Chest Creek Watershed Assessment and Restoration Plan

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Executive Summary

This project was done to develop a restoration plan for the Chest Creek watershed based on information gathered during the study. This project was completed through the partnership with the Cambria County Conservation District and the Chest Creek Watershed Alliance. The project partners worked together to complete the necessary goals to bring this project to completion. Chapter 93 of the Water Quality Standards designates Chest Creek as a CWF and it is the goal of the project partners to keep this designation where it is.

As part of the deliverables of this project, a Geographic Information System (GIS), unique to this watershed has been developed to link data to a watershed map. This tool will allow a user to click on a specific point and see site-specific information generated in this study for that location. This tool will benefit the District, Watershed Groups, Government Agencies, and other who utlize GIS software.

The Chest Creek Watershed encompasses parts of Cambria and Clearfield Counties. The watershed has a drainage area of 129 square miles (334 km^2). It can be found on the Carrolltown, Hastings, Westover, Irvona, Burnside and Mahaffey 7.5-minute USGS quadrangle maps. Several small towns are located within the Chest Creek Watershed: Winterset, Carrolltown, Patton, Hastings, Westover, Newburg (LaJose), Ostend and Mahaffey.

The water quality of Chest Creek has never really been studied in great detail until this report. The West Branch Susquehanna River Non-Point Source Assessment –1997 states that Chest Creek is the only tributary where agricultural activities have made a noticeable influence to water quality in the West Branch or the Susquehanna River. Volunteers from the Chest Creek Watershed Alliance and representatives from the Cambria County Conservation District conducted stream walks on all 66 tributaries flowing into the mainstem of Chest Creek. Sampling locations were determined for all individual tributaries, discharges, and instream points. Individual tributary samples were taken on a quarterly basis. Discharge sampling was done on a monthly basis for 12 months, and instream samples were taken on a monthly basis for 9 consecutive months. Most of the discharges effecting tributaries are characterized as alkaline by nature but possess high concentrations of metals such as iron and aluminum. They emanate from abandoned coal mining operations throughout the watershed.

This study required separating the Chest Creek watershed into three sections (Headwaters, Middle, and Lower). In the Headwaters Section, tributaries (1-30) were sampled for basic AMD (Abandoned Mine Drainage) parameters, nitrates, and phosphates. These tests were done due to the number of farms in this section along with this section being the water supply for Patton Borough. The Middle Section tributaries (31-56) were sampled for basic AMD parameters only, because this section contains the most mining operations throughout the whole watershed. The Lower Section tributaries (57-66) were sampled for basic AMD parameters, Fecal Coliform, and Biological

Oxygen Demand (BOD). The Lower Section contained a few mining operations, plus there are a few little towns in this section that do not have sewage and still wildcat directly into a tributary or mainstem of Chest Creek.

Each section was ranked according to tributary water quality. The discharges were ranked according to water quality along with instream points. This assessment has targeted tributaries and discharges for remediation. Three Problem Areas in each section were recommended for remediation.

The study concluded that in the Headwaters Section Tributaries 24 (Unnamed), 25 (Duclos Run), and 30 (Little Chest Creek) showed the most impact to this section. The Middle Section concluded that discharges on Tributary 48 King's Run: (King's Run Pipe Discharge 48-1R), Tributary 50 North Camp Run: (50-2R North Camp #2 & 50-3R North Camp #3), and Tributary 38 Brubaker Run: (38-1L Route 36 Discharge) showed the most impact to this section. Additional assessment work needs to be done in the Brubaker Run watershed for additional discharges that were not monitored during the study do to landownership access being denied. The Lower Section concluded that Tributaries 66 (Unnamed), 64 (Unnamed), and 57 (Wilson Run) showed the most impact in this section.

Each identified impaired tributary and consequent discharges are unique unto themselves as each has a different remediation strategy. However, the remediation of even one of these water sources would be the right step in helping to preserve and enhance the Chest Creek watershed. The top three from each section were picked for remediation. Cost estimates for individual projects in each section are given in the report. With emphasis on these recommended remediation projects, the Chest Creek watershed will continue to support a substantial aquatic community along with providing great recreational activities.

The participants of this study are hopeful that the information contained here in is utilized to initiate projects and to serve the Chest Creek Watershed Alliance in going after funding. Also, this study will be the foundation of a modern database for this watershed. Additional studies and assessments must continue in order for a comprehensive record to be compiled for the long term success and understanding of ecological changes in the Chest Creek watershed.

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Watershed Vision

It is the vision of the Chest Creek Watershed Alliance and all its partners to restore the Chest Creek watershed through abandonded mine drainage remediation efforts, erosion and sedimentation controls, stream restoration and best management practices (BMP). These efforts will support the goal of improving water quality and compliment the recreational opportunities that already exist within the watershed.

Restoration of this watershed will also include stream restoration efforts and reclamation of several abandoned mine discharges. Without theses restoration efforts the aesthetic value of the stream and public safety are affected. Also these restoration efforts will help to improve the water quality of Chest Creek and the West Branch of the Susquehanna River. The project partners will work continuosly in trying to include as many educational opportunities as possible into future restoration projects for the Chest Creek watershed. The targeted audiences will include youth groups, school students, sportsmen's groups, federal, state, and local government and the overall general public.

Introduction

The Chest Creek Watershed Assessment Study is the end result of a 2-year (2006-2008) study involving a large-scale water quality sampling program and the ultimate evaluation and analyses of the data.

The intent of the project was to assess the overall health of Chest Creek, identify and define entities, which are impacting the creek, and recommend restoration strategies as well as recommendations for enhancing positive elements of the watershed. These strategies were selected based on a range of qualifying characteristics.

In order to determine the overall health of Chest Creek, great emphasis on water quality, and overall characteristics of the watershed were evaluated. Sixty-six tributaries, twelve discharges, and eight main stem instream points were studied in the watershed.

The Cambria County Conservation District in conjunction with the Chest Creek Watershed Alliance conducted the study.

The study area consisted of the watershed and supporting tributaries originating from the headwaters, Cambria Township, Cambria County to the confluence with the West Branch of the Susquehanna River in Mahaffey Borough, Clearfield County. Approximately 66 tributaries were assessed in this stretch. Six quarters of water quality data was collected on these tributaries beginning in 2006. Eight instream points were monitored for water quality, monthly a nine-month interval in 2008. Selected discharges were monitored for water quality, monthly for a twelve-month interval from 2006-2007.

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Watershed Background

Site Location:

The Chest Creek Watershed encompasses parts of Cambria and Clearfield Counties. The watershed has a drainage area of 129 square miles (334 km^2). It can be found on the Carrolltown, Hastings, Westover, Irvona, Burnside and Mahaffey 7.5-minute USGS quadrangle maps. Several small towns are located within the Chest Creek Watershed: Winterset, Carrolltown, Patton, Hastings, Westover, Newburg (LaJose), Ostend and Mahaffey. The watershed consists of 20 municipalities, which start in Cambria County: (Cambria Township, Allegheny Township, Loretto Borough, East Carroll Township, Carrolltown Borough, Chest Springs Borough, Clearfield Township, Elder Township, Hastings Borough, Susquehanna Township, and Chest Township). Clearfield County municipalities:(Westover Borough, Burnside Township, Chest Township, New Washington Borough, Newburg Borough, Ferguson Township, Bell Township Mahaffey Borough, and Jordan Township).

Several state routes run through the watershed in both Cambria and Clearfield Counties. State Route 36 and State Route 219 are the major ones. There are other side routes, which the state own, also in the watershed. There are many dirt and gravel roads located throughout the watershed and primarily are located near and around Chest Creek, more so in Clearfield County.

Watershed History:

Here are some excerpts from different sources on the history of the Chest Creek Watershed.

The Chest Creek watershed is represented in both Cambria and Clearfield counties. Both counties have extensive deep and surface mining history. Deep mining began in the early 19th century, until around the mid 1940's when surface mining became the most economically feasible way to extract coal reserves located within the watershed.

The Chest Creek watershed has a preserved section of the Kittanning Path. The Kittanning Path was an old trail that crosses northern Cambria County joining the headwaters of the Juniata and Susquehanna Rivers. It was in use from before 1724 until 1781 when the last hostile Indian acts were reported. In 1756 Colonel John Armstrong, "the Hero of Kittanning", pursued the Delaware marauder Shingas along this path, setting up camp on the 3rd & 4th of September, in route to a decisive victory on the Allegheny River during the French & Indian Wars.

“Lumbering has a unique history in the Chest Creek watershed. Chest Creek heads in Allegheny Township among the hemlocks and hardwoods. This stream flows north to Bradley Junction where it becomes a navigable stream for logs.

James Farabaugh of Loretto was the last man to put logs into Chest Creek at this point and drive (float) them to Eckenrode's Mill where others took over to keep the logs moving downstream and to market.

Eckenrode's Mill was the upstream point in the Chest Creek valley for white pine timber. This valley produced some of the largest timber within the state. As we travel downstream to within about one mile of Patton, we find some very large white oak. The king tree in this group was the finest white oak I have ever seen. It stood on the Peter Strittmatter Farm, over 60 feet to the first limb, cut in the summer of 1949 and scaled 4,300 board feet.

The next very large trees we find in the valley stood in a group across Chest Creek from the mouth of Brubaker Run at the present location of Garway Station of the Pennsylvania Railroad. Cambria County can claim the largest of these trees. One large tree, about 130 feet tall, was made into the largest ship spar ever to float on Susquehanna River waters. The measurements were as follows: This spar was standard length of spars for the rigging of America's famous clipper ships. The value of a spar was determined by the diameter 12 feet from the butt or large end. This spar was 43 inches in diameter (measured with a pair of large calipers) and 90 feet long with a 33-inch top diameter. It sold for about $500.00 or $11.60 per inch. Had this tree been cut into lumber it would have made over 6,000 feet of one-inch boards.”[1]

“The early 1800's saw the development of Cambria County into settlements. Count Sedloski initially surveyed the immediate area in and near the future site of the borough of Patton in 1829. The first settlers in the valley known as "Polish Corners", later known as "Marks Mills", and later to become "Patton", are reported to be enterprising men and their presence here is easily explained by following the valley's natural waterway, "Chest Creek". Although no specific records exist to document the dates of these men's residence, legend contends that these men were gainfully self-employed as trappers, traders, farmers or lumbermen at Polish Corners as early as 1844.

Patton was named to honor John Patton and his son, A.E. Patton, whose tireless efforts were powerful factors in the incorporation and development of the new town. Other pioneers in this work were Honorable James Kerr, General John Magee, A.G. Palmer, George S. Good, and others after whom streets are named.

1) R. Dudley Tonkin: Extracted from:The Cambria County Historical Society Sesquicentennial Handbook '54
2) Taken from http://www.pattonboro.com/history.htm

In 1895, the Patton Clay Manufacturing Company was incorporated. It became one of the largest clay manufacturers in the world making clay products that were used world wide to build such things as the Panama Canal." [2]

"The borough of Westover was incorporated September 6, 1895. The town is situated in Chest Township, in the southern part of the county; it is reached by the Cambria and Clearfield division of the Pennsylvania Railroad, and also by trains of the New York Central and Hudson River Railroad, which use the same tracks as the Pennsylvania.

The principal industry of Westover is the large tannery of the William F. Mosser Company. The town has two churches, a fine schoolhouse and has a large trade from the surrounding territory. The present population is five hundred and sixty-nine (569)." [3]

"The Borough of Newburg is situated in the northern end of Chest Township and is one of the oldest towns in the county. The town is located on the banks of Chest Creek and on the line of the Pennsylvania & Northwestern Railroad, and also on the line of the Clearfield & Cambria Branch of the Pennsylvania Railroad.

The village was first called Hurd postoffice, after Henry Hurd, Esq., one of the oldest citizens of the locality, who erected the first dwelling on the site of the present town of Newburg.

After the construction of the Pennsylvania & Northwestern Railroad in 1887, the town grew very rapidly and became quite a center of business for that section of the county.

The town was incorporated as a borough in 1885. The name of the postoffice was changed from Hurci to La Jose in honor of George Jose, Esq., who is one of the prominent citizens.

Near the town are several coal operations that materially assist its business prosperity. The population of the borough at the present time is about three hundred." [4]

"The Borough of New Washington was incorporated in the year 1859, and is situated on Chest Creek, one and one-half miles from La Jose.

In 1835 the Methodist Protestants built the first church known as the "Mount Zion"; this church was built out of hewed logs, and about two years later the Methodist Episcopal denomination [3]built a hewed log church near the location of their present building. Both of these old log churches have geen succeeded by handsome new buildings.

In the New Washington cemetery are the graves of John Ludwig Snyder and his wife, Anna Maria, believed to have been the oldest people who ever lived in Clearfield County. John Ludwig Snyder was born in Ludwig, Germany, March, 1746, and died in

3) Taken from http://history.rays-place.com/pa/clear-b-westover.htm
4) Taken from http://history.rays-place.com/pa/clear-b-newburg.htm

November, 1860, at the remarkable age of one hundred and fourteen years, and his wife, Anna Maria, was born in Philadelphia, in May, 1752, and died in August, 1857, aged over one hundred and five years.

In the lumbering days of Clearfield County, New Washington was an important point and a large business was transacted there, but it is now principally dependent upon the surrounding farms for business. On account of its high altitude, a number of people from other places are in the habit of spending the summer months in this town. The present population is about four hundred."[5]

"The Borough of Mahaffey is situated on the West Branch of the Susquehanna River, near the mouth of Chest Creek. The town was named in honor of the late Robert Mahaffey, who was its founder, having located on the site of the town and made an improvement there in the year 1841. Mr. Mahaffey called the place "Franklin," and it was so designated for many years.

Mahaffey was incorporated as a borough in the year 1889. It has four churches; fine public schools and its industries consist of a large tannery and a gristmill.

Mahaffey is a junction of the Pennsylvania & Northwestern division of the Pennsylvania Railroad with the Beech Creek division of the New York Central & Hudson River Railroad, both roads having branches leading to the different coal operations in the neighborhood.

Mahaffey is a prosperous and growing town and its people are wide-awake and progressive. The present population of the borough is about five hundred." [6]

Watershed Geology/Topography/Soils

Geology:

The Chest Creek watershed starts in the northern part of Cambria County and flows north to its confluence with the West Branch of the Susquehanna River in Mahaffey, Clearfield County. The geology of the watershed is a mix of sandstone, shale, limestone, and bituminous coal. The Conemaugh Group and Allegheny Formation are found throughout underlining the watershed. The Pottsville and Mauch Chunk Formations are located only in Elder and Chest Townships in Cambria County near the mainstem of Chest Creek.

5) Taken from http://history.rays-place.com/pa/clear-b-newwashington.htm
6) Taken from http://history.rays-place.com/pa/clear-b-mahaffey.htm

Conemaugh Group:

This group is stratigraphically defined as the rocks lying between the Upper Freeport coal horizon and the Pittsburgh coal. The thickness of this interval ranges from 520 feet to 890 feet. The gradual eastward thickening is apparent in this group. Flint subdivided the Conemaugh Group into a lower formation, the Glenshaw, containing several widespread marine units, and an upper formation, the Casselman, devoid of marine units except for the Skelley, which is of limited extent. [7]

Casselman Formation: Cyclic sequences of shale, siltstone, sandstone, red beds thin impure limestone and thin nonpersistent coal. The top of the Aims limestone marks the base of this formation.

Glenshaw Formation: Cyclic sequences of shale, siltstone, sandstone, red beds thin impure limestone and thin nonpersistent coal; also included are four marine limestone or shale horizons. The top of the Upper Freeport Coal marks the base of this formation.

Allegheny Formation:

This formation includes those rocks from the base of the Brookville coal to the top of the Upper Freeport coal. Cyclic sequences of sandstone shale, limestone, clay and coal are present. This formation includes the Freeport, Kittanning, Clarion and Brookville coals. The Clarion / Brookville coal or it's underclay marks the base of this group. This formation was specifically defined to include all of the economically significant coals present in that part of the Pennsylvanian sequence.

Pottsville Formation:

This formation ranges from 20 feet to at least 250 feet in thickness in the western Pennsylvania. Its basal contact is apparently everywhere disconformable and south to north overlies increasingly older Mississippian and possibly uppermost Devonian rocks. The base of the Brookville coal marks the upper boundary of this formation. The Pottsville (formerly a group) was divided into the Sharon, Connoquenessing, Mercer, and Homewood Formations, in ascending order. [8]

Mauch Chunk Formation:

This formation is the most pervasive, and possibly the most recognized, Mississippian formation in Pennsylvania. It consists of red to reddish-brown mudstone and siltstone, and chocolate-brown, reddish-brown, and greenish-gray sandstone and conglomerate.

The Cambria County GIS Center [17], through GIS analysis, produced the following Soils Classification report on page 9

7) Taken from Report 56A:Geology and mineral resources of Southern Somerset County, p.267 1965.
8) Taken from the Pennsylvania Geological Survey, 4th ser., Water Resource Report 15, 90 p. 1963.
17) Cambria County GIS Center. See bibliography for complete citation.

Chest Creek Watershed Surface Geology

Map Symbol	Name	Age	LITH1	LITH2	LITH3	Acreage	Square Miles
Pcc	Casselman Formation	Pennsylvanian	Shale	Siltstone	Sandstone; limestone; coal	16575.216119	25.898775
Pcg	Glenshaw Formation	Pennsylvanian	Shale	Sandstone	Limestone; coal	39658.695573	61.966712
Pa	Allegheny Formation	Pennsylvanian	Sandstone	Shale	Limestone; clay; coal	25373.685934	39.646384
Pp	Pottsville Formation	Pennsylvanian	Sandstone	Conglomerate	Shale; siltstone; claystone; limestone; coal	1013.193537	1.583115
Mmc	Mauch Chunk Formation	Mississippian	Shale	Siltstone	Sandstone; conglomerate; limestone	153.500211	0.239844

ACREAGE Sum
82774.291372
SQ_MI Sum
129.3348

The Chest Creek watershed contains three synclines and two anticlines. The first flanking the eastern portion of the headwaters section of the watershed is the Wilmore Syncline. The Wilmore Syncline follows the eastern portion of the headwaters section before crossing into the Clearfield Creek watershed, near Duclos Run in the Chest Creek watershed. The second syncline, the Barnesboro Syncline runs through Barnesboro before crossing over into the Chest Creek watershed near Sylvis. A small portion of the syncline runs northwesterly along the chest creek watershed boundary. The third Bradley Syncline intersects and crosses near Bradley Junction then progressing northeast.

Near the headwaters section in Winterset a portion of the Ebensburg Anticline runs through the watershed. The Laurel Hill Anticline enters the watershed on the western side of Carrolltown before eventually running up through the middle of the watershed and exiting to the east of Westover.

Topography:

The topography, or the physical land features, of the watershed determines the drainage patterns and surface flow characteristics. In the headwater section of the watershed the topography is rolling uplands, the middle section is steep, narrow V-valleys, and the end section consists of narrow valleys and uplands.

The Chest Creek watershed is located entirely in the Appalachian Plateaus Province. Within this province the Allegheny Mountain Section and the Pittsburgh Plateaus Section separate the watershed.

Drainage:

The Chest Creek watershed has a drainage area of 129 square miles (334 km^2). The creek flows northward to its confluence with the West Branch of the Susquehanna River. Sixty-six tributaries contribute to the mainstem of Chest Creek.

Soils:

General soil associations found in the Cambria County portion of the watershed consist of the Cookport-Hazelto-Laidig association, Gilpin-Earnest-Wharton association, Brinkerton-Wharton-Cavode association, and the Atkins-Philo association. There are approximately 39 soil units found along the mainstem and its tributaries. They include but are not limited to the following: At, AmB, BeB, BeC, BmB, BmC, BtB, CaB, CaC, CeB, CeD, CvB, CvD, GnB, GpB, GtC, GtD, GwB, GwC, GwD, GwF, HaB, HaC, HaD, HbD, Hx, LaB, LaC, LDF, NoB, Ph, UDC, UDF, URB, URC, WaB, WaC, WgC and WgD. In Clearfield County the watershed consists of the Rayne-Gilpin-Eanest association, Cookport-Hazleton-Clymer association, Udorthents-Gilpin-Rayne

association, and the Atkins-Philo-Monogahela association. There are approximately 32 soil units found along the mainstem and its tributaries. They include but are not limited to the following: AIB, BeD, BrA, BrB, CIC, CoB, CoC, CxD, DxB, DxD, ErC, ErD, ExB, ExD, GIB, GmD, HbD, HcB, HcC, HdB, MoB, Po, Pu, RaB, RaC, RbF, RcD, TyB, Ud, Uo, WhB and WhC. [9 & 10]

Allegheny silt loam, 3 to 8 percent slopes (AIB)- [10]

This soil is gently sloping, deep, and well drained. It is on terraces. Slopes generally are smooth and convex and are 200 to 600 feet long. The areas of this soil are irregular in shape or oblong and range mainly from 4 to 40 acres.

The permeability of this Allegheny soil is moderate, and available water capacity is high. Runoff is medium. In unlimed areas reaction in the surface layer and upper part of the subsoil is strongly acid to very strongly acid. The hazard of erosion is moderate.
This soil is suited to trees, and potential productivity is high. The soil has few limitations for most non-farm uses.

Armagh silt loam, 0 to 8 percent slopes (AmB)- [9]

This soil is nearly level and gently sloping, deep, and poorly drained. It is on flats and benches and in depressions. The areas are irregular in shape and range from 5 to 80 acres. This Armagh soil has slow permeability and high available water capacity. Surface runoff is slow and medium. In unlimed areas reaction is strongly acid or very strongly acid throughout the soil. A high water table is between the surface and a depth of 6 inches.

Most areas of this soil are pasture and woodland. Some areas are used for row crops. The slow permeability of the soil and high water table limit the soil for most non-farm uses, especially for onsite waste disposal. Some areas are suitable for wildlife habitat and recreational uses.

Atkins silt loam (At)- [9]

This soil is nearly level, deep, poorly drained and found on floodplains, which are frequently flooded. Slopes range from zero to three percent. This soil unit is listed as a Statewide Important Farmland Soil and contains hydric inclusions. The permeability is slow to moderate in the subsoil and moderately slow to rapid in the substratum, available water capacity is high, and runoff is very slow. Reaction in unlimed areas is strongly to very strongly acid. The seasonal high water table of this soil unit is between the surface and a depth of 1 foot. A slight hazard of erosion exists.

This soil unit belongs to Hydrologic Group D with very brief, frequent flooding from September through July. Frequent flooding and the high water table limit the use of this soil for most non-farm uses. It is especially unsuited to onsite waste disposal. According to the soil survey, Atkins silt loam is fairly well, to well suited for wetland plants, open land, woodland, and wetland wildlife.

Berks channery silt loam, 3 to 8 percent slopes (BeB)- [9]

This soil is gently sloping, moderately deep, and well drained. It is on uplands. The areas are irregular in shape and range from 2 to 60 acres. This soil has moderate or moderately rapid permeability and very low available water capacity. Surface runoff is medium. In unlimed areas reaction is strongly acid and very strongly acid in the surface layer and upper part of the subsoil. It ranges from very strongly acid to medium acid in the substratum.

Most areas of this soil are in crops and pasture. Some of the acreage is in woodland. The moderate depth to bedrock, moderately rapid permeability, and high percentage of rock fragments in the soil are the main limitations for most non-farm uses, especially for onsite waste disposal.

Berks channery silt loam, 8 to 15 percent slopes (BeC)- [9]

This soil is sloping, moderately deep, and well drained. It is on uplands. The areas are irregular in shape and range from 2 to 40 acres. This soil has moderate to moderately rapid permeability and very low available water capacity. Surface runoff is rapid. In unlimed areas reaction is strongly acid to very strongly acid in the surface layer and upper part of the subsoil. It is very strongly acid to medium acid in the substratum.

Most areas of this soil are in crops and pasture. Some of the acreage is in woodland. The depth to bedrock, moderately rapid permeability, slope, and high percentage of rock fragments in the soil are the main limitations for non-farm uses, especially for onsite waste disposal.

Berks channery silt loam, 15 to 25 percent slopes (BeD)- [10]

This soil is moderately steep, moderately deep, and well drained. It is on uplands. The areas are irregular in shape and range from 2 to 40 acres. This soil has moderate to moderately rapid permeability and low available water capacity. Surface runoff is very rapid. In unlimed areas reaction is strongly acid or very strongly acid in the surface layer and upper part of the subsoil. It is very strongly acid to medium acid in the substratum.

Much of this soil is used for pasture. The depth to bedrock, moderately rapid permeability, slope, and high percentage of rock fragments in the soil are the main limitations for most non-farm uses, especially for onsite waste disposal.

Blairton silt loam, 3 to 8 percent slopes (BmB)- [9]

This soil is gently sloping, moderately deep, and somewhat poorly drained and moderately well drained. It is on side slopes of uplands adjacent to flats and depressions. The areas are irregular in shape and range from 2 to 60 acres. This soil has moderately slow permeability and low to moderate available water capacity. Surface runoff is

medium. In unlimed areas reaction ranges from strongly acid too extremely acid throughout the soil.

Most areas of this soil are in crops and pasture. Some of the acreage is used for woodland. The depth to bedrock, moderately slow permeability, and a seasonal high water table limit the soil for most non-farm uses, especially for onsite waste disposal.

Blairton silt loam, 8 to 15 percent slopes (BmC)- [9]

This soil is sloping, moderately deep, and somewhat poorly drained and moderately well drained. It is on side slopes adjacent to flats and depressions. The areas are irregular in shape and ranges from 2 to 15 acres. This soil has moderately slow permeability and low to moderate available water capacity. Surface runoff is rapid. In unlimed areas reaction ranges from strongly acid too extremely acid throughout the soil.

Most areas of this soil are in crops and pasture. Some of the acreage is used for woodland. Slope and the depth to bedrock, the seasonal high water table, and moderately slow limit the soil for most non-farm uses, especially for onsite waste disposal.

Brinkerton silt loam, 0 to 3 percent slopes (BrA)- [10]

This soil is nearly level, deep, and poorly drained. It is on uplands. Slopes generally are smooth and concave and 100 to 300 feet long. The areas of this soil are irregular in shape and range mainly from 4 to 20 acres. The permeability of this soil is moderate above the firm part of the subsoil and moderately slow and slow in the firm part. Runoff is slow. Reaction in unlimed areas is medium acid to very strongly acid. The seasonal high water table is between the surface and a depth of 6 inches

Most areas of this soil are in woodland. Some areas are cultivated or are in native vegetation. The seasonal high water table and the permeability in the firm part of the subsoil limit this soil for non-farm use, especially for onsite waste disposal.

Brinkerton silt loam, 3 to 8 percent slopes (BrB)- [10]

This soil is gently sloping, deep, and poorly drained. It is on uplands. Slopes generally are smooth and concave and are about 100 to 400 feet long. The areas of this soil are irregular in shape and range from 4 to 40 acres. The permeability of this soil is moderate above the firm part of the subsoil and moderately slow and slow in the firm part. Runoff is slow. Reaction in unlimed areas is medium acid to very strongly acid. The seasonal high water table is between the surface and a depth of 6 inches.

Most areas of this soil are in woodland. Some areas are cultivated or in native vegetation. The seasonal high water table and the permeability in the firm part of the subsoil limit this soil for non-farm use, especially for onsite waste disposal.

Brinkerton silt loam, 0 to 8 percent slopes (BtB)- [9]

This soil is deep, nearly level and gently sloping, and poorly drained. It is on foot slopes and in depressions. The areas are irregular in shape and range from 2 to 120 acres. This soil has slow permeability and moderate available water capacity. Surface runoff is slow to medium. In unlimed areas reaction ranges from medium acid to very strongly acid in the surface layer and upper part of the subsoil. It is strongly acid to slightly acid in the lower part of the subsoil.

Most areas of this soil are uses for woodland and permanent pasture. Some drained areas are used for row crops. The high water table and slow permeability limit the soil for most non-farm uses, especially for onsite sewage disposal. Some areas, however, are suitable for wildlife habitat and recreation.

Cavode silt loam, 3 to 8 percent slopes (CaB)- [9]

This soil is deep, gently sloping, and somewhat poorly drained. It is on upland ridge tops and benches. The areas are irregular in shape and range from 2 to 150 acres. This soil has slow permeability and high available water capacity. Surface runoff is medium. In unlimed areas reaction is strongly acid and very strongly acid throughout the soil. A seasonal high water table is at a depth of 6 to 18 inches.

Much of the acreage of this soil is used for woodland. Some areas are used for permanent pasture and some for crops. The seasonal high water table and the slow permeability of the soil are the main limitations for most types of non-farm uses, especially for onsite sewage disposal.

Cavode silt loam, 8 to 15 percent slopes (CaC)- [9]

This soil is deep, sloping, and somewhat poorly drained. It is on uplands. Slopes generally are smooth and concave and are 150 to 400 feet long. The areas of this soil are oval or irregular in shape and ranger mainly from 2 to 15 acres. The permeability of this soil is slow, and available water capacity is moderate. Runoff is medium. Reaction in unlimed areas is strongly acid or very strongly acid. A seasonal high water table is at a depth of 6 to 18 inches.

Most areas of this soil are used for woodland, hay, or pasture. A few areas are used for cultivated crops. The permeability, the seasonal high water table, and low strength limit this soil for most non-farm uses, especially onsite waste disposal.

Cookport and Earnest soils, 3 to 8 percent slopes (CeB)- [9]

This unit consists of gently sloping areas of moderately well drained, deep Cookport and Earnest soils on uplands. The areas range from 2 to 650 acres and are irregularly shaped. The permeability of these soils is moderately slow and slow. Surface runoff is medium. Available water capacity is moderate. Reaction is strongly acid and very strongly acid throughout the soils.

Most areas of these soils are in crops and pasture. Some of the acreage is in woodland, and a few small areas are used for building sites and recreation. Slow and moderately slow permeability and the seasonal high water table limit these soils for most non-farm uses, especially for onsite sewage disposal.

Cookport and Earnest soils, 15 to 25 percent slopes (CeD)- [9]

This unit consists of moderately steep areas of moderately well drained, deep Cookport and Earnest soils on uplands. The areas range from 2 to 60 acres and are irregularly shaped. The permeability of these soils is moderately slow to slow. Surface runoff is rapid, and available water capacity is moderate. A seasonal high water table is at a depth of 18 to 30 inches. Reaction is strongly acid and very strongly acid throughout the soils. These soils are suitable for trees, and most areas are wooded. Slope, the slow and moderately slow permeability, and the seasonal high water table limit these soils for many non-farm uses. Some areas are suitable for recreation and wildlife habitat.

Clymer channery loam, 8 to 15 percent slopes (CIC)- [10]

This soil is sloping, deep, and well drained. It is on uplands. Slopes generally are smooth and convex and are about 100 to 400 feet long. The areas of this soil are irregular in shape or long and narrow and range mainly from 4 to 40 acres. The permeability of this soil is moderate, and available water capacity is moderate. Runoff is medium. Reaction in unlimed areas is strongly acid to extremely acid.

This soil is suitable for cultivated crops and pasture. This soil is suited to trees, and potential productivity is high. Slope and depth to bedrock are the main limitations of the soil for non-farm use.

Cookport channery loam, 3 to 8 percent slopes (CoB)- [10]

This soil is gently sloping, deep, and moderately well drained. It is on uplands. Slopes generally are smooth and concave or convex and are about 100 to 500 feet long. The areas of the soil are irregular in shape and range from about 4 to 100 acres. The permeability of this soil is moderate above the firm part of the subsoil, slow in the firm part, and moderately slow in the substratum. Available water capacity is moderate, and runoff is medium. Reaction in unlimed areas is strongly acid to extremely acid. A seasonal high water table is at a depth of 18 to 30 inches.

Most areas of this soil are in woodlands. Some areas are in cultivated crops or native vegetation. The seasonal high water table and slow permeability in the firm part of the subsoil are the main limitations of the soil for non-farm use, especially for onsite waste disposal.

Cookport channery loam, 8 to 15 percent slopes (CoC)- [10]

This soil unit is sloping, deep, and moderately well drained. It is found on uplands. Permeability is moderate above the firm part of the subsoil, slow in the firm part, and moderately slow in the substratum. The available water capacity is moderate, and runoff is medium. The reaction in unlimed areas is strongly acid to extremely acid. The high water table is between 18 to 30 inches, and the erosion hazard is moderate.

Most areas of this soil are in woodland. Other areas are idle or in cultivated crops. The high water table, slope, and the slow permeability in the firm part of the subsoil are the main limitations of the soil for non-farm use, especially onsite waste disposal.

Cookport and Ernest very stony soils, 0 to 8 percent slopes (CvB)- [9]

This unit consists of nearly level and gently sloping, moderately well drained, deep Cookport and Ernest soils on uplands. The areas range from 2 to 60 acres and are irregularly shaped. These soils have moderately slow and slow permeability and moderate available water capacity. Surface runoff is slow. In unlimed areas reaction is strongly acid to and very strongly acid throughout the soils. The seasonal high water table is at a depth of 18 to 30 inches.

The stones on the surface make these soils generally unsuitable for farming. The stony surface, the slow or moderately slow permeability, and the seasonal high water table limit these soils for most non-farm uses, especially for onsite sewage disposal.

Cookport and Ernest very stony soils, 8 to 25 percent slopes (CvD)- [9]

This unit consists of sloping and moderately steep, moderately well drained, deep soils on uplands. The areas ranges from 2 to 60 acres and are irregularly shaped. These soils have moderately slow and slow permeability and moderate available water capacity. Surface runoff is medium to rapid. In unlimed areas reaction is strongly acid and very strongly acid throughout the soils.

The stones on the surface generally make these soils unsuitable for farming, but suitable for woodlands. Slope, the seasonal high water table, the stones on the surface, and the slow and moderately slow permeability limit these soils for most non-farm uses, especially for onsite sewage disposal.

Cookport very stony loam, 8 to 25 percent slopes (CxD)- [10]

This soil unit is sloping, moderately steep, deep, and moderately well drained. It is found on uplands and contains hydric inclusions. Stones of 3 to 10 inches in diameter are found on 3 to 15 percent of the surface. Permeability is moderate above the firm part of the subsoil, slow in the firm part, and moderately slow in the substratum. The available water capacity is moderate, and runoff is medium. The reaction in unlimed areas is strongly

acid to extremely acid. The high water table is at a depth of 18 to 30 inches. The erosion hazard is moderate.

The stony surface makes this soil unit unsuited to cultivated crops, hay, or pasture, but it is suited to trees. The high water table, slope, and slow permeability in the firm part of the subsoil limit non-farm use.

Dekalb very stony loam, 0 to 8 percent slopes (DxB)- [10]

This soil is nearly level and gently sloping, moderately deep, and well drained. It is on uplands. Slopes generally are smooth and convex and are about 100 to 400 feet long. The areas of this soil are irregular in shape or long and narrow and range mainly from 4 to 50 acres. The permeability of this soil is moderately rapid-to-rapid in the subsoil and rapid in the substratum. Available water capacity is low. Runoff is medium. Reaction is extremely acid to strongly acid in unlimed areas.

The stones on the surface generally make it unsuitable to cultivate crops, hay, or pasture. The depth to bedrock is the main limitation of the soil for non-farm use, especially for onsite waste disposal.

Dekalb very stoney loam, 8 to 25 percent slopes (DxD)- [10]

This soil is sloping and moderately steep, moderately deep, and well drained. It is on uplands. Slopes generally are smooth and convex and are about 100 to 300 feet long. The areas of this soil are irregular in shape or long and narrow and range mainly from 4 to 50 acres. The permeability of this soil is moderately rapid-to-rapid in the subsoil and rapid in the substratum. Available water capacity is low. Runoff is medium. Reaction is extremely acid to strongly acid in unlimed areas.

Slope and stones on the surface make this soil generally unsuitable to cultivated crops, hay, or pasture. Slope, the depth to bedrock, and the permeability limit the soil for non-farm use, especially for onsite waste disposal.

Ernest silt loam, 8 to 15 percent slopes (ErC)- [10]

This soil is sloping, deep, and moderately well drained. This soil unit is listed as a Statewide Important Farmland Soil, and it contains hydric inclusions. It has moderately slow to slow permeability and a moderate available water capacity. Runoff is medium, and the erosion hazard of this soil unit is severe. The reaction in unlimed areas is strongly acid to very strongly acid. The seasonal high water table is 18 to 36 inches.

Most areas of this soil are in woodland, but it is also suited to cropland, pasture, and trees. The high water table and permeability limit non-farm use, especially for onsite waste disposal.

Ernest silt loam, 15 to 25 percent slopes (ErD)- [10]

This soil is moderately steep, deep, and moderately well drained. It has moderately slow to slow permeability and a moderate available water capacity. Runoff is medium, and the erosion hazard of this soil unit is severe. The reaction in unlimed areas is strongly acid to very strongly acid. The seasonal high water table is 18 to 36 inches.

Most areas of this soil are in woodland, but it is also suited to cropland, pasture, and trees. The high water table and permeability limit non-farm use, especially for onsite waste disposal.

Ernest very stony silt loam, 0 to 8 percent slopes (ExB)- [10]

This soil unit is characterized as nearly level, gently sloping, deep, and moderately well drained. It contains hydric inclusions. Stones of 3 to 10 inches in diameter cover 3 to 15 percent of the surface. Permeability is moderate above the firm part of the subsoil and moderately slow or slow in the firm part and the substratum. The available water capacity is moderate, and runoff is medium. The reaction in unlimed areas is strongly acid or very strongly acid. The high water table is at a depth of 18 to 36 inches, and the erosion hazard is moderate.

The stony surface makes this soil unit generally unsuited to cultivated crops, hay, or pasture, but it is well suited to trees. The high water table and permeability limit non-farm use.

Ernest very stony silt loam, 8 to 25 percent slopes (ExD)- [10]

This soil unit is characterized as sloping, moderately steep, deep, and moderately well drained. It contains hydric inclusions. Stones of 3 to 10 inches in diameter are found on 3 to 15 percent of the surface. The permeability is moderate above the firm part of the subsoil and moderately slow or slow in the firm part and in the substratum. The available water capacity is moderate, and runoff is medium. The reaction in unlimed areas is strongly acid or very strongly acid. The high water table is at a depth of 18 to 36 inches, and the erosion hazard is moderate.

Most areas of this soil are in woodland. The slope and stony surface make this soil generally unsuited to cultivated crops, hay, and pasture and limits the use of equipment. This soil unit is suited to trees. The slope, the high water table and the permeability in the firm part of the subsoil limit non-farm use.

Gilpin channery silt loam, 3 to 8 percent slopes (GIB)- [10]

This soil is gently sloping, moderately deep, and well drained. It is on uplands. Slopes generally are smooth and convex and are about 200 to 600 feet long. The areas of this soil are irregular in shape or long and narrow and range mainly from 4 to 50 acres. The

permeability of this soil is moderate, and available water capacity is moderate. Runoff is medium. Reaction in unlimed areas is strongly acid to extremely acid.

Most areas of this soil are in native vegetation or woodland. Some areas are in cultivated crops, hay or pasture. The depth to bedrock is the main limitation of this soil for non-farm use, especially onsite waste disposal.

Gilpin very stony silt loam, 8 to 25 percent slopes (GmD)- [10]

This soil is sloping and moderately steep, moderately deep, and well drained. It is on uplands. Slopes generally are smooth and convex and are about 100 to 300 feet long. The areas of this soil are irregular in shape or long and narrow and range mainly from 4 to 100 acres. The permeability of this soil is moderate, and available water capacity is moderate. Runoff is medium. Reaction in unlimed areas is strongly acid to extremely acid.

This soil is well suited to trees, and potential productivity is high. Most areas are wooded. Slope and the depth to bedrock is the main limitation of this soil for non-farm use.

Gilpin silt loam, 3 to 8 percent slopes (GnB)- [9]

This soil is gently sloping, moderately deep, and well drained. It is on uplands. The areas are irregular in shape and range from 2 to 150 acres. This soil has moderate permeability and moderate available water capacity. Surface runoff is medium. In unlimed areas reaction ranges from strongly acid too extremely acid.

Most areas of this soil are in cropland. Some of the acreage is wooded. The depth to bedrock limits this soil for many non-farm uses

Gilpin very stony silt loam, 3 to 8 percent slopes (GpB)- [9]

This soil is gently sloping, moderately deep, and well drained. It is on uplands. The areas are irregular in shape and range from 2 to 240 acres. This soil has moderate permeability and moderate available water capacity. Surface runoff is medium. In unlimed areas reaction ranges from strongly acid to extremely acid.

The stones on the surface make this soil generally unsuitable for farming.

Gilpin-Rayne silt loams, 8 to 15 percent slopes (GtC)- [9]

This complex consists of sloping, well-drained soils on rolling uplands. The areas are irregular in shape and range from 2 to 80 acres. The permeability of these soils is moderate. In unlimed areas reaction is strongly acid to extremely acid in the Gilpin soils and strongly acid to very strongly acid in the Rayne soils.

Most areas of these soils are in cropland and pasture. Some of the acreage is in wooded areas. Slope and the depth to bedrock in the Gilpin soils limit this complex for some non-farm uses.

Gilpin-Rayne silt loams, 15 to 25 percent slopes (GtD)- [9]

This complex consists of moderately steep, well-drained soils on uplands. The areas are irregular in shape and range from 3 to 80 acres. The permeability of these soils is moderate. In unlimed areas reaction is strongly acid to extremely acid in the Gilpin soils and strongly acid to very strongly acid in the Rayne soils.

Most areas of these soils are in cropland and pasture. Some of the acreage is in wooded areas. Slope and the depth to bedrock in the Gilpin soils limit this complex for some non-farm uses.

Gilpin-Weikert channery silt loam, 3 to 8 percent slopes (GwB)- [9]

This complex consists of gently sloping, well-drained soils in uplands. The areas are irregularly shaped and range from 2 to 30 acres. The permeability is moderate in the Gilpin soils and moderately rapid in Weikert soils. The Gilpin soils are strongly acid to extremely acid, and the Weikert soils are strongly acid and very strongly acid.

Most areas of these soils are in cropland and pasture. Some of the acreage is wooded. The main limitation of these soils for non-farm uses, especially onsite sewage disposal, is the depth to bedrock.

Gilpin-Weikert channery silt loams, 8 to 15 percent slopes (GwC)- [9]

This complex consists of sloping, well-drained soils on uplands. The areas are irregularly shaped and range from 2 to 120 acres. The permeability is moderate in the Gilpin soils and moderately rapid in Weikert soils. The Gilpin soils are strongly acid to extremely acid, and the Weikert soils are strongly acid and very strongly acid.

Most areas of these soils are in cropland and pasture. Some of the acreage is wooded. The main limitations of these soils for non-farm uses, especially onsite sewage disposal, are slope and depth to bedrock.

Gilpin-Weikert channery silt loams, 15 to 25 percent slopes (GwD)- [9]

This complex consists of moderately steep, well-drained soils on uplands. The areas are irregularly shaped and range from 2 to 80 acres. The permeability is moderate in the Gilpin soils and moderately rapid in Weikert soils. The Gilpin soils are strongly acid to extremely acid, and the Weikert soils are strongly acid and very strongly acid.

Most areas of these soils are in cropland and pasture. Some of the acreage is wooded. Slope and the depth to bedrock limit these soils for non-farm uses.

Gilpin-Weikert channery silt loams, 25 to 70 percent slopes (GwF)- [9]

This complex consists of steep, well-drained soils on uplands. The areas are irregularly shaped and range from 3 to 140 acres. The permeability is moderate in the Gilpin soils and moderately rapid in Weikert soils. The Gilpin soils are strongly acid to extremely acid, and the Weikert soils are strongly acid and very strongly acid.

Slope and a severe erosion hazard make these soils generally unsuitable for farming. Slope and the depth to bedrock limit these soils for non-farm uses.

Hazelton channery loam, 3 to 8 precent slopes (HaB)- [9]

This soil is gently sloping, deep, and well drained. It is on uplands. The areas are irregular in shape and range from 2 to 160 acres. This soil has moderately rapid-to-rapid permeability and moderate to low available water capacity. Surface runoff is slow. In unlimed areas reaction ranges from strongly acid to extremely acid throughout.

Rock fragments in the soil and the moderately rapid-to-rapid permeability limit the soil for some non-farm uses

Hazleton channery loam, 8 to 15 percent slopes (HaC)- [9]

This soil is sloping, deep, and well drained. It is on uplands. The areas are irregular in shape and range from 2 to 90 acres. This soil has a moderately rapid-to-rapid permeability and moderate to low available water capacity. Surface runoff is slow. In unlimed areas reaction ranges from strongly acid to extremely acid throughout the soil.

Most areas of this soil are cropland and pasture. Some areas are in woodland. Slope, stone fragments on and in the surface layer, and the moderately rapid-to-rapid permeability limit the soil for non-farm uses. Slope and rate of permeability especially limit onsite sewage disposal.

Hazleton very stony loam, 8 to 25 percent slopes (HbD)- [9]

This soil unit is characterized as sloping and moderately steep, deep, and well drained. It is found on uplands. Stones of 3 to 10 inches in diameter cover 3 to 15 percent of the surface of this soil unit. The permeability is moderately rapid-to-rapid, and the available water capacity is moderate. Runoff is medium, and the reaction in unlimed areas is strongly acid to extremely acid. The hazard of erosion is moderate.

The stony surface and slope make this soil unit unsuitable for cultivated crops, hay, or pasture, but this soil unit is suited to trees. The slope and permeability are the main limitations for non-farm use.

Hazleton –Clymer channery loams, 3 to 8 percent slopes (HcB)- [10]

This unit consists of gently sloping, deep, well-drained soils on uplands. Slopes are generally smooth and convex and are 100 to 400 feet long. The areas of the unit are irregular in shape and range mainly from 4 to 100 acres. These soils were mapped together because they are so intermingled that it was not practical to map them separately. This unit is about 60 percent Hazleton soils, 30 percent Clymer soils, and 10 percent other soils. Permeability is moderately rapid to rapid in these Hazleton soils and moderate in these Clymer soils. Available water capacity is moderate. Reaction in unlimed areas is strongly acid to extremely acid. Runoff is medium, and the erosion hazard is moderate.

Most areas in this soil are in woodland. Some areas are cultivated or in hay or pasture. These soils are suited to cultivated crops, pasture, and trees. The main limitations for nonfarm use in this unit are the depth of the bedrock in the Clymer soils and the permeability of the Hazleton soils.

Hazleton –Clymer channery loams, 3 to 8 percent slopes (HcC)- [10]

This unit consists of sloping, deep, well-drained soils on uplands. Slopes are generally smooth and convex and are 100 to 500 feet long. The areas of the unit are irregular in shape and range mainly from 4 to 50 acres. These soils were mapped together because they are so intermingled that it was not practical to map them separately. This unit is about 65 percent Hazleton soils, 25 percent Clymer soils, and 10 percent other soils. Permeability is moderately rapid to rapid in these Hazleton soils and moderate in these Clymer soils. Available water capacity is moderate. Reaction in unlimed areas is strongly acid to extremely acid. Runoff is medium, and the erosion hazard is moderate.

Most areas in this soil are in woodland. Some areas are cultivated or in hay or pasture. These soils are suited to cultivated crops, pasture, and trees. Slope is a limitation of this unit for non-farm use. The depth of the bedrock in the Clymer soils and the permeability of the Hazleton soils are additional limitations for non-farm use.

Hazleton –Clymer channery very stony loams, 0 to 8 percent slopes (HdB)- [10]

This unit consists of nearly level to gently sloping, deep, well-drained soils on uplands. Slopes are generally smooth and convex and are 100 to 400 feet long. The areas of the unit are irregular in shape and range mainly from 4 to 100 acres. Stones that are 3 to 10 inches in diameter cover 3 to 15 percent of the surface. These soils were mapped together because they are so intermingled that it was not practical to map them separately. This unit is about 60 percent Hazleton soils, 25 percent Clymer soils, and 15 percent other soils. Permeability is moderately rapid to rapid in these Hazleton soils and moderate in these Clymer soils. Available water capacity is moderate. Reaction in unlimed areas is strongly acid to extremely acid. Runoff is slow, and the erosion hazard is slight.

Most areas of this unit are wooded. The stones on the surface make these soils generally unsuitable for farming and are the main limitation for non-farm use. Most areas of this unit are wooded. The soils are suited for trees, and potential productivity are moderately high to high. In places, the stones on the surface interfere with machine planting.

Hazleton extremely bouldery sandy loam (Hx)- [9]

This soil is nearly level to steep, deep, and well drained. It is on uplands. The areas are irregular in shape and range from 2 to 40 acres. Slopes range from 0 to 35 percent. Large boulders cover about 50 to 90 percent of the surface area. This soil has moderately rapid-to-rapid permeability and low available water capacity. Runoff is slow. In unlimed areas reaction ranges from strongly acid to extremely acid throughout the soil.
The boulders on the surface make this soil generally unsuitable for farming. This soil is suited for trees, and most of the acreage is wooded. This soil is limited for most non-farm uses, including sewage disposal. The main limitations are the stones on the surface, the moderately rapid-to-rapid permeability, and, in some areas, slope. A few areas are suited for wildlife habitat and recreation.

Laidig loam, 3 to 8 percent slopes (LaB)- [9]

This soil is gently sloping, deep, and well drained. It is on uplands. The areas are irregular in shape and range from 2 to 200 acres. This soil has moderately slow permeability and moderate available water capacity. Surface runoff is rapid. In unlimed areas reaction ranges from strongly acid to extremely acid throughout the soil.

Most areas of the soil are cropland and pasture. Some of the acreage is wooded. The moderately slow permeability of the soil limits the onsite sewage disposal.

Laidig loam, 8t o15 percent slopes (LaC)- [9]

This soil is sloping deep and well drained. It is on broad ridges and side slopes. The areas are irregular in shape and range from 2 to 100 acres. This soil has moderately slow permeability and moderate water capacity. Surface runoff is rapid. In unlimed areas reaction ranges from acid to extremely acid throughout the soil.

Most areas of the soil are cropland and pasture. Some of the acreage is wooded. This soil is suitable for trees. Slope and moderately slow permeability limit this soil for some non-farm uses, especially onsite sewage disposal.

Laidig soils, 25 to 70 percent slopes (LDF)- [9]

This unit consists of steep soil on side slopes**.** The areas are irregular in shape and range from 5 to 280 acres. Stones that are 10 to 36 inches in diameter cover 3 to 15 percent of the surface of some areas of the unit. These soils have moderately slow permeability and moderate water availability. Surface runoff is very rapid. In unlimed areas reaction ranges from strongly acid to extremely acid throughout the soil.

Most areas of this soil is woodland. Some small areas are used for farming, building sites, and recreation. Slopes and stones on the surface make these soils unsuitable for farming and most non-farm uses. The moderately slow permeability is an additional limitation for onsite sewage disposal. The soils are suitable for trees and most of the acreage is wooded, but slope and stones on the surface interfere with the use of harvesting and planting equipment.

Monongahela silt loam, 3 to 8 percent slopes (MoB)- [10]

This soil is gently sloping, deep, and moderately well drained. It is on terraces. Slopes generally are smooth and concave or convex and are 100 to 400 feet long. The areas of this soil are irregular in shape or long and narrow and range mainly from 4 to 40 acres. The permeability of this soil is moderate in the friable part of the subsoil and moderately slow or slow in the firm part. Available water capacity is high, and runoff is medium. Reaction in unlimed areas is very strongly acid or strongly acid throughout. A seasonal high water table is 18 to 36 inches. The hazard of erosion is moderate.

Most of the acreage of this soil is cultivated or in hay. Some areas are used for woodland, pasture or housing and industrial sites. These soils are suited to cultivated crops, pasture, and trees. The seasonal high water table and the permeability in the lower part of the subsoil are the main limitations of the soil for non-farm use, especially for onsite waste disposal.

Nolo loam, 3 to 8 percent slopes (NoB)- [9]

This soil unit is described as gently sloping, deep, and poorly drained. It is found on uplands, and it is listed as hydric. The permeability is moderate in the friable part of the subsoil and slow in the firm part. The available water capacity is moderate, and the runoff is medium. The reaction in unlimed areas is very strongly acid or extremely acid. The high water table is from the surface to 6 inches, and the erosion hazard is medium.

This soil unit is suited to some cultivated crops that tolerate seasonal wetness, but the high water table is a major limitation to use. It is also suited to pasture and woodland. The high water table and the permeability in the firm part of the subsoil limit non-farm use.

Philo silt loam (Ph)- [9]

This soil unit is described as nearly level, deep, and moderately well drained. It is listed as Prime
Farmland of Clearfield County, and is found on flood plains that are commonly flooded. It contains hydric inclusions. Slopes range from 0 to 3 percent. Permeability is moderate in the subsoil and moderately rapid in the substratum. The available water capacity is high, and runoff is slow to very slow. Reaction in unlimed areas is strongly acid to medium acid. The erosion hazard is slight, and the high water table is at a depth of 1.5 to 3 feet.

Most areas of this soil are cultivated or in permanent hay or pasture. Other areas are in woodland or are used for housing and industry. This unit is suited to cultivated crops, pasture, and tree production. Flooding and the seasonal high water table limit non-farm uses.

Pope loam (Po)- [10]

This soil is nearly level, deep, and well drained. It is on flood plains that are subject to rare flooding. Slopes generally are smooth and convex and are about 200 to 400 feet long. The areas of this soil are long and narrow and range mainly from 4 to 50 acres. Slopes range from 0 to 3 percent. The permeability of this Pope soil is moderate to moderately rapid. Available water capacity is high. Runoff is slow. Reaction in unlimed areas is strongly acid to extremely acid. The hazard of erosion is slight.

Most areas of this soil are cultivated or in permanent hay or pasture. Some areas are in woodland, and some are used for housing or industrial sites. This soil is suited to cultivated crops, pasture, and trees. Flooding is the main limitation of this soil for most types of non-farm uses.

Purdy silt loam (Pu)- [10]

This soil is nearly level, deep, and poorly and very poorly drained. It is on terraces. Slopes generally are smooth and slightly concave and are 50 to 400 feet long. The areas of this soil are irregular in shape or long and narrow and range mainly from 4 to 20 acres. Slopes range from 0 to 3 percent. The permeability of this soil is slow or very slow, and available water capacity is high. Runoff is slow, and ponding is frequent. Reaction in unlimed areas is strongly acid to extremely acid. The hazard of erosion is slight. The seasonal high water table is between the surface and the depth of 1 foot.

Most areas of this soil are in native vegetation or woodland. Some areas are used for pasture. This soil is suited to some cultivated crops that tolerate seasonal wetness. This soil is also suited to pasture, and trees. The seasonal high water table is the main limitation of the soil for non-farm use, especially for onsite waste disposal.

Rayne silt loam 3 to 8 percent slopes (RaB)- [10]

This soil is gently sloping, deep, and well drained. It is on uplands. Slopes generally are smooth and convex and are about 200 to 600 feet long. The areas of this soil are irregular in shape or long and narrow and range mainly from 4 to 40 acres. The permeability of this soil is moderate, and available water capacity is high. Runoff is medium. Reaction in unlimed areas is very strongly acid or strongly acid. The hazard of erosion is moderate.

Most areas of this soil are in native vegetation or woodland. Some areas are used in permanent hay or pasture. This soil is suited to cultivated crops, pasture and trees. This soil has few limitations for most types of non-farm uses.

Rayne silt loam 8 to 15 percent slopes (RaC)- [10]

This soil is sloping, deep, and well drained. It is on uplands. Slopes generally are smooth and convex and are about 100 to 500 feet long. The areas of this soil are irregular in shape or long and narrow and range mainly from 4 to 40 acres. The permeability of this soil is moderate, and available water capacity is high. Runoff is medium. Reaction in unlimed areas is very strongly acid or strongly acid. The hazard of erosion is moderate.

Most areas of this soil are in native vegetation or woodland. Some areas are used in permanent hay or pasture. This soil is suited to cultivated crops, pasture and trees. Slope is the main limitation of this soil for non-farm use.

Rayne channery silt loam 25 to 65 percent slopes (RbF)- [10]

This soil is steep and very steep, deep, and well drained. It is on uplands. Slopes generally are smooth and convex and are about 100 to 500 feet long. The areas of soil are long and narrow and range mainly from 4 to 500 acres. The permeability of this soil is moderate, and available water capacity is high. Runoff is medium. Reaction in unlimed areas is very strongly acid or strongly acid. The hazard of erosion is severe.

This soil is not suited to cultivated crops or pasture because of slope and the severe erosion hazard. This soil is suited to trees, and potential productivity is high. Most areas are wooded. Erosion is a hazard, and slope limits the use of equipment. Slope is the main limitation of soil to non-farm use.

Rayne-Gilpin complex, 15 to 25 percent slopes (RcD)- [10]

This unit consists of moderately steep, well-drained soils on uplands. Slopes generally are smooth and convex and are about 100 to 300 feet long. The areas of the unit are irregular in shape or long and narrow and range mainly from 4 to 100 acres. They are about 60 percent deep Rayne soils, 30 percent moderately deep Gilpin soils, and 10 percent other soils. The soils are so mixed that it was not practical to map them separately. The permeability in these Rayne soils is moderate, and available water capacity is moderate to high. Reaction in unlimed areas is very strongly acid or strongly acid. Runoff is rapid, and hazard of erosion is severe. The permeability in these Gilpin soils is moderate, and available water capacity is high. Reaction in unlimed areas is strongly acid to extremely acid. Runoff is rapid, and hazard of erosion is severe.

Most areas of this unit are in woodland. Some areas are in hay, pasture, or native vegetation. These soils are suited to some cultivated crops, but the hazard of erosion and slope are limitations. The soil is suited to pasture. This unit is suited to trees and potential productivity is high. Slope limits the use of equipment. The depth of bedrock in the Gilpin soils and slope are the main limitations of the unit for non-farm use.

Tyler silt loam, 3 to 6 percent slopes (TyB)- [10]

This soil is gently sloping, deep, and somewhat poorly drained. It is on terraces. Slopes generally are smooth, slightly concave, and are 100 to 300 feet long. The areas are oval in shape and range mainly from 4 to 30 acres. The permeability of this soil is moderately slow above the firm part of the sub soil and slow or very slow in the firm part. Available water capacity is high. Reaction in unlimed areas is strongly acid to extremely acid. A seasonal high water table is at a depth of 6 to 24 inches. The hazard of erosion is moderate.

Most areas of this soil are cultivated or in native vegetation. Some areas are in permanent hay or in pasture or woodland. This soil is suited to cultivated crops, pasture and trees. The seasonal high water table and the permeability in the firm part of the subsoil are the main limitations of the soil for non-farm use, especially for onsite waste disposal.

Udifluvents, sandy (Ud)- [10]

This soil unit is characterized as nearly level, deep, and moderately well drained to well drained. It is found on flood plains that are commonly crossed by shallow stream channels, and it contains hydric inclusions. These flood plains are frequently flooded and contain large amounts of rock fragments on the surface. Slopes range from 0 to 3 percent. Permeability is slow to rapid, and the available water capacity is low to high. Runoff is slow, and the reaction in unlimed areas is strongly acid to extremely acid. The high water table is from 24 to 36 inches, and the erosion hazard is slight.

Most areas are in woodland or brush land. Stones on the surface, the high water table, and frequent flooding limit all uses for this soil. This soil unit is suited to some trees.

Udorthents, strip mine, sloping (UDC)- [9]

This unit consists of a mixture of soil and rock material from strip-mined areas. The depth of the material is generally between 10 and 60 inches. The areas are irregular in shape and range from 3 to 40 acres. Slopes range from 8 to 25 percent. The material in this unit is excessively drained to somewhat poorly drained. Permeability ranges from rapid to slow. The water capacity is very low to low. Reaction is extremely acid to slightly acid throughout the material.

Slope, depth to bedrock, a seasonal high water table, and the high content of rock fragments limit this unit for most uses. Onsite investigation of the unit is needed to determine its potential and limitations for a specific use.

Udorthents, strip mine, steep (UDF)- [9]

This unit consists of a mixture of soil and rock material from strip-mined areas. The depth of the material is generally between 10 and 60 inches. The areas are irregular in shape and range from 1 to 80 acres. Slope range from 25 to 75 percent. The material in this unit is excessively drained to somewhat poorly drained. Permeability ranges from rapid to slow. The water capacity is very low to low. Reaction is extremely acid to slightly acid throughout the material.

Slope, depth to bedrock, a seasonal high water table, and the high content of rock fragments limit this unit for most uses. Onsite investigation of the unit is needed to determine its potential and limitations for a specific use.

Urban land-Udorthents complex, gently sloping (URB)- [9]

This complex consists of areas that are covered by such structure as buildings, parking lots, and industrial facilities and areas where the soils have been altered by grading. The areas of the unit range from the 5 to 30 acres. Slopes range from 0 to 8 percent. Udorthents are excessively drained to somewhat poorly drained. Permeability ranges from rapid to slow. The water capacity is very low to low. Reaction is extremely acid to slightly acid throughout the material.

Onsite investigation is needed to determine the potential and limitations of this unit for a specific use.

Urban land-Udorthents complex, sloping (URC)- [9]

This complex consists of areas that are covered by such structure as buildings, parking lots, and industrial facilities and areas where the soils have been altered by grading. The areas of the unit range from the 5 to 30 acres. Slopes range from 8 to 25 percent. Udorthents are excessively drained to somewhat poorly drained. Permeability ranges from rapid to slow. The water capacity is very low to low. Reaction is extremely acid to slightly acid throughout the material.

Onsite investigation is needed to determine the potential and limitations of this unit for a specific use.

Udorthents, shale (Uo)- [10]

This soil unit is nearly level to very steep and well drained to moderately well drained. It is found in uplands in areas that have been surface mined. Slopes vary from 0 to 80 percent. This soil unit may include areas that have not been altered by mining, areas of mine wash, mine dump, sandstone quarries, and sand and gravel pits, and it contains hydric inclusions. Permeability is slow to rapid, and the available water capacity is low to high. Runoff is slow to very rapid depending on slope and cover. Reaction in unlimed

areas is strongly acid to extremely acid. The seasonal high water table is 24 to 36 inches, and the erosion hazard is moderate to very severe.

Soil uses depend on many variables because of the wide range of properties encompassed by this soil unit and varying degrees of reclamation in different areas with this soil type.

Wharton silt loam, 3 to 8 percent slopes (WaB)- [9]

The soil is gently sloping, deep, and moderately well drained. It is on uplands. The areas are irregular in shape and range from 2 to 240 acres. This soil has slow to moderately slow permeability and moderate to high available water capacity. Surface runoff is medium. In unlimed areas the reaction is strongly acid to very strongly acid in the surface layer and upper part of the subsoil. It is very strongly acid to extremely acid in the substratum. A seasonal high water table is at a depth of 18 to 36 inches.

Most areas of the soil are cropland and pasture. Some of the acreage is wooded. The soil is suitable for trees. A seasonal high water table and the moderately slow or slow permeability limit this soil for non-farm uses, especially for onsite sewage disposal.

Wharton silt loam, 8 to 15 percent slopes (WaC)- [9]

The soil is gently sloping, deep, and moderately well drained. It is on uplands. The areas are irregular in shape and range from 3 to 80 acres. This soil has slow or moderately slow permeability and moderate to high available water capacity. Surface runoff is rapid. In unlimed areas the reaction is strongly acid to very strongly acid in the surface layer and upper part of the subsoil. It is very strongly acid to extremely acid in the substratum. A seasonal high water table is at a depth of 18 to 36 inches.

Most areas of the soil are cropland and pasture. Some of the acreage is wooded. The soil is suitable for trees. The slow or moderately slow permeability, slope and the seasonal high water table and the moderately slow or slow permeability limit this soil for non-farm uses, especially for onsite sewage disposal.

Wharton silt loam, 3 to 8 percent slopes (WhB) - [10]

This soil unit is gently sloping, deep, and moderately well drained and found on uplands. It is listed as Prime Farmland of Clearfield County, and it contains hydric inclusions. Permeability is slow or moderately slow, and the available water capacity is high. Runoff is medium, and the reaction in unlimed areas is strongly acid or very strongly acid. The seasonal high water table is 18 to 36 inches, and the erosion hazard is moderate.

Most areas of this soil are in woodland, are cultivated, or are in permanent hay. Some areas are used for pasture, housing, or industry. The soil is also suited to cultivated crops, pasture, and trees. The high water table and permeability limit non-farm uses.

Wharton silt loam, 8 to 15 percent slopes (WhC) – [10]

This soil unit is sloping, deep, and moderately well drained. It is on uplands. Slopes are generally smooth, slightly concave or convex, and 100 to 300 feet long. The areas are of this soil are irregular in shape or long and narrow and range from about 4 to 40 acres. Permeability is slow or moderately slow in the subsoil and substratum. Available water capacity is high. Runoff is medium. The reaction in unlimed areas is strongly acid or very strongly acid. The seasonal high water table is 18 to 36 inches, and the erosion hazard is severe.

Most areas of this soil are in woodland, are cultivated, or are in permanent hay. Some areas are used for pasture, housing, or industry. The soil is also suited to cultivated crops, pasture, and trees. The high water table and permeability limit non-farm uses

Wharton- Gilpin silt loams, 8-15 percent slopes (WgC)- [9]

This complex consists of sloping soils on uplands. The areas are irregular in shape and range from 5 t0 300 acres. The complex is about sixty percent deep, moderately well drained Wharton soils; 30 percent moderately deep, well-drained Gilpin soils; and 10 percent other soils. The Wharton and Gilpin soils are so intermingled that it is not practical to map them separately. The Wharton soils have moderately slow to slow permeability and moderate to high water capacity. Runoff is rapid. In unlimed areas of the Wharton soil the surface area and upper part of the subsoil are strongly acid to very strongly acid. A seasonal high water table is at a depth of 18 to 36 inches. The substratum ranges from very strongly acid to extremely acid. The Gilpin soils have moderate permeability and moderate available water capacity. Runoff is rapid. The Gilpin soils are strongly acid to extremely acid throughout.

Most areas of the soil are cropland and pasture. Some of the acreage is wooded. The soils are suitable for trees. Machine planting is practical in large areas. Slope, a seasonal high water table in the Wharton soils, and bedrock at a depth of 20 to 40 inches in the Gipsin soils are the main limitations of this complex for non-farm uses, especially for onsite sewage disposal.

Wharton- Gilpin silt loams, 15-25 percent slopes (WgD)- [10]

This complex consists of moderately steep soils on uplands. The areas are irregular in shape and range from 5 t0 160 acres. The complex is about sixty percent deep, moderately well drained Wharton soils; 30 percent moderately deep, well-drained Gilpin soils and 10 percent other soils. The Wharton and Gilpin soils are so intermingled that it is not practical to map them separately. The Wharton soils have moderately slow to slow permeability and moderate to high water capacity. Runoff is rapid. In unlimed areas of the Wharton soils the surface layer and upper part of the subsoil are strongly acid to very strongly acid. A seasonal high water table is at a depth of 18 to 36 inches. The substratum ranges from very strongly acid to extremely acid. The Gilpin soils have

moderate permeability and moderate available water capacity. Runoff is rapid. The Gilpin soils are strongly acid to extremely acid.

Much of the acreage of these soils is used for pasture. Some areas are wooded. The soils are suitable for trees. Machine planting is practical in large areas. Slope, a seasonal high water table in the Wharton soils, and bedrock at a depth of 20 to 40 inches in the Gilpin soils are the main limitations of this complex for non-farm uses, especially for onsite sewage disposal.

Bethesda very channery silt loam, 0 - 8 percent slopes (92B)

The Bethesda, unstable fill component makes up 90 percent of the map unit. Slopes are 0 to 8 percent. This component is on surface mines. The parent material consists of acid loamy mine spoil or earthy fill derived from interbedded sedimentary rock. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 0 percent. Nonirrigated land capability classification is 3s. This soil does not meet hydric criteria.

Bethesda very channery silt loam, 8 - 25 percent slopes (92D)

The Bethesda, unstable fill component makes up 90 percent of the map unit. Slopes are 8 to 25 percent. This component is on surface mines. The parent material consists of acid loamy mine spoil or earthy fill derived from interbedded sedimentary rock. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 0 percent. Nonirrigated land capability classification is 6e. This soil does not meet hydric criteria.

Strip Mine, Active, 0 - 8 percent slopes (93B)

Generated brief soil descriptions are created for major soil components. The Active Strip Mine is a miscellaneous area.

Strip Mine, Active, 8 to 40 percent slopes (93D)

Generated brief soil descriptions are created for major soil components. The Active Strip Mine is a miscellaneous area.

Aeric Epiaquents, gently sloping (94B)

The Aeric Epiaquents component makes up 80 percent of the map unit. Slopes are 0 to 15 percent. This component is on upland slopes. The parent material consists of mine spoil or earthy fill derived from sandstone and shale. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 18 inches during January, February, March, April, May, November, December. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria.

Cedarcreek extremely channery loam, strongly sloping (95C)

The Cedarcreek component makes up 85 percent of the map unit. Slopes are 0 to 15 percent. This component is on upland slopes. The parent material consists of mine spoil or earthy fill derived from sandstone and shale. Depth to a root restrictive layer is greater than 60 inches . The natural drainage class is somewhat excessively drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 24 inches during January, February, March, April, May, November, December. Organic matter content in the surface horizon is about 0 percent. Nonirrigated land capability classification is 7s. This soil does not meet hydric criteria.

Cedarcreek extremely channery loam, moderately steep (95D)

The Cedarcreek component makes up 85 percent of the map unit. Slopes are 15 to 50 percent. This component is on upland slopes. The parent material consists of mine spoil or earthy fill derived from sandstone and shale. Depth to a root restrictive layer is greater than 60 inches . The natural drainage class is somewhat excessively drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 24 inches during January, February, March, April, May, November, December. Organic matter content in the surface horizon is about 0 percent. Nonirrigated land capability classification is 7s. This soil does not meet hydric criteria.

The Cambria County GIS Center [17], through GIS analysis, produced the following Soils Classification report on pages 33-39

9) Soil descriptions obtained from Soil Survey of Cambria County, Pennsylvania
10) Soil descriptions obtained from Soil Survey of Clearfield County, Pennsylvania
17) Cambria County GIS Center. See bibliography for complete citation.

Chest Creek Watershed Assessment and Restoration Plan

Cambria County Soils in the Chest Creek Watershed

Description	Acreage	Square Miles	Soils Classification
DUMP			
Du	126.509736	0.197671	Dump

Soils_Cambria_ChestCreek_Dis.ACREAGE Sum
126.509736
Soils_Cambria_ChestCreek_Dis.SQ_MI Sum
0.197671

Description	Acreage	Square Miles	Soils Classification
GENERAL SOILS			
BeD	134.193319	0.209677	General Soils
BnB	105.521557	0.164877	General Soils
CaA	72.467735	0.113231	General Soils
CbB	85.803715	0.134068	General Soils
CeD	71.388785	0.111545	General Soils
CvB	593.269609	0.926984	General Soils
CvD	850.262838	1.328536	General Soils
GpB	66.605937	0.104072	General Soils
GpD	11.368527	0.017763	General Soils
GtD	1375.888015	2.149825	General Soils
GwD	924.103877	1.443912	General Soils
GWF	2303.97074	3.599954	General Soils
HaD	877.217513	1.370652	General Soils
HbB	553.939018	0.86553	General Soils
HbD	1061.371849	1.658394	General Soils
Hx	65.750594	0.102735	General Soils
LDF	2378.520619	3.716438	General Soils
LkD	1.128896	0.001764	General Soils
RaD	86.904805	0.135789	General Soils
WgD	2918.236556	4.559745	General Soils

Soils_Cambria_ChestCreek_Dis.ACREAGE Sum
14537.914507
Soils_Cambria_ChestCreek_Dis.SQ_MI Sum
22.715491

Chest Creek Watershed Assessment and Restoration Plan

Description	Acreage	Square Miles	Soils Classification
HYDRIC SOILS			
AmB	162.809576	0.25439	Hydric Soils
At	1329.069852	2.076672	Hydric Soils
BtB	3466.644968	5.416633	Hydric Soils
BvB	32.184899	0.050289	Hydric Soils
NoB	310.519504	0.485187	Hydric Soils

Soils_Cambria_ChestCreek_Dis.ACREAGE Sum

5301.228799

Soils_Cambria_ChestCreek_Dis.SQ_MI Sum

8.28317

Description	Acreage	Square Miles	Soils Classification
PRIME FARMLAND SOILS			
CeB	2041.411587	3.189706	Prime Farmland Soils
GnB	2344.271353	3.662924	Prime Farmland Soils
HaB	1574.828844	2.46067	Prime Farmland Soils
HaC	1247.531645	1.949268	Prime Farmland Soils
LaB	669.013795	1.045334	Prime Farmland Soils
Ph	285.250682	0.445704	Prime Farmland Soils
Po	128.17302	0.20027	Prime Farmland Soils
RaB	41.967803	0.065575	Prime Farmland Soils
WaB	1659.203301	2.592505	Prime Farmland Soils

Soils_Cambria_ChestCreek_Dis.ACREAGE Sum

9991.652029

Soils_Cambria_ChestCreek_Dis.SQ_MI Sum

15.611956

Description	Acreage	Square Miles	Soils Classification
STATEWIDE IMPORTANT SOILS			
BeB	104.282828	0.162942	Statewide Important Soils
BeC	95.377437	0.149027	Statewide Important Soils
BmB	713.33429	1.114585	Statewide Important Soils

Description	Acreage	Square Miles	Soils Classification
BmC	163.809531	0.255952	Statewide Important Soils
BpC	14.654174	0.022897	Statewide Important Soils
CaB	2180.489438	3.407015	Statewide Important Soils
CaC	474.317093	0.74112	Statewide Important Soils
CeC	1946.870429	3.041985	Statewide Important Soils
GtC	2254.866555	3.523229	Statewide Important Soils
GwB	557.397307	0.870933	Statewide Important Soils
GwC	919.743436	1.437099	Statewide Important Soils
LaC	136.266985	0.212917	Statewide Important Soils
RaC	59.431341	0.092861	Statewide Important Soils
WaC	535.93536	0.837399	Statewide Important Soils
WgC	3480.098226	5.437653	Statewide Important Soils

Soils_Cambria_ChestCreek_Dis.ACREAGE Sum

13636.874431

Soils_Cambria_ChestCreek_Dis.SQ_MI Sum

21.307616

Description	Acreage	Square Miles	Soils Classification
STRIP MINES			
UDC	987.118437	1.542373	Strip Mines
UDF	2105.933992	3.290522	Strip Mines

Soils_Cambria_ChestCreek_Dis.ACREAGE Sum

3093.052429

Soils_Cambria_ChestCreek_Dis.SQ_MI Sum

4.832894

Chest Creek Watershed Assessment and Restoration Plan

Description		Acreage	Square Miles	Soils Classification
URBAN DISTURBED				
	URB	324.543987	0.5071	Urban Disturbed
	URC	119.146352	0.186166	Urban Disturbed

Soils_Cambria_ChestCreek_Dis.ACREAGE Sum
443.690339
Soils_Cambria_ChestCreek_Dis.SQ_MI Sum
0.693266

Description		Acreage	Square Miles	Soils Classification
WATER				
	W	106.962187	0.167128	Water

Soils_Cambria_ChestCreek_Dis.ACREAGE Sum
106.962187
Soils_Cambria_ChestCreek_Dis.SQ_MI Sum
0.167128
Soils_Cambria_ChestCreek_Dis.ACREAGE Sum
47237.884458
Soils_Cambria_ChestCreek_Dis.SQ_MI Sum
73.809194

Clearfield County Soils in the Chest Creek Watershed

Description	Acreage	Square Miles	Soil Classification
GENERAL SOILS			
95D	3773.088833	5.895451	General Soils
BeD	209.182668	0.326848	General Soils
CmB	12.745711	0.019915	General Soils
CmC	28.216198	0.044088	General Soils
CxD	167.80982	0.262203	General Soils
DeD	3.708426	0.005794	General Soils
DxB	38.466369	0.060104	General Soils
DxD	32.760496	0.051188	General Soils

Chest Creek Watershed Assessment and Restoration Plan

Description	Acreage	Square Miles	Soils Classification
ErD	703.878824	1.099811	General Soils
GmB	25.87891	0.040436	General Soils
GmD	180.686735	0.282323	General Soils
HaD	42.798742	0.066873	General Soils
HbD	438.051617	0.684456	General Soils
HbF	580.972515	0.90777	General Soils
HdB	248.551144	0.388361	General Soils
RbF	7349.660996	11.483845	General Soils
RcD	3439.882911	5.374817	General Soils
Ru	4.210404	0.006579	General Soils
WhD	241.531124	0.377392	General Soils

Soils_Clearfield_ChestCreek_Dis.ACREAGE Sum

17522.082441

Soils_Clearfield_ChestCreek_Dis.SQ_MI Sum

27.378254

Description	Acreage	Square Miles	Soil Classification
HYDRIC SOILS			
92B	49.144414	0.076788	Hydric Soils
92D	1519.809179	2.374702	Hydric Soils
94B	57.381886	0.089659	Hydric Soils
Ar	24.654026	0.038522	Hydric Soils
At	960.043637	1.500068	Hydric Soils
BrA	18.275638	0.028556	Hydric Soils
BrB	402.567348	0.629011	Hydric Soils
BxB	59.839632	0.093499	Hydric Soils
CaB	278.568429	0.435263	Hydric Soils
CaC	14.23947	0.022249	Hydric Soils
CoC	65.532461	0.102394	Hydric Soils
CxB	136.499539	0.213281	Hydric Soils
ErB	1230.961086	1.923377	Hydric Soils
ErC	2725.596309	4.258744	Hydric Soils
ExB	129.673024	0.202614	Hydric Soils
ExD	659.313125	1.030177	Hydric Soils
Pu	28.877448	0.045121	Hydric Soils
TyA	10.590357	0.016547	Hydric Soils
TyB	121.922087	0.190503	Hydric Soils
Ud	37.186455	0.058104	Hydric Soils

Uo	31.766227	0.049635	Hydric Soils
Up	0.553965	0.000866	Hydric Soils
WhC	1450.561809	2.266503	Hydric Soils

Soils_Clearfield_ChestCreek_Dis.ACREAGE Sum

10013.557551

Soils_Clearfield_ChestCreek_Dis.SQ_MI Sum

15.646184

Description	Acreage	Square Miles	Soil Classification
PRIME FARMLAND SOILS			
AlB	49.667175	0.077605	Prime Farmland Soils
ClB	34.097846	0.053278	Prime Farmland Soils
CoB	187.180796	0.29247	Prime Farmland Soils
GlB	1383.084175	2.161069	Prime Farmland Soils
HcB	69.021399	0.107846	Prime Farmland Soils
Ph	735.151231	1.148674	Prime Farmland Soils
Po	50.736389	0.079276	Prime Farmland Soils
RaB	478.151966	0.747112	Prime Farmland Soils
WhB	1499.423832	2.34285	Prime Farmland Soils

Soils_Clearfield_ChestCreek_Dis.ACREAGE Sum

4486.514808

Soils_Clearfield_ChestCreek_Dis.SQ_MI Sum

7.010179

Description	Acreage	Square Miles	Soil Classification
STATEWIDE IMPORTANT SOILS			
BeB	119.386093	0.186541	Statewide Important Soils
BeC	114.188966	0.17842	Statewide Important Soils
ClC	81.728592	0.127701	Statewide Important Soils
DeB	18.567249	0.029011	Statewide Important Soils
DeC	9.756911	0.015245	Statewide Important Soils
GlC	2425.769476	3.790265	Statewide Important Soils

Description	Acreage	Square Miles	Soil Classification
HcC	83.817068	0.130964	Statewide Important Soils
MoB	149.576963	0.233714	Statewide Important Soils
RaC	267.567975	0.418075	Statewide Important Soils

Soils_Clearfield_ChestCreek_Dis.ACREAGE Sum
3270.359295
Soils_Clearfield_ChestCreek_Dis.SQ_MI Sum
5.109936

Description	Acreage	Square Miles	Soil Classification
STRIP MINES			
93B	20.414838	0.031898	Strip Mines
93D	53.188365	0.083107	Strip Mines

Soils_Clearfield_ChestCreek_Dis.ACREAGE Sum
73.603203
Soils_Clearfield_ChestCreek_Dis.SQ_MI Sum
0.115005

Description	Acreage	Square Miles	Soil Classification
WATER			
MW	7.450699	0.011642	Water
W	162.846347	0.254447	Water

Soils_Clearfield_ChestCreek_Dis.ACREAGE Sum
170.297046
Soils_Clearfield_ChestCreek_Dis.SQ_MI Sum
0.266089
Soils_Clearfield_ChestCreek_Dis.ACREAGE Sum
35536.414343
Soils_Clearfield_ChestCreek_Dis.SQ_MI Sum
55.525647

A map of the Cambria and Clearfield County Soils can be seen on page A-8, plus individual soil maps for each subwatershed can be found in the individual tributary section.

Land Use/Land Cover

The Chest Creek watershed is mostly forested with several small municipalities. The forested part comprises approximately 60% of the watershed. Both surface and deep mining have been an integral part of the watershed.

The agricultural industry comprises almost the entire headwaters section. Majority of the agricultural is crops and pasture. Dairy farming and sheep farming are the two major farming practices. See the table below for the acreage and square miles of land use/land cover for the entire Chest Creek watershed.

As part of the assessment a survey was mailed to 18 farmers located in the headwaters section. The survey was only sent to farmers that had a receiving stream on their land. This survey was going to be used as a ranking procedure for the water quality parameters found at each tributary. Due to a lack of farmer participation on the survey, a different ranking system had to be formed to prioritize the tributaries in the headwater section of the assessment.

The Cambria County GIS Center [17], through GIS analysis, produced the following Land Use Report on in the Chest Creek Watershed

Description	Acreage	Square Miles
Water	56.583393	0.088412
Low Density Urban	1593.176135	2.489338
High Density Urban	21.439804	0.0335
Hay Pasture	8897.959622	13.903062
Row Crops	16416.47792	25.650747
Coniferous Forest	2889.28954	4.514515
Mixed Forest	1433.372245	2.239644
Deciduous Forest	45383.638694	70.91193
Woody Wetland	92.390059	0.144359
Emergent Wetland	18.345396	0.028665
Quarries	2423.360637	3.786501
Coal Mines	152.951981	0.238987
Transitional	3436.778018	5.369966

Chest Creek Total Acreage
82815.763444

Chest Creek Total Square Miles
129.39963

17) Cambria County GIS Center. See bibliography for complete citation.

Chest Creek Watershed Assessment and Restoration Plan

Natural Heritage Inventory Information

The Pennsylvania Natural Heritage Program has compiled County Natural Heritage Inventories. These inventories highlight important areas that support biodiversity and intact natural landscapes within the county. They define these areas as either Biological Diversity Areas (BDA) or Landscape Conservation Areas (LCA)(1,2). The Cambria County Natural Heritage Inventory defines a BDA as "an area containing and important in the support of plants or animals of special concern at state or federal levels, exemplary natural communities, or exceptional native diversity". Defined by the same source an LCA is "a large contiguous area; important because of its size, contiguous forest, open space, habitats, and/or inclusion of one or more Biological Diversity Areas, and although including a variety of land uses, has not been heavily disturbed and thus retains much of its natural character"(1). If you would like to know more about BDA's, LCA's, and Natural Heritage Inventories visit www.naturalheritage.state.pa.us were you can find an County Natural Heritage Inventory in electric format, or you can contact the appropriate county conservation district or the Pennsylvania Natural Heritage Program for more information. Below are the BDA's and LCA's that occur within the Chest Creek watershed.

Cambria County [11]
Chest Creek Headwaters BDA
Chest Creek at Eckenrode Mills BDA
Rogues Harbor Run BDA & LCA
Gallitzin LCA

Clearfield County [12]
Rogues Harbor Run BDA & LCA
State Gamelands 120 LCA
Chest Creek South Flood Plains BDA
Chest Creek Wetlands BDA

Watershed Characteristics: Municipalities Populations

Cambria County Municipalities: [13]

Cambria Township: 6,323
Allegheny Township: 2,498
Loretto Borough: 1,190
Clearfield Township: 1,680
East Carroll Township: 1,798
Carrolltown Borough: 1,049
Patton Borough: 2,023

11) Cambria County Natural Heirtage Inventory. Western Pennsylvania Conservancy. February 2007
12) Clearfield County Natural Heritage Inventory. Western Pennsylvania Conservancy. Sept. 17, 2004.
13) Taken from the US Census Bureau. Pennsylvania Place and County Subdivision.

Chest Township: 346
Elder Township: 990
Hastings Borough: 1,398
Susquehanna Township: 2,198

Clearfield County Municipalities: [13]

Chest Township: 547
Burnside Township: 1,128
Westover Borough: 458
Jordan Township: 543
Ferguson Township: 410
Newburg Borough: 81
Bell Township: 825
Mahaffey Borough: 402
New Washington Borough: 89

Mining

Mining History:

The Chest Creek watershed has been extensively deep mined and Pre Act surface mined from around the early 1800's to present day. Coal and clay were the main resources extracted during the mining era. Surface mining permits within the watershed were researched and water quality data was attained. The monitoring points of the coal companies correlated with the assessments tributary, instream, and discharge points. To view historic water quality data you need to see Appedendix C. The data sheets are grouped by tributary, instream, or discharge point to which it correlates. The spreadsheet also contains the surfaxce mining permit number. The correlation is defined in the surface mining permit descriptions.

SMP Permits

The following surface mining permits are available to the public at Cambria and Moshannon District Mining Offices. The information in this section was derived from these public documents.

13) Taken from the US Census Bureau. Pennsylvania Place and County Subdivision.

Cambria County Permits –Cambria DEP Mining Office

 # 4276SM15

This permit covers the Wesott No. 3 operation in Elder Township, Cambria County. It was issued to Wesott Inc.; 14.5 acres were affected by mining. Coal seams mined were Upper and Lower Freeport. Drainage from this permit area is to Chest Creek Tributary 38.

 # 11813018

This permit covers an operation by Gard Mining, Inc. in Elder Township, Cambria County. Coal seams mined were Upper, Middle, and Lower Kittanning, and Lower Kittanning Riding. Drainage from this permit area is to Chest Creek Tributary 38. Gard mining monitoring point number SP-6 correlates with discharge 38 IL to Chest Creek Assessment Tributary 38.

 # 11800116

This permit was to cover an operation by Paul F. Becker Coal Co. in Elder Township, Cambria County. The permit application was denied based on failure to demonstrate that the operation would not degrade or diminish the public water supply of Elder Township, nor did the applicant demonstrate that an alternative water supply of similar quality could be readily used.

 # 11870107

This permit covers an operation by Wesott Inc. in Elder Township and Hastings Borough, Cambria County. Coal seams mined were Upper Freeport, Middle and Lower Kittanning, and Lower Kittanning Riding. Drainage from this permit area is to Chest Creek Tributary 38.

#11930101

This permit covers an operation by Wesott Inc. in Elder Township and Hastings Borough, Cambria County. Coal seams mined here included Upper Freeport. Drainage from this permit area is to Chest Creek Tributary 38.

#11840103

This permit covers an operation by Wesott Inc. in Elder Township and Hastings Borough, Cambria County. Coal seams mined here included Middle and Lower Kittanning. Drainage from this permit area is to Chest Creek Tributary 38.

 # 1179112

This permit covers operation Spencer Mine Strip in Elder Township, Cambria County. It was issued to E.P. Bender Coal Company. Coal seems mined were Upper Kittanning and Brookville. Drainage from this permit area is to Chest Creek Tributary 38. Bender monitoring point 1433 correlates with Chest Creek Tributary 38.

 # 4276SMI8

This permit covers an operation at mine Job #12 in Elder Township, Cambria County. It was issued to E.P. Bender Coal Company. Coal seams mined were D and E seam. Drainage from this permit area is to Chest Creek Tributary 34. Bender monitoring point 1202 correlates with Chest Creek CCIS-3, and monitoring point 1203 correlates to Chest Creek Tributary 34.

#4273SM14

This permit covers an operation in Elder Township, Cambria County. It was issued to E.P. Bender Coal Company. Coal seams mined were Upper Kittanning, Upper Freeport, and Lower Freeport. Drainage from this permit area is to Chest Creek Tributaries 38 and Tributary 34.

#4277SM5T

This permit covers an operation Spencer in Elder Township, Cambria County. It was issued to E.P. Bender Coal Company. Coal seems mined were Lower and Upper Freeport. Drainage from this permit is to Chest Creek Tributary 34. Bender monitoring point 1203 correlates with Chest Creek Tributary 34.

 # 11920101

This permit covers an operation by K&J Coal Company, Inc. in Chest Township, Cambria and Clearfield Counties. Coal seams mined were Upper and Lower Freeport, and Upper Kittanning. Drainage for this permit area is to Chest Creek Tributary 37.

 # 11920104

This permit covers an operation at Mine Dry Rock Run in Chest Township, Cambria and Clearfield Counties. It was issued to K&J Coal Company, Inc. Coal seams mined were Upper and Lower Freeport, Lower Freeport Rider, and Upper Kittanning. Drainage for this permit area is to Chest Creek Tributary 37. K&J monitoring points DR-1 and DR-2 both correlate with Chest Creek Tributary 37.

 # 11870101

This permit covers the Hopfer Mine operation in Elder Township, Cambria County. It was issued to M.B. Energy, Inc. Coal seams mined were Upper and Lower Freeport, and Upper Kittanning. Drainage from this permit area is to Chest Creek Tributary 38.

 # 4271BSM12

This permit covers an operation in Elder Township, Cambria County. It was issued to Hepburnia Coal Co. Coal seams mined were B, C, C', D, and E. Drainage from this permit area is to Chest Creek Tributary 33.

 # 427SM4

This permit covers the Weakland No. 1 operation in Elder Township, Cambria County. It was issued to E.P. Bender Coal Company. 13.52 Acres were affected by mining. Coal seams mined were Upper and Lower Freeport. Drainage from this permit area is to Chest Creek Tributary 38.

 # 11813014

This permit was suspended due to failure to comply with Surface Mine Conservation and Reclamation Act, and the Clean Stream Law. Specific violations were sited. This permit covers an operation in East Carroll, Cambria County. The company was Lawrence Resources. Drainage from this permit area is to Chest Creek Tributary 13 and Chest Creek Tributary 10. Lawrence Resources monitoring point 12 correlates to Chest Creek Tributary 13, and Monitoring point 32 correlates to Chest Creek Tributary 10.

 # 11823013

This permit covers an operation by E.P. Bender Coal Company in East Carroll Township, Cambria County. Drainage from this permit area is to Chest Creek Tributary 30. Bender monitoring point 2806 correlates to Chest Creek Tributary 30.

 # 11683027

This permit covers the Rock Run operation in Chest Township, Cambria County. It was issued to Hepburnia. Drainage from this permit area is to Chest Creek Tributaries 33 and 35. Hepburnia sampling number 2 correlates with Chest Creek Tributary 33, and Hepburnia sampling number 4 correlates with Chest Creek Tributary 35.

 # 11840102

This permit covers an operation in Elder Township, Cambria County. The permit was issued to E.P. Bender Coal Company. Drainage from this permit area is to Chest Creek

Tributary 38-38A Combo. Bender monitoring point 3404 correlates with Chest Creek Tributary 38-38A Combo.

 # 11960103

This covers operation Bear #1 in Chest Township, Cambria County. It was issued to

K&J Coal Co., Inc. Drainage from this permit area is to Chest Creek Tributary 33. K&J monitoring point SW-15 correlates with Chest Creek Tributary 33.

 # 4277SM9

This permit covers operation Savage in Elder Township, Cambria County. The permit was issued to E.P. Bender Coal Company. The area affected was 25.5 acres. Coal seams mined were Upper Freeport and Mahoning. Drainage from this permit area is to Chest Creek Tributary 37. Bender sampling number 8 correlates to Chest Creek Tributary 37.

 # 11820108

This permit covers an operation in Elder Township, Cambria County. It was issued to Wesott Inc. Drainage from this permit area is to Chest Creek Tributary 38.

 # 11890701 or # 11841605

This permit covers operation No. 20 Refuse Site in East Carroll Township, Cambria County. It was issued to RNS Services Inc. Drainage from this permit area is to Chest Creek Tributary 13. RNS monitoring point SW-44 correlates with a point that drains to Chest Creek Tributary 13.

 # 11070101

This permit covers an operation at Savage Mine in Elder Township, Cambria County. It was issued to R.J. Coal Company. Drainage from this permit area is to Chest Creek Tributary 38. R.J. monitoring point MP-70 correlates with Chest Creek Tributary 38.

 # 17950110

This permit area covers operation Crooked Run in Chest Township, Cambria and Clearfield Counties. It was issued to K&J Coal Co., Inc. Drainage from this permit area is to Chest Creek Tributary 41. K&J monitoring point F-10 correlates with Chest Creek Tributary 41.

 # 11693000

This permit covers an operation at Westover Mine in Chest Township, Cambria and Clearfield Counties. It was issued to K&J Coal Co., Inc. Drainage from this permit area is to Chest Creek Tributary 33, 35, and 36. K&J sampling point 1W correlates with

CCIS-3, 4W correlates with Chest Creek Tributary 36, 6W correlates with Chest Creek Tributary 33, and 7W correlates with Chest Creek Tributary 35. Also under this permit sample number 780 correlates with CCIS-3, 781 correlates with CCIS-4, 782 correlates with CCIS-5, 783 correlates with CCIS-6, and 784 correlates with Chest Creek Tributary 57.

 # 11823004

This permit covers an operation at Driscoll Hollow Mine in Susquehanna and Elder Townships, Cambria County. It was issued to M.B. Energy, Inc. Drainage from this permit area is to Chest Creek Tributary 38-A. M.B. monitoring point MP-A correlates with Chest Creek Tributary 38-A.

Clearfield County Permits – Moshannon DEP District Mining Office

 # 17050104

This permit covers the Lee Operation in Chest Township, Clearfield County. It was issued to Hepburnia Coal Company. Coal seams mined were Upper and Lower Freeport, and Upper Kittanning. There was 295.5 total permit acres. Drainage from this permit area is to with Chest Creek Tributary 50. Hepburnia monitoring point 22 correlates with Chest Creek Tributary 50.

 # 17830117

This permit covers operation McIlwaine in Chest Township, Clearfield County. It was issued to K&J Coal Co. Coal seams mined were Upper and Lower Freeport, and Upper, Middle, and Lower Kittanning. Drainage from this permit area is to Chest Creek Tributaries 43, 47, and 50. K&J monitoring point 10 correlates with Chest Creek Tributary 46, and K&J monitoring point 4 correlates with Chest Creek Tributary 47. Also, K&J sample number 733 correlates with Chest Creek Tributary 43, 735 correlates with Chest Creek Tributary 47, and 737 correlates with Chest Creek Tributary 50.

 # 4376SM22

This permit covers operation Cambria No. 23 Mine in Burnside Township, Clearfield County. It was issued to Cambria Coal Company. Coal seams mined were Upper, Middle, and Lower Kittanning. 567 acres were affected. Drainage from this permit area is to Chest Creek Tributaries 43, and 45. Cambria point no. 517402 C23-4 correlates with Chest Creek Tributary 43, 537401 C23-6 correlates with Chest Creek Tributary 45, and 537402 C23-7 correlates with CCIS-4.

 # 17080104

This permit covers operation Hurd in Ferguson Township, Clearfield County. It was issued to P&N Coal Company, Inc., but operation has not started. Coal seams to be mined are Lower Freeport. 139 acres will be affected. Drainage from this permit area is to Chest Creek Tributaries 58, 60, and 62.

 # 17980126

This permit covers operation Kings Run in Chest Township, Clearfield County. It was issued to Hepburnia Coal Company. Coal seams mined were Upper Kittanning and Lower Freeport. Drainage from this permit area is to Chest Creek Tributary 48. Hepburnia monitoring point KR-17 correlates with CCIS-4, and monitoring point KR-19 correlates with Chest Creek Tributary 48.

 # 17020103

This permit covers an operation at Thomson Mine in Chest and Ferguson Townships, Clearfield County. It was issued to River Hill Coal Co., Inc. Coal seams mined were Upper Freeport, Lower Freeport 1, Lower Freeport 3, and Upper Kittanning. Drainage from this permit area is to Chest Creek Tributary 57. River Hill monitoring point T-2 correlates with Chest Creek Tributary 57.

 # 17010102

This permit covers operation Camp Run Mine in Chest Township, Clearfield County. It was issued to Compass Coal Company. Drainage from this permit area is to Chest Creek Tributary 50. 50-2R and 50-4R are discharge points. Compass monitoring point MP-47 correlates to 50-2R discharge, and monitoring point MP-2 correlates with 50-4R discharge. Discharges 50-2R and 50-4R flow into tributary 50.

 # 17990110

This permit covers operation Brink-Scollon No. 6 Mine in Chest Township, Clearfield County. It was issued to M.B. Energy, Inc. Amfire Mining was the operator. Coal seams mined were Mahoning, Lower Freeport (1,2,3), Upper Kittanning, and Brush Creek. 295.7 acres were affected. Drainage from this permit area is to Chest Creek Tributary 50 and 52. Amfire monitoring point BR-3-12 and MP-31 correlates with Chest Creek Tributary 52. Amfire monitoring point MP-30 correlates with Chest Creek Tributary 50. Amfire monitoring point BR5-21 correlates with CCIS-5.

 # 17070105

This permit covers an operation at mine Danvir #1 in Chest Township, Clearfield County. It was issued to Waroquier Coal Co. Coal seams mined were Upper and Lower Freeport,

and Upper Kittanning. There was 50 total permit acres. Drainage area of this permit was to Chest Creek and Chest Creek Tributary 47.

 # 17860146

This permit covers operation Brink #2 in Chest Township, Clearfield County. It was issued to MB Energy Inc. Coal seams mined were Upper and Lower Freeport, and Mahoning. Drainage area of this permit was to Chest Creek Tributary 52. MB monitoring points SW-6 and SW-7 correlate with Chest Creek Tributary 52.

 # 17950105

This permit covers operation Riddle in Chest Township, Clearfield County. It was issued to Hepburnia Coal Co., Inc. Coal seams mined were Upper and Lower Freeport, Lower Freeport Bottom Split, Upper Kittanning, and Middle Kittanning. Drainage from this permit area is to Chest Creek Tributary 59. Hepburnia monitoring point MP-84 correlates with Chest Creek Tributary 59.

 # 17860101

This permit covers operation Thompsontown #1 in Ferguson Township, Clearfield County. It was issued to Sky Haven Coal, Inc. Drainage from this permit area is to Chest Creek Tributary 57. Sky Haven monitoring points 4 and 6 correlate with Chest Creek Tributary 57. Also, located within Chest Creek Tributary 57 is the Sky Haven discharge point. Sky Haven monitoring point 10 correlates with the blowout.

 # 17970109

This permit covers operation Brink-Scollon No. 5 Mine in Chest Township, Clearfield County. It was issued to M.B. Energy, Inc. Coal seams mined were Mahoning, Lower Freeport (1,2,3), and Upper Kittanning. Drainage from this permit is to Chest Creek Tributary 52. M.B. monitoring points BS-34 (Headwaters), and BS-35 (Effluent) correlate with Chest Creek Tributary 52.

 # 17030112

This permit covers an operation at North Camp Run Mine in Chest Township, Clearfield County. It was issued to U.S. Operating Services. Total acres affected are 71.3. Drainage from this permit area is to Chest Creek Tributary 50.

AML:

Located throughout the watershed there is several abandoned spoil areas. Heading north on Chest Creek near the town of Patton, the tributary Little Chest Creek (Tributary 30)

enters the mainstem. Near the headwaters of Little Chest Creek near the village of Reillys, there are several spoil piles all relatively small in size. These spoil piles are believed to be from past coal mining operations from the Patton #1, Patton #2, Ashcroft #35, Pardee #26, Pardee #28, Pardee #39, Columbian #32, Pennsylvania Coal & Coke, and Victor #12 mines. The spoil needs to be tested to determine if it can be used.

The second is located along Route 36 near the Seldom Seen Mine. The spoil is situated on both sides of Route 36 just prior to the mine entrance. Accessibility is readily available to the site. Drainage coming from these piles run into the Brubaker Run (Tributary 38) watershed.

The next set of spoil piles is located in the Pine Run (Tributary 47) watershed. The spoil is located near the lower section of the watershed are from past mining operations of Benjamin Coal Company. Accessibility to the spoil is from McPherron Road, making abatement easier and less costly.

Another site located in the Rock Run (Tributary 36) watershed currently has an operation removing spoil from the old K & J Coal cleaning plant located in the watershed. RNS Services Inc. is the operator for this project.

Currently in the North Camp Run (Tributary 50) watershed there is an operation run by U.S. Operating Services called North Camp Run Mine, which is reclaiming the spoil and shipping it to a nearby co-generation plant to produce electricity. This spoil is from the North Camp #1, North Camp #2, and Benjamin mines. Reclamation of this site will help the water quality in North Camp Run.

The final spoil piles are located in the Wilson Run (Tributary 57) watershed. The spoil is located just above the Susquehanna Rod & Gun Co-Operative Trout Nursery along the stream. Drainage from the spoil goes directly into Wilson Run. Riverhill Coal Company is the mining operator in charge of removing the spoil.

Current Mining:

Currently in the Chest Creek watershed there are several surface mining operations and one deep mine located in both Cambria and Clearfield Counties.

The Johnson Operation SMP# 11060101, in Chest Township Cambria County, is operated by C.M.T. Energy, Inc. out of Brisban, PA. The operation is on the eastern side of Chest Creek above Thomas Mills in the tributary 33 watershed. The surface mine is taking the Upper Freeport seam of coal. Approximately 33.1 acres are permitted but only 16.8 acres will be mined.

The Savage Mine Operation SMP# 11070101, in Elder Township, Cambria County is operated by R.J. Coal Company out of LaJose, PA. The operation is located on the eastern side of Route 36 between Brubaker Run and Chest Creek, approximately 3 miles

north of St. Boniface. Approximately 14.7 acres of the permitted area will have the Middle Kittanning and Lower Kittanning coal seams removed.

Near Five Points, Burnside Township Clearfield County in the Spring Run watershed is the Harmony Mine. Rosebud Mining Company runs this deep mine, which is currently under construction. SMP# 17071301 is the permit number for this operation on file at the Moshannon District Mining Office.

Hepburnia Coal Company, Lee Operation SMP# 17050104 is currently surface mining in the North Camp Run watershed. The mine located on the north side of North Camp Run will be removing 21.2 acres of Upper Freeport, 38.3 acres of Lower Freeport, and 39.0 acres of Upper Kittanning. Approximately 98.5 acres will be mined, out of 295.9 acres being permitted.

Amfire Mining operates M.B. Energy Inc., Brink-Scollon No. 6 Mine SMP # 17990110 in Chest Township, Clearfield County. The surface mine is located off of Horseshoe Road, Chest Township, Clearfield County in tributary 52 watershed. Coal seams mined were 75.3 acres of the Mahoning, 154.7 acres of the Lower Freeport (1,2,3), 172.5 acres of the Upper Kittanning, and 20.2 acres of the Brush Creek. Approximately 295.7 acres will be affected out of the 350 acres permitted.

River Hill Coal Co. Inc. has an operation off of Horseshoe Road, Chest and Ferguson Townships, Clearfield County called the Thomson Pit #20 SMP# 17020103 in the Wilson Run watershed. The surface mine will be mining 65 acres of the Upper Freeport, 111 acres of the Lower Freeport, 82 acres of the Lower Freeport 3, and 26 acres of the Upper Kittanning. Approximately 284 acres will be affected out of 561 acres permitted.

P & N Coal Company Inc., is currently starting an operation named the Hurd Mine SMP#17080104 near Newburg (LaJose), Clearfield County. The surface mine will be mining and augering the Lower Freeport seam. Surface mining will affect 24.2 acres while augering will affect 43.8 acres. Approximately 139 acres will be affected out of 233.6 acres permitted.

Reclamation Efforts:

During the time this assessment started, there were several reclamation operations that were active throughout the Chest Creek watershed in both Cambria and Clearfield Counties.

In the Laurel Lick Run watershed, tributary 13, RNS Services Inc., completed a reclamation job at the old Barnes & Tucker No. 20 Refuse Site SMP# 11890701 in East Carroll Township, Cambria County. The refuse from the site was shipped to nearby COGEN plants and flyash was shipped back to the site for grading and capping over burnt refuse. The site was seeded and trees were planted to stabilize the site. The site initially had very little impact on Laurel Lick Run, but it wasn't significant enough to

hurt the fish population. The stream sustains an aquatic fishery along with a section of stream being stocked by the Pennsylvania Fish & Boat Commission.

In the North Camp Run watershed, tributary 50, Chest Township Clearfield County, there are two current reclamation jobs. The first is the Camp Run Mine Coal Refuse Removal Job SMP# 17010102 by Compass Coal Company. This job is reclaiming refuse, 72.5 acres from several surface mines and deep mines in the area. Benjamin Coal Company and Cougar Contracting Company ran the surface mines. North Camp Run Mining Company ran the deep mine. The Mahoning, Upper Freeport, Lower Freeport, Upper Kittanning, Middle Kittanning, and Lower Kittanning coal seams were removed and the refuse from them remained. Several discharges located in the area are associated with the past mining. The reclamation of the refuse will aid in the recovery of the section of North Camp Run being impacted.

The second reclamation job in the North Camp Run watershed, tributary 50, Chest Township, Clearfield County is the North Camp Run Refuse Site SMP# 17030112 by U.S. Operating Services. This job is reclaiming refuse, 71.3 acres from several surface mines and one deep mine. Benjamin Coal Company, Horseshoe Coal Company, and Bon Ayr Coal Corporation ran the surface mines. North Camp Run Mining Company ran the deep mine. The Upper Freeport, Lower Freeport, Upper Kittanning, Middle Kittanning, and Lower Kittanning coal seams were removed and the refuse from them remained. The refuse is being shipped to a nearby COGEN plant to be used to produce electricity.

Remining Potential:

In the Chest Creek watershed few subwatersheds are impacted by AMD. The Kings Run subwatershed, tributary 48, is one potential site where remining might alleviate the acid and iron, aluminum, and manganese loadings contributing to the tributary. Previously mined areas in the watershed have not affected the water quality of Kings Run except the area near discharge 48-1R. The discharge is highly acidic ranging from 236 to 354 mg/l, iron levels range from 3.9 to 23.7 mg/l, aluminum levels range from 31.7 to 59.3 mg/l and manganese levels range from 8.06 to 13.3 mg/l.

This area was part of the old Westover Deep Mine. It is believed that portions of the deep mine are still in tact, and could be day lighted to remove any coal left and possibly fix the water quality in the stream from that point downstream.

Data Collection

Field Reconnaissance:

Representatives from the Cambria County Conservation District and Chest Creek Watershed Alliance completed 67 tributary walks along the mainstem of Chest Creek from Winterset, Cambria County to Mahaffey, Clearfield County. Individuals walked from the bottom of each tributary to the headwaters and tested any water coming into the tributary to determine if it was impaired. At any point were a discharge was located, the spot was marked and flagged. Longitude and latitude was taken at each discharge along with a monitoring point located at the effluent of each tributary.

Of all the discharges that were identified and flagged, 12 monitoring points were established and sampled for 12 months. Flow measuring devices were used at some of the monitoring points along with the bucket/stopwatch method and pigmy meter method. All 67 tributary effluents were flagged and marked for samples and flow. Flow was taken with a pigmy meter. Six quarters of sampling occurred at each tributary monitoring point.

Pre-Existing Data:

Historical mining permits were obtained from PADEP Cambria & Moshannon District Mining Offices and researched for water quality data (see Appendix A page A-11). The water quality data was included in the database and used to evaluate discharges over time.

Documentation of Problem Areas:

Water Samples: See Map A-10, in Appendix A for all sample locations in the Chest Creek watershed. Discharges were monitored for 12 months and tributaries were monitored for 6 quarters. Instream points were monitored for 9 consecutive months.

Flow Rate: Discharges either had a rectangular or 90^{o} V-notch weir installed; the bucket method was used at some discharges along with the pigmy meter method.

Historical Mining Permit Sampling: In Appendix A, page A-11 shows a map of the historical mining in the Chest Creek watershed and the permit numbers for each.

Chest Creek Watershed Assessment and Restoration Plan

Development of Monitoring Plan:

A monitoring plan was developed from the original reconnaissance walks on each tributary. As part of the monitoring plan a survey was developed for the Headwaters Section for the farmers in this section. See survey in Appendix B. The Headwaters Section of Chest Creek is the drinking water supply for the Borough of Patton. The survey was going to be used to help rank the tributaries in this section by water quality. Eighteen surveys were sent out and only one was sent back. Due to lack of farmer participation every tributary was monitored for six consecutive quarters.

The watershed was divided into three sections. The Headwaters Section, which consisted of tributaries 1 through 30. The Middle Section, which consisted of tributaries 31 through 56, and the Lower Section, which consisted of tributaries 57 through 66.

The monitoring plan focused on the three sections for mine drainage. The Headwaters Section also focused on Nitrate and Phosphate parameters, and the Lower Section also focused on Fecal Coliform and BOD (Biological Oxygen Demand). A stream sample was taken at the mouth of every tributary on a quarterly basis for a year and a half. AMD discharges were sampled monthly for 12 consecutive months, and instream samples were done on a monthly basis for 9 consecutive months.

Sampling Methods:

Sampling methods for the Chest Creek Assessment were adopted from the Clearfield Creek Quality Assurance/Quality Control Manual, which was developed by a consultant. The manual can be viewed at the Cambria County Conservation District. The following is a summary of the sampling methods used during the assessment.

The watershed specialist trained AmeriCorps members, and watershed alliance members to properly conduct field chemistry tests, collect water samples, and measure flow rates. Samplers were trained to collect pH, alkalinity, TDS (Total Dissolved Solids) conductivity, nitrates, phosphates and water temperature measurements in the field. They were also trained on the proper care and use of each piece of equipment required for these measurements.

The watershed specialist conducted most of the sampling and made sure that other samplers knew the exact location of each monitoring point. The sampling methods used require that samples be taken as close to the source as possible. Samplers were directed to take samples in a section of the stream or discharge where flow was concentrated to provide the best representation of the chemical properties and to avoid sampling in pooled backwater areas or areas that were littered with decaying organic matter. Samplers were also directed to avoid areas that contained heavy concentrations of aquatic vegetation.

Samplers were taught to collect water samples in a manner that would prevent contamination. These steps included the exclusive use of bottles supplied by the lab and the technique of field rinsing equipment. Field rinsing was used to equilibrate the equipment to the sample environment; this was also done to ensure that all cleaning solution residues had been removed before sampling began. Samplers were taught to rinse and then fill bottles in a manner that minimizes contact with the air. The exposure of the sample to the atmosphere can increase the dissolved oxygen concentration, causing reduced metal ions to oxidize and precipitate as hydroxides. The precipitation of iron and other metal hydroxides can result in lower concentrations of iron and co-precipitating metals in the analyzed sample.

Samplers were instructed to keep all samples on ice in a cooler. Provisions were made as part of the monitoring plan to ensure prompt delivery of samples to the lab.

Samplers were taught to record all field data into a field book. Field data included the date, field pH, field conductivity, field nitrates, field phosphates, field alkalinity, field DO (Dissolved Oxygen), field TDS (Total Dissolved Solids), flow, and water and air temperature. Samplers were also taught to record any unusual contamination source at the site.

Samplers were instructed to properly label and fill out sampling bottles. The labels represented information that was recorded on the chain of custody form that was sent to the lab. The watershed specialist was responsible for all chain of custody lab paperwork and any additional paperwork.

