		all impacts- ag, res, past 4 highways, culverts, mov	iture, rwing 11.4 Suboptimal (11	filamentous algae; 2nd site at broken public sewer (40.22305 -79.60590); last site (upstream	n at
Trib 37670 To				6/2/201		showers				Type of	Some of other potential								Normal/N																				Residential area. Yards, but not mowed quite up to stream edge. Some small trees. Culverted a road. Short section. Undeveloped right by stream. Sort of forested. Higher banks.	under
1490 Buffalo Run U Trib 37639 Of	Unassessed	37670_0.83_0.97 0.14			100% cloud	showers	81 Perennial Spring-fe		0 0 0		fuse sources Non Some f other potential	e Low	5	Mostly	0 0 0			3.5	Clear one None Normal/N	N/A 0	0 0	0 0 0	0 0 0	0 0	0 0	0	0	0	0	0	,	0	0 0 0	0	0 0	0 0	0	12.0 Suboptimal (11	<ol> <li>Gravel/sed/garbage piles right next to road and stream. AMD coming from</li> </ol>	
1494 Sewickley Creek U	Unassessed	37639 0 1.1 1.10	Middle Sewickley UNT	RH, AT, TS 9/09/09 11	1:40 a Yes cover	(intermittent) Yes	65 Perennial Spring-fe	led 60 1	0 15 0 0	15 0 0 land		e Low	3	Shaded	0 0 0	0 0 0		6.6-7.5	Clear one None	N/A 0	0 0	0 0 0	0 0 0	0 0	0 0		0	0	0	0	1	0	0 0 0	0	0 0	0 0	12	14.0 Suboptimal (11	<ol> <li>Rural Res, some ag, crop fields at top, pastured area near bottom.</li> </ol>	
1495 Buffalo Run U	Unassessed	37664_0_0.83	Buffalo Run	GS, SG 8/13/09 11	1:15 a Yes 75% cloud cover	er 25% cloud cover Yes	70 Perennial Spring-fe	led water 40 2	0 0 10 0	30 0 0 land	fuse sources Non Some	e Low	4	Mostly Oper	0 0 0	0 0 0		7.5	Clear one None	N/A 0	0 0	0 0 0	0 0 0	0 0	0 0		0	0	0	0		0	0 0 0	0	0 0	0 0	0	11.0 Suboptimal (11	<ol> <li>Excavation building at mouth, piped at bottom by excavation co, little bit of silt, good cobb</li> </ol>	
Trib 37693 Of 1497 Sewickley Creek U	Unassessed	37693_0.47_0.78 0.31	Middle Sewickley UNT	At, Av, CTIS 7/9/09 11			72 Perennial Spring-fe	led 0 8	0 0 0 0	20 0 0 land	f other potential duse sources Non Some	e Low	4	Mostly Shaded	0 0 0	0 0 0		8.4	Normal/N Clear one None	N/A 0	0 0	0 0 0	0 0 0	0 0	0 0		0	0	0	0		0	0 0 0	0	0 0	0 0	0	11.0 Suboptimal (11		
Trib 37643 To 1498 Sewickley Creek U	Unassessed	37643_2.13_2.54 0.41	UNT to Middle Sewickley	AT, TS 9/22/09 1:	rain (steady :30 p Yes rain)	showers (intermittent) No	70 Perennial Spring-fe	Warm led water 75 2	0 0 0 0	5 0 0 land	f other potential duse sources Non	e Low	2	Mostly Shaded	0 0 0	0 0 0		n/a	Normal/N Clear one None	N/A 0	0 0	0 0 0	0 0 0	0 0	0 0		0 0	0	0	0		0	0 0 0	0	0 0	0 0	12	15.0 Suboptimal (11	Dry channel, score based on channel apperances downstream pH shows no issues, some res a and forest.	ag
	Dendered Merc	27777 4272 42			4000 -14			******		7	Some of other potential			Mark			Control		No					lots of po					etan la					LB-active erosion and high bank /RB- better			LB-road on top of stre bank/ RB-RR close but les	eam .		
1499 Sewickley Creek N	Drainage/Metals:19	7 37536_12.03_12. 996 Aquatic Life 81 0.18	sewickley main	AT, TS 4/9/10 9	9:45 No cover	rain) Yes	45 Perennial Spring-fe	led water 50	0 0 0	50 0 0 land	duse sources Model Some	ate Low Trees	disd. 40	Moderate Shaded	30 40 30	0 0 0	nt None	0 7.5	Turbid one None Fai	AMD N/A 0	5 25	20 20 20	0 0 0	without th 0 14 sedim	ent 10 0	AMD sed in riffles 1	8 0 evenly	y 10 pools	17 fi	lowing good 16 r	road close to left bank 1	0 some riffles	3 5 8	8 but still eroding	banks but some sp 5 5 are bare/ R8-sam	e 2 8	10 nice buffer	12.9 Suboptimal (11	15) main stem has paved road hugging left bank, RR crosses but not on top of right bank. Surface mining, farming and residential, erosion at outside bends in lower segment, channe	lis
Trib 37660 To 1503 Sewickley Creek U	Unassessed	37660_0_1.36 1.36	UNT to Middle Sewickley	RH, MK 9/22/09 10	rain (steady 0:00 a Yes rain)	showers (intermittent) No	72 Perennial Spring-fe	Warm led water 10 1	5 30 0 0	10 0 35 Surface	potential se mine sources Non Some	e Low	3	Mostly Shaded	0 0 0	0 0 0		4.3	Normal/N Clear one None	N/A 0	0 0	0 0 0	0 0 0	0 0	0 0		0	0	0	0		0	0 0 0	0	0 0	0 0	4	2.0 Poor (0-5)	mostly concrete. Bedrock exposed. Bank stablized with tires. AMD treatment plant near more untreated AMD discharge near mouth.	
Trib 37693 Of 1504 Sewickley Creek U	Unassessed	37693_0_0.47 0.47	Middle Sewickley	AT, AV, CTIS 7/9/09 10	0:30 a Yes clear/sunny	clear/sunny Yes	71 Perennial Spring-fe	led 0 1	0 0 40 0	25 25 0 land	f other potential duse sources Non	e Low	3-4	Mostly Shaded	0 0 0	0 0 1		8.3	Normal/N Clear one None	N/A 0	0 0	0 0 0	0 0 0	0 0	0 0		0	0	0	0		0	0 0 0	0	0 0	0 0	12	12.0 Suboptimal (11	highway, wetland (mitigated), pacture/open field (reestablishing), good buffers- with the exce 15) of double concrete culvert section (40.24501, -79.61095)	ption
1509 Belson Run U	Unassessed	37677 0 1.79 1.79	Belson Run	AV, AT, BP, PR 7/30/09 2:	:30 p No 75% cloud cover	storm (heavy er rain) Yes	80 Perennial Spring-fe	led 20 1	0 0 5 5		f other potential duse sources Minir	nal Low Trees m	ixed decid 12		40 40 20	0 1 1	None None	7.7-7.9	Slightly Normal/N Turbid one None Goo	N/A 0	10 60	10 10 10	0 0 0	0 17	17 0	1	8 0	17 fast movi	ing 17	12	small dam, culverts, driveways 1	8 0	7 7 1	urstable in pasture 14 areas	5 5 some yards mowe	nd 6 6	small section of pasture 12 even in yards shade to		long section, fast flowing, flows into Sewickley mainstern in Hunker, folloows road for most p good shading and forest	art,
1510 Sewickley Creek N	Abandoned Mine Drainage/Metals:19		main stem sewickley	RH, MK 4/1/10 2:3	30 PM No clear/sunny	clear/sunny No	60 Perennial Spring-fe	cioldwa led ter 40	0 60 0	0 0 0 land	Some	nal Low Trees h	ardwoods 40	Mostly Moderate Shaded	30 40 30	0 0 0	Attached Minimal Algae green	20 7.6	Normal/N Turbid one None Fai	AMD N/A 0	10 60	15 5 5	5 15 0	0 15	15 0	1	6 0	13	17	15	2	0	7 7 1	14	7 7	4 6	10 LB-industrial land us	se 14.3 Suboptimal (11	15) lots of industry and businessin surrounding land	DAM FIX AMD
Trib 37676 To 1513 Buffalo Run U	Unassessed	37676_0_0.35 0.35	Leighty Hollow	GS, SG 8/13/09 1:	:15 p Yes 50% cloud cover	er 25% cloud cover Yes	75 Perennial Spring-fe	Warm led water 0 8	0 20 0 0		f other potential duse sources Non Some	e Low	2	Open	0 0 0	0 0 0		7.7	Normal/N Clear one None	N/A 0	0 0	0 0 0	0 0 0	0 0	0 0		0	0	0	0		0	0 0 0	0	0 0	0 0	4	4.0 Poor (0-5)	Large dairy operation, mostly pasture with no stream bank fencing.  Start of acid pond? (picture), GPS N.40.16109 W:79.58807 (other pictures of stream, too) Or	anse
Trib 37670 To 1526 Buffalo Run U	Unassessed	37670_0.97_2.18 1.21	Buf Middle Sewickley	GS, SG 8/13/09 2:	:10 p Yes 25% cloud cover	er 25% cloud cover Yes	80 Perennial Spring-fe	led 70 2	0 0 0 0		f other potential duse sources Non	e Low	5	Mostly Shaded	0 0 0	0 0 0		3.28	Normal/N Clear one None	N/A 0	0 0	0 0 0	0 0 0	0 0	0 0		0	0	0	0		0	0 0 0	0	0 0	0 0		14.0 Suboptimal (11	acidic water, acidic pond at headwater above possible AMD drainage site, acidic backwater in	pond,
Trib 37634 To 1528 Sewickley Creek U	Unassessed	37634_0_0.63 0.63	unt to main sewickley	AT, TS 4/9/10 3:1	100% cloud 10 PM Yes cover	storm (heavy rain) Yes	50 Perennial Spring-fe	fed 40	0 60 0	Type of 0 0 land	Some if other potential duse sources Non	e Low	3	Mostly Oper	0 0 0	0 0 0			Normal/N Clear one None Poo	N/A 0	0 0	0 0 0	0 0 0	0 0	0 0		0	0	0	0		0	0 0 0	0	0 0	0 0	0	0.0 Poor (0-5)	UNT is dry. Lower end forested, upper end has chemical waste plant. Review through ariel m plant restricts access.	aps

Sample ID	SCWA ID Sar	mple ate	Flow GPM	pH Field	pH Lab	Cond. Umhos	Temp C	Alka-linity mg/L	Acidity mg/L	Iron mg/L	Mang-anese mg/L	Alum-inum mg/L	Sulfate S mg/L	usp. Solids mg/L	TDS mg/L	Fe Loading lbs/day Al Loading lbs/day	Mn Loading lbs/day	Acidity Loading lbs/day	Alkalinity Loading lbs/day	Latitude	Longitude	Notes
DMP-WR1		7/5/2012	648	6.7	6.7	1090.0	20.4	176.0	-62.0	1.2	0.1	0.0	310.8	1.3	503.7	9.6 0.	1 0.4	-482.9	1370.9			
DMP-WR1		9/4/2012 0/9/2012	263	6.3 7.0	6.1	1254.0 1270.0	14.4	140.0 204.0	-14.0 -100.0	10.8	0.1	0.0	430.5 170.6	1.9	626.0 585.0	0.0 0. 4.6 0	0.0	0.0	0.0 643.8			
DMP-WR1	1	1/9/2012	1090	7.0 7.1	6.3	1250.0	10.2	196.0	-94.0	6.8	0.0	0.0	345.2	2.2	590.0	88.4 0.	3 0.1	-1231.2	2567.2			
DMP-WR1 DMP-WR1		/14/2012 1/8/2013	1459 1459	7.1	6.8 7.1	1190.0 1200.0	9.6 9.1	200.0 228.0	-130.0 -180.0	6.3 5.0	0.4 2.8	0.0	675.7 370.6	1.7	590.0 590.0	109.6 0. 88.4 0.			3508.4 3999.6			Velocity: 1.05 ft/sec
DMP-WR1		2/6/2013	2060		6.7	1158.0		86.0	-72.0	11.8	1.0	0.0	402.1	1.7	573.0	290.9	2 23.5	-1782.8	2129.5			No chemical field data, use lab results.
DMP-WR1	3/	/12/2013	2319	7.0		1320.0	10.6									0.0 0.			0.0			
																0.0	0.0	0.0	0.0			
Average			1328	6.9	6.6	1216.5		175.7	-93.1	62	0,6	0.0	386.5	1.8	579.7	0.0 0.			0.0 2805.5			
rreruge		-	1020	0.7	0.01	1210.0	1	175.7	-5512	0.51	0.01	0.01	5002	2101	57517	50.01	*, 20	140711	2000101			
DMP-WR2	T .	7/5/2012	648	6.3	6.4	1340.0	13.8	150.0	-70.0	19.5	0.9	0.1	412.1	1.8	617.5	151.5	9 6.7	-545.2	1168.3			No flow discharge piped underground
DMP-WR2		9/4/2012 0/9/2012	143 263	6.7	6.6	1127.0 1360.0	19.6 12.9	202.0 146.0	-108.0 -50.0	6.5 25.4	0.0	0.0	322.5 170.8	2.1 5.2	582.0 607.0	11.1 0. 80.2 0.			347.2 461.5			
DMP-WR2		1/9/2012	1090	6.4	6.0	1320.0	13.1	132.0	-50.0	25.4	0.0	0.0	351.3	2.4	612.0	33.1 0.			1729.4			Chemical data only, no flow data Chemical data only, no flow data
DMP-WR2 DMP-WR2	12	/14/2012	1459 1459	6.2 6.1	6.2	1260.0 1240.0	12.8	138.0	-20.0 -84.0	24.8 23.8	0.6	0.3	402.2 452.5	1.1 1.1	608.0 606.0	434.0 4. 416.5 4.		-350.7 -1473.1	2420.1 2244.8			
DMP-WR2		1/8/2013 2/6/2013	2060	0.1	5.9	1991.0	13.0	128.0 116.0	-62.0	21.3	0.9	0.2	450.7	1.1	575.0	526.2 5.	7 22.8	-1473.1	2872.3			No chemical field data, use lab results.
DMP-WR2	3/	/12/2013	2320	6.1		1450.0	12.2									0.0 0.			0.0			
																0.0	0.0	0.0	0.0			
																0.0 0.			0.0			
Average			1180	6.3	6.2	1386.0	13.9	144.6	-63.4	17.7	0.5	0.1	366.0	2.1	601.1		0 0.0 8 6.7	-899.8	2051.0			
DMP-SOB1		7/5/2012	5	3.0	4.0	1850.0	17.2	0.0	344.0	26.8	8.3	2.3	867.9	2.6	801.2	1.6 0.			0.0			
DMP-SOB1 DMP-SOB1		9/4/2012 0/9/2012	3	2.7 2.6	4.2 2.7	1657.0 1830.0	17.9 14.8	0.0	280.0 330.0	18.6 32.7	8.8 9.9	2.1 1.2	660.8 368.7	2.6 5.6	840.0 885.0	0.7 0. 1.2 0.			0.0			
DMP-SOB1	1	1/9/2012	30	2.7	4.0	1650.0	11.2	0.0	382.0	46.5	0.8	0.2	775.6	3.1	793.0	16.8 0.	1 0.3	137.7	0.0			Flow data gathered manually
DMP-SOB1	12	/14/2012 1/8/2013	72 17	3.9 2.9	4.4	1120.0 1050.0	9.6	0.0	204.0 154.0	14.1	3.7 5.0	0.5 0.4	402.3 480.6	3.6	550.0 536.0	12.2 0. 2.7 0.		176.5 31.7	0.0			
DMP-SOB1		2/6/2013	20		3.8	830.0		0.0	91.0	11.6	4.1	0.6	375.8	2.7	414.0	2.8 0.	1 1.0	21.9	0.0			No chemical field data, use lab results.
DMP-SOB1	3)	/12/2013		2.7		1030.0	7.6									0.0			0.0			
																0.0	0.0	0.0	0.0			
																0.0 0.	0.0		0.0			
Average			22	2.9	3.9	1377.1	13.1	0.0	255.0	23.3	5.8	1.1	561.7	3.4	688.5	6.0			0.0			
DMP-SOB2 DMP-SOB2		7/5/2012 9/4/2012	140 143	4.3	4.3	1980.0	12.7	0.0	284.0	84.9	6.7	1.9	703.5	2.4	909.0	142.9 3.		477.9	0.0			
DMP-SOB2							12.9		279.0	70.6	10.0	1.7	725.7		1022.0		0 199	477.9	2.4			
	10	/10/2012	93	4.2 4.2	4.6 4.0	1977.0 2000.0	12.8 12.5	2.0 0.0	278.0 334.0	70.6 109.5	10.9 12.8	1.7 3.5	735.7 506.8	3.6 6.9	1032.0 1107.0	122.2 3	9 18.8 9 14.2	372.6	3.4 0.0			
DMP-SOB2	1	1/9/2012	93 274	4.2 4.2	4.0 4.4	2000.0 2010.0	12.5 12.8	0.0	334.0 370.0	109.5 82.5	12.8 0.1	3.5 0.1	506.8 1250.5	6.9 2.6	1107.0 1108.0	122.2 3 271.3 0	9 14.2 3 0.2	372.6 1216.9	0.0			
DMP-SOB2 DMP-SOB2	1 12	1/9/2012 /14/2012 1/8/2013	93 274 169 315	4.2	4.0 4.4 4.3 4.0	2000.0 2010.0 1970.0 2200.0	12.5	0.0 0.0 0.0 0.0	334.0 370.0 348.0 442.0	109.5 82.5 115.7 110.1	12.8	3.5 0.1 2.8 3.7	506.8 1250.5 1200.9 1272.5	6.9 2.6 4.7 6.6	1107.0 1108.0 1142.0 1190.0	122.2 3. 271.3 0. 234.8 5. 417.5 14.	9 14.2 3 0.2 6 27.4 0 39.2	372.6 1216.9 706.4 1675.8	0.0 0.0 0.0 0.0			
DMP-SOB2 DMP-SOB2 DMP-SOB2	1 12	1/9/2012 /14/2012 1/8/2013 2/6/2013	93 274 169	4.2 4.2 4.2 3.3	4.0 4.4 4.3	2000.0 2010.0 1970.0 2200.0 2038.0	12.5 12.8 12.5 12.3	0.0 0.0 0.0	334.0 370.0 348.0	109.5 82.5 115.7	12.8 0.1 13.5	3.5 0.1 2.8	506.8 1250.5 1200.9	6.9 2.6 4.7	1107.0 1108.0 1142.0	122.2 3. 271.3 0. 234.8 5. 417.5 14. 328.8 14.	9 14.2 3 0.2 6 27.4 0 39.2 1 38.0	372.6 1216.9 706.4 1675.8 1547.5	0.0 0.0 0.0 0.0 0.0			No chemical field data, use lab results.
DMP-SOB2 DMP-SOB2	1 12	1/9/2012 /14/2012 1/8/2013	93 274 169 315	4.2 4.2 4.2	4.0 4.4 4.3 4.0	2000.0 2010.0 1970.0 2200.0	12.5 12.8 12.5	0.0 0.0 0.0 0.0	334.0 370.0 348.0 442.0	109.5 82.5 115.7 110.1	12.8 0.1 13.5	3.5 0.1 2.8 3.7	506.8 1250.5 1200.9 1272.5	6.9 2.6 4.7 6.6	1107.0 1108.0 1142.0 1190.0	122.2 3. 271.3 0. 234.8 5. 417.5 14. 328.8 14. 0.0 0.0 0.0	9 14.2 3 0.2 6 27.4 0 39.2 1 38.0 0 0.0	372.6 1216.9 706.4 1675.8 1547.5 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0			No chemical field data, use lab results.
DMP-SOB2 DMP-SOB2 DMP-SOB2	1 12	1/9/2012 /14/2012 1/8/2013 2/6/2013	93 274 169 315	4.2 4.2 4.2 3.3	4.0 4.4 4.3 4.0	2000.0 2010.0 1970.0 2200.0 2038.0	12.5 12.8 12.5 12.3	0.0 0.0 0.0 0.0	334.0 370.0 348.0 442.0	109.5 82.5 115.7 110.1	12.8 0.1 13.5	3.5 0.1 2.8 3.7	506.8 1250.5 1200.9 1272.5	6.9 2.6 4.7 6.6	1107.0 1108.0 1142.0 1190.0	122.2 3. 271.3 0. 234.8 5. 417.5 14 328.8 14. 0.0 0. 0.0 0.	9 14.2 3 0.2 6 27.4 0 39.2 1 38.0 0 0.0 0 0.0	372.6 1216.9 706.4 1675.8 1547.5 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0			No chemical field data, use lab results.
DMP-SOB2 DMP-SOB2 DMP-SOB2	1 12	1/9/2012 /14/2012 1/8/2013 2/6/2013	93 274 169 315	4.2 4.2 4.2 3.3	4.0 4.4 4.3 4.0	2000.0 2010.0 1970.0 2200.0 2038.0	12.5 12.8 12.5 12.3	0.0 0.0 0.0 0.0	334.0 370.0 348.0 442.0	109.5 82.5 115.7 110.1	12.8 0.1 13.5	3.5 0.1 2.8 3.7	506.8 1250.5 1200.9 1272.5	6.9 2.6 4.7 6.6	1107.0 1108.0 1142.0 1190.0	122.2 3. 271.3 0. 234.8 5. 417.5 14. 328.8 14. 0.0 0.0 0.0	9 14.2 3 0.2 6 27.4 0 39.2 1 38.0 0 0.0 0 0.0 0 0.0	372.6 1216.9 706.4 1675.8 1547.5 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0			No chemical field data, use lab results.
DMP-SOB2 DMP-SOB2 DMP-SOB2 DMP-SOB2	1 12	1/9/2012 /14/2012 1/8/2013 2/6/2013	93 274 169 315 410	4.2 4.2 4.2 3.3 3.1	4.0 4.4 4.3 4.0 3.7	2000.0 2010.0 1970.0 2200.0 2038.0 2020.0	12.5 12.8 12.5 12.3	0.0 0.0 0.0 0.0 0.0	334.0 370.0 348.0 442.0 314.0	109.5 82.5 115.7 110.1 66.7	12.8 0.1 13.5 10.3 7.7	3.5 0.1 2.8 3.7 2.9	506.8 1250.5 1200.9 1272.5 1305.6	6.9 2.6 4.7 6.6 3.8	1107.0 1108.0 1142.0 1190.0 1015.0	122.2 3 271.3 0 234.8 5 417.5 14 328.8 14 0.0 0 0.0 0 0.0 0 0.0 0	9 14.2 3 0.2 6 27.4 0 39.2 1 38.0 0 0.0 0 0.0 0 0.0	372.6 1216.9 706.4 1675.8 1547.5 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0			No chemical field data, use lab results.
DMP-SOB2 DMP-SOB2 DMP-SOB2 DMP-SOB2 Average  DMP-SOB3	12.	1/9/2012 /14/2012 1/8/2013 2/6/2013 /12/2013	93 274 169 315 410 221	4.2 4.2 4.2 3.3 3.1 3.1 6.3	4.0 4.4 4.3 4.0 3.7 4.2	2000.0 2010.0 1970.0 2200.0 2038.0 2020.0 2024.4	12.5 12.8 12.5 12.3 12.2 12.2	0.0 0.0 0.0 0.0 0.0 0.0 0.0	334.0 370.0 348.0 442.0 314.0 338.6	109.5 82.5 115.7 110.1 66.7 91.4	12.8 0.1 13.5 10.3 7.7 8.9	3.5 0.1 2.8 3.7 2.9 2.4	506.8 1250.5 1200.9 1272.5 1305.6 996.5	6.9 2.6 4.7 6.6 3.8 4.4	1107.0 1108.0 1142.0 1199.0 1015.0	122.2   3   271.3   0   0   234.8   5   147.5   147.5   147.5   147.5   147.5   0.0   0.	9 14.2 3 0.2 6 27.4 0 39.2 1 38.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 2 23.5	372.6 1216.9 706.4 1675.8 1547.5 0.0 0.0 0.0 0.0 897.5	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0			No chemical field data, use lab results.
DMP-SOB2 DMP-SOB2 DMP-SOB2 DMP-SOB2 DMP-SOB3 DMP-SOB3 DMP-SOB3 DMP-SOB3	1 12 12 3 3 3 10 10 10 10 10 10	1/9/2012 /14/2012 1/8/2013 2/6/2013 /12/2013 7/5/2012 9/4/2012 /10/2012	93 274 169 315 410 221	4.2 4.2 4.2 3.3 3.1 3.1 6.3 6.6 6.5	4.0 4.4 4.3 4.0 3.7	2000.0 2010.0 1970.0 2200.0 2038.0 2020.0 2024.4 2024.4	12.5 12.8 12.5 12.3 12.2 12.2 12.5	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 158.0 156.0	334.0 370.0 348.0 442.0 314.0	109.5 82.5 115.7 110.1 66.7 91.4	12.8 0.1 13.5 10.3 7.7	3.5 0.1 2.8 3.7 2.9 2.4 0.7 0.2 0.0	506.8 1250.5 1200.9 1272.5 1305.6 996.5	6.9 2.6 4.7 6.6 3.8 4.4 4.4	1107.0 1108.0 1142.0 1199.0 1015.0 1071.9	1222 3 2713 0 2248 5 5 4 175 14475 14475 144 3288 144 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	9 14.2 3 0.2 6 27.4 0 39.2 1 38.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 5 23.5 5 5.1 1 1.6	372.6 1216.9 706.4 1675.8 1547.5 0.0 0.0 0.0 897.5 323.4 149.6 -86.1	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0			No chemical field data, use lab results.