Water Quality Measurements:

The Chest Creek watershed was divided into three sections. The Headwaters Section was analyzed for mine drainage parameters along with nitrates and phosphates. The Middle Section was analyzed for mine drainage only. The Lower Section was analyzed for mine drainage, fecal coliform, and BOD (Biological Oxygen Demand). The pH, conductivity, DO, alkalinity, and TDS were measured in the field. The pH, conductivity, and TDS were measured using a hand held Extech ExStik II meter. Alkalinity was measured using a portable field kit by LaMotte. Dissolved Oxygen was measured with a hand held Oakton Dissolved Oxygen meter. Air and water temperature was measured with a standard thermometer. All meters were calibrated once a week. Samples for metals were preserved in the field with nitric acid. Samples were not filtered so they represented total metal concentration.

Flow Rate:

Flow data was collected using several different methods. For all quarterly tributary sampling a pigmy meter was used. V-notch and rectangular weirs were installed at

several discharges. The bucket/stopwatch method along with the pigmy meter method was used for discharges also.

Mapping

Location Maps:

The location of Chest Creek watershed can be found in Appendix A on page A-1. This map displays the state of Pennsylvania and the Chest Creek watershed within the state. A map of the Chest Creek watershed and its surrounding municipalities is found on page A-2.

Stream Quality Integrated List:

Appendix A page A-3 displays the Chest Creek watershed and all receiving streams that are attaining or non-attaining in a color-coded version to represent stream quality throughout the entire watershed in Cambria and Clearfield Counties.

Chapter 93 Stream Quality:

Appendix A page A-4 displays the Chest Creek watershed and all receiving streams and their Chapter 93 designation in Cambria and Clearfield Counties.

Land Use/Land Cover:

Appendix A page A-5 displays the Chest Creek watershed land use/land cover in each municipality in Cambria and Clearfield Counties.

Industrial Influences:

Appendix A page A-6 is a map displaying the Chest Creek watershed and areas that were influenced by industry in or near the boundary outline.

Surface Geology:

Appendix A page A-7 displays the underline geological formation found in the Chest Creek watershed in Cambria and Clearfield Counties.

Classified Soils:

Appendix A page A-8 displays the Chest Creek watershed and the underline soil classifications found throughout the watershed in Cambria and Clearfield Counties.

Subwatershed Boundaries:

Appendix A page A-9 displays the Chest Creek watershed and 66 subwatersheds located in Cambria and Clearfield Counties.

Sampling Point Locations:

Appendix A page A-10 displays the Chest Creek watershed and all points monitored during the study in Cambria and Clearfield Counties.

Historical Sampling Points:

Appendix A page A-11 displays the Chest Creek watershed and points from historical mining permits water quality data.

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps: 1.) Subwatershed Boundry Outline (topography), 2.) Subwatershed Surface Geology, 3.) Subwatershed Soils, 4.) Subwatershed Aerial Photography, and 5.) Subwatershed Industrial Influences.

Data Analysis

All the data in this report is either current or historical. During 2006-2008 data from water quality samples was compiled and placed in a spreadsheet. Each point whether a tributary, discharge, instream, background, or historical sample has its own spreadsheet, which correlates to an individual sample points. All water quality data can be found in each individual subwatershed chapter.

Tributaries were monitored quarterly for one and a half years, while discharges were monitored monthly for twelve consecutive months. Instream sampling points were monitored for nine consecutive months. The Chest Creek watershed was divided into three sections, headwaters, middle, and lower. Each section was ranked according to water quality. The following tables are the rankings for tributaries only. The discharge ranking section immediately follows this section along with instream monitoring point rankings, data and charts.

Tributary Sampling Points:

Headwaters Section

The Headwaters Section consisted of tributaries 1-30. This section of the Chest Creek watershed is primarily where most of the farming takes place. Nitrates and phosphates were added to the original AMD analyses, to help track nutrient influxes during the sampling period. All points monitored during the study in this section have an individual water quality database. Loadings and concentrations for metals, nitrates, and phosphates are calculated. The following tables display the rankings of each tributary for iron, aluminum, manganese, nitrates, and phosphates in concentrations (mg/l) and loadings (lbs./day)

Chest Creek Headwaters

Rankings for AMD Metals Concentration and Loadings

Chest Creek Headwaters Ranking for Iron Concentration		
Rank	**Trib # / Name**	**Average mg/L**
1	Trib 18	1.07
2	Trib 13, Laurel Lick Run	0.67
3	Trib 9	0.63
4	Trib 15	0.48
5	Trib 10	0.47
6	Trib 25, Duclos Run	0.46
7	Trib 24	0.41
8	Trib 1	0.38
9	Trib 3	0.37
10	Trib 5	0.35
11	Trib 23	0.32
12	Trib 28	0.28
13	Trib 21	0.24
14	Trib 17	0.21
15	Trib 22	0.20
16	Trib 2	0.19
17	Trib 4	0.18
18	Trib 30, Little Chest Creek	0.09
19	Trib 29	0.08
Unranked	Trib 6	Unknown
Unranked	Trib 7	Unknown
Unranked	Trib 8	Unknown
Unranked	Trib 11	Unknown
Unranked	Trib 12	Unknown
Unranked	Trib 14	Unknown
Unranked	Trib 16	Unknown
Unranked	Trib 19	Unknown
Unranked	Trib 20	Unknown
Unranked	Trib 26	Unknown
Unranked	Trib 27	Unknown

Table 1. Average Iron concentrations and ranking for Headwater Section tributaries.

Chest Creek Headwaters

Rankings for AMD Metals Concentration and Loadings

Chest Creek Headwaters Ranking for Iron Loading		
Rank	**Trib # / Name**	**Average lbs/day**
1	Trib 9	2.77
2	Trib 18	2.56
3	Trib 15	2.49
4	Trib 13, Laurel Lick Run	2.34
5	Trib 3	2.29
6	Trib 5	2.26
7	Trib 25, Duclos Run	2.18
8	Trib 24	2.14
9	Trib 4	1.70
10	Trib 1	1.09
11	Trib 10	1.05
12	Trib 30, Little Chest Creek	0.57
13	Trib 23	0.43
14	Trib 2	0.40
15	Trib 17	0.22
16	Trib 21	0.19
17	Trib 28	0.09
18	Trib 29	0.08
19	Trib 22	0.05
Unranked	6	Unknown
Unranked	7	Unknown
Unranked	8	Unknown
Unranked	11	Unknown
Unranked	12	Unknown
Unranked	14	Unknown
Unranked	16	Unknown
Unranked	19	Unknown
Unranked	20	Unknown
Unranked	26	Unknown
Unranked	27	Unknown

Table 2. Average Iron loadings and ranking for Headwater Section tributaries.

Chest Creek Headwaters

Rankings for AMD Metals Concentration and Loadings

Chest Creek Headwaters Ranking for Aluminum Concentration		
Rank	**Trib # / Name**	**Average mg/L**
1	Trib 1	0.27
1	Trib 18	0.27
3	Trib 15	0.25
4	Trib 28	0.21

5	Trib 3	0.20
6	Trib 9	0.19
7	Trib 10	0.17
8	Trib 23	0.15
9	Trib 2	0.14
10	Trib 13, Laurel Lick Run	0.13
10	Trib 17	0.13
10	Trib 22	0.13
10	Trib 25, Duclos Run	0.13
14	Trib 5	0.12
15	Trib 4	0.11
16	Trib 21	0.10
17	Trib 24	0.07
18	Trib 30, Little Chest Creek	0.06
19	Trib 29	0.05
Unranked	Trib 6	Unknown
Unranked	Trib 7	Unknown
Unranked	Trib 8	Unknown
Unranked	Trib 11	Unknown
Unranked	Trib 12	Unknown
Unranked	Trib 14	Unknown
Unranked	Trib 16	Unknown
Unranked	Trib 19	Unknown
Unranked	Trib 20	Unknown
Unranked	Trib 26	Unknown
Unranked	Trib 27	Unknown

Table 3. Average Aluminum concentrations and ranking for Headwater Section tributaries.

Chest Creek Headwaters

Rankings for AMD Metals Concentration and Loadings

Chest Creek Headwaters Ranking for Aluminum Loading		
Rank	**Trib # / Name**	**Average lbs/day**
1	Trib 3	1.54
2	Trib 15	1.51
3	Trib 5	1.46
4	Trib 18	1.23
5	Trib 4	1.22
6	Trib 9	0.96
7	Trib 1	0.95
8	Trib 10	0.67
9	Trib 25, Duclos Run	0.63
10	Trib 30, Little Chest Creek	0.47
11	Trib 24	0.42
12	Trib 2	0.39
13	Trib 13, Laurel Lick Run	0.37
14	Trib 23	0.21
15	Trib 17	0.13
16	Trib 21	0.08

17	Trib 28	0.06
18	Trib 29	0.05
19	Trib 22	0.03
Unranked	Trib 6	Unknown
Unranked	Trib 7	Unknown
Unranked	Trib 8	Unknown
Unranked	Trib 11	Unknown
Unranked	Trib 12	Unknown
Unranked	Trib 14	Unknown
Unranked	Trib 16	Unknown
Unranked	Trib 19	Unknown
Unranked	Trib 20	Unknown
Unranked	Trib 26	Unknown
Unranked	Trib 27	Unknown

Table 4. Average Aluminum loadings and ranking for Headwater Section tributaries.

Chest Creek Headwaters

Rankings for AMD Metals Concentration and Loadings

Chest Creek Headwaters Ranking for Manganese Concentration		
Rank	**Trib # / Name**	**Average mg/L**
1	Trib 18	0.37
2	Trib 13, Laurel Lick Run	0.23
3	Trib 5	0.15
4	Trib 9	0.14
5	Trib 25, Duclos Run	0.11
6	Trib 3	0.10
7	Trib 15	0.09
8	Trib 10	0.08
8	Trib 28	0.08
10	Trib 22	0.07
11	Trib 24	0.06
12	Trib 1	0.04
12	Trib 21	0.04
12	Trib 23	0.04
15	Trib 4	0.03
15	Trib 17	0.03
17	Trib 2	0.02
17	Trib 29	0.02
17	Trib 30, Little Chest Creek	0.02
Unranked	Trib 6	Unknown
Unranked	Trib 7	Unknown
Unranked	Trib 8	Unknown
Unranked	Trib 11	Unknown
Unranked	Trib 12	Unknown
Unranked	Trib 14	Unknown

Unranked	Trib 16	Unknown
Unranked	Trib 19	Unknown
Unranked	Trib 20	Unknown
Unranked	Trib 26	Unknown
Unranked	Trib 27	Unknown

Table 5. Average Manganese concentrations and ranking for Headwater Section tributaries.

Chest Creek Headwaters

Rankings for AMD Metals Concentration and Loadings

Chest Creek Headwaters Ranking for Manganese Loading		
Rank	**Trib # / Name**	**Average lbs/day**
1	Trib 13, Laurel Lick Run	0.97
2	Trib 9	0.65
3	Trib 18	0.50
4	Trib 25, Duclos Run	0.48
5	Trib 5	0.36
5	Trib 24	0.36
7	Trib 15	0.35
8	Trib 3	0.27
9	Trib 4	0.22
10	Trib 30, Little Chest Creek	0.18
11	Trib 10	0.13
12	Trib 1	0.09
13	Trib 23	0.07
14	Trib 2	0.03
14	Trib 21	0.03
14	Trib 22	0.03
17	Trib 17	0.02
17	Trib 28	0.02
17	Trib 29	0.02
Unranked	Trib 6	Unknown
Unranked	Trib 7	Unknown
Unranked	Trib 8	Unknown
Unranked	Trib 11	Unknown
Unranked	Trib 12	Unknown
Unranked	Trib 14	Unknown
Unranked	Trib 16	Unknown
Unranked	Trib 19	Unknown
Unranked	Trib 20	Unknown
Unranked	Trib 26	Unknown
Unranked	Trib 27	Unknown

Table 6. Average Manganese loadings and ranking for Headwater Section tributaries.

Chest Creek Headwaters

Rankings for Nitrate and Phosphate Concentration and Loadings

Chest Creek Headwaters Ranking for Nitrate Concentration		
Rank	**Trib # / Name**	**Average mg/L**
1	Trib 2	11.27
2	Trib 24	6.28
3	Trib 30, Little Chest Creek	5.35
4	Trib 1	4.71
5	Trib 5	4.41
6	Trib 25, Duclos Run	3.40
7	Trib 23	2.67
8	Trib 17	1.92
9	Trib 3	1.64
10	Trib 9	1.42
11	Trib 4	1.33
12	Trib 18	1.25
13	Trib 22	1.11
14	Trib 21	1.10
15	Trib 29	1.09
16	Trib 10	1.06
17	Trib 15	0.94
18	Trib 13, Laurel Lick Run	0.73
19	Trib 28	0.25
Unranked	Trib 6	Unknown
Unranked	Trib 7	Unknown
Unranked	Trib 8	Unknown
Unranked	Trib 11	Unknown
Unranked	Trib 12	Unknown
Unranked	Trib 14	Unknown
Unranked	Trib 16	Unknown
Unranked	Trib 19	Unknown
Unranked	Trib 20	Unknown
Unranked	Trib 26	Unknown
Unranked	Trib 27	Unknown

Table 7. Average Nitrate concentrations and ranking for Headwater Section tributaries.

Chest Creek Headwaters

Rankings for Nitrate and Phosphate Concentration and Loadings

Chest Creek Headwaters Ranking for Nitrate Loadings		
Rank	**Trib # / Name**	**Average lbs/day**
1	Trib 30, Little Chest Creek	36.58
2	Trib 24	34.57
3	Trib 5	21.94
4	Trib 25, Duclos Run	17.45
5	Trib 4	16.38
6	Trib 9	14.53
7	Trib 3	10.23

8	Trib 2	9.31
9	Trib 18	8.84
10	Trib 1	8.08
11	Trib 10	7.37
12	Trib 15	4.25
13	Trib 23	2.50
14	Trib 17	1.12
15	Trib 29	0.88
16	Trib 13, Laurel Lick Run	0.83
16	Trib 21	0.83
18	Trib 22	0.43
19	Trib 28	0.08
Unranked	Trib 6	Unknown
Unranked	Trib 7	Unknown
Unranked	Trib 8	Unknown
Unranked	Trib 11	Unknown
Unranked	Trib 12	Unknown
Unranked	Trib 14	Unknown
Unranked	Trib 16	Unknown
Unranked	Trib 19	Unknown
Unranked	Trib 20	Unknown
Unranked	Trib 26	Unknown
Unranked	Trib 27	Unknown

Table 8. Average Nitrate loadings and ranking for Headwater Section tributaries.

Chest Creek Headwaters

Rankings for Nitrate and Phosphate Concentration and Loadings

Chest Creek Headwaters Ranking for Phosphate Concentration		
Rank	**Trib # / Name**	**Average mg/L**
1	Trib 18	0.22
2	Trib 21	0.16
3	Trib 15	0.15
4	Trib 30, Little Chest Creek	0.14
5	Trib 23	0.13
6	Trib 3	0.11
6	Trib 5	0.11
6	Trib 17	0.11
9	Trib 1	0.10
9	Trib 2	0.10
11	Trib 9	0.09
11	Trib 4	0.09
13	Trib 24	0.08
14	Trib 28	0.07
14	Trib 29	0.07
16	Trib 25, Duclos Run	0.06
17	Trib 13, Laurel Lick Run	0.05
18	Trib 10	0.04

19	Trib 22	0.03
Unranked	Trib 6	Unknown
Unranked	Trib 7	Unknown
Unranked	Trib 8	Unknown
Unranked	Trib 11	Unknown
Unranked	Trib 12	Unknown
Unranked	Trib 14	Unknown
Unranked	Trib 16	Unknown
Unranked	Trib 19	Unknown
Unranked	Trib 20	Unknown
Unranked	Trib 26	Unknown
Unranked	Trib 27	Unknown

Table 9. Average Phosphate concentrations and ranking for Headwater Section tributaries.

Chest Creek Headwaters

Rankings for Nitrate and Phosphate Concentration and Loadings

Chest Creek Headwaters Ranking for Phosphate Loadings		
Rank	**Trib # / Name**	**Average lbs/day**
1	Trib 15	0.85
1	Trib 30, Little Chest Creek	0.85
3	Trib 3	0.76
3	Trib 5	0.76
5	Trib 18	0.71
6	Trib 9	0.63
7	Trib 4	0.54
8	Trib 24	0.47
9	Trib 25, Duclos Run	0.33
10	Trib 1	0.20
11	Trib 10	0.17
12	Trib 2	0.14
13	Trib 23	0.11
14	Trib 13, Laurel Lick Run	0.10
14	Trib 21	0.10
16	Trib 17	0.08
16	Trib 29	0.08
18	Trib 28	0.02
19	Trib 22	0.01
Unranked	Trib 6	Unknown
Unranked	Trib 7	Unknown
Unranked	Trib 8	Unknown
Unranked	Trib 11	Unknown
Unranked	Trib 12	Unknown
Unranked	Trib 14	Unknown
Unranked	Trib 16	Unknown
Unranked	Trib 19	Unknown
Unranked	Trib 20	Unknown
Unranked	Trib 26	Unknown
Unranked	Trib 27	Unknown

Table 10. Average Phosphate loadings and ranking for Headwater Section tributaries.

Middle Section

The Middle Section consisted of tributaries 31 to 56. This section only had AMD parameters analyzed for each tributary. This section of the watershed contains the majority of the mining operations. Tributaries were ranked according to metal concentrations and loadings.

Chest Creek Middle Section

Rankings in AMD Metals Concentration and Loadings

Chest Creek Middle Section Ranking for Iron Concentration		
Rank	**Trib # / Name**	**Average mg/L**
1	Trib 38A, Little Brubaker Run	5.93
2	Trib 38 + 38A Combo	3.70
3	Trib 48, Kings Run	2.13
4	Trib 45	0.79
5	Trib 39, Moss Run	0.48
6	Trib 43, Ashcraft Run	0.47
7	Trib 35, Whiskey Run	0.46
8	Trib 38, Brubaker Run	0.43
9	Trib 51, Snyder Run	0.33
10	Trib 40	0.31
11	Trib 55	0.29
12	Trib 44	0.24
13	Trib 52	0.22
14	Trib 54	0.20
15	Trib 42, Rouges Harbor Run	0.17
16	Trib 33	0.16
17	Trib 37	0.15
17	Trib 49, Spring Run	0.15
19	Trib 53	0.14
20	Trib 36, Rock Run	0.13
20	Trib 50, North Camp Run	0.13
22	Trib 46	0.12
23	Trib 56	0.11
24	Trib 41	0.10
24	Trib 47, Pine Run	0.10
26	Trib 32	0.08
Unranked	Trib 31	N/A
Unranked	Trib 34	N/A

Table 11. Average Iron concentrations and ranking for the Middle Section tributaries of Cambria and Clearfield Counties.

Chest Creek Middle Section

Rankings in AMD Metals Concentration and Loadings

Chest Creek Middle Section Ranking for Iron Loading		
Rank	**Trib # / Name**	**Average lbs/day**
1	Trib 38 + 38A Combo	137.18
2	Trib 38A, Little Brubaker Run	79.91
3	Trib 48, Kings Run	19.68
4	Trib 39, Moss Run	15.01
5	Trib 38, Brubaker Run	14.46
6	Trib 42, Rogues Harbor Run	5.50
7	Trib 40	3.18
8	Trib 50, North Camp Run	2.89
9	Trib 56	2.48
10	Trib 47, Pine Run	2.36
11	Trib 51, Snyder Run	1.67
12	Trib 54	1.18
13	Trib 49, Spring Run	1.12
14	Trib 45	0.87
15	Trib 36, Rock Run	0.84
16	Trib 35, Whiskey Run	0.72
17	Trib 52	0.68
18	Trib 44	0.61
19	Trib 53	0.59
20	Trib 55	0.57
21	Trib 41	0.48
22	Trib 37	0.24
23	Trib 32	0.14
24	Trib 33	0.10
25	Trib 46	0.08
Unranked	Trib 31	N/A
Unranked	Trib 34	N/A
Unranked	Trib 43, Ashcraft Run	N/A

Table 12. Average Iron loadings and ranking for the Middle Section tributaries of Cambria and Clearfield Counties.

Chest Creek Middle Section

Rankings in AMD Metals Concentration and Loadings

Chest Creek Middle Section Ranking for Aluminum Concentration		
Rank	**Trib # / Name**	**Average mg/L**
1	Trib 38A, Little Brubaker Run	1.77
2	Trib 48, Kings Run	1.61
3	Trib 38 + 38A Combo	1.13
4	Trib 39, Moss Run	0.35
5	Trib 36, Rock Run	0.32
6	Trib 38, Brubaker Run	0.24

7	Trib 44	0.17
8	Trib 43, Ashcraft Run	0.15
9	Trib 55	0.14
10	Trib 35, Whiskey Run	0.13
11	Trib 40	0.13
12	Trib 52	0.13
13	Trib 33	0.11
14	Trib 37	0.11
15	Trib 45	0.10
16	Trib 46	0.10
17	Trib 56	0.10
18	Trib 54	0.09
19	Trib 49, Spring Run	0.08
20	Trib 51, Snyder Run	0.08
21	Trib 53	0.08
22	Trib 41	0.07
23	Trib 42, Rogues Harbor Run	0.07
24	Trib 47, Pine Run	0.07
25	Trib 32	0.05
26	Trib 50, North Camp Run	0.03
Unranked	Trib 31	N/A
Unranked	Trib 34	N/A

Table 13. Average Aluminum concentrations and ranking for the Middle Section tributaries of Cambria and Clearfield Counties.

Chest Creek Middle Section

Rankings in AMD Metals Concentration and Loadings

Chest Creek Middle Section Ranking for Aluminum Loading		
Rank	**Trib # / Name**	**Average lbs/day**
1	Trib 38 + 38A Combo	47.22
2	Trib 38A, Little Brubaker Run	25.94
3	Trib 48, Kings Run	18.51
4	Trib 39, Moss Run	13.43
5	Trib 38, Brubaker Run	8.66
6	Trib 42, Rogues Harbor Run	4.14
7	Trib 56	2.80
8	Trib 36, Rock Run	2.31
9	Trib 47, Pine Run	1.77
10	Trib 40	1.75
11	Trib 50, North Camp Run	0.84
12	Trib 49, Spring Run	0.77
13	Trib 51, Snyder Run	0.65
14	Trib 54	0.55
15	Trib 44	0.50
16	Trib 55	0.47
17	Trib 52	0.34
18	Trib 53	0.34
19	Trib 41	0.33
20	Trib 45	0.32

21	Trib 35, Whiskey Run	0.21
22	Trib 37	0.21
23	Trib 32	0.12
24	Trib 46	0.07
25	Trib 33	0.06
Unranked	Trib 31	N/A
Unranked	Trib 34	N/A
Unranked	Trib 43, Ashcraft Run	N/A

Table 14. Average Aluminum loadings and ranking for the Middle Section tributaries of Cambria and Clearfield Counties.

Chest Creek Middle Section

Rankings in AMD Metals Concentration and Loadings

Chest Creek Middle Section Ranking for Manganese Concentration		
Rank	**Trib # / Name**	**Average mg/L**
1	Trib 36, Rock Run	1.52
2	Trib 48, Kings Run	1.37
3	Trib 38A, Little Brubaker Run	1.02
4	Trib 38 + 38A Combo	0.91
5	Trib 50, North Camp Run	0.36
6	Trib 55	0.34
7	Trib 38, Brubaker Run	0.30
8	Trib 45	0.27
9	Trib 52	0.21
10	Trib 35, Whiskey Run	0.19
10	Trib 43, Ashcraft Run	0.19
12	Trib 51, Snyder Run	0.12
13	Trib 49, Spring Run	0.10
14	Trib 39, Moss Run	0.08
15	Trib 37	0.06
15	Trib 40	0.06
17	Trib 41	0.05
17	Trib 42, Rogues Harbor Run	0.05
19	Trib 54	0.04
20	Trib 32	0.03
20	Trib 47, Pine Run	0.03
20	Trib 53	0.03
23	Trib 33	0.02
23	Trib 56	0.02
25	Trib 44	0.01
25	Trib 46	0.01
Unranked	Trib 31	N/A
Unranked	Trib 34	N/A

Table 15. Average Manganese concentrations and ranking for the Middle Section tributaries of Cambria and Clearfield Counties.

Chest Creek Middle Section

Rankings in AMD Metals Concentration and Loadings

Chest Creek Middle Section Ranking for Manganese Loading		
Rank	**Trib# / Name**	**Average lbs/day**
1	Trib 38 + 38A Combo	34.98
2	Trib 38A, Little Brubaker Run	15.74
3	Trib 48, Kings Run	11.63
4	Trib 38, Brubaker Run	10.92
5	Trib 36, Rock Run	10.65
6	Trib 50, North Camp Run	5.61
7	Trib 39, Moss Run	2.81
8	Trib 42, Rogues Harbor Run	0.77
9	Trib 47, Pine Run	0.77
10	Trib 52	0.65
11	Trib 49, Spring Run	0.56
12	Trib 56	0.48
13	Trib 51, Snyder Run	0.42
14	Trib 55	0.41
15	Trib 35, Whiskey Run	0.35
16	Trib 40	0.28
17	Trib 45	0.19
18	Trib 41	0.13
19	Trib 37	0.12
20	Trib 53	0.08
21	Trib 32	0.04
22	Trib 44	0.04
23	Trib 54	0.04
24	Trib 33	0.01
25	Trib 46	0.01
Unranked	Trib 31	N/A
Unranked	Trib 34	N/A
Unranked	Trib 43, Ashcraft Run	N/A

Table 16. Average Manganese loadings and ranking for the Middle Section tributaries of Cambria and Clearfield Counties.

Lower Section

The Lower Section of the Chest Creek watershed is located solely in Clearfield County. This section consists of tributaries 57-66. Some mining has occurred in this section and potentially three new surface mines may open in next few years. This sections water samples were analyzed for AMD parameters plus Fecal Coliform and BOD. Fecal Coliform and BOD were added to the parameters due to the numerous homes located near Chest Creek and surrounding tributaries, which still wildcat their sewage.

Chest Creek Lower Section

Rankings in AMD Metals Concentration and Loadings

Chest Creek Lower Section Ranking for Iron Concentration		
Rank	**Trib # / Name**	**Average mg/L**
1	Trib 62, Snyder Run	0.49
2	Trib 60, Rattling Run	0.48
3	Trib 63	0.31
4	Trib 57, Wilson Run	0.26
5	Trib 66	0.25
6	Trib 59	0.19
7	Trib 58, Tuckers Run	0.16
8	Trib 64	0.13
9	Trib 61	0.12
10	Trib 65	0.11

Table 17. Average Iron concentrations and ranking for the Lower Section tributaries in Clearfield County.

Chest Creek Lower Section

Rankings in AMD Metals Concentration and Loadings

Chest Creek Lower Section Ranking for Iron Loading		
Rank	**Trib # / Name**	**Average lbs/day**
1	Trib 57, Wilson Run	23.05
2	Trib 62, Snyder Run	16.53
3	Trib 59	3.70
4	Trib 60, Rattling Run	2.50
5	Trib 58, Tuckers Run	2.09
6	Trib 64	1.55
7	Trib 61	1.15
8	Trib 66	0.40
9	Trib 65	0.19
10	Trib 63	0.09

Table 18. Average Iron loadings and ranking for the Lower Section tributaries in Clearfield County.

Chest Creek Lower Section

Rankings in AMD Metals Concentration and Loadings

Chest Creek Lower Section Ranking for Aluminum Concentration		
Rank	**Trib # / Name**	**Average mg/L**
1	Trib 60, Rattling Run	0.69
2	Trib 58, Tuckers Run	0.61
3	Trib 64	0.51
4	Trib 62, Snyder Run	0.30
5	Trib 63	0.23

6	Trib 66	0.20
7	Trib 59	0.12
8	Trib 57, Wilson Run	0.11
9	Trib 61	0.09
10	Trib 65	0.07

Table 19. Average Aluminum concentrations and ranking for the Lower Section tributaries in Clearfield County.

Chest Creek Lower Section

Rankings in AMD Metals Concentration and Loadings

Chest Creek Lower Section Ranking for Aluminum Loading		
Rank	**Trib # / Name**	**Average lbs/day**
1	Trib 57, Wilson Run	13.20
2	Trib 62, Snyder Run	8.42
3	Trib 58, Tuckers Run	6.90
4	Trib 60, Rattling Run	4.18
5	Trib 59	2.47
6	Trib 64	1.00
7	Trib 61	0.88
8	Trib 66	0.32
9	Trib 65	0.13
10	Trib 63	0.06

Table 20. Average Aluminum loadings and ranking for the Lower Section tributaries in Clearfield County.

Chest Creek Lower Section

Rankings in AMD Metals Concentration and Loadings

Chest Creek Lower Section Ranking for Manganese Concentration		
Rank	**Trib # / Name**	**Average mg/L**
1	Trib 58, Tuckers Run	0.87
2	Trib 60, Rattling Run	0.48
3	Trib 57, Wilson Run	0.13
3	Trib 64	0.13
5	Trib 59	0.05
5	Trib 62, Snyder Run	0.05
7	Trib 63	0.04
8	Trib 66	0.02
9	Trib 61	0.01
9	Trib 65	0.01

Table 21. Average Manganese concentrations and ranking for the Lower Section tributaries in Clearfield County.

Chest Creek Lower Section

Rankings in AMD Metals Concentration and Loadings

Chest Creek Lower Section Ranking for Manganese Loading		
Rank	**Trib # / Name**	**Average lbs/day**
1	Trib 57, Wilson Run	9.85
2	Trib 58, Tuckers Run	9.55
3	Trib 60, Rattling Run	3.12
4	Trib 62, Snyder Run	2.28
5	Trib 59	0.81
6	Trib 64	0.23
7	Trib 61	0.09
8	Trib 66	0.03
9	Trib 63	0.01
10	Trib 65	0.01

Table 22. Average Manganese loadings and ranking for the Lower Section tributaries in Clearfield County.

Chest Creek Lower Section

Rankings in Fecal Coliform Colony and Biological Oxygen Demand Concentration and Loadings

Chest Creek Lower Section Rankings for Concentration of Fecal Coliform Bacteria Colonies		
Rank	**Trib # / Name**	**Average Colonies/100mL**
1	Trib 66	375.83
2	Trib 64	301.25
3	Trib 62, Snyder Run	144
4	Trib 63	70
5	Trib 57, Wilson Run	53
6	Trib 58, Tuckers Run	51
7	Trib 59	47.5
8	Trib 65	30
9	Trib 60, Rattling Run	11.25
10	Trib 61	5

Table 23. Average Fecal Coliform average colony concentrations and ranking for the Lower Section tributaries in Clearfield County.

Chest Creek Lower Section

Rankings in Fecal Coliform Colony and Biological Oxygen Demand Concentration and Loadings

Chest Creek Lower Section Rankings for Loading of Fecal Coliform Bacteria Colonies		
Rank	**Trib # / Name**	**Average # of colonies/day**
1	Trib 57, Wilson Run	1.29×10^{10}
2	Trib 62, Snyder Run	8.31×10^{9}
3	Trib 64	3.16×10^{9}
4	Trib 59	1.07×10^{9}
5	Trib 58, Tuckers Run	1.02×10^{9}
6	Trib 60, Rattling Run	2.55×10^{8}
7	Trib 65	2.54×10^{8}
8	Trib 61	1.96×10^{8}
9	Trib 66	1.90×10^{8}
10	Trib 63	4.02×10^{7}

Table 24. Average Fecal Coliform average colony loadings and ranking for the Lower Section tributaries in Clearfield County.

Chest Creek Lower Section

Rankings in Fecal Coliform Colony and Biological Oxygen Demand Concentration and Loadings

Chest Creek Lower Section Rankings for Concentrations of Biological Oxygen Demand per mL		
Rank	**Trib # / Name**	**Avg. Demand in mg/L**
1	Trib 66	4.25
2	Trib 59	2.50
3	Trib 61	2.00
4	Trib 64	1.88
5	Trib 65	1.88
6	Trib 62, Snyder Run	1.80
7	Trib 60, Rattling Run	1.75
8	Trib 63	1.70
9	Trib 58, Tuckers Run	1.60
10	Trib 57, Wilson Run	1.30

Table 25. Average Biological Oxygen Demand concentrations and ranking for the Lower Section tributaries in Clearfield County.

Chest Creek Lower Section

Rankings in Fecal Coliform Colony and Biological Oxygen Demand Concentration and Loadings

Chest Creek Lower Section Rankings for Loadings of Biological Oxygen Demand in lbs/day		
Rank	**Trib # / Name**	**Average lbs/day**
1	Trib 57, Wilson Run	103.56
2	Trib 62, Snyder Run	84.01
3	Trib 59	31.12
4	Trib 61	15.92
5	Trib 58, Tuckers Run	15.49
6	Trib 64	11.73
7	Trib 60, Rattling Run	9.20
8	Trib 66	2.59
9	Trib 65	2.25
10	Trib 63	1.04

Table 26. Average Biological Oxygen Demand loadings and ranking for the Lower Section tributaries in Clearfield County.

Discharge Sample Points:

This section discusses the AMD discharges located in the Chest Creek watershed. Some of the discharge points have historical data associated with them. Both Cambria and Clearfield County have discharges located in them. The majority of the discharges are located in Clearfield County. All discharges were sampled for basic AMD parameters and flows were calculated for loadings and concentration values of metals and acidity in each sample. Each section of the Chest Creek watershed possessed a discharge(s).

The following tables show the loadings and concentration values plus the ranking order of each discharge. Following this section is the individual discharge section, with description of the location and water quality data along with charts that show metal concentrations for each discharge.

Chest Creek Discharges

Discharge Rankings for Loadings and Concentrations of Metals

Chest Creek Discharge Rankings for Iron Concentrations		
Rank	**Discharge # / Name**	**Average mg/L**
1	50-3R, North Camp #3	21.00
2	50-2R, North Camp #2	19.65

3	48-1R, Kings Run Pipe	10.61
4	57-2L, Wilson Run #2	5.60
5	PD-1, Patton Discharge	5.39
6	50-1R, North Camp #1	5.09
7	57-3L, Wilson Run #3	2.86
8	38-2L, Two Truck Discharge	2.26
9	50-4R, North Camp #4	1.77
10	38-1L, Route 36 Discharge	0.68
11	48-1L, Kings Run Mine	0.61
12	BJD-1, Bradley Junction Discharge	0.08

Table 27. Average Iron concentrations and ranking for Discharges in the Chest Creek Watershed.

Chest Creek Discharges

Discharge Rankings for Loadings and Concentrations of Metals

Chest Creek Discharge Rankings for Iron Loadings		
Rank	**Discharge # / Name**	**Average lbs/day**
1	PD-1, Patton Discharge	26.22
2	50-3R, North Camp #3	10.22
3	50-2R, North Camp #2	5.17
4	57-2L, Wilson Run #2	3.77
5	48-1R, Kings Run Pipe	2.79
6	50-1R, North Camp #1	0.76
7	38-1L, Route 36 Discharge	0.67
8	57-3L, Wilson Run #3	0.64
9	38-2L, Two Truck Discharge	0.38
10	50-4R, North Camp #4	0.30
11	48-1L, Kings Run Mine	0.19
12	BJD-1, Bradley Junction Discharge	0.01

Table 28. Average Iron loadings and ranking for Discharges in the Chest Creek Watershed.

Chest Creek Discharges

Discharge Rankings for Loadings and Concentrations of Metals

Chest Creek Discharge Rankings for Aluminum Concentrations		
Rank	**Discharge # / Name**	**Average mg/L**
1	48-1R, Kings Run Pipe	40.87
2	38-1L, Route 36 Discharge	3.79
3	38-2L, Two Truck Discharge	0.87
4	50-1R, North Camp #1	0.05
4	57-2L, Wilson Run #2	0.05
6	BJD-1, Bradley Junction Discharge	0.04
6	50-2R, North Camp #2	0.04
8	PD-1, Patton Discharge	0.03

8	48-1L, Kings Run Mine	0.03
8	50-3R, North Camp #3	0.03
8	50-4R, North Camp #4	0.03
8	57-3L, Wilson Run #3	0.03

Table 29. Average Aluminum concentrations and ranking for Discharges in the Chest Creek Watershed.

Chest Creek Discharges

Discharge Rankings for Loadings and Concentrations of Metals

Chest Creek Discharge Rankings for Aluminum Loadings		
Rank	**Discharge # / Name**	**Average lbs/day**
1	48-1R, Kings Run Pipe	13.98
2	38-1L, Route 36 Discharge	3.59
3	38-2L, Two Truck Discharge	0.33
4	PD-1, Patton Discharge	0.13
5	57-2L, Wilson Run #2	0.04
6	BJD-1, Bradley Junction Discharge	0.01
6	48-1L, Kings Run Mine	0.01
6	50-1R, North Camp #1	0.01
6	50-2R, North Camp #2	0.01
6	50-3R, North Camp #3	0.01
6	50-4R, North Camp #4	0.01
6	57-3L, Wilson Run #3	0.01

Table 30. Average Aluminum loadings and ranking for Discharges in the Chest Creek Watershed.

Chest Creek Discharges

Discharge Rankings for Loadings and Concentrations of Metals

Chest Creek Discharge Rankings for Manganese Concentrations		
Rank	**Discharge # / Name**	**Average mg/L**
1	48-1R, Kings Run Pipe	10.37
2	50-3R, North Camp #3	10.32
3	50-2R, North Camp #2	7.41
4	50-4R, North Camp #4	4.69
5	38-1L, Route 36 Discharge	2.90
6	50-1R, North Camp #1	1.51
7	PD-1, Patton Discharge	0.43
8	57-2L, Wilson Run #2	0.29
9	57-3L, Wilson Run #3	0.27
10	38-2L, Two Truck Discharge	0.19
11	BJD-1, Bradley Junction Discharge	0.01
11	48-1L, Kings Run Mine	0.01

Table 31. Average Manganese concentrations and ranking for Discharges in the Chest Creek Watershed.

Chest Creek Discharges

Discharge Rankings for Loadings and Concentrations of Metals

Chest Creek Discharge Rankings for Manganese Loadings		
Rank	**Discharge # / Name**	**Average lbs/day**
1	50-3R, North Camp #3	5.09
2	48-1R, Kings Run Pipe	3.30
3	38-1L, Route 36 Discharge	3.03
4	PD-1, Patton Discharge	2.18
5	50-2R, North Camp #2	1.92
6	50-4R, North Camp #4	1.32
7	50-1R, North Camp #1	0.23
8	57-2L, Wilson Run #2	0.19
9	57-3L, Wilson Run #3	0.06
10	38-2L, Two Truck Discharge	0.04
10	48-1L, Kings Run Mine	0.04
12	BJD-1, Bradley Junction Discharge	<0.005

Table 32. Average Manganese loadings and ranking for Discharges in the Chest Creek Watershed.

Chest Creek Discharges

Discharge Rankings for Loadings and Concentrations of Acidity

Chest Creek Discharge Rankings for Acidity Concentrations		
Rank	**Discharge # / Name**	**Average mg/L**
1	48-1R, Kings Run Pipe	310.36
2	38-1L, Route 36 Discharge	25.83
3	38-2L, Two Truck Discharge	11.20
4	50-2R, North Camp #2	-29.92
5	50-3R, Northcamp #3	-47.33
6	57-2L, Wilson Run #2	-67.75
7	PD-1, Patton Discharge	-71.92
8	57-3L, Wilson Run #3	-78.00
9	50-1R, North Camp #1	-83.50
10	48-1L, Kings Run Mine	-168.42
11	50-4R, North Camp #4	-172.40
12	BJD-1, Bradley Junction Discharge	-380.27

Table 33. Average Acidity concentrations and ranking for Discharges in the Chest Creek Watershed.

Chest Creek Discharges

Discharge Rankings for Loadings and Concentrations of Acidity

Chest Creek Discharge Rankings for Acidity Loadings		
Rank	**Discharge # / Name**	**Average mg/L**
1	48-1R, Kings Run Pipe	106.34
2	38-1L, Route 36 Discharge	9.83
3	38-2L, Two Truck Discharge	5.49
4	50-2R, North Camp #2	-9.23
5	50-1R, North Camp #1	-12.75
6	57-3L, Wilson Run #3	-17.76
7	50-3R, North Camp #3	-31.15
8	57-2L, Wilson Run #2	-45.32
9	48-1L, Kings Run Mine	-51.68
10	BJD-1, Bradley Junction Discharge	-57.01
11	50-4R, North Camp #4	-87.51
12	PD-1, Patton Discharge	-353.65

Table 34. Average Acidity loadings and ranking for Discharges in the Chest Creek Watershed

Individual Discharge Section

BJD-1 – Bradley Junction Discharge

This discharge is located in Bradley Junction, Allegheny Township just below the bridge that crosses over Chest Creek. The discharge is located about 10 yards from the mainstem of Chest Creek. The discharge comes from an abandoned deep mine and is high in alkalinity averaging 403.82 mg/l. This discharge does not flow directly into an individual tributary, but does flow directly into Chest Creek.

Discharge Number: BJD-1, Bradley Junction Discharge
Cambria County; Allegheny Township

CCWA Monitoring Point: BJD-1, Bradley Junction Discharge																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Bucket)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/21/2006	CCWA	12.84	8.4	935	42	-400	414	0.05	0.025	0.01	2.5	3.1		-61.83	63.99	0.01	0.00	0.00	0.39
10/12/2006	CCWA	12.78	8.6	1060	48	-389	417	0.06	0.025	0.01	2.5	3.1	531	-59.85	64.16	0.01	0.00	0.00	0.38
11/14/2006	CCWA	13.01	8.5	929	48	-388	409	0.08	0.025	0.01	2.5	3.1	536	-60.77	64.06	0.01	0.00	0.00	0.39
12/11/2006	CCWA	11.48			39									0.00	0.00	0.00	0.00	0.00	0.00
1/19/2007	CCWA	15.95	8.5	905	25	-365	378	0.05	0.025	0.01	5	2.5	490	-70.08	72.58	0.01	0.00	0.00	0.96
2/12/2007	CCWA	13.51	8.5	959	19	-397	413	0.09	0.025	0.01	2.5	9	558	-64.57	67.17	0.01	0.00	0.00	0.41
3/20/2007	CCWA	15.02	8.5	932	34	-356	379	0.06	0.025	0.02	2.5	2.5	508	-64.37	68.53	0.01	0.00	0.00	0.45
4/24/2007	CCWA	14.07	8.5	978	55	-395	409	0.27	0.22	0.02	520	2.5	541	-66.91	69.28	0.05	0.04	0.00	88.08
5/24/2007	CCWA	12.24	8.6	1020	58	-368	409	0.06	0.025	0.01	2.5	2.5	536	-54.22	60.27	0.01	0.00	0.00	0.37
6/26/2007	CCWA	11.53	8.6	983	70	-388	405	0.07	0.025	0.01	2.5	2.5	453	-53.86	56.22	0.01	0.00	0.00	0.35
7/23/2007	CCWA	11.53	8.7	1000	60	-357	409	0.05	0.025	0.01	2.5	2.5	558	-49.55	56.77	0.01	0.00	0.00	0.35
8/29/2007	CCWA	17.08	8.6	989	68	-380	400	0.07	0.025	0.01	2.5	2.5	527	-78.13	82.25	0.01	0.01	0.00	0.51
Number of sample Dates	Count	12	11	11	12	11	11	11	11	11	11	11	10	12	12	12	12	12	12
	Max	17.08	8.7	1060	70	-356	417	0.27	0.22	0.02	520	9	558	0.00	82.25	0.05	0.04	0.00	88.08
	Min	11.48	8.4	905	19	-400	378	0.05	0.025	0.01	2.5	2.5	453	-78.13	0.00	0.00	0.00	0.00	0.00
12	Average	13.42	8.55	971.82	47.17	-380.27	403.82	0.08	0.04	0.01	49.77	3.25	523.80	-57.01	60.44	0.01	0.01	0.00	7.72

Table 35. Water Quality data for BJD-1 discharge.

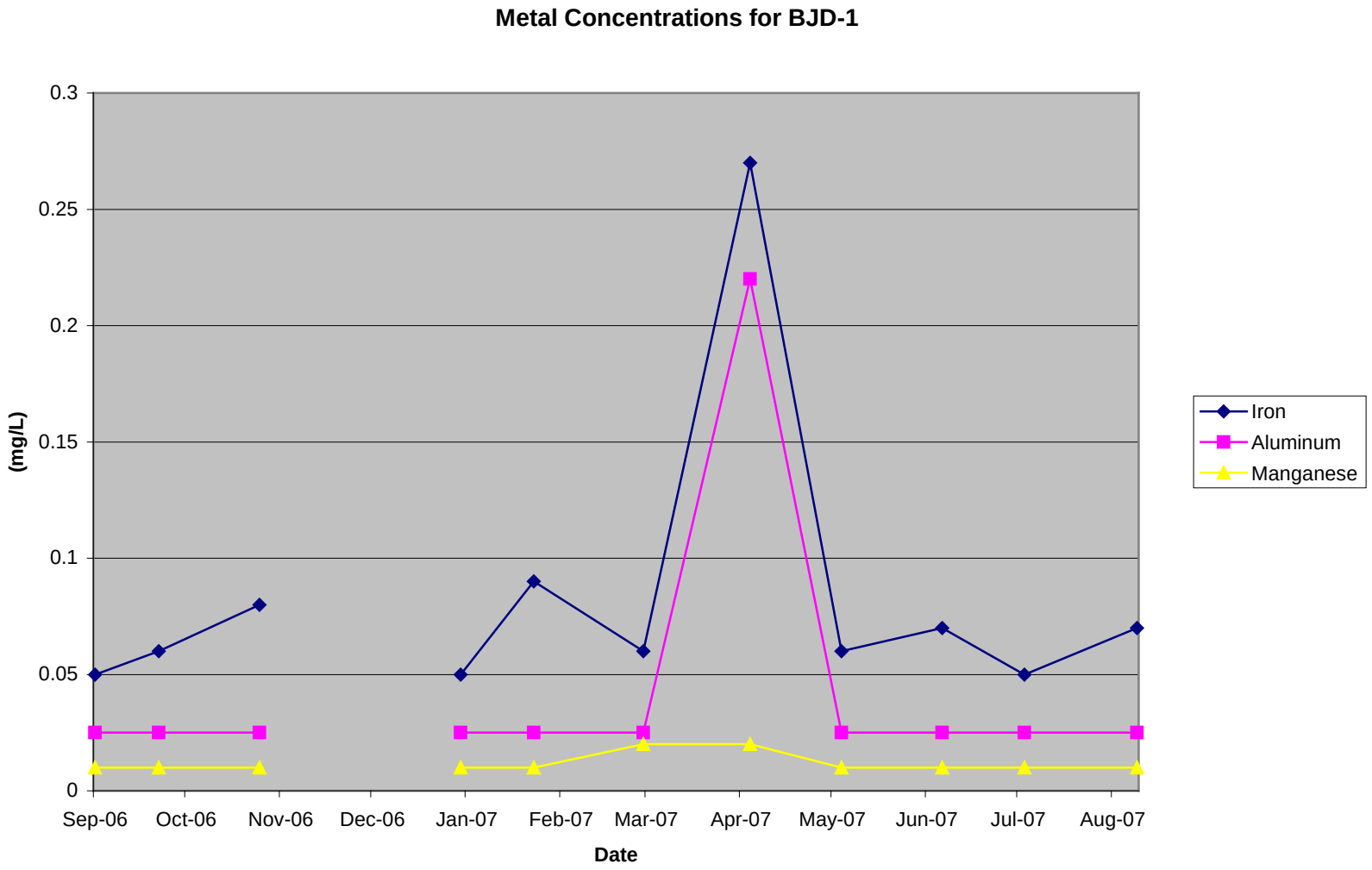


Chart 1. Metal concentrations for BJD-1 discharge.

PD-1 – Patton Discharge

This discharge is located in the Borough of Patton off of Cowher Lane. The discharge flows into a pond before entering Chest Creek, which helps to settle out a lot of the iron precipitate. Average total iron is 5.39 mg/l and an average alkalinity of 444.04 mg/l. This discharge does not flow directly into an individual tributary, but does flow directly into Chest Creek

Discharge Number PD-1, Patton Discharge

Cambria County; Patton Borough

CCWA Monitoring Point: Discharge Number PD-1, Patton Discharge																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/21/2006	CCWA	177.65	6.5	692	45	-77	92	5.99	0.025	0.4	240	8.6		-164.67	196.75	12.81	0.05	0.86	513.27
10/12/2006	CCWA	390.23	6.8	775	49	-82	102	5.57	0.025	0.37	249	10	464	-385.22	479.17	26.17	0.12	1.74	1169.74
11/14/2006	CCWA	199.73	6.6	698	48	-81	96	6.13	0.025	0.42	237	3.1	449	-194.76	230.83	14.74	0.06	1.01	569.85
12/12/2006	CCWA	338.78	6.7	685	36	-80	98	6.27	0.025	0.46	247	3.1	91	-326.27	399.68	25.57	0.10	1.88	1007.36
1/19/2007	CCWA	612.97	6.5	654	23	-69	81	4.78	0.025	0.42	223	8	410	-509.16	597.71	35.27	0.18	3.10	1645.56
2/12/2007	CCWA	500.67	6.5	678	22	-69	92	5.75	0.025	0.51	231	14	473	-415.88	554.51	34.66	0.15	3.07	1392.30
3/20/2007	CCWA	687.07	6.7	672	34	-63	85	5.01	0.025	0.46	223	2.5	431	-521.09	703.05	41.44	0.21	3.80	1844.48
4/24/2007	CCWA	722.53	6.6	680	56	-70	83	4.71	0.025	0.47	210	9	438	-608.87	721.94	40.97	0.22	4.09	1826.60
5/24/2007	CCWA	441.74	6.8	676	63	-67	81	3.88	0.025	0.38	246	2.5	425	-356.30	430.75	20.63	0.13	2.02	1308.19
6/26/2007	CCWA	353.59	6.5	702	72	-64	87	5.5	0.025	0.42	222	6	380	-272.43	370.33	23.41	0.11	1.79	944.98
7/23/2007	CCWA	241.02	6.6	701	64	-71	95	5.29	0.025	0.38	248	2.5	473	-206.01	275.64	15.35	0.07	1.10	719.57
8/29/2007	CCWA	335.99	6.5	678	69	-70	91	5.83	0.025	0.43	232	5	460	-283.13	368.08	23.58	0.10	1.74	938.39
Number of sample Dates	Count	12	12	12	12	12	12	12	12	12	12	12	11	12	12	12	12	12	12
	Max	722.53	6.8	775	72	-63	102	6.27	0.025	0.51	249	14	473	-164.67	721.94	41.44	0.22	4.09	1844.48
	Min	177.65	6.5	654	22	-82	81	3.88	0.025	0.37	210	2.5	91	-608.87	196.75	12.81	0.05	0.86	513.27
12	Average	416.83	6.61	690.92	48.42	-71.92	90.25	5.39	0.03	0.43	234.00	6.19	408.55	-353.65	444.04	26.22	0.13	2.18	1156.69

Table 36. Water Quality data for PD-1 discharge.

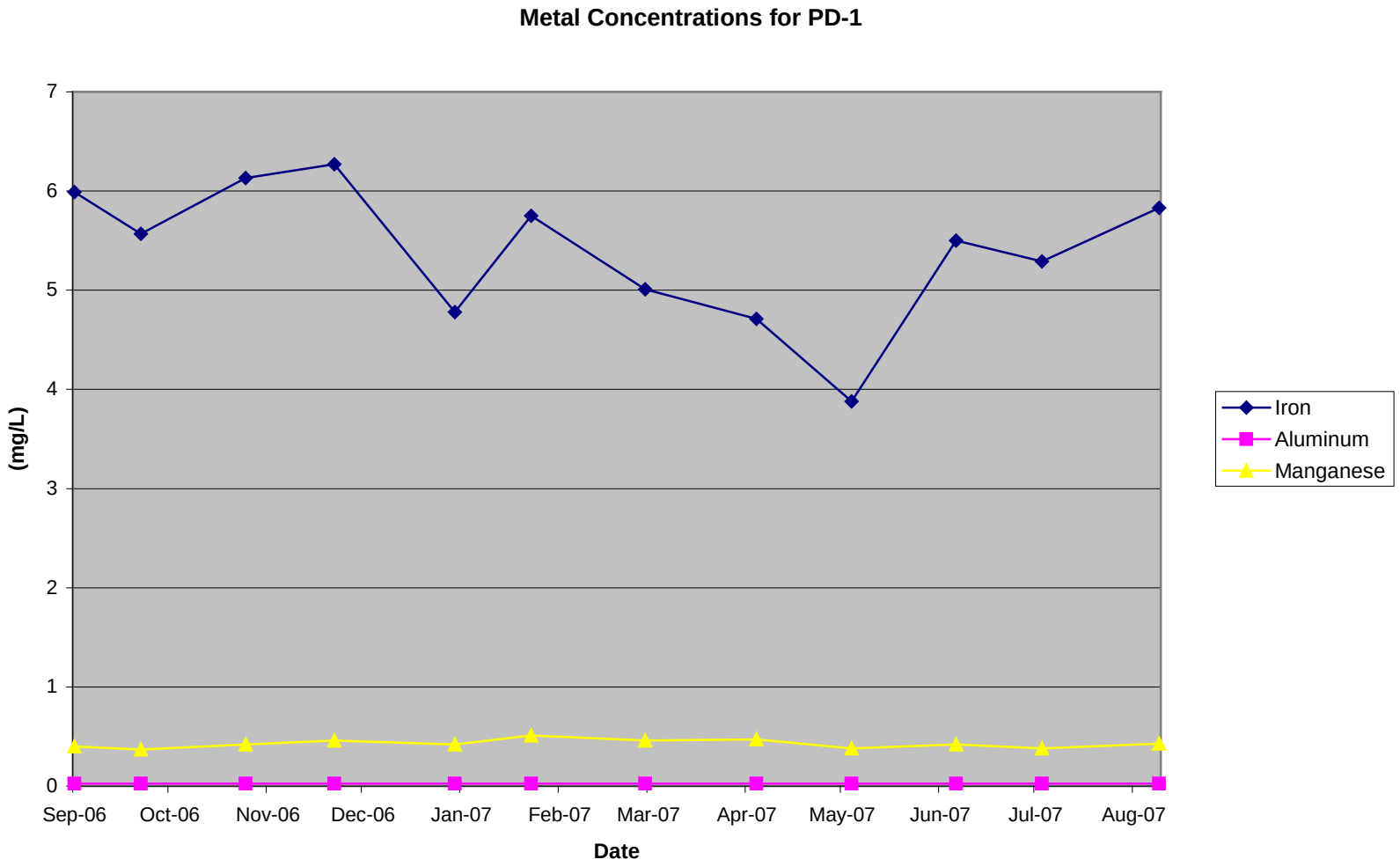


Chart 2. Metal concentrations for PD-1 discharge.

38-1L – Route 36 Discharge

This discharge is located in the Brubaker Run watershed. Heading north on Route 36 from Patton, the discharge is located on the right hand side of the road approximately 2 miles past the town of St. Boniface before Hockenberry Road. It emanates from the Seldom Seam Mine and flows under Route 36 to land between the stream and the highway. The discharge averages 28.53 mg/l of acidity and 6.42 mg/l of alkalinity, and 3.79 mg/l of aluminum.

Discharge Number 38-1L, Route 36 Discharge

Cambria County; Elder Township

CCWA Monitoring Point: Discharge Number 38-1L, Route 36 Discharge																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
			pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/27/2006	CCWA	6.8	3.8	1190	54	54	0	1.03	5.46	3.66	609	3.1	919	4.42	0.00	0.08	0.45	0.30	49.85
10/12/2006	CCWA	5.3	3.8	1300	48	48	0	0.89	5.23	3.6	622	3.1	920	3.06	0.00	0.06	0.33	0.23	39.69
11/14/2006	CCWA	63.2	3.7	998	47	43	0	1.04	5.09	3.76	479	3.1	723	32.72	0.00	0.79	3.87	2.86	364.44
12/12/2006	CCWA	67.37	4.4	1230	40	34	0	0.33	4.29	3.39	706	3.1	1063	27.57	0.00	0.27	3.48	2.75	572.59
1/19/2007	CCWA	235.6	5.4	1080	22	8	6	0.63	2.6	2.4	559	6	861	22.69	17.02	1.79	7.37	6.81	1585.46
2/12/2007	CCWA	89.46	4.9	1430	20	22	9	0.48	3.74	3.19	67	11	1076	23.69	9.69	0.52	4.03	3.44	72.16
3/29/2007	CCWA	271.08	6.1	1020	34	-6	20	0.57	2.34	1.83	516	2.5	770	-19.58	65.27	1.86	7.64	5.97	1683.90
4/24/2007	CCWA	387.93	6.3	1140	60	-3	18	0.4	2.3	2.14	549	12	870	-14.01	84.06	1.87	10.74	9.99	2563.86
5/24/2007	CCWA	62.54	5	1180	66	17	7	0.38	2.86	2.36	626	5	949	12.80	5.27	0.29	2.15	1.78	471.30
6/25/2007	CCWA	31.28	4.7	1180	73	30	6	0.64	3.61	2.77	596	2.5	943	11.30	2.26	0.24	1.36	1.04	224.43
7/23/2007	CCWA	16.58	4.8	1190	65	32	7	0.61	4.56	3.18	630	2.5	960	6.39	1.40	0.12	0.91	0.63	125.75
8/29/2007	CCWA	18.42	4.4	1040	72	31	4	0.59	3.4	2.5	512	2.5	824	6.87	0.89	0.13	0.75	0.55	113.53
Number of sample Dates	Count	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
	Max	387.93	6.3	1430	73	54	20	1.04	5.46	3.76	706	12	1076	32.72	84.06	1.87	10.74	9.99	2563.86
	Min	5.3	3.7	998	20	-6	0	0.33	2.3	1.83	67	2.5	723	-19.58	0.00	0.06	0.33	0.23	39.69
12	Average	104.63	4.78	1164.83	50.08	25.83	6.42	0.63	3.79	2.90	539.25	4.70	906.50	9.83	15.49	0.67	3.59	3.03	655.58

Table 37. Water Quality data for 38-1L discharge.

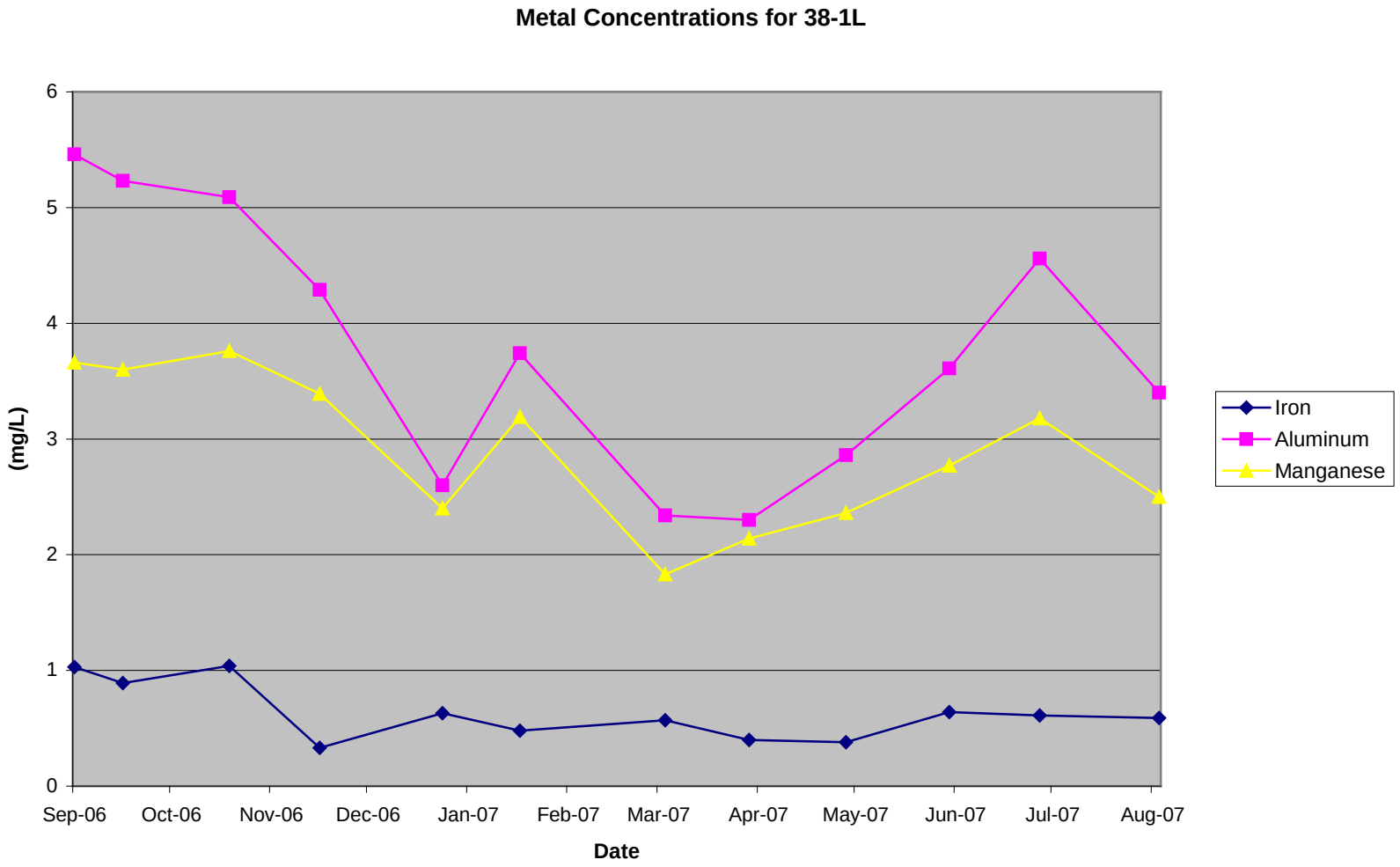


Chart 3. Metal concentrations for 38-1L discharge.

38-2L – Two Truck Discharge

This discharge is located in the Brubaker Run watershed. Heading north on Route 36 from Patton, the discharge is located on the right hand side of the road approximately 2 ½ miles past the town of St. Boniface right after the intersection of Route 36 and Seldom Seem Road. The discharge comes from and old mine opening and flows under the highway into a vacant lot. The discharge averages 2.26 mg/l of iron and 0.87 mg/l of aluminum.

Discharge Number: 38-2L, Two Truck Discharge

Cambria County; Elder Township

CCWA Monitoring Point: Discharge Number: 38-2L, Two Truck Discharge																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(V-Notch)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/21/2006	CCWA	1.1	5.3	405	48	3	9	2.35	0.56	0.25	95	11.4	--	0.04	0.12	0.03	0.01	0.00	1.26
10/12/2006	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11/14/2006	CCWA	42.83	6.2	244	47	20	20	1.08	0.24	0.08	57	3.1	149	10.31	10.31	0.56	0.12	0.04	29.39
12/12/2006	CCWA	3.93	5.6	309	38	4	14	2.5	1.18	0.21	105	10	189	0.19	0.66	0.12	0.06	0.01	4.97
1/19/2007	CCWA	142.05	4.9	195	22	12	5	0.72	0.83	0.09	65	2.5	100	20.52	8.55	1.23	1.42	0.15	111.15
2/12/2007	CCWA	9.11	5.2	375	20	12	7	4.31	1.49	0.29	111	17	227	1.32	0.77	0.47	0.16	0.03	12.17
3/20/2007	CCWA	96.62	5.3	260	33	13	6	0.45	0.72	0.07	67	2.5	142	15.12	6.98	0.52	0.84	0.08	77.93
4/24/2007	CCWA	51.55	5.1	298	58	11	6	1.03	0.93	0.1	82	2.5	183	6.83	3.72	0.64	0.58	0.06	50.89
5/24/2007	CCWA	3.93	5.3	371	65	13	7	3.23	1.26	0.24	131	5	200	0.62	0.33	0.15	0.06	0.01	6.20
6/25/2007	CCWA	0.4	4.6	430	73	28	4	4.92	1.12	0.36	134	2.5	256	0.13	0.02	0.02	0.01	0.00	0.65
7/23/2007	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
8/29/2007	CCWA	3.46	6	338	68	-4	20	2.03	0.35	0.17	82	2.5	202	-0.17	0.83	0.08	0.01	0.01	3.42
Number of sample Dates	Count	10	10	10	10	10	10	10	10	10	10	10	9	10	10	10	10	10	10
	Max	142.05	6.2	430	73	28	20	4.92	1.49	0.36	134	17	256	20.52	10.31	1.23	1.42	0.15	111.15
	Min	0.4	4.6	195	20	-4	4	0.45	0.24	0.07	57	2.5	100	-0.17	0.02	0.02	0.01	0.00	0.65
12	Average	35.50	5.35	322.50	47.20	11.20	9.80	2.26	0.87	0.19	92.90	5.90	183.11	5.49	3.23	0.38	0.33	0.04	29.80

Table 38. Water Quality data for 38-2L discharge.

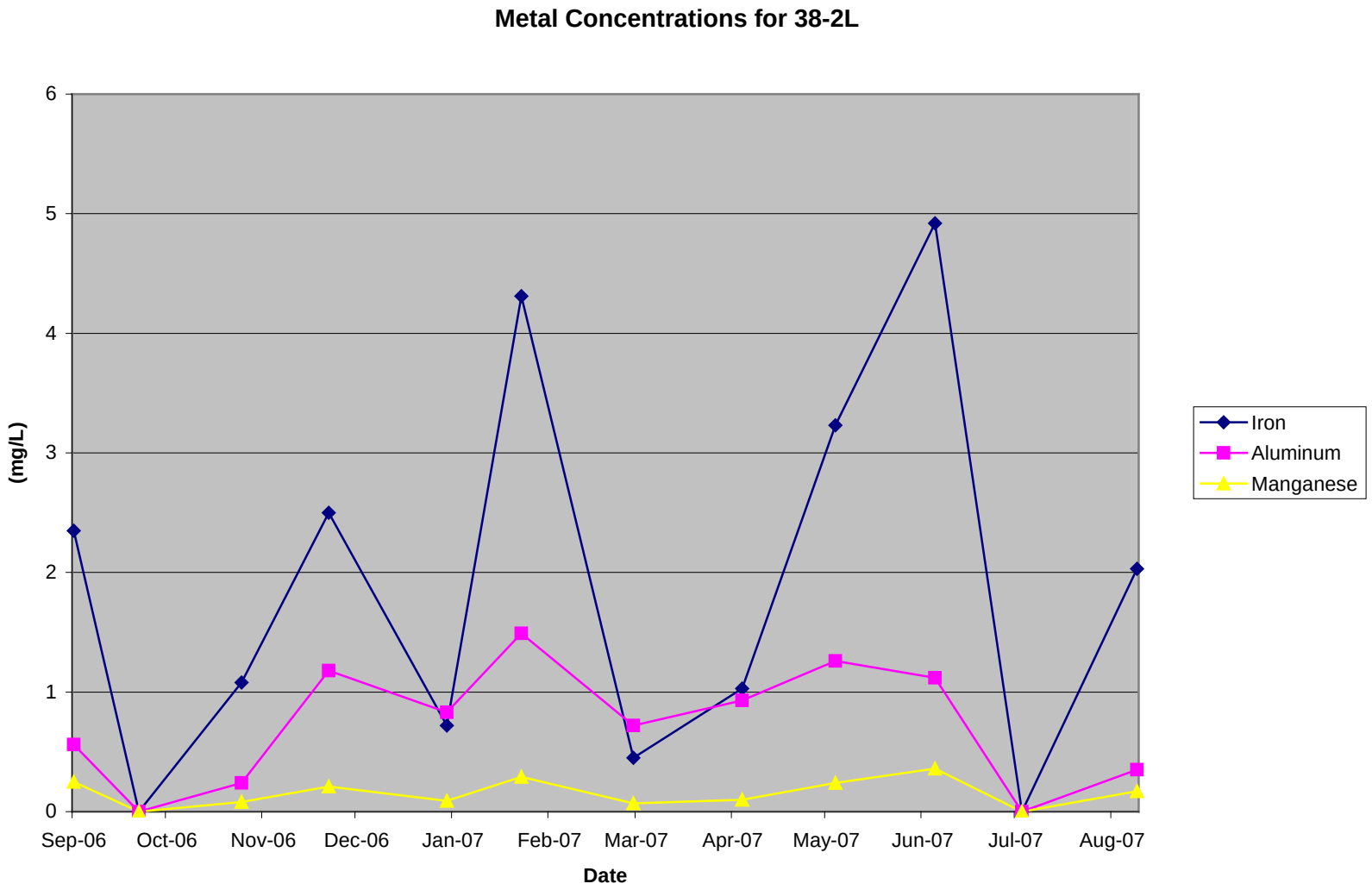


Chart 4. Metal concentrations for 38-2L discharge.

48-1L – King's Run Mine Discharge

This discharge is located in the King's Run watershed just outside the Borough of Westover in Clearfield County. This discharge emanates from a pond near the old mine building foundations. The discharge averages 200.42 mg/l of alkalinity and 0.61 mg/l of iron.

Discharge Number 48-1L, King's Run Mine

Clearfield County; Burnside Township

CCWA Monitoring Point: Discharge Number 48-1L, King's Run Mine																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Rect.)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/27/2006	CCWA	24.75	7.7	426	56	-192	210	0.67	0.025	0.13	2.5	3.1	240	-57.21	62.57	0.20	0.01	0.04	0.74
10/16/2006	CCWA	24.75	7.4	430	40	-182	195	0.54	0.025	0.1	2.5	3.1	244	-54.23	58.10	0.16	0.01	0.03	0.74
11/15/2006	CCWA	30.2	7.5	419	51	-171	196	0.56	0.025	0.13	2.5	10	234	-62.17	71.26	0.20	0.01	0.05	0.91
12/15/2006	CCWA	30.2	7.6	432	43	-171	214	0.71	0.025	0.13	2.5	3.1	237	-62.17	77.80	0.26	0.01	0.05	0.91
1/24/2007	CCWA	30.2	7.5	445	24	-188	202	0.82	0.025	0.12	2.5	2.5	251	-68.35	73.44	0.30	0.01	0.04	0.91
2/16/2007	CCWA	24.75	7.5	443	12	-189	203	0.62	0.025	0.12	2.5	2.5	245	-56.31	60.48	0.18	0.01	0.04	0.74
3/21/2007	CCWA	30.2	7.6	415	36	-1	181	0.36	0.025	0.15	2.5	2.5	231	-0.36	65.80	0.13	0.01	0.05	0.91
4/26/2007	CCWA	30.2	7.4	431	42	-181	196	0.6	0.025	0.15	2.5	2.5	238	-65.80	71.26	0.22	0.01	0.05	0.91
5/25/2007	CCWA	24.75	7.4	444	69	-186	198	0.67	0.025	0.12	2.5	2.5	257	-55.42	58.99	0.20	0.01	0.04	0.74
6/28/2007	CCWA	22.16	7.4	454	70	-183	198	0.66	0.06	0.1	2.5	2.5	246	-48.82	52.82	0.18	0.02	0.03	0.67
7/25/2007	CCWA	19.67	7.5	453	68	-190	205	0.58	0.025	0.1	2.5	2.5	249	-44.99	48.54	0.14	0.01	0.02	0.59
8/31/2007	CCWA	19.67	7.5	421	68	-187	207	0.57	0.05	0.1	2.5	2.5	233	-44.28	49.02	0.13	0.01	0.02	0.59
Number of sample Dates	Count	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
	Max	30.2	7.7	454	70	-1	214	0.82	0.06	0.15	2.5	10	257	-0.36	77.80	0.30	0.02	0.05	0.91
	Min	19.67	7.4	415	12	-192	181	0.36	0.025	0.1	2.5	2.5	231	-68.35	48.54	0.13	0.01	0.02	0.59
12	Average	25.96	7.50	434.42	48.25	-168.42	200.42	0.61	0.03	0.12	2.50	3.28	242.08	-51.68	62.51	0.19	0.01	0.04	0.78

Table 39. Water Quality data for 48-1L discharge.

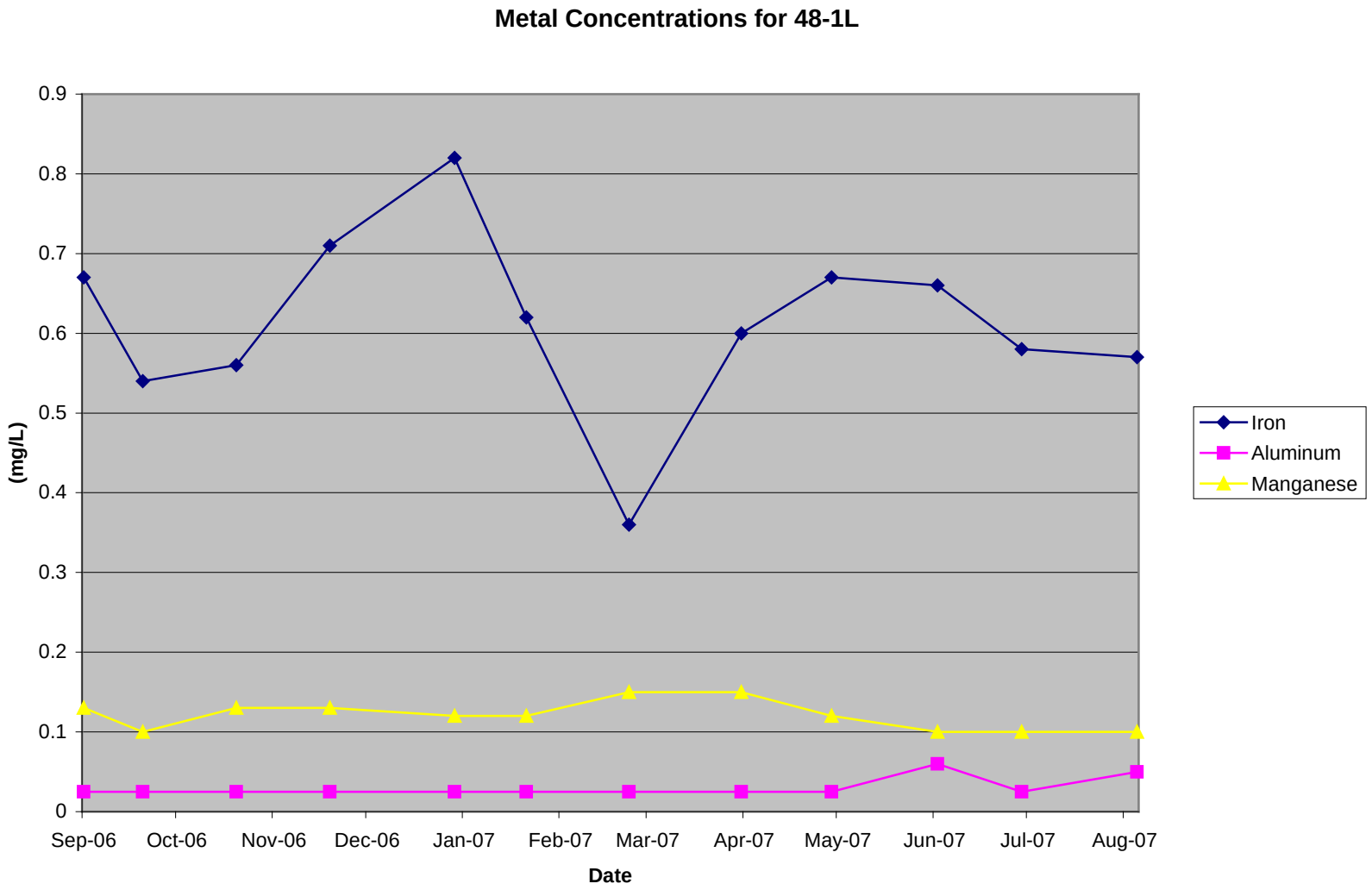


Chart 5. Metal concentrations for 48-1L discharge.

48-1R – King's Run Pipe Discharge

This discharge point is located in the King's Run watershed and is the first discharge on the right hand side of the stream facing upstream, emanating from the toe of and old strip job. The discharge averages 310.36 mg/l of acidity, 10.61 mg/l of total iron, 40.87 mg/l of total aluminum, and 10.37 mg/l of total manganese, with an average flow of 26.30 GPM.

Discharge Number: 48-1R, King's Run Pipe
Clearfield County; Burnside Township

CCWA Monitoring Point: Discharge Number: 48-1R, King's Run Pipe																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Bucket)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/27/2006	CCWA	2.38	3	1320	56	256	0	7.83	35.4	10.3	569	3.1	859	7.33	0.00	0.22	1.01	0.30	16.30
10/16/2006	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11/15/2006	CCWA	27.81	3	1260	52	236	0	3.9	26.6	8.06	512	10	803	79.01	0.00	1.31	8.91	2.70	171.41
12/15/2006	CCWA	15.21	3	1380	45	301	0	6.71	49.5	12.9	601	3.1	920	55.11	0.00	1.23	9.06	2.36	110.05
1/24/2007	CCWA	40.93	2.9	1750	25	389	0	9.89	59.3	13.3	701	2.5	1101	191.67	0.00	4.87	29.22	6.55	345.40
2/16/2007	CCWA	10.36	2.9	1540	12	345	0	7.21	51.7	10.7	664	2.5	1018	43.03	0.00	0.90	6.45	1.33	82.81
3/21/2007	CCWA	118.42	3	1520	37	340	0	9.17	43.1	9.61	643	2.5	938	484.70	0.00	13.07	61.44	13.70	916.65
4/26/2007	CCWA	54.28	2.9	1390	44	354	0	9.59	42.1	10.6	634	2.5	987	231.32	0.00	6.27	27.51	6.93	414.28
5/25/2007	CCWA	13.13	2.9	1440	71	346	0	9.02	48.2	10.7	603	2.5	1016	54.69	0.00	1.43	7.62	1.69	95.31
6/28/2007	CCWA	2.25	2.9	1420	72	294	0	23.7	29.8	8.89	612	2.5	1036	7.96	0.00	0.64	0.81	0.24	16.58
7/25/2007	CCWA	0.81	2.9	1530	70	278	0	17.5	32.2	9.99	620	2.5	936	2.71	0.00	0.17	0.31	0.10	6.05
8/31/2007	CCWA	3.69	3	1350	68	275	0	12.2	31.7	9.02	616	2.5	966	12.22	0.00	0.54	1.41	0.40	27.36
Number of sample Dates	Count	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
	Max	118.42	3	1750	72	389	0	23.7	59.3	13.3	701	10	1101	484.70	0.00	13.07	61.44	13.70	916.65
	Min	0.81	2.9	1260	12	236	0	3.9	26.6	8.06	512	2.5	803	2.71	0.00	0.17	0.31	0.10	6.05
12	Average	26.30	2.95	1445.45	50.18	310.36	0.00	10.61	40.87	10.37	615.91	3.29	961.82	106.34	0.00	2.79	13.98	3.30	200.20

Table 40. Water Quality data for 48-1L discharge.

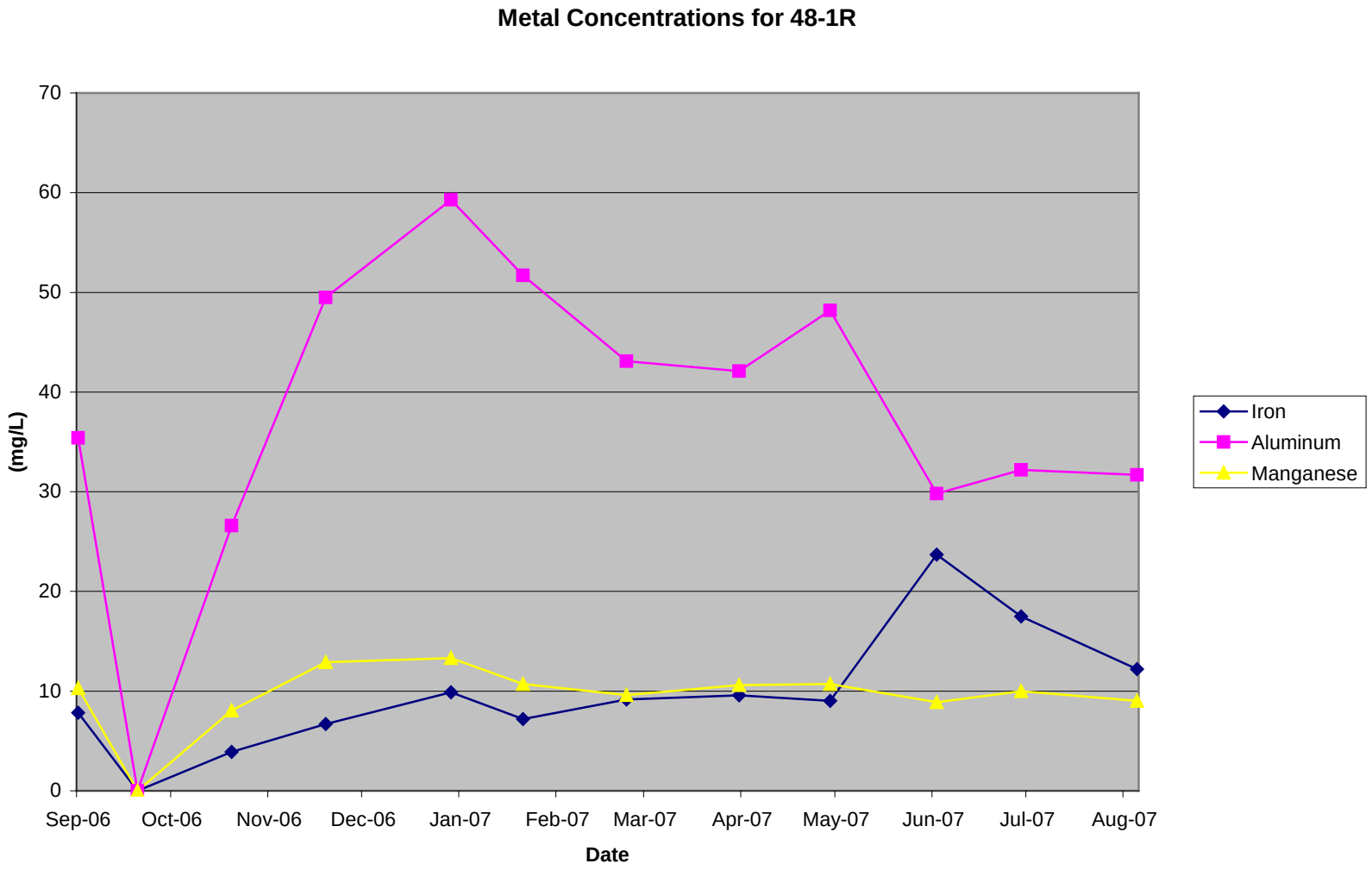


Chart 6. Metal concentrations for 48-1R discharge.

50-1R North Camp #1 Discharge

This discharge point is located in the North Camp Run watershed, located in Chest Township Clearfield County. 50-1R is the first discharge looking upstream on the right, just off of North Camp road. It comes from a seep along the road and is eventually piped under the road to a natural wetland before entering North Camp Run. The discharge averages 101.42 mg/l of alkalinity and 5.09 mg/l of iron.

Discharge Number: 50-1R, North Camp #1

Clearfield County; Chest Township

CCWA Monitoring Point: Discharge Number: 50-1R, North Camp #1																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Bucket)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/27/2006	CCWA	10.42	7.4	940	62	-120	138	8.25	0.025	2.21	378	15.7	700	-15.05	17.31	1.03	0.00	0.28	47.42
10/18/2006	CCWA	19.15	6.7	132	52	-12	26	0.27	0.16	0.05	25	8.6	77	-2.77	5.99	0.06	0.04	0.01	5.76
11/15/2006	CCWA	12.9	6.6	902	52	-96	119	7.97	0.025	2.03	332	11.4	662	-14.91	18.48	1.24	0.00	0.32	51.56
12/15/2006	CCWA	11.92	7	831	46	-92	110	6.3	0.025	1.79	319	3.1	581	-13.20	15.78	0.90	0.00	0.26	45.78
1/23/2007	CCWA	19.21	6.9	704	20	-76	89	5.02	0.05	1.44	272	10	450	-17.58	20.58	1.16	0.01	0.33	62.90
2/15/2007	CCWA	18.51	6.9	789	8	-81	96	4.59	0.05	1.29	291	10	549	-18.05	21.39	1.02	0.01	0.29	64.84
3/22/2007	CCWA	21.01	6.9	568	43	-49	65	2.04	0.08	0.86	199	7	366	-12.39	16.44	0.52	0.02	0.22	50.33
4/26/2007	CCWA	20.04	6.9	603	44	-56	72	2.53	0.08	0.93	220	2.5	390	-13.51	17.37	0.61	0.02	0.22	53.07
5/29/2007	CCWA	11.08	6.9	997	62	-110	128	5.39	0.025	1.82	360	14	723	-14.67	17.07	0.72	0.00	0.24	48.02
6/26/2007	CCWA	8.44	7	1020	78	-106	127	9.16	0.025	2.1	400	2.5	578	-10.77	12.90	0.93	0.00	0.21	40.64
7/24/2007	CCWA	7.95	7	1090	--	-100	123	5.31	0.025	1.8	393	11	740	-9.57	11.77	0.51	0.00	0.17	37.61
8/29/2007	CCWA	8.39	7	1000	75	-104	124	4.28	0.025	1.81	375	5	716	-10.50	12.52	0.43	0.00	0.18	37.88
Number of sample Dates	Count	12	12	12	11	12	12	12	12	12	12	12	12	12	12	12	12	12	12
	Max	21.01	7.4	1090	78	-12	138	9.16	0.16	2.21	400	15.7	740	-2.77	21.39	1.24	0.04	0.33	64.84
	Min	7.95	6.6	132	8	-120	26	0.27	0.025	0.05	25	2.5	77	-18.05	5.99	0.06	0.00	0.01	5.76
12	Average	14.09	6.93	798.00	49.27	-83.50	101.42	5.09	0.05	1.51	297.00	8.40	544.33	-12.75	15.64	0.76	0.01	0.23	45.48

Table 41. Water Quality data for 50-1R discharge.

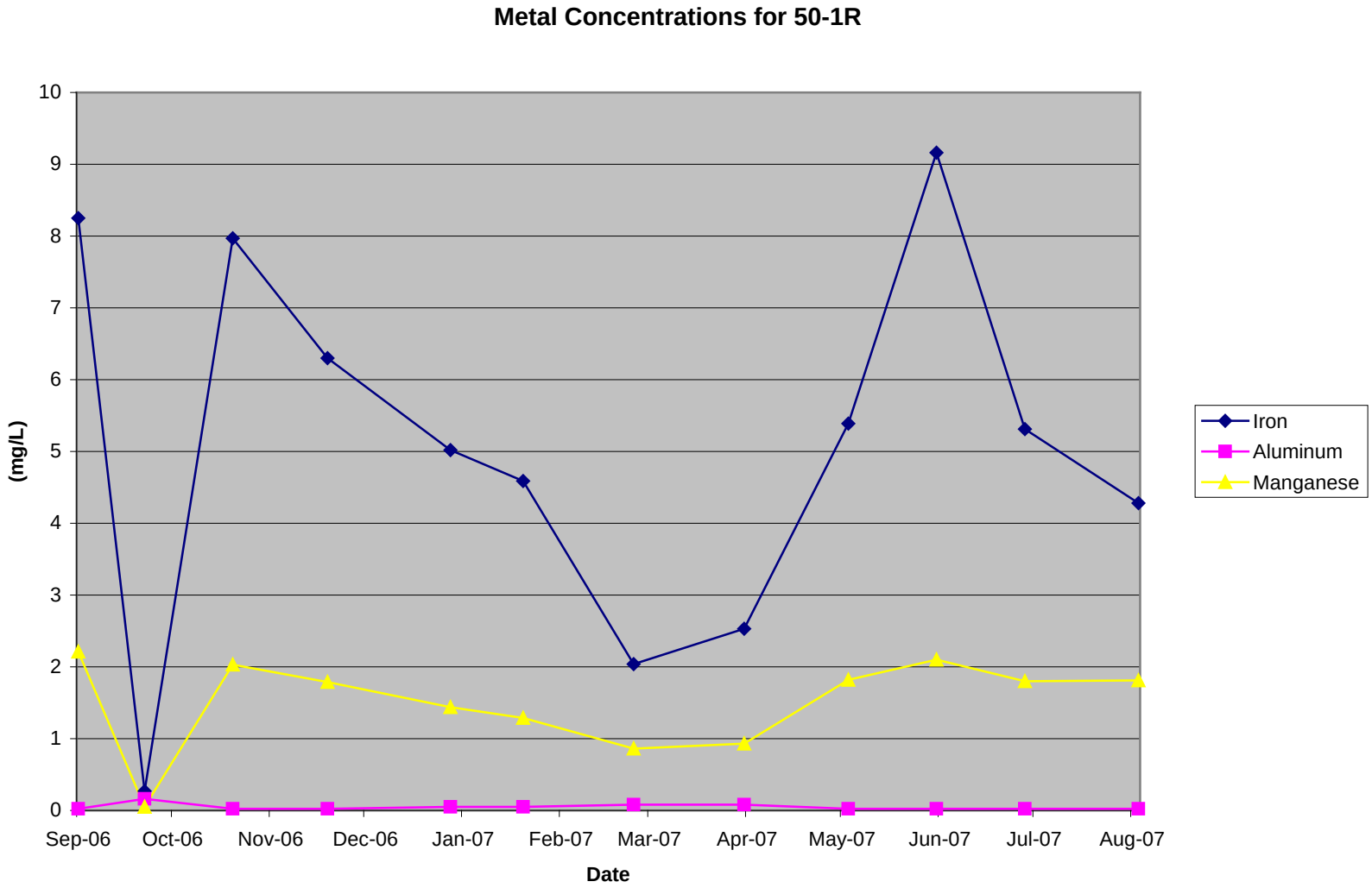


Chart 7. Metal concentrations for 50-1R discharge.

50-2R North Camp #2 Discharge

This discharge point is located in the North Camp Run watershed, located in Chest Township Clearfield County. 50-2R is the second discharge looking upstream on the right hand side. It is located across from the Compass Coal entrance on North Camp road, about 30 yards in the woods. It emanates from an old deep mine opening. This discharge averages 75.50 mg/l of alkalinity and 19.65 mg/l of iron.

Discharge Number: 50-2R, North Camp #2

Clearfield County; Chest Township

CCWA Monitoring Point: Discharge Number: 50-2R, North Camp #2																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Rect.)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/27/2006	CCWA	14.34	6.6	1620	62	-30	78	24.6	0.025	10.4	892	3.1	1359	-5.18	13.47	4.25	0.00	1.80	153.99
10/18/2006	CCWA	15.7	6.3	1620	52	-26	84	21.6	0.025	9.36	889	14.3	1371	-4.91	15.88	4.08	0.00	1.77	168.02
11/15/2006	CCWA	14.34	6.3	1690	52	-27	81	24.9	0.025	10.4	903	12.9	1379	-4.66	13.98	4.30	0.00	1.80	155.89
12/18/2006	CCWA	18.54	6.4	1630	53	-20	79	25.2	0.05	9.44	861	12.9	1333	-4.46	17.63	5.62	0.01	2.11	192.17
1/23/2007	CCWA	40.38	6.4	1480	22	-33	70	17.3	0.025	6.94	747	16	1186	-16.04	34.03	8.41	0.01	3.37	363.12
2/13/2007	CCWA	20.01	6.4	1480	22	-27	78	26	0.025	9.37	758	19	1237	-6.50	18.79	6.26	0.01	2.26	182.59
3/22/2007	CCWA	40.38	6.5	1310	45	-32	63	10.3	0.05	4.04	660	2.5	1047	-15.56	30.62	5.01	0.02	1.96	320.83
4/26/2007	CCWA	48.13	6.6	1190	43	-40	66	9.82	0.05	3.42	550	6	906	-23.18	38.24	5.69	0.03	1.98	318.67
5/25/2007	CCWA	26.28	6.4	1340	72	-35	70	17.2	0.06	4.99	598	6	1048	-11.07	22.15	5.44	0.02	1.58	189.19
6/27/2007	CCWA	26.28	6.3	1390	78	-27	70	19.2	0.07	5.98	714	9	1147	-8.54	22.15	6.07	0.02	1.89	225.89
7/24/2007	CCWA	14.34	6.4	1480	65	-29	82	18.9	0.06	6.57	786	7	1220	-5.01	14.16	3.26	0.01	1.13	135.69
8/30/2007	CCWA	14.34	6.4	1500	78	-33	85	20.8	0.05	8.01	821	2.5	1279	-5.70	14.67	3.59	0.01	1.38	141.73
Number of sample Dates	Count	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
	Max	48.13	6.6	1690	78	-20	85	26	0.07	10.4	903	19	1379	-4.46	38.24	8.41	0.03	3.37	363.12
	Min	14.34	6.3	1190	22	-40	63	9.82	0.025	3.42	550	2.5	906	-23.18	13.47	3.26	0.00	1.13	135.69
12	Average	24.42	6.42	1477.50	53.67	-29.92	75.50	19.65	0.04	7.41	764.92	9.27	1209.33	-9.23	21.31	5.17	0.01	1.92	212.32

Table 42. Water Quality data for 50-2R discharge.

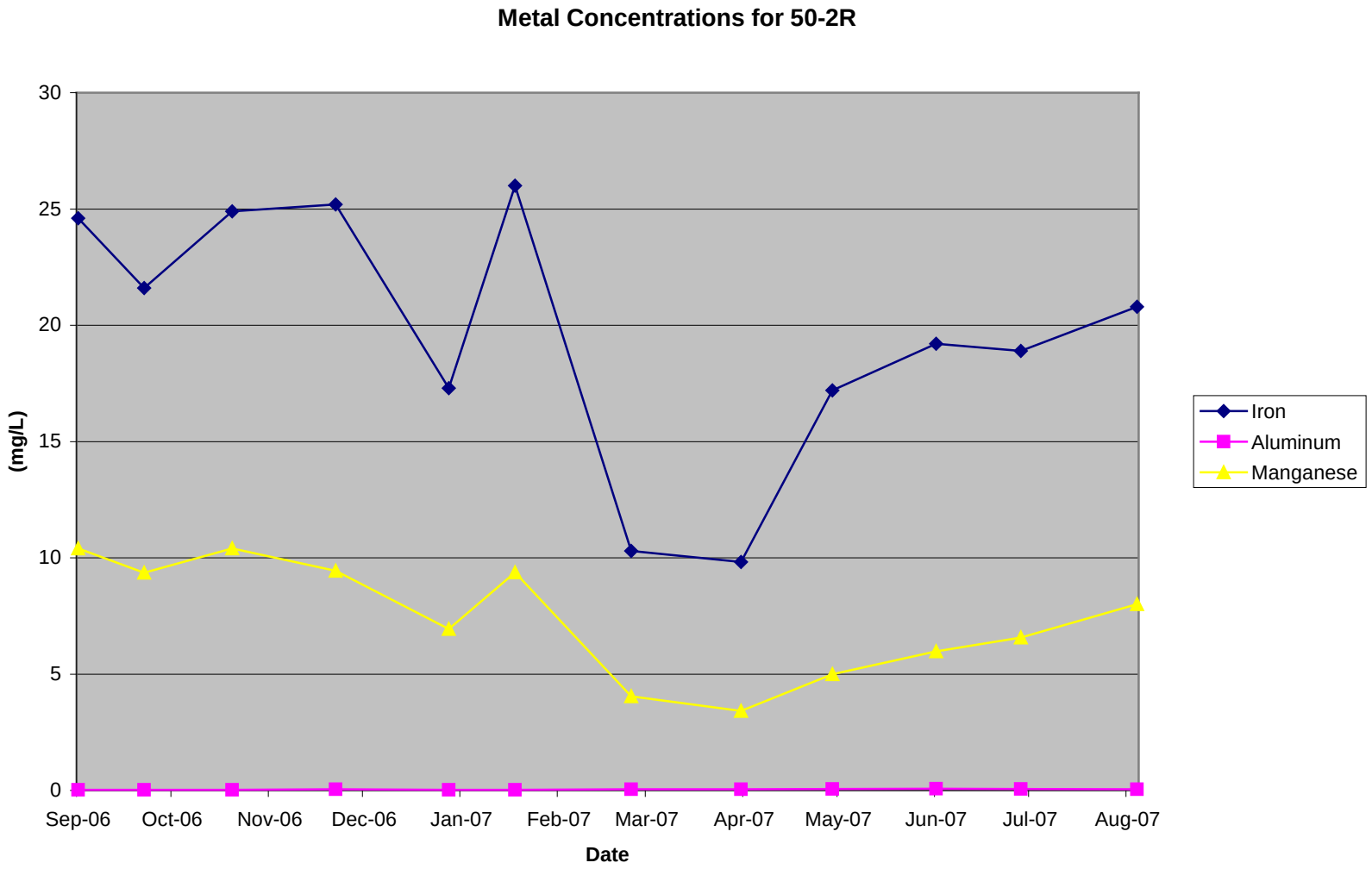


Chart 8. Metal concentrations for 50-2R discharge.

50-3R North Camp #3 Discharge

This discharge point is located in the North Camp Run watershed, located in Chest Township Clearfield County. 50-3R is the third discharge looking upstream on the right hand side. This discharge is located across from the Compass Coal entrance off of North Camp road directly on the side of the road. It eventually mixes with 50-2R before going under the road to a wetland. This discharge averages 103.25 mg/l of alkalinity and 21.00 mg/l of iron.

Discharge Number: 50-3R, Northcamp #3

Clearfield County; Chest Township

CCWA Monitoring Point: Discharge Number 50-3R, Northcamp #3																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(V-Notch)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/27/2006	CCWA	2.25	6.4	1800	66	-48	106	22.7	0.025	11.8	994	3.1	1570	-1.30	2.87	0.61	0.00	0.32	26.92
10/18/2006	CCWA	1.1	6.2	1550	52	-41	97	17	0.025	9.95	803	11.4	1267	-0.54	1.28	0.23	0.00	0.13	10.63
11/15/2006	CCWA	12.72	6	1890	52	-24	105	30.7	0.025	14	1016	3.1	1546	-3.68	16.08	4.70	0.00	2.14	155.58
12/18/2006	CCWA	28.21	6.1	1790	53	-22	99	35.1	0.025	14.9	950	3.1	1464	-7.47	33.62	11.92	0.01	5.06	322.62
1/23/2007	CCWA	83.76	6	1600	20	-43	107	23.1	0.025	10.4	811	6	1331	-43.36	107.89	23.29	0.03	10.49	817.76
2/13/2007	CCWA	51.55	6	1480	21	-33	101	30.7	0.025	13.7	798	11	1331	-20.48	62.68	19.05	0.02	8.50	495.22
3/22/2007	CCWA	125.74	6.1	1430	47	-55	102	15.9	0.025	8.11	663	5	1139	-83.25	154.40	24.07	0.04	12.28	1003.59
4/26/2007	CCWA	110.6	6.2	1230	43	-74	102	8.04	0.025	5.22	512	2.5	927	-98.53	135.81	10.70	0.03	6.95	681.70
5/25/2007	CCWA	69.2	6	1390	74	-74	108	12.3	0.025	7.37	579	2.5	1390	-61.65	89.97	10.25	0.02	6.14	482.34
6/27/2007	CCWA	42.83	6	1460	84	-56	97	14	0.025	7.55	728	2.5	1167	-28.87	50.01	7.22	0.01	3.89	375.36
7/24/2007	CCWA	25.11	6	1490	66	-47	103	18.8	0.025	8.96	823	6	1327	-14.21	31.14	5.68	0.01	2.71	248.78
8/30/2007	CCWA	17.08	6.1	1640	82	-51	112	23.7	0.025	11.9	877	2.5	1393	-10.49	23.03	4.87	0.01	2.45	180.33
Number of sample Dates	Count	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
	Max	125.74	6.4	1890	84	-22	112	35.1	0.025	14.9	1016	11.4	1570	-0.54	154.40	24.07	0.04	12.28	1003.59
	Min	1.1	6	1230	20	-74	97	8.04	0.025	5.22	512	2.5	927	-98.53	1.28	0.23	0.00	0.13	10.63
12	Average	47.51	6.09	1562.50	55.00	-47.33	103.25	21.00	0.03	10.32	796.17	4.89	1321.00	-31.15	59.06	10.22	0.01	5.09	400.07

Table 43. Water Quality data for 50-3R discharge.

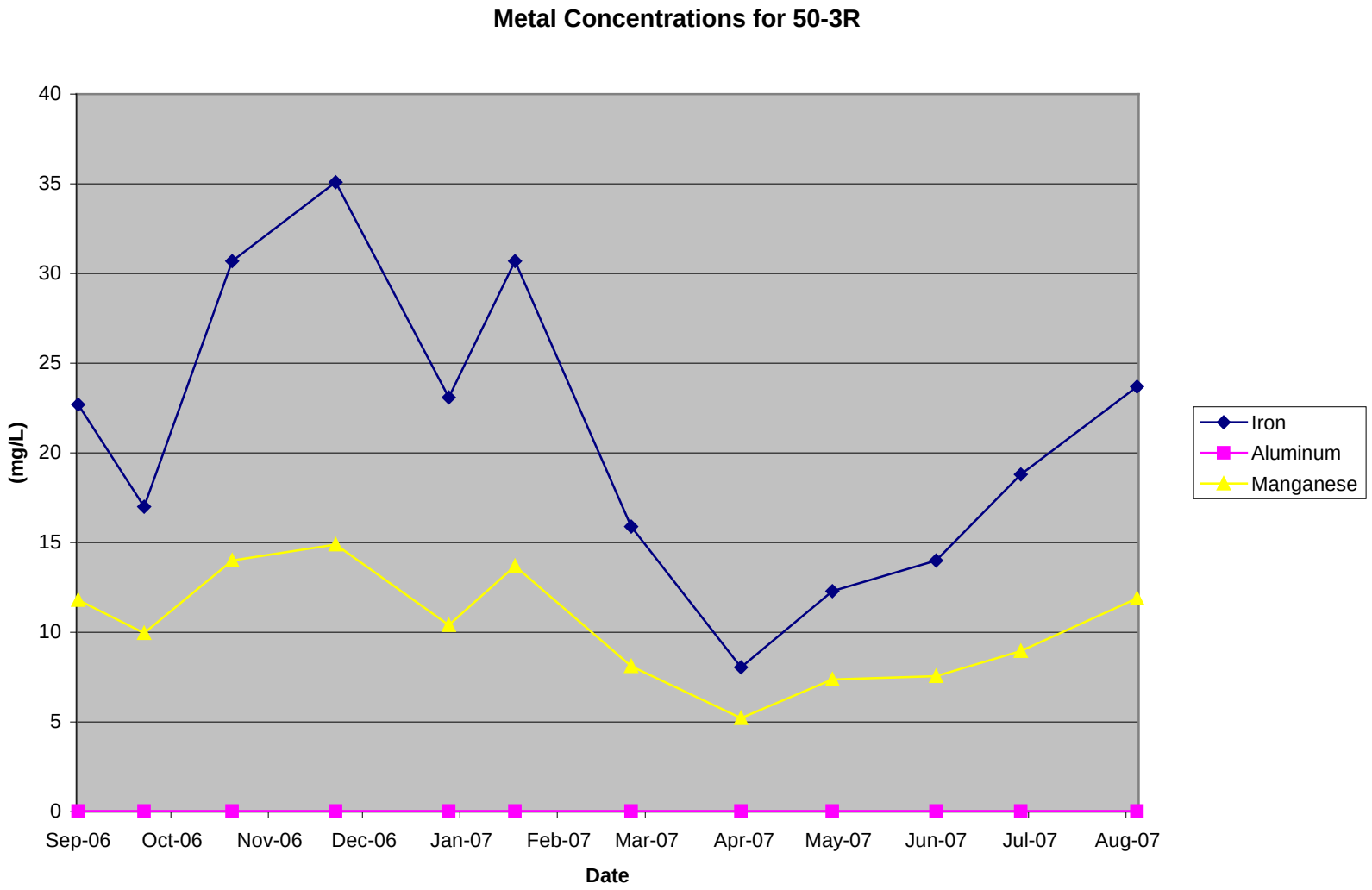


Chart 9. Metal concentrations for 50-3R discharge.

50-4R North Camp #4 Discharge

This discharge point is located in the North Camp Run watershed, located in Chest Township Clearfield County. 50-4R is the fourth discharge looking upstream on the right hand side. It is located behind the Compass Coal facility on the other side of North Camp road. It emanates from an old backfill pile, then through a pipe and down the hill into North Camp Run. The discharge averages 194.8 mg/l of alkalinity and 1.77 mg/l of iron.

Discharge Number 50-4R, North Camp #4

Clearfield County; Chest Township

CCWA Monitoring Point: Discharge Number 50-4R, North Camp #4																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(V-Notch)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/27/2006	CCWA	1.1	6.9	1570	66	-186	210	2.25	0.025	6.78	737	3.1	1270	-2.46	2.78	0.03	0.00	0.09	9.76
10/18/2006	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11/15/2006	CCWA	6.2	6.7	1580	52	-171	209	2.86	0.025	5.38	714	3.1	1223	-12.76	15.60	0.21	0.00	0.40	53.29
12/15/2006	CCWA	17.08	6.8	1620	46	-197	216	1.13	0.025	3.71	770	3.1	1311	-40.51	44.41	0.23	0.01	0.76	158.32
1/24/2007	CCWA	77.73	6.7	1570	24	-194	211	0.38	0.025	1.95	656	2.5	1197	-181.53	197.44	0.36	0.02	1.82	613.85
2/15/2007	CCWA	17.08	6.6	1630	8	-180	196	0.59	0.05	1.5	786	9	1365	-37.01	40.30	0.12	0.01	0.31	161.61
3/22/2007	CCWA	159.57	6.7	1470	47	-180	195	0.26	0.025	1.95	648	2.5	1185	-345.77	374.59	0.50	0.05	3.75	1244.79
4/27/2007	CCWA	83.76	6.6	1400	52	-168	182	0.55	0.025	2.73	657	2.5	1216	-169.40	183.52	0.55	0.03	2.75	662.48
5/25/2007	CCWA	35.06	6.6	1860	75	-156	174	1.08	0.025	5.13	810	5	1481	-65.84	73.44	0.46	0.01	2.17	341.87
6/27/2007	CCWA	6.2	6.5	1890	86	-153	179	3.16	0.025	7.71	979	2.5	1671	-11.42	13.36	0.24	0.00	0.58	73.07
7/24/2007	CCWA	4.99	6.4	1850	63	-139	176	5.46	0.025	10.1	965	2.5	1603	-8.35	10.57	0.33	0.00	0.61	57.97
8/30/2007	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Number of sample Dates	Count	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Max	159.57	6.9	1890	86	-139	216	5.46	0.05	10.1	979	9	1671	-2.46	374.59	0.55	0.05	3.75	1244.79
	Min	1.1	6.4	1400	8	-197	174	0.26	0.025	1.5	648	2.5	1185	-345.77	2.78	0.03	0.00	0.09	9.76
12	Average	40.88	6.65	1644.00	51.90	-172.40	194.80	1.77	0.03	4.69	772.20	3.58	1352.20	-87.51	95.60	0.30	0.01	1.32	337.70

Table 44. Water Quality data for 50-4R discharge.

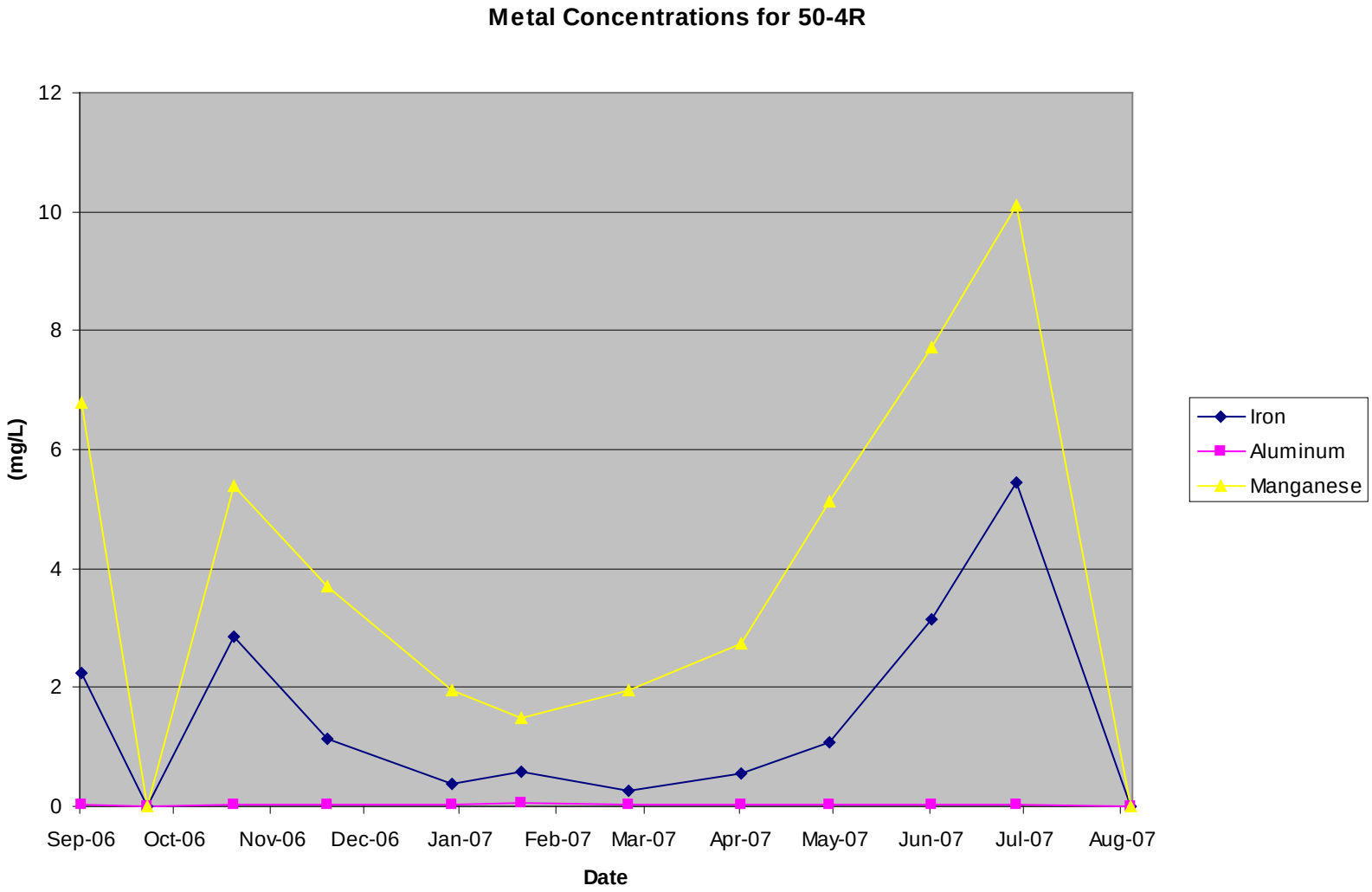


Chart 10. Metal concentrations for 50-4R discharge.

57-2L Wilson Run #2 Discharge

This discharge is located in the Wilson Run watershed, in Ferguson Township Clearfield County. 57-2L is located off of Thompsontown road right above the old ball field. The discharge emanates from an old deep mine opening. The discharge averages 84.42 mg/l of alkalinity and 5.60 mg/l of iron.