DMP-SOB2 DMP-SOB2 DMP-SOB2 DMP-SOB2 DMP-SOB2 DMP-SOB3 DMP-SOB3 DMP-SOB3 DMP-SOB3 DMP-SOB3	1 1 12 12 3 3 3 10 10 10 11 1 1 1 1 1 1 1 1 1 1 1	1/9/2012 1/4/2012 1/8/2013 2/6/2013 1/12/2013 7/5/2012 9/4/2012 1/10/2012 1/9/2012	93 274 169 315 410 221 177 127 149 122	4.2 4.2 4.2 3.3 3.1 3.1 3.9 6.3 6.6 6.5 6.6	4.0 4.4 4.3 4.0 3.7 4.2 6.5 6.5 6.4 6.4	2000.0 2010.0 1970.0 2200.0 2038.0 2020.0 2024.4 2024.4 990.0 928.0 940.0 920.0	12.5 12.8 12.5 12.3 12.2 12.5 12.5 12.5 12.5 12.5 12.5 12.7 12.5	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.3 158.0 156.0 110.0 174.0	334.0 370.0 348.0 442.0 314.0 338.6 152.0 -98.0 -60.0	109.5 82.5 115.7 110.1 66.7 91.4 95.6 6.9 5.8	12.8 0.1 13.5 10.3 7.7 8.9 2.4 1.0 0.9	3.5 0.1 2.8 3.7 2.9 2.4 0.7 0.2 0.0	506.8 1250.5 1200.9 1272.5 1305.6 996.5 310.5 48.7 151.7 275.7	6.9 2.6 4.7 6.6 3.8 4.4 1.0 465.0 2.6 1.9	1107.0 1108.0 1142.0 1190.0 1015.0 1071.9 456.0 461.0 470.0 452.0	1222   3   3   2713   0   2348   5   47175   14   4755   14   4755   14   4755   14   4755   14   4755   14   4755   14   4755   14   4755   14   4755   14   4755   14   4755   14   4755   15   47	9   14.2   3   0.2   3   0.2   6   27.4   0   39.2   0   0   0.0   0   0   0   0   0   0	372.6 1216.9 706.4 1675.8 1547.5 0.0 0.0 0.0 0.0 897.5 323.4 -149.6 -86.1 -88.3	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0			No chemical field data, use lab results.
DMP-SOB2 DMP-SOB2 DMP-SOB2 DMP-SOB2 DMP-SOB3 DMP-SOB3 DMP-SOB3 DMP-SOB3	1 12 12 3 3 3 1 1 1 1 1 1 1 1 1 1 1 1 1	1/9/2012 /14/2012 1/8/2013 2/6/2013 /12/2013 7/5/2012 9/4/2012 /10/2012	93 274 169 315 410 221	4.2 4.2 4.2 3.3 3.1 3.1 6.3 6.6 6.5	4.0 4.4 4.3 4.0 3.7 4.2 6.5 6.5 6.4	2000.0 2010.0 1970.0 2200.0 2038.0 2020.0 2024.4 2024.4	12.5 12.8 12.5 12.3 12.2 12.2 12.5	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 158.0 156.0	334.0 370.0 348.0 442.0 314.0 338.6 152.0 -98.0 -48.0	109.5 82.5 115.7 110.1 66.7 91.4	12.8 0.1 13.5 10.3 7.7 8.9	3.5 0.1 2.8 3.7 2.9 2.4 0.7 0.2 0.0	506.8 1250.5 1200.9 1272.5 1305.6 996.5	6.9 2.6 4.7 6.6 3.8 4.4 4.4	1107.0 1108.0 1142.0 1199.0 1015.0 1071.9	1222 3 2713 0 2248 5 5 4 175 14475 14475 144 3288 144 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	9   14.2   3   0.2   6   27.4   0   39.2   0   0   0   0   0   0   0   0   0	372.6 1216.9 706.4 1675.8 1547.5 0.0 0.0 0.0 897.5 323.4 149.6 -86.1 -88.3 -47.5	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0			
DMF-SOB2 DMP-SOB2 DMP-SOB2 DMP-SOB2 DMP-SOB3 DMP-SOB3 DMF-SOB3 DMF-SOB3 DMF-SOB3 DMF-SOB3 DMF-SOB3 DMF-SOB3 DMF-SOB3 DMF-SOB3	1 1 12 12 12 12 13 13 13 14 14 14 14 14 14 14 14 14 14 14 14 14	1.9/2012 /14/2012 /18/2013 /12/2013 /12/2013 /12/2013 /12/2013 /12/2013 /12/2012 /10/2012 /19/2012 /14/2012 /14/2012 /14/2012 /14/2012 /14/2012	93 274 169 315 410 221 27 177 127 149 122 110	4.2 4.2 4.2 3.3 3.1 3.1 6.3 6.6 6.5 6.5 6.5	4.0 4.4 4.3 4.0 3.7 4.2 6.5 6.5 6.4 6.4 6.9	2000.0 2010.0 1970.0 2200.0 2038.0 2020.0 2020.0 2024.4 2024.4 990.0 928.0 940.0 920.0 920.0 920.0 920.0	12.5 12.8 12.5 12.3 12.2 12.2 12.5 12.5 12.5 12.7 12.5 12.7 12.5 12.9 12.4 12.5	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 158.0 156.0 110.0 174.0	334.0 370.0 348.0 442.0 314.0 338.6 152.0 -98.0 -48.0 -60.0	109.5 82.5 115.7 110.1 66.7 91.4 9.5 6.9 5.8 0.8 16.3	12.8 0.1 13.5 10.3 7.7 8.9 2.4 1.0 0.9 0.0	3.5 0.1 2.8 3.7 2.9 2.4 2.4 0.7 0.2 0.0 0.0	\$06.8 1250.5 1200.9 1272.5 1305.6 996.5 310.5 48.7 151.7 275.7 204.4	6.9 2.6 4.7 6.6 3.8 4.4 1.0 465.0 2.6 1.9 2.1	1107.0 1108.0 1142.0 1190.0 1015.0 1071.9 456.0 461.0 470.0 452.0 436.0	1222   3   3   2713   0   2348   5   4175   144   5   248   5   248   5   248   5   248   5   248   5   248   6   248   248   6   248	9   142   3   02   2   6   27.4   0   39.2   1   38.0   0   0   0   0   0   0   0   0   0	372.6 1216.9 706.4 1675.8 1547.5 0.0 0.0 0.0 897.5 323.4 149.6 -86.1 -88.3 -47.5 475.4 324.7	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0			No chemical field data, use lab results.  No chemical field data, use lab results.
DMF-SOB2 DMF-SOB2 DMP-SOB2 DMP-SOB2 DMP-SOB3 DMP-SOB3 DMP-SOB3 DMF-SOB3 DMF-SOB3 DMF-SOB3 DMF-SOB3 DMF-SOB3 DMF-SOB3	1 1 12 12 12 12 13 13 13 14 14 14 14 14 14 14 14 14 14 14 14 14	1/9/2012 1/4/2012 1/4/2012 1/4/2013 2/6/2013 2/6/2013 2/12/2013 7/5/2012 9/4/2012 1/12/2012 1/14/2012 1/14/2013	93 274 169 315 410 221 177 127 149 122 110 271	4.2 4.2 4.2 3.3 3.1 3.1 3.9 6.3 6.6 6.5 6.6	4.0 4.4 4.3 4.0 3.7 4.2 6.5 6.5 6.4 6.4 6.9 6.8	2000.0 2010.0 1970.0 2200.0 2038.0 2020.0 2024.4 2024.4 990.0 928.0 940.0 910.0 920.0	12.5 12.8 12.5 12.3 12.2 12.2 12.5 12.5 12.5 12.5 12.7 12.5 12.9 12.9	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	334.0 370.0 348.0 442.0 314.0 314.0 152.0 -98.0 -48.0 -60.0 -36.0 -146.0	109.5 82.5 115.7 110.1 66.7 91.4 9.5 6.9 5.8 0.8 16.3 8.0	12.8 0.1 13.5 10.3 7.7 8.9 8.9 2.4 1.0 0.9 0.0 0.9	3.5 0.1 2.8 3.7 2.9 2.4 0.7 0.2 0.0 0.0 0.1	506.8 1250.5 1200.9 1272.5 1305.6 996.5 310.5 48.7 151.7 275.7 204.4 261.2	6.9 2.6 4.7 6.6 3.8 4.4 1.0 465.0 2.6 1.9 2.1	1107.0 1108.0 1142.0 1190.0 1015.0 1071.9 456.0 461.0 470.0 432.0 436.0	1222   3   3   2713   0   2348   5   4175   144   5   248   5   248   5   248   5   248   5   248   5   248   6   148   248   6   148   248   6   148   248   6   148   248   6   148   248	9   14.2   3   0.2   2   3   0.2   2   3   0.2   2   3   0.2   2   3   0.2   2   3   0.2   3   0.2   3   0.2   3   0.2   0.0	372.6 1216.9 706.4 1675.8 1547.5 0.0 0.0 0.0 897.5 323.4 149.6 -86.1 -88.1 -87.5 47.5 47.5 47.5 0.0 0.0	336.2 336.2 336.2 326.1 32			
DMF-SOB2 DMP-SOB2 DMP-SOB2 DMP-SOB2 DMP-SOB3 DMP-SOB3 DMF-SOB3 DMF-SOB3 DMF-SOB3 DMF-SOB3 DMF-SOB3 DMF-SOB3 DMF-SOB3 DMF-SOB3	1 1 12 12 12 12 13 13 13 14 14 14 14 14 14 14 14 14 14 14 14 14	1.9/2012 /14/2012 /18/2013 /12/2013 /12/2013 /12/2013 /12/2013 /12/2013 /12/2012 /10/2012 /19/2012 /14/2012 /14/2012 /14/2012 /14/2012 /14/2012	93 274 169 315 410 221 177 127 149 122 110 271	4.2 4.2 4.2 3.3 3.1 3.1 6.3 6.6 6.5 6.5 6.5	4.0 4.4 4.3 4.0 3.7 4.2 6.5 6.5 6.4 6.4 6.9 6.8	2000.0 2010.0 1970.0 2200.0 2038.0 2020.0 2020.0 2024.4 2024.4 990.0 928.0 940.0 920.0 920.0 920.0 920.0	12.5 12.8 12.5 12.3 12.2 12.2 12.5 12.5 12.5 12.7 12.5 12.7 12.5 12.9 12.4 12.5	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	334.0 370.0 348.0 442.0 314.0 314.0 152.0 -98.0 -48.0 -60.0 -36.0 -146.0	109.5 82.5 115.7 110.1 66.7 91.4 9.5 6.9 5.8 0.8 16.3 8.0	12.8 0.1 13.5 10.3 7.7 8.9 8.9 2.4 1.0 0.9 0.0 0.9	3.5 0.1 2.8 3.7 2.9 2.4 0.7 0.2 0.0 0.0 0.1	506.8 1250.5 1200.9 1272.5 1305.6 996.5 310.5 48.7 151.7 275.7 204.4 261.2	6.9 2.6 4.7 6.6 3.8 4.4 1.0 465.0 2.6 1.9 2.1	1107.0 1108.0 1142.0 1190.0 1015.0 1071.9 456.0 461.0 470.0 432.0 436.0	1222   3   3   2713   3   0   2348   5   4717   5   14   1328   4717   5   14   14   10   0   0   0   0   0   0   0   0	9   14.2   3   0.2   6   27.4   0   0.0   0.0   0   0.0   0   0.0   0	372.6 1216.9 706.4 1675.8 1547.5 0.0 0.0 0.0 897.5 323.4 -149.6 -86.1 -88.3 -47.5 -475.4 -324.7 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0			
DMF-SOB2 DMP-SOB2 DMP-SOB2 DMP-SOB2 DMP-SOB3 DMP-SOB3 DMF-SOB3 DMF-SOB3 DMF-SOB3 DMF-SOB3 DMF-SOB3 DMF-SOB3 DMF-SOB3 DMF-SOB3	1 1 12 12 12 12 13 13 13 14 14 14 14 14 14 14 14 14 14 14 14 14	1.9/2012 /14/2012 /18/2013 /12/2013 /12/2013 /12/2013 /12/2013 /12/2013 /12/2012 /10/2012 /19/2012 /14/2012 /14/2012 /14/2012 /14/2012 /14/2012	93 274 169 315 410 221 177 127 149 122 110 271	4.2 4.2 4.2 3.3 3.1 3.1 6.3 6.6 6.5 6.5 6.5	4.0 4.4 4.3 4.0 3.7 4.2 6.5 6.5 6.4 6.4 6.9 6.8	2000.0 2010.0 1970.0 2200.0 2038.0 2020.0 2020.0 2024.4 2024.4 990.0 928.0 940.0 920.0 920.0 920.0 920.0	12.5 12.8 12.5 12.3 12.2 12.2 12.5 12.5 12.5 12.7 12.5 12.7 12.5 12.9 12.4 12.5	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	334.0 370.0 348.0 442.0 314.0 314.0 152.0 -98.0 -48.0 -60.0 -36.0 -146.0	109.5 82.5 115.7 110.1 66.7 91.4 9.5 6.9 5.8 0.8 16.3 8.0	12.8 0.1 13.5 10.3 7.7 8.9 8.9 2.4 1.0 0.9 0.0 0.9	3.5 0.1 2.8 3.7 2.9 2.4 0.7 0.2 0.0 0.0 0.1	506.8 1250.5 1200.9 1272.5 1305.6 996.5 310.5 48.7 151.7 275.7 204.4 261.2	6.9 2.6 4.7 6.6 3.8 4.4 1.0 465.0 2.6 1.9 2.1	1107.0 1108.0 1142.0 1190.0 1015.0 1071.9 456.0 461.0 470.0 432.0 436.0	1222   3   3   2713   0   2348   5   4717   5   14   1328   14   15   14   14   15   14   15   14   15   16   16   16   16   16   16   16	9	372.6 372.6 1675.8 1675	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0			
DMF-SOB2 DMF-SOB2 DMF-SOB2 DMF-SOB2 DMF-SOB3	1 1 12 12 12 12 13 13 13 14 14 14 14 14 14 14 14 14 14 14 14 14	1.9/2012 /14/2012 /18/2013 /12/2013 /12/2013 /12/2013 /12/2013 /12/2013 /12/2012 /10/2012 /19/2012 /14/2012 /14/2012 /14/2012 /14/2012 /14/2012	93 274 169 315 410 221 177 127 149 122 110 271	4.2 4.2 4.2 3.3 3.1 3.1 6.3 6.6 6.5 6.5 6.5	4.0 4.4 4.3 4.0 3.7 4.2 6.5 6.5 6.4 6.4 6.9 6.8	2000.0 2010.0 1970.0 2200.0 2038.0 2020.0 2020.0 2024.4 2024.4 990.0 928.0 940.0 920.0 920.0 920.0 920.0	125 128 125 123 122 122 125 125 127 127 127 129 129 124 121	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	334.0 370.0 348.0 442.0 314.0 314.0 152.0 -98.0 -48.0 -60.0 -36.0 -146.0	109.5 82.5 115.7 110.1 66.7 91.4 9.5 6.9 5.8 0.8 16.3 8.0	12.8 0.1 13.5 10.3 7.7 8.9 8.9 2.4 1.0 0.9 0.0 0.9	3.5 0.1 2.8 3.7 2.9 2.4 0.7 0.2 0.0 0.0 0.1	506.8 1250.5 1200.9 1272.5 1305.6 996.5 310.5 48.7 151.7 275.7 204.4 261.2	6.9 2.6 4.7 6.6 3.8 4.4 1.0 465.0 2.6 1.9 2.1	1107.0 1108.0 1142.0 1190.0 1015.0 1071.9 456.0 461.0 470.0 432.0 436.0	1222   3   3   271.3   0   234.8   5   4175   144   5   284.8   144   100   0   0   0   0   0   0   0   0	9	372.6 (37	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0			
DMF-SOB2 DMP-SOB2 DMP-SOB2 DMP-SOB2 DMP-SOB3 DMP-SOB3 DMF-SOB3 DMF-SOB3 DMF-SOB3 DMF-SOB3 DMF-SOB3 DMF-SOB3 DMF-SOB3 DMF-SOB3	1 1 12 12 12 12 13 13 13 14 14 14 14 14 14 14 14 14 14 14 14 14	1.9/2012 /14/2012 /18/2013 /12/2013 /12/2013 /12/2013 /12/2013 /12/2013 /12/2012 /10/2012 /19/2012 /14/2012 /14/2012 /14/2012 /14/2012 /14/2012	93 274 169 315 410 221 177 127 149 122 110 271 307	4.2 4.2 4.2 3.3 3.3 3.1 3.1 3.1 3.3 6.6 6.5 6.5 6.5 6.5	4.0 4.4 4.3 4.3 4.0 3.7 4.2 6.5 6.5 6.4 6.4 6.9 6.8 6.5	2000.0 2010.0 2010.0 2020.0 2038.0 2020.0 2020.0 2020.0 990.0 910.0 920.0 910.0 920.0 1120.0	12.5 12.8 12.5 12.3 12.2 12.2 12.5 12.5 12.5 12.7 12.5 12.7 12.5 12.9 12.4 12.5	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 158.0 156.0 110.0 174.0 160.0 192.0	334.0 370.0 348.0 442.0 314.0 314.0 338.6 152.0 98.0 48.0 36.0 36.0 36.0 36.0 36.0 36.0 36.0 36	91.4 91.4 91.4 91.4 91.4	12.8 0.1 13.5 10.3 10.3 7.7 7.7 8.9 2.4 1.0 0.9 0.9 0.9 0.9	3.5 0.1 2.8 3.7 2.9 2.9 2.4 2.4 0.7 0.2 0.0 0.0 0.0 0.0 0.0 0.0	506.8 1200.5 1200.9 1272.5 1305.6 1305.6 1305.6 1305.6 1305.6 1305.6 148.7 148.7 257.7 257.7 261.2 847.5	6.9 2.6 4.7 6.6 3.8 4.4 4.4 1.0 465.0 2.6 1.9 9.2 1.1 1.0 1.6	1107.0 1108.0 1142.0 1190.0 1190.0 1015.0 1015.0 1071.9 456.0 470.0 470.0 436.0 436.0 422.0	1222   3   3   2713   0   2348   5   4175   144   3288   144   5   6   10   0   0   0   0   0   0   0   0	9	372.6 (37	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0			
DMF-SOB2 DMF-SOB2 DMF-SOB2 DMF-SOB2 DMF-SOB3	1 12 12 12 13 13 14 14 15 15 15 15 15 15 15 15 15 15 15 15 15	1/9/2012 1/4/2012 1/4/2013 2/6/2013 1/12/2013 1/12/2013 1/12/2013 1/12/2013 1/12/2013 1/12/2013 1/12/2013	93 274 169 315 410 221 177 127 149 122 110 271 307	4.2 4.2 4.2 3.3 3.3 3.1 3.1 3.1 3.3 6.6 6.5 6.5 6.5 6.5	4.0 4.4 4.3 4.3 4.0 3.7 4.2 6.5 6.5 6.4 6.4 6.9 6.8 6.5	2000.0 2010.0 1970.0 2200.0 2008.0 2020.0 2020.0 990.0 928.0 940.0 920.0 920.0 910.0 920.0 910.0 920.0	125 128 125 123 122 122 125 125 127 127 127 129 129 129 121 129	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 158.0 156.0 110.0 174.0 160.0 192.0	334.0 370.0 348.0 442.0 314.0 314.0 338.6 152.0 98.0 48.0 36.0 36.0 36.0 36.0 36.0 36.0 36.0 36	91.4 91.4 91.4 91.4 91.4	2.4 1.0 8.9 2.4 1.0 0.9 0.9 0.9	3.5 0.1 2.8 3.7 2.9 2.9 2.4 2.4 0.7 0.2 0.0 0.0 0.0 0.0 0.0 0.0	996.5 99	6.9 2.6 4.7 6.6 3.8 4.4 4.4 1.0 465.0 2.6 1.9 9.2 1.1 1.0 1.6	1107.0 1108.0 1142.0 1190.0 1190.0 1015.0 1015.0 1015.0 1071.9 456.0 461.0 470.0 452.0 460.0 422.0	1222   3   3   2713   0   2348   5   4175   14   4175   14   428   0   0   0   0   0   0   0   0   0	9	372.6 372.6	3381 3381			
DMF-SOB2 DMF-SOB2 DMF-SOB2 DMF-SOB2 DMF-SOB3	1 1 12 12 3 3 3	1/9/2012 1/4/2012 1/8/2013 2/6/2013 1/2/2013 1/2/2013 1/2/2013 1/2/2012 1/9/2012 1/9/2012 1/9/2012 1/9/2013 1/2/2013 1/2/2013 1/2/2013 1/2/2013	93 93 274 199 199 199 199 199 199 199 199 199 19	42 42 42 33 33 31 31 66 65 65 65 65 65 65	4.0 4.4 4.3 4.3 4.0 3.7 3.7 4.2 6.5 6.5 6.4 6.6 6.5 6.5 6.5	200.0 200.0 200.0 1970.0 220.0 2038.0 2020.0 2020.0 990.0 920.0 940.0 940.0 940.0 910.0 1120.0	12.5 12.5 12.5 12.3 12.3 12.3 12.3 12.3 12.5 12.5 12.5 12.5 12.5 12.5 12.5 12.5	0.0 0.0 0.0 0.0 0.0 0.0 0.0 158.0 156.0 110.0 174.0 164.0 192.0	3340 3700 3480 4420 3140 3140 338.6 48.0 -98.0 -48.0 -36.0 -146.0 -88.0	91.4 91.4 91.4 91.4 91.4 91.4 91.4 91.4	128 128 135 135 135 135 135 135 137 77 77 24 10 09 09 09 09 111	3.5 3.5 3.7 2.9 2.4 2.4 2.4 0.7 0.0 0.0 0.0 0.1 0.1	996.5 99	6.9 2.6 4.7 6.6 3.8 4.4 4.4 4.4 1.0 465.0 2.6 1.9 2.1 1.0 1.0 1.6 6.7 9	1107.0 1108.0 1142.0 1190.0 1015.0 1015.0 456.0 441.0 470.0 435.0 432.0 432.0 432.0 432.0 435.0	1222 3 3 2713 0 2348 5 4 475 144 5 28 8 14 4 5 2 4 4 5 2 4 4 5 2 4 4 5 2 4 4 5 2 4 4 5 2 4 4 5 2 4 4 5 2 4 4 5 2 4 4 5 2 4 4 5 2 4 4 5 2 4 4 5 2 4 4 5 2 4 5	9	372.6.9 101.675.8 10675.8 107.0 1	33 8 3 3 8 3 3 4 4 5 3 8 8 3 3 4 5 3 8 8 5 8 8 5 8 8 5 8 8 5 8 8 8 5 8 8 8 5 8 8 8 5 8 8 8 8 5 8 8 8 8 5 8 8 8 8 8 8 8 9 8 8 9			
DMF-SOB2 DMF-SOB2 DMF-SOB2 DMF-SOB2 DMF-SOB3	1 1 12 12 12 13 3 3 3 1 1 1 1 1 1 1 1 1	1/9/2012 1/4/2012 1/8/2013 2/6/2013 1/2/2013 1/2/2013 1/2/2013 1/2/2013 1/2/2012 1/9/2012 1/4/2012 1/4/2012 1/4/2013 1/2/2013	93 274 169 315 315 410 221 177 127 129 120 271 307	42 42 42 33 33 33 31 31 39 66 65 65 65 65	4.0 4.4 4.3 4.3 4.0 3.7 4.2 6.5 6.5 6.4 6.4 6.8 6.5 6.6	2000.0 2010.0 1970.0 2200.0 2038.0 2020.0 20	12.5 12.8 12.5 12.5 12.3 12.2 12.2 12.5 12.7 12.7 12.7 12.9 12.9 12.9 12.9 12.9 12.9 12.9 12.9	0.9 0.0 0.0 0.0 0.0 0.0 0.0 156.0 1174.0 160.0 192.0	3340 3700 3480 4420 3140 3140 -980 -980 -980 -1460 -380 -463	91.4 91.4 91.4 91.4 91.4 91.4 95.6 99.8 98.0 98.0 98.0 98.0 98.0 98.0 98.0	2.28 0.1 13.5 10.3 10.3 7.7 2.7 8.9 2.4 1.0 0.0 0.0 0.9 1.1	3.5 0.1 2.8 3.7 2.9 2.4 2.4 0.7 0.2 0.0 0.0 0.1 0.1	506.8 1200.9 1200.9 1372.5 1305.6 1305.6 1305.6 1305.6 1305.6 148.7 254.4 261.2 847.5 1300.0	6.9 2.6 4.7 6.6 3.8 3.8 4.4 4.4 1.0 465.0 2.6 1.9 2.1 1.0 1.6 67.9	1107.0 1108.0 1142.0 1190.0 1015.0 1015.0 1071.9 1071.9 456.0 440.0 452.0 452.0 452.0 452.0	1222 3 3 2713 0 0 2348 5 5 4475 144 5 288 144 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	9	372.6 (3 170.6 ) 372.6	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0			
DMF-SOB2 DMF-SOB2 DMF-SOB2 DMF-SOB2 DMF-SOB2 DMF-SOB3	1 1 12 12 12 12 12 12 12 12 12 12 12 12	1/9/2012 1/4/2012 1/8/2013 1/8/2013 1/8/2013 1/12/2013	93 274 169 315 410 221 177 127 149 122 110 271 307 180 180	42 42 42 33 33 33 33 33 66 65 65 65 65 65 65 65 65	4.0 4.4 4.3 4.0 3.7 4.2 6.5 6.5 6.4 6.4 6.9 6.5 6.5 6.5 6.5 6.5 6.5 6.5 6.5 6.5 6.5	2000.0 2010.0 1970.0 2200.0 2038.0 2020.0 2038.0 2020.0 2038.0 2020.0 20	12.5 12.8 12.5 12.5 12.5 12.5 12.5 12.5 12.7 12.5 12.7 12.5 12.9	0.9 0.9 0.0 0.0 0.0 0.0 0.0 158.0 158.0 110.0 174.0 160.0 192.0 159.1	334.0 370.0 348.0 348.0 442.0 314.0 314.0 338.6 152.0 -98.0 -48.0 -88.0 -88.0 -46.3 -46.3	109.5 82.5 115.7 110.1 66.7 91.4 95.5 6.9 9.5 8.0 11.4 11.4 8.4 71.5 11.6 77.6 78.5	128	3.5 0.1 2.8 3.7 2.9 2.9 2.4 0.7 0.2 0.0 0.0 0.1 0.0 0.1 0.0 0.1 0.0 0.0 0.0	506.8 120.9 120.9 120.9 1305.6 996.5 1305.6 148.7 151.7 151.7 201.4 201.	6.9   2.6   4.7   6.6   6.8   4.4   4.4   4.4   4.4   4.5   6.6   6.7   6.6   6.7	1107.0 1108.0 1142.0 1190.0 1190.0 1015.0 1015.0 1015.0 456.0 4470.0 470.0 452.0 452.0 452.0 955.0 996.0 998.0 998.0 998.0	1222 3 3 2713 0 0 2713 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	9	372.6 372.6 1216.9 706.4 1216.9 706.4 1216.9 706.4 1216.9 706.4 1216.1 1	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0			
DMF-SOB2 DMF-SOB2 DMF-SOB2 DMF-SOB2 DMF-SOB3	1 1 12 12 12 12 12 12 12 12 12 12 12 12	1/9/2012 1/4/2012 1/8/2013 2/6/2013 2/6/2013 2/12/	93 93 274 199 199 199 199 199 199 199 199 199 19	42 42 42 33 33 33 31 33 33 33 33 66 65 65 65 65 65 65 65	4.2 4.4 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0	2000.0 2010.0 2010.0 2010.0 1970.0 2038.0 2038.0 2020.0 2038.0 2020.0 2038.0 2020.0 2038.0 2020.0 2038.0 2020.0 2038.0 2020.0 20	12.5 12.5 12.5 12.5 12.5 12.5 12.5 12.5	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 158.0 156.0 110.0 174.0 164.0 192.0 159.1	334.0 370.0 348.0 348.0 442.0 314.0 314.0 338.6 338.6 48.0 -98.0 -98.0 -48.0 -88.0 -88.0 -88.0 -14.0 -16.0 -16.0 -16.0 -16.0 -16.0 -16.0 -16.0 -16.0 -16.0 -16	91.4 91.4 91.4 91.4 91.4 91.4 91.4 91.4	128 128 135 135 135 135 135 137 77 77 24 10 09 09 09 09 111	3.5 3.5 3.7 2.9 2.9 2.0 0.0 0.0 0.1 0.1	996.5 996.5 1207.5 1305.6	6.9 6.9 2.6 6.7 4.7 6.7 6.6 6.6 3.8 4.4 4.4 4.5 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	1107.0 1108.0 1142.0 1190.0 1190.0 1015.0 1015.0 456.0 441.0 470.0 442.0 432.0 442.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0	1222   3   3   2713   3   0   2243   5   2713   3   0   2243   5   2713   28   4175   14   428   28   4175   14   428   20   0   0   0   0   0   0   0   0	9	372.6 372.6	33621 3000			No chemical field data, use lab results.