Discharge Number 57-2L, Wilson Run #2

Clearfield County; Ferguson Township

CCWA Monitoring Point: Discharge Number 57-2L, Wilson Run #2																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(V-Notch)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/28/2006	CCWA	80.71	7.2	393	60	-94	112	8.01	0.025	0.3	76	7.1	230	-91.33	108.82	7.78	0.02	0.29	73.84
10/23/2006	CCWA	61.25	6.7	306	42	-87	106	5.49	0.025	0.26	71	<6.2	220	-64.15	78.16	4.05	0.02	0.19	52.35
11/17/2006	CCWA	51.55	6.5	355	40	-46	68	9.06	0.08	0.38	93	7.1	217	-28.55	42.20	5.62	0.05	0.24	57.71
12/18/2006	CCWA	51.55	6.7	379	54	-64	83	7.11	0.025	0.37	84	<6.2	229	-39.72	51.51	4.41	0.02	0.23	52.13
1/22/2007	CCWA	83.76	6.5	288	24	-37	54	4.31	0.12	0.21	69	6	131	-37.31	54.45	4.35	0.12	0.21	69.58
2/14/2007	CCWA	25.11	6.5	364	19	-68	85	6.81	0.05	0.39	71	10	226	-20.56	25.69	2.06	0.02	0.12	21.46
3/23/2007	CCWA	51.55	6.4	303	54	-35	50	6.14	0.15	0.33	72	7	185	-21.72	31.03	3.81	0.09	0.20	44.68
4/27/2007	CCWA	96.62	6.5	316	55	-49	60	3.45	0.07	0.27	64	<5.0	175	-56.99	69.79	4.01	0.08	0.31	74.44
5/29/2007	CCWA	61.25	6.6	363	68	-78	92	3.57	0.025	0.22	68	8	219	-57.51	67.84	2.63	0.02	0.16	50.14
6/29/2007	CCWA	51.55	6.8	355	68	-81	98	4.08	0.025	0.24	61	5	221	-50.27	60.82	2.53	0.02	0.15	37.86
7/26/2007	CCWA	33.26	6.8	408	65	-83	98	4.29	0.025	0.23	63	<5.0	221	-33.23	39.24	1.72	0.01	0.09	25.23
8/31/2007	CCWA	38.83	6.8	365	68	-91	107	4.93	0.025	0.26	62	6	207	-42.54	50.02	2.30	0.01	0.12	28.98
Number of sample Dates	Count	12	12	12	12	12	12	12	12	12	12	8	12	12	12	12	12	12	12
	Max	96.62	7.2	408	68	-35	112	9.06	0.15	0.39	93	10	230	-20.56	108.82	7.78	0.12	0.31	74.44
	Min	25.11	6.4	288	19	-94	50	3.45	0.025	0.21	61	5	131	-91.33	25.69	1.72	0.01	0.09	21.46
12	Average	57.25	6.67	349.58	51.42	-67.75	84.42	5.60	0.05	0.29	71.17	7.03	206.75	-45.32	56.63	3.77	0.04	0.19	49.03

Table 45. Water Quality data for 57-2L discharge.

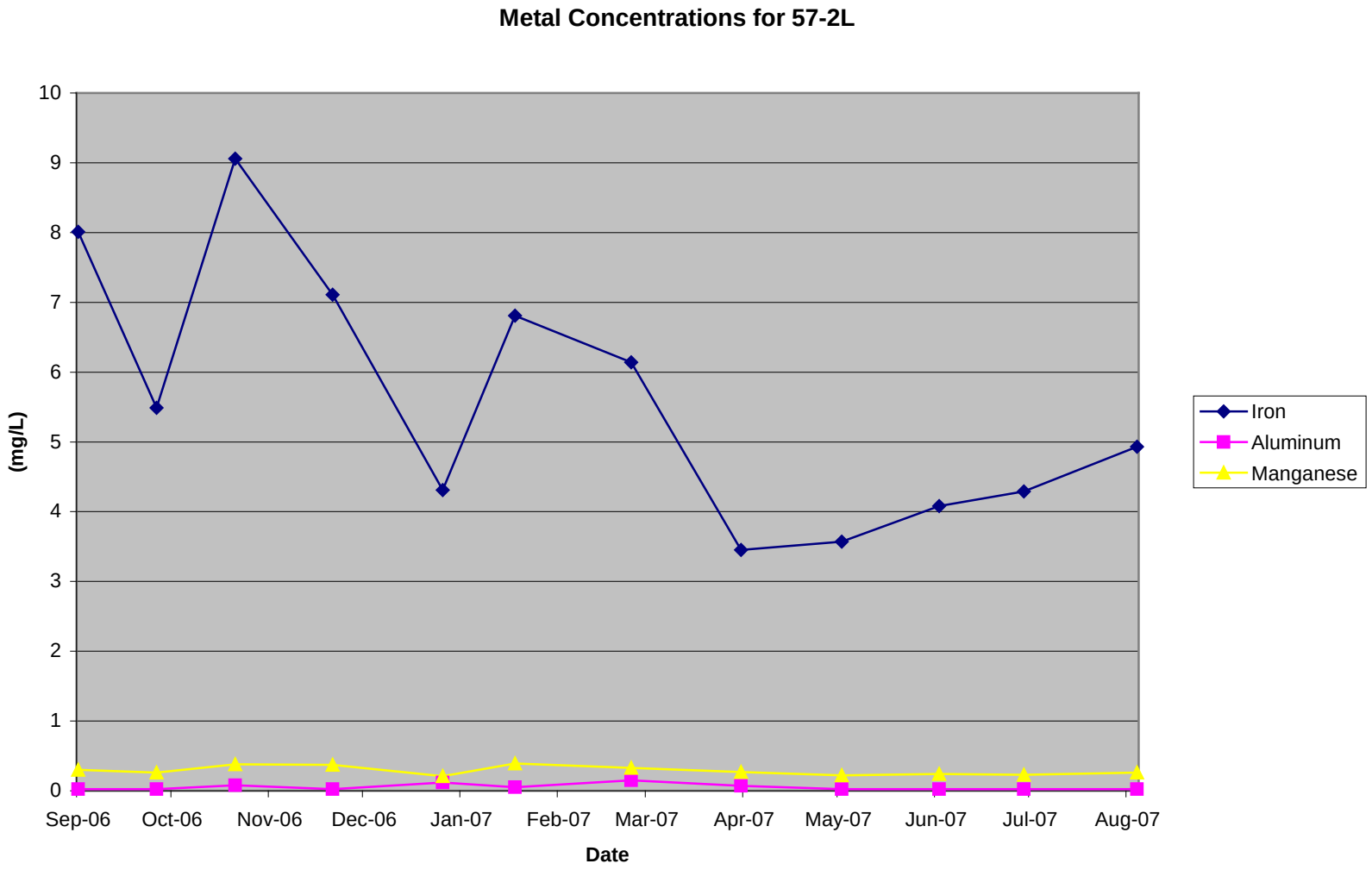


Chart 11. Metal concentrations for 57-2L discharge.

57-3L Wilson Run #3 Discharge

This discharge is located in the Wilson Run watershed, in Ferguson Township Clearfield County. 57-3L is located just below 57-2L right next to Wilson Run. This discharge averages 93.25 mg/l of alkalinity and 2.86 mg/l of iron.

Discharge Number 57-3L, Wilson Run #3
Clearfield County; Ferguson Township

CCWA Monitoring Point: Discharge Number 57-3L, Wilson Run #3																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(V-Notch)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/28/2006	CCWA	22.23	7.2	315	60	-96	114	3.64	0.025	0.3	40	3.1	174	-25.69	30.51	0.97	0.01	0.08	10.70
10/23/2006	CCWA	22.23	6.9	385	42	-82	94	2.66	0.025	0.26	37	3.1	177	-21.94	25.16	0.71	0.01	0.07	9.90
11/17/2006	CCWA	22.23	6.8	283	40	-69	88	2.09	0.06	0.26	39	3.1	164	-18.47	23.55	0.56	0.02	0.07	10.44
12/18/2006	CCWA	19.55	7	308	54	-71	93	3.46	0.025	0.31	38	3.1	176	-16.71	21.89	0.81	0.01	0.07	8.94
1/22/2007	CCWA	22.23	7	280	25	-77	88	2.01	0.025	0.24	30	2.5	122	-20.61	23.55	0.54	0.01	0.06	8.03
2/14/2007	CCWA	9.11	6.8	300	19	-80	93	3.92	0.025	0.38	33	5	181	-8.77	10.20	0.43	0.00	0.04	3.62
3/23/2007	CCWA	12.72	6.9	274	54	-67	82	3.18	0.025	0.24	32	5	161	-10.26	12.56	0.49	0.00	0.04	4.90
4/27/2007	CCWA	22.23	6.9	291	56	-71	86	2.79	0.025	0.28	31	2.5	149	-19.00	23.01	0.75	0.01	0.07	8.30
5/29/2007	CCWA	12.24	6.8	313	70	-78	91	2.21	0.025	0.23	39	2.5	182	-11.49	13.41	0.33	0.00	0.03	5.75
6/29/2007	CCWA	22.23	6.9	299	67	-80	94	3.07	0.025	0.25	38	2.5	152	-21.41	25.16	0.82	0.01	0.07	10.17
7/26/2007	CCWA	22.23	6.9	353	66	-78	95	2.45	0.025	0.23	41	2.5	191	-20.87	25.42	0.66	0.01	0.06	10.97
8/31/2007	CCWA	17.08	6.8	309	68	-87	101	2.84	0.025	0.27	39	7	170	-17.89	20.77	0.58	0.01	0.06	8.02
Number of sample Dates	Count	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
	Max	22.23	7.2	385	70	-67	114	3.92	0.06	0.38	41	7	191	-8.77	30.51	0.97	0.02	0.08	10.97
	Min	9.11	6.8	274	19	-96	82	2.01	0.025	0.23	30	2.5	122	-25.69	10.20	0.33	0.00	0.03	3.62
12	Average	18.86	6.91	309.17	51.75	-78.00	93.25	2.86	0.03	0.27	36.42	3.49	166.58	-17.76	21.26	0.64	0.01	0.06	8.31

Table 46. Water Quality data for 57-3L discharge.

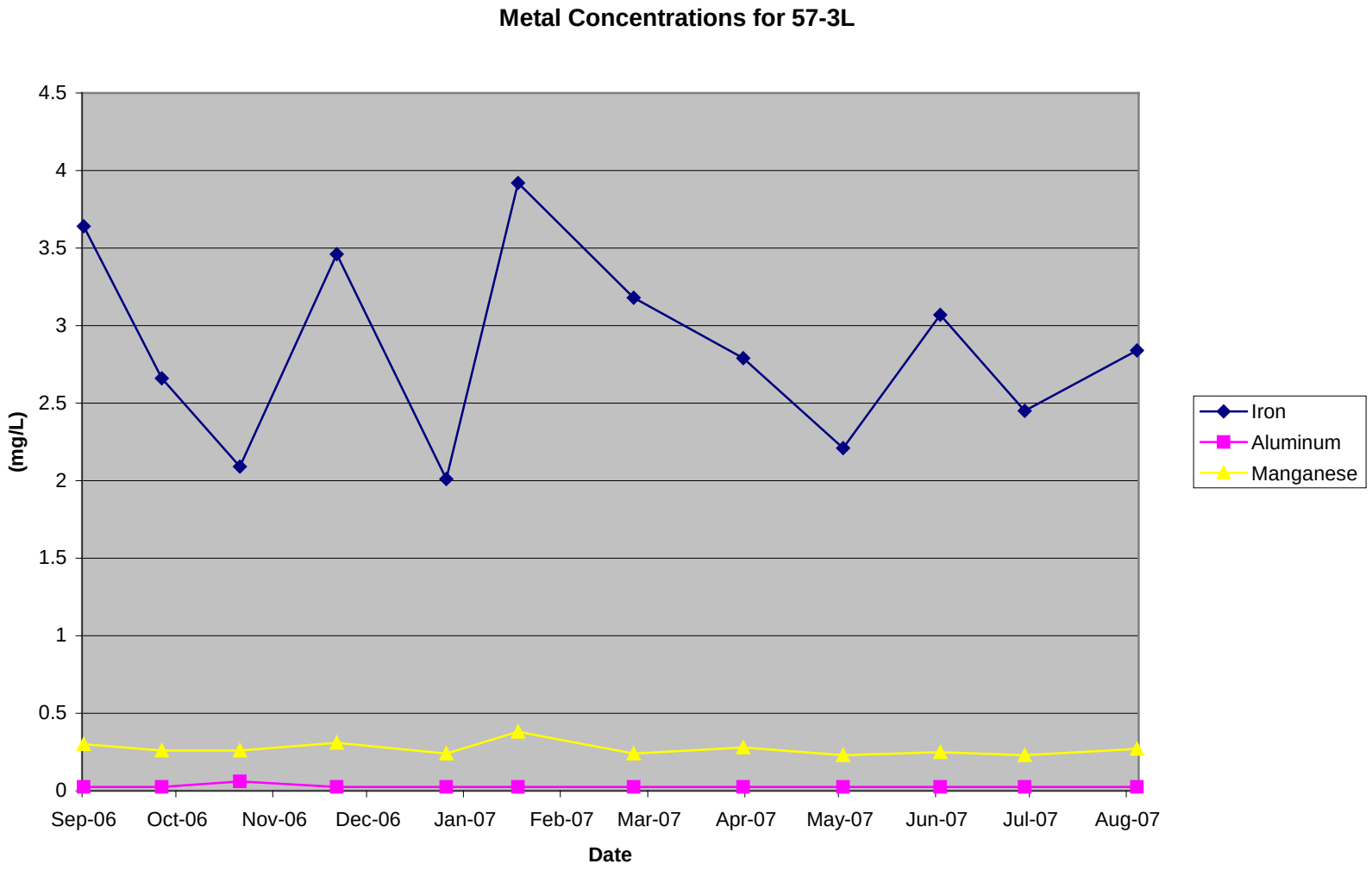


Chart 12. Metal concentration for 57-3L discharge.

Instream Sampling Points:

This section deals with eight instream sampling points. These points were analyzed for AMD parameters along with the additional nitrate and phosphate analyses for the Headwaters section and Fecal Coliform and BOD for the Lower section. Flows were not taken due to widths of the stream and depths along the flow segment, so loadings weren't calculated. Water quality data was used to determine if the mainstem of Chest Creek was being impaired by a certain stream segment or individual tributary. The following tables will show individual metal concentration rankings, alkalinity rankings, and pH rankings. Following the tables are the individual instream point water quality data sheets and graphs of metal concentrations for each point.

Chest Creek Instream Points

Instream Points Rankings for Concentrations of Iron

Chest Creek Instream Points Ranking for Iron Concentration		
Rank	**Point # / Name**	**Average mg/L**
1	CCIS-2	0.48
2	CCIS-1	0.43
3	CCIS-3	0.39
4	CCIS-6	0.29
5	CCIS-7	0.24
6	CCIS-8	0.23
7	CCIS-5	0.21
8	CCIS-4	0.17

Table 47. Average Iron concentrations for Instream Points.

Chest Creek Instream Points

Instream Points Rankings for Concentrations of Aluminum

Chest Creek Instream Points Ranking for Aluminum Concentration		
Rank	**Point # / Name**	**Average mg/L**
1	CCIS-3	0.41
2	CCIS-1	0.36
3	CCIS-5	0.31
3	CCIS-2	0.30
3	CCIS-4	0.30
3	CCIS-6	0.30
7	CCIS-7	0.24
8	CCIS-8	0.24

Table 48. Average Aluminum concentrations for Instream Points.

Chest Creek Instream Points

Instream Points Rankings for Concentrations of Manganese

Chest Creek Instream Points Ranking for Manganese Concentration		
Rank	**Point # / Name**	**Average mg/L**
1	CCIS-5	0.20
2	CCIS-1	0.17
2	CCIS-4	0.17
2	CCIS-6	0.17
3	CCIS-2	0.16
3	CCIS-7	0.15
7	CCIS-8	0.13
8	CCIS-3	0.12

Table 49. Average Manganese concentrations for Instream Points.

Chest Creek Instream Points

Instream Points Rankings for Concentrations of Alkalinity

Chest Creek Instream Points Ranking for Average Alkalinity Concentration		
Rank	**Point # / Name**	**Average mg/L**
1	CCIS-1	69.31
2	CCIS-7	52.67
2	CCIS-8	52.67
3	CCIS-6	52.00
4	CCIS-2	50.78
5	CCIS-5	50.67
7	CCIS-3	49.89
8	CCIS-4	46.89

Table 50. Average Alkalinity concentrations for Instream Points.

Instream Point Description and Location

CCIS-1

This monitoring point is located on the border of Allegheny and East Carroll townships near Bradley Junction Cambria County at the bridge on Lemon Drop Road in the Headwaters Section of the Chest Creek watershed. This instream point combines tributaries 1-9.

Chest Creek In-Stream Sample Point #1, Bradley Junction
Cambria County; Border of Allegheny and East Carroll Townships

CCWA Monitoring Point: CCIS-1

Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.	Loading					
		(None)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/12/2006	CCWA	N/A	7.78	222	60	--	50	--	--	--	--	--	158	--	--	--	--	--	--
12/6/2006	CCWA	N/A	7.5	209	38	-47	61	0.45	0.08	0.08	19	3.1	113	--	--	--	--	--	--
1/31/2007	CCWA	N/A	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	--	--	--	--	--	--
4/18/2007	CCWA	N/A	6.6	140	40	-9	24	0.43	0.24	0.04	18	6	91	--	--	--	--	--	--
7/17/2007	CCWA	N/A	7.7	290	70	-90	105	1.02	0.31	0.21	15	5	155	--	--	--	--	--	--
10/9/2007	CCWA	N/A	7.3	291	70	-82	103	0.78	0.3	0.12	16	5	161	--	--	--	--	--	--
3/6/2008	CCWA	N/A	7.5	131	30	-7	19	1.32	0.8	0.08	16	6	103	--	--	--	--	--	--
5/6/2008	CCWA	N/A	7.2	167	68	-28	46	0.64	0.22	0.1	17	5	93	--	--	--	--	--	--
6/5/2008	CCWA	N/A	7.2	159	68	-32	47	1.41	0.75	0.16	14	14	92	--	--	--	--	--	--
7/9/2008	CCWA	N/A	7.8	240	66	-61	75	1.11	0.28	0.2	15	10	131	--	--	--	--	--	--
8/5/2008	CCWA	N/A	7.3	269	64	-82	103	1.24	0.35	0.28	16	5	154	--	--	--	--	--	--
9/2/2008	CCWA	N/A	7.1	257	70	-66	92	1.19	0.27	0.28	17	5	147	--	--	--	--	--	--
10/7/2008	CCWA	N/A	7.5	266	45	-78	100	1.47	0.26	0.32	14	2.5	152	--	--	--	--	--	--
11/3/2008	CCWA	N/A	7.5	226	53	-55	76	1.05	0.42	0.19	16	5	132	--	--	--	--	--	--
12/9/2008	CCWA	N/A	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	--	--	--	--	--	--
Number of sample Dates	Count	0	13	13	13	12	13	12	12	12	12	12	13	0	0	0	0	0	0
	Max	0	7.8	291	70	-7	105	1.47	0.8	0.32	19	14	161	0.00	0.00	0.00	0.00	0.00	0.00
	Min	0	6.6	131	30	-90	19	0.43	0.08	0.04	14	2.5	91	0.00	0.00	0.00	0.00	0.00	0.00
14	Average	--	7.38	220.54	57.08	-53.08	69.31	1.01	0.36	0.17	16.08	5.97	129.38	--	--	--	--	--	--

Note: 9/12/06 Data is FIELD only.

Date	Nitrates (ppm)	Phos. (ppm)	Nitrates (lbs/day)	Phos. (lbs/day)
9/12/2006	2.2	0.5	--	--
12/6/2006	1.77	0.06	--	--
1/31/2006	Frozen	Frozen	--	--
4/18/2007	2.35	0.08	--	--
7/17/2007	0.55	0.07	--	--
10/9/2007	0.54	0.07	--	--
3/6/2008			--	--
5/6/2008	0.873	0.05	--	--
6/5/2008	0.794	0.11	--	--
7/9/2008	1.55	0.05	--	--
8/5/2008	0.6	0.05	--	--
9/2/2008	0.25	0.05	--	--
10/7/2008	0.25	0.19	--	--
11/3/2008	0.52	0.05	--	--
12/9/2008	Frozen	Frozen	--	--
Count	12	12	0	0
Max	2.35	0.5	0	0
Min	0.25	0.05	0	0
Average	1.020583	0.110833	#DIV/0!	#DIV/0!

Table 51. CCIS-1 monitoring point water quality data

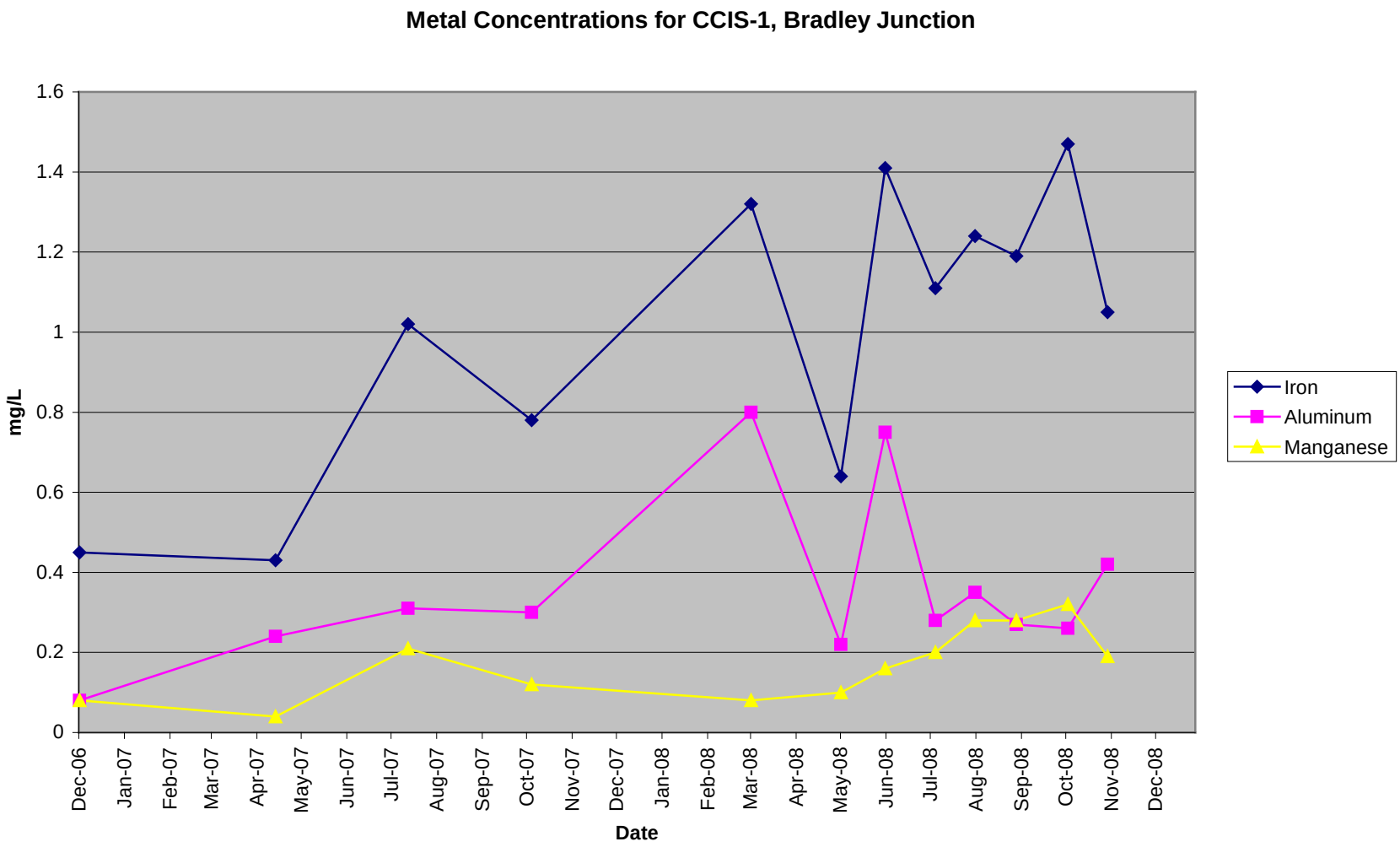


Chart 13. Metal Concentrations for CCIS-1.

CCIS-2

This monitoring point is located in Patton Borough, Cambria County near the Patton Borough Water Treatment Facility. This monitoring point includes tributaries 10-30, discharges BJD-1 and PD-1.

Chest Creek In-Stream Sample Point #2, Patton
Cambria County; Patton Borough

CCWA Monitoring Point: CCIS-2																			
Sample		Flow (Method)	Lab pH	Lab Conductivity	Air Temp	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Loading					
														Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
3/6/2008	CCWA	N/A	6.8	116	36	1	13	1.94	1	0.13	16	24	77	--	--	--	--	--	--
5/6/2008	CCWA	N/A	7	150	68	-18	35	0.88	0.35	0.08	18	5	89	--	--	--	--	--	--
6/5/2008	CCWA	N/A	7.2	181	69	-32	47	1.28	0.51	0.11	17	10	101	--	--	--	--	--	--
7/9/2008	CCWA	N/A	7.6	236	66	-61	52	1.06	0.16	0.14	25	2.5	135	--	--	--	--	--	--
8/5/2008	CCWA	N/A	7	341	66	-59	82	1.7	0.13	0.32	64	2.5	203	--	--	--	--	--	--
9/2/2008	CCWA	N/A	6.8	276	71	-37	59	2.11	0.22	0.28	51	2.5	179	--	--	--	--	--	--
10/7/2008	CCWA	N/A	7.3	296	44	-54	73	1.7	0.17	0.2	44	2.5	177	--	--	--	--	--	--
11/3/2008	CCWA	N/A	7.5	254	56	-39	61	0.98	0.11	0.09	33	6	150	--	--	--	--	--	--
12/9/2008	CCWA	N/A	7.3	201	36	-21	35	0.48	0.09	0.1	22	2.5	116	--	--	--	--	--	--
Number of sample Dates	Count	0	9	9	9	9	9	9	9	9	9	9	9	0	0	0	0	0	0
	Max	0	7.6	341	71	1	82	2.11	1	0.32	64	24	203	0.00	0.00	0.00	0.00	0.00	0.00
	Min	0	6.8	116	36	-61	13	0.48	0.09	0.08	16	2.5	77	0.00	0.00	0.00	0.00	0.00	0.00
9	Average	#DIV/0!	7.17	227.89	56.89	-35.56	50.78	1.35	0.30	0.16	32.22	7.75	136.33	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Date	Nitrates (ppm)	Phos. (ppm)	Nitrates (lbs/day)	Phos. (lbs/day)
3/6/2008	--	--	--	--
5/6/2008	0.996	0.05	--	--
6/5/2008	1.1	0.05	--	--
7/9/2008	0.782	0.05	--	--
8/5/2008	0.25	0.05	--	--
9/2/2008	0.25	0.11	--	--
10/7/2008	0.6	0.13	--	--
11/3/2008	0.76	0.16	--	--
12/9/2008	2.65	0.05	--	--
Count	8	8	0	0
Max	2.65	0.16	0	0
Min	0.25	0.05	0	0
Average	0.9235	0.08125	#DIV/0!	#DIV/0!

Table 52. CCIS-2 monitoring point water quality data.

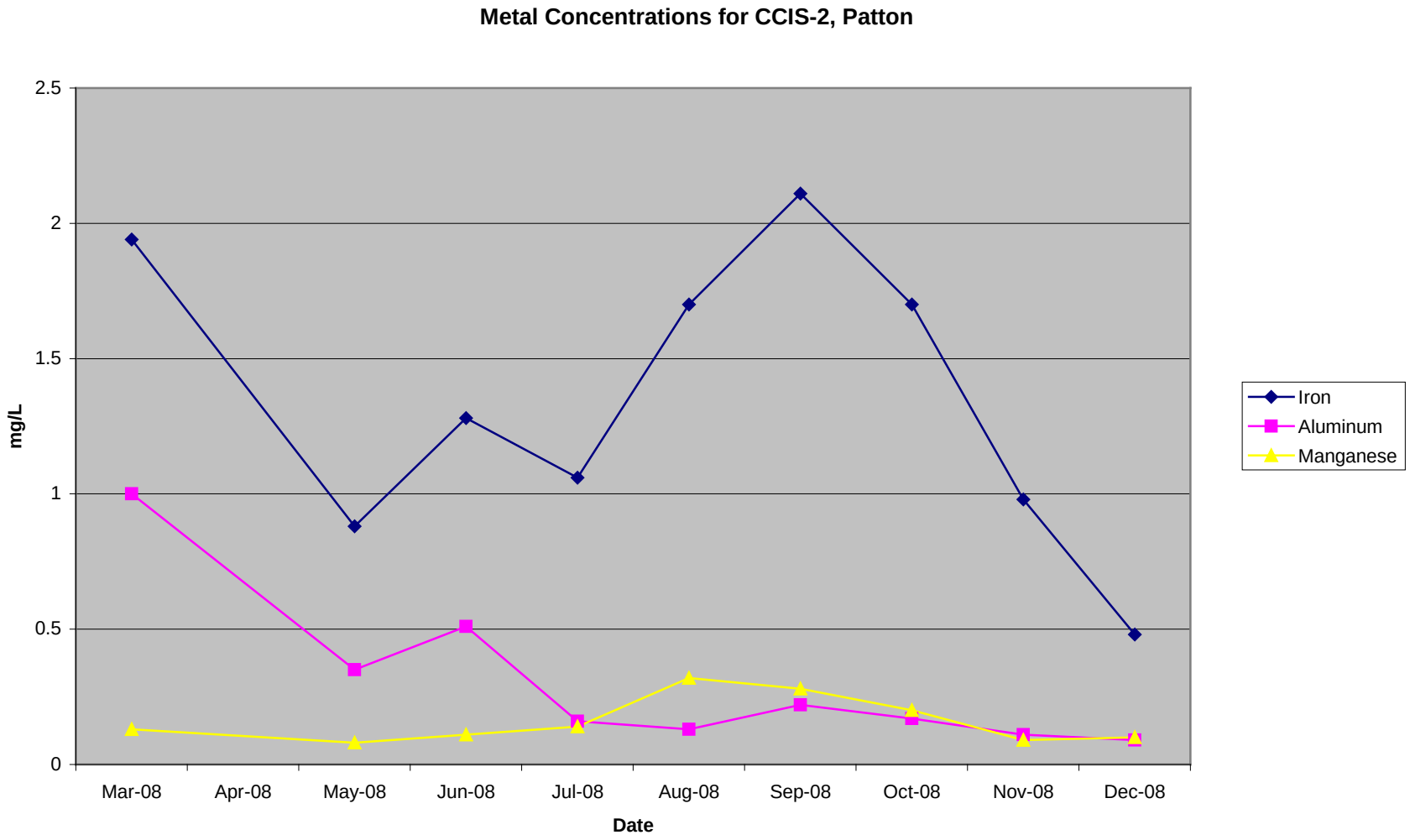


Chart 14. Metal Concentrations for CCIS-2.

CCIS-3

This monitoring is located on the border of Chest and Elder Townships in Cambria County at the bridge near Thomas Mills. The monitoring point includes tributaries 31 and 32. This segment of Chest Creek is stocked by the PA Fish & Boat Commission, and also is part of the Pennsylvania Scenic River System.

Chest Creek In-Stream Sample Point #3, Thomas Mills

Cambria County; Border of Chest and Elder Townships

CCWA Monitoring Point: CCIS-3																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.	Loading					
		(Method)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
3/7/2008	CCWA	N/A	7	153	40	-3	18	1.41	1.3	0.12	23	17	109	--	--	--	--	--	--
5/6/2008	CCWA	N/A	7.2	194	69	-19	35	0.72	0.25	0.12	34	6	114	--	--	--	--	--	--
6/5/2008	CCWA	N/A	7.3	209	70	-31	46	1.14	0.34	0.13	27	10	120	--	--	--	--	--	--
7/8/2008	CCWA	N/A	6.9	304	68	-27	51	0.9	0.19	0.13	39	2.5	145	--	--	--	--	--	--
8/5/2008	CCWA	N/A	7.2	392	67	-51	73	0.39	0.07	0.08	82	2.5	237	--	--	--	--	--	--
9/2/2008	CCWA	N/A	7	333	73	-34	59	0.69	0.12	0.09	66	2.5	205	--	--	--	--	--	--
10/7/2008	CCWA	N/A	7.6	335	45	-49	69	0.55	0.06	0.06	52	2.5	198	--	--	--	--	--	--
11/3/2008	CCWA	N/A	7.9	287	58	-43	62	0.74	0.07	0.07	41	2.5	169	--	--	--	--	--	--
12/10/2008	CCWA	N/A	7.5	244	40	-18	36	2.15	1.28	0.25	32	16	149	--	--	--	--	--	--
Number of sample Dates	Count	0	9	9	9	9	9	9	9	9	9	9	9	0	0	0	0	0	0
	Max	0	7.9	392	73	-3	73	2.15	1.3	0.25	82	17	237	0.00	0.00	0.00	0.00	0.00	0.00
	Min	0	6.9	153	40	-51	18	0.39	0.06	0.06	23	2.5	109	0.00	0.00	0.00	0.00	0.00	0.00
9	Average	#DIV/0!	7.29	272.33	58.89	-30.56	49.89	0.97	0.41	0.12	44.00	6.83	160.67	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Table 53. CCIS-3 monitoring point water quality data.

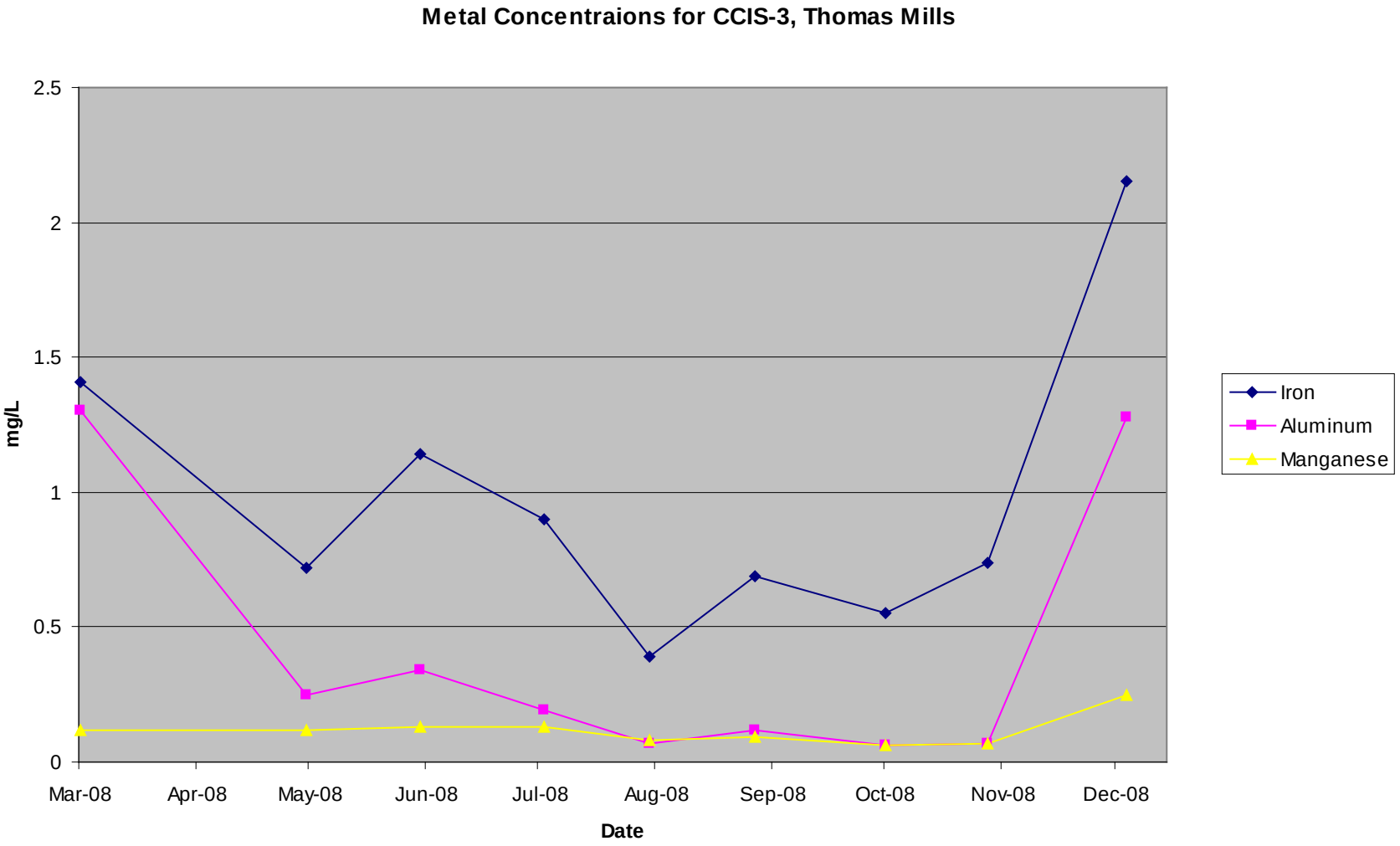


Chart 15. Metal Concentrations for CCIS-3.

CCIS-4

This monitoring point is located in the borough of Westover in Clearfield County at the bridge crossing over Chest Creek located on Westover road. The monitoring point includes tributaries 33-44 and discharges 38-1L, and 38-2L.

Chest Creek In-Stream Sample Point #4, Westover

Clearfield County; Westover Borough

CCWA Monitoring Point: CCIS-4																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Method)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
3/7/2008	CCWA	N/A	7	230	43	-5	19	0.81	0.66	0.22	60	17	150	--	--	--	--	--	--
5/7/2008	CCWA	N/A	7.2	357	70	-19	38	0.37	0.12	0.16	115	2.5	230	--	--	--	--	--	--
6/6/2008	CCWA	N/A	7.4	429	80	-28	46	0.61	0.25	0.17	128	5.0	245	--	--	--	--	--	--
7/8/2008	CCWA	N/A	7	521	70	-26	48	1.41	0.59	0.28	146	9	276	--	--	--	--	--	--
8/6/2008	CCWA	N/A	6.8	631	70	-29	51	0.74	0.37	0.19	226	5	410	--	--	--	--	--	--
9/2/2008	CCWA	N/A	7.8	661	73	-43	64	0.23	0.08	0.09	258	2.5	501	--	--	--	--	--	--
10/8/2008	CCWA	N/A	7.5	639	58	-35	63	0.17	0.025	0.07	247	2.5	449	--	--	--	--	--	--
11/4/2008	CCWA	N/A	7.6	536	62	-34	57	0.22	0.025	0.06	171	2.5	339	--	--	--	--	--	--
12/10/2008	CCWA	N/A	7.5	377	41	-16	36	1.23	0.55	0.33	105	11	229	--	--	--	--	--	--
Number of sample Dates	Count	0	9	9	9	9	9	9	9	9	9	9	9	0	0	0	0	0	0
	Max	0	7.8	661	80	-5	64	1.41	0.66	0.33	258	17	501	0.00	0.00	0.00	0.00	0.00	0.00
	Min	0	6.8	230	41	-43	19	0.17	0.025	0.06	60	2.5	150	0.00	0.00	0.00	0.00	0.00	0.00
9	Average	#DIV/0!	7.31	486.78	63.00	-26.11	46.89	0.64	0.30	0.17	161.78	6.33	314.33	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Table 54. CCIS-4 monitoring point water quality data.

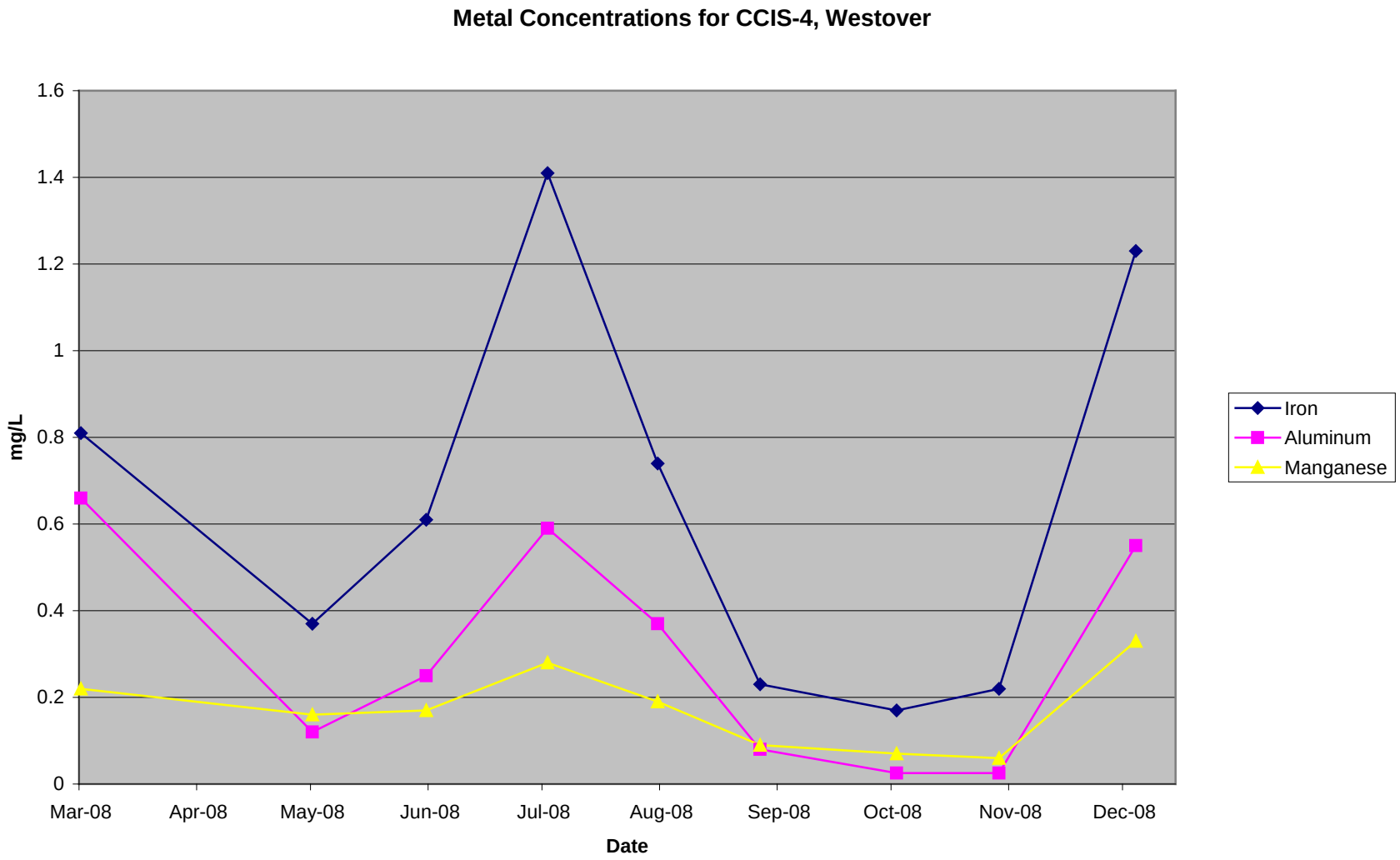


Chart 16. Metal Concentrations for CCIS-4.

CCIS-5

This monitoring point is located in Chest Township Clearfield County at the bridge on Five Points Road before Spring Run Road. This monitoring point includes tributaries 45-50 and discharges 48-1L, 48-1R 50-1R, 50-2R, 50-3R, and 50-4R.

Chest Creek In-Stream Sample Point #5, Five Points

Clearfield County; Chest Township

CCWA Monitoring Point: CCIS-5																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Method)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
3/11/2008	CCWA	N/A	7.1	285	33	-7	21	0.62	0.44	0.35	91	2.5	166	--	--	--	--	--	--
5/7/2008	CCWA	N/A	7.2	380	70	-20	40	0.45	0.16	0.18	124	2.5	248	--	--	--	--	--	--
6/6/2008	CCWA	N/A	7.4	409	82	-29	48	0.48	0.17	0.17	123	2.5	235	--	--	--	--	--	--
7/8/2008	CCWA	N/A	6.9	534	72	-28	51	2.12	1.03	0.34	159	21	297	--	--	--	--	--	--
8/6/2008	CCWA	N/A	7.2	676	72	-45	64	0.78	0.31	0.19	244	6	448	--	--	--	--	--	--
9/2/2008	CCWA	N/A	7.6	639	73	-44	66	0.25	0.07	0.11	242	5	446	--	--	--	--	--	--
10/8/2008	CCWA	N/A	7.5	647	61	-39	66	0.21	0.025	0.08	247	2.5	453	--	--	--	--	--	--
11/4/2008	CCWA	N/A	7.7	564	63	-42	62	0.31	0.025	0.09	186	2.5	360	--	--	--	--	--	--
12/10/2008	CCWA	N/A	7.4	369	40	-20	38	1.87	0.57	0.33	107	9	221	--	--	--	--	--	--
Number of sample Dates	Count	0	9	9	9	9	9	9	9	9	9	9	9	0	0	0	0	0	0
	Max	0	7.7	676	82	-7	66	2.12	1.03	0.35	247	21	453	0.00	0.00	0.00	0.00	0.00	0.00
	Min	0	6.9	285	33	-45	21	0.21	0.025	0.08	91	2.5	166	0.00	0.00	0.00	0.00	0.00	0.00
9	Average	#DIV/0!	7.33	500.33	62.89	-30.44	50.67	0.79	0.31	0.20	169.22	5.94	319.33	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Table 55. CCIS-5 monitoring point water quality data.

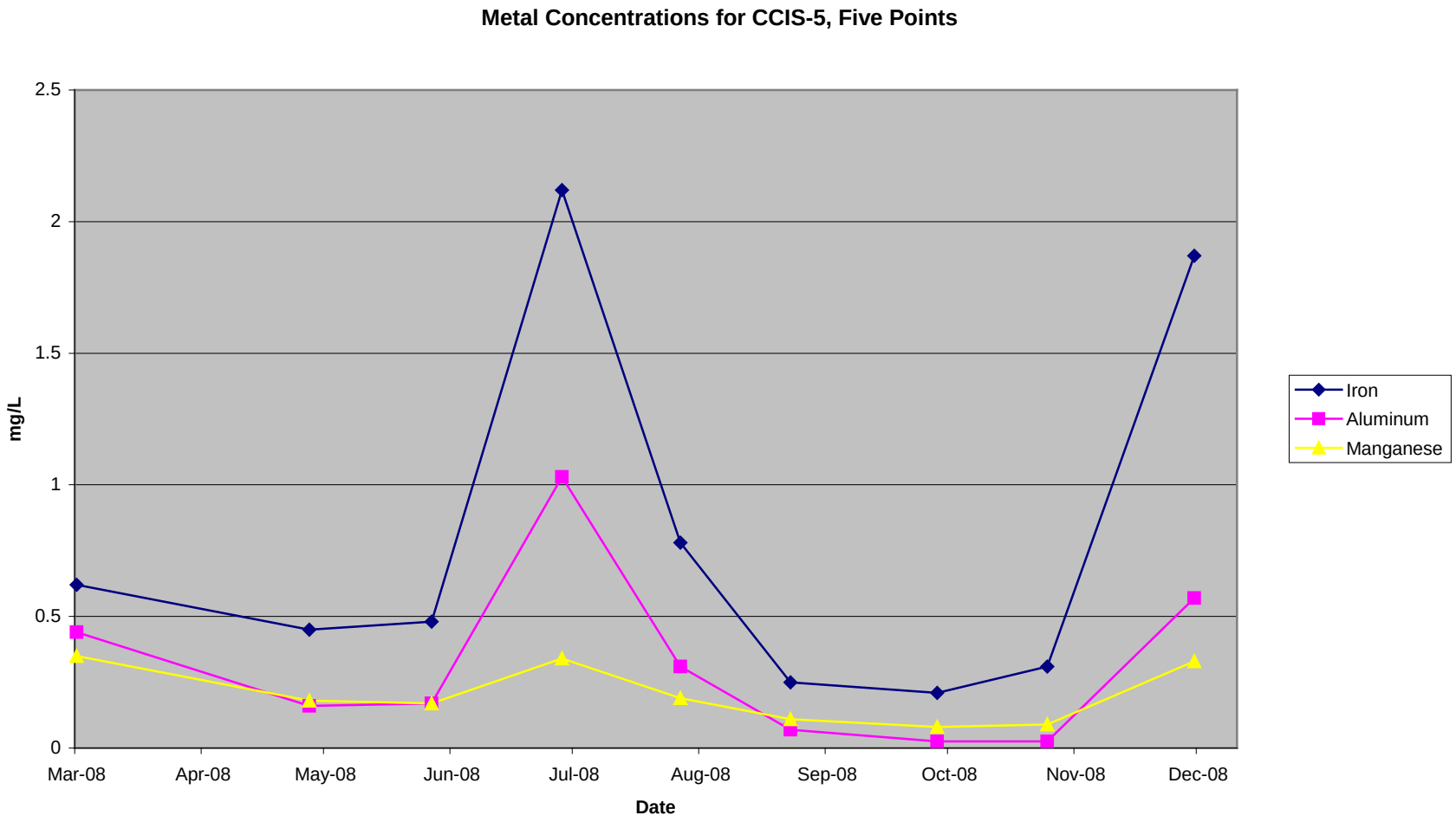


Chart 17. Metal Concentrations for CCIS-5.

CCIS-6

This monitoring point is located in the Borough of Newburg, Clearfield County right below the railroad bridge crossing over Chest Creek at the Curly Hurd Park. This monitoring point includes tributaries 51-57 and discharges 57-2L and 57-3L.

Chest Creek In-Stream Sample Point #6, La Jose
Clearfield County; Newburg Borough

CCWA Monitoring Point: CCIS-6																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.	Loading					
		(Method)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
3/11/2008	CCWA	N/A	7.1	285	38	-7	21	0.68	0.5	0.33	89	11	172	--	--	--	--	--	--
5/8/2008	CCWA	N/A	7.6	423	64	-17	43	0.58	0.29	0.15	132	2.5	259	--	--	--	--	--	--
6/9/2008	CCWA	N/A	7.5	540	85	-33	52	0.29	0.09	0.18	181	2.5	331	--	--	--	--	--	--
7/10/2008	CCWA	N/A	7.7	485	72	-38	56	0.61	0.18	0.16	156	2.5	301	--	--	--	--	--	--
8/7/2008	CCWA	N/A	7.2	645	65	-41	60	0.47	0.19	0.11	238	2.5	434	--	--	--	--	--	--
9/2/2008	CCWA	N/A	7.2	666	75	-49	72	0.33	0.1	0.1	257	2.5	484	--	--	--	--	--	--
10/9/2008	CCWA	N/A	7.4	702	60	-50	71	0.29	0.05	0.07	252	2.5	456	--	--	--	--	--	--
11/5/2008	CCWA	N/A	7.5	566	61	-48	64	0.42	0.025	0.08	195	6	373	--	--	--	--	--	--
12/11/2008	CCWA	N/A	7.3	255	31	-14	29	2.27	1.31	0.38	52	14	145	--	--	--	--	--	--
Number of sample Dates	Count	0	9	9	9	9	9	9	9	9	9	9	9	0	0	0	0	0	0
	Max	0	7.7	702	85	-7	72	2.27	1.31	0.38	257	14	484	0.00	0.00	0.00	0.00	0.00	0.00
	Min	0	7.1	255	31	-50	21	0.29	0.025	0.07	52	2.5	145	0.00	0.00	0.00	0.00	0.00	0.00
9	Average	#DIV/0!	7.39	507.44	61.22	-33.00	52.00	0.66	0.30	0.17	172.44	5.11	328.33	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Date	BOD (mg/L)	Fecal Col (c/100mL)	BOD (lbs/day)	Fecal Col (#/day)
3/12/2008	1.5	60	--	--
5/8/2008	1.5	30	--	--
6/9/2008	2	50	--	--
7/10/2008	1.5	80	--	--
8/7/2008	1.5	60	--	--
9/2/2008	1.5	60	--	--
10/9/2008	1.5	30	--	--
11/5/2008	1.5	10	--	--
12/11/2008	1.5	550	--	--
Count	9	9	0	0
Max	2	550	0	0
Min	1.5	10	0	0
Average	1.555556	103.3333	#DIV/0!	#DIV/0!

Table 56. CCIS-6 monitoring point water quality data.

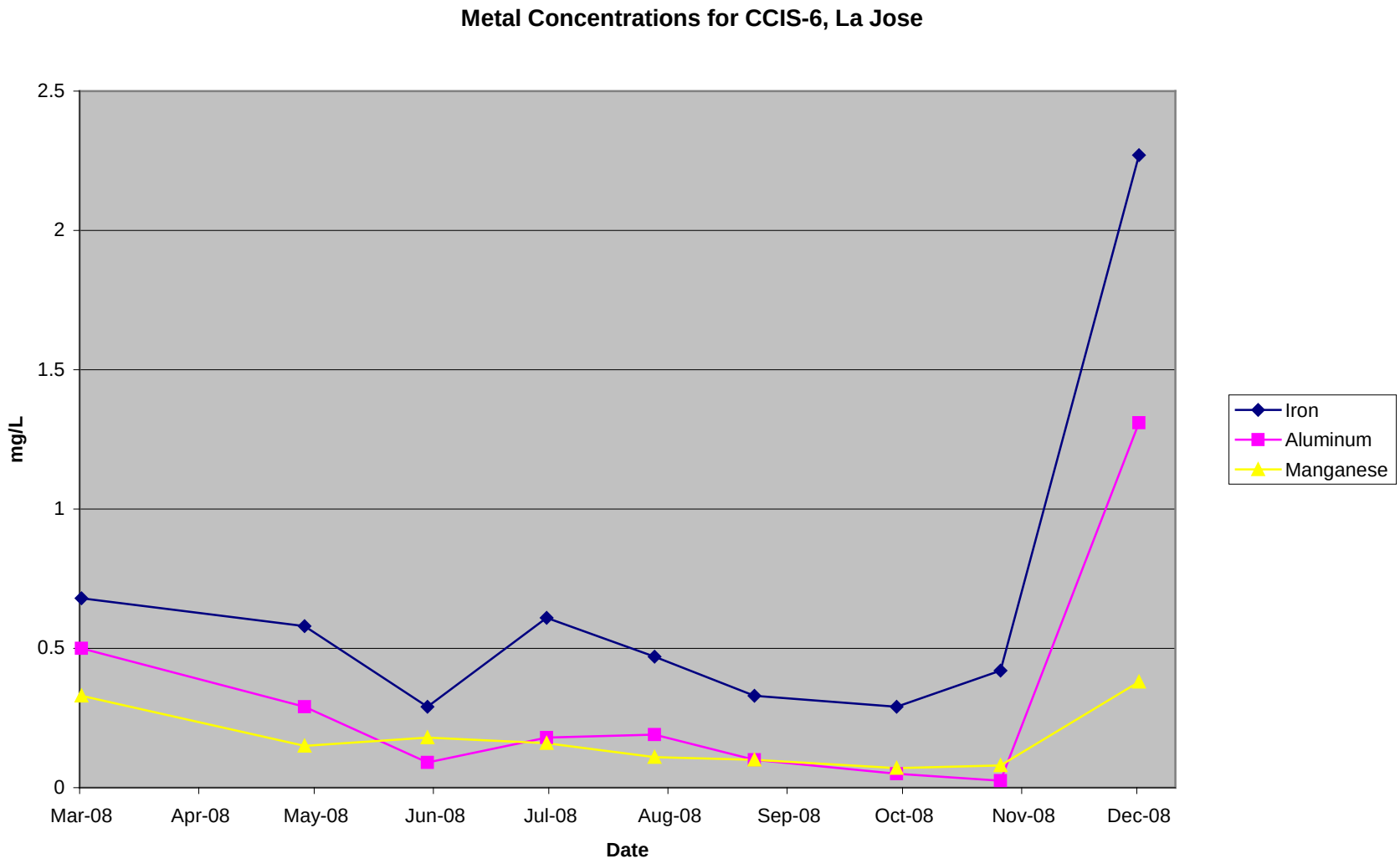


Chart 18. Metal Concentrations for CCIS-6.

CCIS-7

This monitoring point is located in Bell Township, in the town of Ostend, Clearfield County at the bridge crossing over Chest Creek on Bethlehem Road. This monitoring point includes tributaries 58-63 and no known discharges.

Chest Creek In-Stream Sample Point #7, Ostend
Clearfield County; Bell Township

CCWA Monitoring Point: CCIS-7														Loading					
Sample		Flow (Method)	Lab pH	Lab Conductivity	Air Temp	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
3/12/2008	CCWA	N/A	7.2	298	34	-12	26	0.57	0.38	0.29	97	5	187	--	--	--	--	--	--
5/8/2008	CCWA	N/A	7.4	397	65	-17	41	0.45	0.15	0.12	120	2.5	239	--	--	--	--	--	--
6/9/2008	CCWA	N/A	7.6	510	85	-37	54	0.35	0.08	0.13	166	2.5	310	--	--	--	--	--	--
7/10/2008	CCWA	N/A	8	483	73	-37	53	0.56	0.17	0.13	151	2.5	290	--	--	--	--	--	--
8/7/2008	CCWA	N/A	7.6	646	66	-44	63	0.41	0.21	0.09	233	2.5	427	--	--	--	--	--	--
9/2/2008	CCWA	N/A	7.2	627	76	-49	71	0.27	0.08	0.06	235	7	453	--	--	--	--	--	--
10/9/2008	CCWA	N/A	7.5	669	62	-52	71	0.24	0.025	0.04	238	2.5	433	--	--	--	--	--	--
11/5/2008	CCWA	N/A	7.5	552	62	-48	65	0.41	0.025	0.05	188	5	362	--	--	--	--	--	--
12/11/2008	CCWA	N/A	7.3	253	31	-15	30	2.37	1.01	0.45	51	20	58	--	--	--	--	--	--
Number of sample Dates	Count	0	9	9	9	9	9	9	9	9	9	9	9	0	0	0	0	0	0
	Max	0	8	669	85	-12	71	2.37	1.01	0.45	238	20	453	0.00	0.00	0.00	0.00	0.00	0.00
	Min	0	7.2	253	31	-52	26	0.24	0.025	0.04	51	2.5	58	0.00	0.00	0.00	0.00	0.00	0.00
9	Average	#DIV/0!	7.48	492.78	61.56	-34.56	52.67	0.63	0.24	0.15	164.33	5.50	306.56	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Date	BOD (mg/L)	Fecal Col (c/100mL)	BOD (lbs/day)	Fecal Col (#/day)
3/12/2008	1.5	60	--	--
5/8/2008	1.5	40	--	--
6/9/2008	2	20	--	--
7/10/2008	1.5	90	--	--
8/7/2008	1.5	120	--	--
9/2/2008	1.5	70	--	--
10/9/2008	1.5	10	--	--
11/5/2008	1.5	5	--	--
12/11/2008	1.5	530	--	--
Count	9	9	0	0
Max	2	530	0	0
Min	1.5	5	0	0
Average	1.555556	105	#DIV/0!	#DIV/0!

Table 57. CCIS-7 monitoring point water quality data.

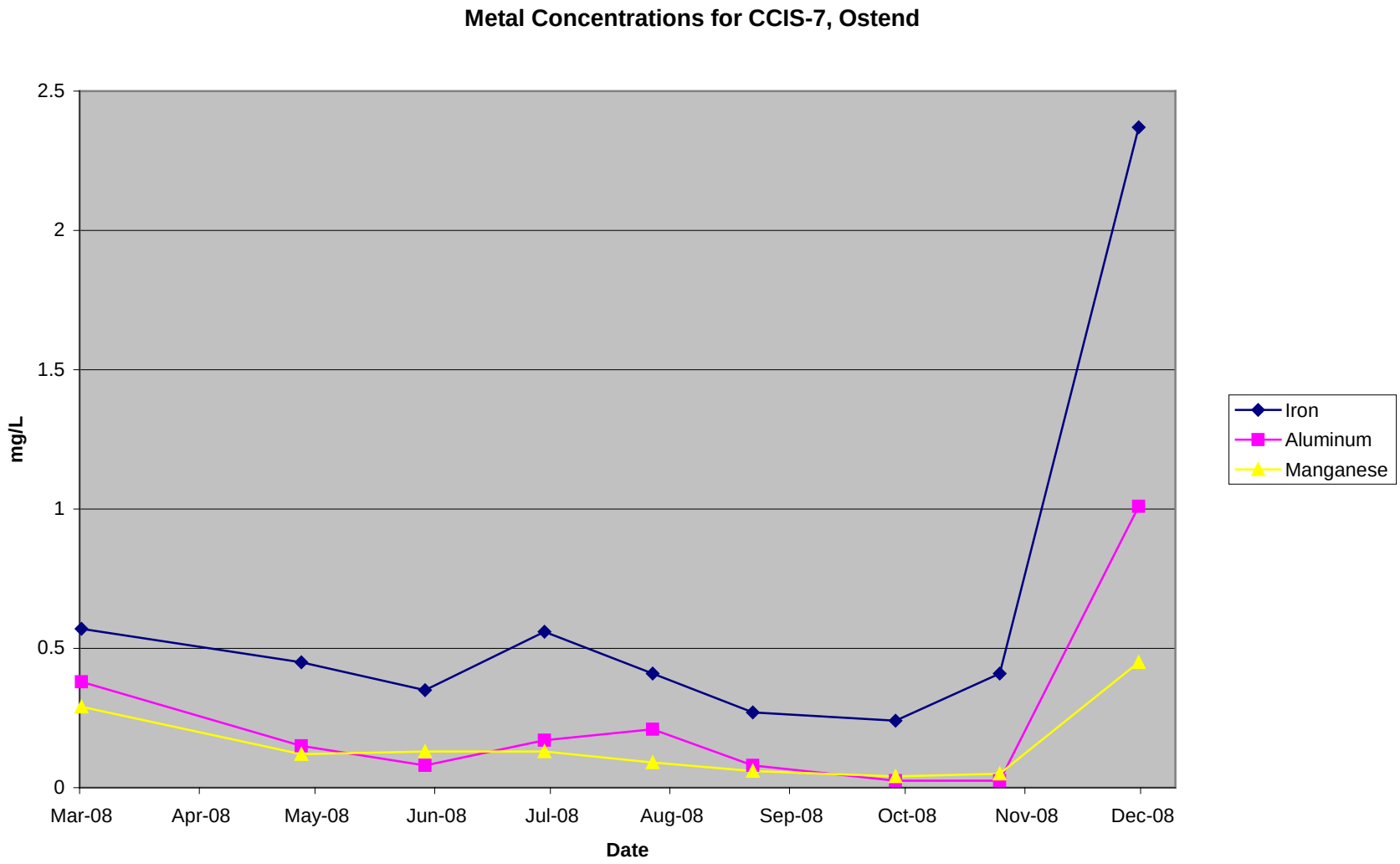


Chart 19. Metal Concentrations for CCIS-7.

CCIS-8

This monitoring point is located in Bell Township right before the Borough of Mahaffey, Clearfield County about 100 yards upstream from the confluence with the West Branch of the Susquehanna River. This monitoring point includes tributaries 64-66 and no known discharges.

Chest Creek In-Stream Sample Point #8, Mahaffey
Clearfield County; Bell Township

CCWA Monitoring Point: CCIS-8																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Method)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
3/12/2008	CCWA	N/A	7.4	298	35	-11	25	0.58	0.36	0.26	96	8	189	--	--	--	--	--	--
5/8/2008	CCWA	N/A	7.3	397	66	-17	41	0.55	0.19	0.13	121	2.5	240	--	--	--	--	--	--
6/9/2008	CCWA	N/A	7.5	502	86	-36	55	0.28	0.08	0.11	161	2.5	356	--	--	--	--	--	--
7/10/2008	CCWA	N/A	7.8	474	75	-35	54	0.62	0.18	0.1	150	2.5	287	--	--	--	--	--	--
8/7/2008	CCWA	N/A	7.5	640	66	-42	65	0.35	0.13	0.07	231	2.5	429	--	--	--	--	--	--
9/2/2008	CCWA	N/A	7.3	618	76	-47	70	1.1	0.15	0.08	232	8	440	--	--	--	--	--	--
10/9/2008	CCWA	N/A	7.5	662	63	-50	69	0.23	0.025	0.02	237	2.5	434	--	--	--	--	--	--
11/5/2008	CCWA	N/A	7.6	560	64	-46	65	0.33	0.025	0.03	187	2.5	358	--	--	--	--	--	--
12/11/2008	CCWA	N/A	7.4	252	31	-15	30	2.28	0.98	0.41	51	12	138	--	--	--	--	--	--
Number of sample Dates	Count	0	9	9	9	9	9	9	9	9	9	9	9	0	0	0	0	0	0
	Max	0	7.8	662	86	-11	70	2.28	0.98	0.41	237	12	440	0.00	0.00	0.00	0.00	0.00	0.00
	Min	0	7.3	252	31	-50	25	0.23	0.025	0.02	51	2.5	138	0.00	0.00	0.00	0.00	0.00	0.00
9	Average	#DIV/0!	7.48	489.22	62.44	-33.22	52.67	0.70	0.24	0.13	162.89	4.78	319.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Date	BOD (mg/L)	Fecal Col (c/100mL)	BOD (lbs/day)	Fecal Col (#/day)
3/12/2008	1.5	40	--	--
5/8/2008	1.5	10	--	--
6/9/2008	2	80	--	--
7/10/2008	1.5	90	--	--
8/7/2008	1.5	50	--	--
9/2/2008	1.5	20	--	--
10/9/2008	1.5	5	--	--
11/5/2008	1.5	20	--	--
12/11/2008	1.5	430	--	--
Count	9	9	0	0
Max	2	430	0	0
Min	1.5	5	0	0
Average	1.555556	82.77778	#DIV/0!	#DIV/0!

Table 58. CCIS-8 monitoring point water quality data.

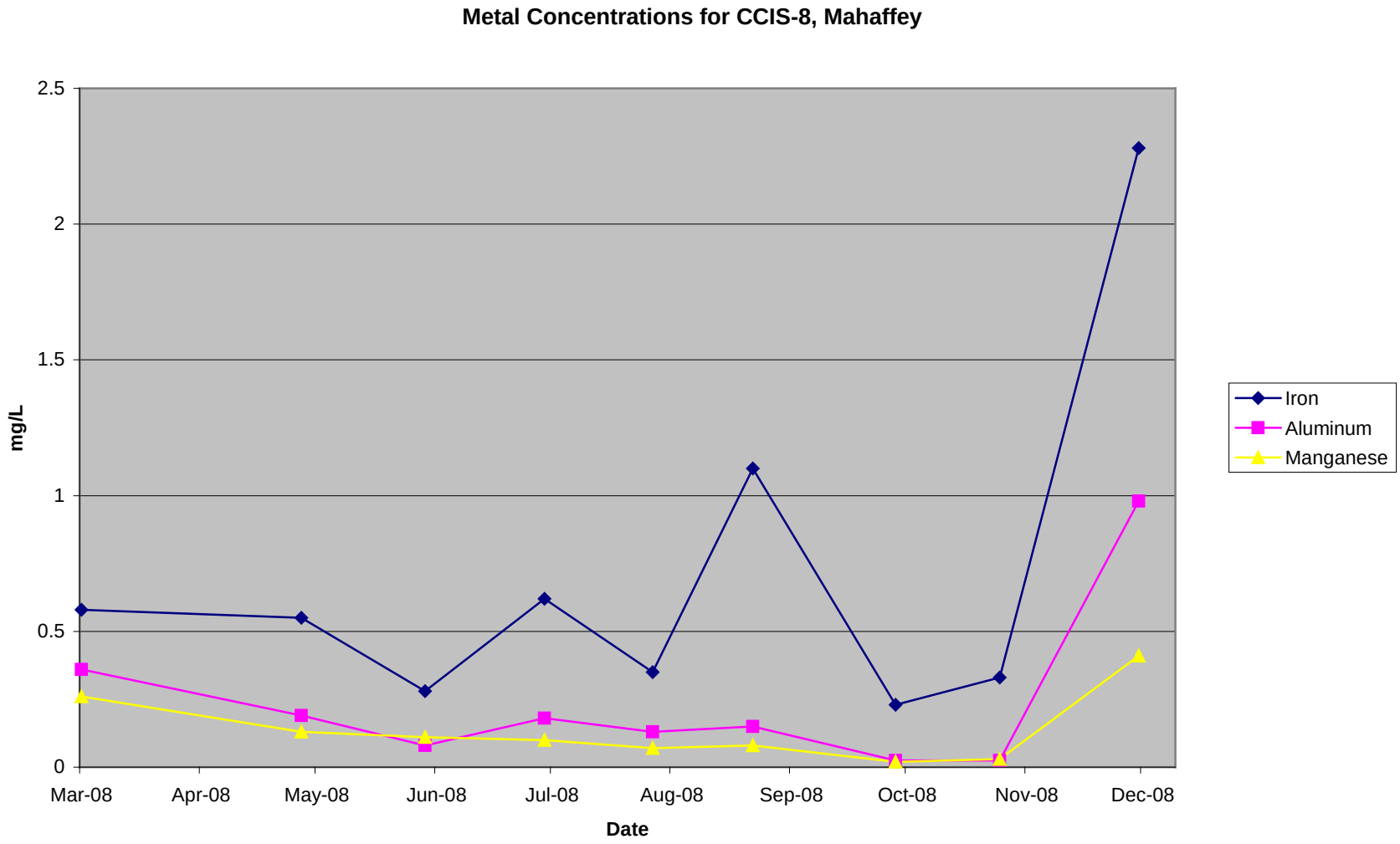


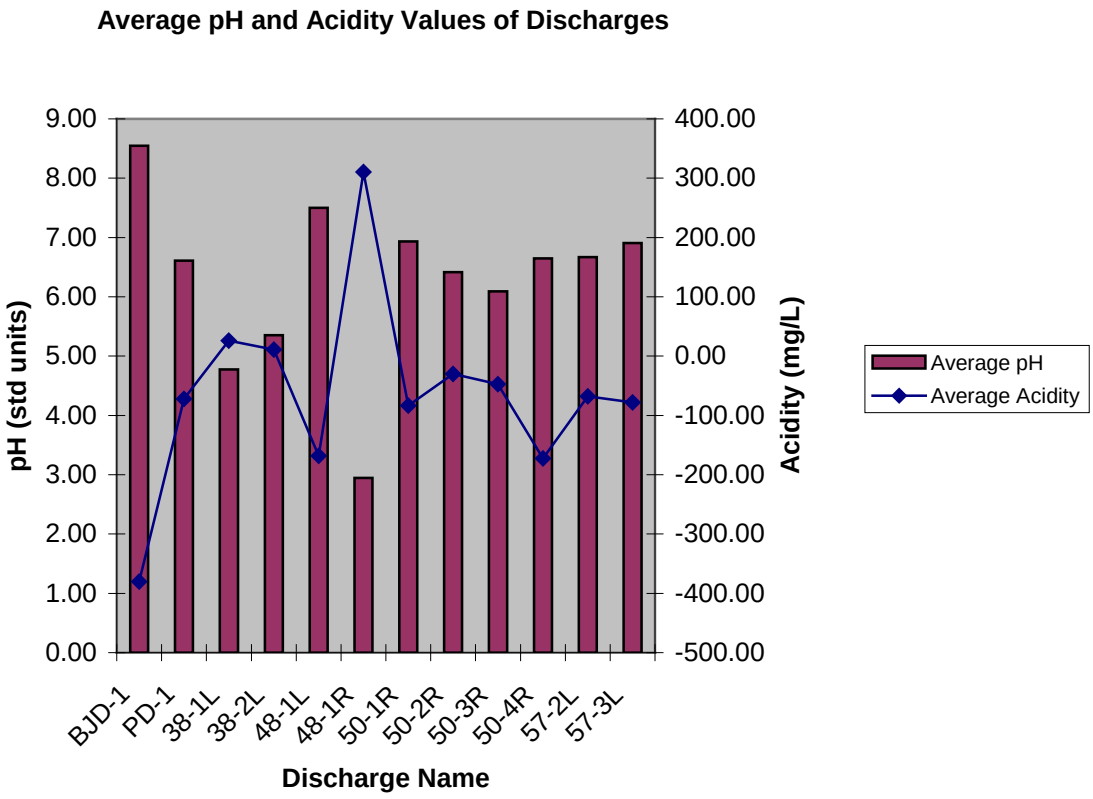
Chart 20. Metal Concentrations for CCIS-8

Chest Creek Watershed Assessment and Restoration Plan

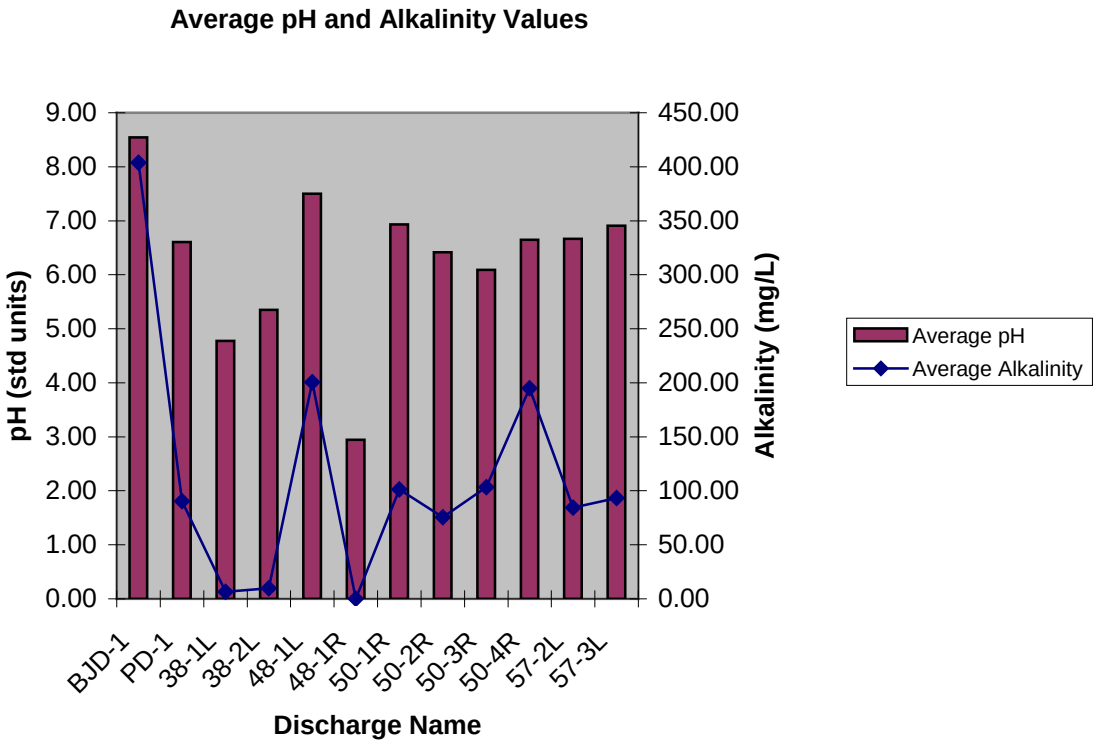
Comparison of Water Quality Parameters for Discharges Sampling Points

The following graphs compare average acidity, alkalinity and conductivity values to all the discharges in the Chest Creek watershed.

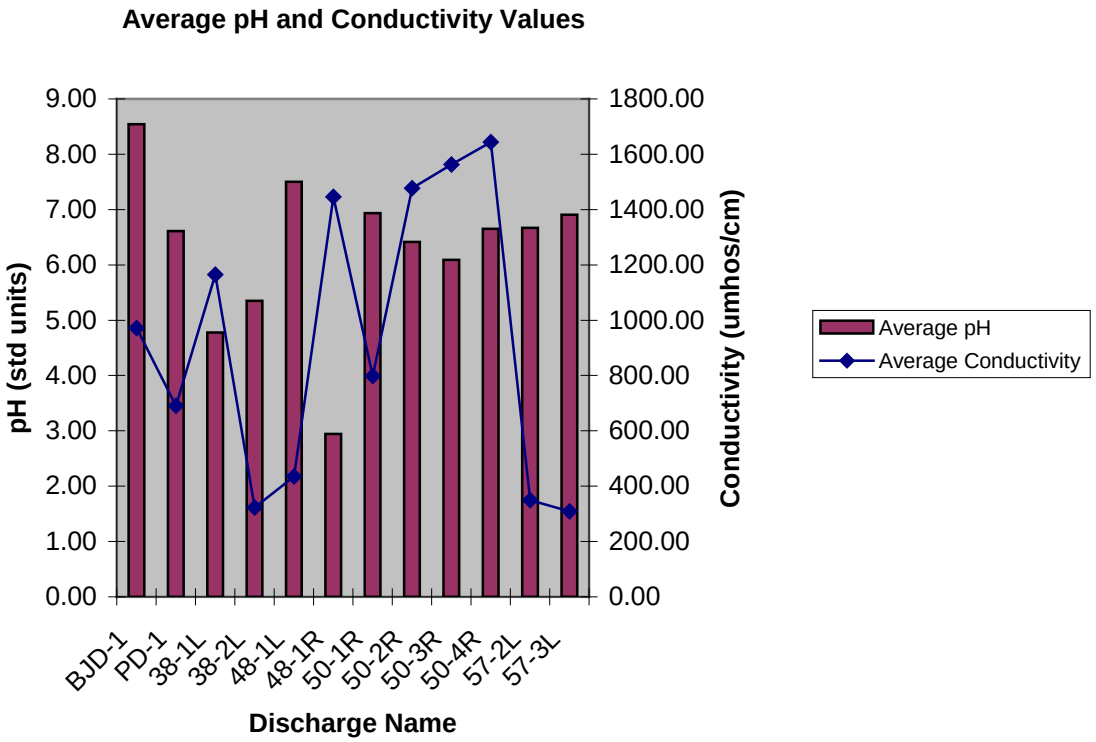
The below graph shows the average pH values compared to the acidity values for all discharges.



This graph shows the average pH values compared to the alkalinity values for all discharges in the Chest Creek watershed.



This graph shows the comparison between average pH values to conductivity values for all the discharges in the Chest Creek watershed.

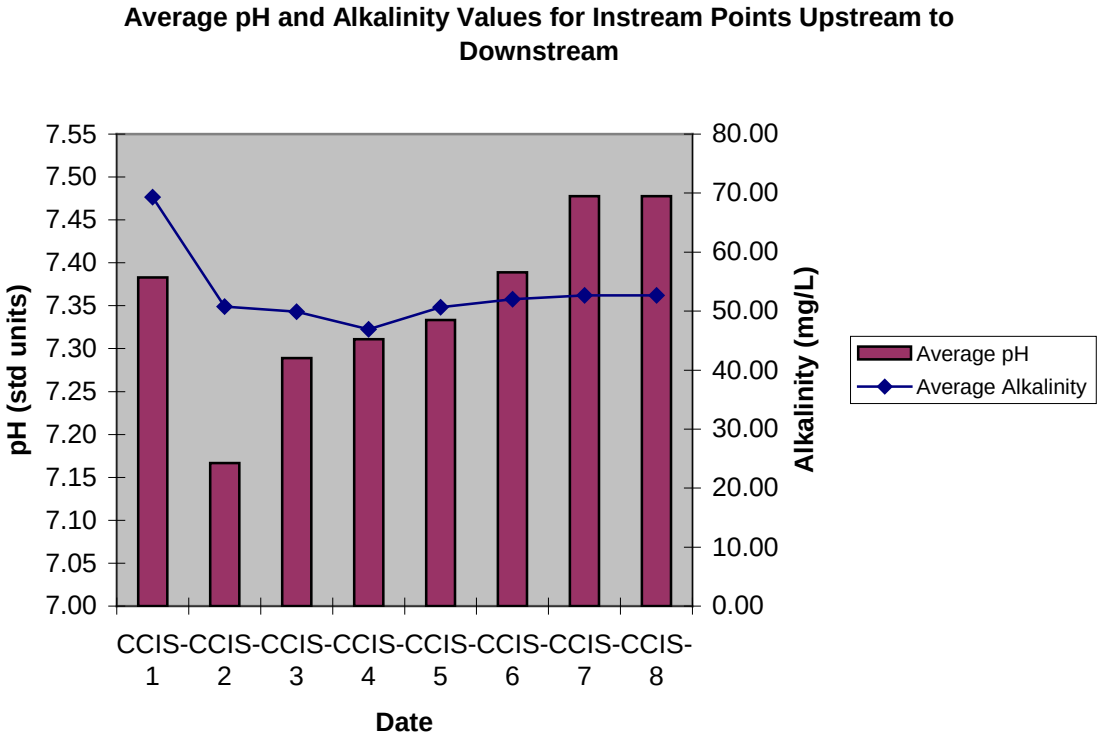


Chest Creek Watershed Assessment and Restoration Plan

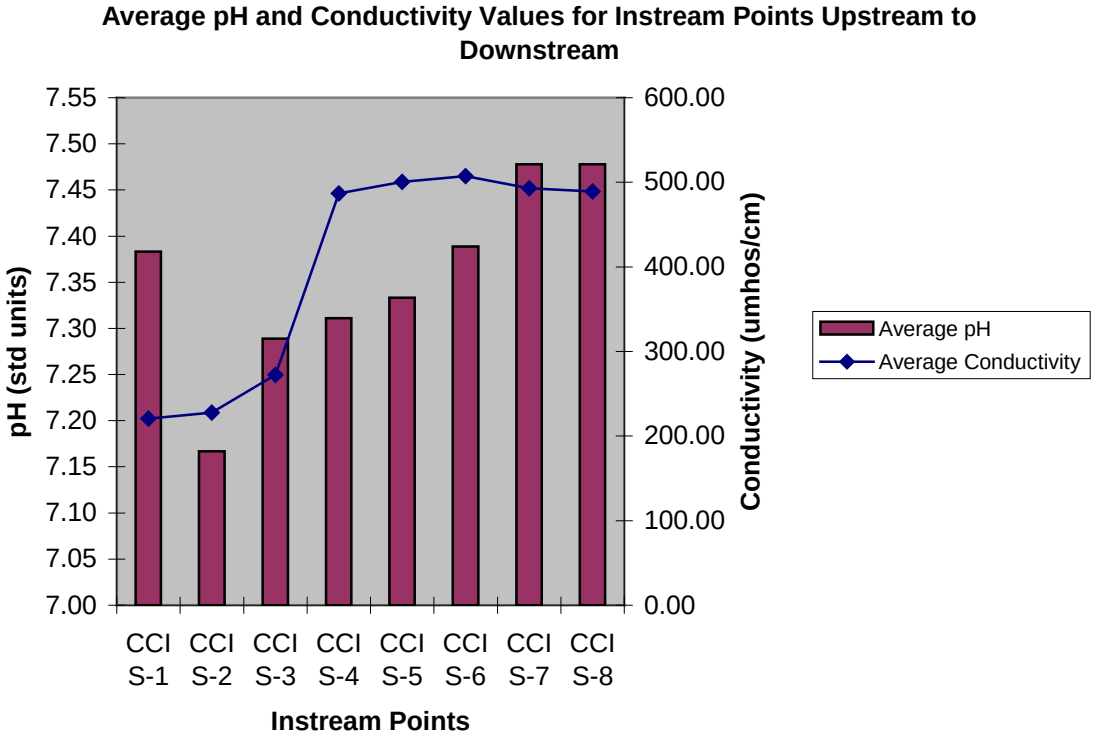
Comparison of Water Quality Parameters for Instream Sampling Points Upstream to Downstream

The following graphs show the comparison between average alkalinity, pH, and conductivity values, for all instream sampling points.

This graph shows the comparison between average alkalinity to average pH values for all instream sampling points in the Chest Creek watershed. As pH increases as you move downstream, alkalinity remains relatively consistent after CCIS –1.



This graph shows the comparison between average conductivity to average pH values for all instream sampling points in the Chest Creek watershed. As pH values increase after CCIS-1, conductivity values gradually increase before remaining relatively consistent after CCIS-3.



AMD Treatment Methods

Through the years, many treatments have been developed for AMD remediation and currently there are a number of organized efforts in Pennsylvania using both active and passive treatment methods on a watershed scale. Active treatment methods incorporate the use of mechanized procedures for the addition of alkaline materials and require constant monitoring and maintenance. Basic chemicals are used as additives to increase the pH and cause the precipitation of metals, such as Fe, Mn, and Al. The chemicals commonly used are Ca(OH)2 (hydrated lime), NaOH (caustic soda), NH3 (ammonia), CaO (pebble quicklime) and Na2CO3 (soda ash) (Robb and Robinson, 1995). The chemicals used on a particular site depend on mine drainage characteristics and site accessibility. Hydrated lime is commonly used, but is hydrophobic and requires mixing. Pebble quicklime (CaO) is utilized at sites where it is usually dissolved by a water wheel arrangement. Soda ash, in the form of briquettes, is used in remote areas with low flows and low acidity. Caustic soda is also used in remote areas with low flows. Liquid caustic soda is capable of treating high acidity and high Mn because it raises the pH quickly, but it is expensive and dangerous to handle. Another potentially dangerous chemical used less frequently is ammonia. It must be handled carefully and is stored as a liquid. Ammonia can raise the pH above 9.2, but may have direct negative impacts on the biota of the receiving streams (Skousen and Ziemkiewicz, 1995).

Other active treatment methods include dissolved air flotation and ion exchange devices, flocculants, coagulants, and oxidants (Skousen and Ziemkiewicz, 1995). Active methods are successful, but expensive. It is not uncommon for water treatment costs to exceed $200,000 per year at AMD sites using active treatment. Another concern is the large volume of sludge produced from the precipitation of metals. Disposal costs for the sludge add to the cost of chemical treatment. Active methods may also cause environmental damage because potentially harmful chemicals are used. The high cost and possible side effects of active treatment can be avoided by the use of passive treatment systems. Passive treatment systems, which require only limited maintenance, are the alternative approach to active treatment methods. They require no input of manufactured chemicals and have a lower operation and maintenance cost. A downside is that they do require longer retention times and larger treatment areas (Hedin et al., 1994).

Passive treatment systems were first designed after it was observed that natural wetland systems in the path of AMD had some positive effects. The first passive systems described were natural *Sphagnum* wetlands that were improving AMD as discharges flowed through them. The first constructed wetlands were small and planted with cattails (*Typha latifolia)*. They were designed to encourage oxidation processes to precipitate unwanted metals and in turn increase the pH (Robb and Robinson, 1995). Constructed wetlands function by precipitating metal hydroxides, forming metal sulfides, and adsorbing small amounts of metals to the plant community (Skousen and Ziemkiewicz, 1995).

Two types of wetlands are constructed, aerobic and anaerobic. Aerobic wetland systems are designed to encourage metal precipitation through oxidation processes and are therefore normally shallow, vegetated, and have surface flow predominating (Robb and Robinson, 1995). Anaerobic wetland systems require that the mine water flow through an organic layer under anaerobic conditions. The organic material most commonly used is

spent mushroom compost. This organic material must contain sulfate-reducing bacteria for metal sulfide precipitates to form (Robb and Robinson, 1995).

Both vegetation and bacteria are vital to wetland treatment success. Wetland plant species have many roles in mine drainage treatment. They include substrate consolidation, metal accumulation, and stimulation of microbial activity to improve the aesthetics of the site. Constructed wetlands can also provide valuable wildlife habitat, for animals such as reptiles and amphibians. Plants may also serve as a food source. Sulfate reducing bacteria, such as *Desulfovibrio* and *Desulfotomaculum,* play a major role by increasing the pH and encouraging metal precipitation. It has been shown that *Desulfovibrio* are most effective at a pH > 4.5 so an important aspect of anaerobic wetland treatment is maintaining the pH within the organic layer (Nawrot and Klimstra, 1990). Sulfate reducers exist in the absence of oxygen and are only found in the deeper parts of the organic layer where they are able to perform their function of sulfate reduction and alkalinity production. Treatment efficiencies of these microbial dependent wetlands show trends of seasonal variation. The decrease in treatment efficiency may be due to biological functions slowing with decreasing temperatures (Kepler, 1990). These bacteria utilize the organic substrate as a carbon source and use sulfate as an electron acceptor in the following reactions:

$SO_4^{2-} + 2\ CH_2CHOHCOO^- + 4\ H^+ \rightarrow H_2S + 2\ CH_3COOH + 2\ H_2CO_3$ (1)

$SO_4^{2-} + CH_3OO^- + 3\ H^+ \rightarrow H_2S + 2\ H_2CO_3$ (2)

$SO_4^{2-} + 2\ CH_3CHOHCOO^- + 3\ H^+ \rightarrow 3\ H_2S + 6\ H_2CO_3$ (3)

Sulfate reducing bacteria cannot break down complex organic substrates so they rely mainly on fermenting bacteria to provide substrates like acetate and lactate from larger organic molecules (Cork and Cusanovich, 1979). Plants aid in maintaining these bacterial communities by providing attachment sites and a continual supply of organic matter (Skousen and Ziemkiewicz, 1995).

Another type of passive treatment technology is an anoxic limestone drain (ALD). The Tennessee Division of Water Pollution Control in 1988 first built prototype ALDs. At the same time, the Tennessee Valley Authority (TVA) personnel found that AMD from a coal refuse dam was being neutralized by calcium carbonate limestone in an old road buried beneath the dam (Brodie et al., 1993). In an ALD, alkalinity is produced when AMD contacts limestone in an anoxic environment producing bicarbonate alkalinity. ALDs consist of a shallow limestone filled trench, sealed from the atmosphere, through which the AMD is channeled. Limestone with greater than 90% $CaCO_3$ is used to produce the greatest amount of alkalinity (Brodie et al., 1993). The limestone layer is often covered with plastic or geotextile fabric. Clay soil is then placed over the plastic or fabric followed by a covering of a heavy soil, then vegetated. The amount of limestone used is determined by the flow and loading of the AMD and desired longevity for the system. Usually, extra limestone is employed to ensure a comfortable safety factor for longevity. The use of an oxidation basin immediately after the ALD allows for precipitation of the metals (Brodie et al., 1993).

Three other criteria are followed when constructing ALDs. The first is to keep out any organic matter that may allow microorganisms to grow and coat the limestone. The second is that larger limestone (1"-6") should be used to maintain flow in case plugging occurs due to metal precipitation. Finally, oxygen should be kept out of the drain to deter metal precipitates from forming (Skousen and Ziemkiewicz, 1995). ALDs have been

found to raise pH and introduce as much as 300 mg/l of bicarbonate alkalinity as shown by the following equations:

$CaCO_3 (s) + 2 H^+ \rightarrow Ca^{2+} + H_2CO_3$ - (1)

$CaCO_3 (s) + H_2CO_3 \rightarrow Ca^{2+} + 2 HCO_3^-$ - (2)

$CaCO_3 (s) + H_2O \rightarrow Ca^{2+} + HCO_3^- + OH^-$ (3)

The rate of calcium dissolution is dependent on carbon dioxide partial pressure. Generally, the rate of calcium dissolution will increase as the partial pressure increases (Plummer et al., 1979). As the water leaves the ALD and is exposed to oxygen, the increased pH promotes metal precipitation and the bicarbonate alkalinity neutralizes the acidity produced by metal hydrolysis (Hedin and Watzlaf, 1994). Dissolved oxygen (DO) concentration is a limiting factor in the utility of ALDs. A DO level of less than 1.0 mg/l is recommended to ensure that Fe^{3+} will not precipitate, coating the limestone or clogging the system (Kepler and McCleary, 1994). Al^{3+}, however, can precipitate at a pH > 4.5 in the absence of oxygen, therefore clogging the system even in the absence of oxygen (Kepler and McCleary, 1994). ALDs are often used in combination with anaerobic constructed wetlands and vertical flow wetlands, which are also called successive alkalinity producing systems (SAPS) in the literature.

Vertical flow wetlands are being used on mine sites for the treatment of AMD (page C6 and C7). It is a newer technology that has shown great success. Vertical flow wetlands combine ALDs and anaerobic wetlands into one integrated system. Vertical flow is promoted through rich organic wetland substrates followed by a limestone bed (Kepler and McCleary, 1994). Most systems are constructed as ponds lined with 65-85 cm of limestone on which approximately 65 cm of spent mushroom compost is spread. To maintain reducing conditions within the organic layer, at least 85 cm of compost is recommended (Demchak, et al. 2001). On top of the compost layer is freestanding water with a depth of 40-255 cm (Skousen and Ziemkiewicz, 1995). Perforated pipes under the limestone layer collect the flow. Various piping patterns are used from a minimal approach where only 2-3 pipes are placed lengthwise through the system, to a maximal approach where piping is placed in a grid-like pattern on 5' or 10' centers. Demchak et al. recommends the use of increased piping to insure preferential flow does not occur.

Vertical flow wetlands add alkalinity both through bacterial sulfate reduction and limestone dissolution. Bacterial-mediated sulfate reduction occurs in the organic layer. Bacteria oxidize organic compounds using sulfate and release hydrogen sulfide and bicarbonate. The sulfate reduction directly affects concentrations of dissolved metals by raising alkalinity and providing the conditions necessary for precipitating them as metal sulfides (Skousen and Ziemkiewicz, 1995). Metals precipitating in the system may decrease the lifespan. Flushing the wetlands may be a solution to increasing the treatment success and may aid in the prevention of clogging. Acidic conditions may also be created from reactions involving H_2S, including $H_2S \rightarrow H^+ + HS^-$ and $Fe^{2+} + HS^- \rightarrow FeS + H^+$. When the mine water enters the organic layer containing dissolved Fe^{3+}, dissolved O_2, or precipitated Fe and Mn oxides, the H_2S is oxidized and mineral acidity is affected (Hedin et al., 1994). As the H_2S levels increase, the acidity decreases raising pH levels. The amount of H_2S produced can be qualitatively detected by both the odor of the gas and the rich black color of the organic layer, which can be an indicator of successful treatment within the wetland (Nawrot and Klimstra, 1990).

Another source of bicarbonate in vertical flow wetlands is attributed to dissolution of the limestone, $CaCO_3 + H^+ \rightleftharpoons Ca^{2+} + HCO_3^-$. The dissolution rate and concomitant alkalinity generation are greatly affected by the partial pressure of CO_2. Anaerobic mine water increases CO_2 partial pressures due to decomposing organic matter and precipitation of metal sulfides. The dissolved CO_2 is a weak diprotic acid and continues to react with limestone, producing more Ca^{2+} and HCO_3^-. When highly acidic water contacts limestone, the first reaction is neutralization of proton acidity. The reaction increases pH and decreases metal solubility. As pH rises above 4.5, bicarbonate accumulates, decreasing the solubility of metals (Hedin et al., 1994a). It has been stated that limestone dissolution requires a 12-hour contact time for maximum alkalinity production (Kepler and McCleary, 1994). In vertical flow wetlands, through a combination of bacterial mediated sulfate reduction and limestone dissolution, alkalinity is produced. The increased pH results in the precipitation of metals when the discharged water is exposed to oxygen.

Passive treatment technology is undergoing rapid development because of the importance of developing remediation methods for AMD at a low cost. Other systems are being studied to determine if they can be successfully used as cost-efficient systems, either alone or in combination with other systems. One such system is a limestone pond. The pond is constructed on an upwelling of an AMD seep or underground discharge point. Limestone is placed on the bottom of the pond and water flows up through it. They are normally constructed with 1-3 m of water, 0.3-1.0 m of limestone, and have a retention time of 1-2 days. The drainage requires a low DO, and should contain minimal Fe^{3+} and Al^{3+}, so clogging does not occur (Skousen and Ziemkiewicz, 1995). If higher concentrations of metals are present, a flushing system can be added.

Another technique involves the use of open limestone channels. They add alkalinity to acidic water in open channels or ditches lined with limestone. The channel should contain a slope greater than 20% to maintain flow velocities that keep precipitates in suspension (Skousen and Ziemkiewicz, 1995). Direct addition of limestone sand to streams is another technique being used. The sand is placed in the headwaters of a stream and during high flows the sand moves downstream and mixes with natural sediments. No harmful effects have been seen. Increases in pH and calcium levels have been observed along with a decrease in toxic aluminum species. A careful selection of particle size, purity and mass of the limestone is important for treatment success (Downey et al., 1994).

Diversion wells have been used in Scandinavia to treat small acidic streams since the late 1970's (Sverdrup, 1983). The first full-sized wells were implemented in Sweden in 1980 and were first used in Lebanon County, Pennsylvania in 1986. Diversion wells are constructed from a cylinder or vertical tank made of either concrete or metal. They are 1.5-1.8 m in diameter, 2.0-2.5 m deep and filled with limestone. They contain a large pipe that extends vertically down the center of the well. Water is fed from the stream into the pipe that exits near the bottom through a nozzle. Water then flows up through the limestone, fluidizing it. Grinding and dissolution of the limestone occurs creating alkalinity. Due to the high pressure created within the wells, floc is removed at a consistent rate, so limestone coating is not a concern. Diversion wells are not entirely passive in that limestone must be added on a monthly basis and sometimes even daily.

They work best where metal concentrations are low since there are no settling ponds employed.
Bioremediation is another passive treatment technique being used. Seeded microbes are used to convert metals to their less harmful species. Metal oxidation and precipitation are promoted through hydroxide formation, as is metal reduction and precipitation through sulfide formation. One example is the use of metal oxidizing beds for the treatment of both Mn and Fe (Skousen and Ziemkiewicz, 1995). Mn is difficult to remove because of the high pH required to precipitate it (> 9.0) and competition with Fe precipitation when Fe is present in high concentration. Researchers in Maryland have established a combination of microbes that have been shown to precipitate Mn to effluent standards. These beds have been in use for approximately 10 years, with the first being constructed in Pennsylvania in 1994. [14]

Maintenance

A partnership between the Chest Creek Watershed Alliance and the Cambria County Conservation District will perform long-term maintenance of any constructed treatment systems. The partners are willing to do the fieldwork associated with maintenance of the treatment cells. An operation and maintenance plan will be developed for each treatment project as it enters final design. Potential problems are as follows: Wetlands require minimal maintenance. Visual inspections are necessary to insure muskrats and beavers, along with ATV's are not impacting inlet/outlet structures or destroying vegetation. VFWs require regular flushing to insure plugging does not occur, especially at sites with moderate to high aluminum levels. The flushing frequency will vary depending on the size of the system and metal loading entering the system. The primary maintenance issue is with the removal of the solids in the settling ponds. The purpose of the settling pond is to collect precipitated metals. These solids accumulate over time and will eventually need to be removed and disposed of properly.

Ponds are typically designed to operate for 5 to 10 years before needing to be cleaned out. Sometimes fluffing of the limestone will help in the longevity of the system.

Prioritization of Problem Areas

The prioritization of problem areas was based on water quality loadings and their impacts to the watershed, availability of space for construction, cost feasibility, and access.

Problem areas were identified in each section of the Chest Creek watershed. The top three problem areas from each section were identified. The problem areas stated in this

14) AMD Treatment Methods taken in entirety from Morgan Run Watershed Mine Drainage Assessment and Restoration Plan, March 31, 2006

section would help to improve the Chest Creek watershed. The Headwaters Section of the Chest Creek watershed is mainly impacted by sediment and nutrient runoff. The Middle Section is mainly impacted by AMD, and the Lower Section is mainly impacted by untreated sewage.

Each problem area and its recommendations for improvement are presented below. Each discharge will have a conceptual design and will most likely change during the design and permitting phase as more information and data is gathered. Cost estimates are given to each project. AMDtreat software was used for the costs estimates of the discharges.

Headwaters Section

Priority #1: Tributary 24 Unnamed

Site Description:

This monitoring point is located at the end of Freightner Road near Eckenrodes Mills 35 yards above the railroad bridge. The sample was taken as a composite at the last point before entering Chest Creek. Nitrate levels on average are 6.28 mg/l. not exceeding drinking water standards. Numerous farms impact this watershed. Water quality data can be found in the individual tributary sections.

Recommendations:

Tributary 24 watershed needs to reduce nitrate loadings entering the tributary. Portions of the tributary run through farmland, which inevitably add to the nitrate levels. Best Management Practices or BMP's such as riparian buffers, stream bank stabilization, and contour buffers need to be implemented to help restore this watershed.

Estimated cost to implement BMP's $40,000 - $60,000.

Predicted Effect of BMP's on Receiving Stream:

The addition of riparian buffers and stream bank stabilization projects will minimize the nutrient runoff and slow down the effects of eroding waters. Contour crop rotation is a practiced farming procedure, but contour elevations on most of the farming fields in this watershed are steep. By adding contour buffers between contour elevations, will help to slow down runoff. These BMP's will also help in reducing suspended solids.

Priority #2: Tributary 30 Little Chest Creek

Site Description:

This monitoring point is located about 35 yards above the railroad bridge crossing. The sample was taken in the stream through a composite. This sample represents the last point before entering Chest Creek. Nitrate levels on average are 5.35 mg/l not exceeding drinking water standards. Near the headwaters and lower portion of this watershed, farming occurs. Water quality data can be found in the individual tributary sections.

Recommendations:

The Little Chest Creek watershed needs to reduce nitrate loadings entering the tributary. Portions of the tributary run through farmland, which inevitably add to the nitrate levels. Best Management Practices or BMP's such as riparian buffers and stream bank stabilization need to be implemented to help restore this watershed.

Estimated cost to implement BMP's $30,000 - $50,000.

Predicted Effect of BMP's on Receiving Stream:

The addition of riparian buffers and stream bank stabilization projects will minimize the nutrient runoff and slow down the effects of eroding waters. These BMP's will also help in reducing suspended solids.

Priority #3: Tributary 25 Duclos Run

Site Description:

This monitoring point is located about 30yards upstream from the effluent with Chest Creek. The sample was taken in the stream through a composite. The sample represents the last point before entering Chest Creek. Nitrate levels on average are 3.40 mg/l not exceeding drinking water standards. Farming occurs throughout the entire watershed. Water quality data can be found in the individual tributary sections.

Recommendations:

The Duclos Run watershed needs to implement BMP's such as riparian buffers, stream bank stabilization, and contour buffers to help reduce nitrate infiltration. Sediment runoff during high rainfall needs to be slowed down to prevent high nutrient loadings. With the implementation of the BMP's, the watershed will be able to sustain levels of nitrates below drinking water standards.

Estimated cost to implement BMP's $30,000 - $50,000.

Predicted Effect of BMP's on Receiving Stream:

The addition of riparian buffers and stream bank stabilization projects will minimize the nutrient runoff and slow down the effects of eroding waters. Contour crop rotation is a practiced farming procedure, but contour elevations on most of the farming fields in this watershed are steep. By adding contour buffers between contour elevations, will help to slow down runoff. These BMP's will also help in reducing suspended solids.

Middle Section

Priority #1: King's Run Pipe Discharge 48-1R

Site Description:

This discharge point is located in the King's Run watershed and is the first discharge on the right hand side of the stream facing upstream, emanating from the toe of and old strip job. The discharge averages 310.36 mg/l of acidity, 10.61 mg/l of total iron, 40.87 mg/l of total aluminum, and 10.37 mg/l of total manganese, with an average flow of 26.30 GPM. Water quality data can be found in the individual tributary sections.

Recommendations:

The first recommendation for this discharge is remining. It is believed that portions of the old Westover Deep mine are still intact and that removing the existing coal and proper backfilling could lessen the acidity loading.

Secondly according to the AMDtreat software, it is recommended that the discharge be treated passively using an Anaerobic Wetlands and a Manganese Removal Bed.

Estimated cost to implement both passive treatment systems $232,232.00

Predicted Effects of Passive Treatment and Remining on Receiving Stream:

It is unknown whether the coal remaining in the watershed is economically feasible to get to. If so, the removal of the coal along with backfilling with alkaline material would allow acidity levels to decrease and lessen acidity loadings to King's Run and the Chest Creek mainstem.

The passive treatment facilities would allow for reduction in acidity, iron, aluminum, and manganese levels. The metals would be retained in the settling pond and wetland. By installing these facilities you would restore the aquatic community in the King's Run watershed plus help to neutralize the amount of acidity entering the stream.

Other:

Once the design is final, a final O&M plan will be developed. Flushing may need to be done automatically or manually depending material costs at time of construction. Visual checks of the treatment system will need to be done on a monthly basis for any wildlife disturbance.

Priority #2: North Camp Run #3 50-3R & North Camp Run #2 50-R2 Discharges

Site Description:

These two discharges are located relatively close to one another and have similar water quality data. The water quality is so close that it is assumed that the discharges are coming from the same origin. The discharges are located in the North Camp Run watershed. Facing upstream from the confluence with Chest Creek, this is the second and third discharge located on the right hand side. The discharges are located just off of North Camp Road near the Compass Coal Refuse Site entrance. 50-3R combines with 50-2R about 30yards below 50-2R's origin and flows into a wetland. The wetland then flows into a huge beaver dam, before entering North Camp Run. Water quality data can be found in the individual tributary sections.

Recommendations:

According to the AMDtreat software both discharges require Aerobic wetlands and Manganese Removal beds. These systems will decrease iron loadings along with manganese loadings entering North Camp Run.

Estimated cost to implement both passive treatment systems $309,918.00

Predicted Effects of Passive Treatment on Receiving Stream:

By combining the discharges the treatment facilities would eliminate iron loadings along with reducing manganese concentrations entering North Camp Run. The metals would be retained in the settling pond and wetlands. North Camp Run already possesses an aquatic community but lacks in diversity. With these treatment facilities, North Camp Run would be able to sustain a more viable and diversified aquatic community.

Other:

Once the design is final, a final O&M plan will be developed. Precipitated metals in the settling ponds will need addition maintenance for removal. Visual checks of the treatment system will need to be done on a monthly basis for any wildlife disturbance.

Priority #3: Route 36 Discharge 38-1L

Site Description:

The Route 36 discharge, 38-1L is located in the Brubaker Run watershed. Heading north on Route 36 from Patton, the discharge is located on the right hand side of the road approximately 2 miles past the town of St. Boniface before Hockenberry Road. It emanates from the Seldom Seam Mine and flows under Route 36 to land between the stream and the highway. The discharge averages 28.53 mg/l of acidity and 6.42 mg/l of alkalinity, and 3.79 mg/l of aluminum. Water quality data can be found in the individual tributary sections.

Recommendations:

According to the AMDtreat software the discharge requires a Vertical Flow Pond treatment facility. This treatment facility will decrease the aluminum loadings along with acidity loadings entering Brubaker Run.

Estimated cost to implement a passive treatment systems $142,218.00

Predicted Effects of Passive Treatment on Receiving Stream:

The vertical flow pond system would decrease acidity and aluminum along with adding alkalinity to Brubaker Run. The metals would be retained in the settling pond and the polishing pond would produce alkaline water with minimum aluminum concentrations.

Other:

Once the design is final, a final O&M plan will be developed. Precipitated metals in the settling ponds will need addition maintenance for removal. Visual checks of the treatment system will need to be done on a monthly basis for any wildlife disturbance.

Priority #4: Little Brubaker Run 38A

Site Description:

The Little Brubaker Run watershed is impacted by AMD in the lower section. During the study, permission to sample the discharge(s) located in the watershed was denied by the landowner. Samples were taken at the mouth of Little Brubaker Run, which showed average loadings of iron at 79.91 lbs/day. These loadings indicate AMD is a problem. Water quality data can be found in the individual tributary sections.

Recommendations:

A change of ownership over the land is currently in its beginning stages. The Pennsylvania Game Commission is in the process of acquiring the land from a mining company. Once ownership has changed hands getting access from the Game Commission shouldn't be a problem. An additional individual watershed monitoring plan needs to be developed, along with installation of weirs and a 12 month sampling program to fully assess the Little Brubaker Run watershed.

Predicted Effects on Receiving Stream:

With the additional study of the discharge(s), the water quality data will be used to design a passive treatment system(s). By treating these discharge(s) the lower portion of the watershed would support aquatic communities.

Other:

Additional monies were leftover from the Chest Creek Assessment Growing Greener Grant. A letter was sent to DEP upon approval, to extent the monies to further study the watershed, and upon completion of the study, the report would be added to the assessment.

Lower Section

Priority #1 Tributary 66

Site Description:

Tributary 66 is located in the borough of Mahaffey. This tributary is piped through part of the borough. Samples were taken right after the pipe. During sampling visual sightings of raw sewage were detected. Average Fecal Coliform colony counts were 375.83 colonies/100ml.

Recommendations:

Mahaffey Borough has a Wastewater Treatment Plant that serves the borough, but some homes in the community are speculated to not be online with the plant. The borough or the DEP needs to enforce stricter regulations to homeowners who are not online with the plant.

Predicted Effects of Fecal Coliform on Receiving Stream:

If the tributary continues to establish colonies of Fecal Coliform it becomes a health hazard to the community.

Other:

The Borough of Mahaffey could write grants through PENNVEST, a state agency that helps municipalities with water infrastructure problems, to fund a project to help connect homes that are not online with the plant.

Priority #2 Tributary 64

Site Description:

Tributary 64 is located in the southern part of Mahaffey Borough. The tributary runs past numerous homes through Mahaffey before entering Chest Creek. Samples were taken approximately 20 yards above the confluence with Chest Creek. No visual sightings of raw sewage were detected at this sampling point. Average Fecal Coliform colony counts were 301.25 colonies/100ml.

Recommendations:

Mahaffey Borough has a Wastewater Treatment Plant that serves the borough, but some homes in the community are speculated to not be online with the plant. The borough or the DEP needs to enforce stricter regulations to homeowners who are not online with the plant.

Predicted Effects of Fecal Coliform on Receiving Stream:

If the tributary continues to establish colonies of Fecal Coliform it becomes a health hazard to the community.

Other:

The Borough of Mahaffey could write grants through PENNVEST, a state agency that helps municipalities with water infrastructure problems, to fund a project to help connect homes that are not online with the plant.

Priority #3 Tributary 57 Wilson Run

Site Description:

Tributary 57 starts in Ferguson Township before entering Chest Creek in the town of LaJose. The tributary runs through the towns of Thompsontown and LaJose. Both towns are small in population but nether has a Wastewater Treatment Plant. Samples were taken at the effluent of Wilson Run near Curly Hurd Park about 25 yards upstream. Visual

sightings of raw sewage were not detected. Average Fecal Coliform colony counts were 53 colonies/100ml.

Recommendations:

The town of Thompsontown and LaJose need to develop a sanitary sewage plan to capture the numerous homes in these towns. Raw sewage then can be pumped or gravity flow to the Mahaffey Plant located about 3miles north on route 36 downstream.

Predicted Effects of Fecal Coliform on Receiving Stream:

If the tributary continues to establish colonies of Fecal Coliform it becomes a health hazard to the community.

Other:

The towns of Thompsontown and LaJose along with their local municipality governing body could write grants through PENNVEST, a state agency that helps municipalities with water infrastructure problems, to fund a project to help connect homes that are not online with the plant.

Summary

The Chest Creek mainstem from the headwaters to its confluence with the West Branch of the Susquehanna River does not show severe impairment, which substantially affects the aquatic communities. No one individual tributary impacts the mainstem enough to degrade the overall chemistry of the Chest Creek mainstem.

The areas recommended for remediation would help to improve the overall health of Chest Creek, and aid in supporting growing aquactic communities.

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APPENDIX A

Location Maps:

A-1 This map displays the state of Pennsylvania and the Chest Creek watershed within the state.

A-2 A map of the Chest Creek watershed and its surrounding municipalities.

Stream Quality Integrated List:

A-3 Displays the Chest Creek watershed and all receiving streams that are attaining or non-attaining in a color-coded version to represent stream quality throughout the entire watershed in Cambria and Clearfield Counties.