DMF-SOB2 DMF-SOB2 DMF-SOB2 DMF-SOB2 DMF-SOB2 DMF-SOB3	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1/9/2012 1/4/2012 1/8/2013 1/8/2013 1/8/2013 1/12/2013	93 274 169 315 410 221 177 127 149 122 110 271 307 180 180	42 42 42 33 33 33 33 33 66 65 65 65 65 65 65 65 65	4.2 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0	2000.0 2010.0 1970.0 2200.0 2038.0 2020.0 2038.0 2020.0 2038.0 2020.0 20	12.5 12.5 12.5 12.5 12.5 12.5 12.5 12.5	0.0 0.0 0.0 0.0 0.0 0.0 0.0 158.0 156.0 110.0 174.0 160.0 192.0 159.1 15	334.0 370.0 348.0 348.0 442.0 314.0 314.0 338.6 152.0 -98.0 -48.0 -46.3 -46.3 -46.3 -46.3	91.4 91.4 91.4 91.4 91.4 91.4 91.4 91.4	128	3.5 3.5 3.5 3.8 3.8 2.9 2.9 2.0 0.0 0.0 0.1 0.1 0.1 0.1 0.2 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	506.8 120.9 120.9 120.9 1305.6 996.5 1305.6 148.7 151.7 151.7 201.4 201.	6.9 6.9 2.6 6.6 6.6 6.6 6.6 6.6 6.6 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	1107.0 1108.0 1142.0 1190.0 1190.0 1015.0 1015.0 1015.0 456.0 4470.0 470.0 452.0 452.0 452.0 955.0 996.0 998.0 998.0 998.0	1222   3   3   2713   3   0   2248   5   5   4175   14   428   6   10   6   10   6   10   6   10   6   10   6   10   6   10   6   10   6   10   6   10   6   10   6   10   6   10   6   10   10	9	372.6 372.6	338.1 33			
DMF-SOB2 DMF-SOB2 DMF-SOB2 DMF-SOB2 DMF-SOB3 DMF	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1/9/2012 1/4/2012 1/8/2013 1/8/2013 1/8/2013 1/12/2013	93 93 274 199 199 199 199 199 199 199 199 199 19	42 42 42 33 33 33 33 33 66 65 65 65 65 65 65 65	4.2 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0	2000.0 2010.0 1970.0 2200.0 2038.0 2020.0 2038.0 2020.0 2038.0 2020.0 2038.0 2020.0 20	12.5 12.8 12.5 12.3 12.3 12.2 12.5 12.5 12.5 12.7 12.5 12.9 12.4 12.5 11.9 12.5	0.0 0.0 0.0 0.0 0.0 0.0 0.0 158.0 156.0 110.0 174.0 160.0 192.0 159.1 15	334.0 370.0 348.0 348.0 442.0 314.0 314.0 338.6 152.0 -98.0 -48.0 -46.3 -46.3 -46.3 -46.3	91.4 91.4 91.4 91.4 91.4 91.4 91.4 91.4	128	3.5 3.5 3.5 3.8 3.8 2.9 2.9 2.0 0.0 0.0 0.1 0.1 0.1 0.1 0.2 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	996.5 996.5 1207.5 1305.6	6.9 6.9 2.6 6.6 6.6 6.6 6.6 6.6 6.6 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	1107.0 1108.0 1142.0 1190.0 1190.0 1015.0 1015.0 456.0 441.0 470.0 442.0 432.0 442.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0	1222   3   3   2713   0   2348   5   4175   144   1475   144   1475   144   1475   144   1475   144   1475   144   1475   144   1475	9	372.6 372.6 1 1216.9 706.4 1 1216.9 706.4 1 1216.9 706.4 1 1216.1 1 1 1216.1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0			No chemical field data, use lab results.
DMF-SOB2 DMF-SOB2 DMF-SOB2 DMF-SOB2 DMF-SOB3 DMF	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1/9/2012 1/4/2012 1/8/2013 1/8/2013 1/8/2013 1/12/2013	93 93 274 199 199 199 199 199 199 199 199 199 19	42 42 42 33 33 33 33 33 66 65 65 65 65 65 65 65	4.2 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0	2000.0 2010.0 1970.0 2200.0 2038.0 2020.0 2038.0 2020.0 2038.0 2020.0 2038.0 2020.0 20	12.5 12.8 12.5 12.3 12.3 12.2 12.5 12.5 12.5 12.7 12.5 12.9 12.4 12.5 11.9 12.5	0.0 0.0 0.0 0.0 0.0 0.0 0.0 158.0 156.0 110.0 174.0 160.0 192.0 159.1 15	334.0 370.0 348.0 348.0 442.0 314.0 314.0 338.6 152.0 -98.0 -48.0 -46.3 -46.3 -46.3 -46.3	91.4 91.4 91.4 91.4 91.4 91.4 91.4 91.4	128	3.5 3.5 3.5 3.8 3.8 2.9 2.9 2.0 0.0 0.0 0.1 0.1 0.1 0.1 0.2 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	996.5 996.5 1207.5 1305.6	6.9 6.9 2.6 6.6 6.6 6.6 6.6 6.6 6.6 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	1107.0 1108.0 1142.0 1190.0 1190.0 1015.0 1015.0 456.0 441.0 470.0 442.0 432.0 442.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0	1222   3   3   2713   0   2348   5   4175   144   1475   144   1475   144   1475   144   1475   144   1475   144   1475   144   1475	9	372.6 372.6	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0			No chemical field data, use lab results.
DMF-SOB2 DMF-SOB2 DMF-SOB2 DMF-SOB2 DMF-SOB3 DMF	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1/9/2012 1/4/2012 1/8/2013 1/8/2013 1/8/2013 1/12/2013	93 93 274 199 199 199 199 199 199 199 199 199 19	42 42 42 33 33 33 33 33 66 65 65 65 65 65 65 65	4.2 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0	2000.0 2010.0 1970.0 2200.0 2038.0 2020.0 2038.0 2020.0 2038.0 2020.0 2038.0 2020.0 20	12.5 12.8 12.5 12.3 12.3 12.2 12.5 12.5 12.5 12.7 12.5 12.9 12.4 12.5 11.9 12.5	0.0 0.0 0.0 0.0 0.0 0.0 0.0 158.0 156.0 110.0 174.0 160.0 192.0 159.1 15	334.0 370.0 348.0 348.0 442.0 314.0 314.0 338.6 152.0 -98.0 -48.0 -46.3 -46.3 -46.3 -46.3	91.4 91.4 91.4 91.4 91.4 91.4 91.4 91.4	128	3.5 3.5 3.5 3.8 3.8 2.9 2.9 2.0 0.0 0.0 0.1 0.1 0.1 0.1 0.2 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	996.5 996.5 1207.5 1305.6	6.9 6.9 2.6 6.6 6.6 6.6 6.6 6.6 6.6 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	1107.0 1108.0 1142.0 1190.0 1190.0 1015.0 1015.0 456.0 441.0 470.0 442.0 432.0 442.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0 451.0	1222   3   3   2713   0   2348   5   4475   144   328   4475   144   328   4475   144   328   4475   144   328   4475   144   146	9	372.6 9 172.6 9 172.6 17	338-1 309-1 30			No chemical field data, use lab results.

																			Acidity	Alkalinity			
Sample		Sample	Flow	pH	pH	Cond.	Temp	Alka-linity	Acidity	Iron	Mang-anese	Alum-inum	Sulfate	Susp. Solids	TDS	Fe Loading	Al Loading	Mn Loading	Loading	Loading			
ID	SCWA ID	Date	GPM	Field	Lab	Umhos	С	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	Latitude	Longitude	Notes
DMP-JR1		7/3/2012	847	5.9		1560.0	13.3	58.0	44.0	36.9	0.2		503.6	2.1	720.2	375.4	0.2	2.3	448.0	590.5			
DMP-JR1 DMP-JR1		9/4/2012 10/9/2012	612 724	5.8		1419.0 1540.0	13.4	38.0 20.0	68.0 8.0	10.5 31.3	1.4		990.6 203.4	2.3	703.0 698.0	76.9 272.6	0.6	10.1 29.3	500.2 69.6	279.5 173.9			
DMP-JR1		11/9/2012	1399	5.9		1540.0	13.4	20.0 58.0	-24.0	28.3	0.0		284.7			475.0	0.6	0.2	-403.5	975.2			
DMP-JR1		12/14/2012	1550	6.0		1380.0	13.2	36.0	-4.0	27.8	1.2		375.5			517.1	1.3	23.1	-74.5	670.8			
DMP-JR1		1/8/2013	1702	5.9		1350.0	13.2	28.0	-10.0	29.3	1.4		604.3		675.0	598.4	1.2	28.0	-204.6	572.8			
DMP-JR1		2/6/2013	1702		5.5	1342.0		38.0	76.0	28.6	1.4	0.4	502.5	2.1	670.0	584.3	7.6	27.6	1554.8	777.4			No chemical field data, use lab results.
DMP-JR1		3/12/2013	1550	5.7		1680.0	12.7									0.0	0.0	0.0	0.0				
																0.0	0.0	0.0	0.0				
																0.0	0.0	0.0	0.0				
																0.0	0.0	0.0	0.0				
																0.0	0.0	0.0	0.0	0.0			
Average			1261	5.9	5.6	1458.9	13.2	39.4	22.6	27.5	1.3	0.1	494.9	2.8	688.5	416.7	1.5		342.0				
																					•		
DMP-BR1		7/3/2012	1131	6.3	5.6	1240.0	13.3	130.0	14.0	38.6	2.0		453.3		560.3 593.0	524.8	1.5	26.9	190.3	1767.3			
DMP-BR1 DMP-BR1		9/4/2012 10/9/2012	932 1304	6.2		1189.0 1240.0	13.2 13.0	130.0 80.0	-48.0 -14.0	34.2 19.0	0.1					383.0 297.2	0.6 8.8	1.1 76.3	-537.7 -219.5	1456.3 1254.1	1	+	
DMP-BR1		10/9/2012	1304 2282	6.0		1240.0	13.0	136.0	-14.0 34.0	23.8	0.0					651.4	0.5	/6.3 0.3	-219.5 932.6	1254.1 3730.3		+	Flow on 30 in bypass: 1116.9 GPM. Flow on 46 in
DMP-BR1		12/14/2012	1870	6.2		1160.0	13.0	68.0	-24.0	18.5	1.0		412.5			416.4	11.7	21.8	-539.4	1528.2		1	Overflow: 971 GPM
DMP-BR1		1/8/2013	1131	0.2	6.2	1034.0	15.0	80.0	-36.0	37.8	1.2		410.8			513.2	9.9	16.4	-489.4	1087.6			O'CHOW. 271 GIM
DMP-BR1		2/6/2013	1867		5.8	1036.0		44.0	-22.0	34.0	1.1	0.7	490.5		518.0	763.5	14.6	25.4	-493.7	987.4			No chemical field data, use lab results.
DMP-BR1		3/12/2013	527	6.1		1330.0	12.3									0.0	0.0	0.0	0.0	0.0			Overflow: 3038 GPM
																0.0	0.0	0.0	0.0				
																0.0	0.0	0.0	0.0				
Average			1380	6.2	6.0	1178.6	13.0	95.4	-13.7	29.4	1.5	0.4	394.1	2.2	544.5	487.8	6.3		-227.6				
																	0.00	0.00	0.00				
BR1 Overflow		9/4/2012	0	6.3	5.6	1240.0	13.3	130.0	14.0	38.6	2.0	0.1	453.3	1126.0	560.3	0.0	0.0		0.0				overflow not flowing
BR1 Overflow		10/9/2012	0				13.2	130.0	-48.0						593.0	0.0	0.0		0.0				overflow not flowing
BR1 Overflow		11/9/2012	1116				13.0	80.0	-14.0	19.0					542.0	254.3	7.5		-187.8				5 1/2" at 30"
BR1 Overflow		12/14/2012	1011	6.0			13.0	136.0	34.0	23.8					550.0	288.6	0.2		413.2	1652.7			5" at 30"
BR1 Overflow		1/8/2013	1925				13.0	68.0	-24.0	18.5						428.8	12.0		-555.3	1573.4			8"at 30"
BR1 Overflow		2/6/2013	3038		6.2	1034.0		80.0	-36.0	37.8	1.2	0.7	410.8	2.7	512.0	1378.5	26.7	44.2 0.0	-1314.6 0.0				11"at 30"
																0.0	0.0		0.0				
																0.0	0.0		0.0				
Average			1182	6.2	6.0	1177.0	13.0	104.0	-12.3	28.6	1.5	0.3	378.0	189.6	548.9	406.7	4.7	21.6	-175.2	1477.2			
DMP-BR1A		10/10/2012	1204					76.0	16.0	12.2	0.1	0.0	220.6	2.2	550.0	102.0	0.2	1.1	250.9	1101.2			Tourism on the Element DD1
DMP-BR1A		11/9/2012	1304 2281	6.6	6.4	1190.0	6.9	76.0 90.0	-16.0 -10.0	12.3 27.8	0.1					192.0 760.8	0.3	1.1 0.3	-250.8 -274.2	1191.2 2467.6		+	Treatment system outlet-Flow as BR1 flow data is the same as DMP-BR1
DMP-BR1A		12/14/2012	1869	6.6		1130.0	7.1	72.0	-26.0	22.3	1.2					499.9	14.2	26.5	-584.1	1617.5		1	non dam is the same as Divir DK1
DMP-BR1A		1/8/2013	1131	6.6		1100.0	5.3	78.0	-28.0	22.3	1.1				523.0	302.5	6.3	15.0	-380.6	1060.4			
DMP-BR1A		2/6/2013	1867		6.5	1038.0		76.0	-42.0	21.5	1.2	0.4	475.0	2.0	513.0	482.5	9.9	26.9	-942.5	1705.5			No chemical field data, use lab results.
DMP-BR1A		3/12/2013		8.9	1	1240.0	8.9									0.0	0.0	0.0	0.0	0.0			
					1							1				0.0	0.0	0.0	0.0			+	
					1							1				0.0	0.0	0.0	0.0	0.0	1	+	
Average			1690	7.2	6.6	1139.6	7.1	78.4	-24.4	21.2	0.7	0.3	396.0	2.8	535.0	430.8	6.4		-495.8			1	
Arciage			1090	1.2	0.0	1139.0	/.1	73.4	-24.4	41.4	0.7	0.3	370.0	2.0	333.0	450.0	0.4	14.3	-4/3.0	1593.0		1	
	<u> </u>	·		·	·				'			·		· '	·								<u> </u>
DMP-BR2		7/3/2012	975	6.4		1240.0	15.2	210.0	-102.0	16.9	0.2		375.8		513.0	197.9	0.9	2.2	-1195.4	2461.1			
DMP-BR2		9/4/2012	1670	6.6		1156.0	13.6	210.0	-190.0	15.8			259.8			316.8	1.4	3.2	-3813.9	4215.4		1	
DMP-BR2 DMP-BR2		10/9/2012	1042	6.6		1250.0 1220.0	12.2	216.0	-102.0 -70.0	16.9						212.0	4.9		-1277.5 -778.3	2705.4		+	
DMP-BR2 DMP-BR2		11/9/2012 12/14/2012	925 1042	6.6		1220.0 1170.0	11.6 12.1	220.0 230.0	-70.0 -146.0	18.1 10.5	0.0		335.5 340.7			200.8 131.8	0.2 2.9	0.1 6.8	-778.3 -1828.6	2446.1 2880.7	1	+	
DMP-BR2		1/8/2013	1289	6.6		1510.0	13.3	216.0	-140.0	22.0	0.6					341.0	6.5	9.3	-2169.1	3346.7		1	
DMP-BR2		2/6/2013	1162	0.0	6.6	1103.0	13.3	206.0	-160.0	15.5	0.7		375.5			216.5	6.7	9.8	-2234.8	2877.3			
DMP-BR2		3/12/2013	1690	6.7		1360.0	11.7									0.0	0.0	0.0	0.0	0.0			
							• • • • • • • • • • • • • • • • • • • •									0.0	0.0	0.0	0.0	0.0			
																0.0	0.0	0.0	0.0	0.0			
																0.0	0.0	0.0	0.0	0.0			
Average	ľ		1224	6.6	6.4	1251.1	12.8	215.4	-130.0	16.5	1.1	0.2	319.9	2.6	550.6	243.2	3.6	16.8	-1913.2	3170.5			I

ample ID	SCWA ID	Sample Date	Flow GPM	pH Field	pH Lab	Cond. Umhos	Temp C	Alka-linity mg/L	Acidity mg/L	Iron mg/L	Mang-anese mg/L	Alum-inum mg/L	Sulfate mg/L	Susp. Solids mg/L	TDS mg/L	Fe Loading lbs/day	Al Loading lbs/day	Mn Loading lbs/day	Acidity Loading lbs/day	Alkalinity Loading lbs/day	Latitude	Longitude	Notes
3R3		7/3/2012		4.1	4.1	1550.0	13.2	0.0	116.0	35.5	2.4	0.3	726.8		672.0	0.0	0.0		0.0	0.0			No flow data
3R3		9/4/2012	506	5.2	5.0	1312.0	13.3	10.0	142.0	29.3	3.8	0.1	645.8		655.0	177.9	0.7		863.7				
BR3 BR3		10/9/2012 11/9/2012	40 100	4.5 3.9	4.6	1390.0 1430.0	13.1 13.4	4.0	-104.0 150.0	25.8 30.3	4.8 0.0	0.8	302.5 650.7	2.3 1.7	545.0 680.0	12.4 36.4	0.4		-50.0 180.3				Flow rate is an estimate
SR3		12/14/2012	100	4.2	4.3	1430.0	13.4	0.0	118.0	33.8	1.9		675.8		803.0	0.0	0.0		0.0				Flow rate is an estimate
BR3		1/8/2012		6.1	4.0	1170.0	12.2	0.0	126.0	32.8			804.5		831.0	0.0	0.0		0.0				Add 20 GPM
3R3		2/6/2013		0.1	4.0	1520.0	12.2	0.0	236.0	24.8	2.8	0.8	950.8	2.0	759.0	0.0	0.0		0.0				No chemical field data, use lab results. No flow of
3R3		3/12/2013		3.2		1870.0	12.3									0.0	0.0	0.0	0.0	0.0			
																0.0	0.0		0.0	0.0			
																0.0	0.0		0.0				
																0.0	0.0		0.0				
																0.0	0.0		0.0				
e			215	4.5	4.3	1455.3	13.0	2.0	112.0	30,3	2.6	0.4	679.6	2.2	706.4	78.4	1.0		289.9				
			215	4.3	4.5	1433.3	13.0	2.0	112.0	30.3	2.0	0.4	0/9.0	2.2	/00.4	/0.4	1.0	0.0	209.9	5.2		1	
		7/24/2012	107579	8.0	7.7	990.0	24.7	136.0	-98.0	17.8	0.0	0.0	178.4	1.6	471.0	22952.5	12.9	12.9	-126723.8	175861.5			
		9/5/2012		8.1	7.5	850.5	24.2		-92.0	0.9	0.0		190.1		420.0	274.1	0.6		-29670.8				
1		10/10/2012	35519	8.2	8.1	1000.0	11.1		-60.0	0.1	0.0	0.0	226.7		460.0	34.2	4.3		-25616.4				
		11/9/2012	74867	8.1	7.4	800.0	7.8	126.0	-40.0	1.8			170.7		398.0	1592.8	18.0	9.0	-35996.0	113387.3			
		12/14/2012	170178	7.6	7.2	620.0	3.4	106.0	-60.0	0.5	0.0		90.2		290.0	1104.6	20.5		-122732.3	216827.1			
		1/8/2013 2/6/2013	101948 69578		7.2	910.0 1260.0	17.0	116.0	-76.0 -56.0	1.5	0.0	0.0	185.6	1.0	432.0 645.0	1825.9	12.3 16.7	12.3 225.8	-93131.5 -46834.2	142148.1 88650.5			User error on pH. Use lab results.  pH meter broken Use lab results
		3/12/2013	215222	8.0	0.9	990.0	8.3		-50.0	2.3	0.3	0.0	103.3	1.4	043.0	0.0	0.0		-40834.2			<del>                                     </del>	par meses oroken. Ose iao resuns.
		013 يندا در	213222	0.0		220.0	0.3		+						+	0.0	0.0		0.0	0.0		1	1
															t	0.0	0.0		0.0				
																0.0	0.0	0.0	0.0	0.0			
	-		100215	8.0	7.4	927.6	12.5	122.9	-68.9	3.5	0.0	0.0	172.5	1.3	445.1	4255.6	14.1	56.8	-82944.4	147992.1		1	
											·	·											
		7/24/2012	49266	7.5	7.0	970.0	22.8	108.0	-52.0	6.5	0.2	0.0	190.7	1.7	475.3	3866.9	23.7	124.4	-30793.2	63955.2	40.21344	-79.4931	9
		9/5/2012	23703	7.6	7.3	830.0	22.4	114.0	-54.0	1.0	0.0		239.8		412.0	270.7	0.6	5.7	-15385.1				
		10/10/2012	21762	7.5	7.4	930.0	11.7	110.0	-44.0	0.8	0.0	0.0	195.5	1.3	424.0	204.0	2.6	2.6	-11509.5	28773.7			
		11/9/2012	46357	7.6	7.1	790.0	7.8		-40.0	3.1	0.0		168.3		374.0	1716.2	11.1		-22288.5				
		12/14/2012	103274	7.9	7.2	560.0	4.4		-68.0	1.5	0.0	0.0	80.2		260.0	1874.4	12.4	12.4	-84412.3				
		1/8/2013	63110	8.1	7.2	910.0	2.6		-58.0	1.4	0.0		170.3		406.0	1046.8	7.6		-43997.9	72824.1			
		2/6/2013	45830		7.0	1366.0		86.0	-50.0	1.6	0.4	0.1	155.6	1.2	684.0	864.9	44.1		-27543.9				No chemical field data, use lab results.
		3/12/2013	187117	7.5		1160.0	8.1									0.0	0.0		0.0				
																0.0	0.0		0.0				
																0.0	0.0		0.0	0.0			
			67552	7.7	7.2	939.5	11.4	101.4	-52.3	2.3	0.1	0.0	171.5	1.4	433.6	1832.8	20.0		-42455.0				
1		7/3/2012		7.1	6.5	1060.0	20.3	136.0	-50.0	4.6			402.0		472.0	0.0	0.0		0.0				No flow data
4		7/24/2012	7568	7.2	6.8	930.0	20.3	142.0	-102.0	2.8	0.4	0.0	225.8		444.2	250.2	1.8		-9278.7				
1		9/4/2012	8955	7.3	7.0	62.0	20.7	132.0	-110.0	4.3		0.0	170.5		310.0	460.7	0.2		-11840.3				
i i		10/9/2012 11/9/2012	9687 24503	7.5	7.1 6.9	810.0 730.0	10.9	150.0 134.0	-58.0 -84.0	1.4 0.5	0.0 0.4	0.0	186.5 189.7		375.0 340.0	161.8 156.1	1.2 5.9	1.2 120.8	-6753.2 -24740.2	17465.1 39466.6			
		12/14/2012	24503 38054	7.5	7.1	540.0	5.9	110.0	-84.0 -70.0	3.2	0.4	0.0	189.7	1.9	256.0	1472.8	4.6	4.6	-24740.2				
		1/8/2013	25121	7.5	7.1	730.0	4.5	116.0	-90.0	2.9	0.8	0.0	180.6		347.0	860.6	3.0		-27175.9				
		2/6/2013	34915	7.2	6.8	760.0	4.2	110.0	-64.0	3.8	0.6	0.0	97.5		378.0	1603.2	0.0		-26859.1	46164.0			No chemical field data, use lab results.
		3/12/2013		7.3		630.0	7.6									0.0	0.0		0.0				
																0.0	0.0		0.0	0.0			
																0.0	0.0		0.0				
	-															0.0	0.0		0.0				
			21257	7.3	6.9	694.7	12.1	128.8	-78.5	2.9	0.5	0.0	196.7	1.6	365.3	748.3	3.3	129.4	-20057.9	32897.5 0.00		1	
																						1	Iv a
		7/3/2012 7/24/2012	6619	6.8 7.0	6.2	1100.0 1000.0	19.6 19.4		-34.0 -76.0	9.6 2.8		0.0	354.0 265.7		498.0 470.6	0.0 218.8	0.0		0.0 -6046.6			1	No flow data
			1553	7.0	7.0	708.0	19.4		-76.0	4.0			162.5		353.0	73.7	0.4		-1194.7			<del>                                     </del>	
				7.2	6.9	850.0	10.6	142.0	-50.0	3.2		0.0	188.3	2.1	394.0	296.5			-4648.0	13200.4		1	<u> </u>
		9/5/2012			7.2	740.0	7.0	118.0	-130.0	7.1	0.7		170.6	2.9	341.0	938.4			-17109.9				
			7734 10950	7.2		550.0	6.0	104.0	-42.0	4.3	0.0	0.0	135.6		258.0	1438.2	6.7		-13982.6	34623.5			
		9/5/2012 10/9/2012	7734		7.1			110.0	-25.0	6.2	0.0	0.0	240.3		351.0	1309.5	4.2	2.1	-5297.5	23309.1			
		9/5/2012 10/9/2012 11/9/2012 12/14/2012 1/8/2013	7734 10950 27697 17629	7.2	7.0	750.0	5.6			7.3	0.4	0.0	195.4	1.8	350.0	2080.8	5.7		-17220.7				No chemical field data, use lab results.