Chapter 93 Stream Quality:

A-4 Displays the Chest Creek watershed and all receiving streams and their Chapter 93 designation in Cambria and Clearfield Counties.

Land Use/Land Cover:

A-5 Displays the Chest Creek watershed land use/land cover in each municipality in Cambria and Clearfield Counties.

Industrial Influences:

A-6 A map displaying the Chest Creek watershed and areas that were influenced by industry in or near the boundary outline.

Surface Geology:

A-7 Displays the underline geological formation found in the Chest Creek watershed in Cambria and Clearfield Counties.

Classified Soils:

A-8 Displays the Chest Creek watershed and the underline soil classifications found throughout the watershed in Cambria and Clearfield Counties.

Subwatershed Boundaries:

A-9 Displays the Chest Creek watershed and 66 subwatersheds located in Cambria and Clearfield Counties.

Sampling Point Locations:

A-10 Displays the Chest Creek watershed and all points monitored during the study in Cambria and Clearfield Counties.

Historical Sampling Points:

A-11 Displays the Chest Creek watershed and points from historical mining permits water quality data.

Chest Creek Watershed Assessment and Restoration Plan

Individual Tributaries

The Individual Tributaries section contains maps, water quality data sheets, and informative text concerning each tributary in the Chest Creek watershed. Each tributary has a surface geology map, a soils map, a topographic map, an aerial photography map, and an industrial influences map. Spreadsheets for tributary water quality are located in every individual section. In addition, spreadsheets for discharge water quality may be found in a tributary section, if the information is available and relevant. Below is a breakdown of the informative text that is found in each individual tributary section.

Location

The locations of these tributaries were derived from 7.5-minute series (topographic) quadrangle maps produced by the United States Department of Interior Geological Survey. The Chest Creek watershed falls within six quadrangles used: Carrolltown, PA; Hastings, PA; Westover, PA, Irvona, PA, Burnside, PA, and Mahaffey, PA.

Chapter 93 Designation

The Chapter 93 Designation is a designation granted by the Pennsylvania Department of Environmental Protection. The provisions of Chapter 93 are issued under sections 5 and 402 of the Clean Streams Law. [16] All tributaries within the Chest Creek watershed fall within three protected use designations and are defined as below within Chapter 93:

Aquatic Life

CWF: Cold Water Fishes- Maintenance and/or propagation of fish species including the family Salmonidae and additional flora and fauna which are indigenous to a cold water habitat.[16]

Special Protection

HQ: High Quality Waters- A stream or watershed which has excellent quality waters and environmental or other features that require special water quality protection. [16]
EV: Exceptional Value Waters- A stream or watershed which constitutes an outstanding national, State, regional or local resource, such as waters of national, State or county parks or forests, or waters which are used as a source of unfiltered potable water supply, or waters of wildlife refuges or State game lands, or waters which have been characterized by the Fish Commission as “Wilderness Trout Streams,” and other waters of substantial recreational or ecological significance. [16]
National Wetlands Inventory Information

16) Commonwealth of Pennsylvania: Pennsylvania Code. Title 25. Environmental Code: Department of Environmental Protection Chapter 93 Water Quality Standards. Pages 93-7, 93-8, 93-81. Current through 29 Pa.B. 968 (February 13, 1999).

The wetlands inventory section provides a list of wetland habitat types found within the watershed. The U.S. Fish and Wildlife Service produces the national wetlands inventory. The inventory lists the type and location of wetlands found in the United States. When compiling wetland data two sources were consulted for tributary watersheds. One being the wetlands digital mapper found at http://www.fws.gov/wetlands/, the other being 7.5-minute series (topographic) quadrangle maps prepared by the National Wetlands Inventory: Department of the Interior. The two quadrangle maps used in this report were Carrolltown, PA and Hastings, PA. The digital mapper was used on the section of the watershed found on the Westover quadrangle map. *Special Note: When "None Mapped" appears in the habitat type section this does not necessarily suggest wetlands are absent in that watershed. This only indicates that no wetlands were mapped.

Geology and Soils

The Geology and Soils section contains data on surface geology and soils found in each watershed. The data was derived from reports produced by GIS analysis. The surface geology section contains the symbol, name, acreage, and square miles of each surface geology formation within the watershed. It also contains the acreage and square miles sum of all surface geology formations within the watershed. The soils section contains the symbol, acreage, square miles, and soils classification. It also contains the acreage and square miles sum of the soils by classification. More information on the soils found in this watershed can be found on pages 8-37.

Mining

The mining section contains the names of all SMP permits within the watershed. Refer to pages 42-49 for specific information concerning individual surface mining permits.

Land Use

The Land Use section contains data on the type of land use found in each watershed. The data was derived from reports produced by GIS analysis. The surface geology section contains the description of land use, acreage, and square miles of each type of land use within the watershed. It also contains the acreage and square miles sum of all land use in the watershed.

Pollution Sources

The pollution sources sections include the discharges found within each watershed.

Additional Notes

The additional notes section contains unique information about the individual watersheds.

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-01	Subwatershed Boundry Outline (topography)
B-IN-01	Subwatershed Industrial Influences
B-SO-01	Subwatershed Soils
B-AP-01	Subwatershed Aerial Photography
B-SG-01	Subwatershed Surface Geology

Tributary 1 ** Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Allegheny Township, Cambria County

B. Chapter 93 Designation: HQ-CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PEM1A- Palustrine, emergent, persistent, temporary

II. Quadrangle: Carrolltown, PA

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcc	Casselman Formation	242.377029	0.378714

ACREAGE Sum

242.377029

SQ_MI Sum

0.378714

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
GwD	25.456491	0.039776	General Soils
WgD	17.4889	0.027326	General Soils

SubShedSoilsCambria.ACREAGE Sum

42.94539

SubShedSoilsCambria.SQ_MI Sum

0.067102

HYDRIC SOILS			
At	14.253744	0.022271	Hydric Soils
BtB	9.140952	0.014283	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum

23.394696

SubShedSoilsCambria.SQ_MI Sum

0.036554

PRIME FARMLAND SOILS			
GnB	5.781995	0.009034	Prime Farmland Soils
RaB	0.206185	0.000322	Prime Farmland Soils
WaB	15.622869	0.024411	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

21.61105

SubShedSoilsCambria.SQ_MI Sum

0.033767

STATEWIDE IMPORTANT SOILS

CaB	71.524734	0.111757	Statewide Important Soils
CaC	17.009102	0.026577	Statewide Important Soils
GtC	4.222858	0.006598	Statewide Important Soils
GwB	9.620208	0.015032	Statewide Important Soils
GwC	31.924404	0.049882	Statewide Important Soils
WaC	0.066725	0.000104	Statewide Important Soils
WgC	20.057857	0.03134	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

154.425887

SubShedSoilsCambria.SQ_MI Sum

0.24129

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	**Acreage**	**SQ_MI**
Low Density Urban	0.98011	0.001531
Hay Pasture	49.761587	0.077752
Row Crops	86.23014	0.134735
Coniferous Forest	9.686603	0.015135
Mixed Forest	7.307081	0.011417
Deciduous Forest	78.696927	0.122964
Transitional	9.714578	0.015179

Acreage Sum

242.377024

SQ_MI Sum

0.378714

G. Pollution Sources: Some Nutrient Runoff

H. Additional Notes: Work with local farmers in this watershed to improve BMP’s

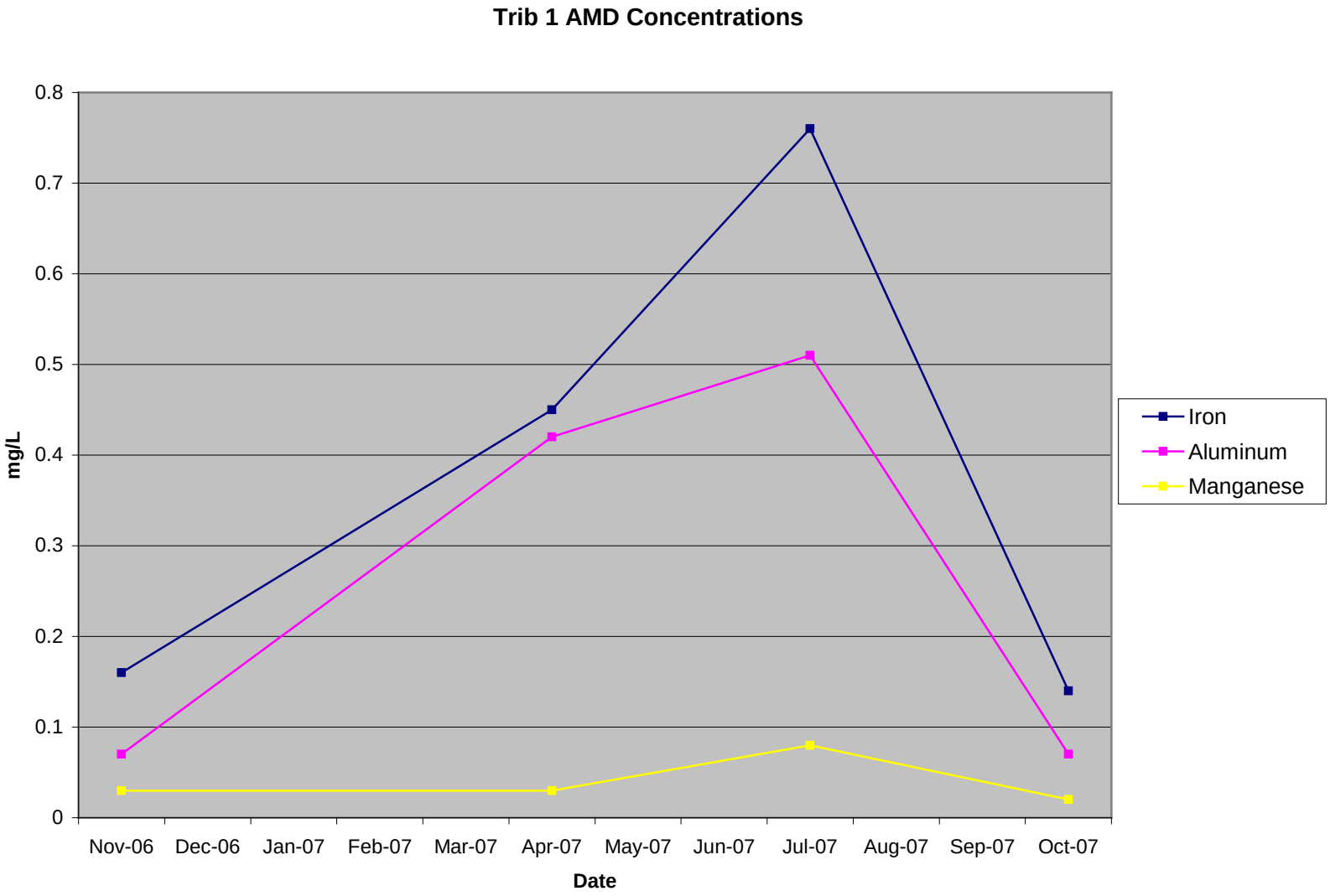
Tributary Number 1

Cambria County; Allegheny Township

CCWA Monitoring Point: Trib Number 1																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids*	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/11/2006	CCWA	46.05	8.08	307	65	--	80	--	--	--	--	--	131.6	--	44.35	--	--	--	--
11/21/2006	CCWA	216.65	8	207	37	-39	58	0.16	0.07	0.03	21	3.1	139	-101.72	151.27	0.42	0.18	0.08	54.77
1/30/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
4/17/2007	CCWA	698.74	6.8	150	33	-18	35	0.45	0.42	0.03	18	2.5	106	-151.41	294.41	3.79	3.53	0.25	151.41
7/10/2007	CCWA	10.95	7.7	348	74	-107	123	0.76	0.51	0.08	21	2.5	197	-14.10	16.21	0.10	0.07	0.01	2.77
10/2/2007	CCWA	27.58	7.9	308	70	-104	117	0.14	0.07	0.02	19	2.5	191	-34.53	38.85	0.05	0.02	0.01	6.31
Number of sample Dates	Count	5	5	5	5	4	5	4	4	4	4	4	5	4	5	4	4	4	4
	Max	698.74	8.08	348	74	-18	123	0.76	0.51	0.08	21	3.1	197	-14.10	294.41	3.79	3.53	0.25	151.41
	Min	10.95	6.8	150	33	-107	35	0.14	0.07	0.02	18	2.5	106	-151.41	16.21	0.05	0.02	0.01	2.77
6	Average	199.99	7.70	264.00	55.80	-67.00	82.60	0.38	0.27	0.04	19.75	2.65	152.92	-75.44	109.02	1.09	0.95	0.09	53.81

Note: 9/11/06 Data is FIELD only.

Date	Nitrates (ppm)	Phos. (ppm)	Nitrates (lbs/day)	Phos. (lbs/day)
9/11/2006	13.2	0.1	7.317662	0.055437
11/21/2006	3.77	0.09	9.83261	0.234731
1/30/2007	Frozen	Frozen	Frozen	Frozen
4/17/2007	2.65	0.08	22.29104	0.672937
7/10/2007	1.82	0.18	0.239913	0.023728
10/2/2007	2.13	0.03	0.707201	0.009961
Count	5	5	5	5
Max	13.2	0.18	22.29104	0.672937
Min	1.82	0.03	0.239913	0.009961
Average	4.714	0.096	8.077684	0.199359


Trib 1 AMD Concentrations
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
mg/L
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-02	Subwatershed Boundry Outline (topography)
B-IN-02	Subwatershed Industrial Influences
B-SO-02	Subwatershed Soils
B-AP-02	Subwatershed Aerial Photography
B-SG-02	Subwatershed Surface Geology

Tributary 2 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Allegheny Township, Cambria County

B. Chapter 93 Designation: HQ-CWF

C. National Wetlands Inventory Information:
I. Habitat Types: none mapped
II. Quadrangle: Carrolltown, PA

D. Geology and Soils:
I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcc	Casselman Formation	122.674161	0.191678

ACREAGE Sum
122.674161
SQ_MI Sum
0.191678

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
GwD	8.151307	0.012736	General Soils

SubShedSoilsCambria.ACREAGE Sum
8.151307
SubShedSoilsCambria.SQ_MI Sum
0.012736

HYDRIC SOILS			
BtB	17.074074	0.026678	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum
17.074074
SubShedSoilsCambria.SQ_MI Sum
0.026678

PRIME FARMLAND SOILS			
CeB	10.400897	0.016251	Prime Farmland Soils
GnB	5.61237	0.008769	Prime Farmland Soils
HaB	0.364158	0.000569	Prime Farmland Soils
RaB	1.082913	0.001692	Prime Farmland Soils
WaB	23.203978	0.036256	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum
40.664316
SubShedSoilsCambria.SQ_MI Sum

0.063538

STATEWIDE IMPORTANT SOILS

CaC	0.034398	0.000054	Statewide Important Soils
CeC	9.564403	0.014944	Statewide Important Soils
GwB	7.287038	0.011386	Statewide Important Soils
GwC	25.94078	0.040532	Statewide Important Soils
WaC	7.537746	0.011778	Statewide Important Soils
WgC	6.420099	0.010031	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

56.784463

SubShedSoilsCambria.SQ_MI Sum

0.088726

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	**Acreage**	**SQ_MI**
Hay Pasture	14.989229	0.023421
Row Crops	66.778055	0.104341
Mixed Forest	7.608529	0.011888
Deciduous Forest	25.976206	0.040588
Transitional	7.322143	0.011441

Acreage Sum

122.674161

SQ_MI Sum

0.191678

G. Pollution Sources: Some Nutrient Runoff

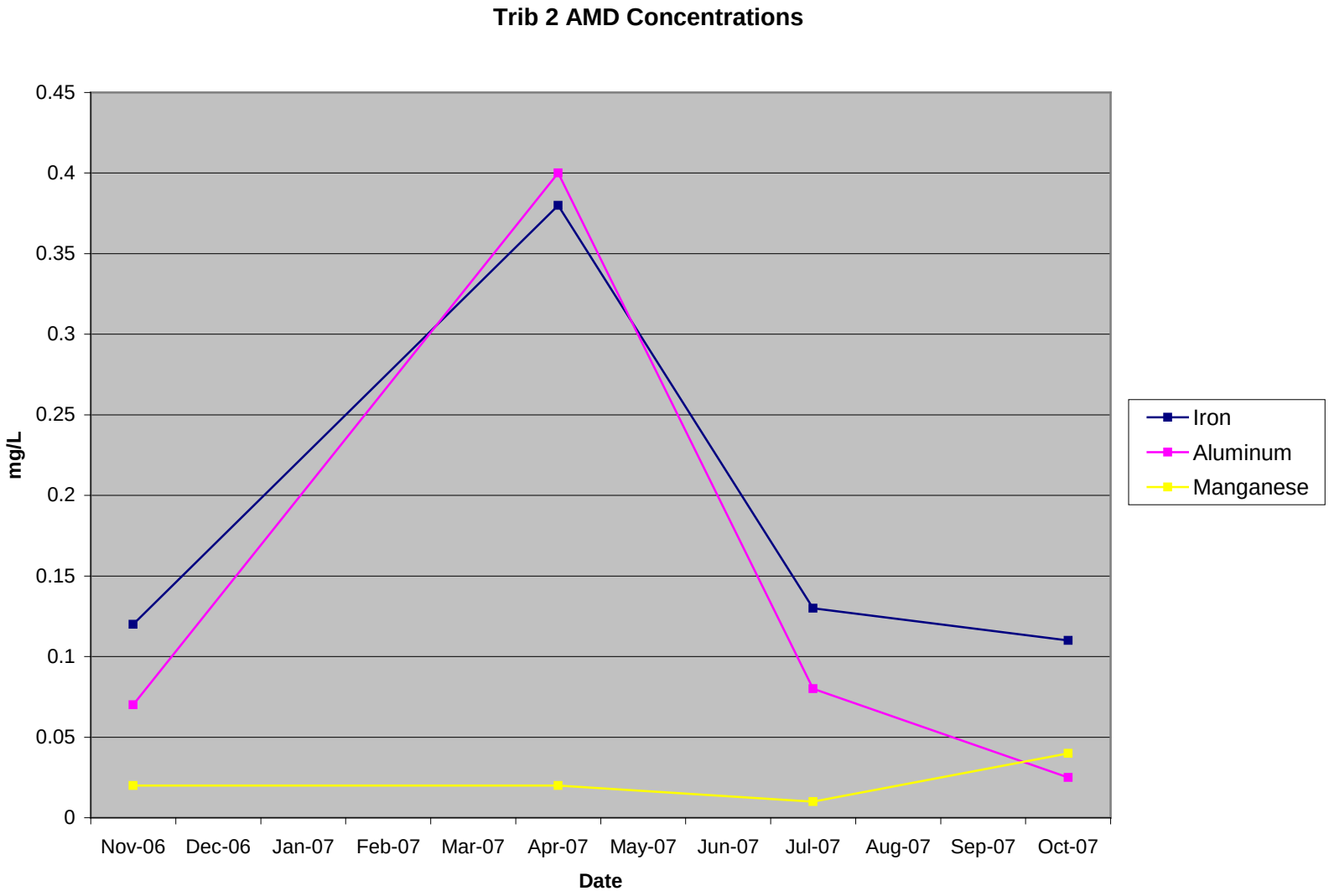
H. Additional Notes: Work with local farmers in this watershed to improve BMP’s

Tributary Number 2
Cambria County; Allegheny Township

CCWA Monitoring Point: Trib Number 2																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/11/2006	CCWA	39.68	8.08	502	65	--	70	--	--	--	--	--	350	--	33.44	--	--	--	--
11/21/2006	CCWA	92.1	7.9	298	42	-53	70	0.12	0.07	0.02	21	3.1	191	-58.76	77.61	0.13	0.08	0.02	23.28
1/30/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
4/17/2007	CCWA	301.7	6.9	208	33	-26	45	0.38	0.40	0.02	17	2.5	143	-94.43	163.44	1.38	1.45	0.07	61.74
7/10/2007	CCWA	6.1	7.9	448	75	-121	136	0.13	0.08	0.01	25	5	254	-8.89	9.99	0.01	0.01	0.00	1.84
10/2/2007	CCWA	50.27	7.9	410	65	-119	131	0.11	0.025	0.04	23	2.5	276	-72.02	79.28	0.07	0.02	0.02	13.92
Number of sample Dates	Count	5	5	5	5	4	5	4	4	4	4	4	5	4	5	4	4	4	4
	Max	301.7	8.08	502	75	-26	136	0.38	0.4	0.04	25	5	350	-8.89	163.44	1.38	1.45	0.07	61.74
	Min	6.1	6.9	208	33	-121	45	0.11	0.025	0.01	17	2.5	143	-94.43	9.99	0.01	0.01	0.00	1.84
6	Average	97.97	7.74	373.20	56.00	-79.75	90.40	0.19	0.14	0.02	21.50	3.28	242.80	-58.52	72.75	0.40	0.39	0.03	25.20

Note: 9/11/06 Data is FIELD only.

Date	Nitrates (ppm)	Phos. (ppm)	Nitrates (lbs/day)	Phos. (lbs/day)
9/11/2006	26.4	0.1	12.61085	0.047768
11/21/2006	8.24	0.09	9.13599	0.099786
1/30/2007	Frozen	Frozen	Frozen	Frozen
4/17/2007	5.21	0.15	18.92264	0.544798
7/10/2007	7.69	0.11	0.564709	0.008078
10/2/2007	8.82	0.03	5.337603	0.018155
Count	5	5	5	5
Max	26.4	0.15	18.92264	0.544798
Min	5.21	0.03	0.564709	0.008078
Average	11.272	0.096	9.314359	0.143717


Trib 2 AMD Concentrations
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
mg/L
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-03	Subwatershed Boundry Outline (topography)
B-IN-03	Subwatershed Industrial Influences
B-SO-03	Subwatershed Soils
B-AP-03	Subwatershed Aerial Photography
B-SG-03	Subwatershed Surface Geology

Chest Creek Watershed Assessment and Restoration Plan

Tributary 3 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Cambria and East Carroll Townships, Cambria County

B. Chapter 93 Designation: HQ-CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PFO4A- Palustrine, forested, needle-leaved evergreen, temporary

PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded

II. Quadrangle: Carrolltown, PA

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcc	Casselman Formation	882.000645	1.378126

ACREAGE Sum

882.000645

SQ_MI Sum

1.378126

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
CvD	58.09707	0.090777	General Soils
GWF	23.274579	0.036367	General Soils
GtD	87.416687	0.136589	General Soils
HaD	4.57322	0.007146	General Soils
HbB	15.302119	0.02391	General Soils
HbD	66.151253	0.103361	General Soils
WgD	9.848659	0.015389	General Soils

SubShedSoilsCambria.ACREAGE Sum

264.663587

SubShedSoilsCambria.SQ_MI Sum

0.413537

HYDRIC SOILS

BtB	112.239466	0.175374	Hydric Soils
NoB	26.444939	0.04132	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum

138.684405

SubShedSoilsCambria.SQ_MI Sum

0.216694

PRIME FARMLAND SOILS

CeB	53.733212	0.083958	Prime Farmland Soils
GnB	50.730334	0.079266	Prime Farmland Soils
HaB	31.471876	0.049175	Prime Farmland Soils
HaC	12.443468	0.019443	Prime Farmland Soils
LaB	1.341042	0.002095	Prime Farmland Soils
WaB	58.699022	0.091717	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

208.418954

SubShedSoilsCambria.SQ_MI Sum

0.325655

STATEWIDE IMPORTANT SOILS

BeB	3.38565	0.00529	Statewide Important Soils
BmB	11.024592	0.017226	Statewide Important Soils
BmC	18.518192	0.028935	Statewide Important Soils
CaB	28.023151	0.043786	Statewide Important Soils
CaC	5.403679	0.008443	Statewide Important Soils
CeC	45.591395	0.071237	Statewide Important Soils
GtC	62.979817	0.098406	Statewide Important Soils
GwB	4.904174	0.007663	Statewide Important Soils
GwC	12.767905	0.01995	Statewide Important Soils
WaC	5.118056	0.007997	Statewide Important Soils
WgC	71.965686	0.112446	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

269.682298

SubShedSoilsCambria.SQ_MI Sum

0.421379

WATER

Soils Classification

W	0.551379	0.000862	Water

SubShedSoilsCambria.ACREAGE Sum

0.551379

SubShedSoilsCambria.SQ_MI Sum

0.000862

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Low Density Urban	1.768231	0.002763
Hay Pasture	94.279738	0.147312
Row Crops	210.126953	0.328323
Coniferous Forest	27.896033	0.043588

Mixed Forest	7.425471	0.011602
Deciduous Forest	507.76846	0.793388
Transitional	32.008773	0.050014

Acreage Sum

881.27366

SQ_MI Sum

1.37699

G. Pollution Sources: Some Nutrient Runoff and Erosion from Dirt Roads.

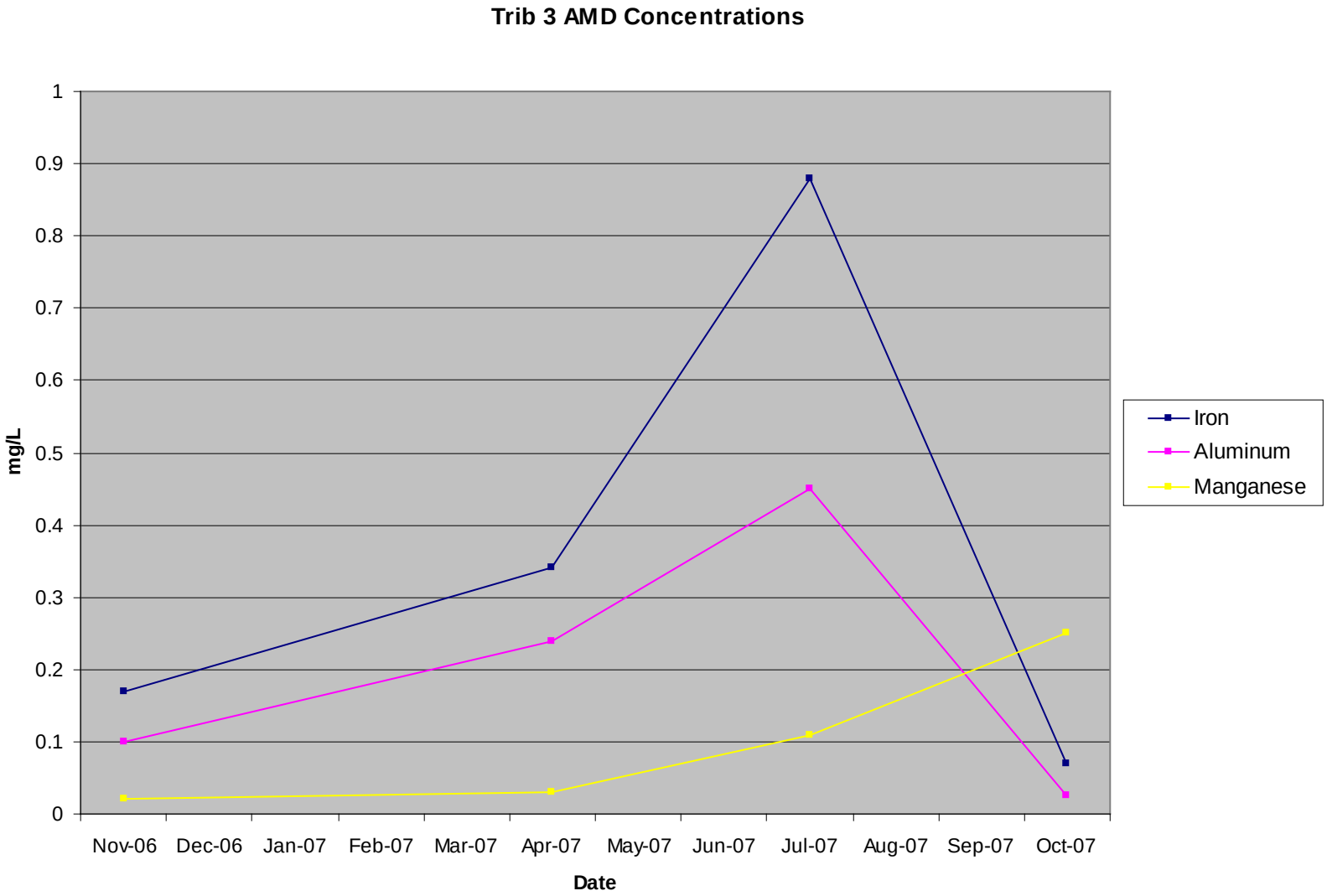
H. Additional Notes: Work with the farmers in the watershed to improve or build BMP's, plus try and work with the local municipality on drainage issues on their Dirt & Gravel roads.

Tributary Number 3
Cambria County; Cambria Township

CCWA Monitoring Point: Trib Number 3														Loading					
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.						
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/11/2006	CCWA	96.45	7.75	149.1	63	--	60	--	--	--	--	--	95	--	69.67	--	--	--	--
11/21/2006	CCWA	855.78	7	109	42	-5	25	0.17	0.1	0.02	15	3.2	84	-51.51	257.56	1.75	1.03	0.21	154.53
1/30/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
4/17/2007	CCWA	1727.46	6.5	104	32	-2	17	0.34	0.24	0.03	14	2.5	75	-41.59	353.53	7.07	4.99	0.62	291.14
7/10/2007	CCWA	24.82	7.3	188	76	-50	65	0.88	0.45	0.11	13	13	99	-14.94	19.42	0.26	0.13	0.03	3.88
10/3/2007	CCWA	66.2	7.4	173	65	-44	58	0.07	0.025	0.25	13	2.5	90	-35.07	46.22	0.06	0.02	0.20	10.36
Number of sample Dates	Count	5	5	5	5	4	5	4	4	4	4	4	5	4	5	4	4	4	4
	Max	1727.46	7.75	188	76	-2	65	0.88	0.45	0.25	15	13	99	-14.94	353.53	7.07	4.99	0.62	291.14
	Min	24.82	6.5	104	32	-50	17	0.07	0.025	0.02	13	2.5	75	-51.51	19.42	0.06	0.02	0.03	3.88
6	Average	554.14	7.19	144.62	55.60	-25.25	45.00	0.37	0.20	0.10	13.75	5.30	88.60	-35.78	149.28	2.29	1.54	0.27	114.98

Note: 9/11/06 Data is FIELD only.

Date	Nitrates (ppm)	Phos. (ppm)	Nitrates (lbs/day)	Phos. (lbs/day)
9/11/2006	4.4	0.11	5.108856	0.1277
11/21/2006	1.53	0.15	15.7624	1.5453
1/30/2007	Frozen	Frozen	Frozen	Frozen
4/17/2007	1.43	0.1	29.73807	2.0796
7/10/2007	0.25	0.14	0.074698	0.0418
10/3/2007	0.601	0.03	0.478962	0.0239
Count	5	5	5	5
Max	4.4	0.15	29.73807	2.0796
Min	0.25	0.03	0.074698	0.0239
Average	1.6422	0.106	10.2326	0.7637


Trib 3 AMD Concentrations
mg/L
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-04	Subwatershed Boundry Outline (topography)
B-IN-04	Subwatershed Industrial Influences
B-SO-04	Subwatershed Soils
B-AP-04	Subwatershed Aerial Photography
B-SG-04	Subwatershed Surface Geology

Chest Creek Watershed Assessment and Restoration Plan

Tributary 4 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: East Carroll Township, Cambria County

B. Chapter 93 Designation: HQ-CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded
PSS1A- Palustrine, scrub/ shrub, broad-leaved deciduous, temporary
PEM1A- Palustrine, emergent, persistent, temporary
PFO4A- Palustrine, forested, needle-leaved evergreen, temporary
P EM/SS 1A- Palustrine, emergent, persistent, temporary/ Palustrine, scrub/ shrub, broad-leaved deciduous, temporary
PUBHx- Palustrine, unconsolidated bottom, permanent, excavated

II. Quadrangle: Carrolltown, PA

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcc	Casselman Formation	587.160628	0.917438
Pcg	Glenshaw Formation	318.976428	0.498401

ACREAGE Sum
906.137056
SQ_MI Sum
1.415839

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
CvD	50.206246	0.078447	General Soils
GWF	29.032436	0.045363	General Soils
GtD	33.734429	0.05271	General Soils
GwD	14.819154	0.023155	General Soils
HaD	14.065759	0.021978	General Soils
HbB	1.312951	0.002051	General Soils
HbD	98.573612	0.154021	General Soils
WgD	46.086101	0.07201	General Soils

SubShedSoilsCambria.ACREAGE Sum
287.830687
SubShedSoilsCambria.SQ_MI Sum
0.449735

HYDRIC SOILS

AmB	4.277573	0.006684	Hydric Soils
BtB	95.974756	0.149961	Hydric Soils
NoB	2.928685	0.004576	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum

103.181014

SubShedSoilsCambria.SQ_MI Sum

0.16122

PRIME FARMLAND SOILS

CeB	47.974912	0.074961	Prime Farmland Soils
GnB	67.810402	0.105954	Prime Farmland Soils
HaB	34.227163	0.05348	Prime Farmland Soils
LaB	34.731883	0.054269	Prime Farmland Soils
RaB	10.660783	0.016657	Prime Farmland Soils
WaB	34.095897	0.053275	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

229.501039

SubShedSoilsCambria.SQ_MI Sum

0.358595

STATEWIDE IMPORTANT SOILS

BmB	19.430934	0.030361	Statewide Important Soils
BmC	2.609689	0.004078	Statewide Important Soils
CaB	67.561874	0.105565	Statewide Important Soils
CeC	83.416941	0.130339	Statewide Important Soils
GtC	21.423139	0.033474	Statewide Important Soils
GwC	4.052171	0.006332	Statewide Important Soils
WaC	22.871933	0.035737	Statewide Important Soils
WgC	64.257632	0.100403	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

285.624313

SubShedSoilsCambria.SQ_MI Sum

0.446288

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	**Acreage**	**SQ_MI**
Low Density Urban	0.736913	0.001151
Hay Pasture	136.23349	0.212865
Row Crops	191.758326	0.299622
Coniferous Forest	23.061238	0.036033
Mixed Forest	4.469531	0.006984

Deciduous Forest	521.785947	0.815291
Transitional	27.994479	0.043741

Acreage Sum

906.039924

SQ_MI Sum

1.415687

G. Pollution Sources: Some Nutrient Runoff.

H. Additional Notes: Work with local farmers in this watershed to improve BMP's.

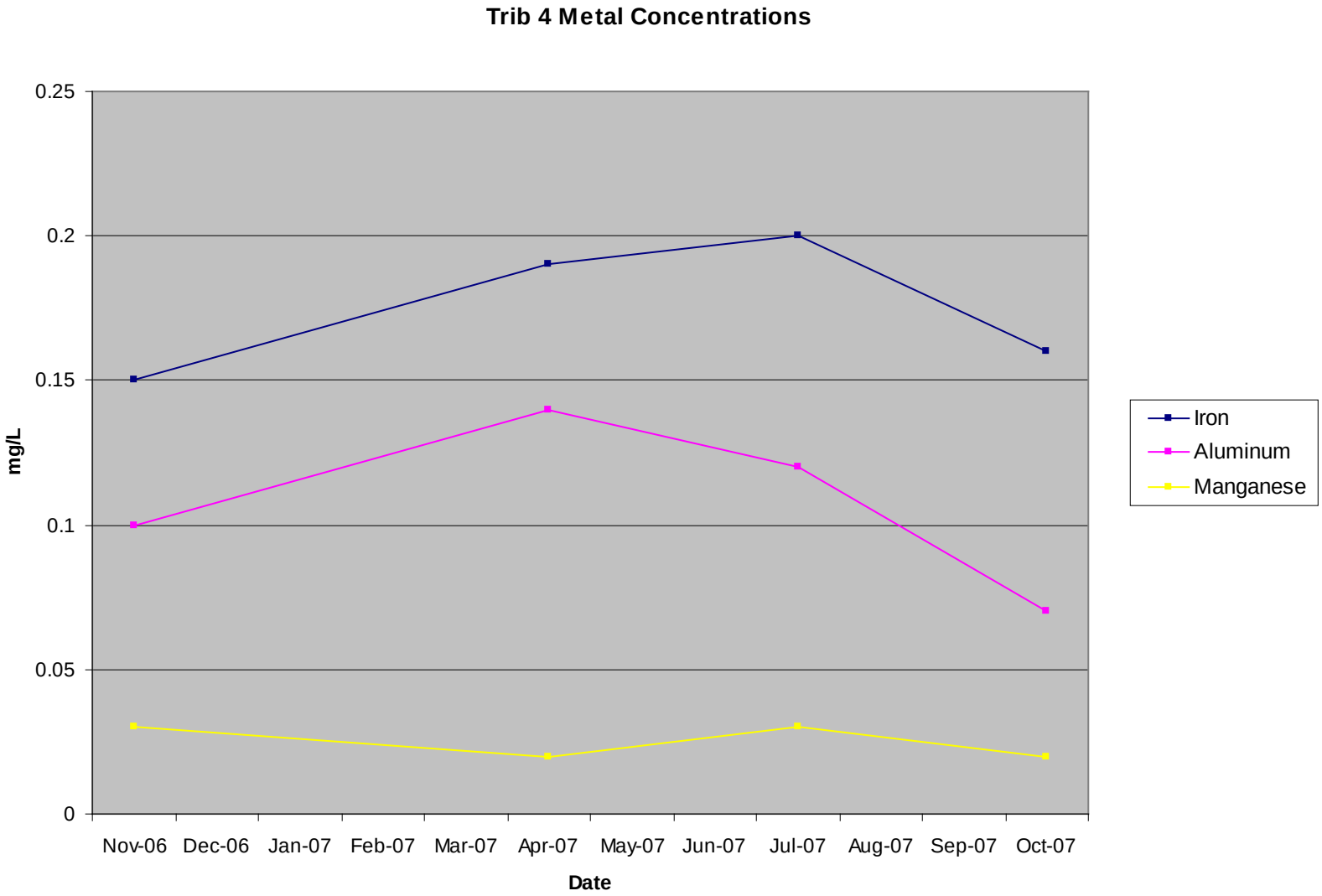
Tributary Number 4

Cambria County; Border of Cambria and East Carroll Townships

CCWA Monitoring Point: Trib Number 4																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/12/2006	CCWA	132.85	7.9	184.4	62	--	70	--	--	--	--	--	131.6	--	111.95	--	--	--	--
11/22/2006	CCWA	824.7	7.7	130	36	-5	28	0.15	0.1	0.03	15	3.2	63	-49.64	277.99	1.49	0.99	0.30	148.92
1/30/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
4/18/2007	CCWA	2256.63	6.5	115	34	-4	19	0.19	0.14	0.02	17	2.5	74	-108.66	516.16	5.16	3.80	0.54	461.83
7/11/2007	CCWA	24.51	7.8	277	74	-83	98	0.2	0.12	0.03	15	2.5	141	-24.49	28.92	0.06	0.04	0.01	4.43
10/3/2007	CCWA	56.82	7.7	241	70	-78	92	0.16	0.07	0.02	13	2.5	161	-53.35	62.93	0.11	0.05	0.01	8.89
Number of sample Dates	Count	5	5	5	5	4	5	4	4	4	4	4	5	4	5	4	4	4	4
	Max	2256.63	7.9	277	74	-4	98	0.2	0.14	0.03	17	3.2	161	-24.49	516.16	5.16	3.80	0.54	461.83
	Min	24.51	6.5	115	34	-83	19	0.15	0.07	0.02	13	2.5	63	-108.66	28.92	0.06	0.04	0.01	4.43
6	Average	659.10	7.52	189.48	55.20	-42.50	61.40	0.18	0.11	0.03	15.00	2.68	114.12	-59.04	199.59	1.70	1.22	0.22	156.02

Note: 9/12/06 Data is FIELD only.

Date	Nitrates (ppm)	Phos. (ppm)	Nitrates (lbs/day)	Phos. (lbs/day)
9/12/2006	1.1	0.09	1.759232	0.143937
11/22/2006	2.27	0.06	22.53672	0.595684
1/30/2007	Frozen	Frozen	Frozen	Frozen
4/18/2007	2.1	0.07	57.04905	1.901635
7/11/2007	0.56	0.18	0.165234	0.053111
10/3/2007	0.601	0.03	0.411097	0.020521
Count	5	5	5	5
Max	2.27	0.18	57.04905	1.901635
Min	0.56	0.03	0.165234	0.020521
Average	1.3262	0.086	16.38427	0.542978


Trib 4 Metal Concentrations
0.25
0.2
0.15
0.1
0.05
0
mg/L
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-05	Subwatershed Boundry Outline (topography)
B-IN-05	Subwatershed Industrial Influences
B-SO-05	Subwatershed Soils
B-AP-05	Subwatershed Aerial Photography
B-SG-05	Subwatershed Surface Geology

Chest Creek Watershed Assessment and Restoration Plan

Tributary 5 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: East Carroll Township, Cambria County

B. Chapter 93 Designation: HQ-CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PFO1A- Palustrine, forested, broad-leaved deciduous, temporary
PSS1C- Palustrine, scrub/ shrub, broad-leaved deciduous, seasonal
PFO4A- Palustrine, forested, needle-leaved evergreen, temporary
P EM/SS 1A- Palustrine, emergent, persistent, temporary/ Palustrine, scrub/ shrub, broad-leaved deciduous, temporary
PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded
PEM1C- Palustrine, emergent, persistent, seasonal

II. Quadrangle: Carrolltown, PA

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcc	Casselman Formation	455.78903	0.71217
Pcg	Glenshaw Formation	165.103162	0.257974

ACREAGE Sum

620.892193

SQ_MI Sum

0.970144

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
GWF	11.683504	0.018255	General Soils
GtD	9.759678	0.015249	General Soils
HaD	5.2048	0.008132	General Soils
HbD	0.034699	0.000054	General Soils
LDF	22.07689	0.034495	General Soils
WgD	75.149113	0.11742	General Soils

SubShedSoilsCambria.ACREAGE Sum

123.908684

SubShedSoilsCambria.SQ_MI Sum

0.193607

HYDRIC SOILS

BtB	134.883756	0.210756	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum

134.883756

SubShedSoilsCambria.SQ_MI Sum

0.210756

PRIME FARMLAND SOILS

CeB	8.596632	0.013432	Prime Farmland Soils
GnB	71.771451	0.112143	Prime Farmland Soils
HaB	24.41037	0.038141	Prime Farmland Soils
HaC	2.3552	0.00368	Prime Farmland Soils
LaB	4.140236	0.006469	Prime Farmland Soils
WaB	24.745954	0.038666	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

136.019842

SubShedSoilsCambria.SQ_MI Sum

0.212531

STATEWIDE IMPORTANT SOILS

CaB	82.02243	0.12816	Statewide Important Soils
CaC	16.53215	0.025831	Statewide Important Soils
CeC	32.797805	0.051247	Statewide Important Soils
GtC	12.56678	0.019636	Statewide Important Soils
GwB	4.710179	0.00736	Statewide Important Soils
WgC	71.82787	0.112231	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

220.457215

SubShedSoilsCambria.SQ_MI Sum

0.344464

WATER

W	5.622694	0.008785	Water

SubShedSoilsCambria.ACREAGE Sum

5.622694

SubShedSoilsCambria.SQ_MI Sum

0.008785

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	**Acreage**	**SQ_MI**
Water	2.21029	0.003454
Low Density Urban	1.401474	0.00219
Hay Pasture	81.815706	0.127837

Row Crops	226.035426	0.35318
Coniferous Forest	15.844154	0.024756
Mixed Forest	9.68858	0.015138
Deciduous Forest	258.882054	0.404503
Transitional	25.014505	0.039085

Acreage Sum

620.89219

SQ_MI Sum

0.970144

G. Pollution Sources: Some Nutrient Runoff.

H. Additional Notes: Work with local farmers and local golf course on improving or establishing new BMP'S.

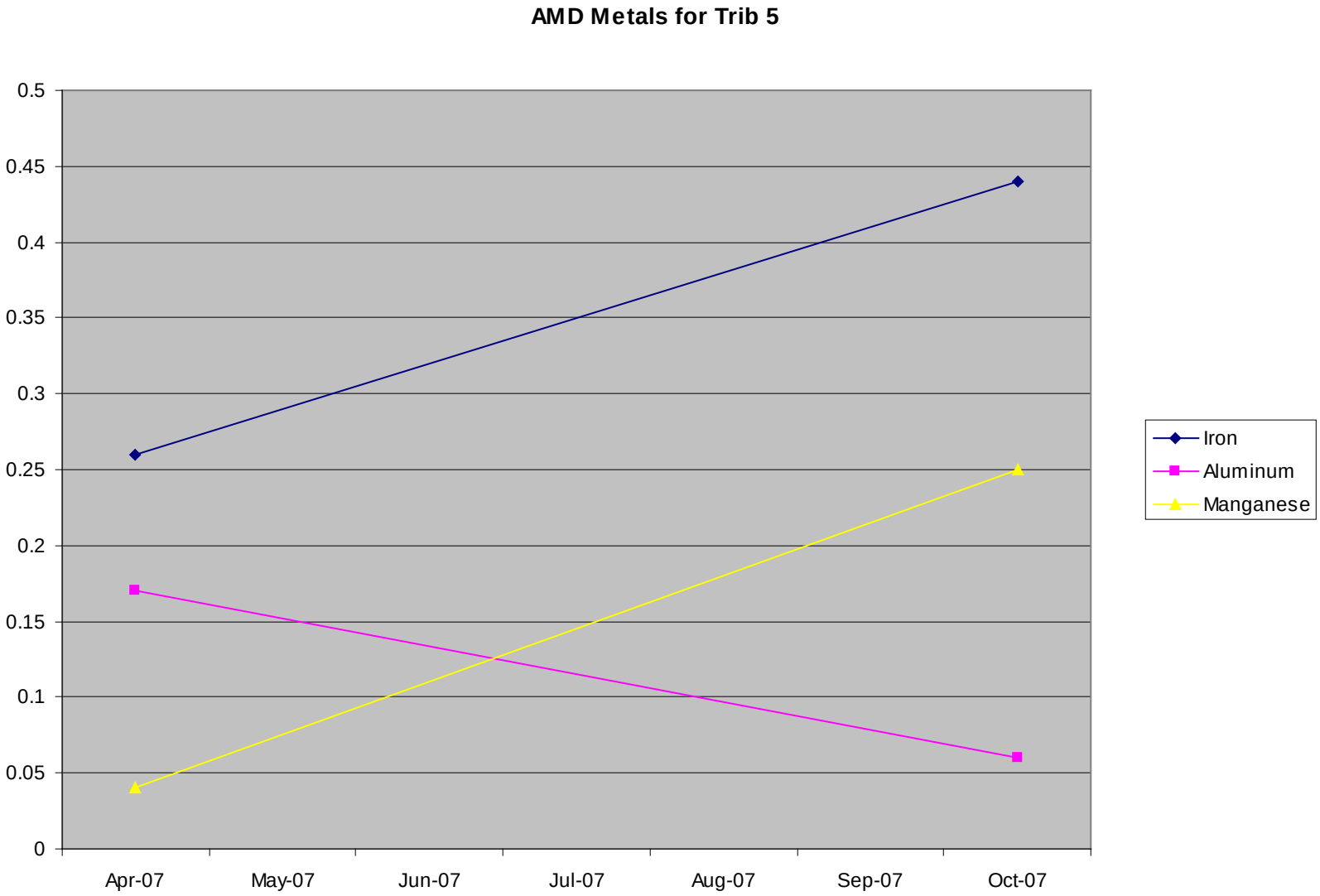
Tributary Number 5

Cambria County; East Carroll Township

CCWA Monitoring Point: Trib Number 5																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/12/2006	CCWA	38.06	7.8	255	60	--	60	--	--	--	--	--	182	--	27.49	--	--	--	--
11/22/2006	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
1/30/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
4/18/2007	CCWA	1422.88	6.5	151	34	-3	18	0.26	0.17	0.04	16	6	99	-51.39	308.33	4.45	2.91	0.69	274.07
7/11/2007	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
10/3/2007	CCWA	13.29	7.5	252	70	-75	89	0.44	0.06	0.25	13	5	134	-12.00	14.24	0.07	0.01	0.04	2.08
Number of sample Dates	Count	3	3	3	3	2	3	2	2	2	2	2	3	2	3	2	2	2	2
	Max	1422.88	7.8	255	70	-3	89	0.44	0.17	0.25	16	6	182	-12.00	308.33	4.45	2.91	0.69	274.07
	Min	13.29	6.5	151	34	-75	18	0.26	0.06	0.04	13	5	99	-51.39	14.24	0.07	0.01	0.04	2.08
6	Average	491.41	7.27	219.33	54.67	-39.00	55.67	0.35	0.12	0.15	14.50	5.50	138.33	-31.69	116.69	2.26	1.46	0.36	138.07

Note: 9/12/06 Data is FIELD only.

Date	Nitrates (ppm)	Phos. (ppm)	Nitrates (lbs/day)	Phos. (lbs/day)
9/12/2006	8.8	0.11	4.031997	0.0504
11/22/2006	Frozen	Frozen	Frozen	Frozen
1/30/2007	Frozen	Frozen	Frozen	Frozen
4/18/2007	3.6	0.13	61.66511	2.226796
7/11/2007	--	--	--	--
10/3/2007	0.844	0.08	0.135032	0.012799
Count	3	3	3	3
Max	8.8	0.13	61.66511	2.226796
Min	0.844	0.08	0.135032	0.012799
Average	4.414667	0.106667	21.94405	0.763332


AMD Metals for Trib 5
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-06	Subwatershed Boundry Outline (topography)
B-IN-06	Subwatershed Industrial Influences
B-SO-06	Subwatershed Soils
B-AP-06	Subwatershed Aerial Photography
B-SG-06	Subwatershed Surface Geology

Tributary 6 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: East Carroll Townships, Cambria County

B. Chapter 93 Designation: HQ-CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded

II. Quadrangle: Carrolltown, PA

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcc	Casselman Formation	18.930873	0.029579
Pcg	Glenshaw Formation	2.683948	0.004194

ACREAGE Sum

21.614821

SQ_MI Sum

0.033773

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
GWF	5.588684	0.008732	General Soils
GwD	0.143665	0.000224	General Soils
WgD	5.716107	0.008931	General Soils

SubShedSoilsCambria.ACREAGE Sum

11.448457

SubShedSoilsCambria.SQ_MI Sum

0.017888

HYDRIC SOILS			
BtB	0.568672	0.000889	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum

0.568672

SubShedSoilsCambria.SQ_MI Sum

0.000889

PRIME FARMLAND SOILS			
GnB	1.260892	0.00197	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

1.260892

SubShedSoilsCambria.SQ_MI Sum

0.00197

STATEWIDE IMPORTANT SOILS

CaB	3.497328	0.005465	Statewide Important Soils
GtC	3.76224	0.005878	Statewide Important Soils
WgC	1.077228	0.001683	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

8.336796

SubShedSoilsCambria.SQ_MI Sum

0.013026

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	**Acreage**	**SQ_MI**
Hay Pasture	3.884614	0.00607
Row Crops	7.109842	0.011109
Coniferous Forest	0.002469	0.000004
Mixed Forest	0.380795	0.000595
Deciduous Forest	7.986541	0.012479
Transitional	2.250558	0.003516

Acreage Sum

21.614818

SQ_MI Sum

0.033773

G. Pollution Sources: None

H. Additional Notes: This tributary never makes it directly to Chest Creek. It ends up flowing into a wetland, which is separate from Chest Creek by a road.

Tributary Number 6

Cambria County; East Carroll Township

CCWA Monitoring Point: Trib Number 6														Loading					
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.						
		(None)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/12/2006	CCWA	NO DATA, WETLAND												--	--	--	--	--	--
11/22/2006	CCWA													--	--	--	--	--	--
1/30/2007	CCWA													--	--	--	--	--	--
4/18/2007	CCWA													--	--	--	--	--	--
7/11/2007	CCWA													--	--	--	--	--	--
10/4/2007	CCWA													--	--	--	--	--	--
Number of sample Dates	Count	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Max	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Min	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
6	Average	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-07	Subwatershed Boundry Outline (topography)
B-IN-07	Subwatershed Industrial Influences
B-SO-07	Subwatershed Soils
B-AP-07	Subwatershed Aerial Photography
B-SG-07	Subwatershed Surface Geology

Tributary 7 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: East Carroll Township, Cambria County

B. Chapter 93 Designation: HQ-CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded

II. Quadrangle: Carrolltown, PA

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcc	Casselman Formation	27.513444	0.04299
Pcg	Glenshaw Formation	7.625497	0.011915

ACREAGE Sum

35.138941

SQ_MI Sum

0.054905

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
GWF	0.001694	0.000003	General Soils
GwD	6.829526	0.010671	General Soils
WgD	6.656876	0.010401	General Soils

SubShedSoilsCambria.ACREAGE Sum

13.488096

SubShedSoilsCambria.SQ_MI Sum

0.021075

HYDRIC SOILS			
BtB	0.145983	0.000228	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum

0.145983

SubShedSoilsCambria.SQ_MI Sum

0.000228

PRIME FARMLAND SOILS			
GnB	2.677545	0.004184	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

2.677545

SubShedSoilsCambria.SQ_MI Sum

0.004184

STATEWIDE IMPORTANT SOILS

CaB	5.293801	0.008272	Statewide Important Soils
CaC	3.097496	0.00484	Statewide Important Soils
GtC	8.241667	0.012878	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

16.632964

SubShedSoilsCambria.SQ_MI Sum

0.025989

WATER

W	2.19435	0.003429	Water

SubShedSoilsCambria.ACREAGE Sum

2.19435

SubShedSoilsCambria.SQ_MI Sum

0.003429

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Water	0.705702	0.001103
Hay Pasture	9.107629	0.014231
Row Crops	20.930785	0.032704
Coniferous Forest	0.635465	0.000993
Mixed Forest	1.35774	0.002121
Deciduous Forest	1.245678	0.001946
Transitional	1.155939	0.001806

Acreage Sum

35.138937

SQ_MI Sum

0.054905

G. Pollution Sources: None

H. Additional Notes: This tributary never makes it directly to Chest Creek. It ends up flowing into a wetland, which is separate from Chest Creek by a road.

Tributary Number 7

Cambria County; East Carroll Township

CCWA Monitoring Point: Trib Number 7														Loading					
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.						
		(None)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/12/2006	CCWA	NO DATA, WETLAND												--	--	--	--	--	--
11/22/2006	CCWA													--	--	--	--	--	--
1/30/2007	CCWA													--	--	--	--	--	--
4/18/2007	CCWA													--	--	--	--	--	--
7/11/2007	CCWA													--	--	--	--	--	--
10/4/2007	CCWA													--	--	--	--	--	--
Number of sample Dates	Count	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Max	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Min	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
6	Average	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-08	Subwatershed Boundry Outline (topography)
B-IN-08	Subwatershed Industrial Influences
B-SO-08	Subwatershed Soils
B-AP-08	Subwatershed Aerial Photography
B-SG-08	Subwatershed Surface Geology

Tributary 8 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: East Carroll Township, Cambria County

B. Chapter 93 Designation: HQ-CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PSS1A- Palustrine, scrub/ shrub, broad-leaved deciduous, temporary

II. Quadrangle: Carrolltown, PA

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcc	Casselman Formation	33.589672	0.052484
Pcg	Glenshaw Formation	4.253993	0.006647

ACREAGE Sum

37.843666

SQ_MI Sum

0.059131

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
GwD	0.018164	0.000028	General Soils
HaD	3.172193	0.004957	General Soils
WgD	16.27365	0.025428	General Soils

SubShedSoilsCambria.ACREAGE Sum

19.464007

SubShedSoilsCambria.SQ_MI Sum

0.030413

HYDRIC SOILS			
BtB	1.269859	0.001984	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum

1.269859

SubShedSoilsCambria.SQ_MI Sum

0.001984

PRIME FARMLAND SOILS			
GnB	7.355357	0.011493	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

7.355357

SubShedSoilsCambria.SQ_MI Sum

0.011493

STATEWIDE IMPORTANT SOILS

CaB	2.7291	0.004264	Statewide Important Soils
CaC	4.26698	0.006667	Statewide Important Soils
GtC	1.092221	0.001707	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

8.088302

SubShedSoilsCambria.SQ_MI Sum

0.012638

WATER

W	1.666145	0.002603	Water

SubShedSoilsCambria.ACREAGE Sum

1.666145

SubShedSoilsCambria.SQ_MI Sum

0.002603

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Water	0.322511	0.000504
Low Density Urban	0.592272	0.000925
Hay Pasture	11.147778	0.017418
Row Crops	19.866391	0.031041
Coniferous Forest	0.690708	0.001079
Mixed Forest	1.412348	0.002207
Deciduous Forest	2.558265	0.003997
Transitional	1.253395	0.001958

Acreage Sum

37.843668

SQ_MI Sum

0.059131

G. Pollution Sources: None

H. Additional Notes: This tributary never makes it directly to Chest Creek. It ends up flowing into a wetland, which is separate from Chest Creek by a road.

Tributary Number 8

Cambria County; East Carroll Township

CCWA Monitoring Point: Trib Number 8														Loading					
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.						
		(None)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/12/2006	CCWA	NO DATA, WETLAND												--	--	--	--	--	--
11/22/2006	CCWA													--	--	--	--	--	--
1/30/2007	CCWA													--	--	--	--	--	--
4/18/2007	CCWA													--	--	--	--	--	--
7/11/2007	CCWA													--	--	--	--	--	--
10/4/2007	CCWA													--	--	--	--	--	--
Number of sample Dates	Count	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Max	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Min	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
6	Average	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-09	Subwatershed Boundry Outline (topography)
B-IN-09	Subwatershed Industrial Influences
B-SO-09	Subwatershed Soils
B-AP-09	Subwatershed Aerial Photography
B-SG-09	Subwatershed Surface Geology

Chest Creek Watershed Assessment and Restoration Plan

Tributary 9 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Allegheny Township, Cambria County

B. Chapter 93 Designation: HQ-CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PSS1C- Palustrine, scrub/ shrub, broad-leaved deciduous, seasonal
PFO1A- Palustrine, forested, broad-leaved deciduous, temporary
PEM1E- Palustrine, emergent, persistent, seasonal saturated
P EM/SS 1C- Palustrine, emergent, persistent, seasonal/ Palustrine, scrub/ shrub, broad-leaved deciduous, seasonal
PUBHx- Palustrine, unconsolidated bottom, permanent, excavated
P EM/SS 1A- Palustrine, emergent, persistent, temporary/ Palustrine, scrub/ shrub, broad-leaved deciduous, temporary
PSS1A- Palustrine, scrub/ shrub, broad-leaved deciduous, temporary
PFO4A- Palustrine, forested, needle-leaved evergreen, temporary
PEM1A- Palustrine, emergent, persistent, temporary
P FO/SS 1A- Palustrine, forested, broad-leaved deciduous, temporary/ Palustrine, scrub/ shrub, broad-leaved deciduous, temporary
PFO1A- Palustrine, forested, broad-leaved deciduous, temporary
PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded
PEM1Fh- Palustrine, emergent, persistent, semiperminent, diked/ impounded

II. Quadrangle: Carrolltown, PA

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcc	Casselman Formation	3702.883709	5.785756

ACREAGE Sum
3702.883709
SQ_MI Sum
5.785756

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
BeD	12.974359	0.020272	General Soils
GWF	42.102933	0.065786	General Soils
GtD	195.180964	0.30497	General Soils
GwD	235.333086	0.367708	General Soils

LDF	28.575795	0.04465	General Soils
WgD	451.971067	0.706205	General Soils

SubShedSoilsCambria.ACREAGE Sum

966.138204

SubShedSoilsCambria.SQ_MI Sum

1.509591

HYDRIC SOILS

At	81.669366	0.127608	Hydric Soils
BtB	285.055529	0.445399	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum

366.724896

SubShedSoilsCambria.SQ_MI Sum

0.573008

PRIME FARMLAND SOILS

CeB	9.144823	0.014289	Prime Farmland Soils
GnB	223.536956	0.349276	Prime Farmland Soils
HaB	114.694521	0.17921	Prime Farmland Soils
HaC	47.84398	0.074756	Prime Farmland Soils
LaB	16.304038	0.025475	Prime Farmland Soils
RaB	10.941296	0.017096	Prime Farmland Soils
WaB	155.718629	0.24331	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

578.184244

SubShedSoilsCambria.SQ_MI Sum

0.903413

STATEWIDE IMPORTANT SOILS

BeB	5.653661	0.008834	Statewide Important Soils
BmB	8.27566	0.012931	Statewide Important Soils
BpC	14.654174	0.022897	Statewide Important Soils
CaB	263.730104	0.412078	Statewide Important Soils
CaC	140.695157	0.219836	Statewide Important Soils
CeC	71.526781	0.111761	Statewide Important Soils
GtC	308.742898	0.482411	Statewide Important Soils
GwB	137.793272	0.215302	Statewide Important Soils
GwC	253.377439	0.395902	Statewide Important Soils
WaC	59.122983	0.09238	Statewide Important Soils
WgC	525.900474	0.821719	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

1789.472603

SubShedSoilsCambria.SQ_MI Sum

2.796051

WATER

W	2.363726	0.003693	Water

SubShedSoilsCambria.ACREAGE Sum

2.363726

SubShedSoilsCambria.SQ_MI Sum

0.003693

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Water	1.326171	0.002072
Low Density Urban	30.083754	0.047006
Hay Pasture	739.500469	1.155469
Row Crops	1305.31697	2.039558
Coniferous Forest	68.543075	0.107099
Mixed Forest	56.810718	0.088767
Deciduous Forest	1296.225356	2.025352
Quarries	1.105145	0.001727
Transitional	194.874587	0.304492

Acreage Sum

3693.786245

SQ_MI Sum

5.771541

G. Pollution Sources: Some Nutrient Runoff

H. Additional Notes: Work with area farmers to improve or implement BMP’s.

Tributary Number 9

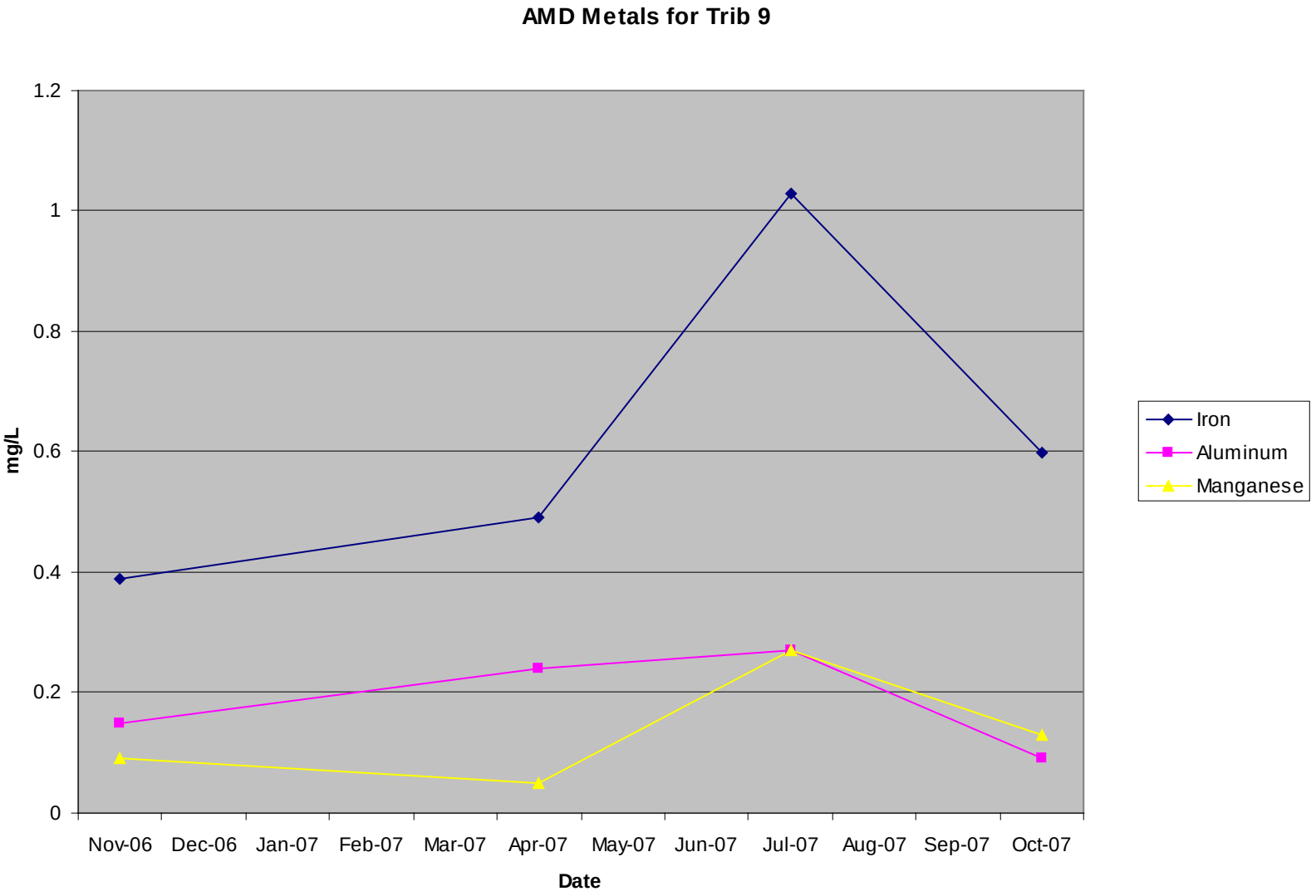
Cambria County; Allegheny Township

CCWA Monitoring Point: Trib Number 9																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/12/2006	CCWA	622.26	7.72	250	60	--	70	--	--	--	--	--	174	--	524.37	--	--	--	--
11/22/2006	CCWA	1378.22	7.2	204	35	-34	45	0.39	0.15	0.09	19	3.1	109	-564.11	746.62	6.47	2.49	1.49	315.24
1/31/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
4/18/2007	CCWA	Flooding	6.6	165	40	-14	32	0.49	0.24	0.05	19	8	107	--	--	--	--	--	--
7/17/2007	CCWA	78.59	7.6	291	70	-96	112	1.03	0.27	0.27	12	2.5	145	-90.83	105.96	0.97	0.26	0.26	11.35
10/9/2007	CCWA	119.61	7.4	304	68	-92	111	0.6	0.09	0.13	14	2.5	169	-132.47	159.83	0.86	0.13	0.19	20.16
Number of sample Dates	Count	4	5	5	5	4	5	4	4	4	4	4	5	3	4	3	3	3	3
	Max	1378.22	7.72	304	70	-14	112	1.03	0.27	0.27	19	8	174	-90.83	746.62	6.47	2.49	1.49	315.24
	Min	78.59	6.6	165	35	-96	32	0.39	0.09	0.05	12	2.5	107	-564.11	105.96	0.86	0.13	0.19	11.35
6	Average	549.67	7.30	242.80	54.60	-59.00	74.00	0.63	0.19	0.14	16.00	4.03	140.80	-262.47	384.20	2.77	0.96	0.65	115.58

Note: 9/12/06 Data is FIELD only.

Note: Flooding on 4/18/07 made taking flow impossible, thus loadings could not be calculated.

Date	Nitrates (ppm)	Phos. (ppm)	Nitrates (lbs/day)	Phos. (lbs/day)
9/12/2006	1.1	0.09	8.240116	0.674191
11/22/2006	2.97	0.1	49.27694	1.659156
1/31/2007	Frozen	Frozen	Frozen	Frozen
4/18/2007	2.54	0.07	--	--
7/17/2007	0.25	0.14	0.236524	0.132454
10/9/2007	0.25	0.03	0.359978	0.043197
Count	5	5	4	4
Max	2.97	0.14	49.27694	1.659156
Min	0.25	0.03	0.236524	0.043197
Average	1.422	0.086	14.52839	0.62725


AMD Metals for Trib 9
1.2
1
0.8
0.6
0.4
0.2
0
mg/L
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-10	Subwatershed Boundry Outline (topography)
B-IN-10	Subwatershed Industrial Influences
B-SO-10	Subwatershed Soils
B-AP-10	Subwatershed Aerial Photography
B-SG-10	Subwatershed Surface Geology

Tributary 10 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: East Carroll Township, Cambria County

B. Chapter 93 Designation: HQ-CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded

II. Quadrangle: Carrolltown, PA

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcc	Casselman Formation	383.443449	0.59913
Pcg	Glenshaw Formation	162.434947	0.253805

ACREAGE Sum

545.878397

SQ_MI Sum

0.852935

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
GWF	53.561141	0.083689	General Soils
GtD	26.974045	0.042147	General Soils
GwD	52.577928	0.082153	General Soils
HaD	0.706175	0.001103	General Soils
LDF	10.780899	0.016845	General Soils
WgD	67.279965	0.105125	General Soils

SubShedSoilsCambria.ACREAGE Sum

211.880153

SubShedSoilsCambria.SQ_MI Sum

0.331063

HYDRIC SOILS			
AmB	12.128231	0.01895	Hydric Soils
BtB	97.657967	0.152591	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum

109.786198

SubShedSoilsCambria.SQ_MI Sum

0.171541

PRIME FARMLAND SOILS

GnB	51.878026	0.081059	Prime Farmland Soils
HaB	3.3923	0.0053	Prime Farmland Soils
LaB	1.613116	0.00252	Prime Farmland Soils
WaB	4.733735	0.007396	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

61.617176

SubShedSoilsCambria.SQ_MI Sum

0.096277

STATEWIDE IMPORTANT SOILS

BeB	5.904163	0.009225	Statewide Important Soils
BmB	8.599222	0.013436	Statewide Important Soils
BmC	17.025204	0.026602	Statewide Important Soils
CaB	16.581195	0.025908	Statewide Important Soils
CaC	18.121193	0.028314	Statewide Important Soils
GtC	9.213626	0.014396	Statewide Important Soils
GwB	2.09118	0.003267	Statewide Important Soils
GwC	3.286527	0.005135	Statewide Important Soils
WaC	26.792938	0.041864	Statewide Important Soils
WgC	54.979623	0.085906	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

162.594871

SubShedSoilsCambria.SQ_MI Sum

0.254054

E. Mining:

I. Mining Permits in Drainage Basin:

11813014

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Low Density Urban	0.751566	0.001174
Hay Pasture	106.414541	0.166273
Row Crops	209.414619	0.32721
Coniferous Forest	15.709406	0.024546
Mixed Forest	3.804491	0.005945
Deciduous Forest	186.067966	0.290731
Transitional	23.715809	0.037056

Acreage Sum

545.878398

SQ_MI Sum

0.852935

G. Pollution Sources: None

H. Additional Notes: A portion of the Lemon Drop Links Golf Course falls in this watershed.

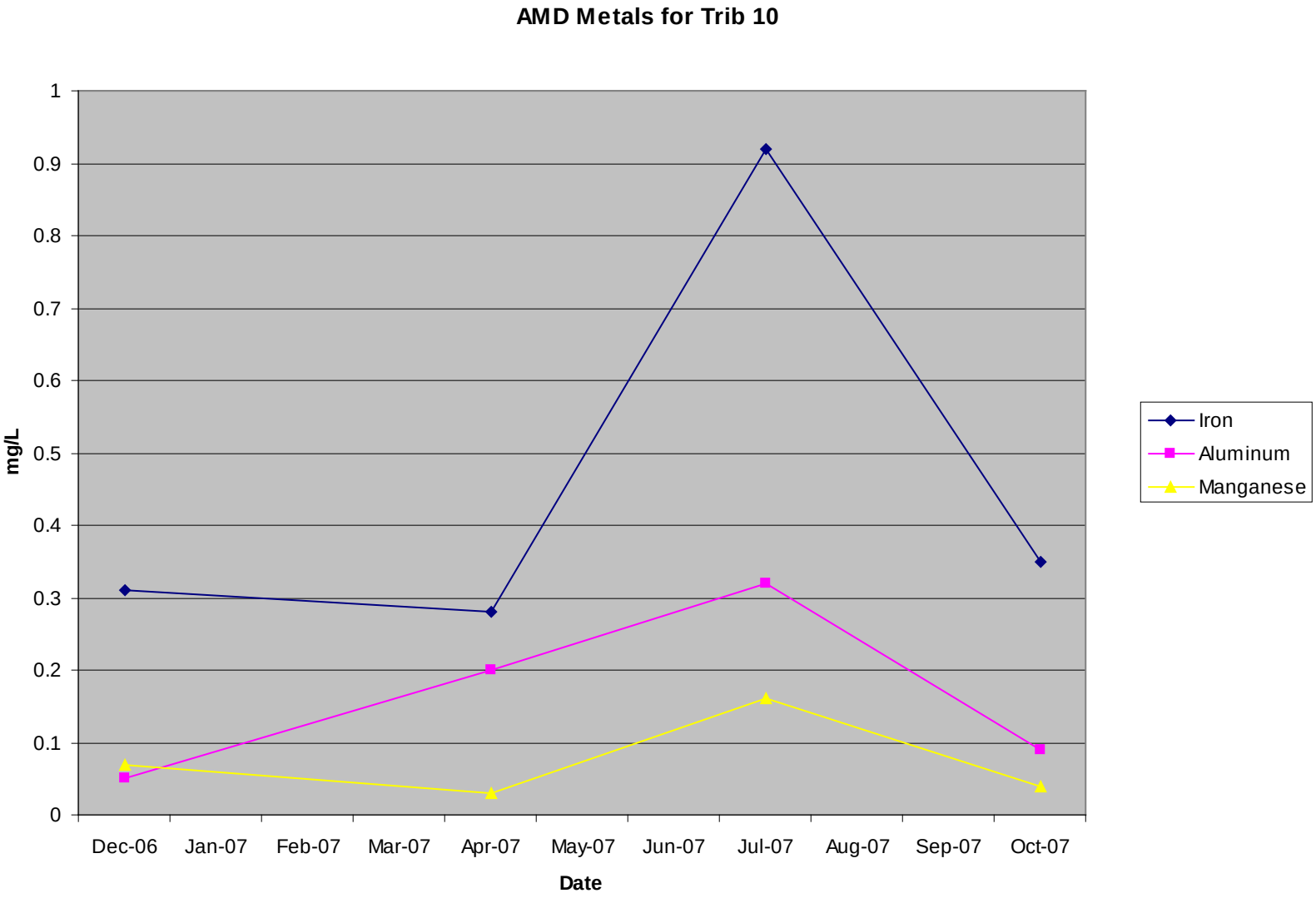
Tributary Number 10

Cambria County; East Carroll Township

CCWA Monitoring Point: Trib Number 10																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/12/2006	CCWA	106.96	7.93	234	61	--	70	--	--	--	--	--	163	--	90.13	--	--	--	--
12/6/2006	CCWA	117.41	7.5	224	38	-50	65	0.31	0.05	0.07	20	3.1	127	-70.67	91.87	0.44	0.07	0.10	28.27
1/31/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
4/19/2007	CCWA	1052.06	7.1	147	48	-14	30	0.28	0.2	0.03	20	2.5	90	-177.31	379.95	3.55	2.53	0.38	253.30
7/17/2007	CCWA	9.34	7.7	279	68	-86	103	0.92	0.32	0.16	15	2.5	141	-9.67	11.58	0.10	0.04	0.02	1.69
10/10/2007	CCWA	30.7	7.6	287	64	-87	105	0.35	0.09	0.04	15	2.5	151	-32.15	38.81	0.13	0.03	0.01	5.54
Number of sample Dates	Count	5	5	5	5	4	5	4	4	4	4	4	5	4	5	4	4	4	4
	Max	1052.06	7.93	287	68	-14	105	0.92	0.32	0.16	20	3.1	163	-9.67	379.95	3.55	2.53	0.38	253.30
	Min	9.34	7.1	147	38	-87	30	0.28	0.05	0.03	15	2.5	90	-177.31	11.58	0.10	0.03	0.01	1.69
6	Average	263.29	7.57	234.20	55.80	-59.25	74.60	0.47	0.17	0.08	17.50	2.65	134.40	-72.45	122.47	1.05	0.67	0.13	72.20

Note: 9/12/06 Data is FIELD only.

Date	Nitrates (ppm)	Phos. (ppm)	Nitrates (lbs/day)	Phos. (lbs/day)
9/12/2006	0.7	0.04	0.901339	0.051505
12/6/2006	1.43	0.03	2.021203	0.042403
1/31/2007	Frozen	Frozen	Frozen	Frozen
4/19/2007	2.67	0.06	33.81587	0.759907
7/17/2007	0.25	0.03	0.02811	0.003373
10/10/2007	0.25	0.03	0.092395	0.011087
Count	5	5	5	5
Max	2.67	0.06	33.81587	0.759907
Min	0.25	0.03	0.02811	0.003373
Average	1.06	0.038	7.371783	0.173655


AMD Metals for Trib 10
mg/L
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-11	Subwatershed Boundry Outline (topography)
B-IN-11	Subwatershed Industrial Influences
B-SO-11	Subwatershed Soils
B-AP-11	Subwatershed Aerial Photography
B-SG-11	Subwatershed Surface Geology

Chest Creek Watershed Assessment and Restoration Plan

Tributary 11 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: East Carroll Township, Cambria County

B. Chapter 93 Designation: HQ-CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PSS1A- Palustrine, scrub/ shrub, broad-leaved deciduous, temporary
PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded
P EM1/UB Fx- Palustrine, emergent, persistent, semiperminent, excavated/ Palustrine, unconsolidated bottom, semiperminent, excavated

II. Quadrangle: Carrolltown, PA

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcc	Casselman Formation	137.514726	0.214867

ACREAGE Sum
137.514726
SQ_MI Sum
0.214867

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
GWF	0.413625	0.000646	General Soils
GwD	38.953543	0.060865	General Soils
WgD	18.11138	0.028299	General Soils

SubShedSoilsCambria.ACREAGE Sum
57.478548
SubShedSoilsCambria.SQ_MI Sum
0.08981

HYDRIC SOILS			
BtB	10.935785	0.017087	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum
10.935785
SubShedSoilsCambria.SQ_MI Sum
0.017087

PRIME FARMLAND SOILS			
GnB	19.018844	0.029717	Prime Farmland Soils
WaB	21.54242	0.03366	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

40.561264

SubShedSoilsCambria.SQ_MI Sum

0.063377

STATEWIDE IMPORTANT SOILS

GtC	0.161984	0.000253	Statewide Important Soils
GwB	2.698054	0.004216	Statewide Important Soils
GwC	9.168832	0.014326	Statewide Important Soils
WgC	16.510256	0.025797	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

28.539127

SubShedSoilsCambria.SQ_MI Sum

0.044592

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Low Density Urban	0.283124	0.000442
Hay Pasture	35.054955	0.054773
Row Crops	63.136452	0.098651
Coniferous Forest	1.876633	0.002932
Mixed Forest	2.409681	0.003765
Deciduous Forest	24.120576	0.037688
Transitional	10.633305	0.016615

Acreage Sum

137.514725

SQ_MI Sum

0.214867

G. Pollution Sources: None

H. Additional Notes: This is a very small subwatershed, and the tributary doesn't flow all year around.

Tributary Number 11

Cambria County; East Carroll Township

CCWA Monitoring Point: Trib Number 11														Loading					
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.						
		(None)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/13/2006	CCWA	NO DATA, WETLAND												--	--	--	--	--	--
12/7/2006	CCWA													--	--	--	--	--	--
1/31/2007	CCWA													--	--	--	--	--	--
4/19/2007	CCWA													--	--	--	--	--	--
7/18/2007	CCWA													--	--	--	--	--	--
10/10/2007	CCWA													--	--	--	--	--	--
Number of sample Dates	Count	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Max	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Min	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
6	Average	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-12	Subwatershed Boundry Outline (topography)
B-IN-12	Subwatershed Industrial Influences
B-SO-12	Subwatershed Soils
B-AP-12	Subwatershed Aerial Photography
B-SG-12	Subwatershed Surface Geology

Tributary 12 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: East Carroll Township, Cambria County

B. Chapter 93 Designation: HQ-CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PSS1C- Palustrine, scrub/ shrub, broad-leaved deciduous, seasonal

II. Quadrangle: Carrolltown, PA

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcc	Casselman Formation	78.542249	0.122722

ACREAGE Sum

78.542249

SQ_MI Sum

0.122722

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
GtD	8.366912	0.013073	General Soils
GwD	5.647784	0.008825	General Soils

SubShedSoilsCambria.ACREAGE Sum

14.014696

SubShedSoilsCambria.SQ_MI Sum

0.021898

HYDRIC SOILS			
BtB	14.844416	0.023194	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum

14.844416

SubShedSoilsCambria.SQ_MI Sum

0.023194

PRIME FARMLAND SOILS			
GnB	3.785713	0.005915	Prime Farmland Soils
WaB	11.467224	0.017918	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

15.252937

SubShedSoilsCambria.SQ_MI Sum

0.023833

STATEWIDE IMPORTANT SOILS

CaB	4.789857	0.007484	Statewide Important Soils
GtC	7.65247	0.011957	Statewide Important Soils
GwB	2.283612	0.003568	Statewide Important Soils
GwC	14.699921	0.022969	Statewide Important Soils
WgC	5.004342	0.007819	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

34.430203

SubShedSoilsCambria.SQ_MI Sum

0.053797

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Low Density Urban	0.221029	0.000345
Hay Pasture	22.001499	0.034377
Row Crops	35.989073	0.056233
Coniferous Forest	1.769511	0.002765
Mixed Forest	1.348329	0.002107
Deciduous Forest	13.981782	0.021847
Transitional	3.231028	0.005048

Acreage Sum

78.542252

SQ_MI Sum

0.122722

G. Pollution Sources: None

H. Additional Notes: None

Tributary Number 12

Cambria County; East Carroll Township

CCWA Monitoring Point: Trib Number 12														Loading					
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.						
		(None)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/13/2006	CCWA	NO DATA, WETLAND												--	--	--	--	--	--
12/7/2006	CCWA													--	--	--	--	--	--
1/31/2007	CCWA													--	--	--	--	--	--
4/19/2007	CCWA													--	--	--	--	--	--
7/18/2007	CCWA													--	--	--	--	--	--
10/10/2007	CCWA													--	--	--	--	--	--
Number of sample Dates	Count	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Max	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Min	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
6	Average	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-13	Subwatershed Boundry Outline (topography)
B-IN-13	Subwatershed Industrial Influences
B-SO-13	Subwatershed Soils
B-AP-13	Subwatershed Aerial Photography
B-SG-13	Subwatershed Surface Geology

Chest Creek Watershed Assessment and Restoration Plan

Tributary 13, Laurel Lick Run **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Cambria and East Carroll Townships, Cambria County

B. Chapter 93 Designation: HQ-CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PSS1A- Palustrine, scrub/ shrub, broad-leaved deciduous, temporary
P EM/SS 1E- Palustrine, emergent, persistent, temporary/ Palustrine, scrub/ shrub, broad-leaved deciduous, seasonal saturated
R5UBH- Riverine, unknown perennial, unconsolidated bottom, permanent
PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded
PEM1C- Palustrine, emergent, persistent, seasonal
PSS1C- Palustrine, scrub/ shrub, broad-leaved deciduous, seasonal
PEM1Eh- Palustrine, emergent, persistent, seasonal saturated, diked/ Impounded
PEM1Fh- Palustrine, emergent, persistent, semiperminent, diked/ impounded

II. Quadrangle: Carrolltown, PA

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcc	Casselman Formation	850.547168	1.32898
Pcg	Glenshaw Formation	4969.941251	7.765533

ACREAGE Sum
5820.488419
SQ_MI Sum
9.094513

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
CaA	22.876776	0.035745	General Soils
CbB	14.77477	0.023086	General Soils
CvB	11.509664	0.017984	General Soils
CvD	84.580383	0.132157	General Soils
GWF	175.538963	0.27428	General Soils
GpB	6.559881	0.01025	General Soils
GpD	11.368527	0.017763	General Soils
GtD	233.848256	0.365388	General Soils

GwD	201.854428	0.315398	General Soils
HaD	186.376044	0.291213	General Soils
HbB	6.823976	0.010662	General Soils
LDF	388.015386	0.606274	General Soils
WgD	573.167985	0.895575	General Soils

SubShedSoilsCambria.ACREAGE Sum

1917.295039

SubShedSoilsCambria.SQ_MI Sum

2.995773

HYDRIC SOILS

AmB	26.598931	0.041561	Hydric Soils
At	124.204491	0.19407	Hydric Soils
BtB	579.731512	0.90583	Hydric Soils
NoB	11.175907	0.017462	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum

741.71084

SubShedSoilsCambria.SQ_MI Sum

1.158923

PRIME FARMLAND SOILS

CeB	270.023088	0.421911	Prime Farmland Soils
GnB	341.68468	0.533882	Prime Farmland Soils
HaB	108.131915	0.168956	Prime Farmland Soils
HaC	168.572409	0.263394	Prime Farmland Soils
LaB	37.15313	0.058052	Prime Farmland Soils
RaB	9.444844	0.014758	Prime Farmland Soils
WaB	128.591835	0.200925	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

1063.601901

SubShedSoilsCambria.SQ_MI Sum

1.661878

STATEWIDE IMPORTANT SOILS

BeB	8.02316	0.012536	Statewide Important Soils
BeC	3.860525	0.006032	Statewide Important Soils
BmB	133.915768	0.209243	Statewide Important Soils
BmC	39.16858	0.061201	Statewide Important Soils
CaB	193.874408	0.302929	Statewide Important Soils
CaC	100.596762	0.157182	Statewide Important Soils
CeC	378.368968	0.591202	Statewide Important Soils
GtC	259.593757	0.405615	Statewide Important Soils
GwB	33.436569	0.052245	Statewide Important Soils
GwC	65.35069	0.10211	Statewide Important Soils
LaC	26.269768	0.041047	Statewide Important Soils
RaC	23.92259	0.037379	Statewide Important Soils
WaC	111.264275	0.17385	Statewide Important Soils
WgC	585.455066	0.914774	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

1963.100885

SubShedSoilsCambria.SQ_MI Sum

3.067345

URBAN DISTURBED

URB	56.491025	0.088267	Urban Disturbed
URC	62.463851	0.0976	Urban Disturbed

SubShedSoilsCambria.ACREAGE Sum

118.954876

SubShedSoilsCambria.SQ_MI Sum

0.185867

WATER

W	15.82488	0.024726	Water

SubShedSoilsCambria.ACREAGE Sum

15.82488

SubShedSoilsCambria.SQ_MI Sum

0.024726

E. Mining:

I. Mining Permits in Drainage Basin:

11813014, # 11890701 or # 11841605

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Water	7.514981	0.011742
Low Density Urban	108.275288	0.16918
Hay Pasture	745.96929	1.165577
Row Crops	1733.467618	2.708543
Coniferous Forest	160.596022	0.250931
Mixed Forest	105.257111	0.164464
Deciduous Forest	2581.469736	4.033546
Woody Wetland	0.221029	0.000345
Emergent Wetland	18.345396	0.028665
Quarries	70.243346	0.109755
Transitional	279.067455	0.436043

Acreage Sum

5810.427273

SQ_MI Sum

9.078793

G. Pollution Sources: Some Nutrient Runoff

H. Additional Notes: Work with local farmers in this watershed to improve BMP's. The Pennsylvania Fish & Boat Commission stocks portions of Laurel Lick Run.

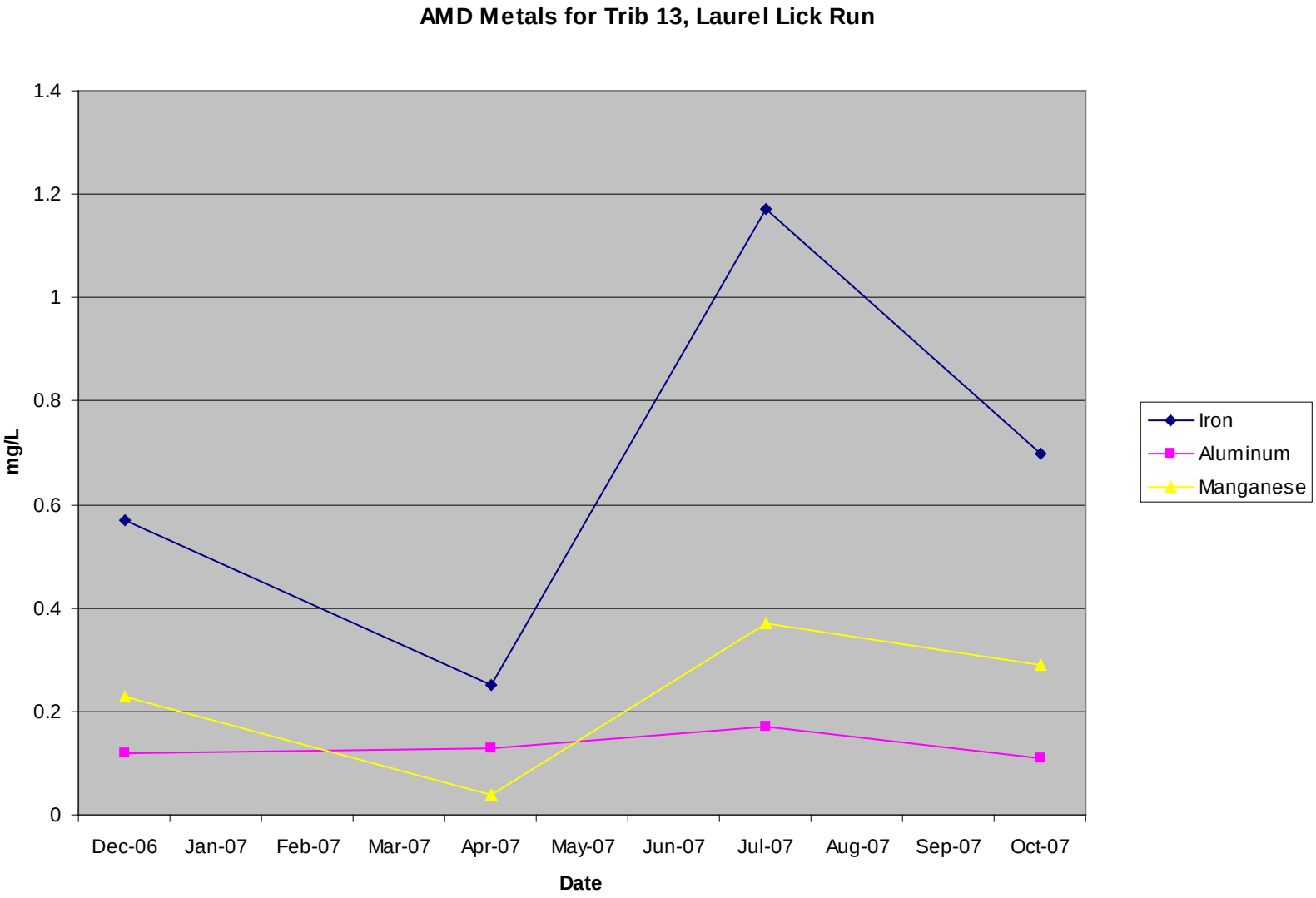
Tributary Number 13, Laurel Lick Run

Cambria County; East Carroll Township, Cambria Township

CCWA Monitoring Point: Trib Number 13, Laurel Lick Run														Loading					
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.						
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/13/2006	CCWA	Bvr. Dam	7.61	252	60	--	40	--	--	--	--	--	177	--	--	--	--	--	--
12/7/2006	CCWA	Bvr. Dam	7.4	199	30	-26	38	0.57	0.12	0.23	29	3.1	119	--	--	--	--	--	--
1/31/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
4/19/2007	CCWA	Bvr. Dam	6.8	147	49	-4	24	0.25	0.13	0.04	21	6	89	--	--	--	--	--	--
7/17/2007	CCWA	Bvr. Dam	7.3	308	73	-56	72	1.17	0.17	0.37	33	2.5	161	--	--	--	--	--	--
10/10/2007	CCWA	277.24	7.1	308	64	-56	71	0.7	0.11	0.29	41	2.5	174	-186.90	236.96	2.34	0.37	0.97	136.84
Number of sample Dates	Count	1	5	5	5	4	5	4	4	4	4	4	5	1	1	1	1	1	1
	Max	277.24	7.61	308	73	-4	72	1.17	0.17	0.37	41	6	177	-186.90	236.96	2.34	0.37	0.97	136.84
	Min	277.24	6.8	147	30	-56	24	0.25	0.11	0.04	21	2.5	89	-186.90	236.96	2.34	0.37	0.97	136.84
6	Average	277.24	7.24	242.80	55.20	-35.50	49.00	0.67	0.13	0.23	31.00	3.53	144.00	-186.90	236.96	2.34	0.37	0.97	136.84

Note: 9/13/06 Data is FIELD only.

Date	Nitrates (ppm)	Phos. (ppm)	Nitrates (lbs/day)	Phos. (lbs/day)
9/13/2006	1.1	0.05	--	--
12/7/2006	1.49	0.03	--	--
1/31/2007	Frozen	Frozen	Frozen	Frozen
4/19/2007	0.58	0.03	--	--
7/17/2007	0.25	0.11	--	--
10/10/2007	0.25	0.03	0.834382	0.100126
Count	5	5	1	1
Max	1.49	0.11	0.834382	0.100126
Min	0.25	0.03	0.834382	0.100126
Average	0.734	0.05	0.834382	0.100126


AMD Metals for Trib 13, Laurel Lick Run
1.4
1.2
1
0.8
0.6
0.4
0.2
0
mg/L
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-14	Subwatershed Boundry Outline (topography)
B-IN-14	Subwatershed Industrial Influences
B-SO-14	Subwatershed Soils
B-AP-14	Subwatershed Aerial Photography
B-SG-14	Subwatershed Surface Geology

Tributary 14 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: East Carroll Township, Cambria County

B. Chapter 93 Designation: HQ-CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

P EM/SS 1E- Palustrine, emergent, persistent, temporary/ Palustrine, scrub/ shrub, broad-leaved deciduous, seasonal saturated

PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded

II. Quadrangle: Carrolltown, PA

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcc	Casselman Formation	35.65695	0.055714

ACREAGE Sum

35.65695

SQ_MI Sum

0.055714

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
CaA	2.794435	0.004366	General Soils
GwD	0.077584	0.000121	General Soils

SubShedSoilsCambria.ACREAGE Sum

2.872019

SubShedSoilsCambria.SQ_MI Sum

0.004488

HYDRIC SOILS			
AmB	16.099025	0.025155	Hydric Soils
At	3.192008	0.004988	Hydric Soils
BtB	0.515449	0.000805	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum

19.806482

SubShedSoilsCambria.SQ_MI Sum

0.030948

STATEWIDE IMPORTANT SOILS			
GtC	12.978449	0.020279	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

12.978449

SubShedSoilsCambria.SQ_MI Sum
0.020279

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Low Density Urban	0.217549	0.00034
Hay Pasture	5.905134	0.009227
Row Crops	16.303341	0.025474
Coniferous Forest	0.061807	0.000097
Mixed Forest	1.984774	0.003101
Deciduous Forest	8.59269	0.013426
Transitional	2.591655	0.004049

Acreage Sum
35.65695

SQ_MI Sum
0.055714

G. Pollution Sources: None

H. Additional Notes: This tributary never makes it to Chest Creek. It flows into a wetland and is blocked by railroad tracks.

Tributary Number 14

Cambria County; East Carroll Township

CCWA Monitoring Point: Trib Number 14														Loading					
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.						
		(None)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/13/2006	CCWA	Dry	NO DATA											--	--	--	--	--	--
12/7/2006	CCWA	Wetland												--	--	--	--	--	--
2/1/2007	CCWA	Frozen												--	--	--	--	--	--
4/19/2007	CCWA	Dry												--	--	--	--	--	--
7/18/2007	CCWA	Dry												--	--	--	--	--	--
10/15/2007	CCWA	Dry												--	--	--	--	--	--
Number of sample Dates	Count	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Max	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
	Min	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
6	Average	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-15	Subwatershed Boundry Outline (topography)
B-IN-15	Subwatershed Industrial Influences
B-SO-15	Subwatershed Soils
B-AP-15	Subwatershed Aerial Photography
B-SG-15	Subwatershed Surface Geology

Tributary 15 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Allegheny Township, Cambria County

B. Chapter 93 Designation: HQ-CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PFO1A- Palustrine, forested, broad-leaved deciduous, temporary
P FO/SS 1A- Palustrine, forested, broad-leaved deciduous, temporary/ Palustrine, scrub/ shrub, broad-leaved deciduous, temporary
PSS1C- Palustrine, scrub/ shrub, broad-leaved deciduous, seasonal

II. Quadrangle:

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcc	Casselman Formation	929.62325	1.452536

ACREAGE Sum
929.62325
SQ_MI Sum
1.452536

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
CaA	4.322207	0.006753	General Soils
GWF	0.768342	0.001201	General Soils
GtD	13.835155	0.021617	General Soils
GwD	38.516375	0.060182	General Soils
WgD	69.203776	0.108131	General Soils

SubShedSoilsCambria.ACREAGE Sum
126.645856
SubShedSoilsCambria.SQ_MI Sum
0.197884

HYDRIC SOILS			
At	3.503478	0.005474	Hydric Soils
BtB	74.71073	0.116736	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum
78.214208
SubShedSoilsCambria.SQ_MI Sum
0.12221

PRIME FARMLAND SOILS			
GnB	83.314453	0.130179	Prime Farmland Soils

HaC	7.20238	0.011254	Prime Farmland Soils
WaB	84.025959	0.131291	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

174.542793

SubShedSoilsCambria.SQ_MI Sum

0.272723

STATEWIDE IMPORTANT SOILS

BmB	12.680263	0.019813	Statewide Important Soils
CaB	141.073072	0.220427	Statewide Important Soils
CaC	48.370085	0.075578	Statewide Important Soils
GtC	55.191348	0.086236	Statewide Important Soils
GwB	14.815308	0.023149	Statewide Important Soils
GwC	62.236068	0.097244	Statewide Important Soils
WaC	29.91551	0.046743	Statewide Important Soils
WgC	184.698523	0.288591	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

548.980177

SubShedSoilsCambria.SQ_MI Sum

0.857782

WATER

W	1.240211	0.001938	Water

SubShedSoilsCambria.ACREAGE Sum

1.240211

SubShedSoilsCambria.SQ_MI Sum

0.001938

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	**Acreage**	**SQ_MI**
Water	0.663086	0.001036
Low Density Urban	1.989257	0.003108
Hay Pasture	204.589553	0.319671
Row Crops	403.084009	0.629819
Coniferous Forest	22.430612	0.035048
Mixed Forest	13.571454	0.021205
Deciduous Forest	224.327122	0.350511
Transitional	58.151393	0.090862

Acreage Sum

928.806487

SQ_MI Sum

1.45126

G. Pollution Sources: Some Nutrient Runoff

H. Additional Notes: Work with local farmers in this watershed to improve BMP's

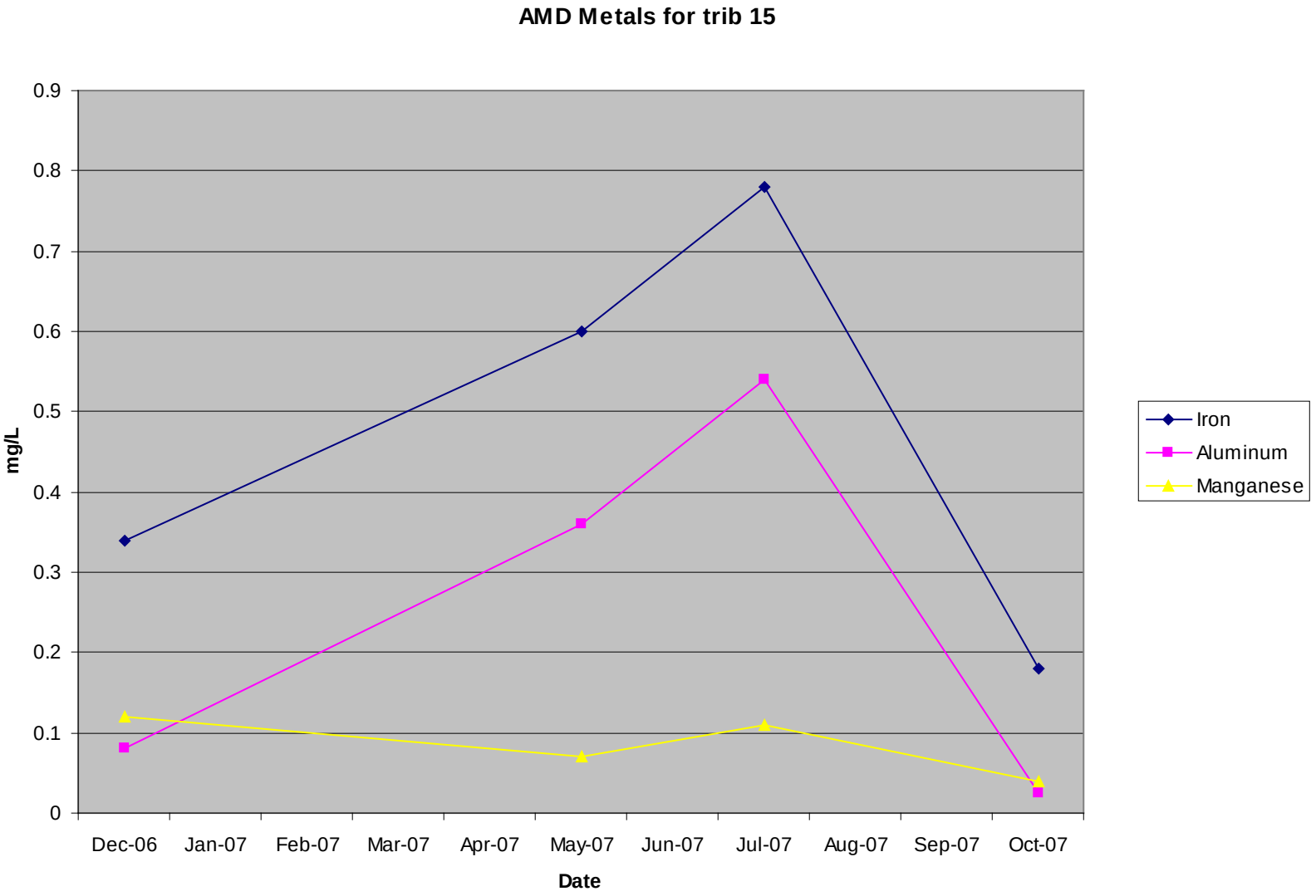
Tributary Number 15

Cambria County; Allegheny Township

CCWA Monitoring Point: Trib Number 15																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/14/2006	CCWA	Bvr. Dam	7.62	172.9	66	--	50	--	--	--	--	--	127.5	--	--	--	--	--	--
12/7/2006	CCWA	159.51	7.6	206	33	-54	64	0.34	0.08	0.12	19	7.1	119	-103.69	122.90	0.65	0.15	0.23	36.48
2/1/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
5/2/2007	CCWA	755.07	7.4	178	57	-31	45	0.6	0.36	0.07	17	2.5	106	-281.78	409.04	5.45	3.27	0.64	154.53
7/19/2007	CCWA	399.86	7.5	187	68	-30	41	0.78	0.54	0.11	22	7	111	-144.41	197.36	3.75	2.60	0.53	105.90
10/15/2007	CCWA	38.24	7.8	298	60	-105	119	0.18	0.025	0.04	15	2.5	172	-48.34	54.78	0.08	0.01	0.02	6.91
Number of sample Dates	Count	4	5	5	5	4	5	4	4	4	4	4	5	4	4	4	4	4	4
	Max	755.07	7.8	298	68	-30	119	0.78	0.54	0.12	22	7.1	172	-48.34	409.04	5.45	3.27	0.64	154.53
	Min	38.24	7.4	172.9	33	-105	41	0.18	0.025	0.04	15	2.5	106	-281.78	54.78	0.08	0.01	0.02	6.91
6	Average	338.17	7.58	208.38	56.80	-55.00	63.80	0.48	0.25	0.09	18.25	4.78	127.10	-144.56	196.02	2.49	1.51	0.35	75.95

Note: 9/14/06 Data is FIELD only.

Date	Nitrates (ppm)	Phos. (ppm)	Nitrates (lbs/day)	Phos. (lbs/day)
9/14/2006	1.1	0.15	--	--
12/7/2006	1.07	0.03	2.054662	0.057607
2/1/2007	Frozen	Frozen	Frozen	Frozen
5/2/2007	0.89	0.17	8.089953	1.545272
7/19/2007	1.4	0.37	6.739144	1.78106
10/15/2007	0.25	0.03	0.115087	0.01381
Count	5	5	4	4
Max	1.4	0.37	8.089953	1.78106
Min	0.25	0.03	0.115087	0.01381
Average	0.942	0.15	4.249712	0.849437


AMD Metals for trib 15
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
mg/L
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-16	Subwatershed Boundry Outline (topography)
B-IN-16	Subwatershed Industrial Influences
B-SO-16	Subwatershed Soils
B-AP-16	Subwatershed Aerial Photography
B-SG-16	Subwatershed Surface Geology

Tributary 16 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: East Carroll Township, Cambria County

B. Chapter 93 Designation: HQ-CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PFO1A- Palustrine, forested, broad-leaved deciduous, temporary
PEM1A- Palustrine, emergent, persistent, temporary
PSS1C- Palustrine, scrub/ shrub, broad-leaved deciduous, seasonal
PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded

II. Quadrangle: Carrolltown, PA

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcc	Casselman Formation	104.901352	0.163908

ACREAGE Sum
104.901352
SQ_MI Sum
0.163908

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
GwD	0.761326	0.00119	General Soils
HaD	1.023039	0.001598	General Soils
LDF	14.283218	0.022318	General Soils
WgD	33.70588	0.052665	General Soils

SubShedSoilsCambria.ACREAGE Sum
49.773462
SubShedSoilsCambria.SQ_MI Sum
0.077771

HYDRIC SOILS			
AmB	8.52532	0.013321	Hydric Soils
At	2.168143	0.003388	Hydric Soils
BtB	9.871667	0.015424	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum
20.56513
SubShedSoilsCambria.SQ_MI Sum
0.032133

PRIME FARMLAND SOILS			
HaB	11.016628	0.017213	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

11.016628

SubShedSoilsCambria.SQ_MI Sum

0.017213

STATEWIDE IMPORTANT SOILS

BeB	1.780709	0.002782	Statewide Important Soils
GtC	2.569941	0.004016	Statewide Important Soils
WaC	1.087825	0.0017	Statewide Important Soils
WgC	18.107655	0.028293	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

23.54613

SubShedSoilsCambria.SQ_MI Sum

0.036791

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Low Density Urban	1.154521	0.001804
Hay Pasture	11.219548	0.017531
Row Crops	32.573539	0.050896
Coniferous Forest	1.493516	0.002334
Mixed Forest	0.858854	0.001342
Deciduous Forest	56.205137	0.087821
Quarries	0.267459	0.000418
Transitional	1.128776	0.001764

Acreage Sum

104.90135

SQ_MI Sum

0.163908

G. Pollution Sources: Some Nutrient Runoff

H. Additional Notes: Work with local farmers in this watershed to improve BMP’s

Tributary Number 16

Cambria County; East Carroll Township

CCWA Monitoring Point: Trib Number 16														Loading					
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.						
		(None)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/14/2006	CCWA	Wetland	NO DATA											--	--	--	--	--	--
12/7/2006	CCWA	Frozen												--	--	--	--	--	--
2/1/2007	CCWA	Frozen												--	--	--	--	--	--
5/2/2007	CCWA	Wetland												--	--	--	--	--	--
8/6/2007	CCWA	Dry												--	--	--	--	--	--
10/17/2007	CCWA	Dry												--	--	--	--	--	--
Number of sample Dates	Count	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Max	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
	Min	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
6	Average	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-17	Subwatershed Boundry Outline (topography)
B-IN-17	Subwatershed Industrial Influences
B-SO-17	Subwatershed Soils
B-AP-17	Subwatershed Aerial Photography
B-SG-17	Subwatershed Surface Geology

Tributary 17 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: East Carroll Township, Cambria County

B. Chapter 93 Designation: HQ-CWF

C. National Wetlands Inventory Information:
I. Habitat Types: none mapped
II. Quadrangle: Carrolltown, PA

D. Geology and Soils:
I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcc	Casselman Formation	126.956625	0.19837

ACREAGE Sum
126.956625
SQ_MI Sum
0.19837

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
CeD	11.459887	0.017906	General Soils
GWF	7.298943	0.011405	General Soils
HaD	8.690465	0.013579	General Soils
LDF	19.715442	0.030805	General Soils
WgD	0.158317	0.000247	General Soils

SubShedSoilsCambria.ACREAGE Sum
47.323055
SubShedSoilsCambria.SQ_MI Sum
0.073942

HYDRIC SOILS			
At	6.279654	0.009812	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum
6.279654
SubShedSoilsCambria.SQ_MI Sum
0.009812

PRIME FARMLAND SOILS			
HaB	25.886412	0.040448	Prime Farmland Soils
HaC	8.132665	0.012707	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum
34.019077
SubShedSoilsCambria.SQ_MI Sum

0.053155

STATEWIDE IMPORTANT SOILS

CaB	3.809271	0.005952	Statewide Important Soils
CeC	6.378043	0.009966	Statewide Important Soils
WgC	29.147526	0.045543	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

39.33484

SubShedSoilsCambria.SQ_MI Sum

0.061461

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	**Acreage**	**SQ_MI**
Hay Pasture	15.742413	0.024598
Row Crops	30.067138	0.04698
Coniferous Forest	0.935943	0.001462
Mixed Forest	0.636252	0.000994
Deciduous Forest	72.546669	0.113354
Quarries	3.091806	0.004831
Transitional	3.936406	0.006151

Acreage Sum

126.956626

SQ_MI Sum

0.19837

G. Pollution Sources: Some Nutrient Runoff

H. Additional Notes: Work with local farmers in this watershed to improve BMP’s

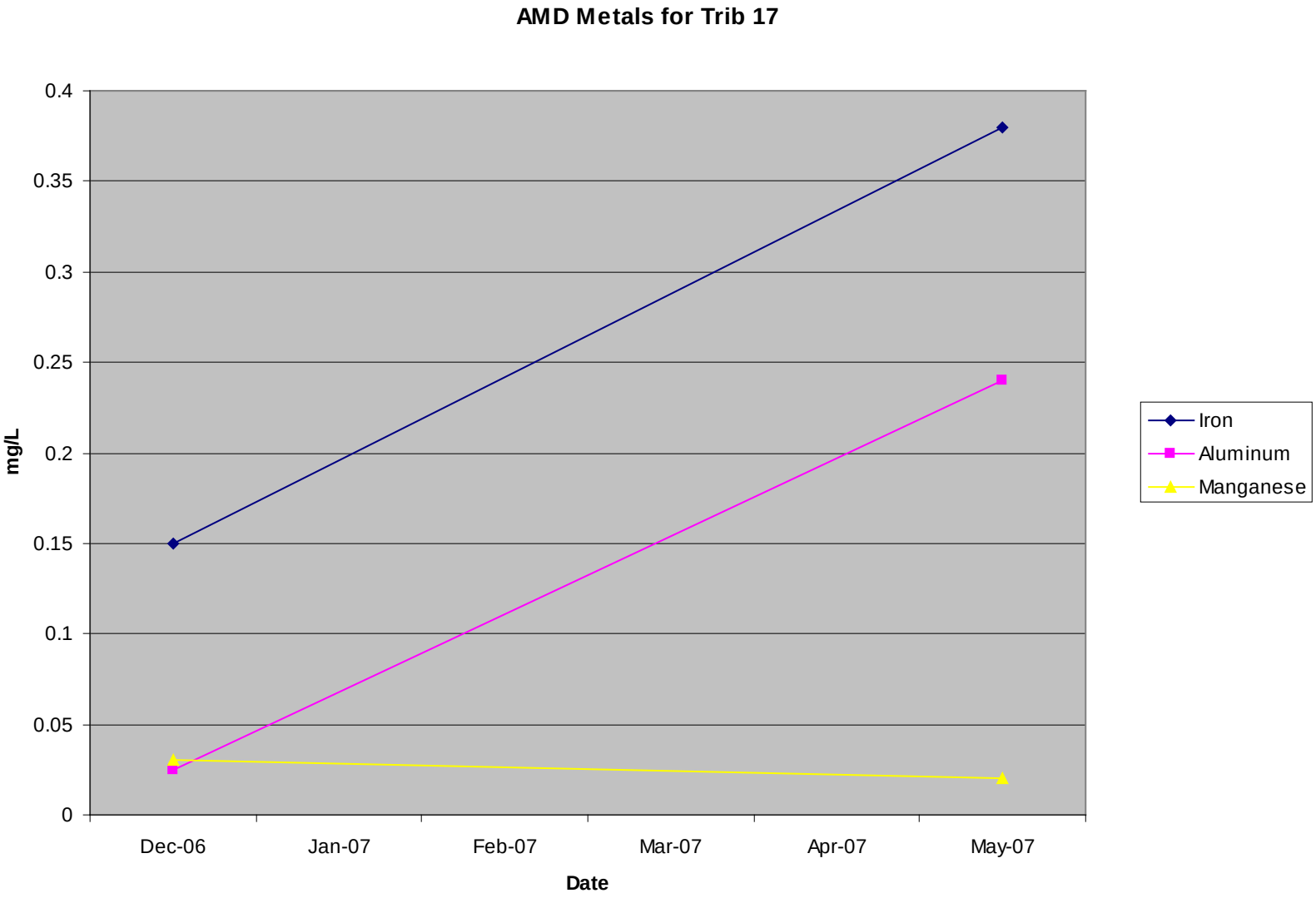
Tributary Number 17

Cambria County; East Carroll Township

CCWA Monitoring Point: Trib Number 17														Loading					
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.						
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/14/2006	CCWA	38.78	7.64	115.4	68	--	20	--	--	--	--	--	78.6	--	9.34	--	-	--	--
12/7/2006	CCWA	25.58	7.2	120	35	-13	23	0.15	0.025	0.03	17	3.1	83	-4.00	7.08	0.05	0.01	0.01	5.24
2/1/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
5/2/2007	CCWA	86.89	6.8	116	55	-5	19	0.38	0.24	0.02	18	2.5	75	-5.23	19.87	0.40	0.25	0.02	18.83
8/6/2007	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
10/17/2007	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Number of sample Dates	Count	3	3	3	3	2	3	2	2	2	2	2	3	2	3	2	2	2	2
	Max	86.89	7.64	120	68	-5	23	0.38	0.24	0.03	18	3.1	83	-4.00	19.87	0.40	0.25	0.02	18.83
	Min	25.58	6.8	115.4	35	-13	19	0.15	0.025	0.02	17	2.5	75	-5.23	7.08	0.05	0.01	0.01	5.24
6	Average	50.42	7.21	117.13	52.67	-9.00	20.67	0.27	0.13	0.03	17.50	2.80	78.87	-4.62	12.10	0.22	0.13	0.02	12.03

Note: 9/14/06 Data is FIELD only.