		9/5/2012 10/9/2012 11/9/2012 12/14/2012 1/8/2013 2/6/2013	7734 10950 27697 17629 23878	7.2 7.5 7.2		704.0	5.6	104.0	-60.0	1.5	0.4	0.0				0.0	0.0		0.0				110 chemical nea data, use mo resume
		9/5/2012 10/9/2012 11/9/2012 12/14/2012 1/8/2013	7734 10950 27697 17629	7.2 7.5	7.0		7.7	104.0	-60.0	1.3	0.4	0.0						0.0					110 CHEMICH IEEE CHEMICAL TO THE TENTES.
		9/5/2012 10/9/2012 11/9/2012 12/14/2012 1/8/2013 2/6/2013	7734 10950 27697 17629 23878	7.2 7.5 7.2	7.0	704.0	7.7	104.0	-60.0	1.3	0.4	0.0				0.0	0.0		0.0	0.0			To chantel feel that, use no results
		9/5/2012 10/9/2012 11/9/2012 12/14/2012 1/8/2013 2/6/2013	7734 10950 27697 17629 23878 52110	7.2 7.5 7.2 7.2	7.0 6.6	704.0 620.0	7.7	104.0						10	277.0	0.0	0.0	0.0	0.0	0.0			a volument from units, use mo resures.
		9/5/2012 10/9/2012 11/9/2012 12/14/2012 1/8/2013 2/6/2013	7734 10950 27697 17629 23878	7.2 7.5 7.2 7.2	7.0	704.0 620.0	7.7	104.0	-60.0	5.5				1.8	377.0	0.0	0.0	0.0	0.0	0.0			TVO GREATER TRACTURE, GOVERNO
		9/5/2012 10/9/2012 11/9/2012 12/14/2012 1/8/2013 2/6/2013 3/12/2013	7734 10950 27697 17629 23878 52110	7.2 7.5 7.2 7.2 7.2	7.0 6.6	704.0 620.0 780.2	7.7	104.0	-60.1	5.5	0.5	0.0	214.1			0.0 0.0 1233.9	0.0 4.7	0.0	0.0 -13385.3	0.0 0.0 28162.0			
		9/5/2012 10/9/2012 11/9/2012 12/14/2012 1/8/2013 3/12/2013 7/3/2012	7734 10950 27697 17629 23878 52110	7.2 7.5 7.2 7.2	7.0 6.6	704.0 620.0 780.2	7.7	104.0 126.5	-60.1 -80.0	5.5	0.5	0.0	<b>214.1</b> 102.7	1.2	327.3	0.0 0.0 1233.9	0.0 <b>4.7</b>	0.0	0.0 -13385.3	0.0 0.0 28162.0			
		9/5/2012 10/9/2012 11/9/2012 12/14/2012 1/8/2013 2/6/2013 3/12/2013	7734 10950 27697 17629 23878 52110 18521	7.2 7.5 7.2 7.2 7.2	7.0 6.6	704.0 620.0 780.2	7.7 11.8 22.3 22.4	104.0	-60.1	5.5	0.5	0.0	214.1	1.2		0.0 0.0 1233.9	0.0 4.7	0.0 101.6	0.0 -13385.3	0.0 0.0 28162.0			
		9/5/2012 10/9/2012 11/9/2012 12/14/2012 12/14/2013 3/12/2013 3/12/2013	7734 10950 27697 17629 23878 52110	7.2 7.5 7.2 7.2 7.2 7.2 7.2	7.0 6.6 <b>6.8</b> 7.1 7.2	704.0 620.0 780.2	7.7	126.5 160.0 178.0	- <b>60.1</b> -80.0 -126.0	5.5 0.3 1.8	0.5	0.0	214.1 102.7 70.8	1.2 0.8 1.6	327.3 341.0	0.0 0.0 1233.9 0.0 126.8	0.0 4.7 0.0 0.7	0.0 101.6 0.0 1.4 0.6	0.0 -13385.3 0.0 -9129.5	0.0 0.0 28162.0 0.0 12897.3 6300.9			
		9/5/2012 10/9/2012 11/9/2012 12/14/2012 12/14/2012 18/2013 3/12/2013 7/3/2012 7/24/2012 9/5/2012 11/9/2012	7734 10950 27697 17629 23878 52110 18521 6028 5242 3447 9200	7.2 7.5 7.2 7.2 7.2 7.2 7.2 8.0 7.9 7.6 7.8	7.0 6.6 <b>6.8</b> 7.1 7.2 7.4	704.0 620.0 780.2 730.0 720.0 390.0 560.0 500.0	7.7 11.8 22.3 22.4 22.8	126.5 126.5 160.0 178.0 100.0 154.0 124.0	-60.1 -80.0 -126.0 -78.0 -66.0 -34.0	0.3 1.8 0.6	0.4 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0	214.1 102.7 70.8 26.0 40.7 45.2	1.2 0.8 1.6 1.4	327.3 341.0 194.0	0.0 0.0 1233.9 0.0 126.8 37.2 5.0 82.9	0.0 4.7 0.0 0.7 0.1 0.4 2.2	0.0 101.6 0.0 1.4 0.6 0.4 1.1	0.0 -13385.3 0.0 -9129.5 -4914.7 -2734.6 -3759.9	0.0 0.0 28162.0 0.0 12897.3 6300.9 6380.7			
		9/5/2012 10/9/2012 11/9/2012 12/14/2012 1/8/2013 3/12/2013 7/3/2012 7/24/2012 10/9/2012	7734 10950 27697 17629 23878 52110 18521	7.2 7.5 7.2 7.2 7.2 7.2 8.0 7.9 7.6 7.8 7.5 7.8	7.0 6.6 6.8 7.1 7.2 7.4 7.5 7.2 7.5	704.0 620.0 780.2 730.0 720.0 390.0 560.0 500.0 410.0	7.7 11.8 22.3 22.4 22.8 10.3 4.7 6.1	104.0 126.5 160.0 178.0 100.0 154.0 108.0	-60.1 -80.0 -126.0 -78.0 -66.0 -34.0 -56.0	5.5 0.3 1.8 0.6 0.1	0.5 0.4 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0	214.1 102.7 70.8 26.0 40.7 45.2 38.6	1.2 0.8 1.6 1.4 1.0	327.3 341.0 194.0 263.0 227.0 192.0	0.0 0.0 1233.9 0.0 126.8 37.2 5.0 82.9 33.8	0.0 4.7 0.0 0.7 0.1 0.4 2.2 4.2	0.0 101.6 0.0 1.4 0.6 0.4 1.1 2.1	0.0 -13385.3 0.0 -9129.5 -4914.7 -2734.6	0.0 0.0 28162.0 0.0 12897.3 6300.9 6380.7 13712.6 22845.3			
		9/5/2012 11/9/2012 11/9/2012 12/14/2012 1/8/2013 3/12/2013 3/12/2013 7/3/2012 7/24/2012 9/5/2012 11/9/2012 11/9/2012 11/8/2013	7734 10950 27697 17629 23878 52110 18521 6028 5242 3447 9200 17598 8900	7.2 7.5 7.2 7.2 7.2 7.2 7.2 8.0 7.9 7.6 7.8	7.0 6.6 <b>6.8</b> 7.1 7.2 7.4	704.0 620.0 780.2 730.0 720.0 720.0 390.0 560.0 500.0 410.0 550.0	7.7 11.8 22.3 22.4 22.8 10.3 4.7	104.0 126.5 160.0 178.0 100.0 154.0 124.0 108.0 120.0	-80.0 -126.0 -78.0 -66.0 -34.0 -56.0 -82.0	5.5 0.3 1.8 0.6 0.1 0.8 0.2 1.2	0.5 0.4 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	214.1 102.7 70.8 26.0 40.7 45.2 38.6 58.3	1.2 0.8 1.6 1.4 1.0 1.1	327.3 341.0 194.0 263.0 227.0 192.0 263.0	0.0 0.0 1233.9 0.0 126.8 37.2 5.0 82.9 33.8 124.1	0.0 4.7 0.0 0.7 0.1 0.4 2.2 4.2 2.1	0.0 101.6 0.0 1.4 0.6 0.4 1.1 2.1	0.0 -13385.3 0.0 -9129.5 -4914.7 -2734.6 -3759.9 -11845.7 -8772.5	0.0 0.0 28162.0 0.0 12897.3 6300.9 6380.7 13712.6 22845.3 12837.8			Meter broke. Disregard flow data in field notes.
		9/5/2012 11/9/2012 11/9/2012 12/14/2012 13/2013 2/6/2013 3/12/2013 7/3/2012 7/24/2012 19/5/2012 11/9/2012 11/9/2012 18/2013 2/6/2013	7734 10950 27697 17629 23878 52110 18521 6028 5242 3447 9200 17598 8900	7.2 7.5 7.2 7.2 7.2 7.2 8.0 7.9 7.6 7.8 7.5 7.8	7.0 6.6 6.8 7.1 7.2 7.4 7.5 7.2 7.5	704.0 620.0 780.2 730.0 720.0 390.0 560.0 410.0 550.0 560.0	7.7 11.8 22.3 22.4 22.8 10.3 4.7 6.1 3.5	104.0 126.5 160.0 178.0 100.0 154.0 108.0 120.0 102.0	-60.1 -80.0 -126.0 -78.0 -66.0 -34.0 -56.0	0.3 1.8 0.6 0.1 0.8 0.2	0.5 0.4 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	214.1 102.7 70.8 26.0 40.7 45.2 38.6	1.2 0.8 1.6 1.4 1.0	327.3 341.0 194.0 263.0 227.0 192.0	0.0 0.0 1233.9 0.0 126.8 37.2 5.0 82.9 33.8 124.1 21.9	0.0 4.7 0.0 0.7 0.1 0.4 2.2 4.2 2.1 3.1	0.0 101.6 0.0 1.4 0.6 0.4 1.1 2.1 1.1	0.0 -13385.3 0.0 -9129.5 -4914.7 -2734.6 -3759.9 -11845.7 -8772.5 -9083.7	0.0 28162.0 0.0 12897.3 6300.9 6380.7 13712.6 22845.3 12837.8 15974.8			
		9/5/2012 11/9/2012 11/9/2012 12/14/2012 1/8/2013 3/12/2013 3/12/2013 7/3/2012 7/24/2012 9/5/2012 11/9/2012 11/9/2012 11/8/2013	7734 10950 27697 17629 23878 52110 18521 6028 5242 3447 9200 17598 8900	7.2 7.5 7.2 7.2 7.2 7.2 8.0 7.9 7.6 7.8 7.5 7.8	7.0 6.6 6.8 7.1 7.2 7.4 7.5 7.2 7.5	704.0 620.0 780.2 730.0 720.0 720.0 390.0 560.0 500.0 410.0 550.0	7.7 11.8 22.3 22.4 22.8 10.3 4.7 6.1	104.0 126.5 160.0 178.0 100.0 154.0 108.0 120.0 102.0	-80.0 -126.0 -78.0 -66.0 -34.0 -56.0 -82.0	5.5 0.3 1.8 0.6 0.1 0.8 0.2 1.2	0.5 0.4 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	214.1 102.7 70.8 26.0 40.7 45.2 38.6 58.3	1.2 0.8 1.6 1.4 1.0 1.1	327.3 341.0 194.0 263.0 227.0 192.0 263.0	0.0 0.0 1233.9 0.0 126.8 37.2 5.0 82.9 33.8 124.1 21.9	0.0 4.7 0.0 0.7 0.1 0.4 2.2 2.1 3.1	0.0 101.6 0.0 1.4 0.6 0.4 1.1 2.1 1.1 1.6	0.0 -13385.3 0.0 -9129.5 -4914.7 -27344.6 -3759.9 -11845.7 -8772.5 -9083.7 0.0	0.0 28162.0 0.0 12897.3 6300.9 6380.7 13712.6 22845.3 12837.8 15974.8 0.0			Meter broke. Disregard flow data in field notes.
		9/5/2012 11/9/2012 11/9/2012 12/14/2012 13/2013 2/6/2013 3/12/2013 7/3/2012 7/24/2012 19/5/2012 11/9/2012 11/9/2012 18/2013 2/6/2013	7734 10950 27697 17629 23878 52110 18521 6028 5242 3447 9200 17598 8900	7.2 7.5 7.2 7.2 7.2 7.2 8.0 7.9 7.6 7.8 7.5 7.8	7.0 6.6 6.8 7.1 7.2 7.4 7.5 7.2 7.5	704.0 620.0 780.2 730.0 720.0 390.0 560.0 410.0 550.0 560.0	7.7 11.8 22.3 22.4 22.8 10.3 4.7 6.1 3.5	104.0 126.5 160.0 178.0 100.0 154.0 108.0 120.0 102.0	-80.0 -126.0 -78.0 -66.0 -34.0 -56.0 -82.0	5.5 0.3 1.8 0.6 0.1 0.8 0.2 1.2	0.5 0.4 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	214.1 102.7 70.8 26.0 40.7 45.2 38.6 58.3	1.2 0.8 1.6 1.4 1.0 1.1	327.3 341.0 194.0 263.0 227.0 192.0 263.0	0.0 0.0 1233.9 0.0 126.8 37.2 5.0 82.9 33.8 124.1 21.9 0.0	0.0 4.7 0.0 0.7 0.1 0.4 2.2 2.1 3.1 0.0 0.0	0.0 101.6 0.0 1.4 0.6 0.6 0.4 1.1 1.1 1.6 0.0	0.0 -13385.3 0.0 -9129.5 -4914.7 -2734.6 -3759.9 -11845.7 -8772.5 -9083.7 0.0	0.0 28162.0 0.0 12897.3 6300.9 6380.7 13712.6 22845.3 12837.8 15974.8 0.0			Meter broke. Disregard flow data in field notes.
		9/5/2012 11/9/2012 11/9/2012 12/14/2012 13/2013 2/6/2013 3/12/2013 7/3/2012 7/24/2012 19/5/2012 11/9/2012 11/9/2012 18/2013 2/6/2013	7734 10950 27697 17629 23878 52110 18521 6028 5242 3447 9200 17598 8900	7.2 7.5 7.2 7.2 7.2 7.2 8.0 7.9 7.6 7.8 7.5 7.8	7.0 6.6 6.8 7.1 7.2 7.4 7.5 7.2 7.5	704.0 620.0 780.2 730.0 720.0 390.0 560.0 500.0 410.0 560.0 490.0	7.7 11.8 22.3 22.4 22.8 10.3 4.7 6.1 3.5	104.0 126.5 160.0 178.0 100.0 154.0 124.0 108.0 120.0 102.0	-80.0 -126.0 -78.0 -66.0 -34.0 -56.0 -82.0	5.5 0.3 1.8 0.6 0.1 0.8 0.2 1.2	0.5 0.4 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	214.1 102.7 70.8 26.0 40.7 45.2 38.6 58.3	1.2 0.8 1.6 1.4 1.0 1.1 1.2 1.5	327.3 341.0 194.0 263.0 227.0 192.0 263.0	0.0 0.0 1233.9 0.0 126.8 37.2 5.0 82.9 33.8 124.1 21.9	0.0 4.7 0.0 0.7 0.1 0.4 2.2 2.1 3.1	0.0 101.6 0.0 1.4 0.6 0.4 1.1 2.1 1.1 1.6 0.0 0.0	0.0 -13385.3 0.0 -9129.5 -4914.7 -27344.6 -3759.9 -11845.7 -8772.5 -9083.7 0.0	0.0 28162.0 0.0 12897.3 6300.9 6380.7 13712.6 22845.3 12837.8 15974.8 0.0 0.0			Meter broke. Disregard flow data in field notes.

																			Acidity	Alkalinity			
Sample ID	SCWA ID	Sample Date	Flow GPM	pH Field	pH Lab	Cond. Umhos	Temp C	Alka-linity mg/L	Acidity mg/L	Iron mg/L	Mang-anese mg/L	Alum-inum mg/L	Sulfate mg/L	Susp. Solids mg/L	TDS mg/L	Fe Loading lbs/day	Al Loading lbs/day	Mn Loading lbs/day	Loading lbs/day	Loading lbs/day	Latitude	Longitude	Notes
SMP-BOYR1		7/3/2012		7.1	6.9	1040.0	17.0	188.0	-70.0	3.9	0.1	0.0	263.0	1.0	473.0	0.0	0.0	0.0	0.0	0.0			No flow data
SMP-BOYR1 SMP-BOYR1		7/24/2012 9/5/2012	979 1100	7.0		990.0 752.0	16.8 21.0	184.0 152.0	-94.0 -94.0	5.0 4.2	0.1		233.1 188.3	1.0	470.2 373.0	59.2 55.7	0.1	1.4 0.1	-1106.0 -1242.9	2165.0			Estimated
SMP-BOYR1		10/9/2012	1359	7.4		920.0	11.5		-94.0	1.8	0.0		188.3	1.8		29.2	0.0	0.1	-1242.9	3495.7			Estimated
SMP-BOYR1		11/9/2012	3317	7.2	7.3	840.0	7.9		-56.0	1.8	0.0		190.4	2.0		69.8	0.8		-2232.9	6619.1			
SMP-BOYR1		12/14/2012	3602	7.4	7.3	730.0	7.7		-114.0	0.1	0.5		125.5	1.0		5.6	1.3		-4935.9	9179.0			
SMP-BOYR1		1/8/2013 2/6/2013	1849 2554	7.4	7.4	840.0	6.4	206.0 198.0	-118.0 -109.0	1.2	0.5		460.6 155.7	1.9	356.0 524.0	26.0 75.5	1.1		-2622.5 -3346.2	4578.3 6078.4			N. 1 . 10111.
SMP-BOYR1 SMP-BOYR1		3/12/2013	4936	7.4		1056.0 900.0	8.0	198.0	-109.0	2.5	0.0	0.0	155./	2.3	524.0	75.5	0.0	0.0	-3346.2	0.0			No chemical field data, use lab results.
Din DOTKI		3/12/2013	4730	7.4		900.0	0.0									0.0	0.0		0.0	0.0			
																0.0	0.0		0.0				
			2462			007.4	12.0	190.0	06.4	2.6		2 0.0	227.0		422.2	0.0 75.7	0.0		0.0				
Average		1	2462	7.2	7.2	896.4	12.0	190.0	-96.4	2.6	0.2	2 0.0	226.8	1.7	422.2	/5./	0.5	4.5	-2852.1	5622.8			
																							Т
SMP-WR1 SMP-WR1		7/24/2012 9/4/2012	2643 1148	7.8 7.9		930.0 1118.0	20.4		-82.0 -120.0	4.0 0.9			254.5 376.7	1.1	440.3 556.0	127.4 11.7	0.3		-2605.0 -1655.9	3621.7 2125.0			
SMP-WR1		10/9/2012	1875	8.1		1130.0	11.7		-58.0	0.7	0.0		275.8	1.4		14.6	0.0		-1307.0	3605.6			
SMP-WR1		11/9/2012	4133	7.9	7.3	980.0	8.4	164.0	-108.0	1.0	0.2	2 0.0	261.3	1.9	475.0	51.2	2.0	9.4	-5365.1	8147.0			
SMP-WR1		12/14/2012	6837	7.8		760.0	6.5	138.0	-94.0	1.0	2.1		160.2	1.0		78.9	4.1		-7724.5	11340.3			
SMP-WR1 SMP-WR1		1/8/2013 2/6/2013	4803 4304	7.8	7.5	990.0 1390.0	4.5	148.0 138.0	-122.0 -74.0	6.4 2.9	0.5		258.2 245.5	1.7	433.0 694.0	370.0 152.1	19.6	30.0	-7042.6 -3828.6	8543.5 7139.8	-		No chemical field data, use lab results.
SMP-WR1		3/12/2013	10809	7.7		1330.0	7.9	158.0	-/4.0	2.9	0.0	, 0.0	243.3	1./	094.0	0.0	0.0		-3828.6	7139.8			tvo circinical field data, use lab results.
																0.0	0.0	0.0	0.0	0.0			
																0.0	0.0	0.0	0.0	0.0			
																0.0	0.0	0.0	0.0	0.0			
Average			4569	7.9	7.3	1078.5	11.5	145.1	-94.0	2.4	0.4	0.1	261.7	1.6	500.5	132.2	3.9		-5162.3	7970.9			
rreruge		1	4507	1.0	12	10702		14011	-54.0	2.4			201.7	1.0	5002	10212	5.5	220	-010210	77.025	t		
SMP-BUF1		7/24/2012	1760	7.3	6.6	1040.0	21.1	36.0	8.0	11.9	1.4	0.8	273.7	2.1	483.7	252.2	16.9	30.0	169.2	761.6			T.
SMP-BUF1		9/4/2012	449	7.5		1113.0	21.8		50.0	5.4	1.3		424.7	2.1		29.1	0.4		269.8	259.1			
SMP-BUF1		10/9/2012	1359	7.2		870.0	12.4	52.0	-16.0	6.4	1.1	0.0	385.6	1.1	412.0	104.4	0.5	17.5	-261.4	849.5			
SMP-BUF1		11/9/2012	2614	7.0		620.0	7.9		36.0				210.3	2.1		0.3	0.6		1131.1	1256.8			
SMP-BUF1 SMP-BUF1		12/14/2012 1/8/2013	6169 4250	6.4		490.0 690.0	5.2 2.0		-16.0 20.0	4.8 8.8			125.4 221.8	1.4 2.1	229.0 315.0	352.2 447.0	28.9 39.3		-1186.4 1021.8	2965.9 1839.2			
SMP-BUF1		2/6/2013	4852	0.0	6.6	703.0	2.0	26.0	-16.0	5.5	0.7		220.5	1.6		317.8	35.6		-933.1	1516.3			No chemical field data, use lab results.
SMP-BUF1		3/12/2013	9493	7.5		670.0	6.9									0.0	0.0	0.0	0.0	0.0			
																0.0	0.0	0.0	0.0	0.0			
																0.0	0.0		0.0	0.0			
																0.0	0.0		0.0	0.0			
																0.0	0.0	0.0	0.0	0.0			
Average			3868	7.1	6.9	774.5	11.0	39.7	9.4	6.1	1.3	0.4	266.0	1.8	376.8	283.4	17.9	58.6	438.4	1846.6			
																					1		
SMP-LS1		7/24/2012 9/4/2012	15282 3596	8.0 7.8	6.9	840.0	23.1 22.8	168.0	-120.0 -144.0	2.1	0.0		139.7 250.7	1.6	383.0 519.0	391.3 38.9	1.8		-22042.8	30859.9			
SMP-LS1 SMP-LS1		9/4/2012	3596 3854	7.8		1040.0 1080.0	22.8		-144.0 -102.0	0.9			250.7 205.3	2.2		38.9	0.1		-6224.1 -4725.3	8298.8 9357.9	-		
SMP-LS1		11/9/2012	11911	8.0		800.0	7.7	160.0	-78.0	1.6			135.5	1.7		224.8	2.9		-11167.4	22907.4			
SMP-LS1		12/14/2012	30111	8.0	7.5	630.0	3.1	136.0	-96.0	1.1	0.4	0.0	80.8	1.0	292.0	390.9	10.9	152.0	-34745.9	49223.4			
SMP-LS1		1/8/2013	13784	8.5		960.0	0.6		-80.0	0.7	0.5		185.3	1.2		107.7	1.7		-13254.3	25183.2			
SMP-LS1 SMP-LS1		2/6/2013 3/12/2013	11777 50403	7.9	7.5	1245.0 1030.0	3.2 7.8		-94.0	1.6	0.2	2 0.0	145.5	1.7	620.0	229.3	1.4		-13307.0 0.0	19252.6	-		pH meter broken, use lab results.
Sant-P91		3/12/2013	30403	7.9		1030.0	/.8					1				0.0	0.0		0.0	0.0			
																0.0	0.0	0.0	0.0	0.0			
																0.0	0.0		0.0	0.0			
			17500			052.1		162.5	102.0				162.2		450 <	0.0	0.0		0.0	0.0	-		
Average	1		17590	8.0	7.5	953.1	9.9	163.7	-102.0	1.2	0.2	0.0	163.3	1.5	450.6	260.7	2.8	35.6	-21565.8	34614.0		l	I .
									1													1	T
SMP-JR1 SMP-JR1		7/3/2012 7/24/2012	7791	6.6 7.1		1390.0 840.0	22.3 22.5		2.0 -40.0	15.2 4.8	0.6		356.0 125.3	1.1		0.0 447.6	0.0 2.8		-3745.9	0.0 8428.3	<del>                                     </del>		No flow data
SMP-JR1		9/5/2012	2977	6.7	6.5	1047.0	20.4	90.0	8.0	9.5	0.6		250.5	3.1	512.0	338.9	2.1		286.3	3220.5			
SMP-JR1		10/9/2012	2367	7.0	6.7	1310.0	13.3	94.0	-36.0	12.0	0.5	0.0	276.5	5.4	615.0	340.6	0.3	13.9	-1024.3	2674.6			
SMP-JR1		11/9/2012	6000	7.0		1120.0	9.5		-16.0	8.5	1.7		260.4	2.5		615.9	4.3		-1153.9	8654.4			
SMP-JR1 SMP-JR1		12/14/2012 1/8/2013	7588 5875	7.4		960.0 1250.0	8.6	132.0 119.0	-62.0 -50.0	5.0 5.5			182.3 285.5	2.4		457.8 384.9	3.6 5.6		-5654.7 -3531.0	12038.9 8403.8	-		
SMP-JR1		2/6/2013	5566	1.2	6.5	2428.0		120.0	-54.0				285.5 275.6			311.8	10.7		-3531.0	8029.0			No chemical field data, use lab results.
SMP-JR1		3/12/2013	14363	7.2		1690.0	8.3		54.0	4.7	0	0.2	273.0	2.1	1212.0	0.0	0.0		-3013.1	0.0			
																0.0	0.0	0.0	0.0	0.0			
Average			6566	7.0	6.6	1337.2	15.0	103.1	-31.0	8.1	0.5	0.1	251.5	2.5	620.6	642.2	5.2	70.6	-2446.6	8138.9			