Date	Nitrates (ppm)	Phos. (ppm)	Nitrates (lbs/day)	Phos. (lbs/day)
9/14/2006	1.8	0.11	0.840328	0.051353
12/7/2006	2.2	0.03	0.677473	0.009238
2/1/2007	Frozen	Frozen	Frozen	Frozen
5/2/2007	1.76	0.18	1.840989	0.188283
8/6/2007	--	--	--	--
10/17/2007	--	--	--	--
Count	3	3	3	3
Max	2.2	0.18	1.840989	0.188283
Min	1.76	0.03	0.677473	0.009238
Average	1.92	0.106667	1.119597	0.082958


AMD Metals for Trib 17
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
mg/L
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-18	Subwatershed Boundry Outline (topography)
B-IN-18	Subwatershed Industrial Influences
B-SO-18	Subwatershed Soils
B-AP-18	Subwatershed Aerial Photography
B-SG-18	Subwatershed Surface Geology

Tributary 18 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Allegheny Township, Cambria County

B. Chapter 93 Designation: HQ-CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PSS1A- Palustrine, scrub/ shrub, broad-leaved deciduous, temporary
PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded
PEM1A- Palustrine, emergent, persistent, temporary

II. Quadrangle: Carrolltown, PA

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcc	Casselman Formation	1327.372799	2.07402

ACREAGE Sum
1327.372799
SQ_MI Sum
2.07402

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
CaA	2.220525	0.00347	General Soils
GWF	19.37707	0.030277	General Soils
GtD	48.876544	0.07637	General Soils
HaD	4.282178	0.006691	General Soils
LDF	13.98576	0.021853	General Soils
WgD	113.905975	0.177978	General Soils

SubShedSoilsCambria.ACREAGE Sum
202.648053
SubShedSoilsCambria.SQ_MI Sum
0.316638

HYDRIC SOILS			
BtB	117.197139	0.183121	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum
117.197139
SubShedSoilsCambria.SQ_MI Sum
0.183121

PRIME FARMLAND SOILS			
CeB	2.575801	0.004025	Prime Farmland Soils
GnB	182.529585	0.285202	Prime Farmland Soils

HaB	5.631832	0.0088	Prime Farmland Soils
HaC	29.579356	0.046218	Prime Farmland Soils
WaB	143.708445	0.224544	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

364.025019

SubShedSoilsCambria.SQ_MI Sum

0.568789

STATEWIDE IMPORTANT SOILS

BeB	10.727079	0.016761	Statewide Important Soils
BmB	41.979105	0.065592	Statewide Important Soils
CaB	208.76487	0.326195	Statewide Important Soils
CaC	11.105754	0.017353	Statewide Important Soils
CeC	15.764618	0.024632	Statewide Important Soils
GtC	111.869554	0.174796	Statewide Important Soils
GwB	4.104914	0.006414	Statewide Important Soils
LaC	8.364123	0.013069	Statewide Important Soils
WaC	7.439237	0.011624	Statewide Important Soils
WgC	219.001193	0.342189	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

639.120446

SubShedSoilsCambria.SQ_MI Sum

0.998626

WATER

W	4.382129	0.006847	Water

SubShedSoilsCambria.ACREAGE Sum

4.382129

SubShedSoilsCambria.SQ_MI Sum

0.006847

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Water	0.884115	0.001381
Low Density Urban	1.949329	0.003046
Hay Pasture	258.43806	0.403809
Row Crops	535.113786	0.836115
Coniferous Forest	42.830863	0.066923
Mixed Forest	47.833535	0.07474
Deciduous Forest	390.02217	0.60941
Transitional	43.468749	0.06792

Acreage Sum

1320.540605

SQ_MI Sum

2.063345

G. Pollution Sources: Some Nutrient Runoff and Sediment Erosion

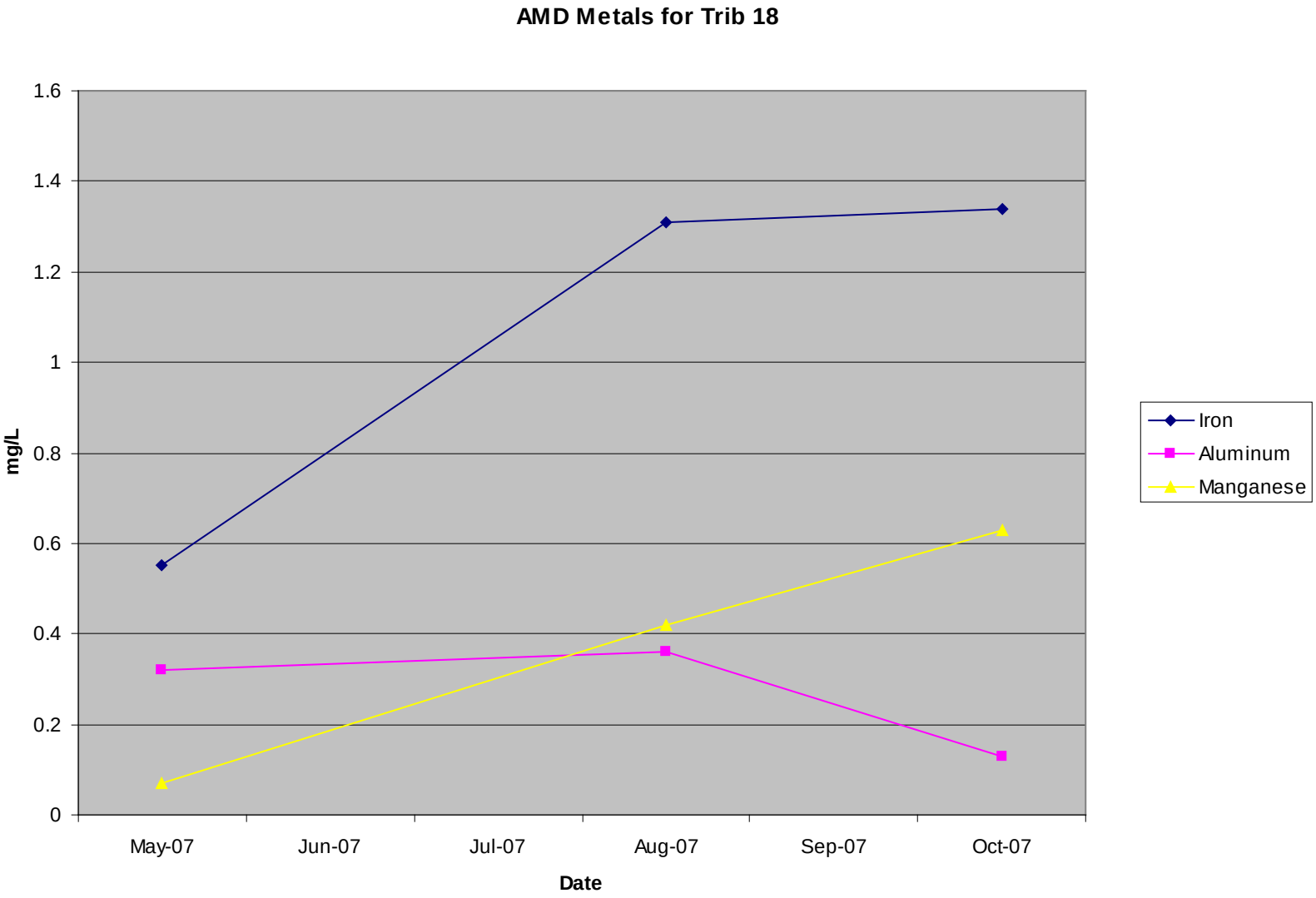
H. Additional Notes: Work with local farmers in this watershed to improve BMP's

Tributary Number 18

Cambria County; Allegheny Township

CCWA Monitoring Point: Trib Number 18																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/14/2006	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12/8/2006	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
2/1/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
5/4/2007	CCWA	855.6	7.2	174	60	-12	28	0.55	0.32	0.07	20	6	105	-123.60	288.40	5.67	3.30	0.72	206.00
8/9/2007	CCWA	66.74	7.2	201	70	-24	57	1.31	0.36	0.42	13	6	121	-19.28	45.80	1.05	0.29	0.34	10.44
10/18/2007	CCWA	59.02	7.2	222	65	-61	77	1.34	0.13	0.63	14	8	137	-43.34	54.71	0.95	0.09	0.45	9.95
Number of sample Dates	Count	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Max	855.6	7.2	222	70	-12	77	1.34	0.36	0.63	20	8	137	-19.28	288.40	5.67	3.30	0.72	206.00
	Min	59.02	7.2	174	60	-61	28	0.55	0.13	0.07	13	6	105	-123.60	45.80	0.95	0.09	0.34	9.95
6	Average	327.12	7.20	199.00	65.00	-32.33	54.00	1.07	0.27	0.37	15.67	6.67	121.00	-62.07	129.64	2.56	1.23	0.50	75.46

Date	Nitrates (ppm)	Phos. (ppm)	Nitrates (lbs/day)	Phos. (lbs/day)
9/14/2006	--	--	--	--
12/8/2006	Frozen	Frozen	Frozen	Frozen
2/1/2007	Frozen	Frozen	Frozen	Frozen
5/4/2007	2.48	0.17	25.54414	1.751009
8/9/2007	0.719	0.36	0.577675	0.289239
10/18/2007	0.56	0.13	0.397884	0.092366
Count	3	3	3	3
Max	2.48	0.36	25.54414	1.751009
Min	0.56	0.13	0.397884	0.092366
Average	1.253	0.22	8.839898	0.710872


AMD Metals for Trib 18
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
mg/L
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-19	Subwatershed Boundry Outline (topography)
B-IN-19	Subwatershed Industrial Influences
B-SO-19	Subwatershed Soils
B-AP-19	Subwatershed Aerial Photography
B-SG-19	Subwatershed Surface Geology

Tributary 19 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Allegheny Township, Cambria County

B. Chapter 93 Designation: HQ-CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded

II. Quadrangle: Carrolltown, PA

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcc	Casselman Formation	135.874717	0.212304

ACREAGE Sum

135.874717

SQ_MI Sum

0.212304

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
LDF	33.350544	0.05211	General Soils
WgD	18.002069	0.028128	General Soils

SubShedSoilsCambria.ACREAGE Sum

51.352613

SubShedSoilsCambria.SQ_MI Sum

0.080238

HYDRIC SOILS			
At	1.056148	0.00165	Hydric Soils
BtB	1.673364	0.002615	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum

2.729512

SubShedSoilsCambria.SQ_MI Sum

0.004265

PRIME FARMLAND SOILS			
GnB	9.63951	0.015062	Prime Farmland Soils
HaB	3.809681	0.005953	Prime Farmland Soils
HaC	12.642907	0.019755	Prime Farmland Soils
Ph	0.371743	0.000581	Prime Farmland Soils
WaB	2.057106	0.003214	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

28.520947

SubShedSoilsCambria.SQ_MI Sum

0.044564

STATEWIDE IMPORTANT SOILS

BmB	3.266709	0.005104	Statewide Important Soils
CeC	13.683391	0.02138	Statewide Important Soils
GtC	7.332852	0.011458	Statewide Important Soils
WgC	28.988697	0.045295	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

53.271648

SubShedSoilsCambria.SQ_MI Sum

0.083237

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	**Acreage**	**SQ_MI**
Low Density Urban	0.599949	0.000937
Hay Pasture	24.674287	0.038554
Row Crops	57.726524	0.090198
Coniferous Forest	2.231212	0.003486
Mixed Forest	16.351021	0.025548
Deciduous Forest	31.140409	0.048657
Transitional	3.151321	0.004924

Acreage Sum

135.874722

SQ_MI Sum

0.212304

G. Pollution Sources: Some Nutrient Runoff

H. Additional Notes: Work with local farmers in this watershed to improve BMP’s

Tributary Number 19

Cambria County; Allegheny Township

CCWA Monitoring Point: Trib Number 19														Loading					
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.						
		(None)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/14/2006	CCWA	Dry	NO DATA											--	--	--	--	--	--
12/8/2006	CCWA	Frozen												--	--	--	--	--	--
2/1/2007	CCWA	Frozen												--	--	--	--	--	--
5/8/2007	CCWA	Dry												--	--	--	--	--	--
8/9/2007	CCWA	Dry												--	--	--	--	--	--
10/18/2007	CCWA	Dry												--	--	--	--	--	--
Number of sample Dates	Count	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Max	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
	Min	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
6	Average	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-20	Subwatershed Boundry Outline (topography)
B-IN-20	Subwatershed Industrial Influences
B-SO-20	Subwatershed Soils
B-AP-20	Subwatershed Aerial Photography
B-SG-20	Subwatershed Surface Geology

Tributary 20 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Allegheny Township, Cambria County

B. Chapter 93 Designation: HQ-CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PEM1F- Palustrine, emergent, persistent, semiperminent
PFO4A- Palustrine, forested, needle-leaved evergreen, temporary
PFO4B- Palustrine, forested, needle-leaved evergreen, saturated
PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded

II. Quadrangle: Carrolltown, PA

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcc	Casselman Formation	108.867731	0.170106

ACREAGE Sum
108.867731
SQ_MI Sum
0.170106

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
GWF	7.931546	0.012393	General Soils
GtD	3.336687	0.005214	General Soils
LDF	14.785048	0.023102	General Soils
WgD	3.011168	0.004705	General Soils

SubShedSoilsCambria.ACREAGE Sum
29.064449
SubShedSoilsCambria.SQ_MI Sum
0.045413

HYDRIC SOILS			
At	12.714019	0.019866	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum
12.714019
SubShedSoilsCambria.SQ_MI Sum
0.019866

PRIME FARMLAND SOILS			
GnB	9.881252	0.015439	Prime Farmland Soils

HaB	0.087947	0.000137	Prime Farmland Soils
HaC	9.824181	0.01535	Prime Farmland Soils
Ph	0.876999	0.00137	Prime Farmland Soils
WaB	3.056756	0.004776	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

23.727136

SubShedSoilsCambria.SQ_MI Sum

0.037074

STATEWIDE IMPORTANT SOILS

BmB	1.738175	0.002716	Statewide Important Soils
CeC	20.126676	0.031448	Statewide Important Soils
GwC	0.030081	0.000047	Statewide Important Soils
WgC	21.467195	0.033542	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

43.362127

SubShedSoilsCambria.SQ_MI Sum

0.067753

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	**Acreage**	**SQ_MI**
Low Density Urban	0.721875	0.001128
Hay Pasture	21.969945	0.034328
Row Crops	34.693358	0.054208
Coniferous Forest	4.626499	0.007229
Mixed Forest	1.783237	0.002786
Deciduous Forest	40.829718	0.063796
Transitional	4.243097	0.00663

Acreage Sum

108.86773

SQ_MI Sum

0.170106

G. Pollution Sources: None

H. Additional Notes: None

Tributary Number 20

Cambria County; Allegheny Township

CCWA Monitoring Point: Trib Number 20														Loading					
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.						
		(Method)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/19/2006	CCWA	Dry	NO DATA											--	--	--	--	--	--
12/11/2006	CCWA	Frozen												--	--	--	--	--	--
2/1/2007	CCWA	Frozen												--	--	--	--	--	--
5/8/2007	CCWA	Wetlands												--	--	--	--	--	--
8/10/2007	CCWA	Dry												--	--	--	--	--	--
10/18/2007	CCWA	Dry												--	--	--	--	--	--
Number of sample Dates	Count	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Max	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
	Min	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
6	Average	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-21	Subwatershed Boundry Outline (topography)
B-IN-21	Subwatershed Industrial Influences
B-SO-21	Subwatershed Soils
B-AP-21	Subwatershed Aerial Photography
B-SG-21	Subwatershed Surface Geology

Tributary 21 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: East Carroll Township, Cambria County

B. Chapter 93 Designation: HQ-CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PEM1C- Palustrine, emergent, persistent, seasonal
PFO4A- Palustrine, forested, needle-leaved evergreen, temporary
P FO/EM 1A- Palustrine, forested, broad-leaved deciduous, temporary/
PEM1A- Palustrine, emergent, persistent, temporary

II. Quadrangle: Carrolltown, PA

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcc	Casselman Formation	102.849331	0.160702

ACREAGE Sum
102.849331
SQ_MI Sum
0.160702

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
GWF	2.259988	0.003531	General Soils
HaD	24.534157	0.038335	General Soils
LDF	5.242388	0.008191	General Soils
WgD	2.528754	0.003951	General Soils

SubShedSoilsCambria.ACREAGE Sum
34.565288
SubShedSoilsCambria.SQ_MI Sum
0.054008

PRIME FARMLAND SOILS			
GnB	0.814905	0.001273	Prime Farmland Soils
HaB	17.701535	0.027659	Prime Farmland Soils
HaC	4.833044	0.007552	Prime Farmland Soils
Ph	0.326673	0.00051	Prime Farmland Soils
WaB	5.186782	0.008104	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum
28.862937
SubShedSoilsCambria.SQ_MI Sum

0.045098

STATEWIDE IMPORTANT SOILS

CeC	17.569343	0.027452	Statewide Important Soils
WgC	21.851762	0.034143	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

39.421105

SubShedSoilsCambria.SQ_MI Sum

0.061595

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Hay Pasture	19.029598	0.029734
Row Crops	35.422134	0.055347
Coniferous Forest	7.471729	0.011675
Mixed Forest	0.890508	0.001391
Deciduous Forest	32.514452	0.050804
Quarries	1.839902	0.002875
Transitional	5.681006	0.008877

Acreage Sum

102.849329

SQ_MI Sum

0.160702

G. Pollution Sources: None

H. Additional Notes: None

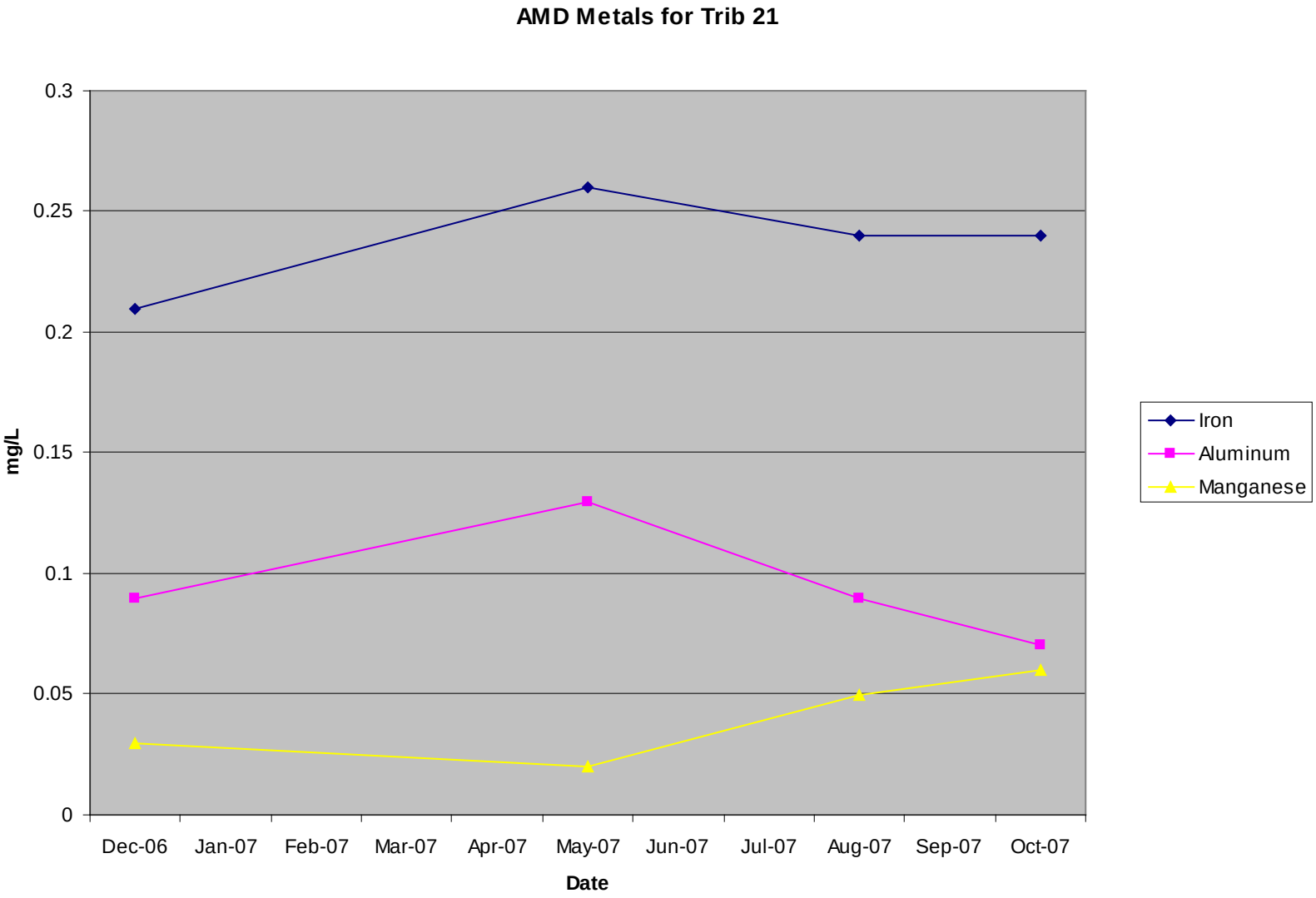
Tributary Number 21

Cambria County; East Carroll Township

CCWA Monitoring Point: Trib Number 21																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/19/2006	CCWA	23.61	7.88	121.1	70	--	60	--	--	--	--	--	90.2	--	17.05	--	--	--	--
12/11/2006	CCWA	51.52	7.2	102	39	-9	20	0.21	0.09	0.03	15	3.1	74	-5.58	12.40	0.13	0.06	0.02	9.30
2/5/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
5/8/2007	CCWA	116.7	6.6	112	58	1	17	0.26	0.13	0.02	15	9	63	1.40	23.88	0.37	0.18	0.03	21.07
8/10/2007	CCWA	21.18	7.2	121	68	-8	31	0.24	0.09	0.05	13	2.5	109	-2.04	7.90	0.06	0.02	0.01	3.31
10/24/2007	CCWA	73.83	7.1	123	55	-18	32	0.24	0.07	0.06	13	2.5	77	-16.00	28.44	0.21	0.06	0.05	11.55
Number of sample Dates	Count	5	5	5	5	4	5	4	4	4	4	4	5	4	5	4	4	4	4
	Max	116.7	7.88	123	70	1	60	0.26	0.13	0.06	15	9	109	1.40	28.44	0.37	0.18	0.05	21.07
	Min	21.18	6.6	102	39	-18	17	0.21	0.07	0.02	13	2.5	63	-16.00	7.90	0.06	0.02	0.01	3.31
6	Average	57.37	7.20	115.82	58.00	-8.50	32.00	0.24	0.10	0.04	14.00	4.28	82.64	-5.55	17.94	0.19	0.08	0.03	11.31

Note: 9/19/06 Data is FIELD only.

Date	Nitrates (ppm)	Phos. (ppm)	Nitrates (lbs/day)	Phos. (lbs/day)
9/19/2006	1.1	0.16	0.312649	0.045476
12/11/2006	1.34	0.03	0.831093	0.018607
2/5/2007	Frozen	Frozen	Frozen	Frozen
5/8/2007	1.6	0.18	2.24781	0.252879
8/10/2007	0.838	0.25	0.213668	0.063743
10/24/2007	0.62	0.16	0.551053	0.142207
Count	5	5	5	5
Max	1.6	0.25	2.24781	0.252879
Min	0.62	0.03	0.213668	0.018607
Average	1.0996	0.156	0.831255	0.104582


AMD Metals for Trib 21
0.3
0.25
0.2
0.15
0.1
0.05
0
mg/L
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-22	Subwatershed Boundry Outline (topography)
B-IN-22	Subwatershed Industrial Influences
B-SO-22	Subwatershed Soils
B-AP-22	Subwatershed Aerial Photography
B-SG-22	Subwatershed Surface Geology

Tributary 22 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Allegheny Township; Chest Springs Borough, Cambria County

B. Chapter 93 Designation: HQ-CWF

C. National Wetlands Inventory Information:
I. Habitat Types: none mapped
II. Quadrangle: Carrolltown, PA

D. Geology and Soils:
I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcc	Casselman Formation	283.821917	0.443472
Pcg	Glenshaw Formation	3.916092	0.006119

ACREAGE Sum
287.738009
SQ_MI Sum
0.449591

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
CeD	16.545865	0.025853	General Soils
HaD	14.248712	0.022264	General Soils
LDF	107.425994	0.167853	General Soils
WgD	65.649864	0.102578	General Soils

SubShedSoilsCambria.ACREAGE Sum
203.870435
SubShedSoilsCambria.SQ_MI Sum
0.318548

HYDRIC SOILS			
BtB	8.723477	0.01363	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum
8.723477
SubShedSoilsCambria.SQ_MI Sum
0.01363

PRIME FARMLAND SOILS			
GnB	2.306006	0.003603	Prime Farmland Soils
HaB	13.8891	0.021702	Prime Farmland Soils
HaC	20.370489	0.031829	Prime Farmland Soils
Ph	17.223973	0.026912	Prime Farmland Soils

WaB	4.468013	0.006981	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

58.257581

SubShedSoilsCambria.SQ_MI Sum

0.091027

STATEWIDE IMPORTANT SOILS

CaB	0.900729	0.001407	Statewide Important Soils
GtC	4.914074	0.007678	Statewide Important Soils
WgC	11.071713	0.0173	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

16.886516

SubShedSoilsCambria.SQ_MI Sum

0.026385

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Low Density Urban	1.326174	0.002072
Hay Pasture	24.648315	0.038513
Row Crops	50.626541	0.079104
Coniferous Forest	7.574238	0.011835
Mixed Forest	1.312532	0.002051
Deciduous Forest	196.394991	0.306867
Transitional	5.855218	0.009149

Acreage Sum

287.738009

SQ_MI Sum

0.449591

G. Pollution Sources: Some Nutrient Runoff

H. Additional Notes: Work with local farmers in this watershed to improve BMP’s

Tributary Number 22

Cambria County; Allegheny Township, Chest Springs Borough

CCWA Monitoring Point: Trib Number 22																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/19/2006	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12/11/2006	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
2/5/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
5/8/2007	CCWA	33.84	7.2	219	62	-5	22	0.08	0.06	0.01	23	9	129	-2.04	8.96	0.03	0.02	--	9.37
8/10/2007	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
10/23/2007	CCWA	17.41	7.3	229	68	-32	45	0.32	0.19	0.12	16	2.5	147	-6.71	9.43	0.07	0.04	0.03	3.35
Number of sample Dates	Count	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2
	Max	33.84	7.3	229	68	-5	45	0.32	0.19	0.12	23	9	147	-2.04	9.43	0.07	0.04	0.03	9.37
	Min	17.41	7.2	219	62	-32	22	0.08	0.06	0.01	16	2.5	129	-6.71	8.96	0.03	0.02	0.03	3.35
6	Average	25.63	7.25	224.00	65.00	-18.50	33.50	0.20	0.13	0.07	19.50	5.75	138.00	-4.37	9.20	0.05	0.03	0.03	6.36

Note: 9/19/06 Data is FIELD only.

Date	Nitrates (ppm)	Phos. (ppm)	Nitrates (lbs/day)	Phos. (lbs/day)
9/19/2006	--	--	--	--
12/11/2006	Frozen	Frozen	Frozen	Frozen
2/5/2007	Frozen	Frozen	Frozen	Frozen
5/8/2007	1.96	0.03	0.798464	0.012221
8/10/2007	--	--	--	--
10/23/2007	0.25	0.03	0.052397	0.006288
Count	2	2	2	2
Max	1.96	0.03	0.798464	0.012221
Min	0.25	0.03	0.052397	0.006288
Average	1.105	0.03	0.42543	0.009255

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-23	Subwatershed Boundry Outline (topography)
B-IN-23	Subwatershed Industrial Influences
B-SO-23	Subwatershed Soils
B-AP-23	Subwatershed Aerial Photography
B-SG-23	Subwatershed Surface Geology

Tributary 23 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: East Carroll Township, Cambria County

B. Chapter 93 Designation: HQ-CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PSS1C- Palustrine, scrub/ shrub, broad-leaved deciduous, seasonal
PEM1C- Palustrine, emergent, persistent, seasonal
PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded

II. Quadrangle: Carrolltown, PA

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcc	Casselman Formation	292.164191	0.456507
Pcg	Glenshaw Formation	93.319366	0.145812

ACREAGE Sum
385.483557
SQ_MI Sum
0.602318

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
BeD	6.661549	0.010409	General Soils
GWF	18.956812	0.02962	General Soils
GtD	22.469073	0.035108	General Soils
GwD	3.569302	0.005577	General Soils
HaD	13.510968	0.021111	General Soils
LDF	99.650057	0.155703	General Soils
WgD	50.840363	0.079438	General Soils

SubShedSoilsCambria.ACREAGE Sum
215.658125
SubShedSoilsCambria.SQ_MI Sum
0.336966

HYDRIC SOILS			
At	5.671651	0.008862	Hydric Soils
BtB	23.495277	0.036711	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum
29.166928

SubShedSoilsCambria.SQ_MI Sum

0.045573

PRIME FARMLAND SOILS

CeB	21.510142	0.03361	Prime Farmland Soils
GnB	5.406941	0.008448	Prime Farmland Soils
HaB	2.519311	0.003936	Prime Farmland Soils
HaC	11.594783	0.018117	Prime Farmland Soils
LaB	1.619197	0.00253	Prime Farmland Soils
Ph	0.538588	0.000842	Prime Farmland Soils
WaB	19.913314	0.031115	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

63.102276

SubShedSoilsCambria.SQ_MI Sum

0.098597

STATEWIDE IMPORTANT SOILS

BeB	3.127115	0.004886	Statewide Important Soils
BeC	9.689699	0.01514	Statewide Important Soils
BmB	2.176981	0.003402	Statewide Important Soils
CaB	17.316408	0.027057	Statewide Important Soils
GtC	16.314664	0.025492	Statewide Important Soils
GwB	13.460555	0.021032	Statewide Important Soils
GwC	13.067153	0.020417	Statewide Important Soils
WgC	2.403659	0.003756	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

77.556234

SubShedSoilsCambria.SQ_MI Sum

0.121182

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	**Acreage**	**SQ_MI**
Low Density Urban	0.665724	0.00104
Hay Pasture	30.899362	0.04828
Row Crops	96.886519	0.151385
Coniferous Forest	23.946309	0.037416
Mixed Forest	15.960971	0.024939
Deciduous Forest	200.587597	0.313418
Quarries	0.351624	0.000549
Transitional	16.185455	0.02529

Acreage Sum

385.483561

SQ_MI Sum
0.602318

G. Pollution Sources: None

H. Additional Notes: None

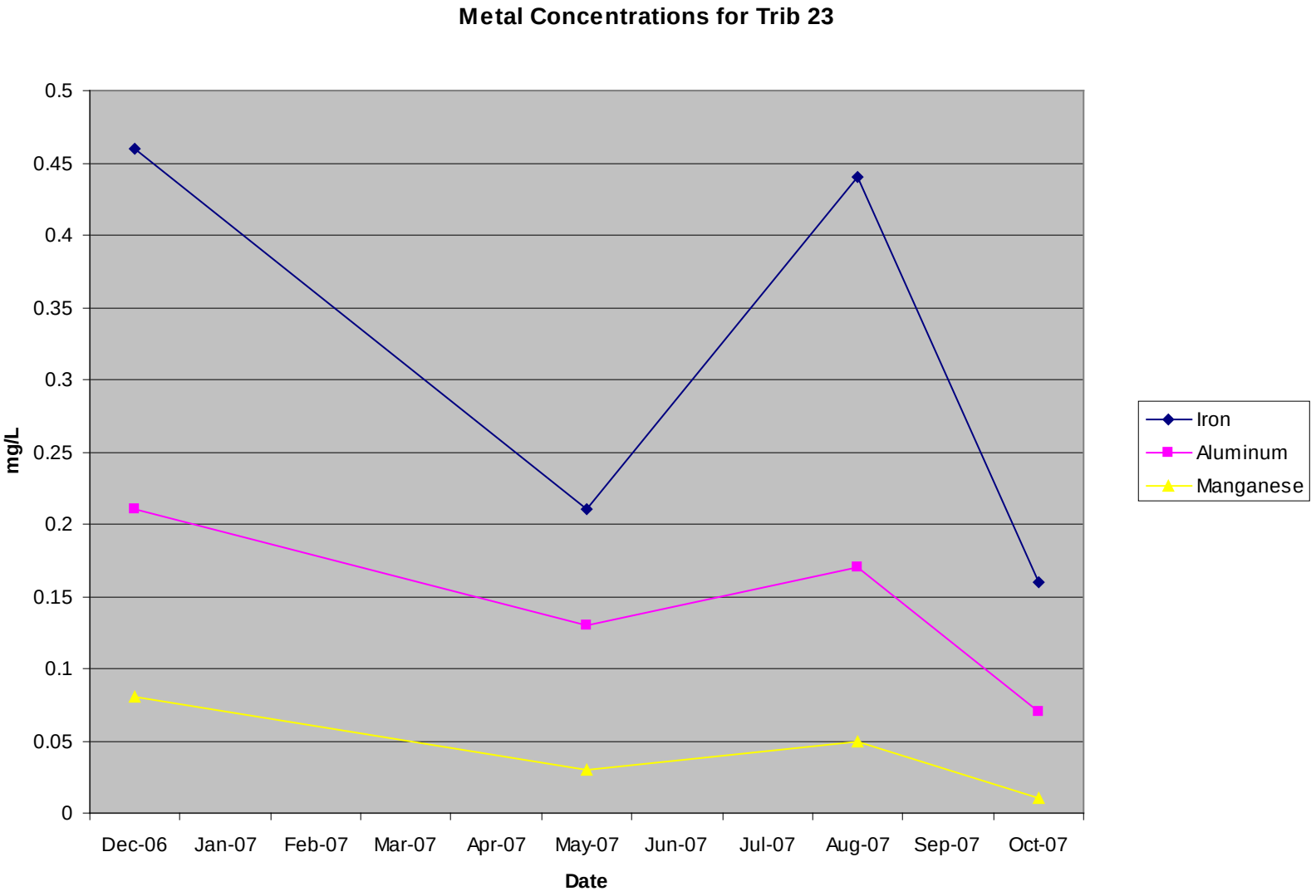
Tributary Number 23

Cambria County; East Carroll Township

CCWA Monitoring Point: Trib Number 23																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/20/2006	CCWA	50.4	7.82	233	49	--	20	--	--	--	--	--	161	--	12.13	--	--	--	--
12/11/2006	CCWA	194.43	7.3	137	39	-9	24	0.46	0.21	0.08	19	17.1	91	-21.07	56.18	1.08	0.49	0.19	44.47
2/5/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
5/4/2007	CCWA	140.21	6.6	137	64	-5	22	0.21	0.13	0.03	19	5	86	-8.44	37.13	0.35	0.22	0.05	32.07
8/10/2007	CCWA	48.25	7.3	176	68	-25	36	0.44	0.17	0.05	17	2.5	117	-14.52	20.91	0.26	0.10	0.03	9.87
10/25/2007	CCWA	27.11	7.4	154	45	-28	43	0.16	0.07	0.01	17	2.5	99	-9.14	14.03	0.05	0.02	0.00	5.55
Number of sample Dates	Count	5	5	5	5	4	5	4	4	4	4	4	5	4	5	4	4	4	4
	Max	194.43	7.82	233	68	-5	43	0.46	0.21	0.08	19	17.1	161	-8.44	56.18	1.08	0.49	0.19	44.47
	Min	27.11	6.6	137	39	-28	20	0.16	0.07	0.01	17	2.5	86	-21.07	12.13	0.05	0.02	0.00	5.55
6	Average	92.08	7.28	167.40	53.00	-16.75	29.00	0.32	0.15	0.04	18.00	6.78	110.80	-13.29	28.08	0.43	0.21	0.07	22.99

Note: 9/20/06 Data is FIELD only.

Date	Nitrates (ppm)	Phos. (ppm)	Nitrates (lbs/day)	Phos. (lbs/day)
9/20/2006	8.8	0.13	5.339271	0.078876
12/11/2006	1.58	0.06	3.698189	0.140438
2/5/2007	Frozen	Frozen	Frozen	Frozen
5/4/2007	1.69	0.09	2.852558	0.151911
8/10/2007	0.794	0.23	0.461197	0.133596
10/25/2007	0.5	0.12	0.163181	0.039163
Count	5	5	5	5
Max	8.8	0.23	5.339271	0.151911
Min	0.5	0.06	0.163181	0.039163
Average	2.6728	0.126	2.502879	0.108797


Metal Concentrations for Trib 23
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
mg/L
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-24	Subwatershed Boundry Outline (topography)
B-IN-24	Subwatershed Industrial Influences
B-SO-24	Subwatershed Soils
B-AP-24	Subwatershed Aerial Photography
B-SG-24	Subwatershed Surface Geology

Tributary 24 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: East Carroll Township, Cambria County

B. Chapter 93 Designation: HQ-CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded
PSS1A- Palustrine, scrub/ shrub, broad-leaved deciduous, temporary
PEM1Cb- Palustrine, emergent, persistent, seasonal, beaver
PEM1Fh- Palustrine, emergent, persistent, semiperminent, diked/ impounded
PSS1Cb- Palustrine, scrub/ shrub, broad-leaved deciduous, seasonal, beaver
PEM1Fb- Palustrine, emergent, persistent, semiperminent, beaver
PFO4A- Palustrine, forested, needle-leaved evergreen, temporary
PEM1C- Palustrine, emergent, persistent, seasonal

II. Quadrangle: Carrolltown, PA

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcc	Casselman Formation	206.623803	0.32285
Pcg	Glenshaw Formation	2000.123164	3.125192

ACREAGE Sum
2206.746967
SQ_MI Sum
3.448042

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
BeD	8.347027	0.013042	General Soils
GWF	137.748152	0.215231	General Soils
GtD	131.491016	0.205455	General Soils
GwD	51.841812	0.081003	General Soils
HaD	47.17424	0.07371	General Soils
LDF	30.376638	0.047463	General Soils
WgD	147.10831	0.229857	General Soils

SubShedSoilsCambria.ACREAGE Sum
554.087196
SubShedSoilsCambria.SQ_MI Sum

0.865761

HYDRIC SOILS

At	67.941047	0.106158	Hydric Soils
BtB	176.40647	0.275635	Hydric Soils
BvB	18.583846	0.029037	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum

262.931363

SubShedSoilsCambria.SQ_MI Sum

0.41083

PRIME FARMLAND SOILS

CeB	194.693909	0.304209	Prime Farmland Soils
GnB	306.164386	0.478382	Prime Farmland Soils
HaB	45.235531	0.070681	Prime Farmland Soils
HaC	101.122309	0.158004	Prime Farmland Soils
LaB	1.688386	0.002638	Prime Farmland Soils
Ph	4.084917	0.006383	Prime Farmland Soils
RaB	3.171041	0.004955	Prime Farmland Soils
WaB	35.869553	0.056046	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

692.030032

SubShedSoilsCambria.SQ_MI Sum

1.081297

STATEWIDE IMPORTANT SOILS

BeB	4.927677	0.007699	Statewide Important Soils
BeC	19.956737	0.031182	Statewide Important Soils
BmB	51.543018	0.080536	Statewide Important Soils
BmC	13.662438	0.021348	Statewide Important Soils
CaC	43.187072	0.06748	Statewide Important Soils
CeC	53.467989	0.083544	Statewide Important Soils
GtC	230.840302	0.360688	Statewide Important Soils
GwB	46.132392	0.072082	Statewide Important Soils
GwC	77.429905	0.120984	Statewide Important Soils
RaC	3.65185	0.005706	Statewide Important Soils
WaC	33.263693	0.051975	Statewide Important Soils
WgC	119.011474	0.185955	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

697.074546

SubShedSoilsCambria.SQ_MI Sum

1.089179

WATER

W	0.623827	0.000975	Water

SubShedSoilsCambria.ACREAGE Sum

0.623827

SubShedSoilsCambria.SQ_MI Sum

0.000975

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Water	0.663086	0.001036
Low Density Urban	101.452683	0.15852
Hay Pasture	365.90618	0.571728
Row Crops	843.409292	1.317827
Coniferous Forest	56.194302	0.087804
Mixed Forest	50.044123	0.078194
Deciduous Forest	673.135314	1.051774
Quarries	2.560989	0.004002
Transitional	112.955082	0.176492

Acreage Sum

2206.321051

SQ_MI Sum

3.447377

G. Pollution Sources: Some Nutrient Runoff and Sediment Erosion

H. Additional Notes: Work with local farmers in this watershed to improve BMP's

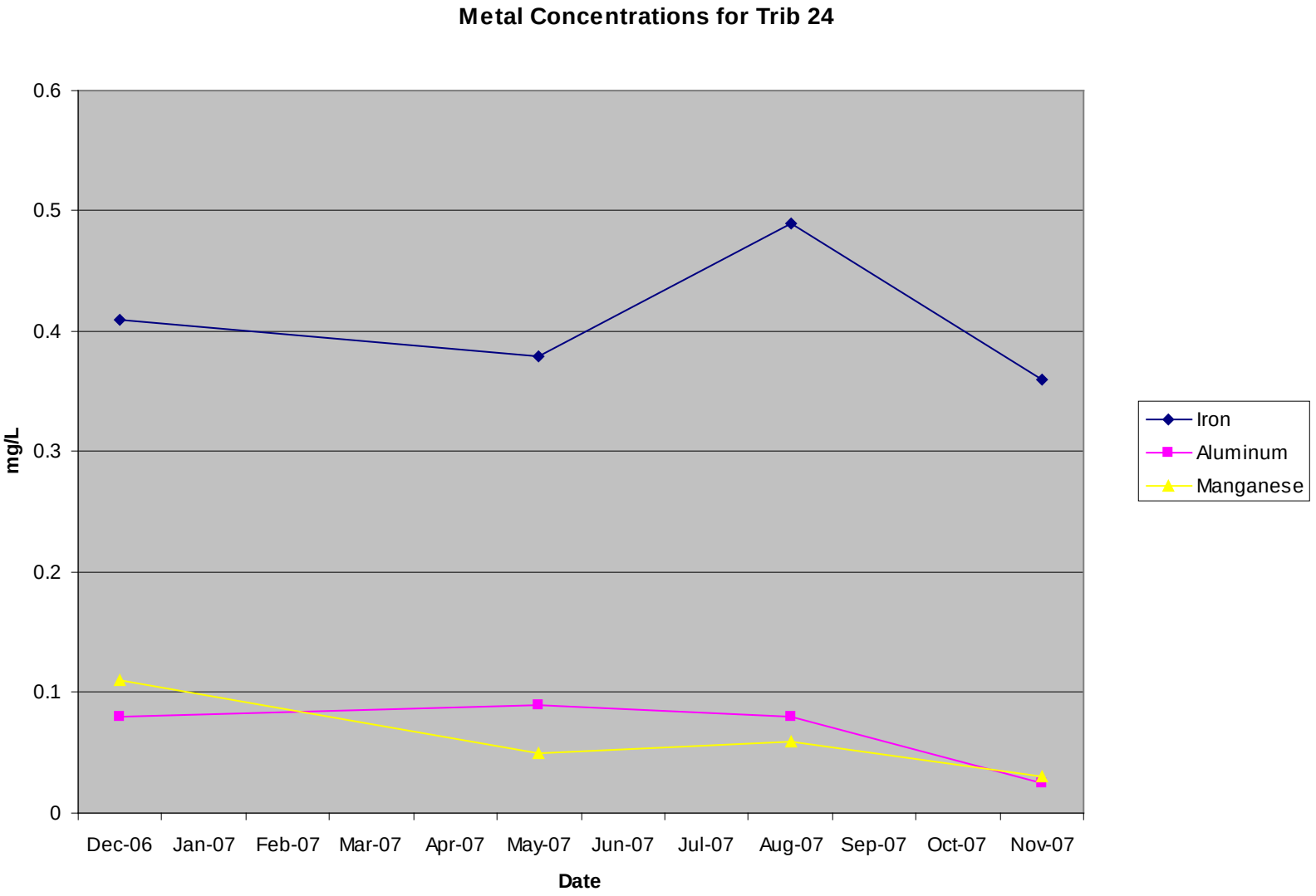
Tributary Number 24

Cambria County; East Carroll Township

CCWA Monitoring Point: Trib Number 24																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/20/2006	CCWA	425.67	7.78	216	49	--	30	--	--	--	--	--	147	--	153.73	--	--	--	--
12/13/2006	CCWA	514.58	7.3	198	41	-19	34	0.41	0.08	0.11	19	3.1	114	-117.70	210.62	2.54	0.50	0.68	117.70
2/5/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
5/9/2007	CCWA	832.04	6.8	205	56	-13	30	0.38	0.09	0.05	18	2.5	115	-130.21	300.49	3.81	0.90	0.50	180.30
8/13/2007	CCWA	243.18	7	227	71	-30	50	0.49	0.08	0.06	18	2.5	135	-87.82	146.37	1.43	0.23	0.18	52.69
11/1/2007	CCWA	181.24	7	230	45	-41	54	0.36	0.025	0.03	18	2.5	101	-89.46	117.82	0.79	0.05	0.07	39.27
Number of sample Dates	Count	5	5	5	5	4	5	4	4	4	4	4	5	4	5	4	4	4	4
	Max	832.04	7.78	230	71	-13	54	0.49	0.09	0.11	19	3.1	147	-87.82	300.49	3.81	0.90	0.68	180.30
	Min	181.24	6.8	198	41	-41	30	0.36	0.025	0.03	18	2.5	101	-130.21	117.82	0.79	0.05	0.07	39.27
6	Average	439.34	7.18	215.20	52.40	-25.75	39.60	0.41	0.07	0.06	18.25	2.65	122.40	-106.30	185.81	2.14	0.42	0.36	97.49

Note: 9/20/06 Data is FIELD only.

Date	Nitrates (ppm)	Phos. (ppm)	Nitrates (lbs/day)	Phos. (lbs/day)
9/20/2006	22	0.08	112.7365	0.409951
12/13/2006	3.18	0.06	19.69921	0.371683
2/5/2007	Frozen	Frozen	Frozen	Frozen
5/9/2007	3.25	0.12	32.5534	1.201972
8/13/2007	1.86	0.08	5.445146	0.2342
11/1/2007	1.11	0.06	2.421842	0.13091
Count	5	5	5	5
Max	22	0.12	112.7365	1.201972
Min	1.11	0.06	2.421842	0.13091
Average	6.28	0.08	34.57122	0.469743


Metal Concentrations for Trib 24
0.6
0.5
0.4
0.3
0.2
0.1
0
mg/L
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-25	Subwatershed Boundry Outline (topography)
B-IN-25	Subwatershed Industrial Influences
B-SO-25	Subwatershed Soils
B-AP-25	Subwatershed Aerial Photography
B-SG-25	Subwatershed Surface Geology

Chest Creek Watershed Assessment and Restoration Plan

Tributary 25, Duclos Run **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Clearfield Township, Cambria County

B. Chapter 93 Designation: HQ-CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded
P EM/SS 1A- Palustrine, emergent, persistent, temporary/ Palustrine, scrub/ shrub, broad-leaved deciduous, temporary
PFO1A- Palustrine, forested, broad-leaved deciduous, temporary
P FO/SS 1A- Palustrine, forested, broad-leaved deciduous, temporary/ Palustrine, scrub/ shrub, broad-leaved deciduous, temporary
PSS1C- Palustrine, scrub/ shrub, broad-leaved deciduous, seasonal

II. Quadrangle: Carrolltown, PA

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcc	Casselman Formation	2518.746869	3.935542

ACREAGE Sum

2518.746869

SQ_MI Sum

3.935542

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
CvD	24.955294	0.038993	General Soils
GWF	6.527612	0.010199	General Soils
GtD	4.644182	0.007257	General Soils
HaD	78.512851	0.122676	General Soils
LDF	219.842047	0.343503	General Soils
WgD	191.749502	0.299609	General Soils

SubShedSoilsCambria.ACREAGE Sum

526.231488

SubShedSoilsCambria.SQ_MI Sum

0.822237

HYDRIC SOILS			
AmB	0.029072	0.000045	Hydric Soils
At	82.447227	0.128824	Hydric Soils
BtB	165.333518	0.258334	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum

247.809817

SubShedSoilsCambria.SQ_MI Sum

0.387203

PRIME FARMLAND SOILS

CeB	119.857932	0.187278	Prime Farmland Soils
GnB	200.505856	0.31329	Prime Farmland Soils
HaB	91.65619	0.143213	Prime Farmland Soils
HaC	236.8881	0.370138	Prime Farmland Soils
LaB	17.106152	0.026728	Prime Farmland Soils
WaB	152.415478	0.238149	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

818.429708

SubShedSoilsCambria.SQ_MI Sum

1.278796

STATEWIDE IMPORTANT SOILS

BeB	5.383039	0.008411	Statewide Important Soils
BmB	59.171787	0.092456	Statewide Important Soils
CaB	222.215186	0.347211	Statewide Important Soils
CaC	17.609328	0.027515	Statewide Important Soils
CeC	127.790075	0.199672	Statewide Important Soils
GtC	66.205271	0.103446	Statewide Important Soils
GwC	21.469204	0.033546	Statewide Important Soils
LaC	29.440105	0.046	Statewide Important Soils
RaC	0.630507	0.000985	Statewide Important Soils
WaC	24.70049	0.038595	Statewide Important Soils
WgC	348.474247	0.544491	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

923.08924

SubShedSoilsCambria.SQ_MI Sum

1.442327

WATER

25	W	3.186632	0.004979	Water

SubShedSoilsCambria.ACREAGE Sum

3.186632

SubShedSoilsCambria.SQ_MI Sum

0.004979

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Water	1.105145	0.001727
Low Density Urban	23.067326	0.036043
Hay Pasture	616.271354	0.962924
Row Crops	1084.869791	1.695109
Coniferous Forest	47.788862	0.07467
Mixed Forest	79.676195	0.124494
Deciduous Forest	578.452851	0.903833
Quarries	3.757492	0.005871
Transitional	70.289155	0.109827
Acreage Sum		
2505.27817		
SQ_MI Sum		
3.914497		

G. Pollution Sources: Nutrient Runoff

H. Additional Notes: Work with local farmers in this watershed to improve BMP's. This is one of the tributaries recommended for remediaition.

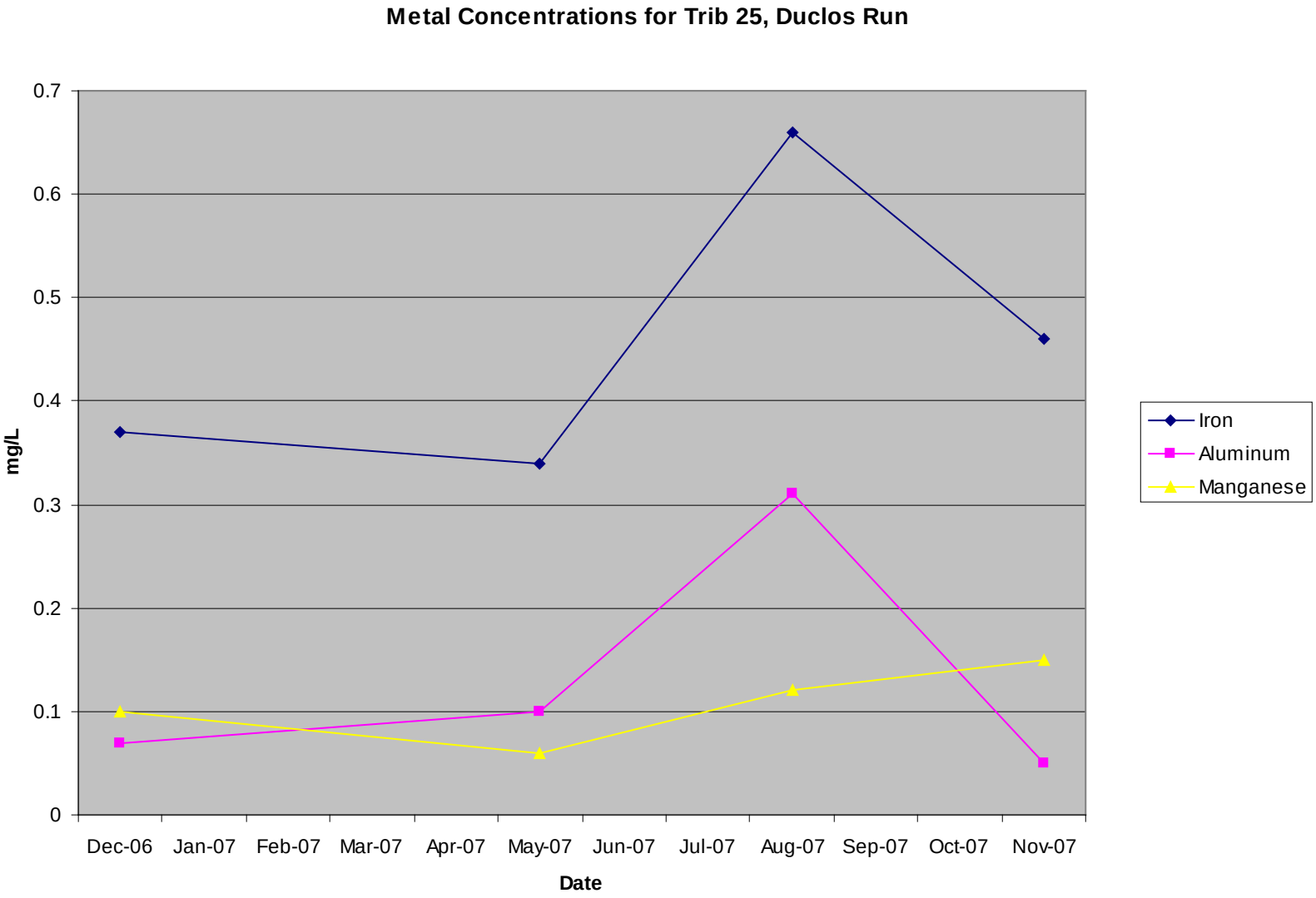
Tributary Number 25, Duclos Run

Cambria County; Clearfield Township

CCWA Monitoring Point: Trib Number 25, Duclos Run																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/20/2006	CCWA	356.86	7.73	225	50	--	20	--	--	--	--	--	156	--	85.92	--	--	--	--
12/13/2006	CCWA	592.23	7.3	186	43	-15	32	0.37	0.07	0.1	24	3.1	144	-106.94	228.14	2.64	0.50	0.71	171.11
2/5/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
5/9/2007	CCWA	756.55	6.8	182	64	-13	28	0.34	0.1	0.06	22	11	106	-118.40	255.01	3.10	0.91	0.55	200.37
8/14/2007	CCWA	273.2	6.9	188	71	-23	41	0.66	0.31	0.12	19	8	116	-75.64	134.84	2.17	1.02	0.39	62.49
11/1/2007	CCWA	147.58	7.4	214	45	-38	51	0.46	0.05	0.15	19	2.5	124	-67.51	90.61	0.82	0.09	0.27	33.76
Number of sample Dates	Count	5	5	5	5	4	5	4	4	4	4	4	5	4	5	4	4	4	4
	Max	756.55	7.73	225	71	-13	51	0.66	0.31	0.15	24	11	156	-67.51	255.01	3.10	1.02	0.71	200.37
	Min	147.58	6.8	182	43	-38	20	0.34	0.05	0.06	19	2.5	106	-118.40	85.92	0.82	0.09	0.27	33.76
6	Average	425.28	7.23	199.00	54.60	-22.25	34.40	0.46	0.13	0.11	21.00	6.15	129.20	-92.12	158.91	2.18	0.63	0.48	116.93

Note: 9/20/06 Data is FIELD only.

Date	Nitrates (ppm)	Phos. (ppm)	Nitrates (lbs/day)	Phos. (lbs/day)
9/20/2006	8.8	0.06	37.80501	0.257761
12/13/2006	2.45	0.03	17.46728	0.213885
2/5/2007	Frozen	Frozen	Frozen	Frozen
5/9/2007	2.57	0.09	23.40666	0.819689
8/14/2007	1.95	0.09	6.413337	0.296
11/1/2007	1.22	0.03	2.167485	0.053299
Count	5	5	5	5
Max	8.8	0.09	37.80501	0.819689
Min	1.22	0.03	2.167485	0.053299
Average	3.398	0.06	17.45195	0.328127


Metal Concentrations for Trib 25, Duclos Run
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
mg/L
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-26	Subwatershed Boundry Outline (topography)
B-IN-26	Subwatershed Industrial Influences
B-SO-26	Subwatershed Soils
B-AP-26	Subwatershed Aerial Photography
B-SG-26	Subwatershed Surface Geology

Tributary 26 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: East Carroll Township, Cambria County

B. Chapter 93 Designation: HQ-CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded

II. Quadrangle:

D. Geology and Soils:

I. Surface Geology

SYMB		NAME	Acreage	Square Miles	
26	28	Pcc	Casselman Formation	79.875891	0.124806
26	29	Pcg	Glenshaw Formation	93.873261	0.146677

ACREAGE Sum

173.749152

SQ_MI Sum

0.271483

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
GWF	44.381593	0.069346	General Soils
GtD	33.324217	0.052069	General Soils
WgD	0.187426	0.000293	General Soils

SubShedSoilsCambria.ACREAGE Sum

77.893235

SubShedSoilsCambria.SQ_MI Sum

0.121708

PRIME FARMLAND SOILS			
CeB	6.441863	0.010065	Prime Farmland Soils
GnB	10.846091	0.016947	Prime Farmland Soils
HaB	2.61502	0.004086	Prime Farmland Soils
Ph	3.375974	0.005275	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

23.278948

SubShedSoilsCambria.SQ_MI Sum

0.036373

STATEWIDE IMPORTANT SOILS			
CeC	46.425087	0.072539	Statewide Important Soils
GtC	26.122869	0.040817	Statewide Important Soils

WaC 0.029015 0.000045 Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

72.57697

SubShedSoilsCambria.SQ_MI Sum

0.113402

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Low Density Urban	6.041493	0.00944
Hay Pasture	35.065494	0.05479
Row Crops	83.620632	0.130657
Coniferous Forest	2.221252	0.003471
Mixed Forest	2.956707	0.00462
Deciduous Forest	31.176622	0.048713
Quarries	0.676269	0.001057
Transitional	11.990683	0.018735

Acreage Sum

173.749153

SQ_MI Sum

0.271483

G. Pollution Sources: None

H. Additional Notes: None

Tributary Number 26

Cambria County; East Carroll Township

CCWA Monitoring Point: Trib Number 26														Loading					
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.						
		(None)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/22/2006	CCWA	Dry	NO DATA											--	--	--	--	--	--
12/13/2006	CCWA	Frozen												--	--	--	--	--	--
2/5/2007	CCWA	Frozen												--	--	--	--	--	--
5/9/2007	CCWA	Dry												--	--	--	--	--	--
8/16/2007	CCWA	Dry												--	--	--	--	--	--
11/2/2007	CCWA	Dry												--	--	--	--	--	--
Number of sample Dates	Count	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Max	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
	Min	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
6	Average	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-27	Subwatershed Boundry Outline (topography)
B-IN-27	Subwatershed Industrial Influences
B-SO-27	Subwatershed Soils
B-AP-27	Subwatershed Aerial Photography
B-SG-27	Subwatershed Surface Geology

Tributary 27 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: East Carroll Township, Cambria County

B. Chapter 93 Designation: HQ-CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded
PUBH- Palustrine, unconsolidated bottom, permanent

II. Quadrangle: Carolltown, PA

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcc	Casselman Formation	8.576834	0.013401
Pcg	Glenshaw Formation	92.008787	0.143764

ACREAGE Sum
100.585622
SQ_MI Sum
0.157165

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
GWF	24.458943	0.038217	General Soils
GtD	4.999611	0.007812	General Soils
LDF	6.194105	0.009678	General Soils

SubShedSoilsCambria.ACREAGE Sum
35.652659
SubShedSoilsCambria.SQ_MI Sum
0.055707

HYDRIC SOILS			
At	11.462925	0.017911	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum
11.462925
SubShedSoilsCambria.SQ_MI Sum
0.017911

PRIME FARMLAND SOILS			
CeB	24.313731	0.03799	Prime Farmland Soils
GnB	6.213031	0.009708	Prime Farmland Soils
HaB	0.420397	0.000657	Prime Farmland Soils
Ph	2.107213	0.003293	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

33.054372

SubShedSoilsCambria.SQ_MI Sum

0.051647

STATEWIDE IMPORTANT SOILS

CeC	0.031551	0.000049	Statewide Important Soils
GtC	19.858321	0.031029	Statewide Important Soils
WaC	0.000011	0	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

19.889883

SubShedSoilsCambria.SQ_MI Sum

0.031078

WATER

W	0.525781	0.000822	Water

SubShedSoilsCambria.ACREAGE Sum

0.525781

SubShedSoilsCambria.SQ_MI Sum

0.000822

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Low Density Urban	2.875164	0.004492
Hay Pasture	17.800098	0.027813
Row Crops	28.733504	0.044896
Coniferous Forest	1.780873	0.002783
Mixed Forest	1.253797	0.001959
Deciduous Forest	43.66184	0.068222
Transitional	4.480345	0.007001

Acreage Sum

100.58562

SQ_MI Sum

0.157165

G. Pollution Sources: None

H. Additional Notes: This tributary flows into an impoundment and is blocked by railroad tracks, before mixing with Chest Creek.

Tributary Number 27

Cambria County; East Carroll Township

CCWA Monitoring Point: Trib Number 27														Loading					
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.						
		(None)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/22/2006	CCWA	Dry	NO DATA											--	--	--	--	--	--
12/13/2006	CCWA	Frozen												--	--	--	--	--	--
2/6/2007	CCWA	Frozen												--	--	--	--	--	--
5/9/2007	CCWA	Wetlands												--	--	--	--	--	--
8/16/2007	CCWA	Dry												--	--	--	--	--	--
11/2/2007	CCWA	Wetlands												--	--	--	--	--	--
Number of sample Dates	Count	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Max	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
	Min	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
6	Average	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-28	Subwatershed Boundry Outline (topography)
B-IN-28	Subwatershed Industrial Influences
B-SO-28	Subwatershed Soils
B-AP-28	Subwatershed Aerial Photography
B-SG-28	Subwatershed Surface Geology

Tributary 28 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Clearfield Township, Cambria County

B. Chapter 93 Designation: HQ-CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PFO4A- Palustrine, forested, needle-leaved evergreen, temporary

PSS1C- Palustrine, scrub/ shrub, broad-leaved deciduous, seasonal

II. Quadrangle: Carrolltown, PA

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcc	Casselman Formation	107.362732	0.167754
Pcg	Glenshaw Formation	46.689827	0.072953

ACREAGE Sum

154.05256

SQ_MI Sum

0.240707

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
CvD	7.79612	0.012181	General Soils
GWF	0.009488	0.000015	General Soils
HaD	5.325585	0.008321	General Soils
WgD	9.397982	0.014684	General Soils

SubShedSoilsCambria.ACREAGE Sum

22.529175

SubShedSoilsCambria.SQ_MI Sum

0.035202

HYDRIC SOILS			
AmB	49.216052	0.0769	Hydric Soils
At	0.323449	0.000505	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum

49.5395

SubShedSoilsCambria.SQ_MI Sum

0.077405

PRIME FARMLAND SOILS			
CeB	23.350423	0.036485	Prime Farmland Soils

GnB	6.622718	0.010348	Prime Farmland Soils
HaB	13.164373	0.020569	Prime Farmland Soils
HaC	0.240191	0.000375	Prime Farmland Soils
Ph	0.286521	0.000448	Prime Farmland Soils
WaB	6.982906	0.010911	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

50.647131

SubShedSoilsCambria.SQ_MI Sum

0.079136

STATEWIDE IMPORTANT SOILS

CaB	14.594708	0.022804	Statewide Important Soils
CeC	8.395327	0.013118	Statewide Important Soils
WgC	8.346717	0.013042	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

31.336753

SubShedSoilsCambria.SQ_MI Sum

0.048964

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	**Acreage**	**SQ_MI**
Hay Pasture	5.403528	0.008443
Row Crops	8.902257	0.01391
Coniferous Forest	8.317276	0.012996
Mixed Forest	1.544085	0.002413
Deciduous Forest	120.543965	0.18835
Quarries	0.06068	0.000095
Transitional	9.280768	0.014501

Acreage Sum

154.05256

SQ_MI Sum

0.240707

G. Pollution Sources: None

H. Additional Notes: None

Tributary Number 28
Cambria County; Clearfield Township

CCWA Monitoring Point: Trib Number 28																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/22/2006	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12/14/2006	CCWA	39.18	5.8	67	42	9	6	0.22	0.17	0.03	13	3.1	47	4.24	2.83	0.10	0.08	0.01	6.13
2/6/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
5/10/2007	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
8/15/2007	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11/5/2007	CCWA	16.34	5.7	68	50	9	6	0.34	0.25	0.12	13	10	48	1.77	1.18	0.07	0.05	0.02	2.56
Number of sample Dates	Count	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Max	39.18	5.8	68	50	9	6	0.34	0.25	0.12	13	10	48	4.24	2.83	0.10	0.08	0.02	6.13
	Min	16.34	5.7	67	42	9	6	0.22	0.17	0.03	13	3.1	47	1.77	1.18	0.07	0.05	0.01	2.56
6	Average	27.76	5.75	67.50	46.00	9.00	6.00	0.28	0.21	0.08	13.00	6.55	47.50	3.01	2.01	0.09	0.06	0.02	4.34

Date	Nitrates (ppm)	Phos. (ppm)	Nitrates (lbs/day)	Phos. (lbs/day)
9/22/2006	--	--	--	--
12/14/2006	0.25	0.03	0.117916	0.01415
2/6/2007	Frozen	Frozen	Frozen	Frozen
5/10/2007	--	--	--	--
8/15/2007	--	--	--	--
11/5/2007	0.25	0.11	0.049177	0.021638
Count	2	2	2	2
Max	0.25	0.11	0.117916	0.021638
Min	0.25	0.03	0.049177	0.01415
Average	0.25	0.07	0.083546	0.017894

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-29	Subwatershed Boundry Outline (topography)
B-IN-29	Subwatershed Industrial Influences
B-SO-29	Subwatershed Soils
B-AP-29	Subwatershed Aerial Photography
B-SG-29	Subwatershed Surface Geology

Tributary 29 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Clearfield Township, Cambria County

B. Chapter 93 Designation: HQ-CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

R5UBH- Riverine, unknown perennial, unconsolidated bottom, permanent
PSS1C- Palustrine, scrub/ shrub, broad-leaved deciduous, seasonal
PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded
PEM1Eh- Palustrine, emergent, persistent, seasonal saturated, diked/ impounded
PEM1C- Palustrine, emergent, persistent, seasonal

II. Quadrangle: Carrolltown and Hastings, PA

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcc	Casselman Formation	198.180501	0.309657
Pcg	Glenshaw Formation	99.995507	0.156243

ACREAGE Sum
298.176008
SQ_MI Sum
0.4659

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
HaD	3.023872	0.004725	General Soils
HbD	9.197886	0.014372	General Soils
LDF	0.177735	0.000278	General Soils

SubShedSoilsCambria.ACREAGE Sum
12.399493
SubShedSoilsCambria.SQ_MI Sum
0.019374

HYDRIC SOILS			
At	0.476565	0.000745	Hydric Soils
BtB	40.946762	0.063979	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum
41.423327
SubShedSoilsCambria.SQ_MI Sum
0.064724

PRIME FARMLAND SOILS

CeB	37.562717	0.058692	Prime Farmland Soils
GnB	15.172414	0.023707	Prime Farmland Soils
HaB	19.733588	0.030834	Prime Farmland Soils
HaC	44.518593	0.06956	Prime Farmland Soils
WaB	44.86448	0.070101	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

161.851792

SubShedSoilsCambria.SQ_MI Sum

0.252893

STATEWIDE IMPORTANT SOILS

BmB	7.242317	0.011316	Statewide Important Soils
CeC	1.093967	0.001709	Statewide Important Soils
GtC	11.94884	0.01867	Statewide Important Soils
GwB	4.080459	0.006376	Statewide Important Soils
GwC	2.790723	0.004361	Statewide Important Soils
LaC	11.15359	0.017427	Statewide Important Soils
WaC	41.973978	0.065584	Statewide Important Soils
WgC	0.512001	0.0008	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

80.795876

SubShedSoilsCambria.SQ_MI Sum

0.126244

WATER

W	1.705518	0.002665	Water

SubShedSoilsCambria.ACREAGE Sum

1.705518

SubShedSoilsCambria.SQ_MI Sum

0.002665

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	**Acreage**	**SQ_MI**
Low Density Urban	4.779193	0.007467
Hay Pasture	61.930061	0.096766
Row Crops	117.851802	0.184143
Coniferous Forest	3.102488	0.004848
Mixed Forest	10.674858	0.016679
Deciduous Forest	70.48466	0.110132
Quarries	1.76823	0.002763
Transitional	26.077305	0.040746

Acreage Sum
296.668598
SQ_MI Sum
0.463545

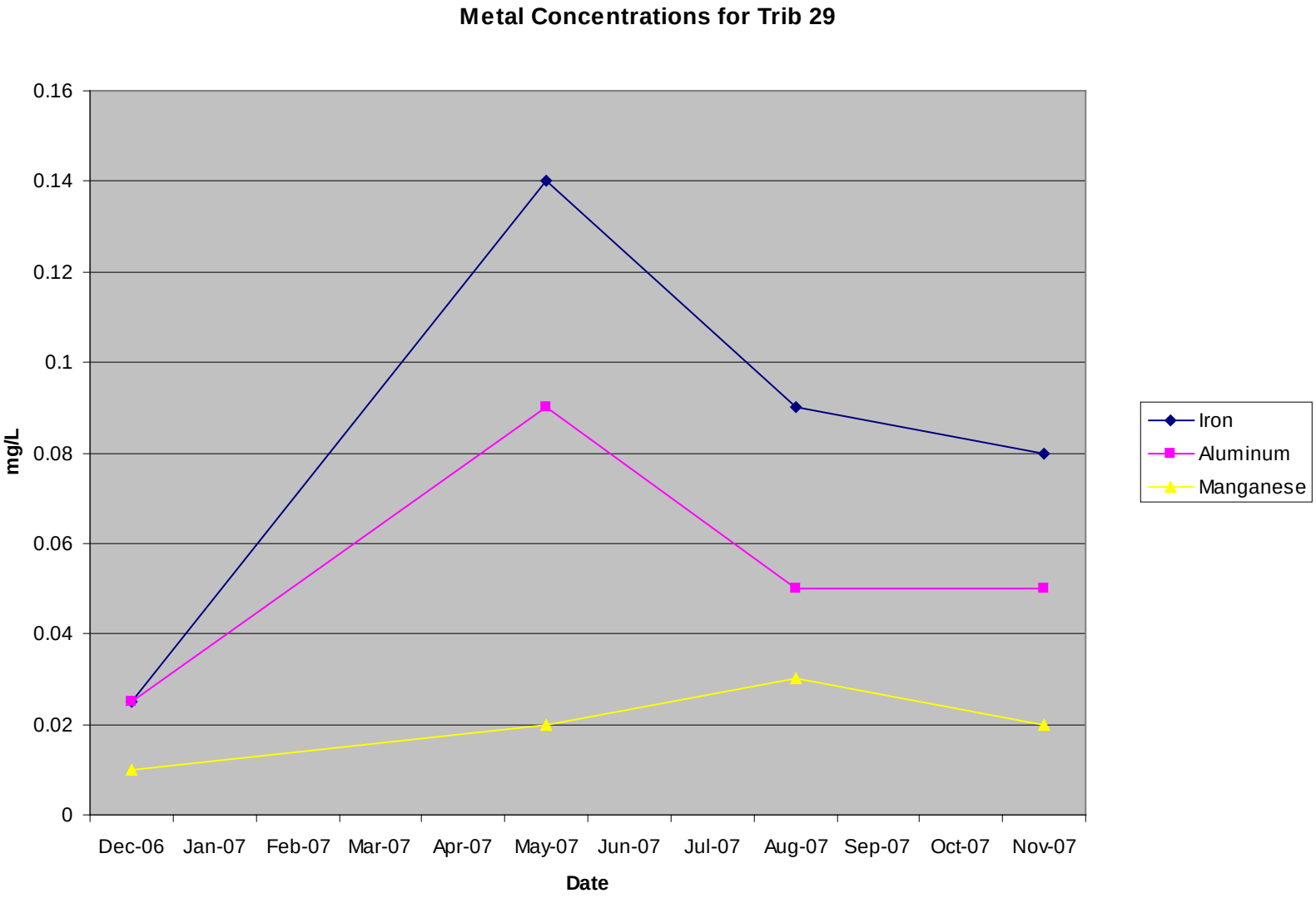
G. Pollution Sources: None

H. Additional Notes: None

Tributary Number 29
Cambria County; Clearfield Township

CCWA Monitoring Point: Trib Number 29																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/22/2006	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12/14/2006	CCWA	54.84	7.5	202	45	-22	35	0.025	0.025	0.01	20	3.1	109	-14.52	23.11	0.02	0.02	0.01	13.20
2/6/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
5/10/2007	CCWA	107	6.7	176	65	-13	31	0.14	0.09	0.02	16	2.5	92	-16.75	39.93	0.18	0.12	0.03	20.61
8/15/2007	CCWA	56.73	6.8	210	68	-20	42	0.09	0.05	0.03	16	2.5	117	-13.66	28.68	0.06	0.03	0.02	10.93
11/6/2007	CCWA	57.5	6.9	263	30	-43	59	0.08	0.05	0.02	16	2.5	142	-29.76	40.84	0.06	0.03	0.01	11.08
Number of sample Dates	Count	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	Max	107	7.5	263	68	-13	59	0.14	0.09	0.03	20	3.1	142	-13.66	40.84	0.18	0.12	0.03	20.61
	Min	54.84	6.7	176	30	-43	31	0.025	0.025	0.01	16	2.5	92	-29.76	23.11	0.02	0.02	0.01	10.93
6	Average	69.02	6.98	212.75	52.00	-24.50	41.75	0.08	0.05	0.02	17.00	2.65	115.00	-18.67	33.14	0.08	0.05	0.02	13.95

Date	Nitrates (ppm)	Phos. (ppm)	Nitrates (lbs/day)	Phos. (lbs/day)
9/22/2006	--	--	--	--
12/14/2006	1.55	0.03	1.023288	0.019806
2/6/2007	Frozen	Frozen	Frozen	Frozen
5/10/2007	0.98	0.2	1.262347	0.257622
8/15/2007	1.18	0.03	0.805867	0.020488
11/6/2007	0.64	0.03	0.443013	0.020766
Count	4	4	4	4
Max	1.55	0.2	1.262347	0.257622
Min	0.64	0.03	0.443013	0.019806
Average	1.0875	0.0725	0.883629	0.07967


Metal Concentrations for Trib 29
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
mg/L
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-30	Subwatershed Boundry Outline (topography)
B-IN-30	Subwatershed Industrial Influences
B-SO-30	Subwatershed Soils
B-AP-30	Subwatershed Aerial Photography
B-SG-30	Subwatershed Surface Geology

Tributary 30, Little Chest Creek **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Carrolltown Borough; East Carroll Township; Patton Borough, Cambria County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded
PUBFx- Palustrine, unconsolidated bottom, semiperminent, excavated
PEM1C- Palustrine, emergent, persistent, seasonal
PSS1F- Palustrine, scrub/ shrub, broad-leaved deciduous, semiperminent
PUBHx- Palustrine, unconsolidated bottom, permanent, excavated

II. Quadrangle: Carrolltown and Hastings, PA

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcc	Casselman Formation	12.749668	0.019921
Pcg	Glenshaw Formation	2620.53129	4.09458
Pa	Allegheny Formation	622.476318	0.972619

ACREAGE Sum

3255.757276

SQ_MI Sum

5.087121

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
BeD	7.047336	0.011011	General Soils
BnB	92.327265	0.144261	General Soils
CbB	69.591459	0.108737	General Soils
CeD	4.005488	0.006259	General Soils
CvB	150.197452	0.234684	General Soils
CvD	108.746399	0.169916	General Soils
GWF	213.849713	0.33414	General Soils
GpB	9.490393	0.014829	General Soils
GtD	129.725282	0.202696	General Soils
GwD	50.644061	0.079131	General Soils
HaD	10.596553	0.016557	General Soils
Hx	56.716431	0.088619	General Soils
LDF	62.246544	0.09726	General Soils

LkD	1.128896	0.001764	General Soils
WgD	45.153089	0.070552	General Soils

SubShedSoilsCambria.ACREAGE Sum

1011.466361

SubShedSoilsCambria.SQ_MI Sum

1.580416

HYDRIC SOILS

AmB	17.492764	0.027332	Hydric Soils
BtB	291.042054	0.454753	Hydric Soils
BvB	13.601053	0.021252	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum

322.135872

SubShedSoilsCambria.SQ_MI Sum

0.503337

PRIME FARMLAND SOILS

CeB	224.857143	0.351339	Prime Farmland Soils
GnB	199.984534	0.312476	Prime Farmland Soils
HaB	77.202847	0.120629	Prime Farmland Soils
HaC	40.858837	0.063842	Prime Farmland Soils
Po	5.566108	0.008697	Prime Farmland Soils
WaB	113.676433	0.177619	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

662.145902

SubShedSoilsCambria.SQ_MI Sum

1.034603

STATEWIDE IMPORTANT SOILS

BeB	0.80415	0.001256	Statewide Important Soils
BmB	218.551922	0.341487	Statewide Important Soils
BmC	29.625458	0.04629	Statewide Important Soils
CaB	81.380713	0.127157	Statewide Important Soils
CaC	26.127096	0.040824	Statewide Important Soils
CeC	124.934477	0.19521	Statewide Important Soils
GtC	234.465285	0.366352	Statewide Important Soils
GwB	25.063686	0.039162	Statewide Important Soils
GwC	78.236334	0.122244	Statewide Important Soils
WaC	43.506866	0.067979	Statewide Important Soils
WgC	91.522677	0.143004	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

954.218664

SubShedSoilsCambria.SQ_MI Sum

1.490967

STRIP MINES

UDC	160.444706	0.250695	Strip Mines
UDF	26.566295	0.04151	Strip Mines

SubShedSoilsCambria.ACREAGE Sum

187.011001

SubShedSoilsCambria.SQ_MI Sum

0.292205

URBAN DISTURBED

URB 77.843934 0.121631 Urban Disturbed

URC 37.531805 0.058643 Urban Disturbed

SubShedSoilsCambria.ACREAGE Sum

115.37574

SubShedSoilsCambria.SQ_MI Sum

0.180275

WATER

W 3.403748 0.005318 Water

SubShedSoilsCambria.ACREAGE Sum

3.403748

SubShedSoilsCambria.SQ_MI Sum

0.005318

E. Mining:

I. Mining Permits in Drainage Basin:

11823013

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Water	1.105145	0.001727
Low Density Urban	282.798672	0.441873
High Density Urban	12.521064	0.019564
Hay Pasture	415.203386	0.648755
Row Crops	950.021612	1.484409
Coniferous Forest	69.507883	0.108606
Mixed Forest	69.801123	0.109064
Deciduous Forest	1312.41694	2.050651
Quarries	1.036586	0.00162
Transitional	135.898851	0.212342

Acreage Sum

3250.311264

SQ_MI Sum

5.078611

G. Pollution Sources: Some Nutrient Runoff

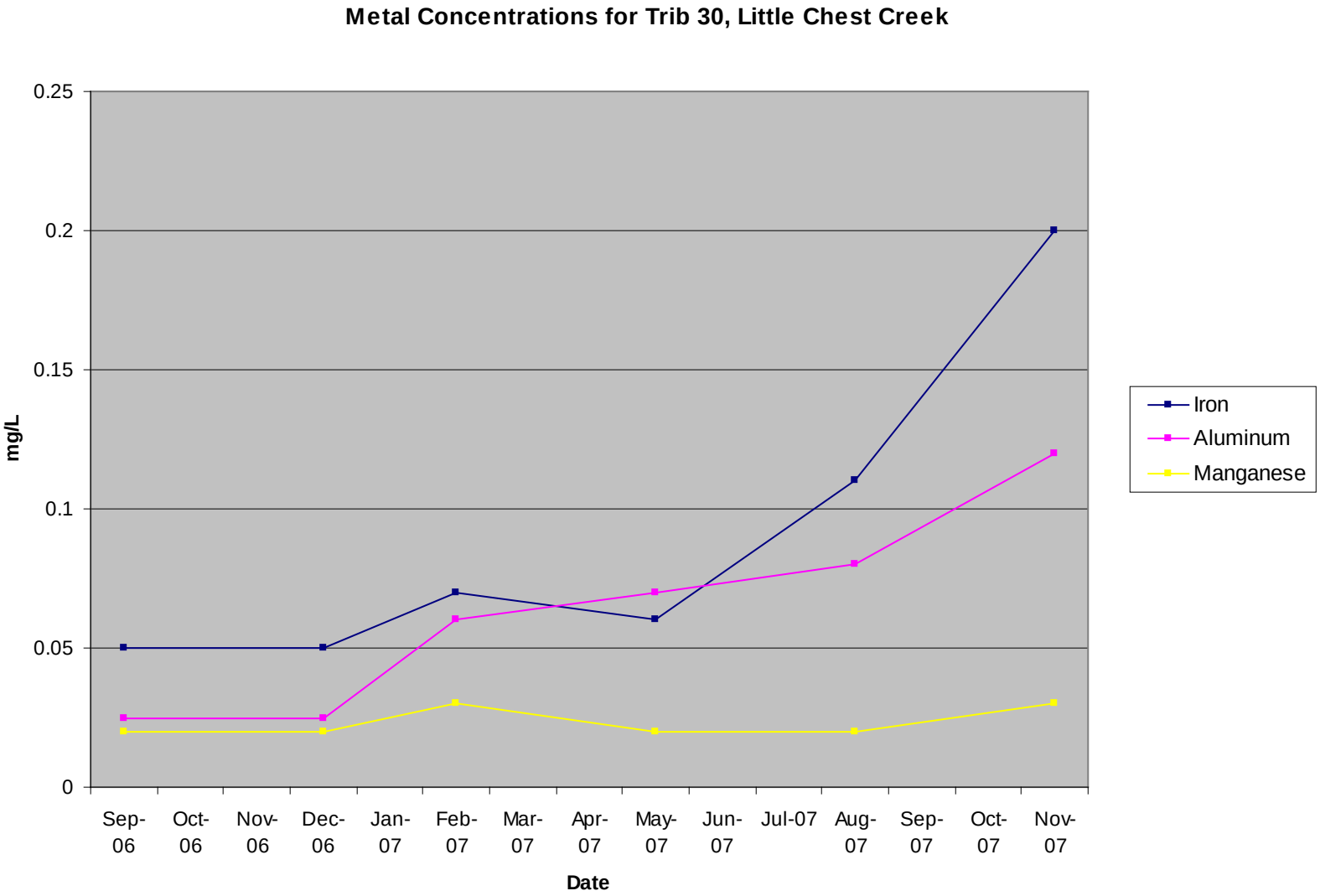
H. Additional Notes: The Patton Trout Nursery is located in the lower portion of this watershed. This tributary is recommended for remediation.

Tributary Number 30, Little Chest Creek

Cambria County; Carrolltown Borough, East Carroll Township, Patton Borough

CCWA Monitoring Point: Trib Number 30, Little Chest Creek														Loading					
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total						
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/22/2006	CCWA	281.87	7.8	516	61	-64	80	0.05	0.025	0.02	127	3.1	319	-217.17	271.46	0.17	0.08	0.07	430.94
12/14/2006	CCWA	667.27	7.9	444	42	-34	49	0.05	0.025	0.02	115	3.1	266	-273.12	393.61	0.40	0.20	0.16	923.78
2/9/2007	CCWA	973.78	7.6	437	15	-34	48	0.07	0.06	0.03	112	2.5	273	-398.57	562.69	0.82	0.70	0.35	1312.95
5/10/2007	CCWA	1373.73	7.3	381	67	-28	45	0.06	0.07	0.02	97	2.5	217	-463.05	744.19	0.99	1.16	0.33	1604.14
8/15/2007	CCWA	267.1	7.6	525	70	-42	65	0.11	0.08	0.02	117	2.5	336	-135.05	209.00	0.35	0.26	0.06	376.21
11/7/2007	CCWA	292.73	7.2	488	30	-47	67	0.2	0.12	0.03	120	12	322	-165.63	236.11	0.70	0.42	0.11	422.88
Number of sample Dates	Count	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	Max	1373.73	7.9	525	70	-28	80	0.2	0.12	0.03	127	12	336	-135.05	744.19	0.99	1.16	0.35	1604.14
	Min	267.1	7.2	381	15	-64	45	0.05	0.025	0.02	97	2.5	217	-463.05	209.00	0.17	0.08	0.06	376.21
6	Average	642.75	7.57	465.17	47.50	-41.50	59.00	0.09	0.06	0.02	114.67	4.28	288.83	-275.43	402.84	0.57	0.47	0.18	845.15

Date	Nitrates (ppm)	Phos. (ppm)	Nitrates (lbs/day)	Phos. (lbs/day)
9/22/2006	13.2	0.14	44.79108	0.475057
12/14/2006	2.52	0.16	20.24282	1.285258
2/9/2007	8.8	0.14	103.1602	1.641185
5/10/2007	1.94	0.03	32.08277	0.496125
8/15/2007	2.15	0.18	6.913232	0.578782
11/7/2007	3.48	0.18	12.26352	0.63432
Count	6	6	6	6
Max	13.2	0.18	103.1602	1.641185
Min	1.94	0.03	6.913232	0.475057
Average	5.348333	0.138333	36.57561	0.851788


Metal Concentrations for Trib 30, Little Chest Creek
0.25
0.2
0.15
0.1
0.05
0
mg/L
Sep-06
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-31	Subwatershed Boundry Outline (topography)
B-IN-31	Subwatershed Industrial Influences
B-SO-31	Subwatershed Soils
B-AP-31	Subwatershed Aerial Photography
B-SG-31	Subwatershed Surface Geology

Tributary 31 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Chest Township; Patton Borough, Cambria County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PEM1C- Palustrine, emergent, persistent, seasonal

II. Quadrangle: Hastings, PA

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcc	Casselman Formation	75.64587	0.118197
Pcg	Glenshaw Formation	857.782411	1.340285
Pa	Allegheny Formation	88.455271	0.138211

ACREAGE Sum

1021.883551

SQ_MI Sum

1.596693

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
BeD	25.637356	0.040058	General Soils
CvD	49.183225	0.076849	General Soils
GWF	45.404718	0.070945	General Soils
GtD	4.594576	0.007179	General Soils
GwD	3.656883	0.005714	General Soils
HaD	12.677325	0.019808	General Soils
HbB	34.46719	0.053855	General Soils
HbD	167.554887	0.261805	General Soils
LDF	42.599216	0.066561	General Soils
WgD	0.191	0.000298	General Soils

SubShedSoilsCambria.ACREAGE Sum

385.966377

SubShedSoilsCambria.SQ_MI Sum

0.603072

HYDRIC SOILS			
At	44.945402	0.070227	Hydric Soils
BtB	158.178935	0.247155	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum

203.124338

SubShedSoilsCambria.SQ_MI Sum

0.317382

PRIME FARMLAND SOILS

CeB	33.020373	0.051594	Prime Farmland Soils
GnB	17.967909	0.028075	Prime Farmland Soils
HaB	98.946904	0.154605	Prime Farmland Soils
HaC	33.73327	0.052708	Prime Farmland Soils
LaB	0.002221	0.000003	Prime Farmland Soils
Po	61.206316	0.095635	Prime Farmland Soils
WaB	18.804754	0.029382	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

263.681746

SubShedSoilsCambria.SQ_MI Sum

0.412003

STATEWIDE IMPORTANT SOILS

BeB	17.835754	0.027868	Statewide Important Soils
BeC	6.048617	0.009451	Statewide Important Soils
BmB	19.060317	0.029782	Statewide Important Soils
BmC	4.276129	0.006681	Statewide Important Soils
CaB	9.951425	0.015549	Statewide Important Soils
CeC	70.165909	0.109634	Statewide Important Soils
GtC	38.152112	0.059613	Statewide Important Soils
GwB	0.552954	0.000864	Statewide Important Soils
GwC	0.443898	0.000694	Statewide Important Soils
RaC	2.624005	0.0041	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

169.111122

SubShedSoilsCambria.SQ_MI Sum

0.264236

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	**Acreage**	**SQ_MI**
Water	0.221029	0.000345
Low Density Urban	50.165389	0.078383
Hay Pasture	79.723167	0.124567
Row Crops	98.941394	0.154596
Coniferous Forest	20.065741	0.031353
Mixed Forest	10.760792	0.016814

Deciduous Forest	725.346426	1.133354
Quarries	0.227851	0.000356
Transitional	30.511798	0.047675

Acreage Sum

1015.963587

SQ_MI Sum

1.587443

G. Pollution Sources: None

H. Additional Notes: None

Tributary Number 31

Cambria County; Chest Township, Patton Borough

CCWA Monitoring Point: Trib Number 31														Loading					
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.						
		(None)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/22/2006	CCWA	Wetland	NO DATA											--	--	--	--	--	--
1/3/2007	CCWA	Wetland												--	--	--	--	--	--
2/8/2007	CCWA	Frozen												--	--	--	--	--	--
5/10/2007	CCWA	Wetland												--	--	--	--	--	--
8/16/2007	CCWA	Wetland												--	--	--	--	--	--
11/8/2007	CCWA	Wetland												--	--	--	--	--	--
Number of sample Dates	Count	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Max	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
	Min	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
6	Average	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-32	Subwatershed Boundry Outline (topography)
B-IN-32	Subwatershed Industrial Influences
B-SO-32	Subwatershed Soils
B-AP-32	Subwatershed Aerial Photography
B-SG-32	Subwatershed Surface Geology

Tributary 32 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Elder Township, Cambria County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PEM1C- Palustrine, emergent, persistent, seasonal

II. Quadrangle: Hastings, PA

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcg	Glenshaw Formation	654.870474	1.023235
Pa	Allegheny Formation	135.579057	0.211842

ACREAGE Sum

790.449531

SQ_MI Sum

1.235077

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
BeD	0.751341	0.001174	General Soils
BnB	13.194292	0.020616	General Soils
CbB	1.437486	0.002246	General Soils
CvD	44.346786	0.069292	General Soils
GpB	20.166083	0.03151	General Soils
GwD	31.342412	0.048973	General Soils
HbD	10.460801	0.016345	General Soils
LDF	19.466565	0.030417	General Soils
WgD	19.879787	0.031062	General Soils

SubShedSoilsCambria.ACREAGE Sum

161.045554

SubShedSoilsCambria.SQ_MI Sum

0.251634

HYDRIC SOILS			
BtB	55.62804	0.086919	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum

55.62804

SubShedSoilsCambria.SQ_MI Sum

0.086919

PRIME FARMLAND SOILS

CeB	5.673449	0.008865	Prime Farmland Soils
GnB	43.136111	0.0674	Prime Farmland Soils
HaB	11.693551	0.018271	Prime Farmland Soils
HaC	7.472227	0.011675	Prime Farmland Soils
WaB	87.593967	0.136866	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

155.569305

SubShedSoilsCambria.SQ_MI Sum

0.243077

STATEWIDE IMPORTANT SOILS

BmB	32.862828	0.051348	Statewide Important Soils
BmC	12.003961	0.018756	Statewide Important Soils
CaB	188.739901	0.294906	Statewide Important Soils
GtC	68.160038	0.1065	Statewide Important Soils
GwB	27.345878	0.042728	Statewide Important Soils
GwC	47.783573	0.074662	Statewide Important Soils
WgC	15.956152	0.024931	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

392.852332

SubShedSoilsCambria.SQ_MI Sum

0.613832

STRIP MINES

UDC	0.13654	0.000213	Strip Mines

SubShedSoilsCambria.ACREAGE Sum

0.13654

SubShedSoilsCambria.SQ_MI Sum

0.000213

URBAN DISTURBED

URB	24.489162	0.038264	Urban Disturbed

SubShedSoilsCambria.ACREAGE Sum

24.489162

SubShedSoilsCambria.SQ_MI Sum

0.038264

WATER

W	0.728592	0.001138	Water

SubShedSoilsCambria.ACREAGE Sum

0.728592

SubShedSoilsCambria.SQ_MI Sum

0.001138

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Water	0.221028	0.000345
Low Density Urban	4.420576	0.006907
Hay Pasture	121.538044	0.189903
Row Crops	346.041705	0.54069
Coniferous Forest	19.666894	0.03073
Mixed Forest	34.531185	0.053955
Deciduous Forest	243.003771	0.379693
Quarries	0.221029	0.000345
Transitional	20.805295	0.032508

Acreage Sum

790.449528

SQ_MI Sum

1.235077

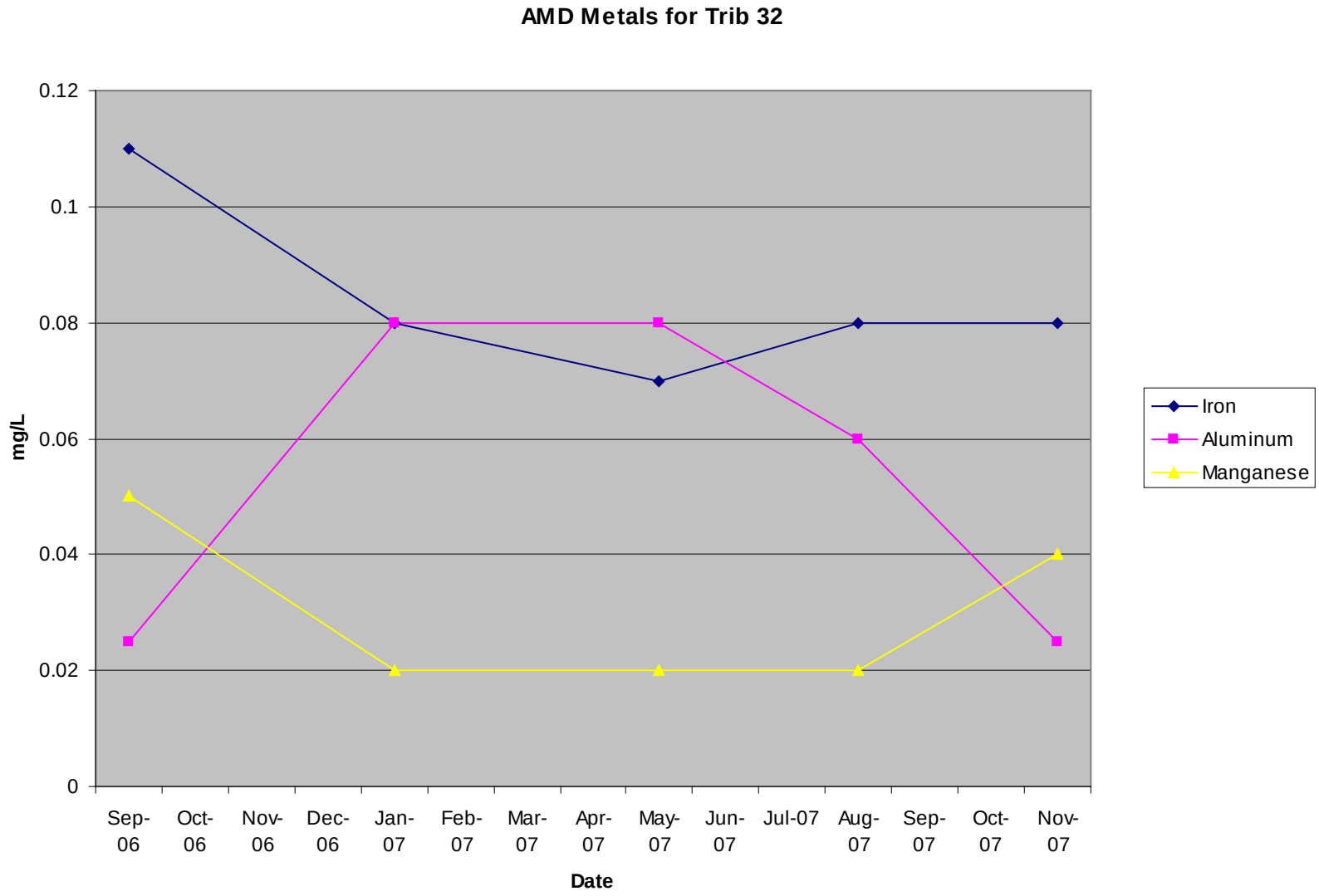
G. Pollution Sources: None

H. Additional Notes: None

Tributary Number 32

Cambria County; Elder Township

CCWA Monitoring Point: Trib Number 32																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Bucket)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/25/2006	CCWA	63.2	8	750	64	-98	114	0.11	0.025	0.05	272	3.1	541	-74.56	86.73	0.08	0.02	0.04	206.94
1/3/2007	CCWA	276.92	7.8	565	44	-54	70	0.08	0.08	0.02	155	3.1	330	-180.02	233.36	0.27	0.27	0.07	516.72
2/8/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
5/10/2007	CCWA	253.52	7.5	534	70	-52	75	0.07	0.08	0.02	163	2.5	345	-158.70	228.90	0.21	0.24	0.06	497.47
8/16/2007	CCWA	59	7.9	708	66	-79	98	0.08	0.06	0.02	230	2.5	508	-56.11	69.61	0.06	0.04	0.01	163.36
11/8/2007	CCWA	64.44	7.9	766	30	-80	100	0.08	0.025	0.04	262	2.5	562	-62.06	77.58	0.06	0.02	0.03	203.25
Number of sample Dates	Count	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Max	276.92	8	766	70	-52	114	0.11	0.08	0.05	272	3.1	562	-56.11	233.36	0.27	0.27	0.07	516.72
	Min	59	7.5	534	30	-98	70	0.07	0.025	0.02	155	2.5	330	-180.02	69.61	0.06	0.02	0.01	163.36
6	Average	143.42	7.82	664.60	54.80	-72.60	91.40	0.08	0.05	0.03	216.40	2.74	457.20	-106.29	139.23	0.14	0.12	0.04	317.55


AMD Metals for Trib 32
0.12
0.1
0.08
0.06
0.04
0.02
0
mg/L
Sep-06
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-33	Subwatershed Boundry Outline (topography)
B-IN-33	Subwatershed Industrial Influences
B-SO-33	Subwatershed Soils
B-AP-33	Subwatershed Aerial Photography
B-SG-33	Subwatershed Surface Geology

Tributary 33 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Chest Township, Cambria County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:
I. Habitat Types: none mapped
II. Quadrangle: Hastings, PA

D. Geology and Soils:
I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcg	Glenshaw Formation	132.529394	0.207077
Pa	Allegheny Formation	164.722787	0.257379
Pp	Pottsville Formation	9.418481	0.014716

ACREAGE Sum
306.670662
SQ_MI Sum
0.479173

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
BeD	44.549555	0.069609	General Soils
CvB	42.602988	0.066567	General Soils
CvD	75.30092	0.117658	General Soils
GWF	8.555132	0.013367	General Soils
GtD	7.663708	0.011975	General Soils
GwD	1.860759	0.002907	General Soils
HbD	11.921202	0.018627	General Soils
LDF	0.340934	0.000533	General Soils

SubShedSoilsCambria.ACREAGE Sum
192.795199
SubShedSoilsCambria.SQ_MI Sum
0.301242

HYDRIC SOILS			
BtB	7.576506	0.011838	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum
7.576506
SubShedSoilsCambria.SQ_MI Sum
0.011838

PRIME FARMLAND SOILS

CeB	12.774792	0.019961	Prime Farmland Soils
GnB	9.906826	0.015479	Prime Farmland Soils
WaB	7.419513	0.011593	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

30.101131

SubShedSoilsCambria.SQ_MI Sum

0.047033

STATEWIDE IMPORTANT SOILS

BeB	12.27974	0.019187	Statewide Important Soils
BeC	12.245559	0.019134	Statewide Important Soils
CeC	6.911509	0.010799	Statewide Important Soils
GtC	30.941124	0.048346	Statewide Important Soils
GwB	9.533337	0.014896	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

71.911268

SubShedSoilsCambria.SQ_MI Sum

0.112361

STRIP MINES

UDC	4.286556	0.006698	Strip Mines

SubShedSoilsCambria.ACREAGE Sum

4.286556

SubShedSoilsCambria.SQ_MI Sum

0.006698

E. Mining:

I. Mining Permits in Drainage Basin:

4271BSM12, # 11683027, # 11960103, and # 11693000

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	**Acreage**	**SQ_MI**
Low Density Urban	0.221028	0.000345
Hay Pasture	22.854354	0.03571
Row Crops	79.122155	0.123628
Coniferous Forest	3.619518	0.005655
Mixed Forest	7.132393	0.011144
Deciduous Forest	178.072868	0.278239
Transitional	14.39289	0.022489

Acreage Sum

305.415206

SQ_MI Sum

0.477211

G. Pollution Sources: None

H. Additional Notes: None

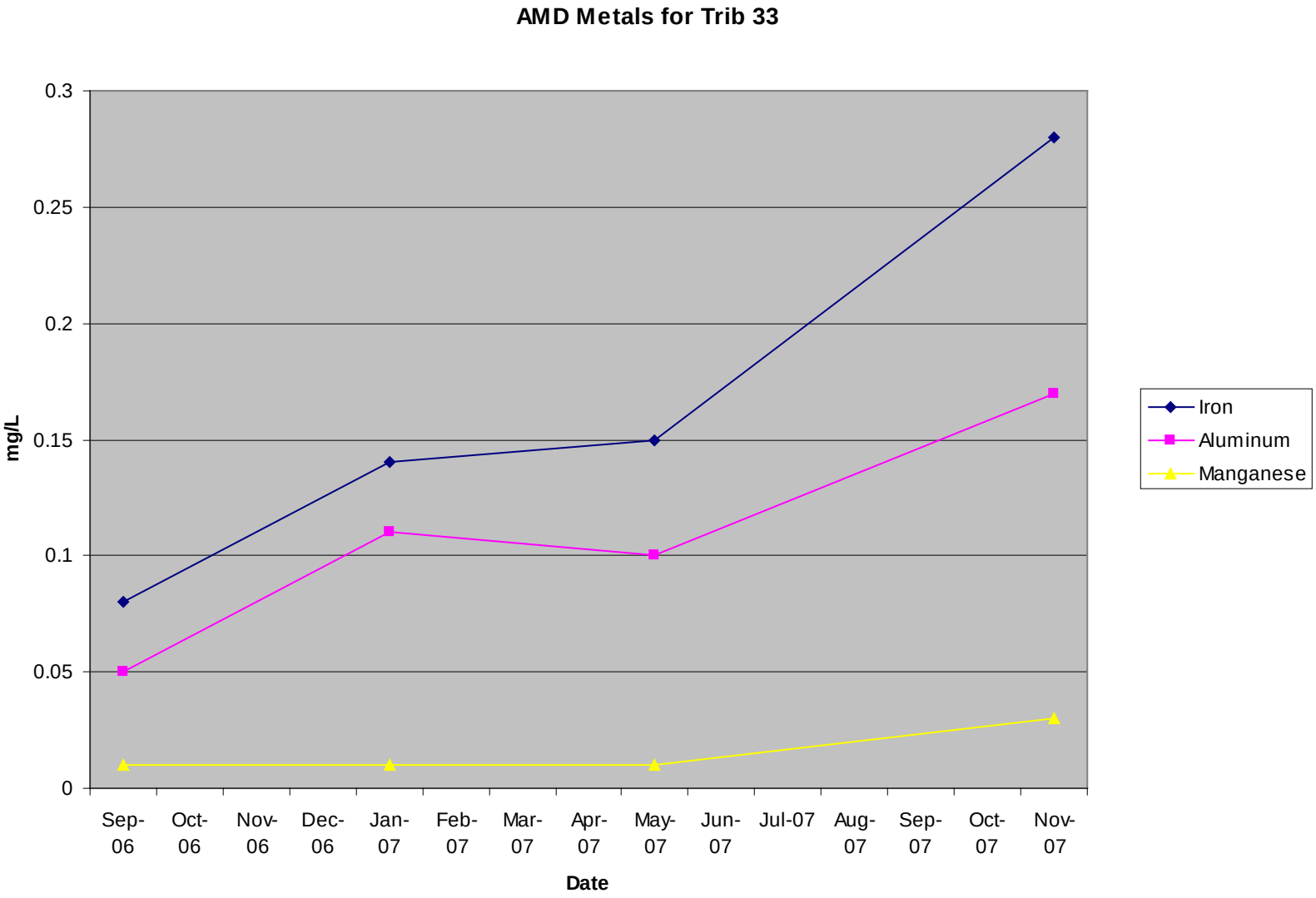
Tributary Number 33

Cambria County; Chest Township

CCWA Monitoring Point: Trib Number 33																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.	Loading					
		(Bucket*)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/22/2006	CCWA	10	7.7	295	68	-60	76	0.08	0.05	0.01	50	3.1	170	-7.22	9.15	0.01	0.01	0.00	6.02
1/3/2007	CCWA	73.95	7.6	191	45	-16	30	0.14	0.11	0.01	32	3.1	101	-14.24	26.71	0.12	0.10	0.01	28.49
2/8/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
5/14/2007	CCWA	12.86	7.1	208	60	-24	42	0.15	0.1	0.01	30	2.5	106	-3.72	6.50	0.02	0.02	0.00	4.64
8/16/2007	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11/13/2007	CCWA	67.14	7.2	295	55	-39	57	0.28	0.17	0.03	48	2.5	168	-31.52	46.07	0.23	0.14	0.02	38.80
Number of sample Dates	Count	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	Max	73.95	7.7	295	68	-16	76	0.28	0.17	0.03	50	3.1	170	-3.72	46.07	0.23	0.14	0.02	38.80
	Min	10	7.1	191	45	-60	30	0.08	0.05	0.01	30	2.5	101	-31.52	6.50	0.01	0.01	0.00	4.64
6	Average	40.99	7.40	247.25	57.00	-34.75	51.25	0.16	0.11	0.02	40.00	2.80	136.25	-14.18	22.11	0.10	0.06	0.01	19.49

Bucket*: 9/22/06 Flow data estimated.

Bucket*: 11/13/07 Flow data acquired using Pigmy Buckets.


AMD Metals for Trib 33
0.3
0.25
0.2
0.15
0.1
0.05
0
mg/L
Sep-06
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-34	Subwatershed Boundry Outline (topography)
B-IN-34	Subwatershed Industrial Influences
B-SO-34	Subwatershed Soils
B-AP-34	Subwatershed Aerial Photography
B-SG-34	Subwatershed Surface Geology

Tributary 34 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Elder Township, Cambria County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded
PSS1C- Palustrine, scrub/ shrub, broad-leaved deciduous, seasonal

II. Quadrangle: Hastings, PA

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcg	Glenshaw Formation	39.125472	0.061134
Pa	Allegheny Formation	127.146288	0.198666
Pp	Pottsville Formation	10.848057	0.01695

ACREAGE Sum
177.119817
SQ_MI Sum
0.27675

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
GWF	13.252152	0.020706	General Soils
GtD	1.681685	0.002628	General Soils
WgD	37.382662	0.05841	General Soils

SubShedSoilsCambria.ACREAGE Sum
52.316499
SubShedSoilsCambria.SQ_MI Sum
0.081745

PRIME FARMLAND SOILS			
CeB	36.230364	0.05661	Prime Farmland Soils
WaB	7.667472	0.01198	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum
43.897836
SubShedSoilsCambria.SQ_MI Sum
0.06859

STATEWIDE IMPORTANT SOILS			
CeC	1.23841	0.001935	Statewide Important Soils

GtC	2.759302	0.004311	Statewide Important Soils
GwB	6.000315	0.009375	Statewide Important Soils
WgC	3.420619	0.005345	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

13.418646

SubShedSoilsCambria.SQ_MI Sum

0.020967

STRIP MINES

UDF	67.473759	0.105428	Strip Mines

SubShedSoilsCambria.ACREAGE Sum

67.473759

SubShedSoilsCambria.SQ_MI Sum

0.105428

WATER

W	0.013072	0.00002	Water

SubShedSoilsCambria.ACREAGE Sum

0.013072

SubShedSoilsCambria.SQ_MI Sum

0.00002

E. Mining:

I. Mining Permits in Drainage Basin:

4276SMI8, #4273SM14, and #4277SM5T

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Low Density Urban	0.221028	0.000345
Hay Pasture	17.92772	0.028012
Row Crops	44.253887	0.069147
Coniferous Forest	5.574536	0.00871
Mixed Forest	3.853662	0.006021
Deciduous Forest	83.441868	0.130378
Quarries	8.174858	0.012773
Transitional	13.672252	0.021363

Acreage Sum

177.119812

SQ_MI Sum

0.27675

G. Pollution Sources: None

H. Additional Notes: None

Tributary Number 34
Cambria County; Elder Township

CCWA Monitoring Point: Trib Number 34														Loading					
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.						
		(None)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/25/2006	CCWA	Dry	NO DATA											--	--	--	--	--	--
1/3/2007	CCWA	Dry												--	--	--	--	--	--
2/8/2007	CCWA	Frozen												--	--	--	--	--	--
5/14/2007	CCWA	Dry												--	--	--	--	--	--
8/16/2007	CCWA	Dry												--	--	--	--	--	--
11/15/2007	CCWA	Dry												--	--	--	--	--	--
Number of sample Dates	Count	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Max	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
	Min	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
6	Average	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-35	Subwatershed Boundry Outline (topography)
B-IN-35	Subwatershed Industrial Influences
B-SO-35	Subwatershed Soils
B-AP-35	Subwatershed Aerial Photography
B-SG-35	Subwatershed Surface Geology

Tributary 35, Whiskey Run **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Chest Township, Cambria County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:
I. Habitat Types: none mapped
II. Quadrangle: Hastings, PA

D. Geology and Soils:
I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcg	Glenshaw Formation	93.087681	0.14545
Pa	Allegheny Formation	177.967099	0.278074
Pp	Pottsville Formation	5.028001	0.007856
Mmc	Mauch Chunk Formation	0.708764	0.001107

ACREAGE Sum
276.791545
SQ_MI Sum
0.432487

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
CvD	68.230019	0.106609	General Soils
GWF	5.832699	0.009114	General Soils
GtD	9.434904	0.014742	General Soils
GwD	5.1944	0.008116	General Soils
LDF	17.673198	0.027614	General Soils

SubShedSoilsCambria.ACREAGE Sum
106.36522
SubShedSoilsCambria.SQ_MI Sum
0.166196

HYDRIC SOILS			
At	0.06297	0.000098	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum
0.06297
SubShedSoilsCambria.SQ_MI Sum
0.000098

PRIME FARMLAND SOILS			
CeB	13.341758	0.020846	Prime Farmland Soils
GnB	13.371398	0.020893	Prime Farmland Soils

HaB	3.953808	0.006178	Prime Farmland Soils
HaC	9.391707	0.014675	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

40.058671

SubShedSoilsCambria.SQ_MI Sum

0.062592

STATEWIDE IMPORTANT SOILS

GtC	43.022114	0.067222	Statewide Important Soils
GwB	12.292393	0.019207	Statewide Important Soils
WgC	4.987019	0.007792	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

60.301526

SubShedSoilsCambria.SQ_MI Sum

0.094221

STRIP MINES

UDC	70.003162	0.10938	Strip Mines

SubShedSoilsCambria.ACREAGE Sum

70.003162

SubShedSoilsCambria.SQ_MI Sum

0.10938

E. Mining:

I. Mining Permits in Drainage Basin:

11683027, and # 11693000

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Water	0.221029	0.000345
Low Density Urban	0.221028	0.000345
Hay Pasture	54.895677	0.085774
Row Crops	54.845339	0.085696
Coniferous Forest	3.66253	0.005723
Mixed Forest	2.487252	0.003886
Deciduous Forest	133.288333	0.208263
Quarries	12.015257	0.018774
Coal Mines	0.221029	0.000345
Transitional	14.174791	0.022148

Acreage Sum

276.032266

SQ_MI Sum

0.4313

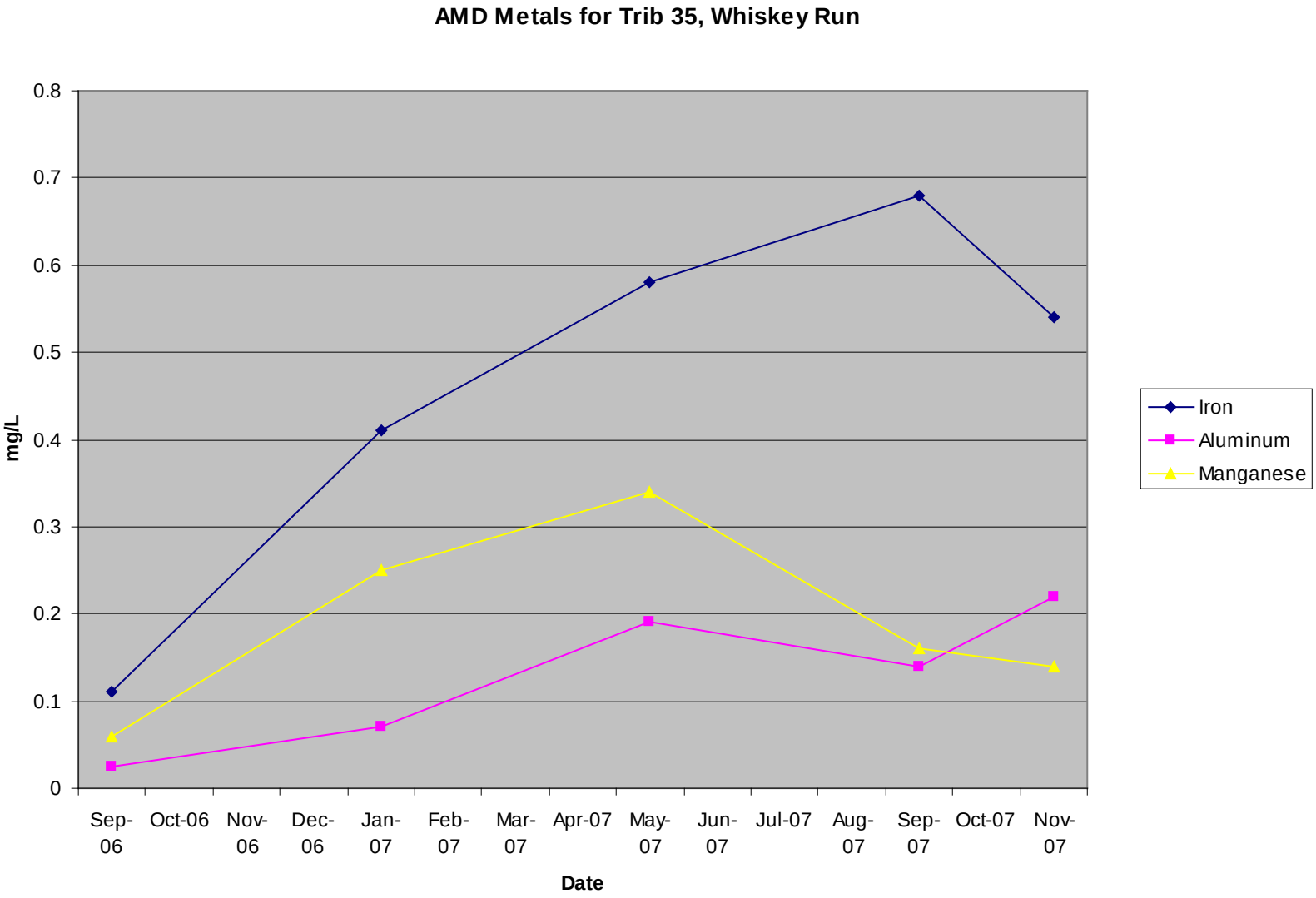
G. Pollution Sources: None

H. Additional Notes: This tributary flows through a portion of the Rock Run Recreation Area, which permits people to ride ATV's throughout the park.

Tributary Number 35, Whiskey Run

Cambria County; Chest Township

CCWA Monitoring Point: Trib Number 35, Whiskey Run														Loading					
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.						
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/28/2006	CCWA	48.56	7.3	471	55	-24	40	0.11	0.025	0.06	195	3.1	339	-14.03	23.38	0.06	0.01	0.04	113.99
1/4/2007	CCWA	129.08	7.4	405	40	-15	29	0.41	0.07	0.25	171	3.1	271	-23.31	45.06	0.64	0.11	0.39	265.72
2/19/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
5/10/2007	CCWA	264.18	6.9	467	55	-8	27	0.58	0.19	0.34	183	2.5	299	-25.44	85.87	1.84	0.60	1.08	582.00
9/10/2007	CCWA	59.07	6.6	520	70	-5	32	0.68	0.14	0.16	202	7	348	-3.56	22.76	0.48	0.10	0.11	143.64
11/15/2007	CCWA	87.61	7.4	374	37	-17	27	0.54	0.22	0.14	143	2.5	259	-17.93	28.48	0.57	0.23	0.15	150.82
Number of sample Dates	Count	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Max	264.18	7.4	520	70	-5	40	0.68	0.22	0.34	202	7	348	-3.56	85.87	1.84	0.60	1.08	582.00
	Min	48.56	6.6	374	37	-24	27	0.11	0.025	0.06	143	2.5	259	-25.44	22.76	0.06	0.01	0.04	113.99
6	Average	117.70	7.12	447.40	51.40	-13.80	31.00	0.46	0.13	0.19	178.80	3.64	303.20	-16.85	41.11	0.72	0.21	0.35	251.23


AMD Metals for Trib 35, Whiskey Run
mg/L
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Sep-06
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-36	Subwatershed Boundry Outline (topography)
B-IN-36	Subwatershed Industrial Influences
B-SO-36	Subwatershed Soils
B-AP-36	Subwatershed Aerial Photography
B-SG-36	Subwatershed Surface Geology

Tributary 36, Rock Run **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Chest Township, Cambria County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PUBFx- Palustrine, unconsolidated bottom, semiperminent, excavated
PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded
PUBHx- Palustrine, unconsolidated bottom, permanent, excavated

II. Quadrangle: Hastings, PA

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcg	Glenshaw Formation	812.393669	1.269365
Pa	Allegheny Formation	1362.166201	2.128385
Pp	Pottsville Formation	93.535671	0.146149

ACREAGE Sum

2268.095541

SQ_MI Sum

3.543899

II. Soils

Cambria Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
CvB	92.764405	0.144944	General Soils
CvD	17.940137	0.028031	General Soils
GWF	181.31496	0.283305	General Soils
GwD	2.318577	0.003623	General Soils
HaD	45.996316	0.071869	General Soils
HbB	83.465874	0.130415	General Soils
HbD	138.978917	0.217155	General Soils
LDF	55.983209	0.087474	General Soils
WgD	52.754393	0.082429	General Soils

SubShedSoilsCambria.ACREAGE Sum

671.516787

SubShedSoilsCambria.SQ_MI Sum

1.049245

HYDRIC SOILS			
At	11.793191	0.018427	Hydric Soils

BtB	20.497937	0.032028	Hydric Soils
NoB	261.311688	0.4083	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum

293.602817

SubShedSoilsCambria.SQ_MI Sum

0.458754

PRIME FARMLAND SOILS

CeB	36.664229	0.057288	Prime Farmland Soils
GnB	71.343671	0.111474	Prime Farmland Soils
HaB	141.729478	0.221452	Prime Farmland Soils
HaC	6.614601	0.010335	Prime Farmland Soils
LaB	43.269755	0.067609	Prime Farmland Soils
WaB	41.275395	0.064493	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

340.897128

SubShedSoilsCambria.SQ_MI Sum

0.532652

STATEWIDE IMPORTANT SOILS

BmB	4.429205	0.006921	Statewide Important Soils
CaB	49.434233	0.077241	Statewide Important Soils
CeC	9.956581	0.015557	Statewide Important Soils
GtC	10.900611	0.017032	Statewide Important Soils
GwB	30.26948	0.047296	Statewide Important Soils
GwC	61.27521	0.095743	Statewide Important Soils
LaC	16.439715	0.025687	Statewide Important Soils
WaC	19.913749	0.031115	Statewide Important Soils
WgC	96.726834	0.151136	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

299.345617

SubShedSoilsCambria.SQ_MI Sum

0.467728

STRIP MINES

UDC	256.7276	0.401137	Strip Mines
UDF	355.624634	0.555663	Strip Mines

SubShedSoilsCambria.ACREAGE Sum

612.352234

SubShedSoilsCambria.SQ_MI Sum

0.9568

WATER

W	0.220471	0.000344	Water

SubShedSoilsCambria.ACREAGE Sum

0.220471

SubShedSoilsCambria.SQ_MI Sum

0.000344

Clearfield Soils

SYMB	NAME	Acreage	Square Miles
GENERAL SOILS			
95D	43.316687	0.067682	General Soils
HdB	1.011203	0.00158	General Soils

SubShedSoilsClearfield.ACREAGE Sum

44.32789

SubShedSoilsClearfield.SQ_MI Sum

0.069262

HYDRIC SOILS			
92B	1.02438	0.001601	Hydric Soils
CoC	1.801519	0.002815	Hydric Soils
ExD	2.239753	0.0035	Hydric Soils

SubShedSoilsClearfield.ACREAGE Sum

5.065652

SubShedSoilsClearfield.SQ_MI Sum

0.007915

PRIME FARMLAND SOILS			
CoB	0.765196	0.001196	Prime Farmland Soils

SubShedSoilsClearfield.ACREAGE Sum

0.765196

SubShedSoilsClearfield.SQ_MI Sum

0.001196

E. Mining:

I. Mining Permits in Drainage Basin:

11693000

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Water	6.944807	0.010851
Low Density Urban	5.735827	0.008962
Hay Pasture	125.452357	0.196019
Row Crops	242.061422	0.378221
Coniferous Forest	48.508349	0.075794
Mixed Forest	44.303325	0.069224
Deciduous Forest	1119.600924	1.749376
Quarries	598.039342	0.934436
Coal Mines	1.105145	0.001727
Transitional	73.353509	0.114615

Acreage Sum

2265.105007

SQ_MI Sum

3.539227

G. Pollution Sources: Current passive treatment facilities in place.

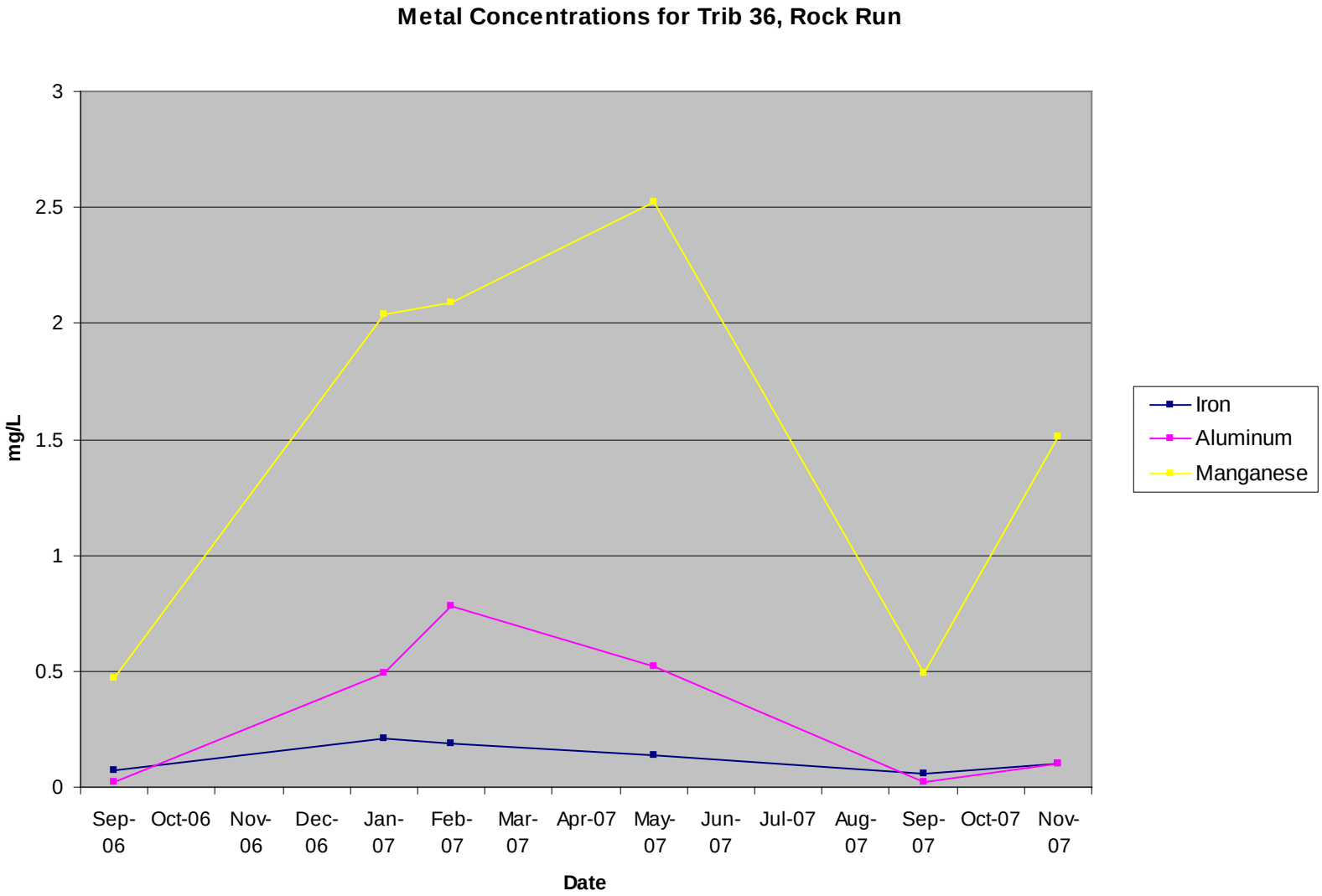
H. Additional Notes: This tributary flows through a portion of the Rock Run Recreation Area, which permits people to ride ATV's throughout the park.

A TMDL study was done on Rock Run in 2009. More information on this TMDL study can be found on the EPA website under the Pennsylvania TMDL (Mid-Atlantic Water). http://www.epa.gov/reg3wapd/tmdl/pa_tmdl/index.htm

Tributary Number 36, Rock Run

Cambria County; Chest Township

CCWA Monitoring Point: Trib Number 36, Rock Run																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/26/2006	CCWA	171.63	7.4	1060	51	-22	36	0.07	0.025	0.47	549	3.1	91	-45.46	74.38	0.14	0.05	0.97	1134.32
1/4/2007	CCWA	639.76	7.1	755	46	-6	19	0.21	0.49	2.04	350	3.1	527	-46.21	146.33	1.62	3.77	15.71	2695.59
2/21/2007	CCWA	486.05	7.2	961	35	-3	18	0.19	0.78	2.09	473	2.5	761	-17.55	105.32	1.11	4.56	12.23	2767.65
5/17/2007	CCWA	747.66	7	1200	50	-1	20	0.14	0.52	2.52	580	2.5	918	-9.00	180.01	1.26	4.68	22.68	5220.37
9/12/2007	CCWA	288.82	7.2	1090	62	-17	32	0.06	0.025	0.49	558	2.5	953	-59.11	111.26	0.21	0.09	1.70	1940.13
11/16/2007	CCWA	582.4	7.1	819	30	-7	20	0.1	0.1	1.51	394	2.5	714	-49.08	140.22	0.70	0.70	10.59	2762.40
Number of sample Dates	Count	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	Max	747.66	7.4	1200	62	-1	36	0.21	0.78	2.52	580	3.1	953	-9.00	180.01	1.62	4.68	22.68	5220.37
	Min	171.63	7	755	30	-22	18	0.06	0.025	0.47	350	2.5	91	-59.11	74.38	0.14	0.05	0.97	1134.32
6	Average	486.05	7.17	980.83	45.67	-9.33	24.17	0.13	0.32	1.52	484.00	2.70	660.67	-37.73	126.26	0.84	2.31	10.65	2753.41


Metal Concentrations for Trib 36, Rock Run
mg/L
3
2.5
2
1.5
1
0.5
0
Sep-06
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-37	Subwatershed Boundry Outline (topography)
B-IN-37	Subwatershed Industrial Influences
B-SO-37	Subwatershed Soils
B-AP-37	Subwatershed Aerial Photography
B-SG-37	Subwatershed Surface Geology

Tributary 37 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Chest Township, Cambria County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:
I. Habitat Types: none mapped
II. Quadrangle: Hastings, PA

D. Geology and Soils:
I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcg	Glenshaw Formation	168.146198	0.262728
Pa	Allegheny Formation	53.343248	0.083349
Pp	Pottsville Formation	3.447969	0.005387

ACREAGE Sum
224.937415
SQ_MI Sum
0.351465

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
CvB	33.987103	0.053105	General Soils
GWF	45.14433	0.070538	General Soils
GpB	28.386984	0.044355	General Soils
HbB	20.157933	0.031497	General Soils

SubShedSoilsCambria.ACREAGE Sum
127.67635
SubShedSoilsCambria.SQ_MI Sum
0.199494

HYDRIC SOILS

At	2.975904	0.00465	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum
2.975904
SubShedSoilsCambria.SQ_MI Sum
0.00465

PRIME FARMLAND SOILS

GnB	0.344141	0.000538	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum
0.344141
SubShedSoilsCambria.SQ_MI Sum
0.000538

STRIP MINES

UDC	0.312859	0.000489	Strip Mines
UDF	93.610677	0.146267	Strip Mines

SubShedSoilsCambria.ACREAGE Sum

93.923536

SubShedSoilsCambria.SQ_MI Sum

0.146756

WATER

W	0.017486	0.000027	Water

SubShedSoilsCambria.ACREAGE Sum

0.017486

SubShedSoilsCambria.SQ_MI Sum

0.000027

E. Mining:

I. Mining Permits in Drainage Basin:

4277SM9, # 11920101, and # 11920104

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Hay Pasture	23.260849	0.036345
Row Crops	49.1232	0.076755
Coniferous Forest	1.225837	0.001915
Mixed Forest	7.766087	0.012135
Deciduous Forest	57.671843	0.090112
Quarries	67.538424	0.105529
Transitional	18.351177	0.028674

Acreage Sum

224.937417

SQ_MI Sum

0.351465

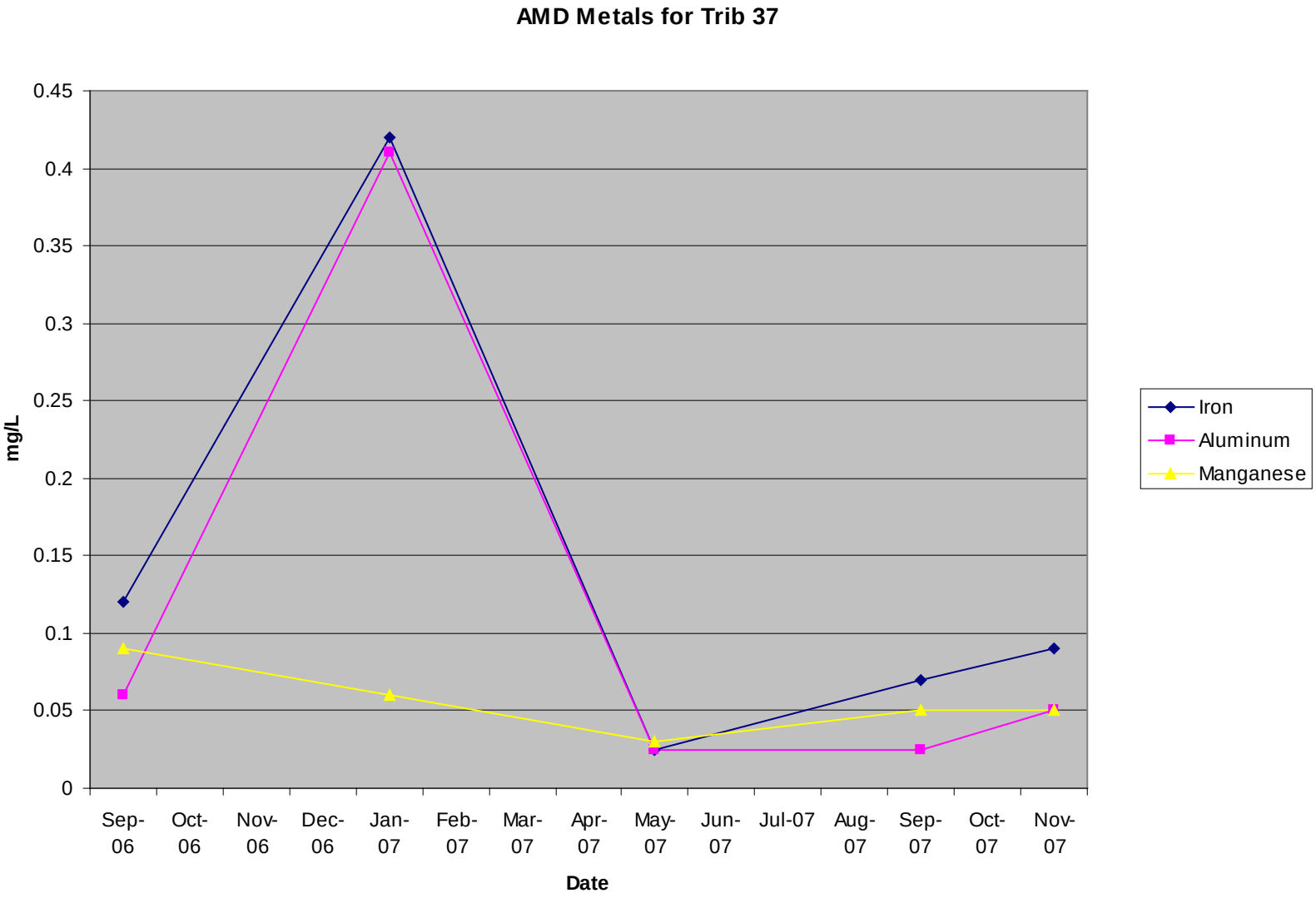
G. Pollution Sources: None

H. Additional Notes: This tributary flows through a portion of the Rock Run Recreation Area, which permits people to ride ATV's throughout the park.

Tributary Number 37

Cambria County; Chest Township

CCWA Monitoring Point: Trib Number 37																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/26/2006	CCWA	68.81	8.1	1740	56	-152	168	0.12	0.06	0.09	957	7.1	1564	-125.91	139.16	0.10	0.05	0.07	792.74
1/4/2007	CCWA	138.14	8.1	1710	50	-151	168	0.42	0.41	0.06	894	3.1	1353	-251.11	279.38	0.70	0.68	0.10	1486.71
2/19/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
5/17/2007	CCWA	917.14	8	1990	53	-182	211	0.025	0.025	0.03	918	2.5	1624	-2009.44	2329.63	0.28	0.28	0.33	10135.54
9/12/2007	CCWA	110.73	8.1	1770	64	-156	176	0.07	0.025	0.05	914	2.5	1615	-207.95	234.61	0.09	0.03	0.07	1218.37
11/19/2007	CCWA	43.67	8	1450	35	-120	134	0.09	0.05	0.05	769	7	1280	-63.09	70.45	0.05	0.03	0.03	404.28
Number of sample Dates	Count	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Max	917.14	8.1	1990	64	-120	211	0.42	0.41	0.09	957	7.1	1624	-63.09	2329.63	0.70	0.68	0.33	10135.54
	Min	43.67	8	1450	35	-182	134	0.025	0.025	0.03	769	2.5	1280	-2009.44	70.45	0.05	0.03	0.03	404.28
6	Average	255.70	8.06	1732.00	51.60	-152.20	171.40	0.15	0.11	0.06	890.40	4.44	1487.20	-531.50	610.65	0.24	0.21	0.12	2807.53


AMD Metals for Trib 37
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
mg/L
Sep-06
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-38 B-38 & 38A	Subwatershed Boundry Outline (topography)
B-IN-38 B-IN-38 & 38A	Subwatershed Industrial Influences
B-SO-38 B-SO-38 & 38A	Subwatershed Soils
B-AP-38 B-AP-38 & 38A	Subwatershed Aerial Photography
B-SG-38 B-SG-38 & 38A	Subwatershed Surface Geology

Tributary 38, Brubaker Run **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Elder Township; Susquehanna Township; Hastings Borough, Cambria County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:

Tributary 38 + Tributary 38A&B Combined

I. Habitat Types:

R3UBH- Riverine, upper perennial, unconsolidated bottom, permanent
PEM1Ch- Palustrine, emergent, persistent, seasonal, diked/ impounded
PFO1Eh- Palustrine, forested, broad-leaved deciduous, seasonal saturated, diked/ impounded
PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded
PFO4C- Palustrine, forested, needle-leaved evergreen, seasonal
PUBHx- Palustrine, unconsolidated bottom, permanent, excavated
PUBF- Palustrine, unconsolidated bottom, semiperminent
PEM1C- Palustrine, emergent, persistent, seasonal
PFO1A- Palustrine, forested, broad-leaved deciduous, temporary
P EM/SS 1C- Palustrine, emergent, persistent, seasonal/ Palustrine, scrub/ shrub, broad-leaved deciduous, seasonal

II. Quadrangle: Hastings, PA

D. Geology and Soils:

I. Surface Geology

Tributary 38

SYMB	NAME	Acreage	Square Miles
Pcg	Glenshaw Formation	1460.515401	2.282055
Pa	Allegheny Formation	3679.522243	5.749254
Pp	Pottsville Formation	22.819852	0.035656

ACREAGE Sum
5162.857496
SQ_MI Sum
8.066965

Tributary38& 38A Combined

SYMB	NAME	Acreage	Square Miles
Pcg	Glenshaw Formation	236.04095	0.368814
Pa	Allegheny Formation	142.095962	0.222025
Pp	Pottsville Formation	43.683881	0.068256

ACREAGE Sum
421.820794

SQ_MI Sum

0.659095

II. Soils

Tributary 38

MUSYM	ACREAGE	Square Miles	Soils Classification
DUMP			
Du	79.646697	0.124448	Dump

SubShedSoilsCambria.ACREAGE Sum

79.646697

SubShedSoilsCambria.SQ_MI Sum

0.124448

GENERAL SOILS			
BeD	1.221271	0.001908	General Soils
GWF	83.7041	0.130788	General Soils
GtD	227.945589	0.356165	General Soils
GwD	66.287168	0.103574	General Soils
HaD	311.176037	0.486213	General Soils
HbD	53.59266	0.083739	General Soils
LDF	136.588411	0.213419	General Soils
WgD	352.342739	0.550536	General Soils

SubShedSoilsCambria.ACREAGE Sum

1232.857976

SubShedSoilsCambria.SQ_MI Sum

1.926341

HYDRIC SOILS			
AmB	11.477252	0.017933	Hydric Soils
At	112.325695	0.175509	Hydric Soils
BtB	309.27429	0.483241	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum

433.077237

SubShedSoilsCambria.SQ_MI Sum

0.676683

PRIME FARMLAND SOILS			
CeB	368.886035	0.576384	Prime Farmland Soils
GnB	81.061224	0.126658	Prime Farmland Soils
HaB	93.12353	0.145506	Prime Farmland Soils
HaC	252.422082	0.39441	Prime Farmland Soils
LaB	66.857063	0.104464	Prime Farmland Soils
Ph	79.859111	0.12478	Prime Farmland Soils
WaB	152.36253	0.238066	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

1094.571576

SubShedSoilsCambria.SQ_MI Sum

1.710268

STATEWIDE IMPORTANT SOILS

BeC	2.952674	0.004614	Statewide Important Soils
BmB	41.852615	0.065395	Statewide Important Soils
BmC	17.64387	0.027569	Statewide Important Soils
CaB	193.261723	0.301971	Statewide Important Soils
CaC	11.669679	0.018234	Statewide Important Soils
CeC	371.84132	0.581002	Statewide Important Soils
GtC	263.38756	0.411543	Statewide Important Soils
GwB	61.836053	0.096619	Statewide Important Soils
GwC	32.867955	0.051356	Statewide Important Soils
WaC	67.080078	0.104813	Statewide Important Soils
WgC	391.908628	0.612357	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

1456.302154

SubShedSoilsCambria.SQ_MI Sum

2.275472

STRIP MINES

UDC	247.716937	0.387058	Strip Mines
UDF	603.08596	0.942322	Strip Mines

SubShedSoilsCambria.ACREAGE Sum

850.802897

SubShedSoilsCambria.SQ_MI Sum

1.32938

URBAN DISTURBED

URB	12.570317	0.019641	Urban Disturbed

SubShedSoilsCambria.ACREAGE Sum

12.570317

SubShedSoilsCambria.SQ_MI Sum

0.019641

WATER

W	3.028615	0.004732	Water

SubShedSoilsCambria.ACREAGE Sum

3.028615

SubShedSoilsCambria.SQ_MI Sum

0.004732

Tributary38& 38A Combined

MUSYM	ACREAGE	Square Miles	Soils Classification

GENERAL SOILS

CvD	12.162601	0.019004	General Soils
GWF	61.332503	0.095832	General Soils
GtD	10.309018	0.016108	General Soils
HbB	18.243589	0.028506	General Soils
HbD	14.881444	0.023252	General Soils

LDF	47.103887	0.0736	General Soils
RaD	86.904805	0.135789	General Soils
WgD	2.38487	0.003726	General Soils

SubShedSoilsCambria.ACREAGE Sum

253.322718

SubShedSoilsCambria.SQ_MI Sum

0.395817

HYDRIC SOILS

At	32.37552	0.050587	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum

32.37552

SubShedSoilsCambria.SQ_MI Sum

0.050587

PRIME FARMLAND SOILS

CeB	3.79389	0.005928	Prime Farmland Soils
GnB	3.773794	0.005897	Prime Farmland Soils
HaB	28.527504	0.044574	Prime Farmland Soils
HaC	15.707089	0.024542	Prime Farmland Soils
WaB	8.119485	0.012687	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

59.921763

SubShedSoilsCambria.SQ_MI Sum

0.093628

STATEWIDE IMPORTANT SOILS

CaB	12.114142	0.018928	Statewide Important Soils
CeC	50.448034	0.078825	Statewide Important Soils
GtC	1.786106	0.002791	Statewide Important Soils
RaC	7.19566	0.011243	Statewide Important Soils
WgC	4.656853	0.007276	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

76.200794

SubShedSoilsCambria.SQ_MI Sum

0.119064

E. Mining:

I. Mining Permits in Drainage Basin:

Tributary 38 + Tributary 38& 38A Combined

4276SM15, # 11813018 or # 11813018, # 11870107, #11930101, #11840103, # 1179112, # 11870101, # 427SM4, # 11840102, # 11820108, and # 11070101

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Tributary 38

Description	Acreage	SQ_MI
Water	0.884116	0.001381
Low Density Urban	327.03612	0.510994
Hay Pasture	844.182061	1.319034
Row Crops	1210.702335	1.891722
Coniferous Forest	100.417311	0.156902
Mixed Forest	149.539324	0.233655
Deciduous Forest	2148.084197	3.356382
Quarries	99.138905	0.154905
Coal Mines	1.547201	0.002418
Transitional	278.897628	0.435778

Acreage Sum

5160.429199

SQ_MI Sum

8.063171

Tributary38&38A Combined

Description	Acreage	SQ_MI
Low Density Urban	0.221029	0.000345
Hay Pasture	13.239151	0.020686
Row Crops	25.467446	0.039793
Coniferous Forest	8.506835	0.013292
Mixed Forest	1.113075	0.001739
Deciduous Forest	364.345227	0.569289
Quarries	0.221029	0.000345
Transitional	8.707003	0.013605

Acreage Sum

421.820795

SQ_MI Sum

0.659095

G. Pollution Sources:

Discharges 38-1L and 38-2L occur within this watershed

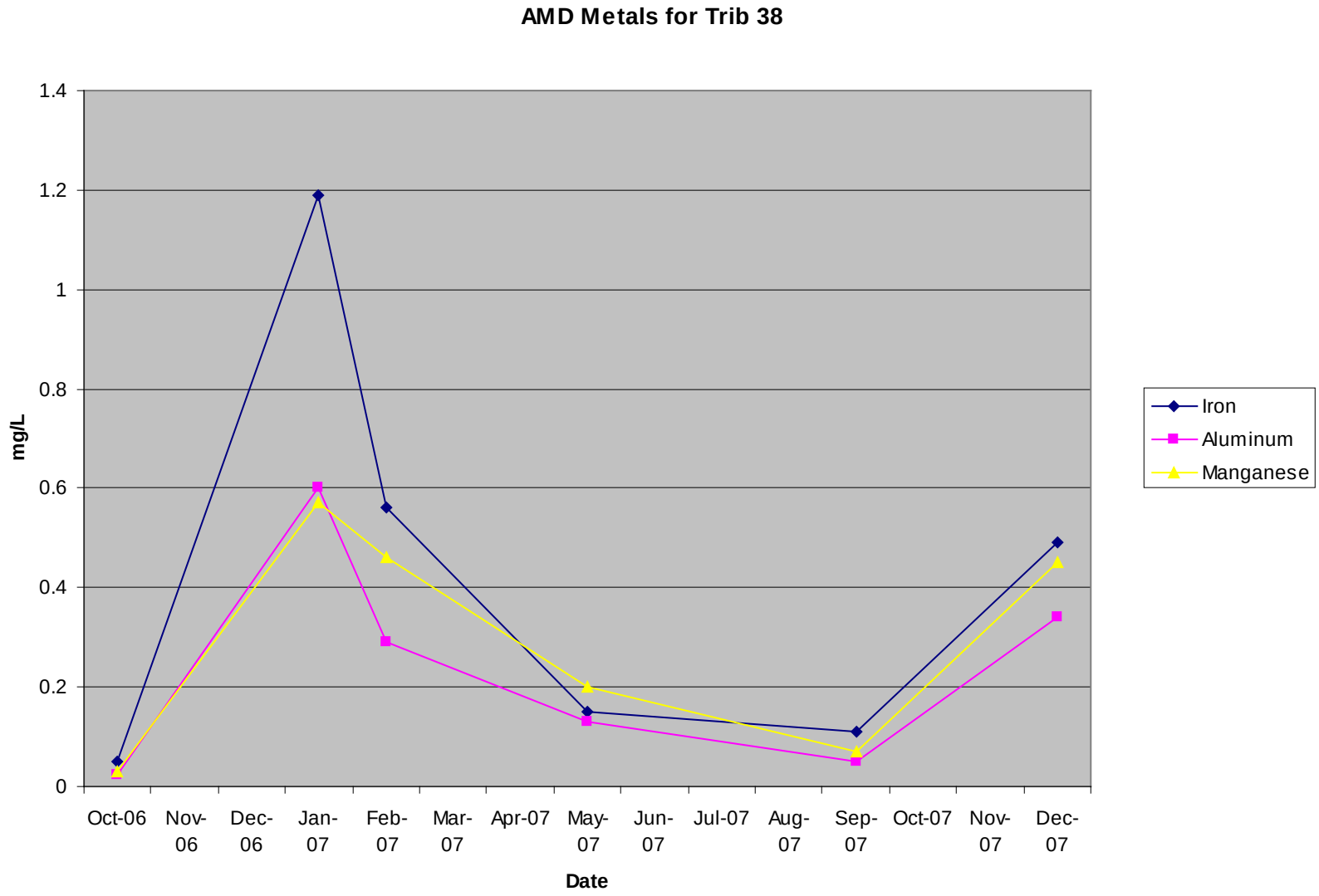
H. Additional Notes:

Subwatershed and Monitoring point 38&38A Combined data and information are included in Tributary 38 section.

Tributary Number 38, Brubaker Run

Cambria County; Elder Township, Susquehanna Township, Hastings Borough

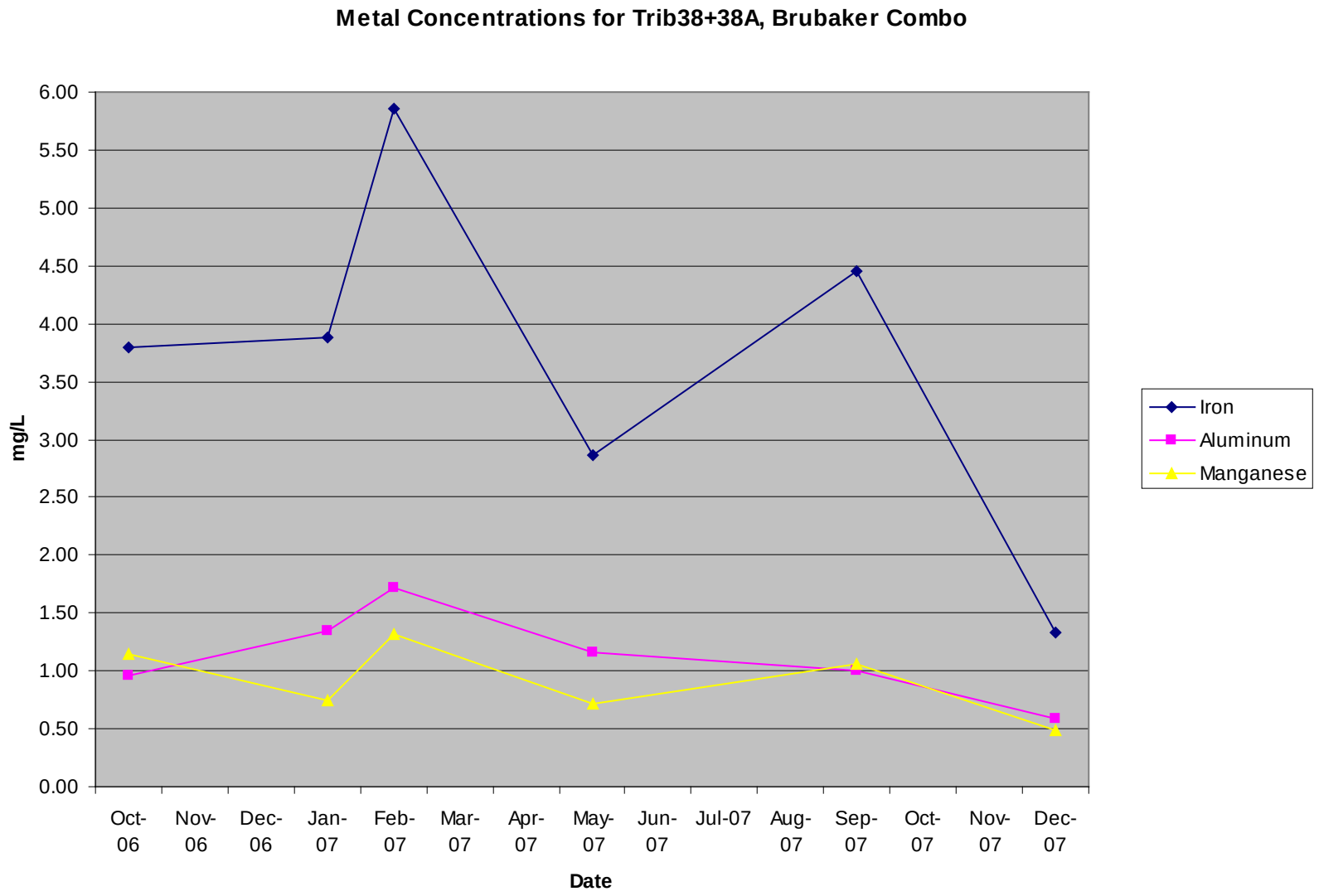
CCWA Monitoring Point: Trib Number 38, Brubaker Run																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
10/3/2006	CCWA	415.03	7.5	804	58	-37	47	0.05	0.025	0.03	257	3.1	551	-184.86	234.83	0.25	0.12	0.15	1284.05
1/5/2007	CCWA	2153.3	7.5	549	52	-28	42	1.19	0.6	0.57	180	3.1	337	-725.82	1088.74	30.85	15.55	14.78	4666.01
2/22/2007	CCWA	2199.48	7.4	739	33	-30	40	0.56	0.29	0.46	171	2.5	403	-794.35	1059.13	14.83	7.68	12.18	4527.78
5/15/2007	CCWA	1517.14	7.2	682	60	-35	55	0.15	0.13	0.2	237	5	439	-639.24	1004.52	2.74	2.37	3.65	4328.55
9/13/2007	CCWA	584.06	7.4	709	50	-40	57	0.11	0.05	0.07	247	2.5	509	-281.25	400.78	0.77	0.35	0.49	1736.69
12/13/2007	CCWA	6327.87	7.3	404	30	-15	28	0.49	0.34	0.45	103	2.5	224	-1142.66	2132.97	37.33	25.90	34.28	7846.28
Number of sample Dates	Count	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	Max	6327.87	7.5	804	60	-15	57	1.19	0.6	0.57	257	5	551	-184.86	2132.97	37.33	25.90	34.28	7846.28
	Min	415.03	7.2	404	30	-40	28	0.05	0.025	0.03	103	2.5	224	-1142.66	234.83	0.25	0.12	0.15	1284.05
6	Average	2199.48	7.38	647.83	47.17	-30.83	44.83	0.43	0.24	0.30	199.17	3.12	410.50	-628.03	986.83	14.46	8.66	10.92	4064.89


AMD Metals for Trib 38
1.4
1.2
1
0.8
0.6
0.4
0.2
0
mg/L
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Dec-07
Date
Iron
Aluminum
Manganese

Tributary Number 38 and 38A Combined

Cambria County; Elder Township

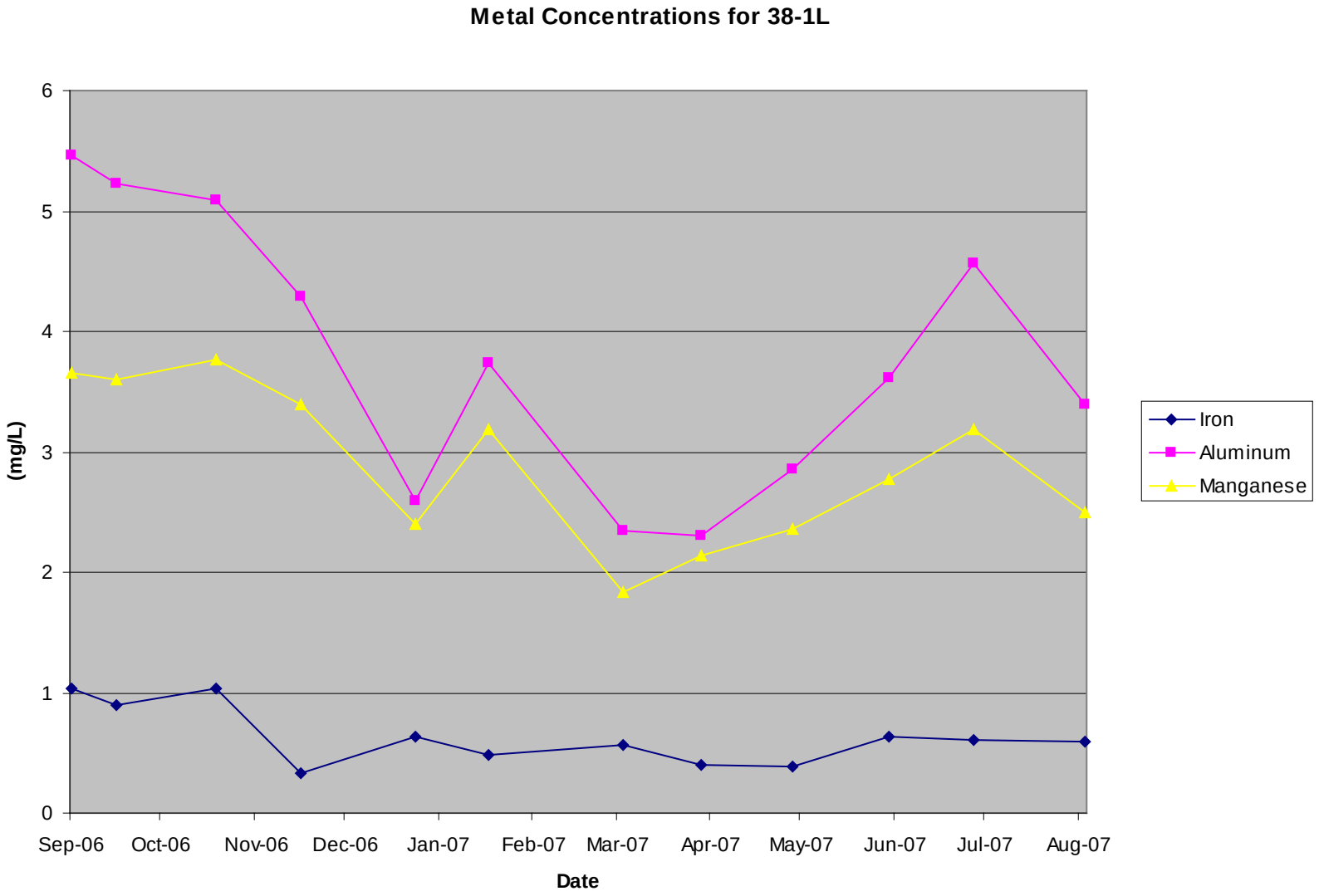
CCWA Monitoring Point: Trib Number 38 and 38A Combined																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
10/3/2006	CCWA	852.24	7.3	883	64	-36	48	3.79	0.96	1.14	328	3.1	691	-369.35	492.46	38.88	9.85	11.70	3365.15
1/5/2007	CCWA	3845.97	7.3	502	53	-26	38	3.88	1.35	0.75	170	30	304	-1203.78	1759.37	179.64	62.50	34.72	7870.89
2/22/2007	CCWA	3946.37	7.3	693	33	-34	46	5.86	1.72	1.32	196	2.5	403	-1615.27	2185.37	278.40	81.71	62.71	9311.56
5/15/2007	CCWA	2642.62	7.1	717	66	-39	61	2.86	1.16	0.71	260	8	437	-1240.70	1940.59	90.98	36.90	22.59	8271.36
9/13/2007	CCWA	1019.02	7	767	56	-31	52	4.46	1	1.06	315	7	601	-380.29	637.90	54.71	12.27	13.00	3864.22
12/13/2007	CCWA	11271.6	7.3	438	30	-23	38	1.33	0.59	0.48	113	6	248	-3120.92	5156.30	180.47	80.06	65.13	15333.20
Number of sample Dates	Count	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	Max	11271.6	7.3	883	66	-23	61	5.86	1.72	1.32	328	30	691	-369.35	5156.30	278.40	81.71	65.13	15333.20
	Min	852.24	7	438	30	-39	38	1.33	0.59	0.48	113	2.5	248	-3120.92	492.46	38.88	9.85	11.70	3365.15
6	Average	3929.64	7.22	666.67	50.33	-31.50	47.17	3.70	1.13	0.91	230.33	9.43	447.33	-1321.72	2028.67	137.18	47.22	34.98	8002.73


Metal Concentrations for Trib38+38A, Brubaker Combo
mg/L
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Dec-07
Date
Iron
Aluminum
Manganese

Discharge Number 38-1L, Route 36 Discharge

Cambria County; Elder Township

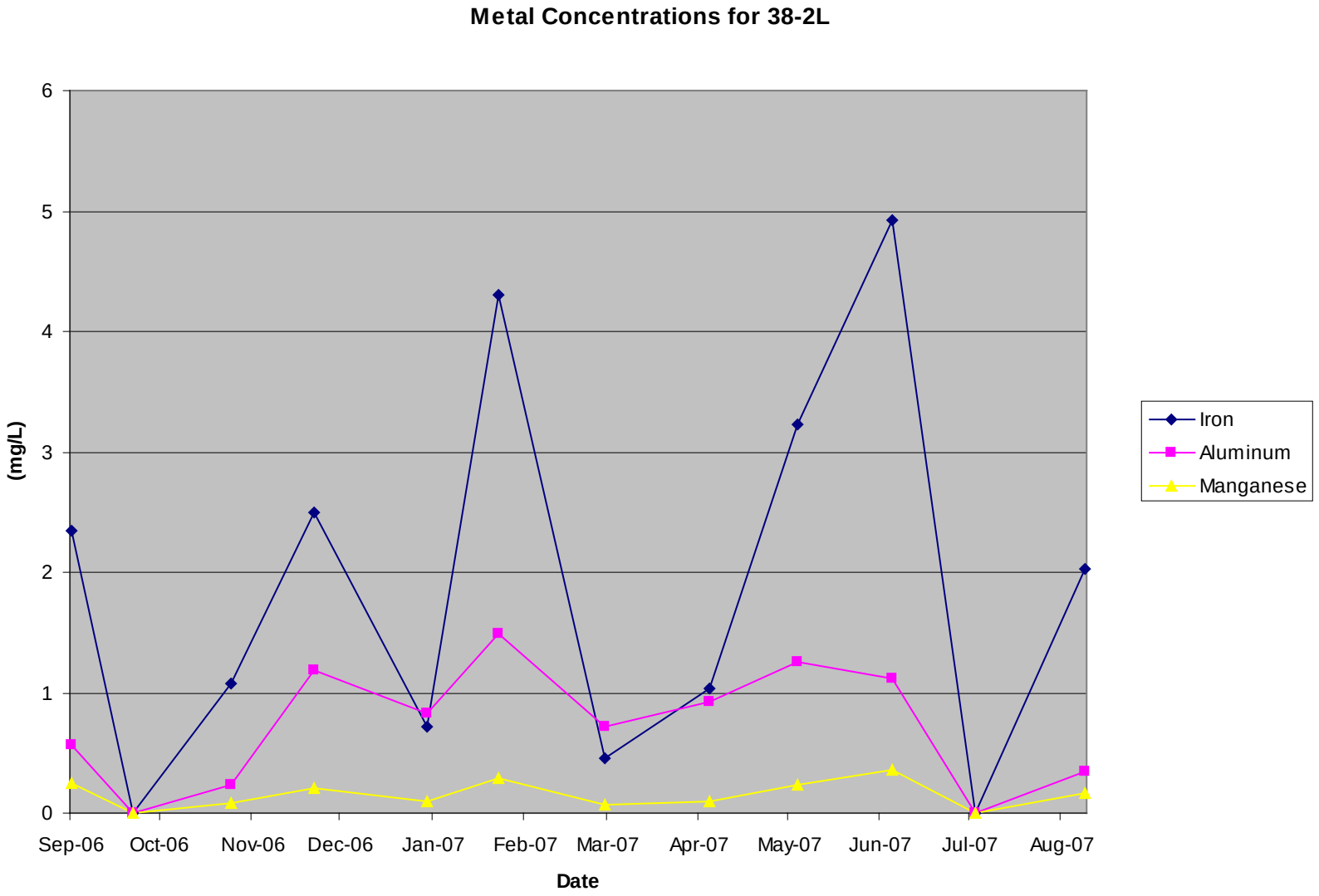
CCWA Monitoring Point: Discharge Number 38-1L, Route 36 Discharge																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Bucket)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/27/2006	CCWA	6.8	3.8	1190	54	54	0	1.03	5.46	3.66	609	3.1	919	4.42	0.00	0.08	0.45	0.30	49.85
10/12/2006	CCWA	5.3	3.8	1300	48	48	0	0.89	5.23	3.6	622	3.1	920	3.06	0.00	0.06	0.33	0.23	39.69
11/14/2006	CCWA	63.2	3.7	998	47	43	0	1.04	5.09	3.76	479	3.1	723	32.72	0.00	0.79	3.87	2.86	364.44
12/12/2006	CCWA	67.37	4.4	1230	40	34	0	0.33	4.29	3.39	706	3.1	1063	27.57	0.00	0.27	3.48	2.75	572.59
1/19/2007	CCWA	235.6	5.4	1080	22	8	6	0.63	2.6	2.4	559	6	861	22.69	17.02	1.79	7.37	6.81	1585.46
2/12/2007	CCWA	89.46	4.9	1430	20	22	9	0.48	3.74	3.19	67	11	1076	23.69	9.69	0.52	4.03	3.44	72.16
3/29/2007	CCWA	271.08	6.1	1020	34	-6	20	0.57	2.34	1.83	516	2.5	770	-19.58	65.27	1.86	7.64	5.97	1683.90
4/24/2007	CCWA	387.93	6.3	1140	60	-3	18	0.4	2.3	2.14	549	12	870	-14.01	84.06	1.87	10.74	9.99	2563.86
5/24/2007	CCWA	62.54	5	1180	66	17	7	0.38	2.86	2.36	626	5	949	12.80	5.27	0.29	2.15	1.78	471.30
6/25/2007	CCWA	31.28	4.7	1180	73	30	6	0.64	3.61	2.77	596	2.5	943	11.30	2.26	0.24	1.36	1.04	224.43
7/23/2007	CCWA	16.58	4.8	1190	65	32	7	0.61	4.56	3.18	630	2.5	960	6.39	1.40	0.12	0.91	0.63	125.75
8/29/2007	CCWA	18.42	4.4	1040	72	31	4	0.59	3.4	2.5	512	2.5	824	6.87	0.89	0.13	0.75	0.55	113.53
Number of sample Dates	Count	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
	Max	387.93	6.3	1430	73	54	20	1.04	5.46	3.76	706	12	1076	32.72	84.06	1.87	10.74	9.99	2563.86
	Min	5.3	3.7	998	20	-6	0	0.33	2.3	1.83	67	2.5	723	-19.58	0.00	0.06	0.33	0.23	39.69
12	Average	104.63	4.78	1164.83	50.08	25.83	6.42	0.63	3.79	2.90	539.25	4.70	906.50	9.83	15.49	0.67	3.59	3.03	655.58


Metal Concentrations for 38-1L
(mg/L)
0
1
2
3
4
5
6
Sep-06
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Date
Iron
Aluminum
Manganese

Discharge Number: 38-2L, Two Truck Discharge

Cambria County; Elder Township

CCWA Monitoring Point: Discharge Number: 38-2L, Two Truck Discharge														Loading					
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.						
		(V-Notch)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/21/2006	CCWA	1.1	5.3	405	48	3	9	2.35	0.56	0.25	95	11.4	--	0.04	0.12	0.03	0.01	0.00	1.26
10/12/2006	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11/14/2006	CCWA	42.83	6.2	244	47	20	20	1.08	0.24	0.08	57	3.1	149	10.31	10.31	0.56	0.12	0.04	29.39
12/12/2006	CCWA	3.93	5.6	309	38	4	14	2.5	1.18	0.21	105	10	189	0.19	0.66	0.12	0.06	0.01	4.97
1/19/2007	CCWA	142.05	4.9	195	22	12	5	0.72	0.83	0.09	65	2.5	100	20.52	8.55	1.23	1.42	0.15	111.15
2/12/2007	CCWA	9.11	5.2	375	20	12	7	4.31	1.49	0.29	111	17	227	1.32	0.77	0.47	0.16	0.03	12.17
3/20/2007	CCWA	96.62	5.3	260	33	13	6	0.45	0.72	0.07	67	2.5	142	15.12	6.98	0.52	0.84	0.08	77.93
4/24/2007	CCWA	51.55	5.1	298	58	11	6	1.03	0.93	0.1	82	2.5	183	6.83	3.72	0.64	0.58	0.06	50.89
5/24/2007	CCWA	3.93	5.3	371	65	13	7	3.23	1.26	0.24	131	5	200	0.62	0.33	0.15	0.06	0.01	6.20
6/25/2007	CCWA	0.4	4.6	430	73	28	4	4.92	1.12	0.36	134	2.5	256	0.13	0.02	0.02	0.01	0.00	0.65
7/23/2007	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
8/29/2007	CCWA	3.46	6	338	68	-4	20	2.03	0.35	0.17	82	2.5	202	-0.17	0.83	0.08	0.01	0.01	3.42
Number of sample Dates	Count	10	10	10	10	10	10	10	10	10	10	10	9	10	10	10	10	10	10
	Max	142.05	6.2	430	73	28	20	4.92	1.49	0.36	134	17	256	20.52	10.31	1.23	1.42	0.15	111.15
	Min	0.4	4.6	195	20	-4	4	0.45	0.24	0.07	57	2.5	100	-0.17	0.02	0.02	0.01	0.00	0.65
12	Average	35.50	5.35	322.50	47.20	11.20	9.80	2.26	0.87	0.19	92.90	5.90	183.11	5.49	3.23	0.38	0.33	0.04	29.80


Metal Concentrations for 38-2L
(mg/L)
6
5
4
3
2
1
0
Sep-06
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-38A Subwatershed Boundry Outline (topography)

B-IN-38A Subwatershed Industrial Influences

B-SO-38A Subwatershed Soils

B-AP-38A Subwatershed Aerial Photography

B-SG-38A Subwatershed Surface Geology

Tributary 38A, Little Brubaker Run **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Susquehanna Township; Elder Township, Cambria County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded
PSS1A- Palustrine, scrub/ shrub, broad-leaved deciduous, temporary
PUBFx- Palustrine, unconsolidated bottom, semiperminent, excavated
PFO1A- Palustrine, forested, broad-leaved deciduous, temporary
PUBHx- Palustrine, unconsolidated bottom, permanent, excavated
PEM1A- Palustrine, emergent, persistent, temporary
PUBF- Palustrine, unconsolidated bottom, semiperminent
PUBH- Palustrine, unconsolidated bottom, permanent
P EM/SS 1C- Palustrine, emergent, persistent, seasonal/ Palustrine, scrub/ shrub, broad-leaved deciduous, seasonal
P EM1/UB Fx- Palustrine, emergent, persistent, semiperminent, excavated/ Palustrine, unconsolidated bottom, semiperminent, excavated

II. Quadrangle: Hastings, PA

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcg	Glenshaw Formation	1916.491658	2.994518
Pa	Allegheny Formation	551.691372	0.862018
Pp	Pottsville Formation	4.981063	0.007783

ACREAGE Sum

2473.164093

SQ_MI Sum

3.864319

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
DUMP			
Du	35.463427	0.055412	Dump

SubShedSoilsCambria.ACREAGE Sum

35.463427

SubShedSoilsCambria.SQ_MI Sum

0.055412

GENERAL SOILS			
CaA	0.142309	0.000222	General Soils

CvB	0.438985	0.000686	General Soils
CvD	81.652923	0.127583	General Soils
GWF	13.411937	0.020956	General Soils
GtD	11.920282	0.018625	General Soils
HaD	11.740006	0.018344	General Soils
HbB	185.390313	0.289672	General Soils
HbD	283.578236	0.443091	General Soils
LDF	394.940785	0.617095	General Soils
WgD	171.265986	0.267603	General Soils

SubShedSoilsCambria.ACREAGE Sum

1154.481761

SubShedSoilsCambria.SQ_MI Sum

1.803878

HYDRIC SOILS

At	36.071306	0.056361	Hydric Soils
BtB	41.284387	0.064507	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum

77.355693

SubShedSoilsCambria.SQ_MI Sum

0.120868

PRIME FARMLAND SOILS

CeB	117.565553	0.183696	Prime Farmland Soils
GnB	26.92841	0.042076	Prime Farmland Soils
HaB	153.908448	0.240482	Prime Farmland Soils
HaC	31.087645	0.048574	Prime Farmland Soils
LaB	147.612383	0.230644	Prime Farmland Soils
RaB	6.460741	0.010095	Prime Farmland Soils
WaB	57.282333	0.089504	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

540.845513

SubShedSoilsCambria.SQ_MI Sum

0.845071

STATEWIDE IMPORTANT SOILS

BmB	19.064427	0.029788	Statewide Important Soils
BmC	3.512335	0.005488	Statewide Important Soils
CaB	42.008041	0.065638	Statewide Important Soils
CeC	105.348508	0.164607	Statewide Important Soils
GtC	19.54157	0.030534	Statewide Important Soils
GwB	2.129207	0.003327	Statewide Important Soils
WgC	61.950676	0.096798	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

253.554764

SubShedSoilsCambria.SQ_MI Sum

0.396179

STRIP MINES

UDC	65.762428	0.102754	Strip Mines
UDF	345.700508	0.540157	Strip Mines

SubShedSoilsCambria.ACREAGE Sum

411.462936

SubShedSoilsCambria.SQ_MI Sum

0.642911

E. Mining:

I. Mining Permits in Drainage Basin:

11840102, and # 11823004

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	**Acreage**	**SQ_MI**
Water	2.431318	0.003799
Low Density Urban	2.210289	0.003454
Hay Pasture	120.564892	0.188383
Row Crops	233.879849	0.365437
Coniferous Forest	103.491395	0.161705
Mixed Forest	30.864185	0.048225
Deciduous Forest	1657.708369	2.590169
Quarries	190.305868	0.297353
Coal Mines	26.302435	0.041098
Transitional	98.364961	0.153695

Acreage Sum

2466.123563

SQ_MI Sum

3.853318

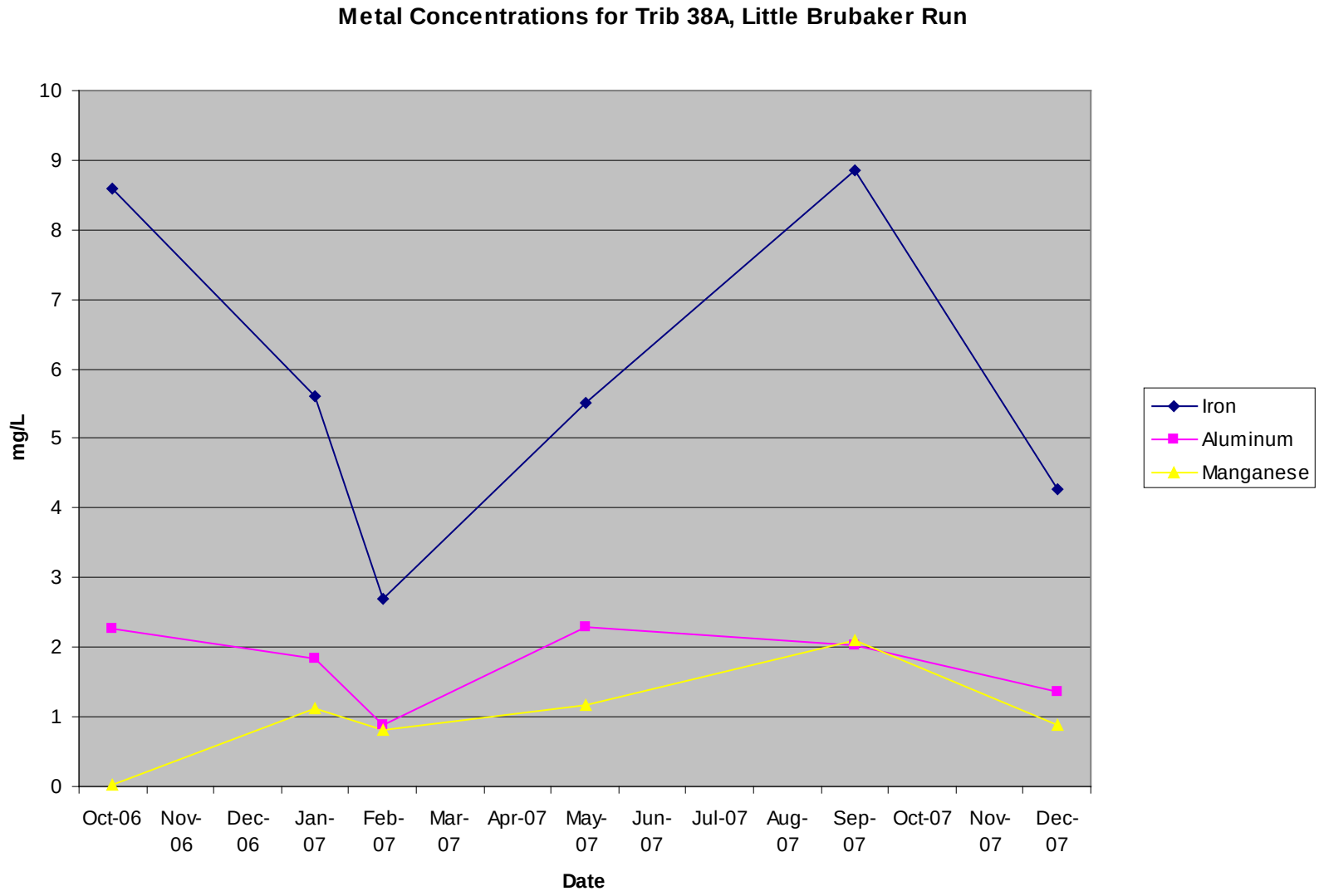
G. Pollution Sources: Additional Discharges

H. Additional Notes: During the assessment the property owner denied access to the Little Brubaker Run watershed. As of 2009 there is a change of ownership process occurring. An assessment for Little Brubaker will be pursued pending on cooperation and funding sources.

Tributary Number 38A, Little Brubaker Run

Cambria County; Susquehanna Township, Elder Township

CCWA Monitoring Point: Trib Number 38A, Little Brubaker Run																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
10/3/2006	CCWA	452.73	6.9	935	59	-35	50	8.59	2.26	0.03	403	18.6	620	-190.76	272.51	46.82	12.32	0.16	2196.41
1/5/2007	CCWA	1692.67	7.1	535	52	-32	48	5.61	1.83	1.11	205	18.6	344	-652.07	978.10	114.32	37.29	22.62	4177.29
2/22/2007	CCWA	1307.73	7.1	667	33	-46	60	2.7	0.88	0.8	256	13	444	-724.18	944.58	42.51	13.85	12.59	4030.20
5/15/2007	CCWA	1436.17	6.9	757	65	-49	68	5.52	2.28	1.17	293	16	495	-847.17	1175.66	95.44	39.42	20.23	5065.73
9/13/2007	CCWA	508.43	6.9	856	54	-24	48	8.86	2.02	2.11	378	20	680	-146.90	293.79	54.23	12.36	12.91	2313.62
12/13/2007	CCWA	2448.64	7.6	437	30	-23	41	4.28	1.37	0.88	153	6	288	-677.99	1208.59	126.16	40.38	25.94	4510.09
Number of sample Dates	Count	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	Max	2448.64	7.6	935	65	-23	68	8.86	2.28	2.11	403	20	680	-146.90	1208.59	126.16	40.38	25.94	5065.73
	Min	452.73	6.9	437	30	-49	41	2.7	0.88	0.03	153	6	288	-847.17	272.51	42.51	12.32	0.16	2196.41
6	Average	1307.73	7.08	697.83	48.83	-34.83	52.50	5.93	1.77	1.02	281.33	15.37	478.50	-539.84	812.20	79.91	25.94	15.74	3715.56


Metal Concentrations for Trib 38A, Little Brubaker Run
mg/L
10
9
8
7
6
5
4
3
2
1
0
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Dec-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-39	Subwatershed Boundry Outline (topography)
B-IN-39	Subwatershed Industrial Influences
B-SO-39	Subwatershed Soils
B-AP-39	Subwatershed Aerial Photography
B-SG-39	Subwatershed Surface Geology

Tributary 39, Moss Run **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Susquehanna Township; Elder Township, Cambria County - Burnside Township; Westover Borough, Clearfield County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded
PSS1C- Palustrine, scrub/ shrub, broad-leaved deciduous, seasonal
PEM1A- Palustrine, emergent, persistent, temporary

II. Quadrangle: Hastings, PA

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcg	Glenshaw Formation	1380.818789	2.157529
Pa	Allegheny Formation	57.74145	0.090221

ACREAGE Sum
1438.560239
SQ_MI Sum
2.24775

II. Soils

Cambria Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
CaA	32.218151	0.050341	General Soils
CvB	2.176634	0.003401	General Soils
CvD	2.573127	0.004021	General Soils
GWF	20.039296	0.031311	General Soils
GtD	3.924733	0.006132	General Soils
HaD	19.730905	0.03083	General Soils
HbB	12.393242	0.019364	General Soils
HbD	61.719501	0.096437	General Soils

SubShedSoilsCambria.ACREAGE Sum
154.775589
SubShedSoilsCambria.SQ_MI Sum
0.241837

HYDRIC SOILS			
AmB	8.752116	0.013675	Hydric Soils
BtB	221.451187	0.346017	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum

230.203303

SubShedSoilsCambria.SQ_MI Sum

0.359693

PRIME FARMLAND SOILS

CeB	72.034825	0.112554	Prime Farmland Soils
GnB	36.537037	0.057089	Prime Farmland Soils
HaB	119.898076	0.187341	Prime Farmland Soils
HaC	60.655315	0.094774	Prime Farmland Soils
WaB	69.942922	0.109286	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

359.068176

SubShedSoilsCambria.SQ_MI Sum

0.561044

STATEWIDE IMPORTANT SOILS

CaB	131.512443	0.205488	Statewide Important Soils
CeC	52.341361	0.081783	Statewide Important Soils
GtC	36.957408	0.057746	Statewide Important Soils
RaC	6.315769	0.009868	Statewide Important Soils
WaC	34.101411	0.053283	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

261.228393

SubShedSoilsCambria.SQ_MI Sum

0.408169

WATER

W	4.567349	0.007136	Water

SubShedSoilsCambria.ACREAGE Sum

4.567349

SubShedSoilsCambria.SQ_MI Sum

0.007136

Clearfield Soils

MUSYM	ACREAGE	Square Miles	Soils Classification

GENERAL SOILS

CxD	0.663437	0.001037	General Soils
RbF	61.793261	0.096552	General Soils
RcD	52.064049	0.08135	General Soils

SubShedSoilsClearfield.ACREAGE Sum

114.520747

SubShedSoilsClearfield.SQ_MI Sum

0.178939

HYDRIC SOILS

BrB	25.560416	0.039938	Hydric Soils
CaB	26.641319	0.041627	Hydric Soils

CoC	13.821864	0.021597	Hydric Soils
ErB	44.644071	0.069756	Hydric Soils
ErC	28.094878	0.043898	Hydric Soils
ExD	28.138668	0.043967	Hydric Soils
TyB	3.097131	0.004839	Hydric Soils
WhC	9.827617	0.015356	Hydric Soils

SubShedSoilsClearfield.ACREAGE Sum

179.825964

SubShedSoilsClearfield.SQ_MI Sum

0.280978

PRIME FARMLAND SOILS

CoB	2.706407	0.004229	Prime Farmland Soils
GlB	1.046532	0.001635	Prime Farmland Soils
HcB	13.921315	0.021752	Prime Farmland Soils
Ph	4.493864	0.007022	Prime Farmland Soils
RaB	20.438027	0.031934	Prime Farmland Soils
WhB	48.106741	0.075167	Prime Farmland Soils

SubShedSoilsClearfield.ACREAGE Sum

90.712887

SubShedSoilsClearfield.SQ_MI Sum

0.141739

STATEWIDE IMPORTANT SOILS

GlC	10.330946	0.016142	Statewide Important Soils
HcC	20.15526	0.031493	Statewide Important Soils
RaC	13.16441	0.020569	Statewide Important Soils

SubShedSoilsClearfield.ACREAGE Sum

43.650616

SubShedSoilsClearfield.SQ_MI Sum

0.068204

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	**Acreage**	**SQ_MI**
Water	1.768233	0.002763
Low Density Urban	0.663087	0.001036
Hay Pasture	98.340141	0.153656
Row Crops	195.991899	0.306237
Coniferous Forest	61.331263	0.09583
Mixed Forest	18.282315	0.028566
Deciduous Forest	1023.700753	1.599532
Transitional	35.88029	0.056063

Acreage Sum
1435.957981
SQ_MI Sum
2.243684

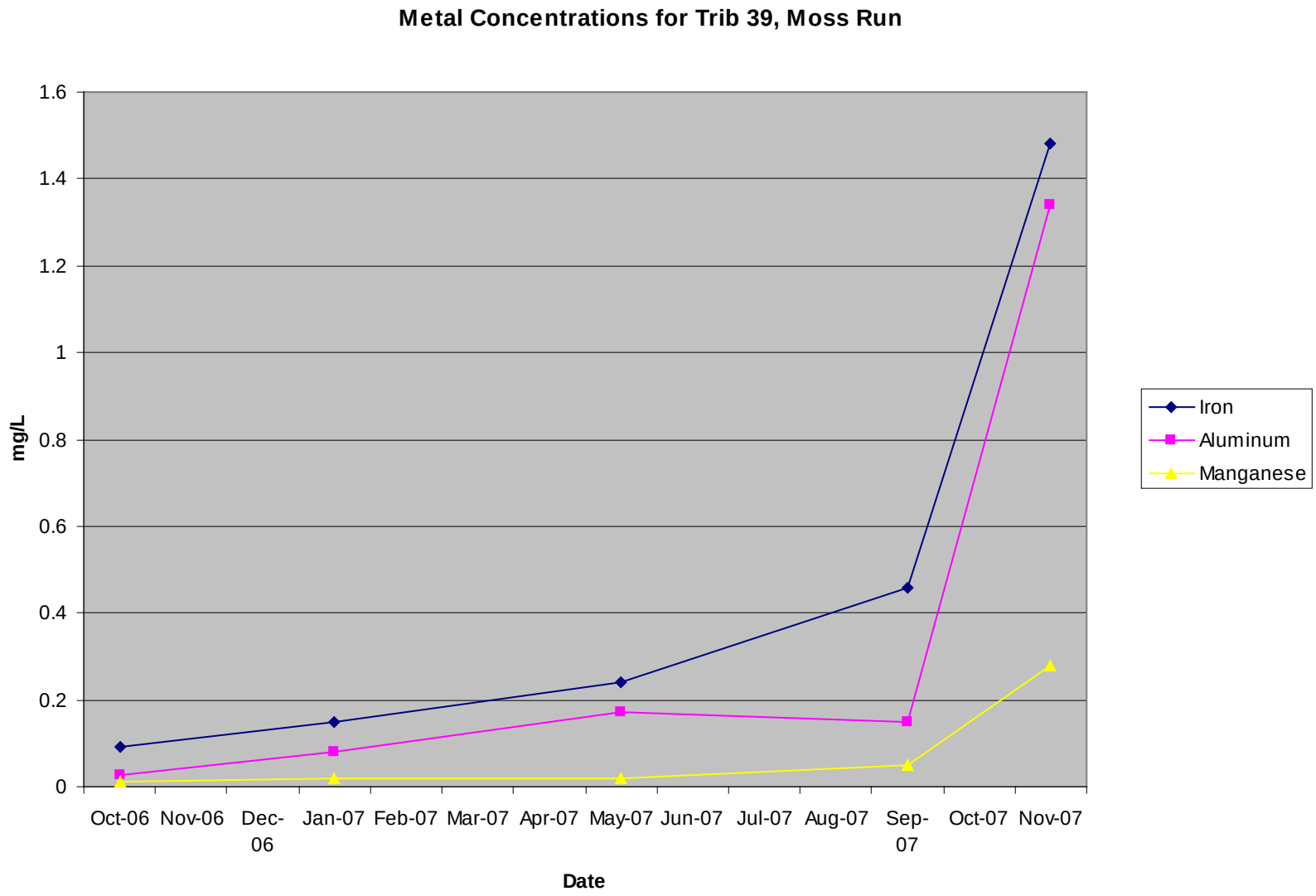
G. Pollution Sources: None

H. Additional Notes: None

Tributary Number 39, Moss Run

Cambria County; Susquehanna Township, Elder Township -- Clearfield County; Burnside Township, Westover Borough

CCWA Monitoring Point: Trib Number 39, Moss Run																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
10/5/2006	CCWA	90.53	7.5	116	52	-26	34	0.09	0.025	0.01	10	3.1	74	-28.34	37.05	0.10	0.03	0.01	10.90
1/4/2007	CCWA	755	7	86	52	-1	14	0.15	0.08	0.02	15	3.1	34	-9.09	127.25	1.36	0.73	0.18	136.33
2/20/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
5/30/2007	CCWA	74.06	7.2	97	61	-7	21	0.24	0.17	0.02	10	2.5	47	-6.24	18.72	0.21	0.15	0.02	8.92
9/12/2007	CCWA	52.33	7.3	108	65	-16	30	0.46	0.15	0.05	9	2.5	92	-10.08	18.90	0.29	0.09	0.03	5.67
11/27/2007	CCWA	4101.32	6.7	92	35	6	11	1.48	1.34	0.28	14	17	64	296.24	543.11	73.07	66.16	13.82	691.23
Number of sample Dates	Count	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Max	4101.32	7.5	116	65	6	34	1.48	1.34	0.28	15	17	92	296.24	543.11	73.07	66.16	13.82	691.23
	Min	52.33	6.7	86	35	-26	11	0.09	0.025	0.01	9	2.5	34	-28.34	18.72	0.10	0.03	0.01	5.67
6	Average	1014.65	7.14	99.80	53.00	-8.80	22.00	0.48	0.35	0.08	11.60	5.64	62.20	48.50	149.01	15.01	13.43	2.81	170.61


Metal Concentrations for Trib 39, Moss Run
mg/L
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-40	Subwatershed Boundry Outline (topography)
B-IN-40	Subwatershed Industrial Influences
B-SO-40	Subwatershed Soils
B-AP-40	Subwatershed Aerial Photography
B-SG-40	Subwatershed Surface Geology

Tributary 40 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Burnside Township; Westover Borough, Clearfield County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded

II. Quadrangle: Hastings, PA

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcg	Glenshaw Formation	530.188172	0.828419
Pa	Allegheny Formation	104.672545	0.163551

ACREAGE Sum

634.860718

SQ_MI Sum

0.99197

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
95D	63.847755	0.099762	General Soils
BeD	12.482295	0.019504	General Soils
CxD	3.772337	0.005894	General Soils
HbD	9.795146	0.015305	General Soils
HbF	19.600216	0.030625	General Soils
HdB	3.568476	0.005576	General Soils
RbF	76.0508	0.118829	General Soils
RcD	71.919507	0.112374	General Soils

SubShedSoilsClearfield.ACREAGE Sum

261.036532

SubShedSoilsClearfield.SQ_MI Sum

0.40787

HYDRIC SOILS			
BrB	13.412401	0.020957	Hydric Soils
CaB	1.84998	0.002891	Hydric Soils
ErB	46.32257	0.072379	Hydric Soils
ErC	77.580041	0.121219	Hydric Soils
ExD	1.297062	0.002027	Hydric Soils
TyB	10.491128	0.016392	Hydric Soils

WhC	40.34055	0.063032	Hydric Soils

SubShedSoilsClearfield.ACREAGE Sum

191.293732

SubShedSoilsClearfield.SQ_MI Sum

0.298896

PRIME FARMLAND SOILS

HcB	20.207652	0.031574	Prime Farmland Soils
Ph	4.21266	0.006582	Prime Farmland Soils
RaB	45.517531	0.071121	Prime Farmland Soils
WhB	39.816978	0.062214	Prime Farmland Soils

SubShedSoilsClearfield.ACREAGE Sum

109.754822

SubShedSoilsClearfield.SQ_MI Sum

0.171492

STATEWIDE IMPORTANT SOILS

BeB	4.242989	0.00663	Statewide Important Soils
ClC	4.253765	0.006647	Statewide Important Soils
GlC	13.984152	0.02185	Statewide Important Soils
HcC	15.607976	0.024387	Statewide Important Soils
RaC	33.111643	0.051737	Statewide Important Soils

SubShedSoilsClearfield.ACREAGE Sum

71.200525

SubShedSoilsClearfield.SQ_MI Sum

0.111251

WATER

W	1.575105	0.002461	Water

SubShedSoilsClearfield.ACREAGE Sum

1.575105

SubShedSoilsClearfield.SQ_MI Sum

0.002461

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Low Density Urban	2.281969	0.003566
Hay Pasture	49.053971	0.076647
Row Crops	111.881627	0.174815
Coniferous Forest	17.024202	0.0266
Mixed Forest	4.466213	0.006978
Deciduous Forest	416.373975	0.650584

Quarries	7.73601	0.012088
Transitional	25.866301	0.040416

Acreage Sum

634.684267

SQ_MI Sum

0.991694

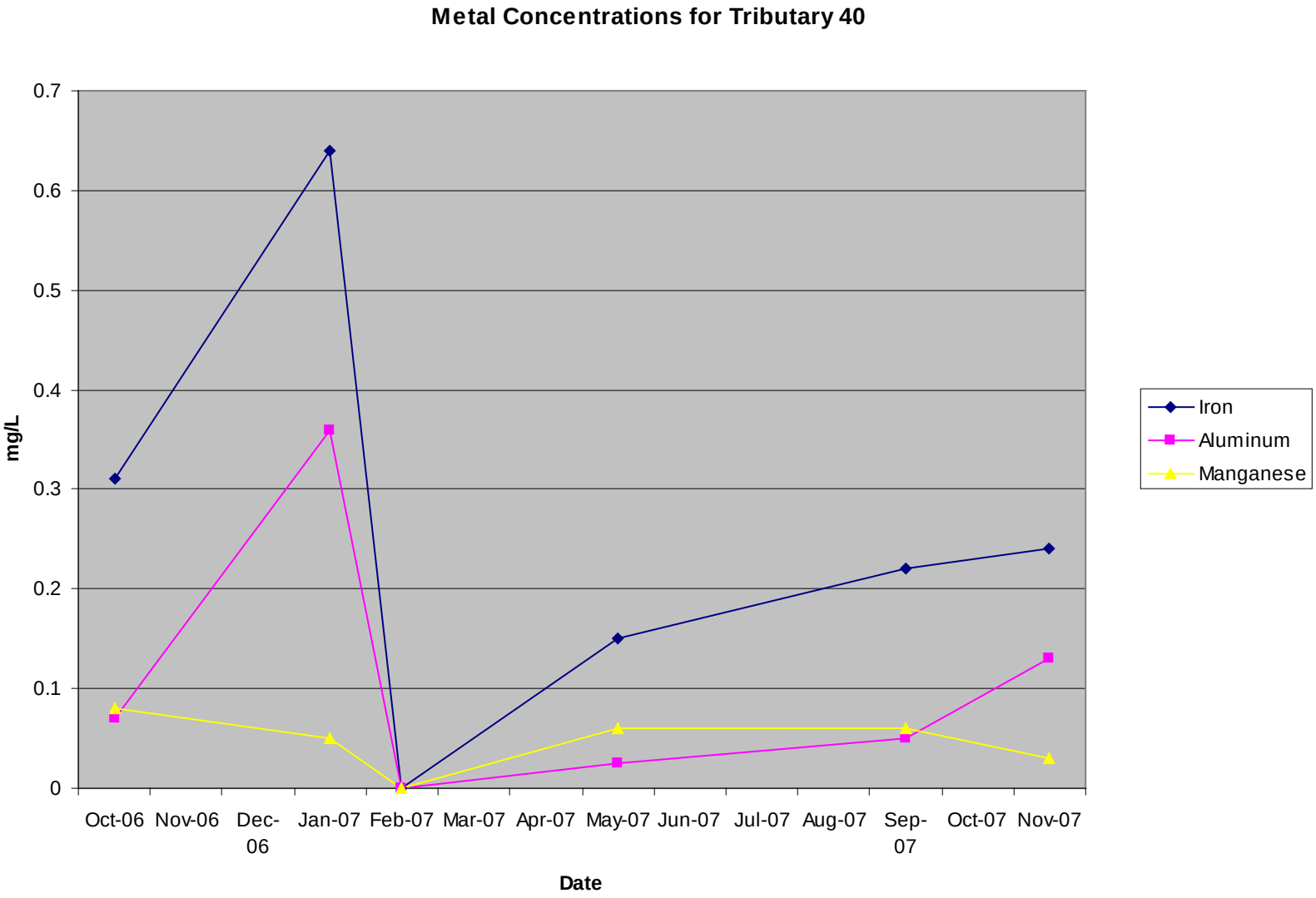
G. Pollution Sources: None

H. Additional Notes: None

Tributary Number 40

Clearfield County; Burnside Township, Westover Borough

CCWA Monitoring Point: Trib Number 40														Loading					
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.						
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
10/3/2006	CCWA	70.2	7	143	63	-35	43	0.31	0.07	0.08	11	3.1	93	-29.58	36.34	0.26	0.06	0.07	9.30
1/8/2007	CCWA	1799.09	6.9	99	37	-10	22	0.64	0.36	0.05	18	10	59	-216.58	476.48	13.86	7.80	1.08	389.85
2/20/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
5/30/2007	CCWA	69.57	7	122	66	-16	30	0.15	0.025	0.06	12	6	57	-13.40	25.13	0.13	0.02	0.05	10.05
9/14/2007	CCWA	31.78	6.9	138	67	-27	43	0.22	0.05	0.06	10	7	68	-10.33	16.45	0.08	0.02	0.02	3.83
11/28/2007	CCWA	535.81	7.2	127	35	-11	25	0.24	0.13	0.03	14	2.5	70	-70.95	161.26	1.55	0.84	0.19	90.30
Number of sample Dates	Count	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Max	1799.09	7.2	143	67	-10	43	0.64	0.36	0.08	18	10	93	-10.33	476.48	13.86	7.80	1.08	389.85
	Min	31.78	6.9	99	35	-35	22	0.15	0.025	0.03	10	2.5	57	-216.58	16.45	0.08	0.02	0.02	3.83
6	Average	501.29	7.00	125.80	53.60	-19.80	32.60	0.31	0.13	0.06	13.00	5.72	69.40	-68.17	143.13	3.18	1.75	0.28	100.66


Metal Concentrations for Tributary 40
mg/L
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-41	Subwatershed Boundry Outline (topography)
B-IN-41	Subwatershed Industrial Influences
B-SO-41	Subwatershed Soils
B-AP-41	Subwatershed Aerial Photography
B-SG-41	Subwatershed Surface Geology

Tributary 41, Crooked Run **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Chest Township; Westover Borough, Clearfield County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PFO1A- Palustrine, forested, broad-leaved deciduous, temporary
PEM1C- Palustrine, emergent, persistent, seasonal
PSS1B- Palustrine, scrub/ shrub, broad-leaved deciduous, saturated

II. Quadrangle: Hastings, PA

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcg	Glenshaw Formation	155.551298	0.243049
Pa	Allegheny Formation	346.53249	0.541457

ACREAGE Sum
502.083788
SQ_MI Sum
0.784506

II. Soils

Cambria Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
CvB	6.193606	0.009678	General Soils

SubShedSoilsCambria.ACREAGE Sum
6.193606
SubShedSoilsCambria.SQ_MI Sum
0.009678

STRIP MINES			
UDF	35.101015	0.054845	Strip Mines

SubShedSoilsCambria.ACREAGE Sum
35.101015
SubShedSoilsCambria.SQ_MI Sum
0.054845

Clearfield Soils

MUSYM	ACREAGE	Square Miles	Soils Classification

GENERAL SOILS

95D	36.044713	0.05632	General Soils
HbD	24.747042	0.038667	General Soils
HbF	43.553871	0.068053	General Soils
HdB	26.38797	0.041231	General Soils
RbF	60.808405	0.095013	General Soils
RcD	25.512379	0.039863	General Soils
WhD	6.08717	0.009511	General Soils

SubShedSoilsClearfield.ACREAGE Sum

223.14155

SubShedSoilsClearfield.SQ_MI Sum

0.348659

HYDRIC SOILS

92B	41.632659	0.065051	Hydric Soils
At	12.971048	0.020267	Hydric Soils
CoC	5.092462	0.007957	Hydric Soils
ErC	59.047933	0.092262	Hydric Soils
ExD	31.760298	0.049625	Hydric Soils
WhC	0.753236	0.001177	Hydric Soils

SubShedSoilsClearfield.ACREAGE Sum

151.257637

SubShedSoilsClearfield.SQ_MI Sum

0.23634

PRIME FARMLAND SOILS

CoB	6.227576	0.009731	Prime Farmland Soils
GlB	10.156537	0.01587	Prime Farmland Soils
Ph	11.584476	0.018101	Prime Farmland Soils
WhB	26.152801	0.040864	Prime Farmland Soils

SubShedSoilsClearfield.ACREAGE Sum

54.12139

SubShedSoilsClearfield.SQ_MI Sum

0.084565

STATEWIDE IMPORTANT SOILS

GlC	23.286025	0.036384	Statewide Important Soils
HcC	8.40979	0.01314	Statewide Important Soils

SubShedSoilsClearfield.ACREAGE Sum

31.695815

SubShedSoilsClearfield.SQ_MI Sum

0.049525

WATER

W	0.571507	0.000893	Water

SubShedSoilsClearfield.ACREAGE Sum

0.571507

SubShedSoilsClearfield.SQ_MI Sum

0.000893

E. Mining:

I. Mining Permits in Drainage Basin:

17950110

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Water	0.442058	0.000691
Low Density Urban	0.708912	0.001108
Hay Pasture	26.071229	0.040736
Row Crops	75.679266	0.118249
Coniferous Forest	7.924321	0.012382
Mixed Forest	14.84525	0.023196
Deciduous Forest	295.031389	0.460987
Quarries	62.992916	0.098426
Transitional	18.38845	0.028732

Acreage Sum

502.083792

SQ_MI Sum

0.784506

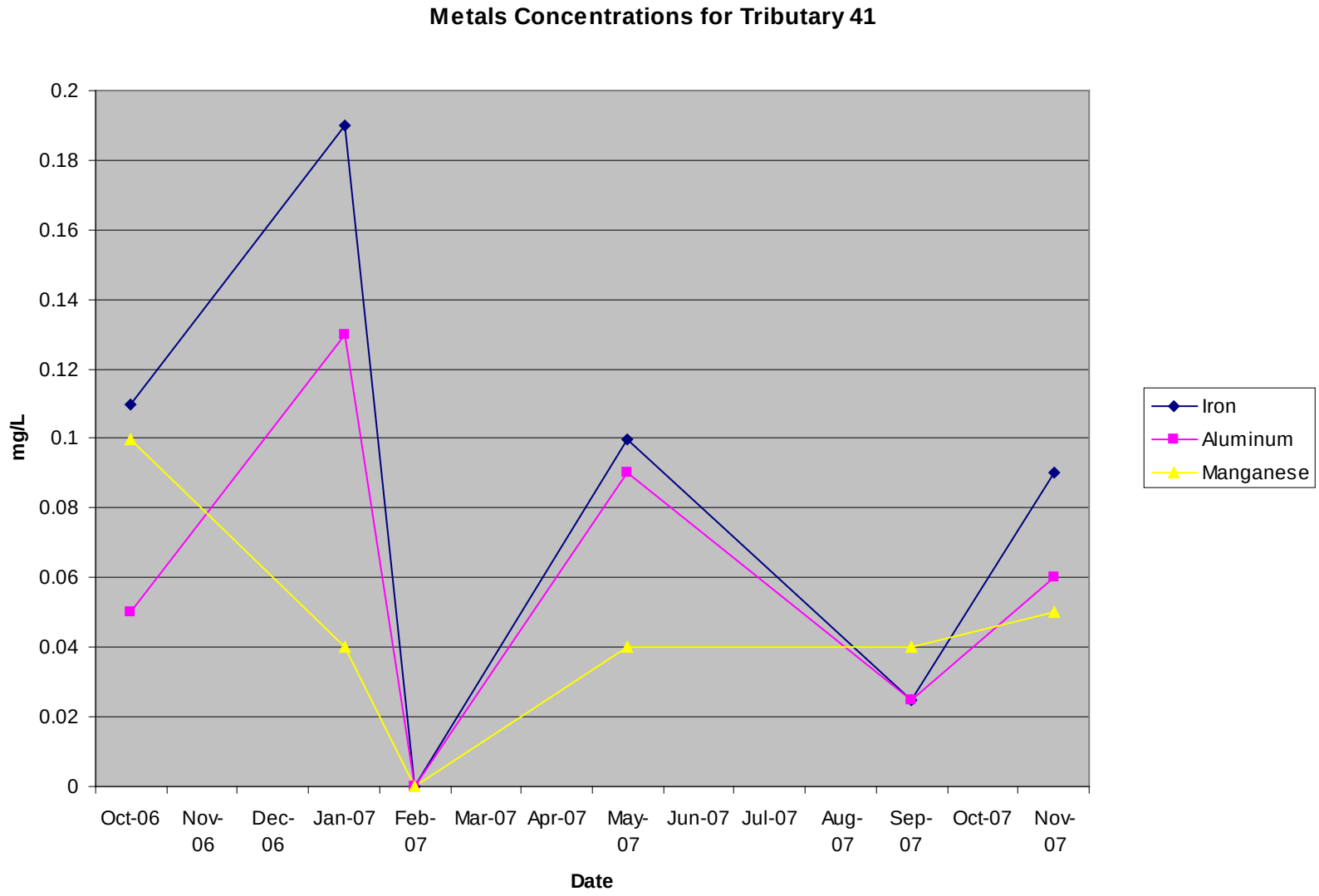
G. Pollution Sources: None

H. Additional Notes: This tributary flows through a portion of the Rock Run Recreation Area, which permits people to ride ATV's throughout the park.

Tributary Number 41 (aka Crooked Run)

Clearfield County; Chest Township, Westover Borough

CCWA Monitoring Point: Trib Number 41																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
10/5/2006	CCWA	47.26	7.5	1140	60	-31	41	0.11	0.05	0.1	586	3.1	967	-17.64	23.33	0.06	0.03	0.06	333.40
1/8/2007	CCWA	849.01	7.1	506	35	-10	24	0.19	0.13	0.04	241	14.3	337	-102.21	245.30	1.94	1.33	0.41	2463.19
2/20/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
5/31/2007	CCWA	120.56	7.9	1760	66	-71	91	0.1	0.09	0.04	938	2.5	1525	-103.05	132.07	0.15	0.13	0.06	1361.37
9/18/2007	CCWA	37.93	7.6	1200	68	-31	50	0.025	0.025	0.04	619	2.5	1029	-14.16	22.83	0.01	0.01	0.02	282.65
11/30/2007	CCWA	198.2	7.4	656	20	-16	29	0.09	0.06	0.05	275	2.5	449	-38.18	69.19	0.21	0.14	0.12	656.15
Number of sample Dates	Count	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Max	849.01	7.9	1760	68	-10	91	0.19	0.13	0.1	938	14.3	1525	-14.16	245.30	1.94	1.33	0.41	2463.19
	Min	37.93	7.1	506	20	-71	24	0.025	0.025	0.04	241	2.5	337	-103.05	22.83	0.01	0.01	0.02	282.65
6	Average	250.59	7.50	1052.40	49.80	-31.80	47.00	0.10	0.07	0.05	531.80	4.98	861.40	-55.04	98.54	0.48	0.33	0.13	1019.35


Metals Concentrations for Tributary 41
mg/L
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-42	Subwatershed Boundry Outline (topography)
B-IN-42	Subwatershed Industrial Influences
B-SO-42	Subwatershed Soils
B-AP-42	Subwatershed Aerial Photography
B-SG-42	Subwatershed Surface Geology

Tributary 42, Rogues Harbor Run **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Chest Township, Cambria County - Chest Township; Westover Borough, Clearfield County

B. Chapter 93 Designation: EV

C. National Wetlands Inventory Information:

I. Habitat Types:

PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded

PFO1A- Palustrine, forested, broad-leaved deciduous, temporary

II. Quadrangle: Hastings, PA

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcg	Glenshaw Formation	1504.471773	2.350737
Pa	Allegheny Formation	1478.245813	2.309759

ACREAGE Sum

2982.717586

SQ_MI Sum

4.660496

II. Soils

Cambria Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
CvB	223.038286	0.348497	General Soils
CvD	48.813684	0.076271	General Soils
HaD	2.151741	0.003362	General Soils
HbB	154.589566	0.241546	General Soils
HbD	130.472157	0.203863	General Soils
Hx	9.034164	0.014116	General Soils

SubShedSoilsCambria.ACREAGE Sum

568.099597

SubShedSoilsCambria.SQ_MI Sum

0.887656

HYDRIC SOILS			
BtB	18.859227	0.029468	Hydric Soils
NoB	8.658285	0.013529	Hydric Soils

SubShedSoilsCambria.ACREAGE Sum

27.517512

SubShedSoilsCambria.SQ_MI Sum

0.042996

PRIME FARMLAND SOILS

CeB	42.321674	0.066128	Prime Farmland Soils
HaB	148.566809	0.232136	Prime Farmland Soils
HaC	8.290776	0.012954	Prime Farmland Soils
LaB	256.75343	0.401177	Prime Farmland Soils
WaB	24.19978	0.037812	Prime Farmland Soils

SubShedSoilsCambria.ACREAGE Sum

480.132469

SubShedSoilsCambria.SQ_MI Sum

0.750207

STATEWIDE IMPORTANT SOILS

CaB	1.9689	0.003076	Statewide Important Soils
CeC	26.557863	0.041497	Statewide Important Soils
LaC	39.963782	0.062443	Statewide Important Soils
WgC	11.073659	0.017303	Statewide Important Soils

SubShedSoilsCambria.ACREAGE Sum

79.564204

SubShedSoilsCambria.SQ_MI Sum

0.124319

Clearfield Soils

MUSYM	ACREAGE	Square Miles	Soils Classification

GENERAL SOILS

95D	1.016123	0.001588	General Soils
CmB	12.745711	0.019915	General Soils
CmC	10.581917	0.016534	General Soils
CxD	148.801356	0.232502	General Soils
HbD	330.470458	0.51636	General Soils
HbF	369.030169	0.57661	General Soils
HdB	194.59279	0.304051	General Soils
RbF	1.822474	0.002848	General Soils
RcD	65.284972	0.102008	General Soils

SubShedSoilsClearfield.ACREAGE Sum

1134.345971

SubShedSoilsClearfield.SQ_MI Sum

1.772416

HYDRIC SOILS

At	0.291974	0.000456	Hydric Soils
BxB	2.114229	0.003303	Hydric Soils
CoC	41.976285	0.065588	Hydric Soils
CxB	123.176366	0.192463	Hydric Soils
ErC	4.529784	0.007078	Hydric Soils

ExB	31.015997	0.048462	Hydric Soils
ExD	208.817926	0.326278	Hydric Soils
Ud	37.186455	0.058104	Hydric Soils
WhC	15.439308	0.024124	Hydric Soils

SubShedSoilsClearfield.ACREAGE Sum

464.548324

SubShedSoilsClearfield.SQ_MI Sum

0.725857

PRIME FARMLAND SOILS

ClB	8.861836	0.013847	Prime Farmland Soils
CoB	78.890753	0.123267	Prime Farmland Soils
GlB	13.162914	0.020567	Prime Farmland Soils
HcB	21.39971	0.033437	Prime Farmland Soils
Ph	16.821863	0.026284	Prime Farmland Soils
WhB	2.370054	0.003703	Prime Farmland Soils

SubShedSoilsClearfield.ACREAGE Sum

141.507129

SubShedSoilsClearfield.SQ_MI Sum

0.221105

STATEWIDE IMPORTANT SOILS

ClC	30.826088	0.048166	Statewide Important Soils
GlC	48.053548	0.075084	Statewide Important Soils
HcC	8.137431	0.012715	Statewide Important Soils

SubShedSoilsClearfield.ACREAGE Sum

87.017067

SubShedSoilsClearfield.SQ_MI Sum

0.135964

E. Mining:

I. Mining Permits in Drainage Basin: N/A

II. Other Mining Information:

The DEP Bureau of Active Mining has deemed this watershed unsuitable for mining. [15]

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial [2]influences map.

F. Land Use:

Description	**Acreage**	**SQ_MI**
Water	0.442058	0.000691
Low Density Urban	3.012704	0.004707
Hay Pasture	233.108985	0.364233
Row Crops	304.781739	0.476221

15)Rogues Harbor Coldwater Conservation Plan. Clearfield County Conservation District. Page 9. Funded by Coldwater Heritage Foundation.

Coniferous Forest	35.274786	0.055117
Mixed Forest	12.664291	0.019788
Deciduous Forest	2179.858595	3.406029
Quarries	33.044104	0.051631
Transitional	170.624797	0.266601

Acreage Sum

2972.81206

SQ_MI Sum

4.645019

G. Pollution Sources: None

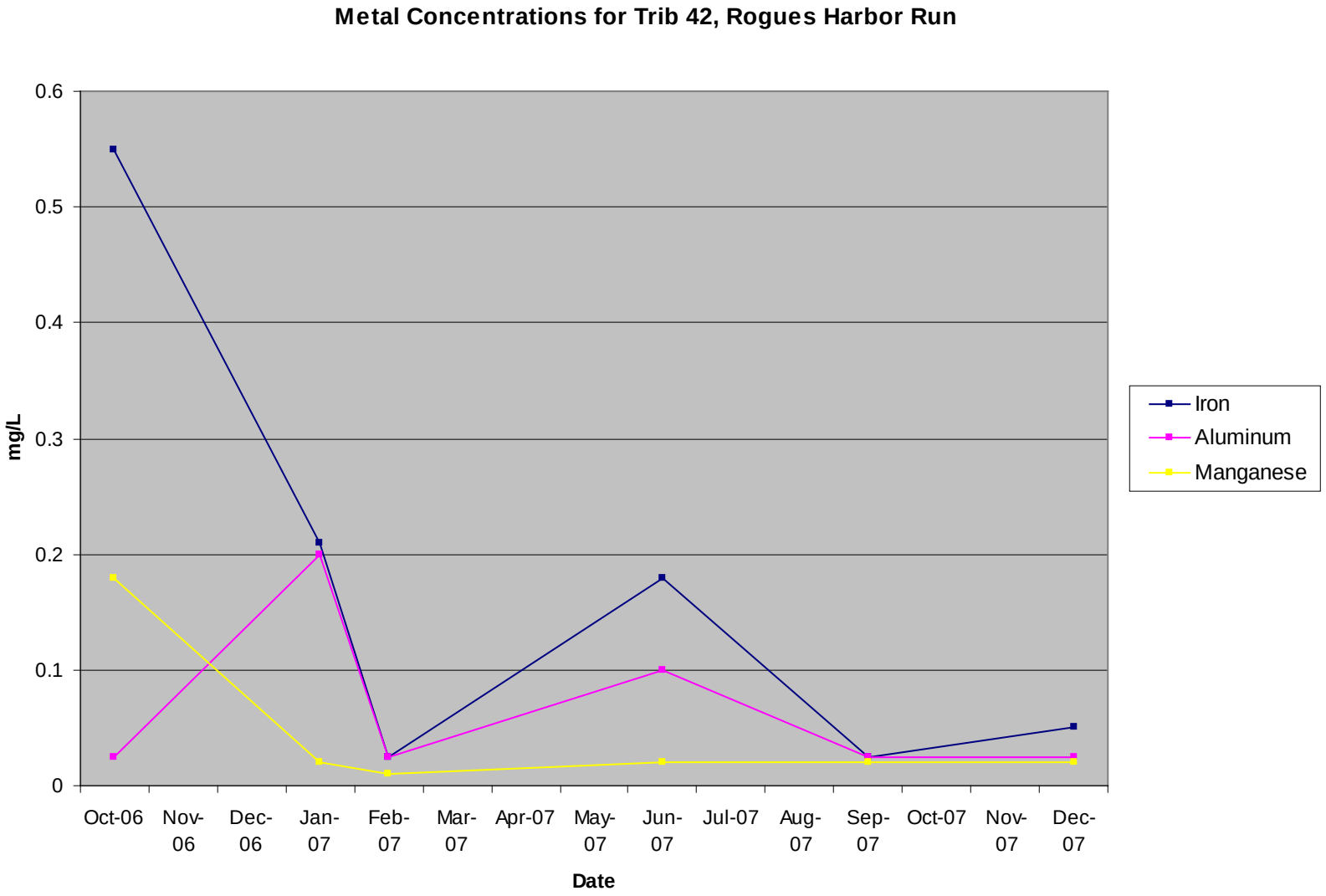
H. Additional Notes: There is a Coldwater Conservation Plan for Rogues Harbor Run prepared by the Clearfield County Conservation District.

This tributary flows through a portion of the Rock Run Recreation Area, which permits people to ride ATV's throughout the park, but this part of the park is off limits to ATV's. This tributary is the drinking water supply for the Borough of Westover.

Tributary Number 42, Rogues Harbor Run

Cambria County; Chest Township -- Clearfield County; Chest Township, Westover Borough

CCWA Monitoring Point: Trib Number 42, Rogues Harbor Run																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
10/5/2006	CCWA	434.65	7.7	531	54	-57	65	0.55	0.025	0.18	188	3.1	380	-298.25	340.11	2.88	0.13	0.94	983.71
1/8/2007	CCWA	7589.89	6.4	114	36	2	10	0.21	0.2	0.02	43	11.4	79	182.74	913.70	19.19	18.27	1.83	3928.92
2/20/2007	CCWA	2849.6	7	403	40	-8	22	0.025	0.025	0.01	161	2.5	267	-274.44	754.70	0.86	0.86	0.34	5523.04
6/6/2007	CCWA	4085.79	6.9	174	62	0	14	0.18	0.1	0.02	52	2.5	98	0.00	688.61	8.85	4.92	0.98	2557.69
9/18/2007	CCWA	274.68	7.3	1070	70	-39	56	0.025	0.025	0.02	529	2.5	890	-128.96	185.18	0.08	0.08	0.07	1749.25
12/5/2007	CCWA	1863	6.9	220	25	1	12	0.05	0.025	0.02	77	2.5	142	22.43	269.13	1.12	0.56	0.45	1726.92
Number of sample Dates	Count	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	Max	7589.89	7.7	1070	70	2	65	0.55	0.2	0.18	529	11.4	890	182.74	913.70	19.19	18.27	1.83	5523.04
	Min	274.68	6.4	114	25	-57	10	0.025	0.025	0.01	43	2.5	79	-298.25	185.18	0.08	0.08	0.07	983.71
6	Average	2849.60	7.03	418.67	47.83	-16.83	29.83	0.17	0.07	0.05	175.00	4.08	309.33	-82.75	525.24	5.50	4.14	0.77	2744.92


Metal Concentrations for Trib 42, Rogues Harbor Run
mg/L
0.6
0.5
0.4
0.3
0.2
0.1
0
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Dec-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-43	Subwatershed Boundry Outline (topography)
B-IN-43	Subwatershed Industrial Influences
B-SO-43	Subwatershed Soils
B-AP-43	Subwatershed Aerial Photography
B-SG-43	Subwatershed Surface Geology

Tributary 43, Ashcraft Run **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Burnside Township; Westover Borough, Clearfield County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PSS1C- Palustrine, scrub/ shrub, broad-leaved deciduous, seasonal
PFO1A- Palustrine, forested, broad-leaved deciduous, temporary
PEM1Ah- Palustrine, emergent, persistent, temporary, diked/ impounded
PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded
PSS1A- Palustrine, scrub/ shrub, broad-leaved deciduous, temporary
PUBFx- Palustrine, unconsolidated bottom, semiperminent, excavated

II. Quadrangle: Hastings, PA and Westover, PA (Wetlands Online Mapper used)

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcg	Glenshaw Formation	1292.110459	2.018923
Pa	Allegheny Formation	493.273339	0.77074

ACREAGE Sum
1785.383798
SQ_MI Sum
2.789662

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
95D	134.28303	0.209817	General Soils
BeD	70.928029	0.110825	General Soils
CmC	17.634281	0.027554	General Soils
CxD	7.533333	0.011771	General Soils
DeD	3.708426	0.005794	General Soils
DxD	10.880511	0.017001	General Soils
ErD	24.694464	0.038585	General Soils
HaD	10.053052	0.015708	General Soils
HbD	1.89955	0.002968	General Soils
HbF	24.746589	0.038667	General Soils
HdB	0.183173	0.000286	General Soils
RbF	195.374008	0.305272	General Soils
RcD	202.488572	0.316388	General Soils
WhD	6.401116	0.010002	General Soils

SubShedSoilsClearfield.ACREAGE Sum

710.808135

SubShedSoilsClearfield.SQ_MI Sum

1.110638

HYDRIC SOILS

92D	30.943584	0.048349	Hydric Soils
At	35.610054	0.055641	Hydric Soils
BrB	11.078316	0.01731	Hydric Soils
CaB	21.668761	0.033857	Hydric Soils
CxB	8.002879	0.012504	Hydric Soils
ErB	34.481941	0.053878	Hydric Soils
ErC	178.11119	0.278299	Hydric Soils
ExB	80.07536	0.125118	Hydric Soils
ExD	45.157641	0.070559	Hydric Soils
Uo	1.135439	0.001774	Hydric Soils
WhC	137.901554	0.215471	Hydric Soils

SubShedSoilsClearfield.ACREAGE Sum

584.166721

SubShedSoilsClearfield.SQ_MI Sum

0.912761

PRIME FARMLAND SOILS

ClB	8.613067	0.013458	Prime Farmland Soils
GlB	9.241484	0.01444	Prime Farmland Soils
HcB	4.262634	0.00666	Prime Farmland Soils
Ph	1.796205	0.002807	Prime Farmland Soils
RaB	58.067603	0.090731	Prime Farmland Soils
WhB	221.08076	0.345439	Prime Farmland Soils

SubShedSoilsClearfield.ACREAGE Sum

303.061753

SubShedSoilsClearfield.SQ_MI Sum

0.473534

STATEWIDE IMPORTANT SOILS

BeB	11.882043	0.018566	Statewide Important Soils
ClC	10.398015	0.016247	Statewide Important Soils
GlC	56.796868	0.088745	Statewide Important Soils
HcC	11.66751	0.01823	Statewide Important Soils
RaC	95.460405	0.149157	Statewide Important Soils

SubShedSoilsClearfield.ACREAGE Sum

186.204841

SubShedSoilsClearfield.SQ_MI Sum

0.290945

WATER

W	1.142358	0.001785	Water

SubShedSoilsClearfield.ACREAGE Sum

1.142358

SubShedSoilsClearfield.SQ_MI Sum

0.001785

E. Mining:

I. Mining Permits in Drainage Basin:

17830117, # 4376SM22

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Water	0.221029	0.000345
Low Density Urban	1.73694	0.002714
Hay Pasture	110.216868	0.172214
Row Crops	243.929053	0.381139
Coniferous Forest	55.920248	0.087375
Mixed Forest	14.440855	0.022564
Deciduous Forest	1290.66581	2.016665
Quarries	0.884116	0.001381
Transitional	66.242797	0.103504

Acreage Sum

1784.257718

SQ_MI Sum

2.787903

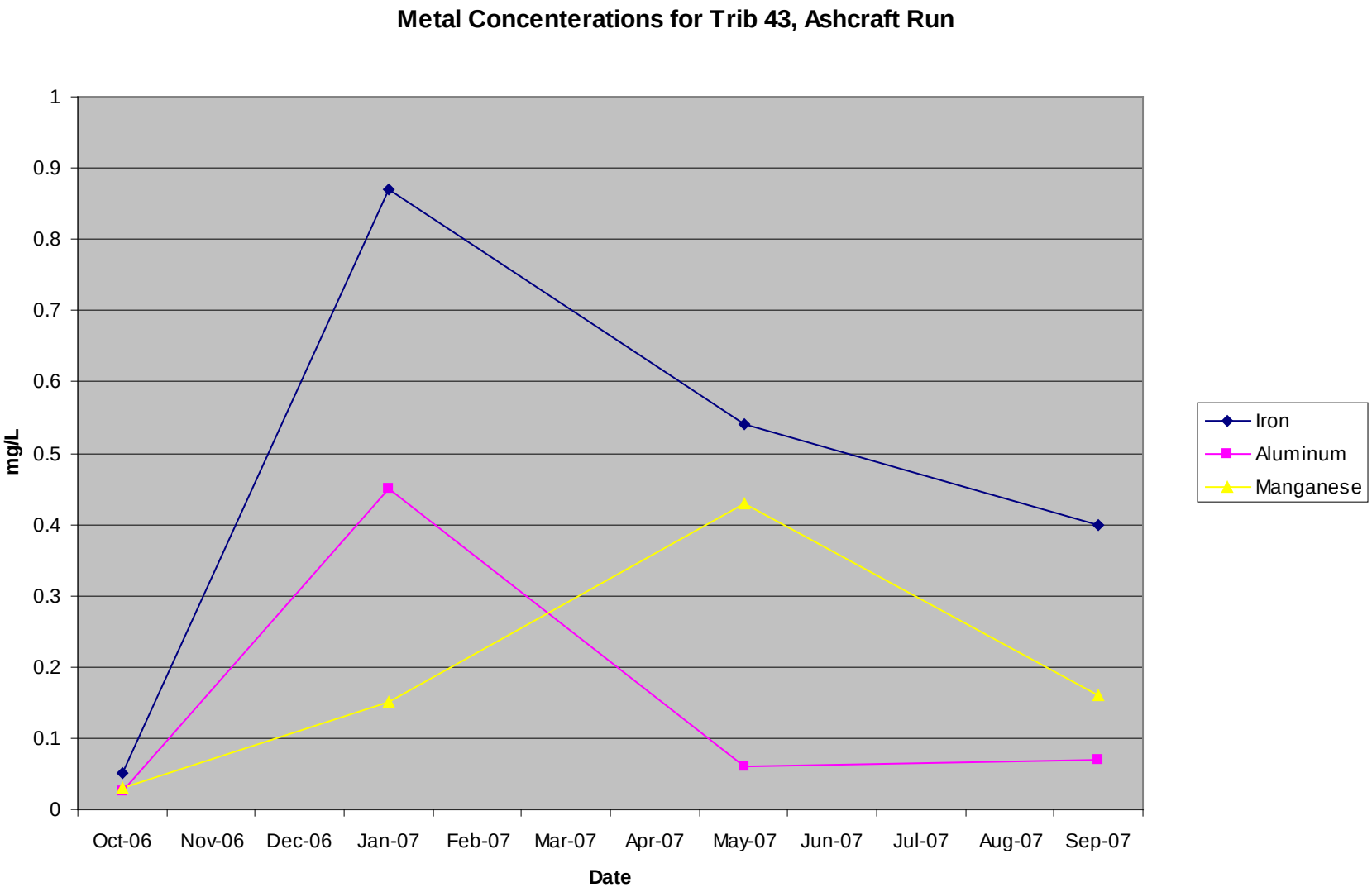
G. Pollution Sources: None

H. Additional Notes: The tributary effluent with Chest Creek is impounded by a massive beaverdam. The dam needs to be removed to allow the normal flow of the tributary to Chest Creek.

Tributary Number 43, Ashcraft Run

Clearfield County; Burnside Township, Westover Borough

CCWA Monitoring Point: Trib Number 43, Ashcraft Run																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(None)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
10/5/2006	CCWA	Wetlands	7.5	863	53	-36	47	0.05	0.025	0.03	382	3.1	684	--	--	--	--	--	--
1/8/2007	CCWA	Wetlands	6.6	109	36	-2	14	0.87	0.45	0.15	33	12.9	69	--	--	--	--	--	--
2/20/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
5/31/2007	CCWA	Wetlands	7.1	456	62	-24	37	0.54	0.06	0.43	156	2.5	253	--	--	--	--	--	--
9/14/2007	CCWA	Wetlands	7.4	542	68	-43	64	0.4	0.07	0.16	197	6	367	--	--	--	--	--	--
12/7/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
Number of sample Dates	Count	0	4	4	4	4	4	4	4	4	4	4	4	0	0	0	0	0	0
	Max	0	7.5	863	68	-2	64	0.87	0.45	0.43	382	12.9	684	0.00	0.00	0.00	0.00	0.00	0.00
	Min	0	6.6	109	36	-43	14	0.05	0.025	0.03	33	2.5	69	0.00	0.00	0.00	0.00	0.00	0.00
6	Average	--	7.15	492.50	54.75	-26.25	40.50	0.47	0.15	0.19	192.00	6.13	343.25	--	--	--	--	--	--


Metal Concenterations for Trib 43, Ashcraft Run
mg/L
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-44	Subwatershed Boundry Outline (topography)
B-IN-44	Subwatershed Industrial Influences
B-SO-44	Subwatershed Soils
B-AP-44	Subwatershed Aerial Photography
B-SG-44	Subwatershed Surface Geology

Tributary 44 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Chest Township; Westover Borough, Clearfield County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:

I. Habitat Types: none mapped

II. Quadrangle: Hastings, PA and Westover, PA (Wetlands Online Mapper used)

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcg	Glenshaw Formation	206.659986	0.322906
Pa	Allegheny Formation	104.502459	0.163285

ACREAGE Sum

311.162445

SQ_MI Sum

0.486191

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
BeD	28.53615	0.044588	General Soils
DxB	3.221742	0.005034	General Soils
ErD	17.642207	0.027566	General Soils
HaD	17.521144	0.027377	General Soils
HbF	5.54006	0.008656	General Soils
RbF	69.414576	0.10846	General Soils
RcD	59.08832	0.092325	General Soils

SubShedSoilsClearfield.ACREAGE Sum

200.964199

SubShedSoilsClearfield.SQ_MI Sum

0.314007

HYDRIC SOILS			
ErC	32.175558	0.050274	Hydric Soils
WhC	17.543241	0.027411	Hydric Soils

SubShedSoilsClearfield.ACREAGE Sum

49.718799

SubShedSoilsClearfield.SQ_MI Sum

0.077686

PRIME FARMLAND SOILS

GlB	18.18422	0.028413	Prime Farmland Soils
Ph	0.192817	0.000301	Prime Farmland Soils
WhB	0.972995	0.00152	Prime Farmland Soils

SubShedSoilsClearfield.ACREAGE Sum

19.350032

SubShedSoilsClearfield.SQ_MI Sum

0.030234

STATEWIDE IMPORTANT SOILS

BeB	10.997125	0.017183	Statewide Important Soils
BeC	13.320395	0.020813	Statewide Important Soils
GlC	14.974128	0.023397	Statewide Important Soils
MoB	1.831674	0.002862	Statewide Important Soils

SubShedSoilsClearfield.ACREAGE Sum

41.123322

SubShedSoilsClearfield.SQ_MI Sum

0.064255

WATER

W	0.00609	0.00001	Water

SubShedSoilsClearfield.ACREAGE Sum

0.00609

SubShedSoilsClearfield.SQ_MI Sum

0.00001

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Low Density Urban	16.965759	0.026509
Hay Pasture	20.939428	0.032718
Row Crops	21.254647	0.03321
Coniferous Forest	11.790565	0.018423
Mixed Forest	3.366974	0.005261
Deciduous Forest	223.399655	0.349062
Quarries	1.105143	0.001727
Transitional	12.340269	0.019282

Acreage Sum

311.16244

SQ_MI Sum

0.486191

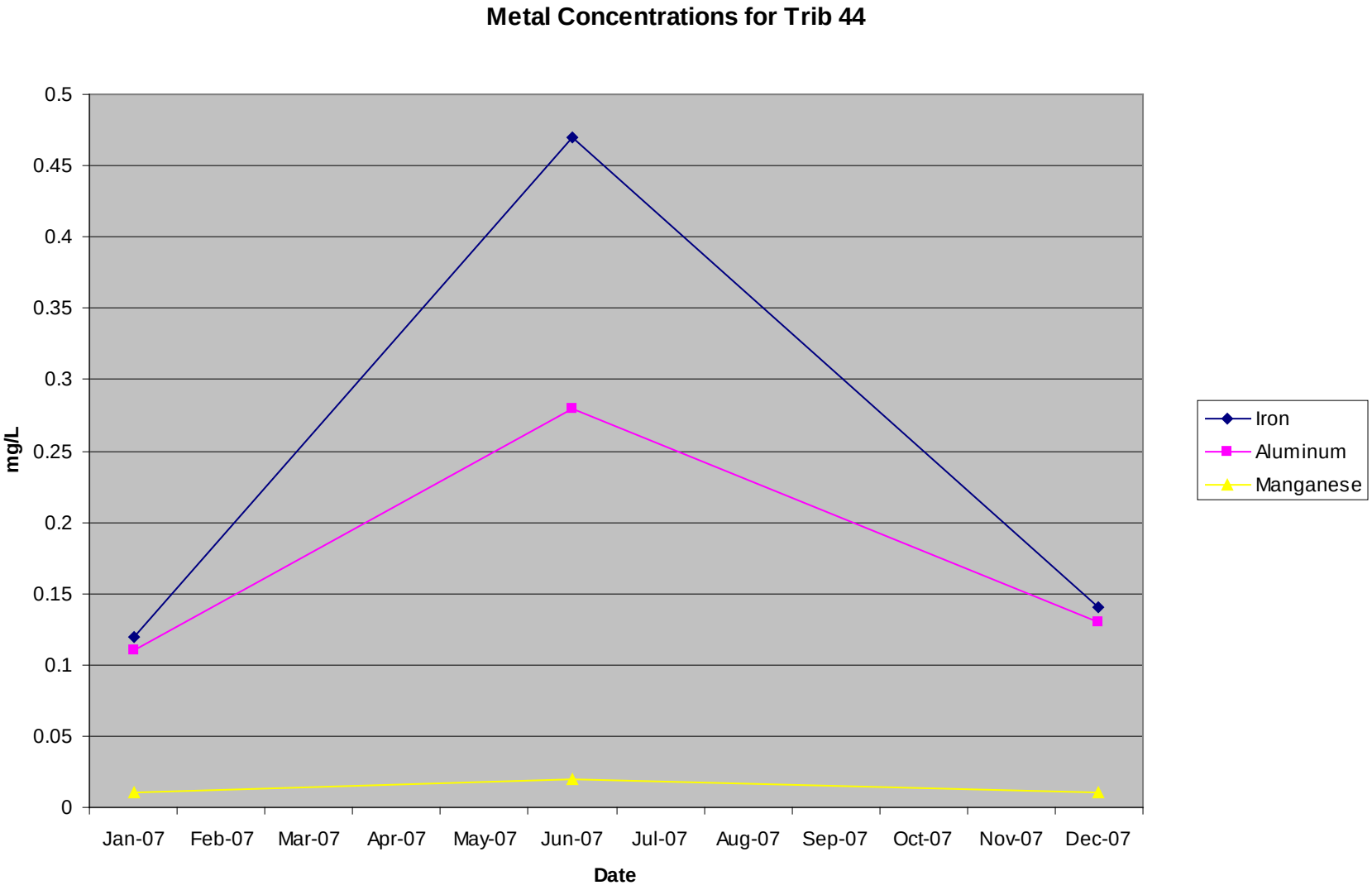
G. Pollution Sources: None

H. Additional Notes: None

Tributary Number 44

Clearfield County; Chest Township, Westover Borough

CCWA Monitoring Point: Trib Number 44																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
10/5/2006	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/9/2007	CCWA	564.08	7.2	130	26	-5	19	0.12	0.11	0.01	19	3.1	84	-33.95	129.02	0.81	0.75	0.07	129.02
2/20/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
6/6/2007	CCWA	112.97	7.4	208	63	-16	30	0.47	0.28	0.02	18	2.5	91	-21.76	40.80	0.64	0.38	0.03	24.48
9/18/2007	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12/11/2007	CCWA	230.43	7.3	223	42	-10	21	0.14	0.13	0.01	20	2.5	126	-27.74	58.25	0.39	0.36	0.03	55.48
Number of sample Dates	Count	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Max	564.08	7.4	223	63	-5	30	0.47	0.28	0.02	20	3.1	126	-21.76	129.02	0.81	0.75	0.07	129.02
	Min	112.97	7.2	130	26	-16	19	0.12	0.11	0.01	18	2.5	84	-33.95	40.80	0.39	0.36	0.03	24.48
6	Average	302.49	7.30	187.00	43.67	-10.33	23.33	0.24	0.17	0.01	19.00	2.70	100.33	-27.82	76.03	0.61	0.50	0.04	69.66


Metal Concentrations for Trib 44
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
mg/L
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Dec-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-45	Subwatershed Boundry Outline (topography)
B-IN-45	Subwatershed Industrial Influences
B-SO-45	Subwatershed Soils
B-AP-45	Subwatershed Aerial Photography
B-SG-45	Subwatershed Surface Geology

Chest Creek Watershed Assessment and Restoration Plan

Tributary 45 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Westover Borough, Clearfield County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PFO1A- Palustrine, forested, broad-leaved deciduous, temporary
PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded
PEM1Eh- Palustrine, emergent, persistent, seasonal saturated, diked/ impounded

II. Quadrangle: Westover, PA (Wetlands Online Mapper used)

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcg	Glenshaw Formation	109.645759	0.171321
Pa	Allegheny Formation	250.495107	0.391399

ACREAGE Sum
360.140867
SQ_MI Sum
0.56272

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
95D	24.305885	0.037978	General Soils
BeD	23.403215	0.036568	General Soils
ErD	4.446083	0.006947	General Soils
HbD	1.698847	0.002654	General Soils
HbF	0.034402	0.000054	General Soils
RbF	26.954813	0.042117	General Soils
RcD	23.212652	0.03627	General Soils

SubShedSoilsClearfield.ACREAGE Sum
104.055897
SubShedSoilsClearfield.SQ_MI Sum
0.162587

HYDRIC SOILS			
BrB	36.168765	0.056514	Hydric Soils
CaB	19.362353	0.030254	Hydric Soils
ErB	11.866678	0.018542	Hydric Soils
ErC	34.331832	0.053643	Hydric Soils

WhC	17.408799	0.027201	Hydric Soils

SubShedSoilsClearfield.ACREAGE Sum

119.138427

SubShedSoilsClearfield.SQ_MI Sum

0.186154

PRIME FARMLAND SOILS

GlB	6.740854	0.010533	Prime Farmland Soils
Ph	16.34549	0.02554	Prime Farmland Soils
WhB	44.513263	0.069552	Prime Farmland Soils

SubShedSoilsClearfield.ACREAGE Sum

67.599607

SubShedSoilsClearfield.SQ_MI Sum

0.105624

STATEWIDE IMPORTANT SOILS

BeB	2.315653	0.003618	Statewide Important Soils
BeC	17.506119	0.027353	Statewide Important Soils
ClC	1.642107	0.002566	Statewide Important Soils
GlC	28.466798	0.044479	Statewide Important Soils
MoB	19.258873	0.030092	Statewide Important Soils

SubShedSoilsClearfield.ACREAGE Sum

69.18955

SubShedSoilsClearfield.SQ_MI Sum

0.108109

WATER

W	0.157383	0.000246	Water

SubShedSoilsClearfield.ACREAGE Sum

0.157383

SubShedSoilsClearfield.SQ_MI Sum

0.000246

E. Mining:

I. Mining Permits in Drainage Basin:

4376SM22

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	**Acreage**	**SQ_MI**
Low Density Urban	71.084991	0.11107
Hay Pasture	64.010822	0.100017
Row Crops	119.000388	0.185938
Coniferous Forest	11.242582	0.017567
Mixed Forest	5.483992	0.008569
Deciduous Forest	73.029696	0.114109
Quarries	0.09525	0.000149

Transitional	16.193144	0.025302

Acreage Sum

360.140866

SQ_MI Sum

0.56272

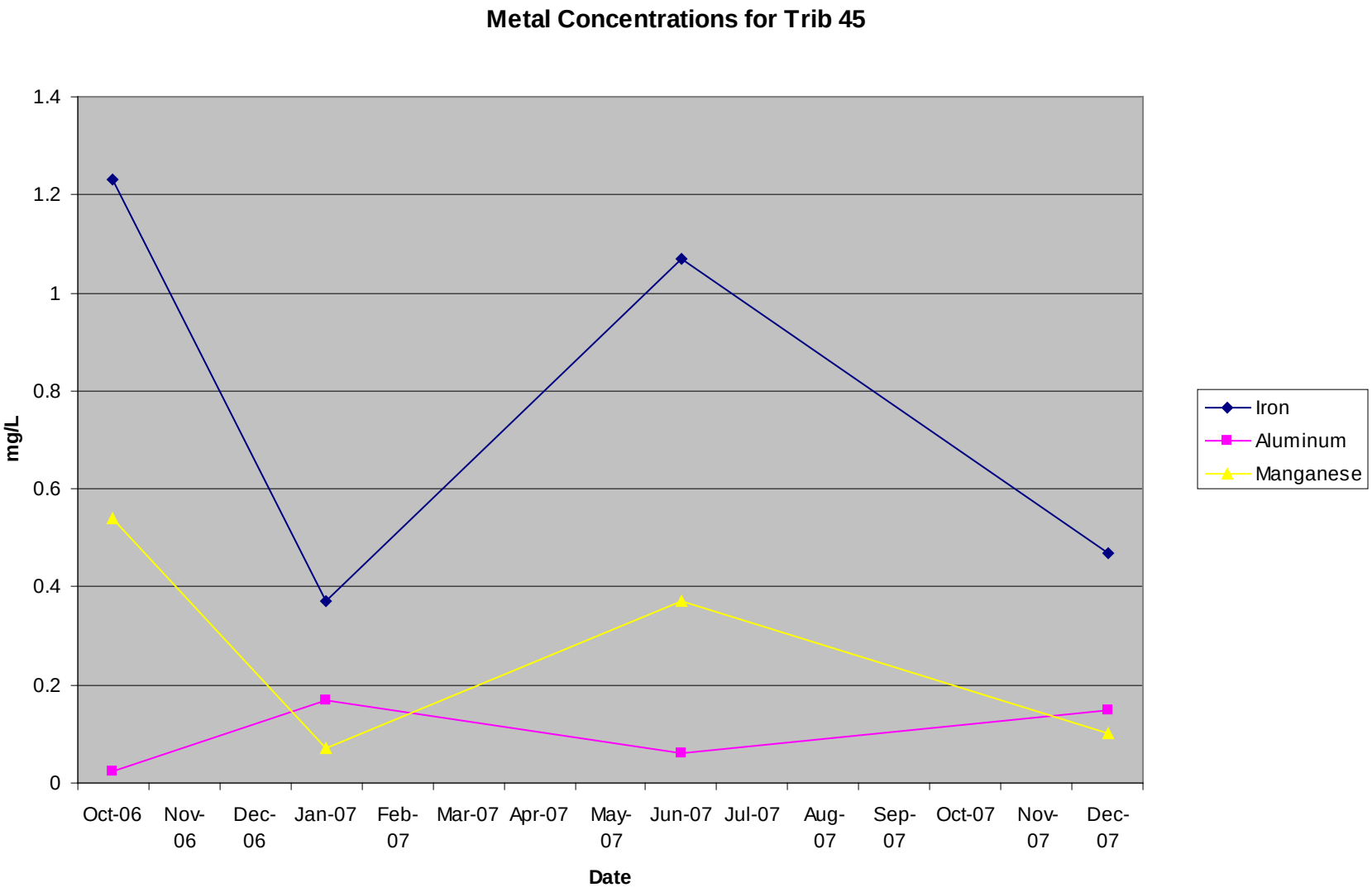
G. Pollution Sources: None

H. Additional Notes: None

Tributary Number 45

Clearfield County; Westover Borough

CCWA Monitoring Point: Trib Number 45																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
10/5/2006	CCWA	12	7.2	345	62	-72	83	1.23	0.025	0.54	23	3.1	221	-10.40	11.99	0.18	0.00	0.08	3.32
1/9/2007	CCWA	509.87	7	191	28	-14	30	0.37	0.17	0.07	19	3.1	121	-85.93	184.14	2.27	1.04	0.43	116.62
2/20/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
6/6/2007	CCWA	29.67	7.3	406	66	-64	78	1.07	0.06	0.37	22	2.5	207	-22.86	27.86	0.38	0.02	0.13	7.86
9/18/2007	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12/7/2007	CCWA	114.5	7.1	245	18	-22	34	0.47	0.15	0.1	20	2.5	138	-30.32	46.87	0.65	0.21	0.14	27.57
Number of sample Dates	Count	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	Max	509.87	7.3	406	66	-14	83	1.23	0.17	0.54	23	3.1	221	-10.40	184.14	2.27	1.04	0.43	116.62
	Min	12	7	191	18	-72	30	0.37	0.025	0.07	19	2.5	121	-85.93	11.99	0.18	0.00	0.08	3.32
6	Average	166.51	7.15	296.75	43.50	-43.00	56.25	0.79	0.10	0.27	21.00	2.80	171.75	-37.38	67.71	0.87	0.32	0.19	38.84


Metal Concentrations for Trib 45
1.4
1.2
1
0.8
0.6
0.4
0.2
0
mg/L
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Dec-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-46	Subwatershed Boundry Outline (topography)
B-IN-46	Subwatershed Industrial Influences
B-SO-46	Subwatershed Soils
B-AP-46	Subwatershed Aerial Photography
B-SG-46	Subwatershed Surface Geology

Tributary 46 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Chest Township, Clearfield County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:
I. Habitat Types: none mapped
II. Quadrangle: Westover, PA (Wetlands Online Mapper used)

D. Geology and Soils:
I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcg	Glenshaw Formation	45.210994	0.070642
Pa	Allegheny Formation	21.305632	0.03329

ACREAGE Sum
66.516626
SQ_MI Sum
0.103932

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
95D	0.482305	0.000754	General Soils
GmD	2.525851	0.003947	General Soils
RbF	5.864042	0.009163	General Soils
RcD	9.566254	0.014947	General Soils

SubShedSoilsClearfield.ACREAGE Sum
18.438453
SubShedSoilsClearfield.SQ_MI Sum
0.02881

HYDRIC SOILS			
92D	15.759441	0.024624	Hydric Soils
CoC	2.495613	0.003899	Hydric Soils
ErC	5.47714	0.008558	Hydric Soils
WhC	10.160615	0.015876	Hydric Soils

SubShedSoilsClearfield.ACREAGE Sum
33.89281
SubShedSoilsClearfield.SQ_MI Sum
0.052958

PRIME FARMLAND SOILS			
GlB	6.343114	0.009911	Prime Farmland Soils

Ph	0.542073	0.000847	Prime Farmland Soils
WhB	2.448099	0.003825	Prime Farmland Soils

SubShedSoilsClearfield.ACREAGE Sum

9.333287

SubShedSoilsClearfield.SQ_MI Sum

0.014583

STATEWIDE IMPORTANT SOILS

BeC	4.718145	0.007372	Statewide Important Soils

SubShedSoilsClearfield.ACREAGE Sum

4.718145

SubShedSoilsClearfield.SQ_MI Sum

0.007372

WATER

W	0.133932	0.000209	Water

SubShedSoilsClearfield.ACREAGE Sum

0.133932

SubShedSoilsClearfield.SQ_MI Sum

0.000209

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Hay Pasture	21.759264	0.033999
Row Crops	13.515396	0.021118
Coniferous Forest	0.20956	0.000327
Mixed Forest	3.477231	0.005433
Deciduous Forest	24.65663	0.038526
Transitional	2.898544	0.004529

Acreage Sum

66.516625

SQ_MI Sum

0.103932

G. Pollution Sources: None

H. Additional Notes: None

Tributary Number 46

Clearfield County; Chest Township

CCWA Monitoring Point: Trib Number 46																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.	Loading					
		(Estimate)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
10/6/2006	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/9/2007	CCWA	55	7.6	263	28	-33	45	0.12	0.1	0.01	74	3.1	173	-21.85	29.80	0.08	0.07	0.01	49.00
2/20/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
6/7/2007	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9/18/2007	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12/9/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
Number of sample Dates	Count	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Max	55	7.6	263	28	-33	45	0.12	0.1	0.01	74	3.1	173	-21.85	29.80	0.08	0.07	0.01	49.00
	Min	55	7.6	263	28	-33	45	0.12	0.1	0.01	74	3.1	173	-21.85	29.80	0.08	0.07	0.01	49.00
6	Average	55.00	7.60	263.00	28.00	-33.00	45.00	0.12	0.10	0.01	74.00	3.10	173.00	-21.85	29.80	0.08	0.07	0.01	49.00

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-47	Subwatershed Boundry Outline (topography)
B-IN-47	Subwatershed Industrial Influences
B-SO-47	Subwatershed Soils
B-AP-47	Subwatershed Aerial Photography
B-SG-47	Subwatershed Surface Geology

Tributary 47, Pine Run **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Chest Township, Clearfield County

B. Chapter 93 Designation: EV

C. National Wetlands Inventory Information:

I. Habitat Types:

PUBH- Palustrine, unconsolidated bottom, permanent
PUBHx- Palustrine, unconsolidated bottom, permanent, excavated
PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded

II. Quadrangle: Westover, PA (Wetlands Online Mapper used)

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcg	Glenshaw Formation	1540.620034	2.407219
Pa	Allegheny Formation	1048.320861	1.638001

ACREAGE Sum
2588.940896
SQ_MI Sum
4.04522

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
95D	727.106467	1.136104	General Soils
BeD	7.645548	0.011946	General Soils
DxB	1.648731	0.002576	General Soils
ErD	111.222193	0.173785	General Soils
GmB	0.431544	0.000674	General Soils
GmD	13.35552	0.020868	General Soils
RbF	347.683368	0.543255	General Soils
RcD	282.948174	0.442107	General Soils
WhD	6.428678	0.010045	General Soils

SubShedSoilsClearfield.ACREAGE Sum
1498.470223
SubShedSoilsClearfield.SQ_MI Sum
2.34136

HYDRIC SOILS			
92B	6.487375	0.010137	Hydric Soils
92D	145.920105	0.228	Hydric Soils
At	38.97027	0.060891	Hydric Soils

BrB	26.825523	0.041915	Hydric Soils
BxB	6.094171	0.009522	Hydric Soils
CaB	5.179198	0.008092	Hydric Soils
CaC	3.324178	0.005194	Hydric Soils
CxB	4.12866	0.006451	Hydric Soils
ErB	76.505027	0.119539	Hydric Soils
ErC	278.870417	0.435735	Hydric Soils
ExB	2.464075	0.00385	Hydric Soils
ExD	23.452698	0.036645	Hydric Soils
TyB	0.231803	0.000362	Hydric Soils
Uo	3.52979	0.005515	Hydric Soils
WhC	31.928557	0.049888	Hydric Soils

SubShedSoilsClearfield.ACREAGE Sum

653.911848

SubShedSoilsClearfield.SQ_MI Sum

1.021737

PRIME FARMLAND SOILS

CoB	95.427842	0.149106	Prime Farmland Soils
GlB	139.280518	0.217626	Prime Farmland Soils
WhB	24.416494	0.038151	Prime Farmland Soils

SubShedSoilsClearfield.ACREAGE Sum

259.124854

SubShedSoilsClearfield.SQ_MI Sum

0.404883

STATEWIDE IMPORTANT SOILS

BeB	5.026228	0.007853	Statewide Important Soils
BeC	3.897468	0.00609	Statewide Important Soils
DeB	11.046384	0.01726	Statewide Important Soils
GlC	144.416586	0.225651	Statewide Important Soils
HcC	11.843001	0.018505	Statewide Important Soils

SubShedSoilsClearfield.ACREAGE Sum

176.229667

SubShedSoilsClearfield.SQ_MI Sum

0.275359

WATER

47	W	1.204298	0.001882	Water

SubShedSoilsClearfield.ACREAGE Sum

1.204298

SubShedSoilsClearfield.SQ_MI Sum

0.001882

E. Mining:

I. Mining Permits in Drainage Basin:

17830117, # 17070105

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Water	1.105143	0.001727
Low Density Urban	2.248159	0.003513
Hay Pasture	153.798123	0.24031
Row Crops	277.116977	0.432995
Coniferous Forest	172.23313	0.269114
Mixed Forest	53.67761	0.083871
Deciduous Forest	1668.382415	2.606848
Woody Wetland	0.040036	0.000063
Quarries	107.357278	0.167746
Coal Mines	2.873375	0.00449
Transitional	141.767912	0.221512

Acreage Sum

2580.600158

SQ_MI Sum

4.032188

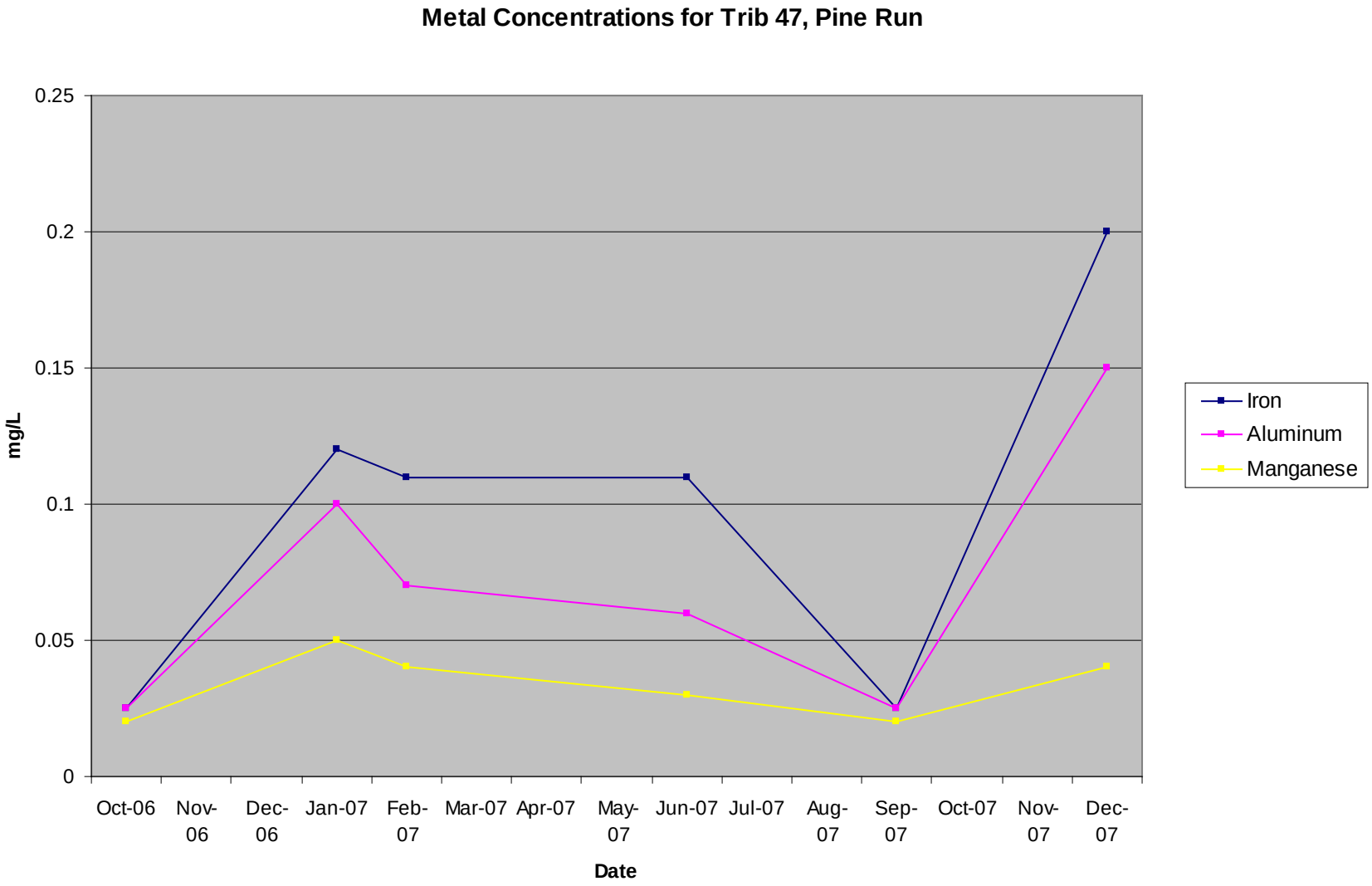
G. Pollution Sources: None

H. Additional Notes: As of 2009 a proposed landfill permit, which would occur in the Pine Run watershed, is currently under review by the DEP. Pine Run used to be designated under Chapter 93 as a HQ-CWF, but recently was changed to EV after futher studing was done.

Tributary Number 47, Pine Run

Clearfield County; Chest Township

CCWA Monitoring Point: Trib Number 47, Pine Run														Loading					
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.						
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
10/6/2006	CCWA	174.55	7.7	476	52	-49	62	0.025	0.025	0.02	159	3.1	320	-102.96	130.28	0.05	0.05	0.04	334.11
1/9/2007	CCWA	4178.87	7.2	212	29	-7	23	0.12	0.1	0.05	63	3.1	140	-352.15	1157.06	6.04	5.03	2.52	3169.34
2/21/2007	CCWA	1500.16	7.3	335	36	-14	29	0.11	0.07	0.04	119	2.5	219	-252.83	523.73	1.99	1.26	0.72	2149.08
6/7/2007	CCWA	1043.62	7.3	322	66	-17	32	0.11	0.06	0.03	91	2.5	183	-213.58	402.03	1.38	0.75	0.38	1143.28
9/18/2007	CCWA	171.36	7.4	487	71	-45	62	0.025	0.025	0.02	179	2.5	345	-92.83	127.90	0.05	0.05	0.04	369.26
12/19/2007	CCWA	1932.39	7.3	250	28	-8	21	0.2	0.15	0.04	79	2.5	152	-186.10	488.52	4.65	3.49	0.93	1837.77
Number of sample Dates	Count	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	Max	4178.87	7.7	487	71	-7	62	0.2	0.15	0.05	179	3.1	345	-92.83	1157.06	6.04	5.03	2.52	3169.34
	Min	171.36	7.2	212	28	-49	21	0.025	0.025	0.02	63	2.5	140	-352.15	127.90	0.05	0.05	0.04	334.11
6	Average	1500.16	7.37	347.00	47.00	-23.33	38.17	0.10	0.07	0.03	115.00	2.70	226.50	-200.08	471.59	2.36	1.77	0.77	1500.47


Metal Concentrations for Trib 47, Pine Run
0.25
0.2
0.15
0.1
0.05
0
mg/L
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Dec-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-48	Subwatershed Boundry Outline (topography)
B-IN-48	Subwatershed Industrial Influences
B-SO-48	Subwatershed Soils
B-AP-48	Subwatershed Aerial Photography
B-SG-48	Subwatershed Surface Geology

Chest Creek Watershed Assessment and Restoration Plan

Tributary 48, Kings Run **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Burnside Township; Chest Township, Clearfield County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PUBHx- Palustrine, unconsolidated bottom, permanent, excavated

PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded

II. Quadrangle: Westover, PA (Wetlands Online Mapper used)

D. Geology and Soils:

I. Surface Geology

SYMB	NAME		Acreage	Square Miles	
48	29	Pcg	Glenshaw Formation	596.66311	0.932286
48	31	Pa	Allegheny Formation	550.155211	0.859618

ACREAGE Sum

1146.818321

SQ_MI Sum

1.791904

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
95D	116.219316	0.181593	General Soils
BeD	10.905696	0.01704	General Soils
DxB	11.682496	0.018254	General Soils
DxD	15.621805	0.024409	General Soils
ErD	16.206705	0.025323	General Soils
HbD	21.96251	0.034316	General Soils
HdB	2.889286	0.004515	General Soils
RbF	207.492798	0.324207	General Soils
RcD	160.118219	0.250185	General Soils

SubShedSoilsClearfield.ACREAGE Sum

563.098831

SubShedSoilsClearfield.SQ_MI Sum

0.879842

HYDRIC SOILS			
92D	57.172462	0.089332	Hydric Soils
BrA	0.444289	0.000694	Hydric Soils
CaB	20.773704	0.032459	Hydric Soils

CaC	7.236206	0.011307	Hydric Soils
ErB	86.825346	0.135665	Hydric Soils
ErC	74.637066	0.11662	Hydric Soils
ExD	36.081699	0.056378	Hydric Soils
WhC	50.474223	0.078866	Hydric Soils

SubShedSoilsClearfield.ACREAGE Sum

333.644996

SubShedSoilsClearfield.SQ_MI Sum

0.52132

PRIME FARMLAND SOILS

GlB	27.066822	0.042292	Prime Farmland Soils
HcB	7.475733	0.011681	Prime Farmland Soils
Ph	21.085534	0.032946	Prime Farmland Soils
RaB	14.209863	0.022203	Prime Farmland Soils
WhB	100.050464	0.156329	Prime Farmland Soils

SubShedSoilsClearfield.ACREAGE Sum

169.888417

SubShedSoilsClearfield.SQ_MI Sum

0.265451

STATEWIDE IMPORTANT SOILS

BeB	5.694189	0.008897	Statewide Important Soils
BeC	6.597968	0.010309	Statewide Important Soils
ClC	4.269179	0.006671	Statewide Important Soils
DeC	2.850736	0.004454	Statewide Important Soils
GlC	59.526154	0.09301	Statewide Important Soils
MoB	0.484761	0.000757	Statewide Important Soils

SubShedSoilsClearfield.ACREAGE Sum

79.422988

SubShedSoilsClearfield.SQ_MI Sum

0.124098

WATER

W	0.763091	0.001192	Water

SubShedSoilsClearfield.ACREAGE Sum

0.763091

SubShedSoilsClearfield.SQ_MI Sum

0.001192

E. Mining:

I. Mining Permits in Drainage Basin:

17980126

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Water	1.547202	0.002418
Low Density Urban	0.167213	0.000261
Hay Pasture	61.122157	0.095503
Row Crops	99.283945	0.155131
Coniferous Forest	34.161373	0.053377
Mixed Forest	7.489996	0.011703
Deciduous Forest	808.916676	1.263932
Quarries	106.336052	0.16615
Transitional	27.717364	0.043308

Acreage Sum

1146.741979

SQ_MI Sum

1.791784

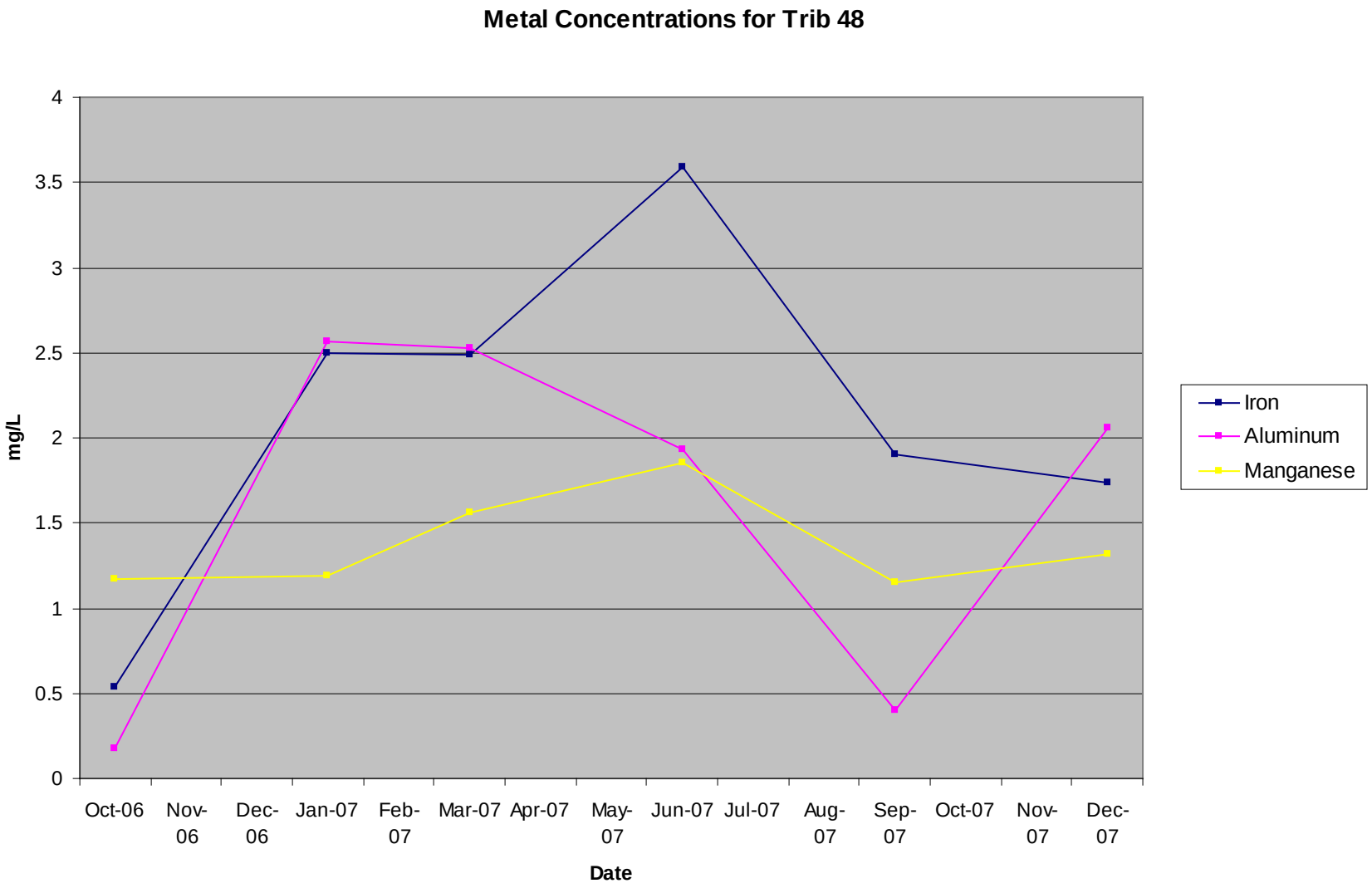
G. Pollution Sources: Discharges 48-1L and 48-1R occur in this watershed.

H. Additional Notes: This tributary is affected by discharge 48-1R more so than 48-1L and is recommended for remediaition. By treating this discharge you would be able to restore the lower half of King's Run.

Tributary Number 48, Kings Run

Clearfield County; Burnside Township, Chest Township

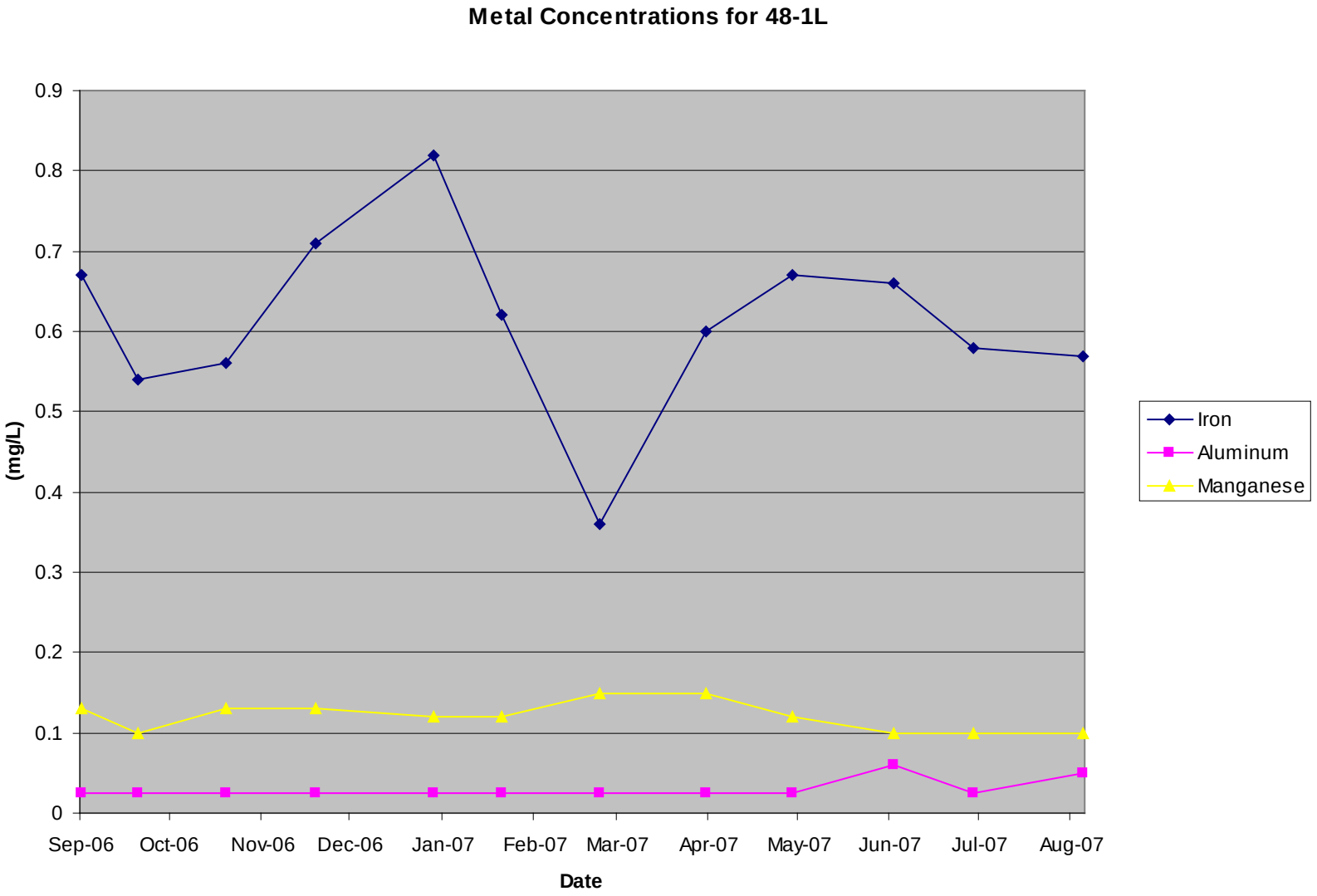
CCWA Monitoring Point: Trib Number 48, Kings Run																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
10/9/2006	CCWA	253.41	8.1	592	67	-122	134	0.54	0.18	1.17	142	3.1	363	-372.18	408.79	1.65	0.55	3.57	433.19
1/10/2007	CCWA	1721.21	6.7	296	20	5	15	2.5	2.57	1.19	110	11.4	197	103.60	310.81	51.80	53.25	24.66	2279.27
3/1/2007	CCWA	724.9	7.5	512	29	-50	66	2.49	2.53	1.56	162	15	317	-436.33	575.96	21.73	22.08	13.61	1413.72
6/7/2007	CCWA	353.23	7.9	667	62	-85	104	3.59	1.93	1.85	181	19	381	-361.45	442.24	15.27	8.21	7.87	769.67
9/19/2007	CCWA	258.08	8.2	592	64	-118	132	1.9	0.4	1.15	136	5	373	-366.61	410.11	5.90	1.24	3.57	422.53
12/19/2007	CCWA	1038.55	7.2	370	26	-16	30	1.74	2.06	1.32	136	8	252	-200.04	375.07	21.75	25.76	16.50	1700.34
Number of sample Dates	Count	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	Max	1721.21	8.2	667	67	5	134	3.59	2.57	1.85	181	19	381	103.60	575.96	51.80	53.25	24.66	2279.27
	Min	253.41	6.7	296	20	-122	15	0.54	0.18	1.15	110	3.1	197	-436.33	310.81	1.65	0.55	3.57	422.53
6	Average	724.90	7.60	504.83	44.67	-64.33	80.17	2.13	1.61	1.37	144.50	10.25	313.83	-272.17	420.50	19.68	18.51	11.63	1169.79


Metal Concentrations for Trib 48
mg/L
4
3.5
3
2.5
2
1.5
1
0.5
0
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Dec-07
Date
Iron
Aluminum
Manganese

Discharge Number 48-1L, King's Run Mine

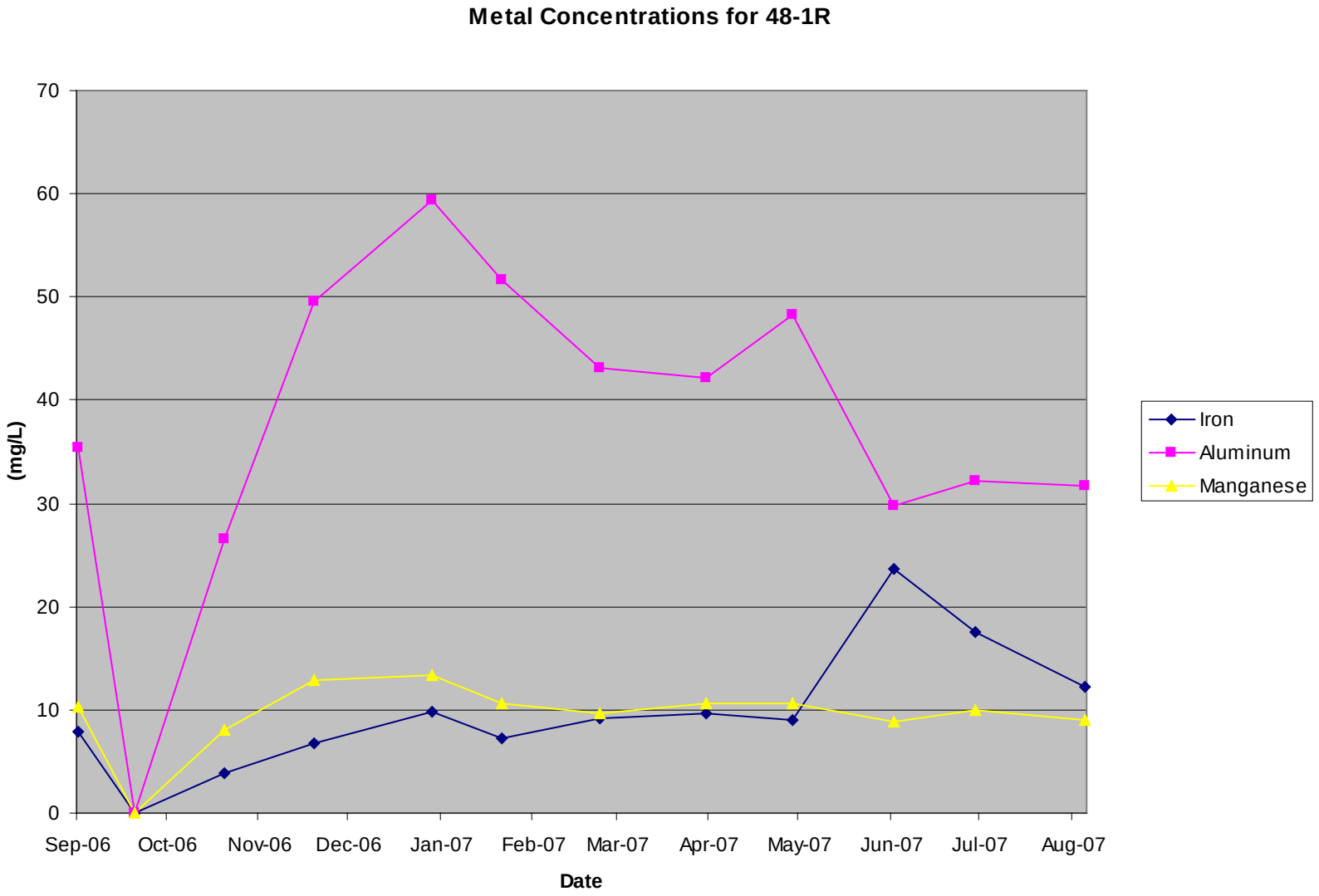
Clearfield County; Burnside Township

CCWA Monitoring Point: Discharge Number 48-1L, King's Run Mine																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Rect.)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/27/2006	CCWA	24.75	7.7	426	56	-192	210	0.67	0.025	0.13	2.5	3.1	240	-57.21	62.57	0.20	0.01	0.04	0.74
10/16/2006	CCWA	24.75	7.4	430	40	-182	195	0.54	0.025	0.1	2.5	3.1	244	-54.23	58.10	0.16	0.01	0.03	0.74
11/15/2006	CCWA	30.2	7.5	419	51	-171	196	0.56	0.025	0.13	2.5	10	234	-62.17	71.26	0.20	0.01	0.05	0.91
12/15/2006	CCWA	30.2	7.6	432	43	-171	214	0.71	0.025	0.13	2.5	3.1	237	-62.17	77.80	0.26	0.01	0.05	0.91
1/24/2007	CCWA	30.2	7.5	445	24	-188	202	0.82	0.025	0.12	2.5	2.5	251	-68.35	73.44	0.30	0.01	0.04	0.91
2/16/2007	CCWA	24.75	7.5	443	12	-189	203	0.62	0.025	0.12	2.5	2.5	245	-56.31	60.48	0.18	0.01	0.04	0.74
3/21/2007	CCWA	30.2	7.6	415	36	-1	181	0.36	0.025	0.15	2.5	2.5	231	-0.36	65.80	0.13	0.01	0.05	0.91
4/26/2007	CCWA	30.2	7.4	431	42	-181	196	0.6	0.025	0.15	2.5	2.5	238	-65.80	71.26	0.22	0.01	0.05	0.91
5/25/2007	CCWA	24.75	7.4	444	69	-186	198	0.67	0.025	0.12	2.5	2.5	257	-55.42	58.99	0.20	0.01	0.04	0.74
6/28/2007	CCWA	22.16	7.4	454	70	-183	198	0.66	0.06	0.1	2.5	2.5	246	-48.82	52.82	0.18	0.02	0.03	0.67
7/25/2007	CCWA	19.67	7.5	453	68	-190	205	0.58	0.025	0.1	2.5	2.5	249	-44.99	48.54	0.14	0.01	0.02	0.59
8/31/2007	CCWA	19.67	7.5	421	68	-187	207	0.57	0.05	0.1	2.5	2.5	233	-44.28	49.02	0.13	0.01	0.02	0.59
Number of sample Dates	Count	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
	Max	30.2	7.7	454	70	-1	214	0.82	0.06	0.15	2.5	10	257	-0.36	77.80	0.30	0.02	0.05	0.91
	Min	19.67	7.4	415	12	-192	181	0.36	0.025	0.1	2.5	2.5	231	-68.35	48.54	0.13	0.01	0.02	0.59
12	Average	25.96	7.50	434.42	48.25	-168.42	200.42	0.61	0.03	0.12	2.50	3.28	242.08	-51.68	62.51	0.19	0.01	0.04	0.78


Metal Concentrations for 48-1L
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
(mg/L)
Sep-06
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Date
Iron
Aluminum
Manganese

Discharge Number: 48-1R, King's Run Pipe
Clearfield County; Burnside Township

CCWA Monitoring Point: Discharge Number: 48-1R, King's Run Pipe																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Bucket)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/27/2006	CCWA	2.38	3	1320	56	256	0	7.83	35.4	10.3	569	3.1	859	7.33	0.00	0.22	1.01	0.30	16.30
10/16/2006	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11/15/2006	CCWA	27.81	3	1260	52	236	0	3.9	26.6	8.06	512	10	803	79.01	0.00	1.31	8.91	2.70	171.41
12/15/2006	CCWA	15.21	3	1380	45	301	0	6.71	49.5	12.9	601	3.1	920	55.11	0.00	1.23	9.06	2.36	110.05
1/24/2007	CCWA	40.93	2.9	1750	25	389	0	9.89	59.3	13.3	701	2.5	1101	191.67	0.00	4.87	29.22	6.55	345.40
2/16/2007	CCWA	10.36	2.9	1540	12	345	0	7.21	51.7	10.7	664	2.5	1018	43.03	0.00	0.90	6.45	1.33	82.81
3/21/2007	CCWA	118.42	3	1520	37	340	0	9.17	43.1	9.61	643	2.5	938	484.70	0.00	13.07	61.44	13.70	916.65
4/26/2007	CCWA	54.28	2.9	1390	44	354	0	9.59	42.1	10.6	634	2.5	987	231.32	0.00	6.27	27.51	6.93	414.28
5/25/2007	CCWA	13.13	2.9	1440	71	346	0	9.02	48.2	10.7	603	2.5	1016	54.69	0.00	1.43	7.62	1.69	95.31
6/28/2007	CCWA	2.25	2.9	1420	72	294	0	23.7	29.8	8.89	612	2.5	1036	7.96	0.00	0.64	0.81	0.24	16.58
7/25/2007	CCWA	0.81	2.9	1530	70	278	0	17.5	32.2	9.99	620	2.5	936	2.71	0.00	0.17	0.31	0.10	6.05
8/31/2007	CCWA	3.69	3	1350	68	275	0	12.2	31.7	9.02	616	2.5	966	12.22	0.00	0.54	1.41	0.40	27.36
Number of sample Dates	Count	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
	Max	118.42	3	1750	72	389	0	23.7	59.3	13.3	701	10	1101	484.70	0.00	13.07	61.44	13.70	916.65
	Min	0.81	2.9	1260	12	236	0	3.9	26.6	8.06	512	2.5	803	2.71	0.00	0.17	0.31	0.10	6.05
12	Average	26.30	2.95	1445.45	50.18	310.36	0.00	10.61	40.87	10.37	615.91	3.29	961.82	106.34	0.00	2.79	13.98	3.30	200.20


Metal Concentrations for 48-1R
70
60
50
40
30
20
10
0
(mg/L)
Sep-06
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-49	Subwatershed Boundry Outline (topography)
B-IN-49	Subwatershed Industrial Influences
B-SO-49	Subwatershed Soils
B-AP-49	Subwatershed Aerial Photography
B-SG-49	Subwatershed Surface Geology

Chest Creek Watershed Assessment and Restoration Plan

Tributary 49, Spring Run **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Burnside Township; Chest Township, Clearfield County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded
PSS1C- Palustrine, scrub/ shrub, broad-leaved deciduous, seasonal

II. Quadrangle: Westover, PA (Wetlands Online Mapper used)

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcg	Glenshaw Formation	750.742826	1.173036
Pa	Allegheny Formation	527.344487	0.823976

ACREAGE Sum

1278.087313

SQ_MI Sum

1.997011

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
95D	189.642272	0.296316	General Soils
BeD	9.846768	0.015386	General Soils
DxB	13.824509	0.021601	General Soils
DxD	4.214024	0.006584	General Soils
ErD	57.187938	0.089356	General Soils
HbD	26.593906	0.041553	General Soils
HbF	3.301748	0.005159	General Soils
HdB	15.644796	0.024445	General Soils
RbF	390.565979	0.610259	General Soils
RcD	89.786796	0.140292	General Soils
WhD	9.419133	0.014717	General Soils

SubShedSoilsClearfield.ACREAGE Sum

810.027868

SubShedSoilsClearfield.SQ_MI Sum

1.265669

HYDRIC SOILS			
At	4.380211	0.006844	Hydric Soils
BrB	20.830028	0.032547	Hydric Soils

ErB	22.993108	0.035927	Hydric Soils
ErC	120.695158	0.188586	Hydric Soils
ExD	48.551417	0.075862	Hydric Soils
WhC	39.880388	0.062313	Hydric Soils

SubShedSoilsClearfield.ACREAGE Sum

257.330309

SubShedSoilsClearfield.SQ_MI Sum

0.402079

PRIME FARMLAND SOILS

GlB	31.144462	0.048663	Prime Farmland Soils
Ph	13.884817	0.021695	Prime Farmland Soils
RaB	33.843226	0.05288	Prime Farmland Soils
WhB	67.286717	0.105135	Prime Farmland Soils

SubShedSoilsClearfield.ACREAGE Sum

146.159222

SubShedSoilsClearfield.SQ_MI Sum

0.228374

STATEWIDE IMPORTANT SOILS

BeB	5.332806	0.008333	Statewide Important Soils
GlC	21.27894	0.033248	Statewide Important Soils
RaC	36.471617	0.056987	Statewide Important Soils

SubShedSoilsClearfield.ACREAGE Sum

63.083363

SubShedSoilsClearfield.SQ_MI Sum

0.098568

WATER

W	1.486551	0.002323	Water

SubShedSoilsClearfield.ACREAGE Sum

1.486551

SubShedSoilsClearfield.SQ_MI Sum

0.002323

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Water	0.442058	0.000691
Hay Pasture	32.370731	0.050579
Row Crops	70.741112	0.110533
Coniferous Forest	94.491207	0.147643
Mixed Forest	8.023894	0.012537
Deciduous Forest	1035.79982	1.618437

Quarries	10.830414	0.016923
Coal Mines	0.221028	0.000345
Transitional	24.166583	0.03776

Acreage Sum

1277.086846

SQ_MI Sum

1.995448

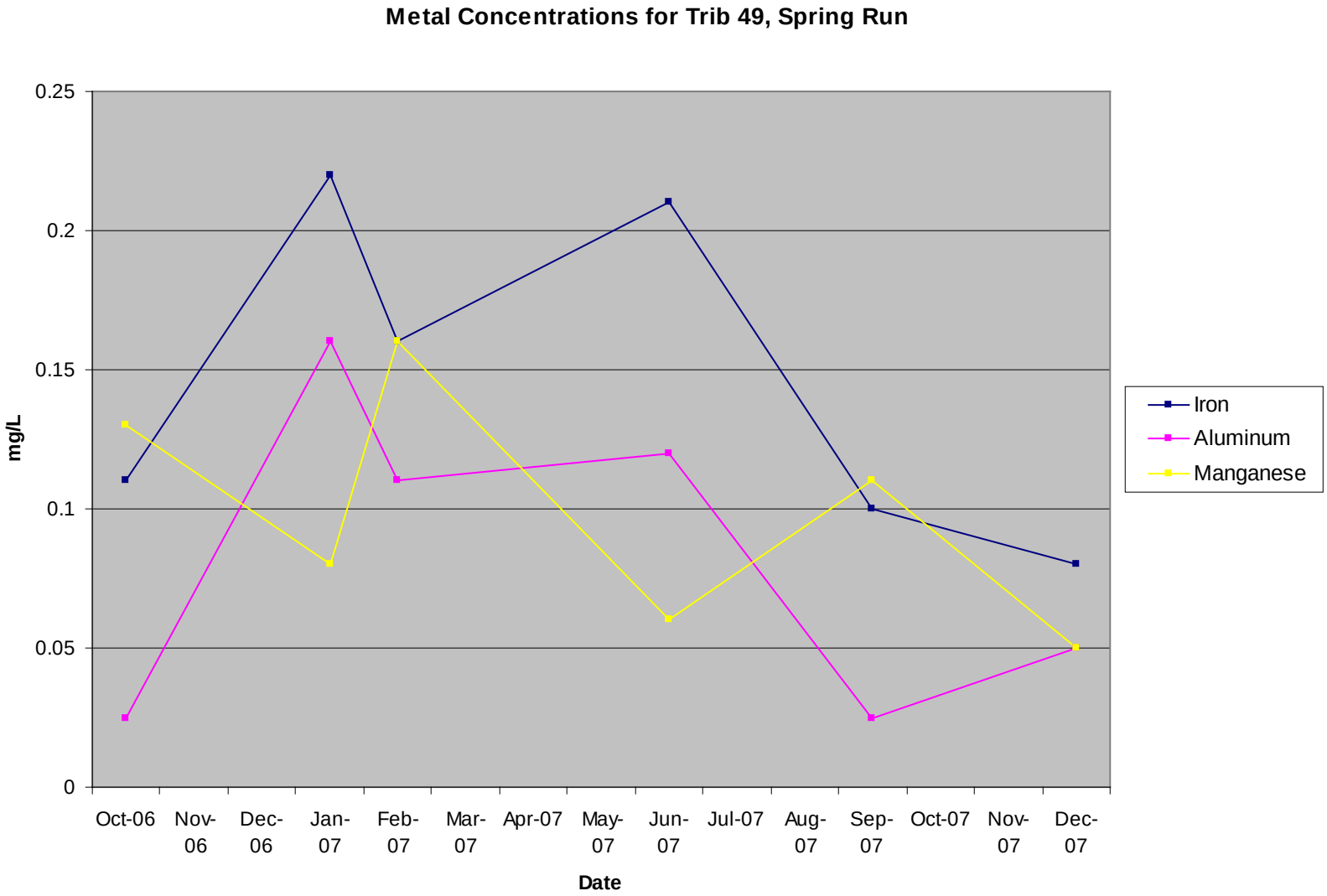
G. Pollution Sources: None

H. Additional Notes: Rosebud Mining Company is currently in the process of opening a deep mine in this watershed. Continued monitoring of this tributary is essential to see if the deep mine will have any impact on the receiving stream.

Tributary Number 49, Spring Run

Clearfield County; Burnside Township, Chest Township

CCWA Monitoring Point: Trib Number 49, Spring Run																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
10/10/2006	CCWA	72.89	7.3	244	52	-35	47	0.11	0.025	0.13	61	3.1	150	-30.71	41.24	0.10	0.02	0.11	53.53
1/11/2007	CCWA	1679.29	6.7	99	18	4	14	0.22	0.16	0.08	32	3.1	67	80.86	283.02	4.45	3.23	1.62	646.91
2/23/2007	CCWA	535.58	6.9	149	14	1	14	0.16	0.11	0.16	40	2.5	76	6.45	90.27	1.03	0.71	1.03	257.90
6/8/2007	CCWA	166.29	7.4	195	79	-14	28	0.21	0.12	0.06	57	2.5	109	-28.03	56.05	0.42	0.24	0.12	114.11
9/19/2007	CCWA	43.81	7.5	280	70	-44	58	0.1	0.025	0.11	69	2.5	187	-23.21	30.59	0.05	0.01	0.06	36.39
12/20/2007	CCWA	715.61	6.6	127	32	2	14	0.08	0.05	0.05	32	2.5	73	17.23	120.61	0.69	0.43	0.43	275.67
Number of sample Dates	Count	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	Max	1679.29	7.5	280	79	4	58	0.22	0.16	0.16	69	3.1	187	80.86	283.02	4.45	3.23	1.62	646.91
	Min	43.81	6.6	99	14	-44	14	0.08	0.025	0.05	32	2.5	67	-30.71	30.59	0.05	0.01	0.06	36.39
6	Average	535.58	7.07	182.33	44.17	-14.33	29.17	0.15	0.08	0.10	48.50	2.70	110.33	3.77	103.63	1.12	0.77	0.56	230.75


Metal Concentrations for Trib 49, Spring Run
0.25
0.2
0.15
0.1
0.05
0
mg/L
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Dec-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-50	Subwatershed Boundry Outline (topography)
B-IN-50	Subwatershed Industrial Influences
B-SO-50	Subwatershed Soils
B-AP-50	Subwatershed Aerial Photography
B-SG-50	Subwatershed Surface Geology

Chest Creek Watershed Assessment and Restoration Plan

Tributary 50, North Camp Run **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Chest Township, Clearfield County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PFO1A- Palustrine, forested, broad-leaved deciduous, temporary
PUBHx- Palustrine, unconsolidated bottom, permanent, excavated
PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded
PEM1A- Palustrine, emergent, persistent, temporary
PUBF- Palustrine, unconsolidated bottom, semiperminent
PUBHx- Palustrine, unconsolidated bottom, permanent, excavated

II. Quadrangle: Westover, PA (Wetlands Online Mapper used)

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcc	Casselman Formation	61.936408	0.096776
Pcg	Glenshaw Formation	1572.988903	2.457795
Pa	Allegheny Formation	958.625349	1.497852

ACREAGE Sum

2593.55066

SQ_MI Sum

4.052423

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
95D	665.705688	1.040165	General Soils
ErD	16.995477	0.026555	General Soils
RbF	595.900264	0.931094	General Soils
RcD	241.702122	0.37766	General Soils
WhD	18.72982	0.029265	General Soils

SubShedSoilsClearfield.ACREAGE Sum

1539.03337

SubShedSoilsClearfield.SQ_MI Sum

2.40474

HYDRIC SOILS			
92D	194.141182	0.303346	Hydric Soils
At	44.597652	0.069684	Hydric Soils
BrB	26.470563	0.04136	Hydric Soils

ErB	53.353284	0.083365	Hydric Soils
ErC	185.165316	0.289321	Hydric Soils
WhC	78.058831	0.121967	Hydric Soils

SubShedSoilsClearfield.ACREAGE Sum

581.786829

SubShedSoilsClearfield.SQ_MI Sum

0.909042

PRIME FARMLAND SOILS

GlB	69.997841	0.109372	Prime Farmland Soils
RaB	19.669492	0.030734	Prime Farmland Soils
WhB	36.963469	0.057755	Prime Farmland Soils

SubShedSoilsClearfield.ACREAGE Sum

126.630801

SubShedSoilsClearfield.SQ_MI Sum

0.197861

STATEWIDE IMPORTANT SOILS

BeB	26.844441	0.041944	Statewide Important Soils
BeC	46.128516	0.072076	Statewide Important Soils
DeB	7.520865	0.011751	Statewide Important Soils
GlC	253.11996	0.3955	Statewide Important Soils
HcC	7.177358	0.011215	Statewide Important Soils
RaC	5.283967	0.008256	Statewide Important Soils

SubShedSoilsClearfield.ACREAGE Sum

346.075108

SubShedSoilsClearfield.SQ_MI Sum

0.540742

WATER

W	0.024544	0.000038	Water

SubShedSoilsClearfield.ACREAGE Sum

0.024544

SubShedSoilsClearfield.SQ_MI Sum

0.000038

E. Mining:

I. Mining Permits in Drainage Basin:

17050104, # 17830117, # 17010102, # 17990110, # 17030112

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	**Acreage**	**SQ_MI**
Water	1.326174	0.002072
Low Density Urban	5.343999	0.00835
Hay Pasture	105.306803	0.164542
Row Crops	187.229556	0.292546

Coniferous Forest	191.638769	0.299436
Mixed Forest	55.520283	0.08675
Deciduous Forest	1660.588454	2.594669
Quarries	246.879254	0.385749
Coal Mines	6.851895	0.010706
Transitional	126.917931	0.198309

Acreage Sum

2587.603118

SQ_MI Sum

4.04313

G. Pollution Sources: Discharges 50-1R, 50-2R, 50-3R, and 50-4R occur in this watershed.

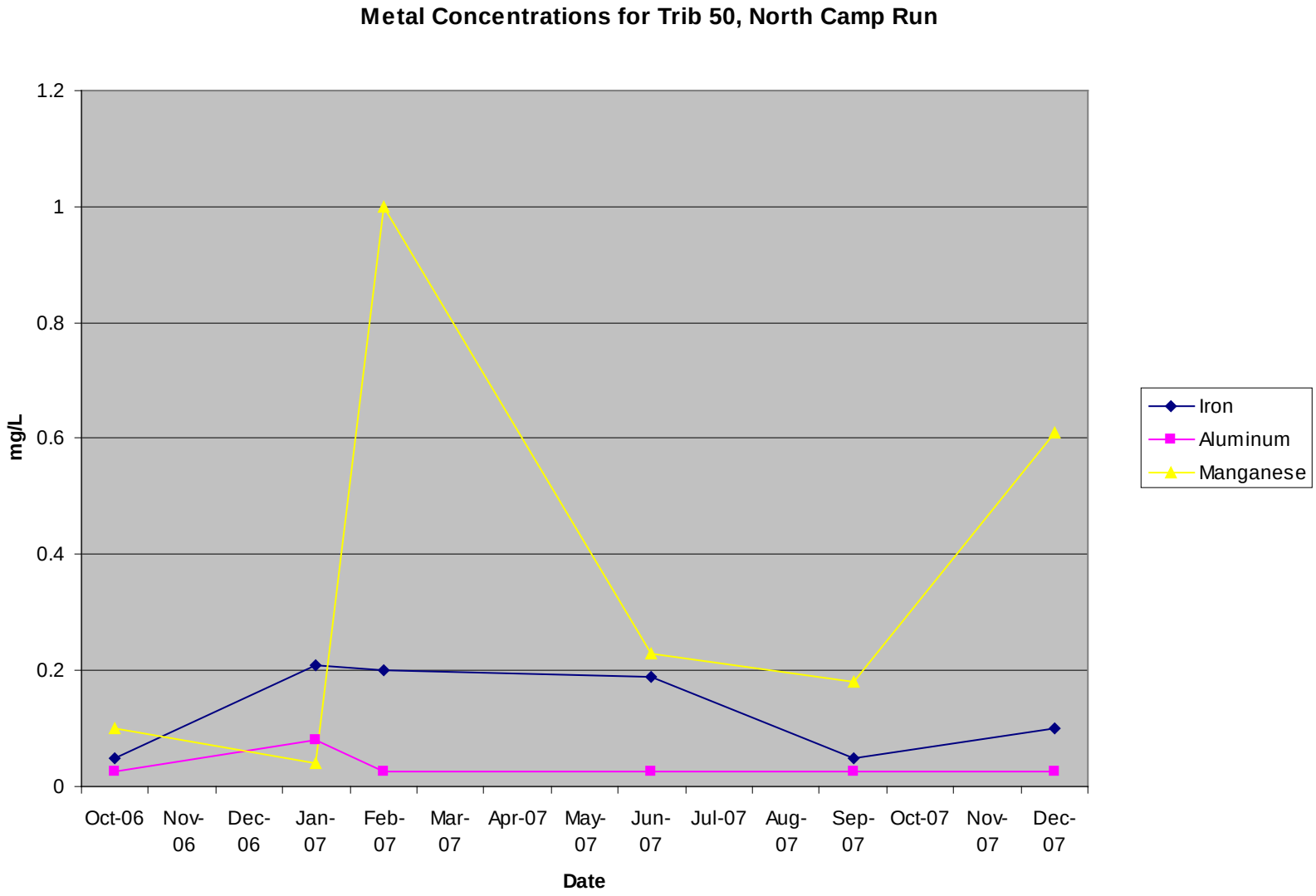
H. Additional Notes: This tributary and two of its discharges are recommended for remediation.

A TMDL study was done on this watershed in 2005. More information on this TMDL study can be found on the EPA website under the Pennsylvania TMDL (Mid-Atlantic Water). http://www.epa.gov/reg3wapd/tmdl/pa_tmdl/index.htm

Tributary Number 50, North Camp Run

Clearfield County; Chest Township

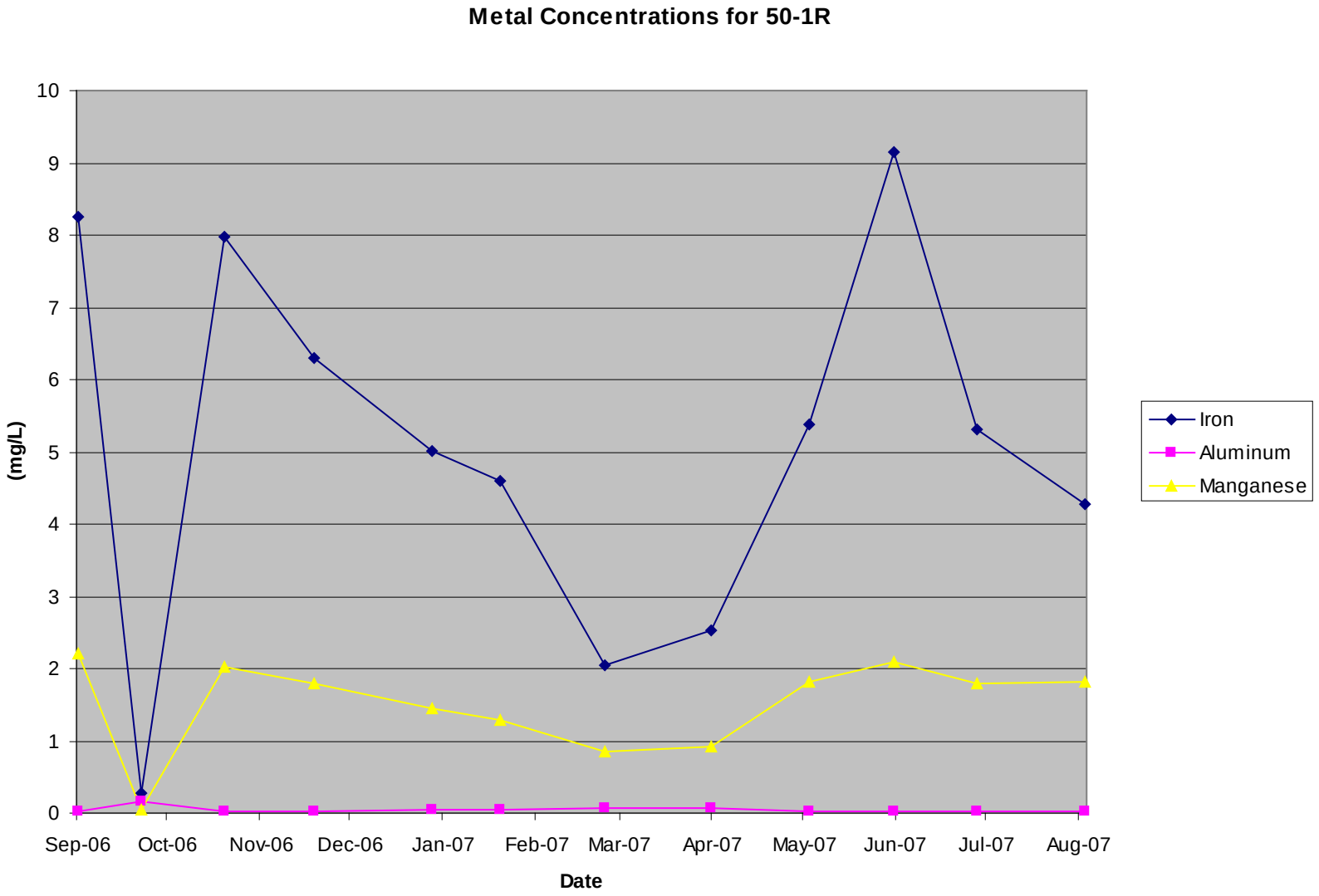
CCWA Monitoring Point: Trib Number 50, North Camp Run																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
10/6/2006	CCWA	593.08	7.8	1000	53	-56	68	0.05	0.025	0.1	451	3.1	784	-399.83	485.50	0.36	0.18	0.71	3220.02
1/10/2007	CCWA	3678.96	7.5	396	30	-28	40	0.21	0.08	0.04	147	3.1	266	-1240.09	1771.55	9.30	3.54	1.77	6510.45
2/23/2007	CCWA	1425.53	7.6	862	15	-41	53	0.2	0.025	1	346	2.5	572	-703.61	909.54	3.43	0.43	17.16	5937.74
6/11/2007	CCWA	1002.73	7.8	991	65	-50	60	0.19	0.025	0.23	438	2.5	717	-603.56	724.28	2.29	0.30	2.78	5287.21
9/19/2007	CCWA	454.62	7.6	1160	68	-46	64	0.05	0.025	0.18	558	2.5	1045	-251.75	350.27	0.27	0.14	0.99	3053.88
12/20/2007	CCWA	1398.24	7.1	631	32	-34	51	0.1	0.025	0.61	265	2.5	442	-572.31	858.46	1.68	0.42	10.27	4460.63
Number of sample Dates	Count	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	Max	3678.96	7.8	1160	68	-28	68	0.21	0.08	1	558	3.1	1045	-251.75	1771.55	9.30	3.54	17.16	6510.45
	Min	454.62	7.1	396	15	-56	40	0.05	0.025	0.04	147	2.5	266	-1240.09	350.27	0.27	0.14	0.71	3053.88
6	Average	1425.53	7.57	840.00	43.83	-42.50	56.00	0.13	0.03	0.36	367.50	2.70	637.67	-628.52	849.93	2.89	0.84	5.61	4744.99


Metal Concentrations for Trib 50, North Camp Run
1.2
1
0.8
0.6
0.4
0.2
0
mg/L
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Dec-07
Date
Iron
Aluminum
Manganese

Discharge Number: 50-1R, Northcamp #1

Clearfield County; Chest Township

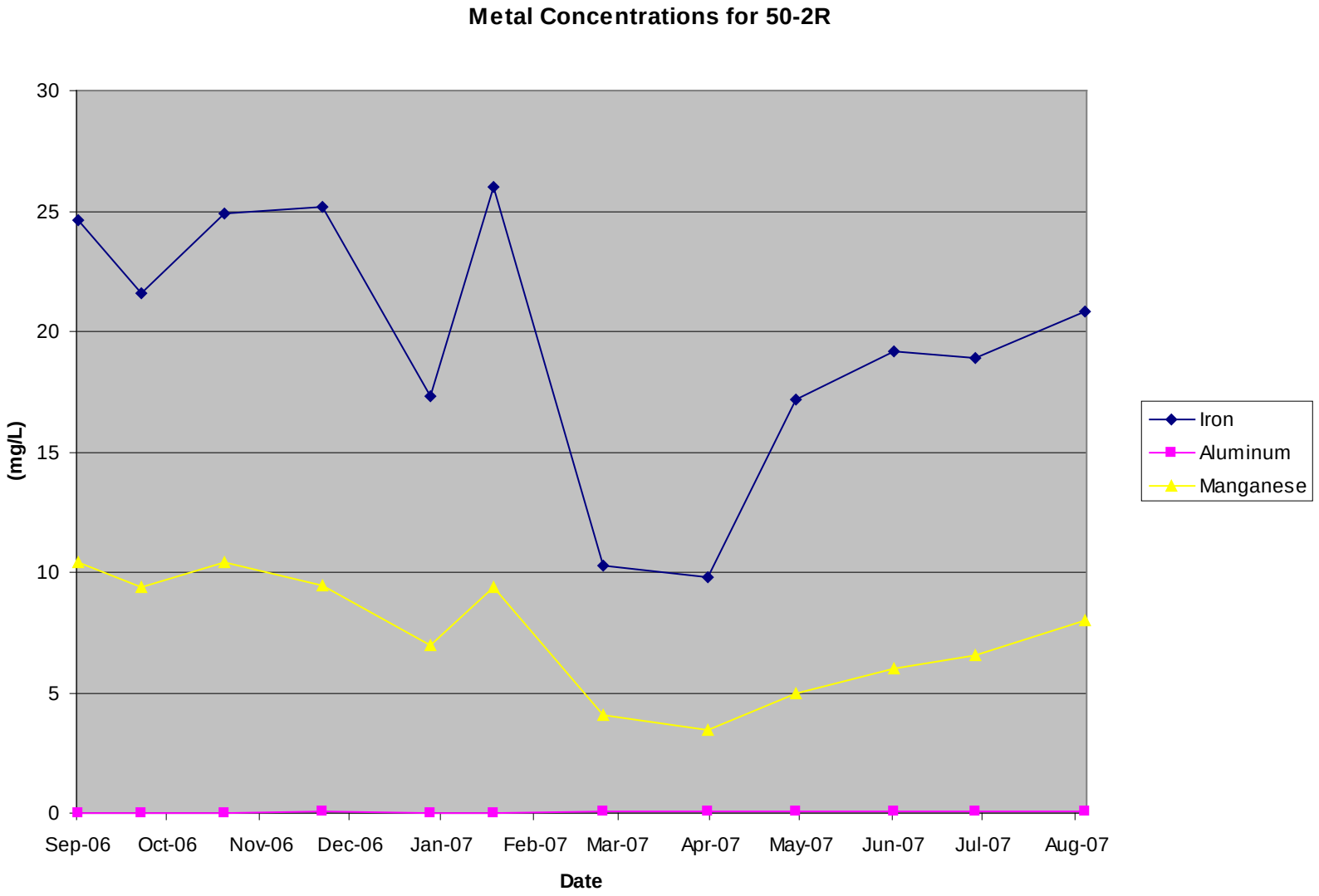
CCWA Monitoring Point: Discharge Number: 50-1R, Northcamp #1														Loading					
Sample		Flow (Bucket)	Lab pH	Lab Conductivity	Air Temp	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/27/2006	CCWA	10.42	7.4	940	62	-120	138	8.25	0.025	2.21	378	15.7	700	-15.05	17.31	1.03	0.00	0.28	47.42
10/18/2006	CCWA	19.15	6.7	132	52	-12	26	0.27	0.16	0.05	25	8.6	77	-2.77	5.99	0.06	0.04	0.01	5.76
11/15/2006	CCWA	12.9	6.6	902	52	-96	119	7.97	0.025	2.03	332	11.4	662	-14.91	18.48	1.24	0.00	0.32	51.56
12/15/2006	CCWA	11.92	7	831	46	-92	110	6.3	0.025	1.79	319	3.1	581	-13.20	15.78	0.90	0.00	0.26	45.78
1/23/2007	CCWA	19.21	6.9	704	20	-76	89	5.02	0.05	1.44	272	10	450	-17.58	20.58	1.16	0.01	0.33	62.90
2/15/2007	CCWA	18.51	6.9	789	8	-81	96	4.59	0.05	1.29	291	10	549	-18.05	21.39	1.02	0.01	0.29	64.84
3/22/2007	CCWA	21.01	6.9	568	43	-49	65	2.04	0.08	0.86	199	7	366	-12.39	16.44	0.52	0.02	0.22	50.33
4/26/2007	CCWA	20.04	6.9	603	44	-56	72	2.53	0.08	0.93	220	2.5	390	-13.51	17.37	0.61	0.02	0.22	53.07
5/29/2007	CCWA	11.08	6.9	997	62	-110	128	5.39	0.025	1.82	360	14	723	-14.67	17.07	0.72	0.00	0.24	48.02
6/26/2007	CCWA	8.44	7	1020	78	-106	127	9.16	0.025	2.1	400	2.5	578	-10.77	12.90	0.93	0.00	0.21	40.64
7/24/2007	CCWA	7.95	7	1090	--	-100	123	5.31	0.025	1.8	393	11	740	-9.57	11.77	0.51	0.00	0.17	37.61
8/29/2007	CCWA	8.39	7	1000	75	-104	124	4.28	0.025	1.81	375	5	716	-10.50	12.52	0.43	0.00	0.18	37.88
Number of sample Dates	Count	12	12	12	11	12	12	12	12	12	12	12	12	12	12	12	12	12	12
	Max	21.01	7.4	1090	78	-12	138	9.16	0.16	2.21	400	15.7	740	-2.77	21.39	1.24	0.04	0.33	64.84
	Min	7.95	6.6	132	8	-120	26	0.27	0.025	0.05	25	2.5	77	-18.05	5.99	0.06	0.00	0.01	5.76
12	Average	14.09	6.93	798.00	49.27	-83.50	101.42	5.09	0.05	1.51	297.00	8.40	544.33	-12.75	15.64	0.76	0.01	0.23	45.48


Metal Concentrations for 50-1R
(mg/L)
10
9
8
7
6
5
4
3
2
1
0
Sep-06
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Date
Iron
Aluminum
Manganese

Discharge Number: 50-2R, Northcamp #2

Clearfield County; Chest Township

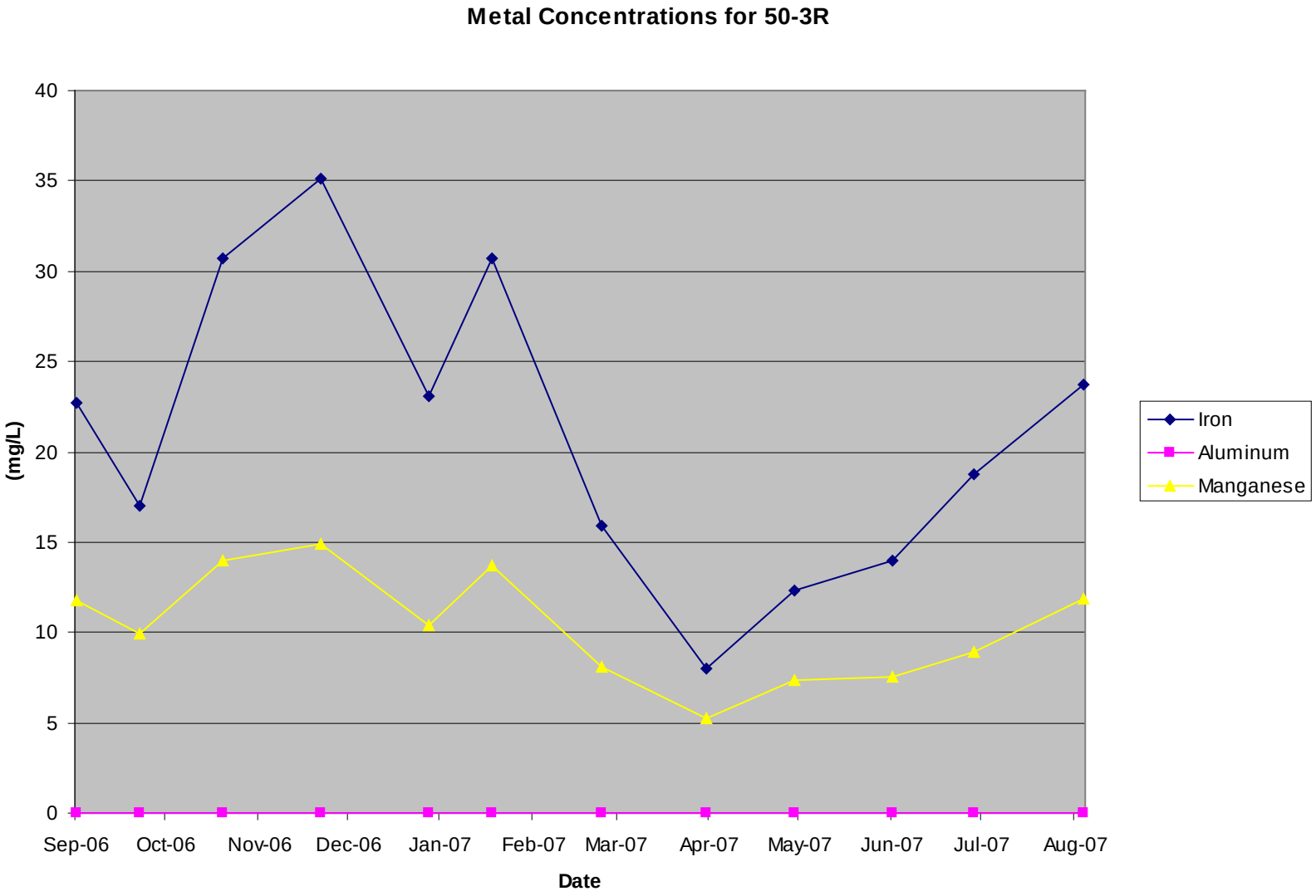
CCWA Monitoring Point: Discharge Number: 50-2R, Northcamp #2														Loading					
Sample		Flow (Rect.)	Lab pH	Lab Conductivity	Air Temp	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/27/2006	CCWA	14.34	6.6	1620	62	-30	78	24.6	0.025	10.4	892	3.1	1359	-5.18	13.47	4.25	0.00	1.80	153.99
10/18/2006	CCWA	15.7	6.3	1620	52	-26	84	21.6	0.025	9.36	889	14.3	1371	-4.91	15.88	4.08	0.00	1.77	168.02
11/15/2006	CCWA	14.34	6.3	1690	52	-27	81	24.9	0.025	10.4	903	12.9	1379	-4.66	13.98	4.30	0.00	1.80	155.89
12/18/2006	CCWA	18.54	6.4	1630	53	-20	79	25.2	0.05	9.44	861	12.9	1333	-4.46	17.63	5.62	0.01	2.11	192.17
1/23/2007	CCWA	40.38	6.4	1480	22	-33	70	17.3	0.025	6.94	747	16	1186	-16.04	34.03	8.41	0.01	3.37	363.12
2/13/2007	CCWA	20.01	6.4	1480	22	-27	78	26	0.025	9.37	758	19	1237	-6.50	18.79	6.26	0.01	2.26	182.59
3/22/2007	CCWA	40.38	6.5	1310	45	-32	63	10.3	0.05	4.04	660	2.5	1047	-15.56	30.62	5.01	0.02	1.96	320.83
4/26/2007	CCWA	48.13	6.6	1190	43	-40	66	9.82	0.05	3.42	550	6	906	-23.18	38.24	5.69	0.03	1.98	318.67
5/25/2007	CCWA	26.28	6.4	1340	72	-35	70	17.2	0.06	4.99	598	6	1048	-11.07	22.15	5.44	0.02	1.58	189.19
6/27/2007	CCWA	26.28	6.3	1390	78	-27	70	19.2	0.07	5.98	714	9	1147	-8.54	22.15	6.07	0.02	1.89	225.89
7/24/2007	CCWA	14.34	6.4	1480	65	-29	82	18.9	0.06	6.57	786	7	1220	-5.01	14.16	3.26	0.01	1.13	135.69
8/30/2007	CCWA	14.34	6.4	1500	78	-33	85	20.8	0.05	8.01	821	2.5	1279	-5.70	14.67	3.59	0.01	1.38	141.73
Number of sample Dates	Count	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
	Max	48.13	6.6	1690	78	-20	85	26	0.07	10.4	903	19	1379	-4.46	38.24	8.41	0.03	3.37	363.12
	Min	14.34	6.3	1190	22	-40	63	9.82	0.025	3.42	550	2.5	906	-23.18	13.47	3.26	0.00	1.13	135.69
12	Average	24.42	6.42	1477.50	53.67	-29.92	75.50	19.65	0.04	7.41	764.92	9.27	1209.33	-9.23	21.31	5.17	0.01	1.92	212.32


Metal Concentrations for 50-2R
30
25
20
15
10
5
0
(mg/L)
Sep-06
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Date
Iron
Aluminum
Manganese

Discharge Number: 50-3R, Northcamp #3

Clearfield County; Chest Township

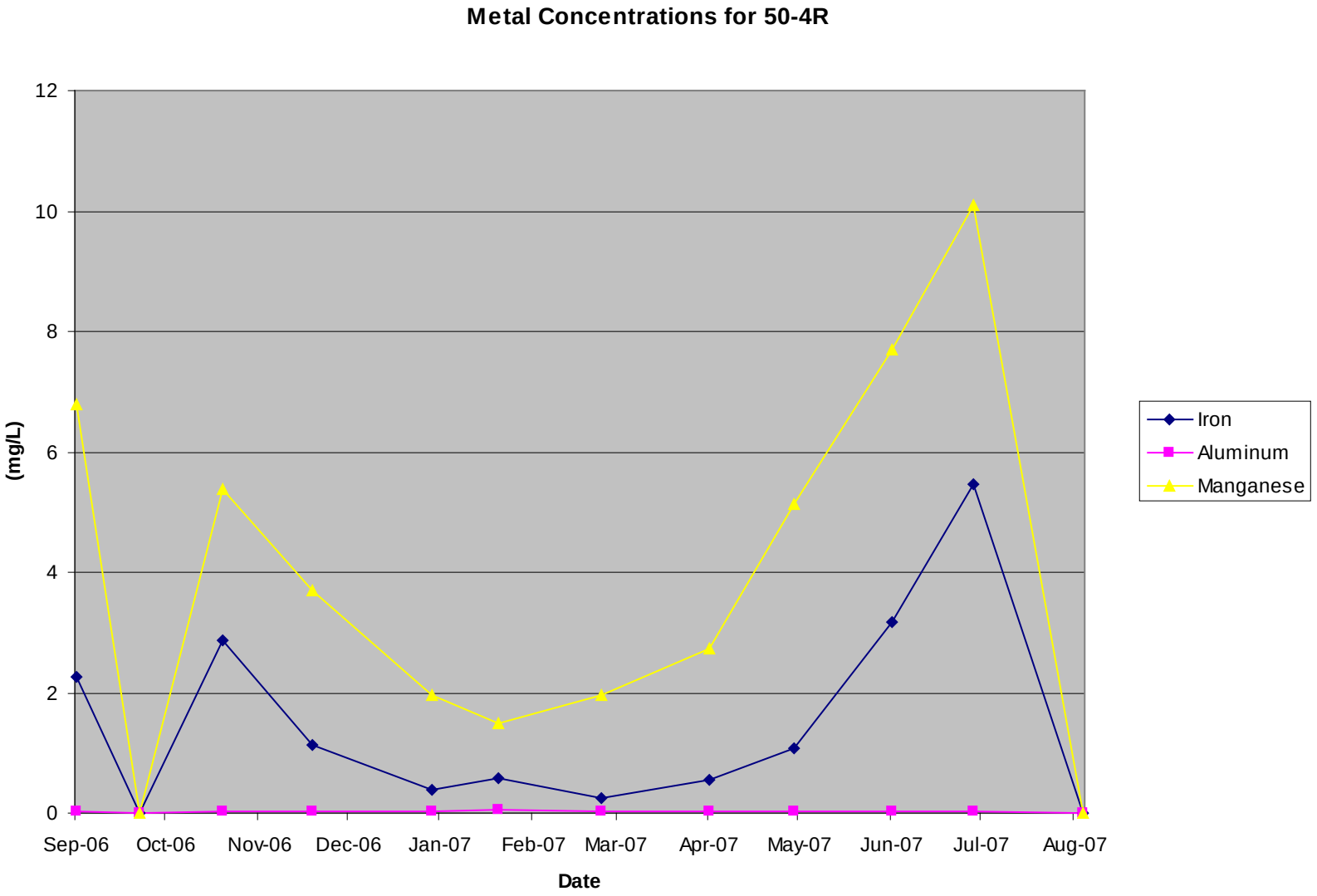
CCWA Monitoring Point: Discharge Number 50-3R, Northcamp #3														Loading					
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.						
		(V-Notch)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/27/2006	CCWA	2.25	6.4	1800	66	-48	106	22.7	0.025	11.8	994	3.1	1570	-1.30	2.87	0.61	0.00	0.32	26.92
10/18/2006	CCWA	1.1	6.2	1550	52	-41	97	17	0.025	9.95	803	11.4	1267	-0.54	1.28	0.23	0.00	0.13	10.63
11/15/2006	CCWA	12.72	6	1890	52	-24	105	30.7	0.025	14	1016	3.1	1546	-3.68	16.08	4.70	0.00	2.14	155.58
12/18/2006	CCWA	28.21	6.1	1790	53	-22	99	35.1	0.025	14.9	950	3.1	1464	-7.47	33.62	11.92	0.01	5.06	322.62
1/23/2007	CCWA	83.76	6	1600	20	-43	107	23.1	0.025	10.4	811	6	1331	-43.36	107.89	23.29	0.03	10.49	817.76
2/13/2007	CCWA	51.55	6	1480	21	-33	101	30.7	0.025	13.7	798	11	1331	-20.48	62.68	19.05	0.02	8.50	495.22
3/22/2007	CCWA	125.74	6.1	1430	47	-55	102	15.9	0.025	8.11	663	5	1139	-83.25	154.40	24.07	0.04	12.28	1003.59
4/26/2007	CCWA	110.6	6.2	1230	43	-74	102	8.04	0.025	5.22	512	2.5	927	-98.53	135.81	10.70	0.03	6.95	681.70
5/25/2007	CCWA	69.2	6	1390	74	-74	108	12.3	0.025	7.37	579	2.5	1390	-61.65	89.97	10.25	0.02	6.14	482.34
6/27/2007	CCWA	42.83	6	1460	84	-56	97	14	0.025	7.55	728	2.5	1167	-28.87	50.01	7.22	0.01	3.89	375.36
7/24/2007	CCWA	25.11	6	1490	66	-47	103	18.8	0.025	8.96	823	6	1327	-14.21	31.14	5.68	0.01	2.71	248.78
8/30/2007	CCWA	17.08	6.1	1640	82	-51	112	23.7	0.025	11.9	877	2.5	1393	-10.49	23.03	4.87	0.01	2.45	180.33
Number of sample Dates	Count	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
	Max	125.74	6.4	1890	84	-22	112	35.1	0.025	14.9	1016	11.4	1570	-0.54	154.40	24.07	0.04	12.28	1003.59
	Min	1.1	6	1230	20	-74	97	8.04	0.025	5.22	512	2.5	927	-98.53	1.28	0.23	0.00	0.13	10.63
12	Average	47.51	6.09	1562.50	55.00	-47.33	103.25	21.00	0.03	10.32	796.17	4.89	1321.00	-31.15	59.06	10.22	0.01	5.09	400.07


Metal Concentrations for 50-3R
40
35
30
25
20
15
10
5
0
(mg/L)
Sep-06
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Date
Iron
Aluminum
Manganese

Discharge Number 50-4R, Northcamp #4

Clearfield County; Chest Township

CCWA Monitoring Point: Discharge Number 50-4R, Northcamp #4																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(V-Notch)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/27/2006	CCWA	1.1	6.9	1570	66	-186	210	2.25	0.025	6.78	737	3.1	1270	-2.46	2.78	0.03	0.00	0.09	9.76
10/18/2006	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11/15/2006	CCWA	6.2	6.7	1580	52	-171	209	2.86	0.025	5.38	714	3.1	1223	-12.76	15.60	0.21	0.00	0.40	53.29
12/15/2006	CCWA	17.08	6.8	1620	46	-197	216	1.13	0.025	3.71	770	3.1	1311	-40.51	44.41	0.23	0.01	0.76	158.32
1/24/2007	CCWA	77.73	6.7	1570	24	-194	211	0.38	0.025	1.95	656	2.5	1197	-181.53	197.44	0.36	0.02	1.82	613.85
2/15/2007	CCWA	17.08	6.6	1630	8	-180	196	0.59	0.05	1.5	786	9	1365	-37.01	40.30	0.12	0.01	0.31	161.61
3/22/2007	CCWA	159.57	6.7	1470	47	-180	195	0.26	0.025	1.95	648	2.5	1185	-345.77	374.59	0.50	0.05	3.75	1244.79
4/27/2007	CCWA	83.76	6.6	1400	52	-168	182	0.55	0.025	2.73	657	2.5	1216	-169.40	183.52	0.55	0.03	2.75	662.48
5/25/2007	CCWA	35.06	6.6	1860	75	-156	174	1.08	0.025	5.13	810	5	1481	-65.84	73.44	0.46	0.01	2.17	341.87
6/27/2007	CCWA	6.2	6.5	1890	86	-153	179	3.16	0.025	7.71	979	2.5	1671	-11.42	13.36	0.24	0.00	0.58	73.07
7/24/2007	CCWA	4.99	6.4	1850	63	-139	176	5.46	0.025	10.1	965	2.5	1603	-8.35	10.57	0.33	0.00	0.61	57.97
8/30/2007	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Number of sample Dates	Count	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Max	159.57	6.9	1890	86	-139	216	5.46	0.05	10.1	979	9	1671	-2.46	374.59	0.55	0.05	3.75	1244.79
	Min	1.1	6.4	1400	8	-197	174	0.26	0.025	1.5	648	2.5	1185	-345.77	2.78	0.03	0.00	0.09	9.76
12	Average	40.88	6.65	1644.00	51.90	-172.40	194.80	1.77	0.03	4.69	772.20	3.58	1352.20	-87.51	95.60	0.30	0.01	1.32	337.70


Metal Concentrations for 50-4R
12
10
8
6
4
2
0
(mg/L)
Sep-06
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-51	Subwatershed Boundry Outline (topography)
B-IN-51	Subwatershed Industrial Influences
B-SO-51	Subwatershed Soils
B-AP-51	Subwatershed Aerial Photography
B-SG-51	Subwatershed Surface Geology

Tributary 51, Snyder Run **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Burnside Township; Chest Township, Clearfield County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded
PFO1A- Palustrine, forested, broad-leaved deciduous, temporary
PSS1A- Palustrine, scrub/ shrub, broad-leaved deciduous, temporary
PEM1A- Palustrine, emergent, persistent, temporary

II. Quadrangle: Westover, PA (Wetlands Online Mapper used)

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcg	Glenshaw Formation	997.159995	1.558062
Pa	Allegheny Formation	422.98978	0.660922

ACREAGE Sum
1420.149775
SQ_MI Sum
2.218984

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
95D	8.693295	0.013583	General Soils
BeD	1.500349	0.002344	General Soils
DxD	2.044155	0.003194	General Soils
ErD	61.809001	0.096577	General Soils
HbD	6.55168	0.010237	General Soils
HbF	1.785772	0.00279	General Soils
HdB	4.273451	0.006677	General Soils
RbF	393.546756	0.614917	General Soils
RcD	176.50157	0.275784	General Soils
WhD	12.047846	0.018825	General Soils

SubShedSoilsClearfield.ACREAGE Sum
668.753874
SubShedSoilsClearfield.SQ_MI Sum
1.044928

HYDRIC SOILS			
94B	14.967234	0.023386	Hydric Soils

At	23.414533	0.036585	Hydric Soils
BrB	22.716639	0.035495	Hydric Soils
CaC	3.679086	0.005749	Hydric Soils
ErB	46.081978	0.072003	Hydric Soils
ErC	179.819891	0.280969	Hydric Soils
ExD	30.453917	0.047584	Hydric Soils
WhC	58.03654	0.090682	Hydric Soils

SubShedSoilsClearfield.ACREAGE Sum

379.169816

SubShedSoilsClearfield.SQ_MI Sum

0.592453

PRIME FARMLAND SOILS

GlB	77.985245	0.121852	Prime Farmland Soils
Ph	7.943943	0.012412	Prime Farmland Soils
RaB	38.900962	0.060783	Prime Farmland Soils
WhB	33.410467	0.052204	Prime Farmland Soils

SubShedSoilsClearfield.ACREAGE Sum

158.240617

SubShedSoilsClearfield.SQ_MI Sum

0.247251

STATEWIDE IMPORTANT SOILS

BeB	3.23839	0.00506	Statewide Important Soils
GlC	180.919057	0.282686	Statewide Important Soils
RaC	28.560209	0.044625	Statewide Important Soils

SubShedSoilsClearfield.ACREAGE Sum

212.717656

SubShedSoilsClearfield.SQ_MI Sum

0.332371

WATER

W	1.267814	0.001981	Water

SubShedSoilsClearfield.ACREAGE Sum

1.267814

SubShedSoilsClearfield.SQ_MI Sum

0.001981

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Low Density Urban	32.62425	0.050975
Hay Pasture	102.440226	0.160063
Row Crops	183.611889	0.286894

Coniferous Forest	75.194744	0.117492
Mixed Forest	9.046675	0.014135
Deciduous Forest	953.249516	1.489452
Quarries	13.303572	0.020787
Transitional	48.902361	0.07641

Acreage Sum

1418.373234

SQ_MI Sum

2.216208

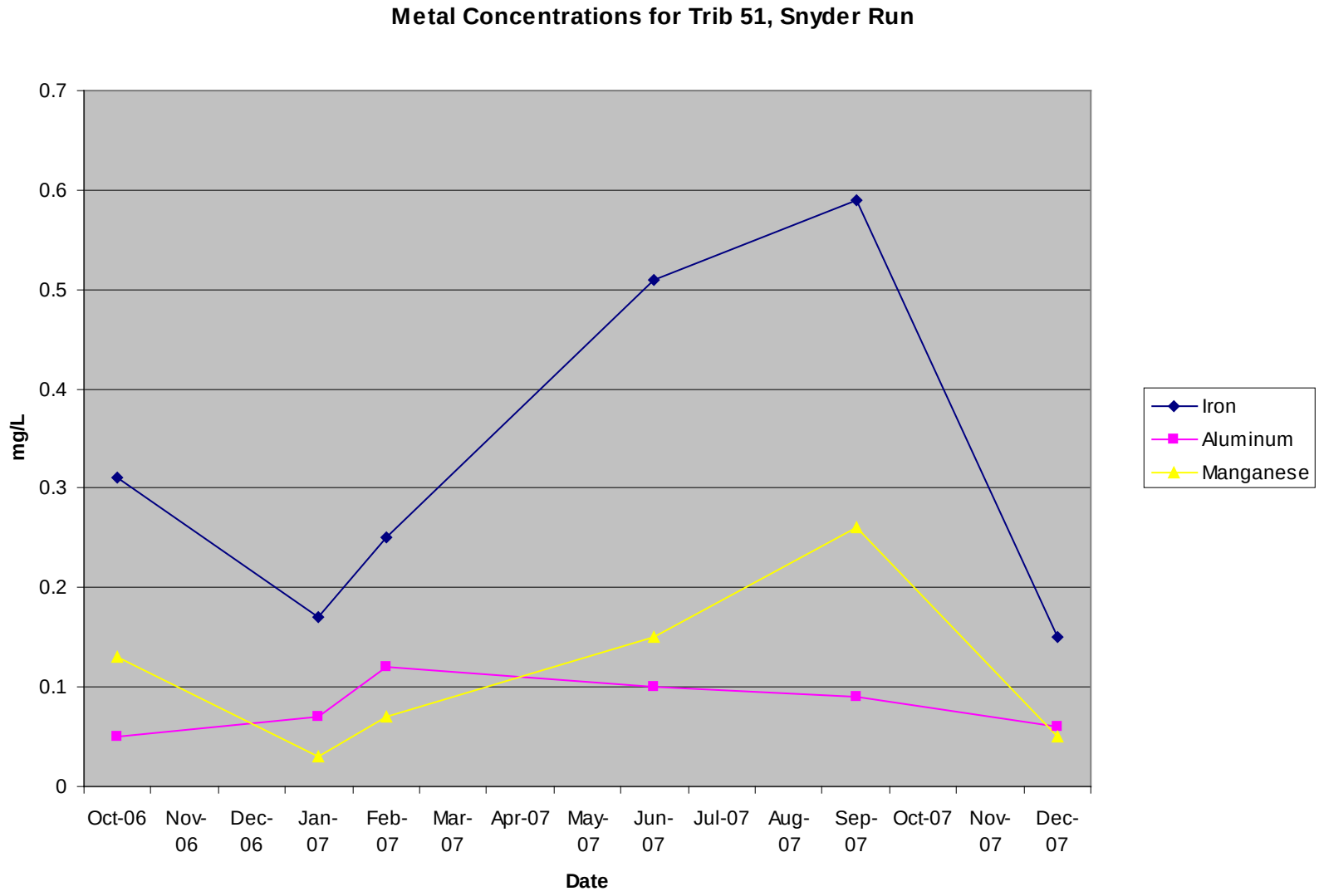
G. Pollution Sources: None

H. Additional Notes: None

Tributary Number 51, Snyder Run

Clearfield County; Burnside Township, Chest Township

CCWA Monitoring Point: Trib Number 51, Snyder Run																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
10/10/2006	CCWA	84.02	7.1	172	65	-26	38	0.31	0.05	0.13	17	3.1	101	-26.30	38.44	0.31	0.05	0.13	17.19
1/11/2007	CCWA	2345.85	6.7	86	18	0	14	0.17	0.07	0.03	17	3.1	59	0.00	395.36	4.80	1.98	0.85	480.08
2/27/2007	CCWA	703.19	6.9	141	36	-3	15	0.25	0.12	0.07	18	2.5	78	-25.40	126.98	2.12	1.02	0.59	152.38
6/11/2007	CCWA	124.42	7.1	152	72	-14	29	0.51	0.1	0.15	18	2.5	76	-20.97	43.44	0.76	0.15	0.22	26.96
9/20/2007	CCWA	53.5	7.3	192	61	-30	41	0.59	0.09	0.26	19	2.5	98	-19.32	26.41	0.38	0.06	0.17	12.24
12/21/2007	CCWA	908.16	6.5	123	34	1	14	0.15	0.06	0.05	18	2.5	70	10.93	153.06	1.64	0.66	0.55	196.79
Number of sample Dates	Count	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	Max	2345.85	7.3	192	72	1	41	0.59	0.12	0.26	19	3.1	101	10.93	395.36	4.80	1.98	0.85	480.08
	Min	53.5	6.5	86	18	-30	14	0.15	0.05	0.03	17	2.5	59	-26.30	26.41	0.31	0.05	0.13	12.24
6	Average	703.19	6.93	144.33	47.67	-12.00	25.17	0.33	0.08	0.12	17.83	2.70	80.33	-13.51	130.61	1.67	0.65	0.42	147.61


Metal Concentrations for Trib 51, Snyder Run
mg/L
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Dec-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-52	Subwatershed Boundry Outline (topography)
B-IN-52	Subwatershed Industrial Influences
B-SO-52	Subwatershed Soils
B-AP-52	Subwatershed Aerial Photography
B-SG-52	Subwatershed Surface Geology

Tributary 52 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Chest Township, Clearfield County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PFO1A- Palustrine, forested, broad-leaved deciduous, temporary
PSS1A- Palustrine, scrub/ shrub, broad-leaved deciduous, temporary
PSS1C- Palustrine, scrub/ shrub, broad-leaved deciduous, seasonal

II. Quadrangle: Westover, PA (Wetlands Online Mapper used)

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcc	Casselman Formation	2.898426	0.004529
Pcg	Glenshaw Formation	350.582252	0.547785
Pa	Allegheny Formation	332.671828	0.5198

ACREAGE Sum

686.152506

SQ_MI Sum

1.072113

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
95D	171.059357	0.26728	General Soils
ErD	3.141995	0.004909	General Soils
RbF	129.293343	0.202021	General Soils
RcD	26.921014	0.042064	General Soils

SubShedSoilsClearfield.ACREAGE Sum

330.415709

SubShedSoilsClearfield.SQ_MI Sum

0.516275

HYDRIC SOILS			
92D	144.943569	0.226474	Hydric Soils
At	3.901355	0.006096	Hydric Soils
BrB	54.223134	0.084724	Hydric Soils
ErB	47.899256	0.074843	Hydric Soils
ErC	29.095788	0.045462	Hydric Soils
TyB	5.509859	0.008609	Hydric Soils
WhC	2.463362	0.003849	Hydric Soils

SubShedSoilsClearfield.ACREAGE Sum

288.036323

SubShedSoilsClearfield.SQ_MI Sum

0.450057

PRIME FARMLAND SOILS

GlB	17.033917	0.026615	Prime Farmland Soils
RaB	11.24675	0.017573	Prime Farmland Soils
WhB	10.90126	0.017033	Prime Farmland Soils

SubShedSoilsClearfield.ACREAGE Sum

39.181927

SubShedSoilsClearfield.SQ_MI Sum

0.061222

STATEWIDE IMPORTANT SOILS

BeC	2.465798	0.003853	Statewide Important Soils
GlC	26.052752	0.040707	Statewide Important Soils

SubShedSoilsClearfield.ACREAGE Sum

28.51855

SubShedSoilsClearfield.SQ_MI Sum

0.04456

E. Mining:

I. Mining Permits in Drainage Basin:

17990110, # 17860146, # 17970109

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Water	1.105145	0.001727
Low Density Urban	11.700856	0.018283
Hay Pasture	45.156177	0.070557
Row Crops	108.344991	0.169289
Coniferous Forest	29.921817	0.046753
Mixed Forest	35.566546	0.055573
Deciduous Forest	362.74072	0.566782
Woody Wetland	0.499563	0.000781
Quarries	36.127435	0.056449
Coal Mines	21.730276	0.033954
Transitional	33.258987	0.051967

Acreage Sum

686.152512

SQ_MI Sum

1.072113

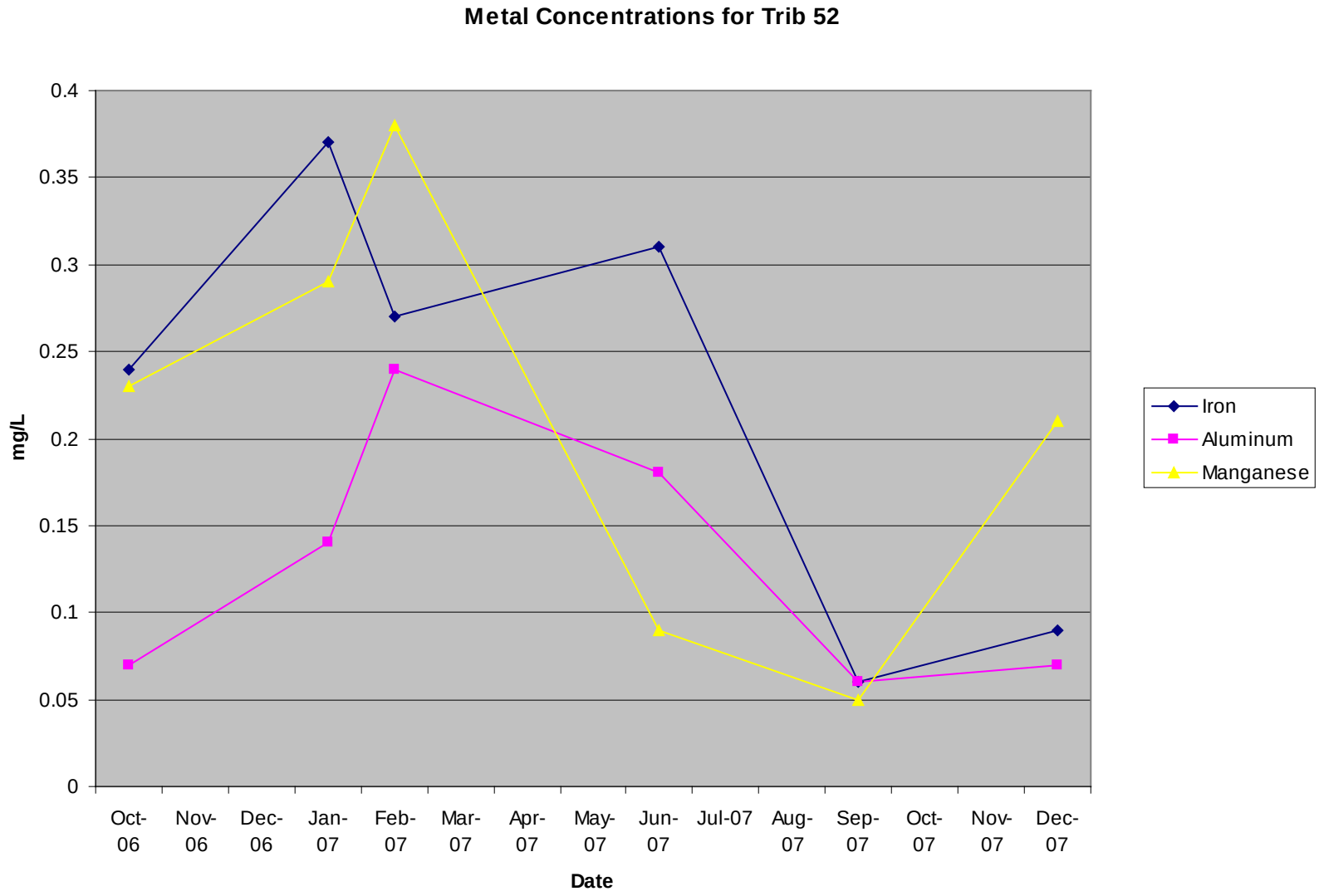
G. Pollution Sources: None

H. Additional Notes: A surface mine operation run by Amfire Mining Company is currently going on in this watershed. Continued monitoring of the tributary shoud occur to compare data.

Tributary Number 52

Clearfield County; Chest Township

CCWA Monitoring Point: Trib Number 52																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
10/10/2006	CCWA	117.68	7.9	1270	60	-116	130	0.24	0.07	0.23	590	3.1	1019	-164.33	184.17	0.34	0.10	0.33	835.84
1/11/2007	CCWA	520.46	7.9	859	22	-110	128	0.37	0.14	0.29	333	3.1	603	-689.21	801.98	2.32	0.88	1.82	2086.41
2/28/2007	CCWA	210.93	7.9	1230	37	-11	126	0.27	0.24	0.38	486	2.5	904	-27.93	319.95	0.69	0.61	0.96	1234.08
6/13/2007	CCWA	104.4	8.3	1450	66	-152	180	0.31	0.18	0.09	548	5	1079	-191.03	226.23	0.39	0.23	0.11	688.73
9/20/2007	CCWA	55.65	8.3	1380	65	-160	177	0.06	0.06	0.05	535	2.5	1077	-107.19	118.58	0.04	0.04	0.03	358.42
12/21/2007	CCWA	256.46	7.9	999	34	-103	122	0.09	0.07	0.21	410	2.5	774	-318.00	376.66	0.28	0.22	0.65	1265.82
Number of sample Dates	Count	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	Max	520.46	8.3	1450	66	-11	180	0.37	0.24	0.38	590	5	1079	-27.93	801.98	2.32	0.88	1.82	2086.41
	Min	55.65	7.9	859	22	-160	122	0.06	0.06	0.05	333	2.5	603	-689.21	118.58	0.04	0.04	0.03	358.42
6	Average	210.93	8.03	1198.00	47.33	-108.67	143.83	0.22	0.13	0.21	483.67	3.12	909.33	-249.62	337.93	0.68	0.34	0.65	1078.22


Metal Concentrations for Trib 52
mg/L
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Dec-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-53	Subwatershed Boundry Outline (topography)
B-IN-53	Subwatershed Industrial Influences
B-SO-53	Subwatershed Soils
B-AP-53	Subwatershed Aerial Photography
B-SG-53	Subwatershed Surface Geology

Tributary 53 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Burnside Township; Chest Township, Clearfield County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded
PFO1A- Palustrine, forested, broad-leaved deciduous, temporary

II. Quadrangle: Westover, PA (Wetlands Online Mapper used)

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcg	Glenshaw Formation	226.858904	0.354467
Pa	Allegheny Formation	161.204756	0.251882

ACREAGE Sum

388.06366

SQ_MI Sum

0.606349

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
95D	57.234066	0.089428	General Soils
ErD	26.930756	0.042079	General Soils
RbF	107.555341	0.168055	General Soils
RcD	35.931182	0.056142	General Soils

SubShedSoilsClearfield.ACREAGE Sum

227.651345

SubShedSoilsClearfield.SQ_MI Sum

0.355705

HYDRIC SOILS			
94B	5.987446	0.009355	Hydric Soils
At	8.805928	0.013759	Hydric Soils
CaB	6.425898	0.01004	Hydric Soils
ErB	0.000197	0	Hydric Soils
WhC	58.303222	0.091099	Hydric Soils

SubShedSoilsClearfield.ACREAGE Sum

79.522691

SubShedSoilsClearfield.SQ_MI Sum

0.124254

PRIME FARMLAND SOILS

GlB	17.971244	0.02808	Prime Farmland Soils
WhB	29.627292	0.046293	Prime Farmland Soils

SubShedSoilsClearfield.ACREAGE Sum

47.598537

SubShedSoilsClearfield.SQ_MI Sum

0.074373

STATEWIDE IMPORTANT SOILS

GlC	30.373613	0.047459	Statewide Important Soils

SubShedSoilsClearfield.ACREAGE Sum

30.373613

SubShedSoilsClearfield.SQ_MI Sum

0.047459

WATER

MW	1.864436	0.002913	Water
W	1.053038	0.001645	Water

SubShedSoilsClearfield.ACREAGE Sum

2.917474

SubShedSoilsClearfield.SQ_MI Sum

0.004559

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	**Acreage**	**SQ_MI**
Hay Pasture	18.396798	0.028745
Row Crops	46.341905	0.072409
Coniferous Forest	13.083919	0.020444
Mixed Forest	5.865989	0.009166
Deciduous Forest	279.934016	0.437397
Woody Wetland	0.880338	0.001376
Quarries	7.650269	0.011954
Transitional	15.910425	0.02486

Acreage Sum

388.063659

SQ_MI Sum

0.606349

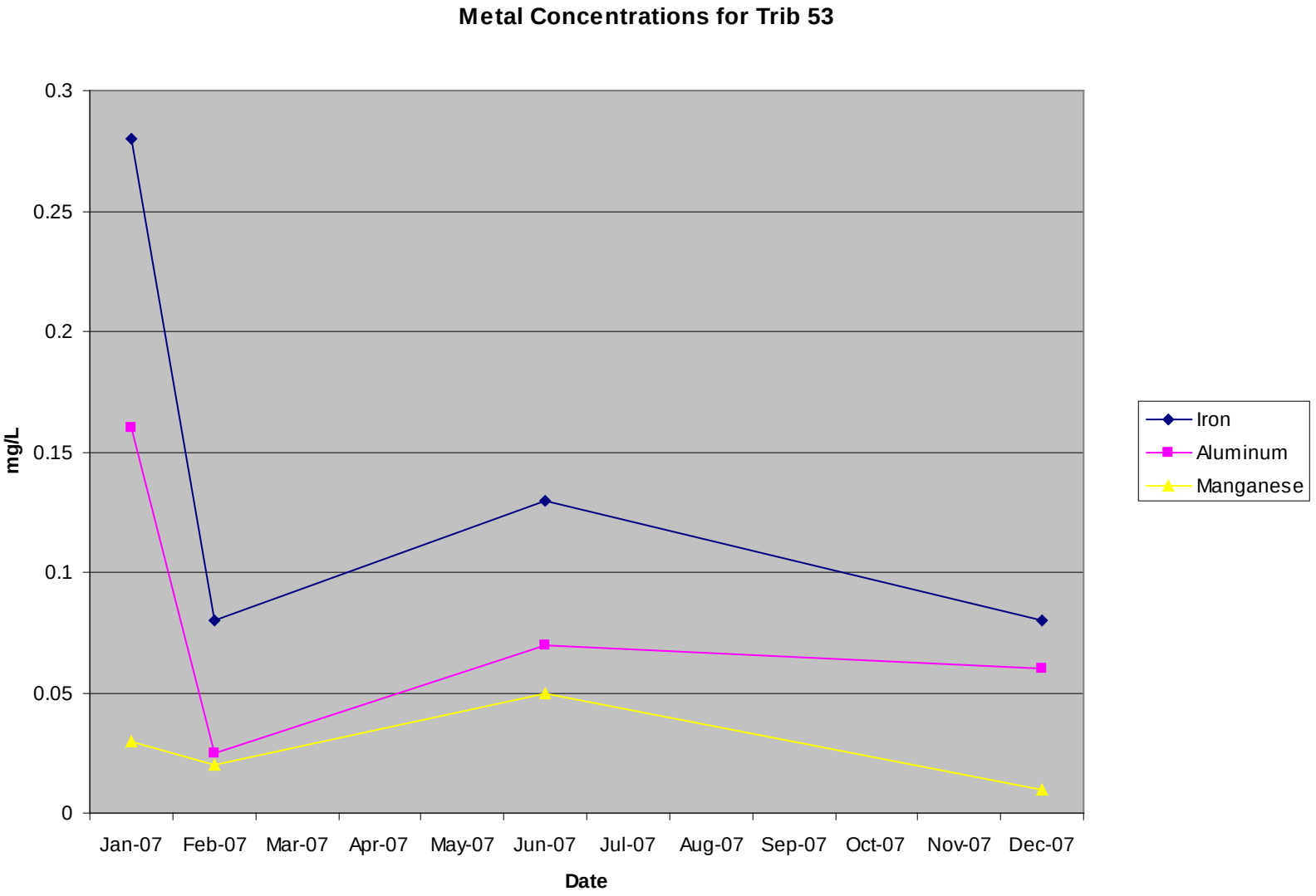
G. Pollution Sources: None

H. Additional Notes: None

Tributary Number 53

Clearfield County; Burnside Township, Chest Township

CCWA Monitoring Point: Trib Number 53																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.	Loading					
		(pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
10/10/2006	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/12/2007	CCWA	449.86	6.9	76	43	-2	12	0.28	0.16	0.03	19	3.1	51	-10.83	64.99	1.52	0.87	0.16	102.90
2/27/2007	CCWA	327.17	7	96	35	-1	16	0.08	0.025	0.02	21	2.5	56	-3.94	63.02	0.32	0.10	0.08	82.71
6/12/2007	CCWA	45.06	7.2	118	67	-13	26	0.13	0.07	0.05	23	2.5	91	-7.05	14.10	0.07	0.04	0.03	12.48
9/20/2007	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12/26/2007	CCWA	486.58	6.5	81	25	3	11	0.08	0.06	0.01	19	2.5	56	17.57	64.43	0.47	0.35	0.06	111.30
Number of sample Dates	Count	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	Max	486.58	7.2	118	67	3	26	0.28	0.16	0.05	23	3.1	91	17.57	64.99	1.52	0.87	0.16	111.30
	Min	45.06	6.5	76	25	-13	11	0.08	0.025	0.01	19	2.5	51	-10.83	14.10	0.07	0.04	0.03	12.48
6	Average	327.17	6.90	92.75	42.50	-3.25	16.25	0.14	0.08	0.03	20.50	2.65	63.50	-1.06	51.64	0.59	0.34	0.08	77.34


Metal Concentrations for Trib 53
0.3
0.25
0.2
0.15
0.1
0.05
0
mg/L
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Dec-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-54	Subwatershed Boundry Outline (topography)
B-IN-54	Subwatershed Industrial Influences
B-SO-54	Subwatershed Soils
B-AP-54	Subwatershed Aerial Photography
B-SG-54	Subwatershed Surface Geology

Tributary 54 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Burnside Township; New Washington Borough; Chest Township; Clearfield County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded
PSS1A- Palustrine, scrub/ shrub, broad-leaved deciduous, temporary
PSS1C- Palustrine, scrub/ shrub, broad-leaved deciduous, seasonal
PFO1/EM1A- Palustrine, forested, broad-leaved deciduous/ Palustrine, emergent, persistent, temporary
PUBHx- Palustrine, unconsolidated bottom, permanent, excavated

II. Quadrangle: Westover, PA (Wetlands Online Mapper used)

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcg	Glenshaw Formation	650.215293	1.015961
Pa	Allegheny Formation	146.155822	0.228368

ACREAGE Sum
796.371115
SQ_MI Sum
1.24433

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
95D	29.936513	0.046776	General Soils
ErD	37.513674	0.058615	General Soils
RbF	67.851452	0.106018	General Soils
RcD	68.689835	0.107328	General Soils

SubShedSoilsClearfield.ACREAGE Sum
203.991475
SubShedSoilsClearfield.SQ_MI Sum
0.318737

HYDRIC SOILS			
92D	41.172863	0.064333	Hydric Soils
94B	4.812071	0.007519	Hydric Soils
Ar	16.243884	0.025381	Hydric Soils
At	5.485921	0.008572	Hydric Soils

BxB	14.668209	0.022919	Hydric Soils
CaB	77.619368	0.12128	Hydric Soils
ErB	59.342003	0.092722	Hydric Soils
ErC	50.794785	0.079367	Hydric Soils
WhC	34.044109	0.053194	Hydric Soils

SubShedSoilsClearfield.ACREAGE Sum

304.183214

SubShedSoilsClearfield.SQ_MI Sum

0.475286

PRIME FARMLAND SOILS

GlB	67.554486	0.105554	Prime Farmland Soils
RaB	14.053658	0.021959	Prime Farmland Soils
WhB	122.912764	0.192051	Prime Farmland Soils

SubShedSoilsClearfield.ACREAGE Sum

204.520908

SubShedSoilsClearfield.SQ_MI Sum

0.319564

STATEWIDE IMPORTANT SOILS

GlC	61.380316	0.095907	Statewide Important Soils
RaC	20.407809	0.031887	Statewide Important Soils

SubShedSoilsClearfield.ACREAGE Sum

81.788125

SubShedSoilsClearfield.SQ_MI Sum

0.127794

WATER

MW	1.176089	0.001838	Water
W	0.711316	0.001111	Water

SubShedSoilsClearfield.ACREAGE Sum

1.887405

SubShedSoilsClearfield.SQ_MI Sum

0.002949

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Low Density Urban	0.442057	0.000691
Hay Pasture	155.465629	0.242915
Row Crops	158.762119	0.248066
Coniferous Forest	25.940919	0.040533
Mixed Forest	8.205205	0.012821
Deciduous Forest	416.862543	0.651348

Woody Wetland	1.146016	0.001791
Quarries	3.24748	0.005074
Coal Mines	0.442058	0.000691
Transitional	25.027339	0.039105

Acreage Sum

795.541366

SQ_MI Sum

1.243033

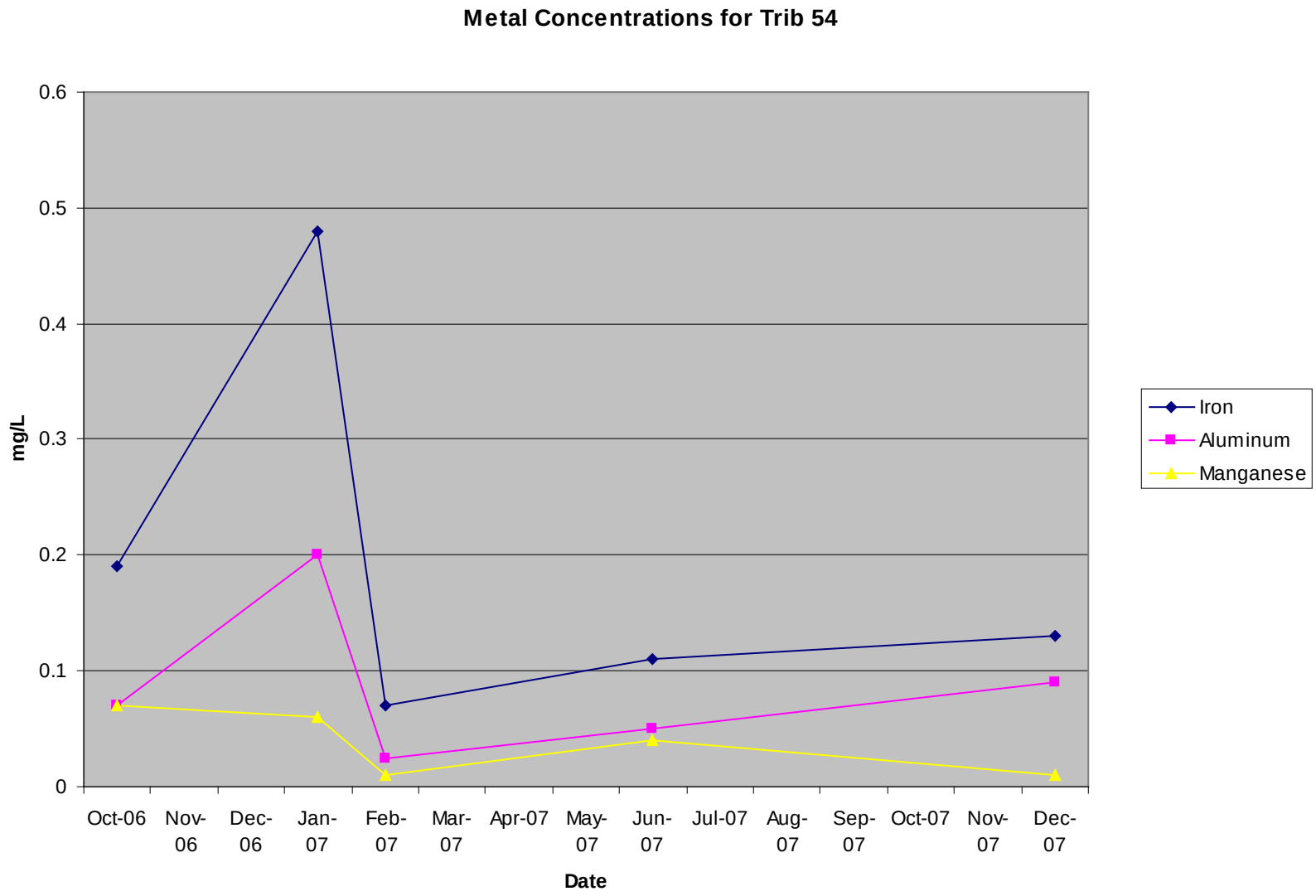
G. Pollution Sources: None

H. Additional Notes: None

Tributary Number 54

Clearfield County; Burnside Township, New Washington Borough, Chest Township

CCWA Monitoring Point: Trib Number 54																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
10/10/2006	CCWA	27.83	6.6	157	65	-6	15	0.19	0.07	0.07	39	3.1	94	-2.01	5.03	0.06	0.02	0.02	13.07
1/12/2007	CCWA	747.17	6.6	75	40	5	8	0.48	0.2	0.06	18	3.1	49	44.97	71.96	4.32	1.80	0.54	161.91
2/27/2007	CCWA	386.83	6.6	102	35	5	9	0.07	0.025	0.01	26	2.5	67	23.28	41.91	0.33	0.12	0.05	121.08
6/12/2007	CCWA	39.68	6.8	161	66	-4	16	0.11	0.05	0.04	48	2.5	101	-1.91	7.64	0.05	0.02	0.02	22.93
9/20/2007	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12/27/2007	CCWA	732.63	6.8	83	35	2	8	0.13	0.09	0.01	17	2.5	23	17.64	70.56	1.15	0.79	0.09	149.93
Number of sample Dates	Count	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Max	747.17	6.8	161	66	5	16	0.48	0.2	0.07	48	3.1	101	44.97	71.96	4.32	1.80	0.54	161.91
	Min	27.83	6.6	75	35	-6	8	0.07	0.025	0.01	17	2.5	23	-2.01	5.03	0.05	0.02	0.02	13.07
6	Average	386.83	6.68	115.60	48.20	0.40	11.20	0.20	0.09	0.04	29.60	2.74	66.80	16.40	39.42	1.18	0.55	0.14	93.78


Metal Concentrations for Trib 54
mg/L
0.6
0.5
0.4
0.3
0.2
0.1
0
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Dec-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-55	Subwatershed Boundry Outline (topography)
B-IN-55	Subwatershed Industrial Influences
B-SO-55	Subwatershed Soils
B-AP-55	Subwatershed Aerial Photography
B-SG-55	Subwatershed Surface Geology

Tributary 55 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Chest Township, Clearfield County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PSS1A- Palustrine, scrub/ shrub, broad-leaved deciduous, temporary

II. Quadrangle: Westover, PA (Wetlands Online Mapper used)

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcg	Glenshaw Formation	53.942826	0.084286
Pa	Allegheny Formation	196.157689	0.306496

ACREAGE Sum

250.100515

SQ_MI Sum

0.390782

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
95D	97.787988	0.152794	General Soils
RbF	28.009304	0.043765	General Soils
RcD	19.515321	0.030493	General Soils

SubShedSoilsClearfield.ACREAGE Sum

145.312613

SubShedSoilsClearfield.SQ_MI Sum

0.227051

HYDRIC SOILS			
BrB	11.49283	0.017958	Hydric Soils
ErB	24.186338	0.037791	Hydric Soils
ErC	15.306371	0.023916	Hydric Soils
WhC	19.144959	0.029914	Hydric Soils

SubShedSoilsClearfield.ACREAGE Sum

70.130498

SubShedSoilsClearfield.SQ_MI Sum

0.109579

PRIME FARMLAND SOILS			
GlB	1.816363	0.002838	Prime Farmland Soils
Ph	1.708277	0.002669	Prime Farmland Soils

WhB 6.188526 0.00967 Prime Farmland Soils

SubShedSoilsClearfield.ACREAGE Sum

9.713166

SubShedSoilsClearfield.SQ_MI Sum

0.015177

STATEWIDE IMPORTANT SOILS

GlC 24.900298 0.038907 Statewide Important Soils

SubShedSoilsClearfield.ACREAGE Sum

24.900298

SubShedSoilsClearfield.SQ_MI Sum

0.038907

WATER

W 0.04394 0.000069 Water

SubShedSoilsClearfield.ACREAGE Sum

0.04394

SubShedSoilsClearfield.SQ_MI Sum

0.000069

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Water	2.609384	0.004077
Low Density Urban	1.328109	0.002075
Hay Pasture	10.049471	0.015702
Row Crops	49.857539	0.077902
Coniferous Forest	14.963708	0.023381
Mixed Forest	12.787585	0.019981
Deciduous Forest	115.281537	0.180127
Woody Wetland	2.003549	0.003131
Quarries	13.091403	0.020455
Coal Mines	19.89423	0.031085
Transitional	8.233999	0.012866

Acreage Sum

250.100513

SQ_MI Sum

0.390782

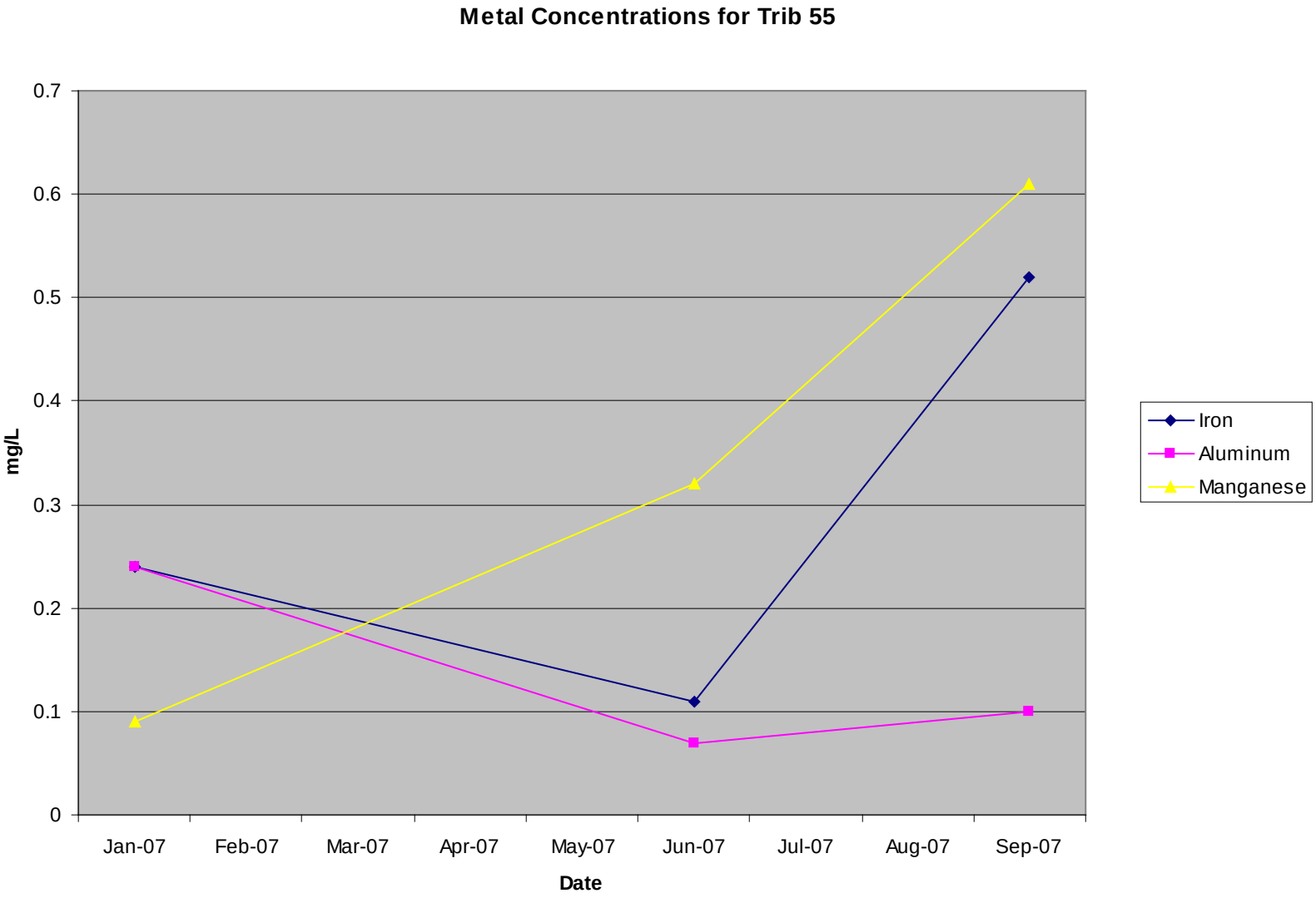
G. Pollution Sources: None

H. Additional Notes: None

Tributary Number 55

Clearfield County; Chest Township

CCWA Monitoring Point: Trib Number 55																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.	Loading					
		(Method)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
10/10/2006	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/16/2007	CCWA	435.1	7.5	815	28	-49	61	0.24	0.24	0.09	291	3.1	576	-256.66	319.51	1.26	1.26	0.47	1524.23
2/28/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
6/13/2007	CCWA	93	8	2080	68	-138	162	0.11	0.07	0.32	950	2.5	1678	-154.50	181.37	0.12	0.08	0.36	1063.59
9/21/2007	CCWA	54.85	8	2230	56	-168	187	0.52	0.1	0.61	1056	6	1850	-110.93	123.48	0.34	0.07	0.40	697.28
1/3/2008	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
Number of sample Dates	Count	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Max	435.1	8	2230	68	-49	187	0.52	0.24	0.61	1056	6	1850	-110.93	319.51	1.26	1.26	0.47	1524.23
	Min	54.85	7.5	815	28	-168	61	0.11	0.07	0.09	291	2.5	576	-256.66	123.48	0.12	0.07	0.36	697.28
6	Average	194.32	7.83	1708.33	50.67	-118.33	136.67	0.29	0.14	0.34	765.67	3.87	1368.00	-174.03	208.12	0.57	0.47	0.41	1095.04


Metal Concentrations for Trib 55
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
mg/L
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-56	Subwatershed Boundry Outline (topography)
B-IN-56	Subwatershed Industrial Influences
B-SO-56	Subwatershed Soils
B-AP-56	Subwatershed Aerial Photography
B-SG-56	Subwatershed Surface Geology

Tributary 56 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Burnside Township; New Washington Borough; Chest Township, Clearfield County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:

I. Habitat Types: none mapped

II. Quadrangle: Westover, PA (Wetlands Online Mapper used)

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcg	Glenshaw Formation	465.1687	0.726826
Pa	Allegheny Formation	102.016366	0.159401

ACREAGE Sum

567.185066

SQ_MI Sum

0.886227

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
95D	7.931482	0.012393	General Soils
BeD	1.390679	0.002173	General Soils
ErD	0.880761	0.001376	General Soils
RbF	59.710899	0.093298	General Soils

SubShedSoilsClearfield.ACREAGE Sum

69.913823

SubShedSoilsClearfield.SQ_MI Sum

0.10924

HYDRIC SOILS			
92D	34.916575	0.054557	Hydric Soils
At	3.446226	0.005385	Hydric Soils
CaB	8.759659	0.013687	Hydric Soils
ErB	17.401278	0.027189	Hydric Soils
ErC	19.176166	0.029963	Hydric Soils
ExD	14.620053	0.022844	Hydric Soils
WhC	83.435142	0.130367	Hydric Soils

SubShedSoilsClearfield.ACREAGE Sum

181.755099

SubShedSoilsClearfield.SQ_MI Sum

0.283992

PRIME FARMLAND SOILS

GlB	62.52948	0.097702	Prime Farmland Soils
RaB	5.784678	0.009039	Prime Farmland Soils
WhB	128.946908	0.20148	Prime Farmland Soils

SubShedSoilsClearfield.ACREAGE Sum

197.261066

SubShedSoilsClearfield.SQ_MI Sum

0.30822

STATEWIDE IMPORTANT SOILS

GlC	118.233424	0.18474	Statewide Important Soils

SubShedSoilsClearfield.ACREAGE Sum

118.233424

SubShedSoilsClearfield.SQ_MI Sum

0.18474

WATER

W	0.021665	0.000034	Water

SubShedSoilsClearfield.ACREAGE Sum

0.021665

SubShedSoilsClearfield.SQ_MI Sum

0.000034

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Low Density Urban	0.442057	0.000691
Hay Pasture	45.868854	0.07167
Row Crops	91.019829	0.142218
Coniferous Forest	11.588342	0.018107
Mixed Forest	5.843557	0.009131
Deciduous Forest	381.971863	0.596831
Quarries	0.018134	0.000028
Transitional	29.766451	0.04651

Acreage Sum

566.519087

SQ_MI Sum

0.885186

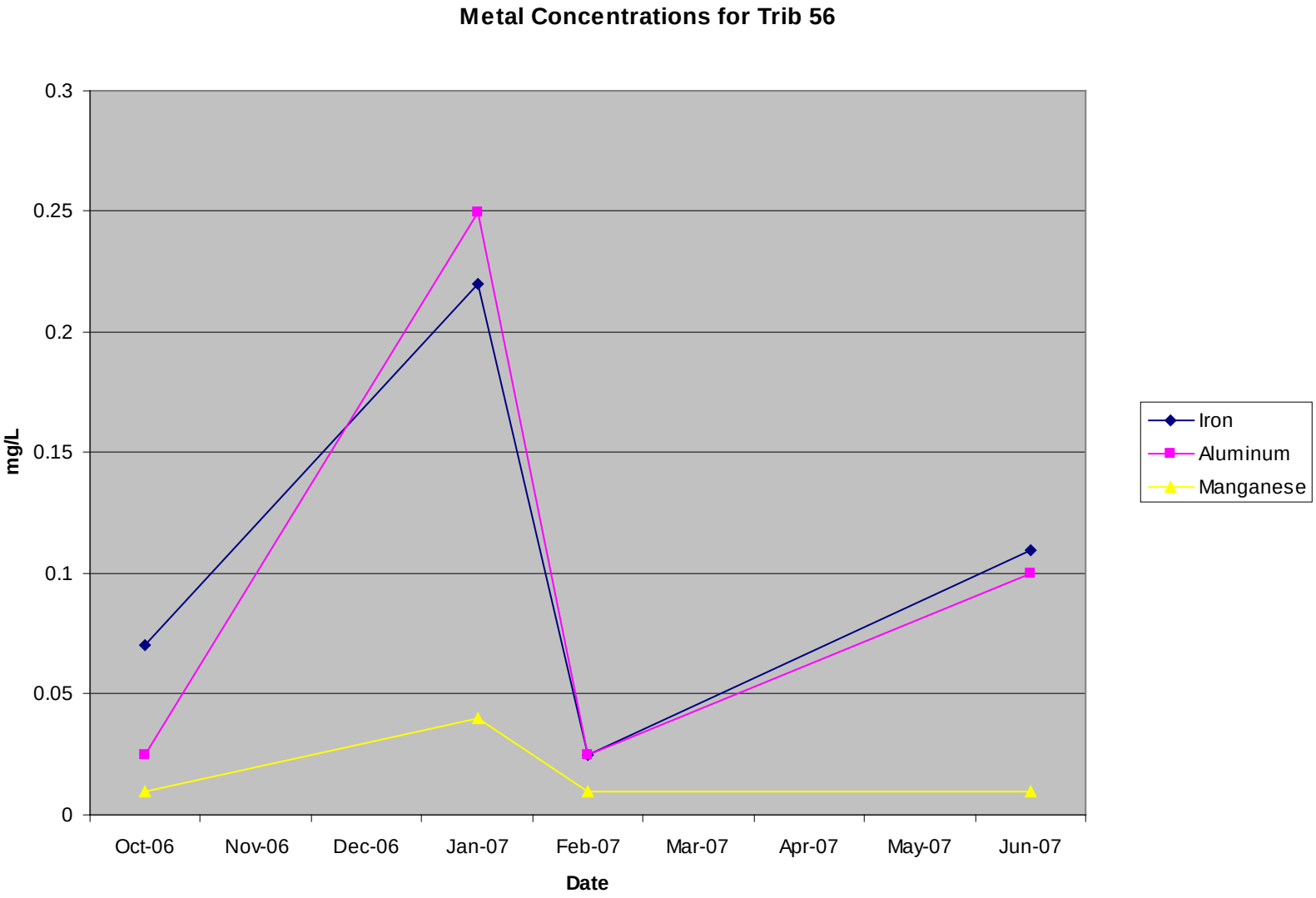
G. Pollution Sources: None

H. Additional Notes: None

Tributary Number 56

Clearfield County; Burnside Township, New Washington Borough, Chest Township

CCWA Monitoring Point: Trib Number 56																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
10/11/2006	CCWA	Near Dry	7.2	180	61	-10	20	0.07	0.025	0.01	40	3.1	109	--	--	--	--	--	--
1/16/2007	CCWA	2645.22	6.6	82	29	5	9	0.22	0.25	0.04	17	3.1	60	159.22	286.60	7.01	7.96	1.27	541.35
2/28/2007	CCWA	1338.32	6.6	140	29	2	11	0.025	0.025	0.01	24	5	73	32.22	177.22	0.40	0.40	0.16	386.67
6/14/2007	CCWA	31.42	7	162	60	-5	20	0.11	0.1	0.01	40	2.5	114	-1.89	7.56	0.04	0.04	0.00	15.13
9/21/2007	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/3/2008	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
Number of sample Dates	Count	3	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3	3
	Max	2645.22	7.2	180	61	5	20	0.22	0.25	0.04	40	5	114	159.22	286.60	7.01	7.96	1.27	541.35
	Min	31.42	6.6	82	29	-10	9	0.025	0.025	0.01	17	2.5	60	-1.89	7.56	0.04	0.04	0.00	15.13
6	Average	1338.32	6.85	141.00	44.75	-2.00	15.00	0.11	0.10	0.02	30.25	3.43	89.00	63.18	157.13	2.48	2.80	0.48	314.38


Metal Concentrations for Trib 56
0.3
0.25
0.2
0.15
0.1
0.05
0
mg/L
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-57	Subwatershed Boundry Outline (topography)
B-IN-57	Subwatershed Industrial Influences
B-SO-57	Subwatershed Soils
B-AP-57	Subwatershed Aerial Photography
B-SG-57	Subwatershed Surface Geology

Chest Creek Watershed Assessment and Restoration Plan

Tributary 57, Wilson Run **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Chest Township; Ferguson Township; Newburg Borough, Clearfield County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PFO1A- Palustrine, forested, broad-leaved deciduous, temporary
PSS1C- Palustrine, scrub/ shrub, broad-leaved deciduous, seasonal
PEM1Eh- Palustrine, emergent, persistent, seasonal saturated, diked/ impounded
PUBHx- Palustrine, unconsolidated bottom, permanent, excavated
PEM1/SS1Eb- Palustrine, emergent, persistent/ Palustrine, scrub/ shrub, broad-leaved deciduous, seasonal saturated, beaver
PEM1/SS1Fb- Palustrine, emergent, persistent/ Palustrine, scrub/ shrub, broad-leaved deciduous, semiperminent, beaver
PSS1A- Palustrine, scrub/ shrub, broad-leaved deciduous, temporary
PEM1Fh- Palustrine, emergent, persistent, semiperminent, diked/ impounded
PUBFh- Palustrine, unconsolidated bottom, semiperminent, diked/ impounded

II. Quadrangle: Westover, PA (Wetlands Online Mapper used)

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcc	Casselman Formation	23.841335	0.037252
Pcg	Glenshaw Formation	3214.673541	5.022927
Pa	Allegheny Formation	3027.443911	4.730381

ACREAGE Sum
6265.958787
SQ_MI Sum
9.790561

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
95D	869.714452	1.358929	General Soils
BeD	0.261891	0.000409	General Soils
CxD	6.500325	0.010157	General Soils
ErD	65.217467	0.101902	General Soils

GmB	25.44737	0.039762	General Soils
GmD	164.426182	0.256916	General Soils
RbF	1653.044698	2.582882	General Soils
RcD	784.607948	1.22595	General Soils
Ru	4.210404	0.006579	General Soils
WhD	129.556665	0.202432	General Soils

SubShedSoilsClearfield.ACREAGE Sum

3702.987402

SubShedSoilsClearfield.SQ_MI Sum

5.785918

HYDRIC SOILS

92D	146.897367	0.229527	Hydric Soils
At	115.580738	0.180595	Hydric Soils
BrB	77.175924	0.120587	Hydric Soils
CaB	23.493002	0.036708	Hydric Soils
ErB	149.197194	0.233121	Hydric Soils
ErC	563.282536	0.880129	Hydric Soils
ExD	11.768685	0.018389	Hydric Soils
Uo	26.666703	0.041667	Hydric Soils
WhC	299.769463	0.46839	Hydric Soils

SubShedSoilsClearfield.ACREAGE Sum

1413.831614

SubShedSoilsClearfield.SQ_MI Sum

2.209112

PRIME FARMLAND SOILS

AlB	10.118569	0.01581	Prime Farmland Soils
GlB	247.625917	0.386915	Prime Farmland Soils
Ph	19.715031	0.030805	Prime Farmland Soils
Po	2.570154	0.004016	Prime Farmland Soils
RaB	71.196487	0.111245	Prime Farmland Soils
WhB	195.350956	0.305236	Prime Farmland Soils

SubShedSoilsClearfield.ACREAGE Sum

546.577114

SubShedSoilsClearfield.SQ_MI Sum

0.854027

STATEWIDE IMPORTANT SOILS

BeB	9.758411	0.015248	Statewide Important Soils
BeC	4.932712	0.007707	Statewide Important Soils
GlC	533.114873	0.832992	Statewide Important Soils
RaC	16.496335	0.025776	Statewide Important Soils

SubShedSoilsClearfield.ACREAGE Sum

564.302331

SubShedSoilsClearfield.SQ_MI Sum

0.881722

STRIP MINES

93D 36.46227 0.056972 Strip Mines

SubShedSoilsClearfield.ACREAGE Sum

36.46227

SubShedSoilsClearfield.SQ_MI Sum

0.056972

WATER

W 1.798061 0.002809 Water

SubShedSoilsClearfield.ACREAGE Sum

1.798061

SubShedSoilsClearfield.SQ_MI Sum

0.002809

E. Mining:

I. Mining Permits in Drainage Basin:

17020103, # 17860101

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Water	9.768231	0.015263
Low Density Urban	56.934227	0.08896
Hay Pasture	336.155986	0.525244
Row Crops	710.485957	1.110134
Coniferous Forest	316.915569	0.495181
Mixed Forest	86.012859	0.134395
Deciduous Forest	4336.835847	6.776306
Quarries	141.983775	0.22185
Coal Mines	61.976767	0.096839
Transitional	190.95023	0.29836

Acreage Sum

6248.019449

SQ_MI Sum

9.76253

G. Pollution Sources: Discharges 57-2L and 57-3L occur in this watershed. Also the Sky Haven Blowout occurs in this watershed. Sewage Infiltration also occurs.

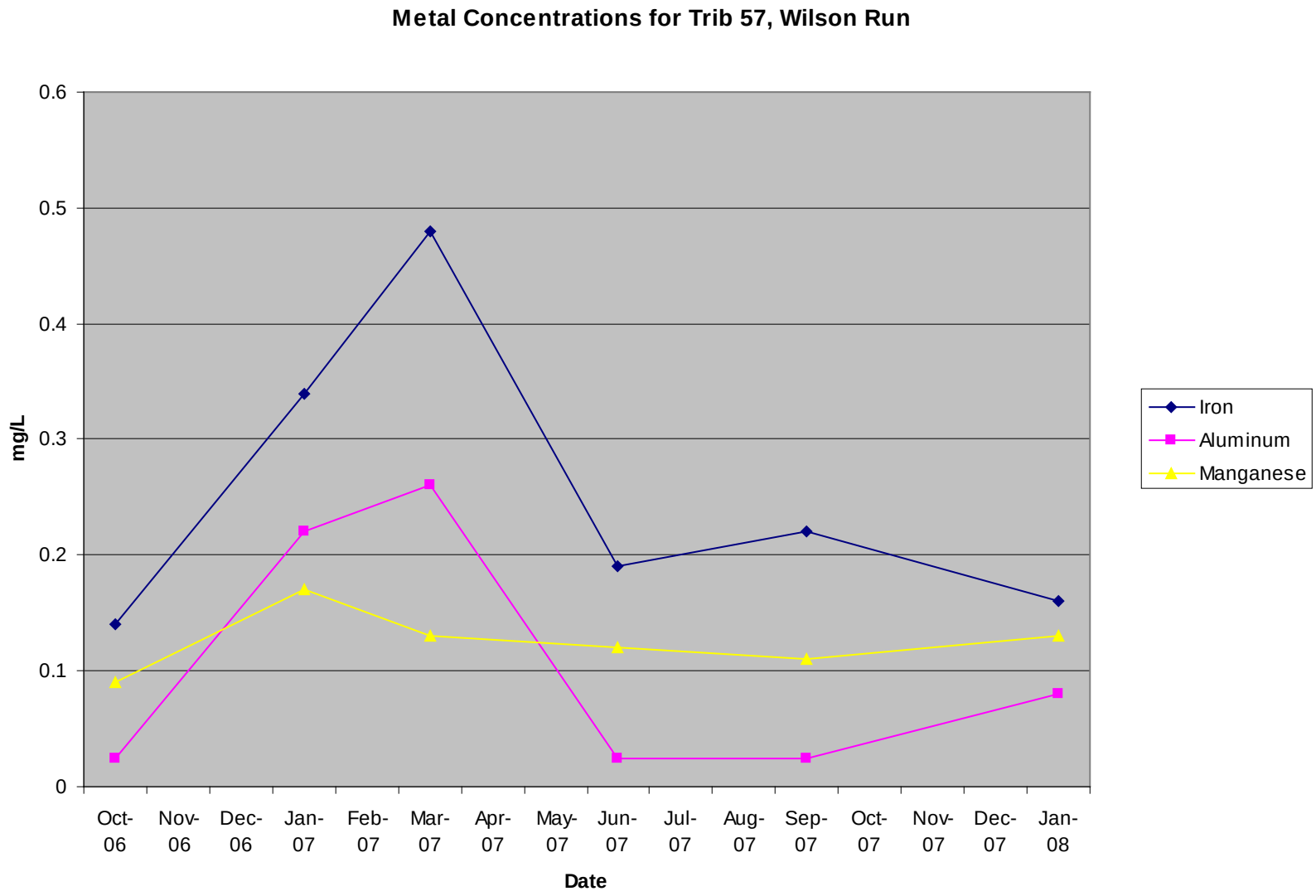
H. Additional Notes: A cooperative trout nursery between the PA Fish and Boat Commission and the Susquehanna Rod and Gun Club occur in this watershed. This tributary is recommended for remediation.

Tributary Number 57, Wilson Run

Clearfield County; Chest Township, Ferguson Township, Newburg Borough

CCWA Monitoring Point: Trib Number 57, Wilson Run																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
10/11/2006	CCWA	931.55	7.7	695	62	-71	82	0.14	0.025	0.09	237	3.1	466	-796.22	919.58	1.57	0.28	1.01	2657.81
1/18/2007	CCWA	15662.64	6.9	247	22	-8	20	0.34	0.22	0.17	76	2.5	149	-1508.43	3771.06	64.11	41.48	32.05	14330.04
3/13/2007	CCWA	10271.34	6.7	257	45	-9	23	0.48	0.26	0.13	73	2.5	141	-1112.85	2843.96	59.35	32.15	16.07	9026.49
6/18/2007	CCWA	1042	7.7	668	68	-59	78	0.19	0.025	0.12	245	5	415	-740.10	978.43	2.38	0.31	1.51	3073.28
9/24/2007	CCWA	468.89	7.6	786	56	-86	105	0.22	0.025	0.11	294	2.5	574	-485.44	592.69	1.24	0.14	0.62	1659.54
1/8/2008	CCWA	5002.66	8.9	341	55	-20	37	0.16	0.08	0.13	93	2.5	193	-1204.48	2228.29	9.64	4.82	7.83	5600.83
Number of sample Dates	Count	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	Max	15662.64	8.9	786	68	-8	105	0.48	0.26	0.17	294	5	574	-485.44	3771.06	64.11	41.48	32.05	14330.04
	Min	468.89	6.7	247	22	-86	20	0.14	0.025	0.09	73	2.5	141	-1508.43	592.69	1.24	0.14	0.62	1659.54
6	Average	5563.18	7.58	499.00	51.33	-42.17	57.50	0.26	0.11	0.13	169.67	3.02	323.00	-974.59	1889.00	23.05	13.20	9.85	6058.00

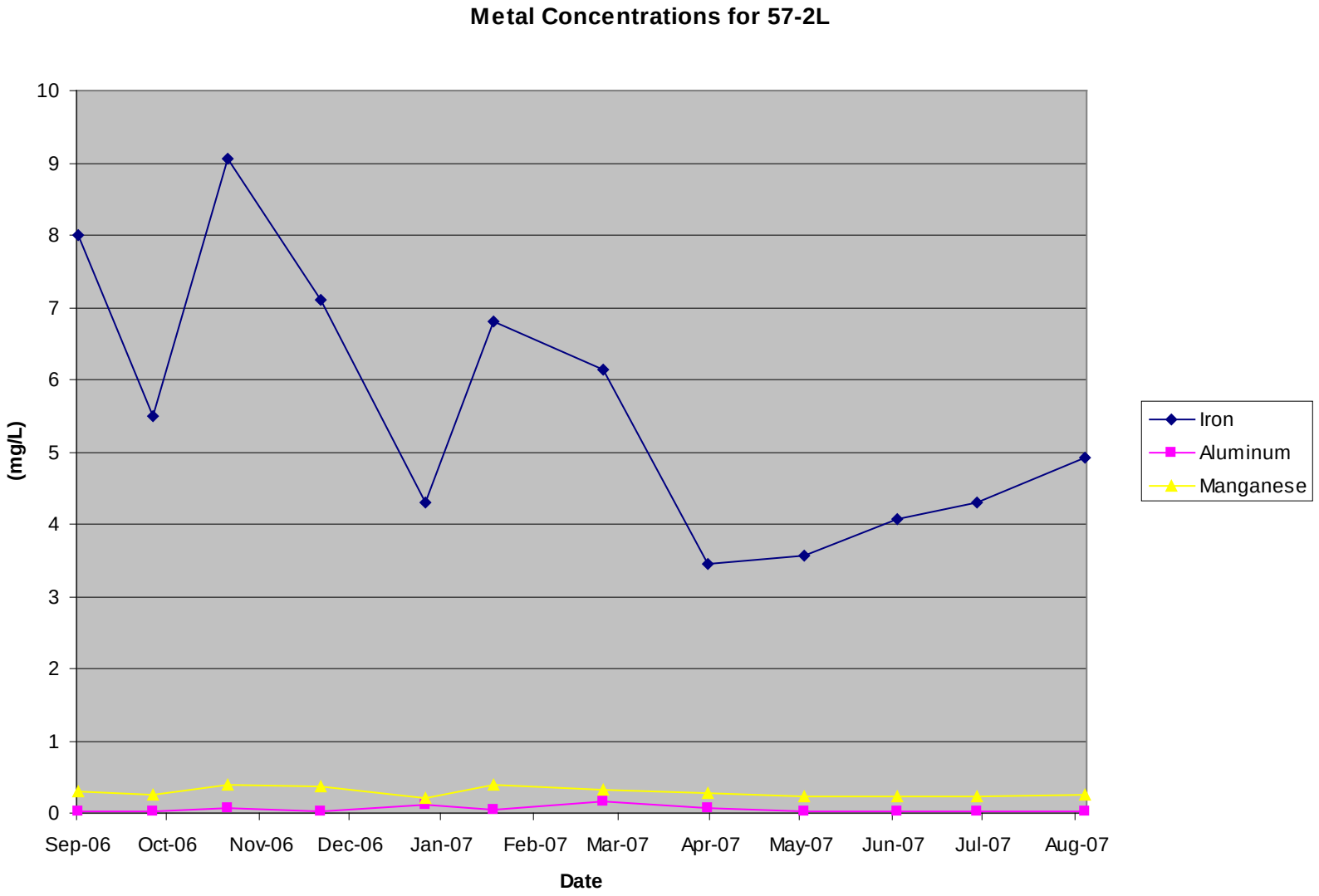
Date	BOD (mg/L)	Fecal Col (c/100mL)	BOD (lbs/day)	Fecal Col (#/day)
10/11/2006	--	--	--	--
1/18/2007	1.5	30	282.8297	2.56E+10
3/13/2007	1	10	123.6505	5.6E+09
6/18/2007	1	5	12.54401	2.84E+08
9/24/2007	1.5	110	8.467028	2.81E+09
1/8/2008	1.5	110	90.33603	3E+10
Count	5	5	5	5
Max	1.5	110	282.8297	3E+10
Min	1	5	8.467028	2.84E+08
Average	1.3	53	103.5655	1.29E+10


Metal Concentrations for Trib 57, Wilson Run
mg/L
0.6
0.5
0.4
0.3
0.2
0.1
0
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Dec-07
Jan-08
Date
Iron
Aluminum
Manganese

Discharge Number 57-2L, Wilson Run #2

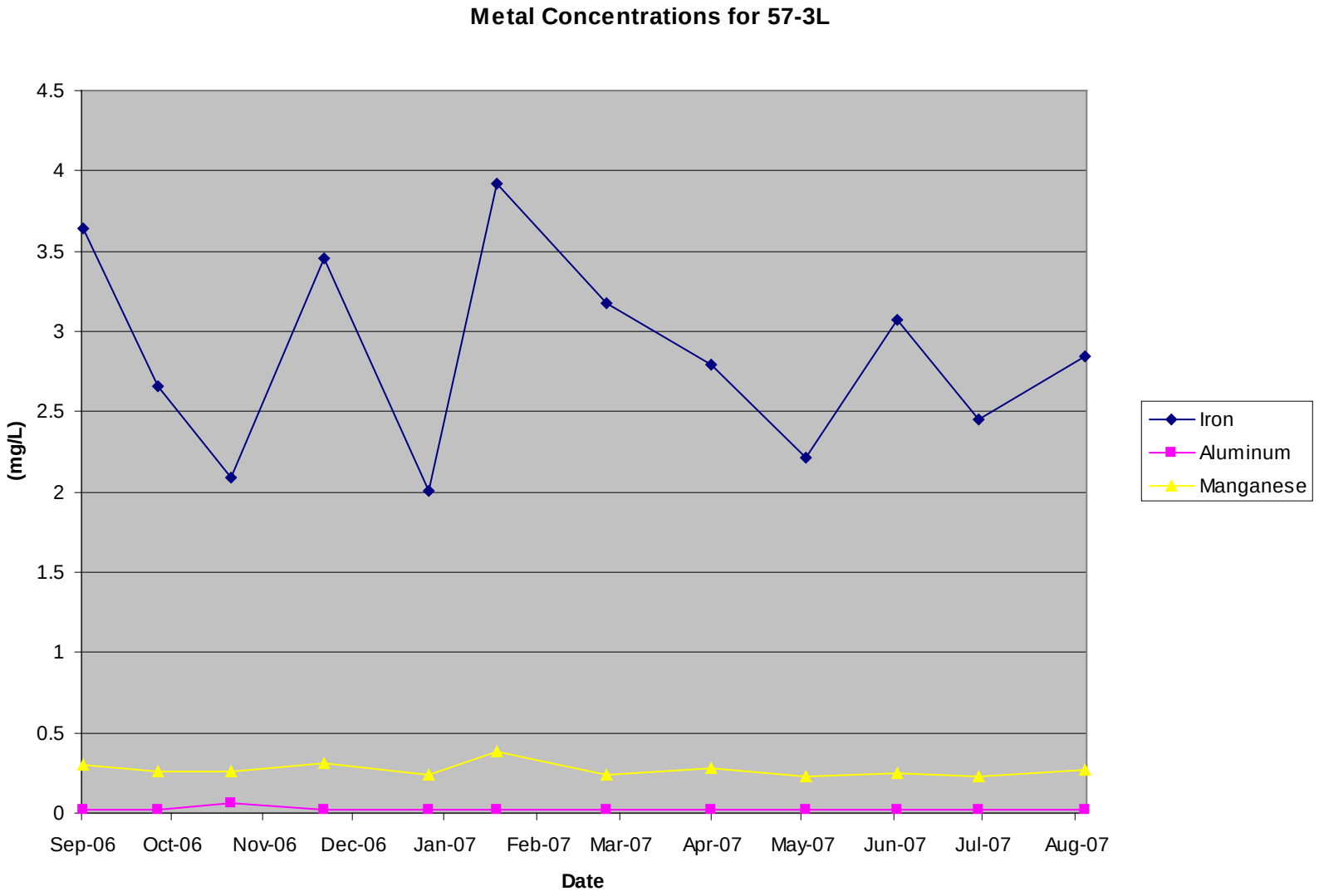
Clearfield County; Ferguson Township

CCWA Monitoring Point: Discharge Number 57-2L, Wilson Run #2														Loading					
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.						
		(V-Notch)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/28/2006	CCWA	80.71	7.2	393	60	-94	112	8.01	0.025	0.3	76	7.1	230	-91.33	108.82	7.78	0.02	0.29	73.84
10/23/2006	CCWA	61.25	6.7	306	42	-87	106	5.49	0.025	0.26	71	<6.2	220	-64.15	78.16	4.05	0.02	0.19	52.35
11/17/2006	CCWA	51.55	6.5	355	40	-46	68	9.06	0.08	0.38	93	7.1	217	-28.55	42.20	5.62	0.05	0.24	57.71
12/18/2006	CCWA	51.55	6.7	379	54	-64	83	7.11	0.025	0.37	84	<6.2	229	-39.72	51.51	4.41	0.02	0.23	52.13
1/22/2007	CCWA	83.76	6.5	288	24	-37	54	4.31	0.12	0.21	69	6	131	-37.31	54.45	4.35	0.12	0.21	69.58
2/14/2007	CCWA	25.11	6.5	364	19	-68	85	6.81	0.05	0.39	71	10	226	-20.56	25.69	2.06	0.02	0.12	21.46
3/23/2007	CCWA	51.55	6.4	303	54	-35	50	6.14	0.15	0.33	72	7	185	-21.72	31.03	3.81	0.09	0.20	44.68
4/27/2007	CCWA	96.62	6.5	316	55	-49	60	3.45	0.07	0.27	64	<5.0	175	-56.99	69.79	4.01	0.08	0.31	74.44
5/29/2007	CCWA	61.25	6.6	363	68	-78	92	3.57	0.025	0.22	68	8	219	-57.51	67.84	2.63	0.02	0.16	50.14
6/29/2007	CCWA	51.55	6.8	355	68	-81	98	4.08	0.025	0.24	61	5	221	-50.27	60.82	2.53	0.02	0.15	37.86
7/26/2007	CCWA	33.26	6.8	408	65	-83	98	4.29	0.025	0.23	63	<5.0	221	-33.23	39.24	1.72	0.01	0.09	25.23
8/31/2007	CCWA	38.83	6.8	365	68	-91	107	4.93	0.025	0.26	62	6	207	-42.54	50.02	2.30	0.01	0.12	28.98
Number of sample Dates	Count	12	12	12	12	12	12	12	12	12	12	8	12	12	12	12	12	12	12
	Max	96.62	7.2	408	68	-35	112	9.06	0.15	0.39	93	10	230	-20.56	108.82	7.78	0.12	0.31	74.44
	Min	25.11	6.4	288	19	-94	50	3.45	0.025	0.21	61	5	131	-91.33	25.69	1.72	0.01	0.09	21.46
12	Average	57.25	6.67	349.58	51.42	-67.75	84.42	5.60	0.05	0.29	71.17	7.03	206.75	-45.32	56.63	3.77	0.04	0.19	49.03


Metal Concentrations for 57-2L
10
9
8
7
6
5
4
3
2
1
0
(mg/L)
Sep-06
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Date
Iron
Aluminum
Manganese

Discharge Number 57-3L, Wilson Run #3
Clearfield County; Ferguson Township

CCWA Monitoring Point: Discharge Number 57-3L, Wilson Run #3														Loading					
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.						
		(V-Notch)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
9/28/2006	CCWA	22.23	7.2	315	60	-96	114	3.64	0.025	0.3	40	3.1	174	-25.69	30.51	0.97	0.01	0.08	10.70
10/23/2006	CCWA	22.23	6.9	385	42	-82	94	2.66	0.025	0.26	37	3.1	177	-21.94	25.16	0.71	0.01	0.07	9.90
11/17/2006	CCWA	22.23	6.8	283	40	-69	88	2.09	0.06	0.26	39	3.1	164	-18.47	23.55	0.56	0.02	0.07	10.44
12/18/2006	CCWA	19.55	7	308	54	-71	93	3.46	0.025	0.31	38	3.1	176	-16.71	21.89	0.81	0.01	0.07	8.94
1/22/2007	CCWA	22.23	7	280	25	-77	88	2.01	0.025	0.24	30	2.5	122	-20.61	23.55	0.54	0.01	0.06	8.03
2/14/2007	CCWA	9.11	6.8	300	19	-80	93	3.92	0.025	0.38	33	5	181	-8.77	10.20	0.43	0.00	0.04	3.62
3/23/2007	CCWA	12.72	6.9	274	54	-67	82	3.18	0.025	0.24	32	5	161	-10.26	12.56	0.49	0.00	0.04	4.90
4/27/2007	CCWA	22.23	6.9	291	56	-71	86	2.79	0.025	0.28	31	2.5	149	-19.00	23.01	0.75	0.01	0.07	8.30
5/29/2007	CCWA	12.24	6.8	313	70	-78	91	2.21	0.025	0.23	39	2.5	182	-11.49	13.41	0.33	0.00	0.03	5.75
6/29/2007	CCWA	22.23	6.9	299	67	-80	94	3.07	0.025	0.25	38	2.5	152	-21.41	25.16	0.82	0.01	0.07	10.17
7/26/2007	CCWA	22.23	6.9	353	66	-78	95	2.45	0.025	0.23	41	2.5	191	-20.87	25.42	0.66	0.01	0.06	10.97
8/31/2007	CCWA	17.08	6.8	309	68	-87	101	2.84	0.025	0.27	39	7	170	-17.89	20.77	0.58	0.01	0.06	8.02
Number of sample Dates	Count	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
	Max	22.23	7.2	385	70	-67	114	3.92	0.06	0.38	41	7	191	-8.77	30.51	0.97	0.02	0.08	10.97
	Min	9.11	6.8	274	19	-96	82	2.01	0.025	0.23	30	2.5	122	-25.69	10.20	0.33	0.00	0.03	3.62
12	Average	18.86	6.91	309.17	51.75	-78.00	93.25	2.86	0.03	0.27	36.42	3.49	166.58	-17.76	21.26	0.64	0.01	0.06	8.31


Metal Concentrations for 57-3L
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
(mg/L)
Sep-06
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-58	Subwatershed Boundry Outline (topography)
B-IN-58	Subwatershed Industrial Influences
B-SO-58	Subwatershed Soils
B-AP-58	Subwatershed Aerial Photography
B-SG-58	Subwatershed Surface Geology

Chest Creek Watershed Assessment and Restoration Plan

Tributary 58, Tuckers Run **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Ferguson Township; Newburg Borough, Clearfield County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:

I. Habitat Types: none mapped

II. Quadrangle: Westover, PA (Wetlands Online Mapper used)

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcg	Glenshaw Formation	304.25106	0.475392
Pa	Allegheny Formation	235.969275	0.368702

ACREAGE Sum

540.220335

SQ_MI Sum

0.844094

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
RbF	160.484249	0.250757	General Soils
RcD	133.95135	0.209299	General Soils
WhD	5.693778	0.008897	General Soils

SubShedSoilsClearfield.ACREAGE Sum

300.129377

SubShedSoilsClearfield.SQ_MI Sum

0.468952

HYDRIC SOILS			
ErB	15.167269	0.023699	Hydric Soils
ErC	38.28175	0.059815	Hydric Soils
ExD	0.846077	0.001322	Hydric Soils
WhC	68.440381	0.106938	Hydric Soils

SubShedSoilsClearfield.ACREAGE Sum

122.735477

SubShedSoilsClearfield.SQ_MI Sum

0.191774

PRIME FARMLAND SOILS			
AlB	2.901499	0.004534	Prime Farmland Soils
GlB	22.285757	0.034821	Prime Farmland Soils
Ph	2.215171	0.003461	Prime Farmland Soils

RaB	20.034047	0.031303	Prime Farmland Soils
WhB	22.110342	0.034547	Prime Farmland Soils

SubShedSoilsClearfield.ACREAGE Sum

69.546815

SubShedSoilsClearfield.SQ_MI Sum

0.108667

STATEWIDE IMPORTANT SOILS

GlC	40.074741	0.062617	Statewide Important Soils
RaC	7.733923	0.012084	Statewide Important Soils

SubShedSoilsClearfield.ACREAGE Sum

47.808664

SubShedSoilsClearfield.SQ_MI Sum

0.074701

E. Mining:

I. Mining Permits in Drainage Basin:

17080104

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Low Density Urban	3.939555	0.006156
Hay Pasture	33.059556	0.051656
Row Crops	39.146384	0.061166
Coniferous Forest	16.132239	0.025207
Mixed Forest	0.442057	0.000691
Deciduous Forest	434.841172	0.679439
Transitional	12.659366	0.01978

Acreage Sum

540.220329

SQ_MI Sum

0.844094

G. Pollution Sources: None

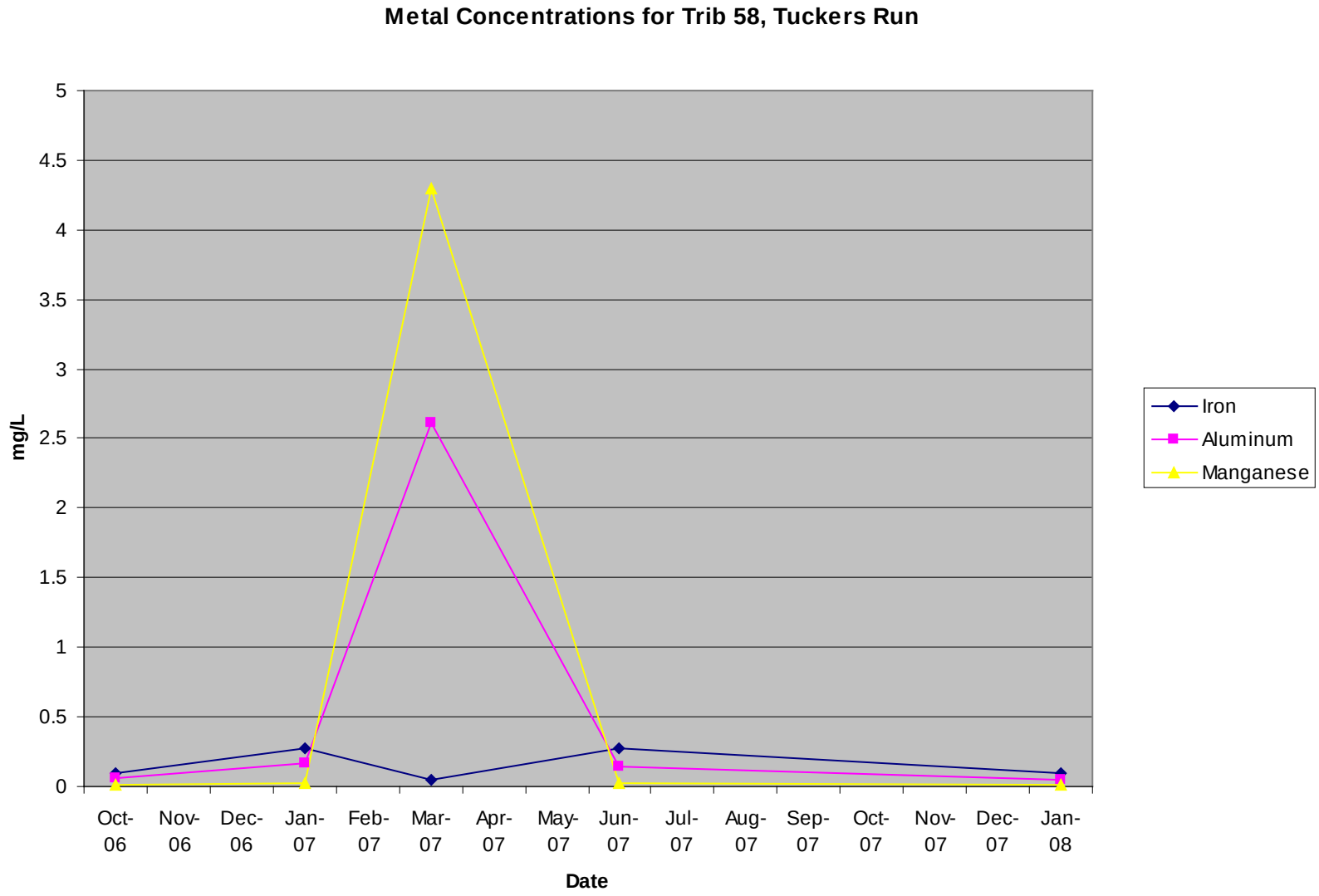
H. Additional Notes: P&N Coal Company has a permit to start mining in this watershed.

Tributary Number 58, Tuckers Run

Clearfield County; Ferguson Township, Newburg Borough

CCWA Monitoring Point: Trib Number 58, Tuckers Run																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
10/24/2006	CCWA	605.24	6.6	62	40	2	12	0.1	0.06	0.01	13	3.1	49	14.57	87.43	0.73	0.44	0.07	94.72
1/16/2007	CCWA	2562.37	6.5	54	27	2	8	0.28	0.17	0.02	13	3.1	50	61.69	246.77	8.64	5.24	0.62	401.01
3/6/2007	CCWA	908.19	6.5	58	15	13	9	0.05	2.61	4.3	13	2.5	47	142.13	98.40	0.55	28.54	47.01	142.13
6/19/2007	CCWA	9.76	6.9	84	68	-8	25	0.28	0.14	0.02	10	8	41	-0.94	2.94	0.03	0.02	0.00	1.17
9/24/2007	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/8/2008	CCWA	455.38	7	67	60	1	11	0.09	0.05	0.01	12	2.5	39	5.48	60.30	0.49	0.27	0.05	65.78
Number of sample Dates	Count	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Max	2562.37	7	84	68	13	25	0.28	2.61	4.3	13	8	50	142.13	246.77	8.64	28.54	47.01	401.01
	Min	9.76	6.5	54	15	-8	8	0.05	0.05	0.01	10	2.5	39	-0.94	2.94	0.03	0.02	0.00	1.17
6	Average	908.19	6.70	65.00	42.00	2.00	13.00	0.16	0.61	0.87	12.20	3.84	45.20	44.59	99.17	2.09	6.90	9.55	140.96

Date	BOD (mg/L)	Fecal Col (c/100mL)	BOD (lbs/day)	Fecal Col (#/day)
10/24/2006	3	120	21.85836	3958978457
1/16/2007	1	5	30.84684	698370869
3/6/2007	1.5	5	16.39973	247526095
6/19/2007	1	120	0.117495	63841830.9
9/24/2007	--	--	--	--
1/8/2008	1.5	5	8.22307	124113273
Count	5	5	5	5
Max	3	120	30.84684	3958978457
Min	1	5	0.117495	63841830.9
Average	1.6	51	15.4891	1018566105


Metal Concentrations for Trib 58, Tuckers Run
mg/L
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Dec-07
Jan-08
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-59	Subwatershed Boundry Outline (topography)
B-IN-59	Subwatershed Industrial Influences
B-SO-59	Subwatershed Soils
B-AP-59	Subwatershed Aerial Photography
B-SG-59	Subwatershed Surface Geology

Tributary 59 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Newburg Borough; New Washington Borough, Clearfield County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded

II. Quadrangle: Westover, PA (Wetlands Online Mapper used)

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcg	Glenshaw Formation	354.638139	0.554122
Pa	Allegheny Formation	289.453402	0.452271

ACREAGE Sum

644.09154

SQ_MI Sum

1.006393

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
95D	65.605404	0.102508	General Soils
HbD	1.897671	0.002965	General Soils
RbF	24.248454	0.037888	General Soils
RcD	114.84515	0.179446	General Soils

SubShedSoilsClearfield.ACREAGE Sum

206.596679

SubShedSoilsClearfield.SQ_MI Sum

0.322807

HYDRIC SOILS			
92D	57.363889	0.089631	Hydric Soils
At	9.992638	0.015613	Hydric Soils
BxB	24.037419	0.037558	Hydric Soils
CaB	4.208279	0.006575	Hydric Soils
CxB	1.131136	0.001767	Hydric Soils
ErB	29.786702	0.046542	Hydric Soils
ErC	53.834758	0.084117	Hydric Soils
ExB	16.117592	0.025184	Hydric Soils
ExD	63.526311	0.09926	Hydric Soils

Up	0.553963	0.000866	Hydric Soils
WhC	11.659681	0.018218	Hydric Soils

SubShedSoilsClearfield.ACREAGE Sum

272.212367

SubShedSoilsClearfield.SQ_MI Sum

0.425332

PRIME FARMLAND SOILS

ClB	4.085323	0.006383	Prime Farmland Soils
GlB	30.959007	0.048373	Prime Farmland Soils
Ph	8.306283	0.012979	Prime Farmland Soils
RaB	30.500893	0.047658	Prime Farmland Soils
WhB	28.107312	0.043918	Prime Farmland Soils

SubShedSoilsClearfield.ACREAGE Sum

101.958818

SubShedSoilsClearfield.SQ_MI Sum

0.159311

STATEWIDE IMPORTANT SOILS

GlC	62.846617	0.098198	Statewide Important Soils
MoB	0.477053	0.000745	Statewide Important Soils

SubShedSoilsClearfield.ACREAGE Sum

63.32367

SubShedSoilsClearfield.SQ_MI Sum

0.098943

E. Mining:

I. Mining Permits in Drainage Basin:

17950105

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Water	0.663087	0.001036
Low Density Urban	2.239683	0.0035
Hay Pasture	67.252167	0.105082
Row Crops	144.545327	0.225852
Coniferous Forest	19.615917	0.03065
Mixed Forest	10.609664	0.016578
Deciduous Forest	349.680594	0.546376
Quarries	23.76412	0.037131
Transitional	25.088024	0.0392

Acreage Sum

643.458582

SQ_MI Sum

1.005404

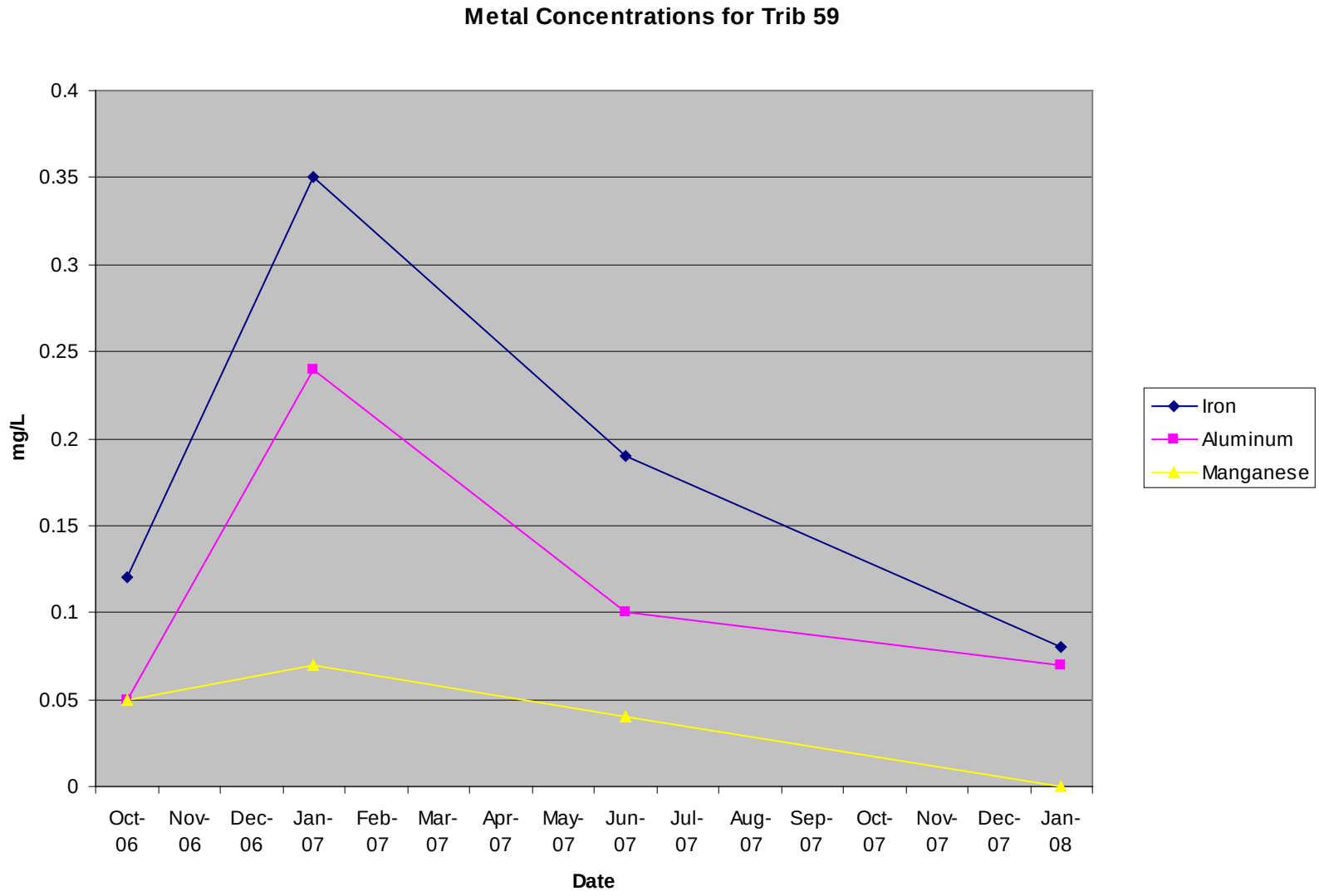
G. Pollution Sources: None

H. Additional Notes: A small coal refuse reclamation job occurred near the lower portion of the tributary. No name or sign was visible at the site.

Tributary Number 59

CCWA Monitoring Point: Trib Number 59																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
10/24/2006	CCWA	827.64	6.9	225	36	-7	22	0.12	0.05	0.05	67	3.1	144	-69.74	219.20	1.20	0.50	0.50	667.55
1/16/2007	CCWA	3061.56	6.9	155	27	-4	15	0.35	0.24	0.07	43	3.1	100	-147.43	552.84	12.90	8.85	2.58	1584.82
3/6/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
6/18/2007	CCWA	94.48	7.2	360	72	-29	47	0.19	0.1	0.04	106	7	143	-32.98	53.46	0.22	0.11	0.05	120.56
9/24/2007	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/8/2008	CCWA	514.94	7.3	275	58	-10	25	0.08	0.07	0.02	79	2.5	161	-61.99	154.98	0.50	0.43	0.12	489.73
Number of sample Dates	Count	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	Max	3061.56	7.3	360	72	-4	47	0.35	0.24	0.07	106	7	161	-32.98	552.84	12.90	8.85	2.58	1584.82
	Min	94.48	6.9	155	27	-29	15	0.08	0.05	0.02	43	2.5	100	-147.43	53.46	0.22	0.11	0.05	120.56
6	Average	1124.66	7.08	253.75	48.25	-12.50	27.25	0.19	0.12	0.05	73.75	3.93	137.00	-78.04	245.12	3.70	2.47	0.81	715.67

Date	BOD (mg/L)	Fecal Col (c/100mL)	BOD (lbs/day)	Fecal Col (#/day)
10/24/2006	3	60	29.89038	2.71E+09
1/16/2007	2	5	73.71257	8.34E+08
3/6/2007	--	--	--	--
6/18/2007	2	120	2.274776	6.18E+08
9/24/2007	--	--	--	--
1/8/2008	3	5	18.59716	1.4E+08
Count	4	4	4	4
Max	3	120	73.71257	2.71E+09
Min	2	5	2.274776	1.4E+08
Average	2.5	47.5	31.11872	1.07E+09


Metal Concentrations for Trib 59
mg/L
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Dec-07
Jan-08
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-60	Subwatershed Boundry Outline (topography)
B-IN-60	Subwatershed Industrial Influences
B-SO-60	Subwatershed Soils
B-AP-60	Subwatershed Aerial Photography
B-SG-60	Subwatershed Surface Geology

Tributary 60, Rattling Run **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Ferguson Township; Newburg Borough, Clearfield County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded

II. Quadrangle: Westover, PA (Wetlands Online Mapper used)

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcg	Glenshaw Formation	228.261601	0.356659
Pa	Allegheny Formation	105.320398	0.164563

ACREAGE Sum

333.581999

SQ_MI Sum

0.521222

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
HaD	3.242167	0.005066	General Soils
RbF	64.298403	0.100466	General Soils
RcD	57.381847	0.089659	General Soils

SubShedSoilsClearfield.ACREAGE Sum

124.922418

SubShedSoilsClearfield.SQ_MI Sum

0.195191

HYDRIC SOILS			
ErB	20.884633	0.032632	Hydric Soils
ErC	63.07703	0.098558	Hydric Soils
ExD	15.081329	0.023565	Hydric Soils
TyB	0.157509	0.000246	Hydric Soils
WhC	16.698079	0.026091	Hydric Soils

SubShedSoilsClearfield.ACREAGE Sum

115.89858

SubShedSoilsClearfield.SQ_MI Sum

0.181092

PRIME FARMLAND SOILS

ClB	3.898959	0.006092	Prime Farmland Soils
GlB	24.018053	0.037528	Prime Farmland Soils
RaB	3.167338	0.004949	Prime Farmland Soils
WhB	3.97812	0.006216	Prime Farmland Soils

SubShedSoilsClearfield.ACREAGE Sum

35.062471

SubShedSoilsClearfield.SQ_MI Sum

0.054785

STATEWIDE IMPORTANT SOILS

ClC	18.126538	0.028323	Statewide Important Soils
GlC	39.011839	0.060956	Statewide Important Soils

SubShedSoilsClearfield.ACREAGE Sum

57.138376

SubShedSoilsClearfield.SQ_MI Sum

0.089279

WATER

W	0.560153	0.000875	Water

SubShedSoilsClearfield.ACREAGE Sum

0.560153

SubShedSoilsClearfield.SQ_MI Sum

0.000875

E. Mining:

I. Mining Permits in Drainage Basin:

17080104

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Water	0.221029	0.000345
Low Density Urban	0.221029	0.000345
Hay Pasture	37.405995	0.058447
Row Crops	42.765306	0.066821
Coniferous Forest	10.585349	0.01654
Mixed Forest	0.442058	0.000691
Deciduous Forest	234.731629	0.366768
Transitional	7.209601	0.011265

Acreage Sum

333.581995

SQ_MI Sum

0.521222

G. Pollution Sources: None

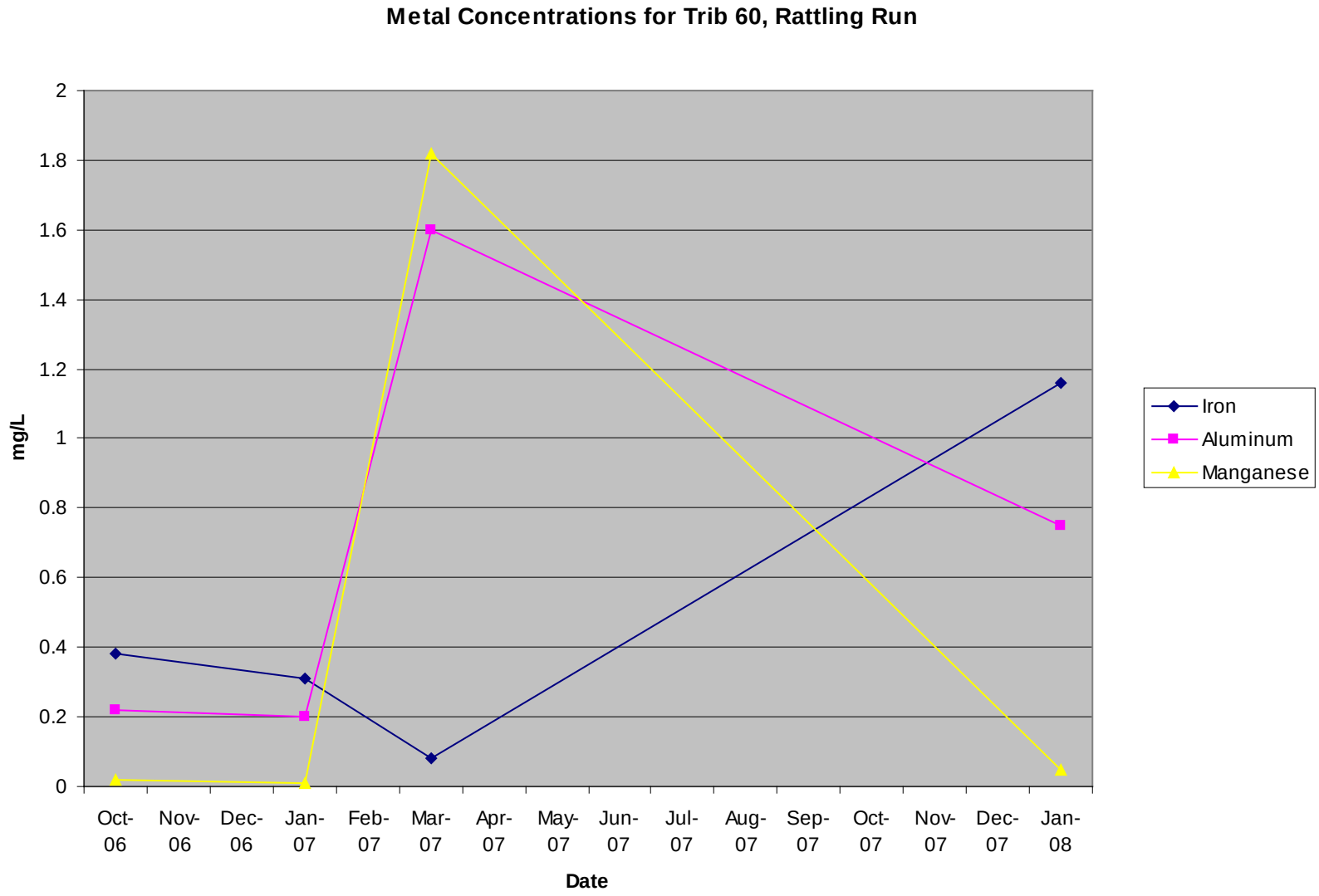
H. Additional Notes: P&N Coal Company has a permit to start mining in this watershed.

Tributary Number 60, Rattling Run

Clearfield County; Ferguson Township, Newburg Borough

CCWA Monitoring Point: Trib Number 60, Rattling Run																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
10/25/2006	CCWA	208.08	6.6	59	35	2	12	0.38	0.22	0.02	13	3.1	49	5.01	30.06	0.95	0.55	0.05	32.56
1/17/2007	CCWA	1145.77	6.3	53	12	5	8	0.31	0.2	0.01	12	7.1	40	68.97	110.35	4.28	2.76	0.14	165.52
3/6/2007	CCWA	552.91	6.4	49	5	8	8	0.08	1.6	1.82	12	2.5	47	53.25	53.25	0.53	10.65	12.11	79.87
6/19/2007	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9/25/2007	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/9/2008	CCWA	304.89	6.8	68	45	4	10	1.16	0.75	0.05	12	2.5	41	14.68	36.70	4.26	2.75	0.18	44.04
Number of sample Dates	Count	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	Max	1145.77	6.8	68	45	8	12	1.16	1.6	1.82	13	7.1	49	68.97	110.35	4.28	10.65	12.11	165.52
	Min	208.08	6.3	49	5	2	8	0.08	0.2	0.01	12	2.5	40	5.01	30.06	0.53	0.55	0.05	32.56
6	Average	552.91	6.53	57.25	24.25	4.75	9.50	0.48	0.69	0.48	12.25	3.80	44.25	35.48	57.59	2.50	4.18	3.12	80.50

Date	BOD (mg/L)	Fecal Col (c/100mL)	BOD (lbs/day)	Fecal Col (#/day)
10/25/2006	3	5	7.514851	56711954
1/17/2007	1	5	13.79324	3.12E+08
3/6/2007	1.5	5	9.984228	1.51E+08
6/19/2007	--	--	--	--
9/25/2007	--	--	--	--
1/9/2008	1.5	30	5.505582	4.99E+08
Count	4	4	4	4
Max	3	30	13.79324	4.99E+08
Min	1	5	5.505582	56711954
Average	1.75	11.25	9.199474	2.55E+08


Metal Concentrations for Trib 60, Rattling Run
mg/L
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Dec-07
Jan-08
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-61	Subwatershed Boundry Outline (topography)
B-IN-61	Subwatershed Industrial Influences
B-SO-61	Subwatershed Soils
B-AP-61	Subwatershed Aerial Photography
B-SG-61	Subwatershed Surface Geology

Tributary 61 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Bell Township, Clearfield County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded
PEM1A- Palustrine, emergent, persistent, temporary

II. Quadrangle: Westover, PA (Wetlands Online Mapper used)

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcg	Glenshaw Formation	446.519643	0.697687
Pa	Allegheny Formation	45.506898	0.071105

ACREAGE Sum

492.026541

SQ_MI Sum

0.768791

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
BeD	11.600881	0.018126	General Soils
RbF	91.843823	0.143506	General Soils
RcD	41.801734	0.065315	General Soils
WhD	3.827708	0.005981	General Soils

SubShedSoilsClearfield.ACREAGE Sum

149.074146

SubShedSoilsClearfield.SQ_MI Sum

0.232928

HYDRIC SOILS			
At	0.121679	0.00019	Hydric Soils
BrB	18.783332	0.029349	Hydric Soils
CaB	56.07148	0.087612	Hydric Soils
ErB	43.851831	0.068518	Hydric Soils
ErC	26.998587	0.042185	Hydric Soils
WhC	40.078841	0.062623	Hydric Soils

SubShedSoilsClearfield.ACREAGE Sum

185.905749

SubShedSoilsClearfield.SQ_MI Sum

0.290478

PRIME FARMLAND SOILS

ClB	3.170698	0.004954	Prime Farmland Soils
GlB	44.841316	0.070065	Prime Farmland Soils
RaB	23.999078	0.037499	Prime Farmland Soils
WhB	59.809666	0.093453	Prime Farmland Soils

SubShedSoilsClearfield.ACREAGE Sum

131.820758

SubShedSoilsClearfield.SQ_MI Sum

0.20597

STATEWIDE IMPORTANT SOILS

GlC	25.21976	0.039406	Statewide Important Soils

SubShedSoilsClearfield.ACREAGE Sum

25.21976

SubShedSoilsClearfield.SQ_MI Sum

0.039406

WATER

W	0.006121	0.00001	Water

SubShedSoilsClearfield.ACREAGE Sum

0.006121

SubShedSoilsClearfield.SQ_MI Sum

0.00001

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Water	0.221029	0.000345
Low Density Urban	0.576061	0.0009
Hay Pasture	71.132147	0.111144
Row Crops	151.69214	0.237019
Coniferous Forest	24.69957	0.038593
Mixed Forest	3.912687	0.006114
Deciduous Forest	215.399862	0.336562
Transitional	23.725996	0.037072

Acreage Sum

491.359493

SQ_MI Sum

0.767749

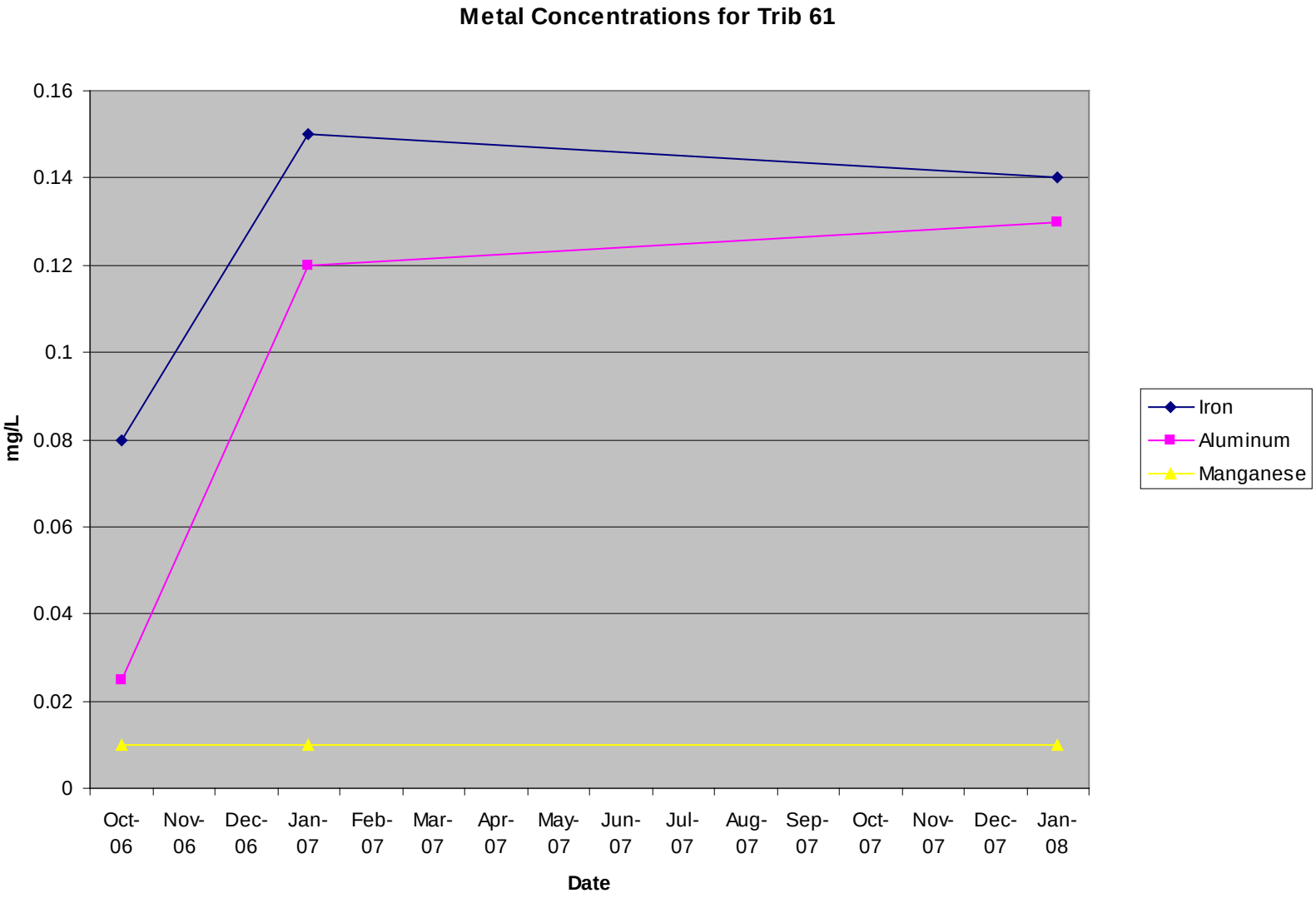
G. Pollution Sources: None

H. Additional Notes: None

Tributary Number 61
Clearfield County; Bell Township

CCWA Monitoring Point: Trib Number 61														Loading					
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.						
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
10/26/2006	CCWA	481.95	6.8	65	35	5	8	0.08	0.025	0.01	10	3.1	37	29.01	46.42	0.46	0.15	0.06	58.02
1/17/2007	CCWA	1182.58	6.2	57	20	6	7	0.15	0.12	0.01	11	7.1	36	85.42	99.65	2.14	1.71	0.14	156.60
3/8/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
6/19/2007	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9/25/2007	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/9/2008	CCWA	498.25	9.2	76	40	0	14	0.14	0.13	0.01	11	2.5	44	0.00	83.97	0.84	0.78	0.06	65.98
Number of sample Dates	Count	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Max	1182.58	9.2	76	40	6	14	0.15	0.13	0.01	11	7.1	44	85.42	99.65	2.14	1.71	0.14	156.60
	Min	481.95	6.2	57	20	0	7	0.08	0.025	0.01	10	2.5	36	0.00	46.42	0.46	0.15	0.06	58.02
6	Average	720.93	7.40	66.00	31.67	3.67	9.67	0.12	0.09	0.01	10.67	4.23	39.00	38.14	76.68	1.15	0.88	0.09	93.53

Date	BOD (mg/L)	Fecal Col (c/100mL)	BOD (lbs/day)	Fecal Col (#/day)
10/26/2006	3	5	17.40572	1.31E+08
1/17/2007	1.5	5	21.35456	3.22E+08
3/8/2007	Frozen	Frozen	Frozen	Frozen
6/19/2007	--	--	--	--
9/25/2007	--	--	--	--
1/9/2008	1.5	5	8.997199	1.36E+08
Count	3	3	3	3
Max	3	5	21.35456	3.22E+08
Min	1.5	5	8.997199	1.31E+08
Average	2	5	15.91916	1.96E+08


Metal Concentrations for Trib 61
mg/L
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Dec-07
Jan-08
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-62	Subwatershed Boundry Outline (topography)
B-IN-62	Subwatershed Industrial Influences
B-SO-62	Subwatershed Soils
B-AP-62	Subwatershed Aerial Photography
B-SG-62	Subwatershed Surface Geology

Tributary 62, Snyder Run **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Ferguson Township; Bell Township, Clearfield County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded
PUBHx- Palustrine, unconsolidated bottom, permanent, excavated
PEM1C- Palustrine, emergent, persistent, seasonal
PEM1A- Palustrine, emergent, persistent, temporary
PSS1C- Palustrine, scrub/ shrub, broad-leaved deciduous, seasonal

II. Quadrangle: Westover, PA (Wetlands Online Mapper used)

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcc	Casselman Formation	6.62073	0.010345
Pcg	Glenshaw Formation	2590.749724	4.048046
Pa	Allegheny Formation	842.805496	1.316884

ACREAGE Sum

3440.17595

SQ_MI Sum

5.375275

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
95D	137.04497	0.214133	General Soils
BeD	3.898691	0.006092	General Soils
ErD	99.789631	0.155921	General Soils
RbF	1183.673304	1.84949	General Soils
RcD	226.964194	0.354632	General Soils
WhD	26.333161	0.041146	General Soils

SubShedSoilsClearfield.ACREAGE Sum

1677.703951

SubShedSoilsClearfield.SQ_MI Sum

2.621412

HYDRIC SOILS			
92D	373.17383	0.583084	Hydric Soils
At	133.713128	0.208927	Hydric Soils
ErB	119.377814	0.186528	Hydric Soils

ErC	172.895439	0.270149	Hydric Soils
ExD	9.80622	0.015322	Hydric Soils
WhC	175.893911	0.274834	Hydric Soils

SubShedSoilsClearfield.ACREAGE Sum

984.860342

SubShedSoilsClearfield.SQ_MI Sum

1.538844

PRIME FARMLAND SOILS

GlB	240.553786	0.375865	Prime Farmland Soils
RaB	37.974288	0.059335	Prime Farmland Soils
WhB	114.869748	0.179484	Prime Farmland Soils

SubShedSoilsClearfield.ACREAGE Sum

393.397821

SubShedSoilsClearfield.SQ_MI Sum

0.614684

STATEWIDE IMPORTANT SOILS

BeB	21.297582	0.033277	Statewide Important Soils
GlC	321.002048	0.501566	Statewide Important Soils
MoB	3.835199	0.005992	Statewide Important Soils

SubShedSoilsClearfield.ACREAGE Sum

346.13483

SubShedSoilsClearfield.SQ_MI Sum

0.540836

STRIP MINES

93B	20.414838	0.031898	Strip Mines
93D	16.726094	0.026135	Strip Mines

SubShedSoilsClearfield.ACREAGE Sum

37.140933

SubShedSoilsClearfield.SQ_MI Sum

0.058033

WATER

W	0.938148	0.001466	Water

SubShedSoilsClearfield.ACREAGE Sum

0.938148

SubShedSoilsClearfield.SQ_MI Sum

0.001466

E. Mining:

I. Mining Permits in Drainage Basin:

17080104

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Low Density Urban	7.940011	0.012406
Hay Pasture	408.632038	0.638488
Row Crops	442.120433	0.690813
Coniferous Forest	108.985046	0.170289
Mixed Forest	24.358962	0.038061
Deciduous Forest	2144.787618	3.351231
Quarries	158.681961	0.247941
Coal Mines	1.150962	0.001798
Transitional	136.008381	0.212513
Acreage Sum		
3432.665413		
SQ_MI Sum		
5.36354		

G. Pollution Sources: None

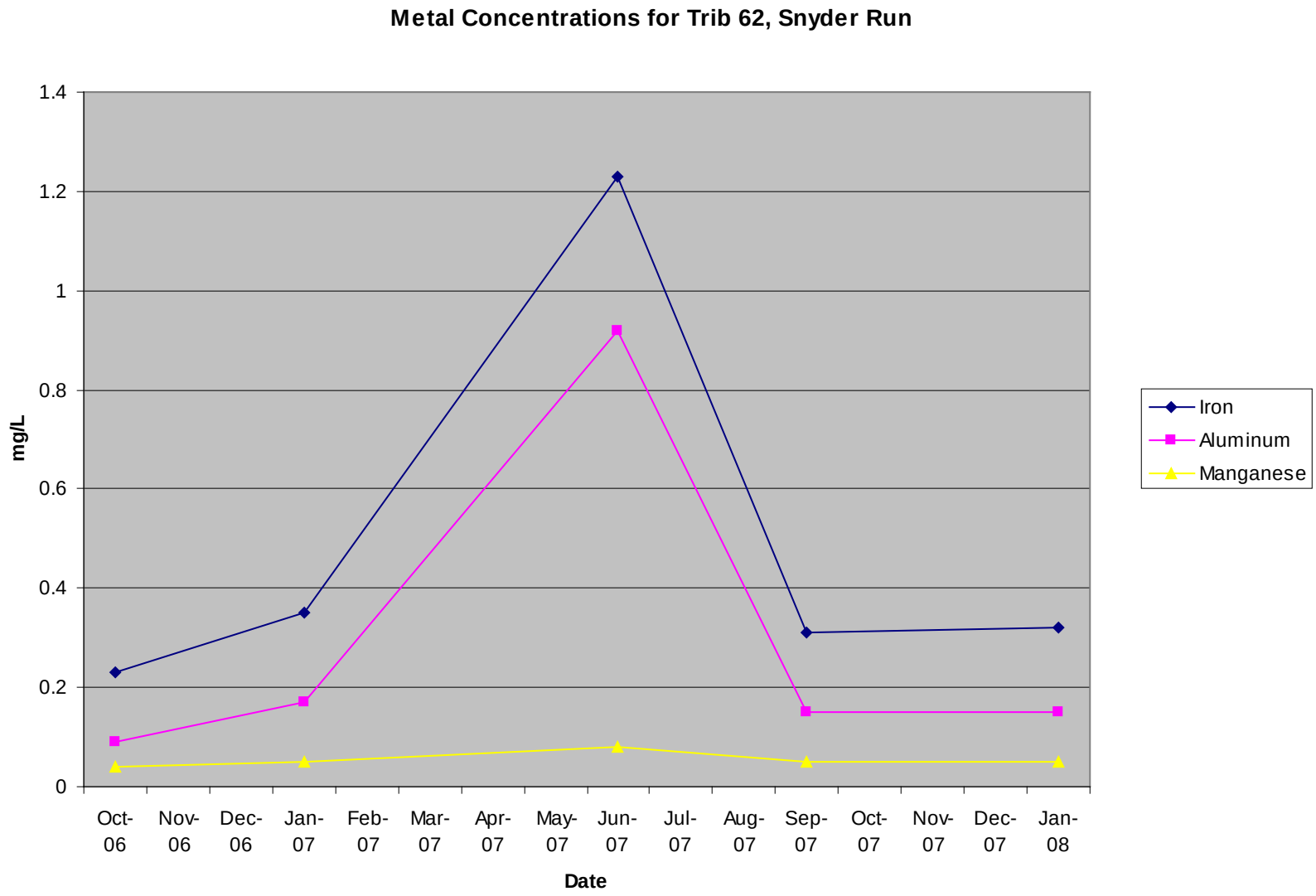
H. Additional Notes: P&N Coal Company has a permit to start mining in this watershed.

Tributary Number 62, Snyder Run

Clearfield County; Ferguson Township, Bell Township

CCWA Monitoring Point: Trib Number 62, Snyder Run																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Pigmy)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
10/25/2006	CCWA	3325.47	7.5	240	36	-32	47	0.23	0.09	0.04	153	3.1	153	-1281.07	1881.57	9.21	3.60	1.60	6125.10
1/18/2007	CCWA	11110.79	7.3	216	22	-24	38	0.35	0.17	0.05	50	2.5	127	-3210.15	5082.73	46.81	22.74	6.69	6687.81
3/8/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
6/20/2007	CCWA	787.25	7.4	306	65	-56	75	1.23	0.92	0.08	58	6	131	-530.72	710.79	11.66	8.72	0.76	549.68
9/25/2007	CCWA	113.78	8	493	69	-113	131	0.31	0.15	0.05	110	2.5	323	-154.78	179.43	0.42	0.21	0.07	150.67
1/9/2008	CCWA	3777.49	7.7	224	40	-27	39	0.32	0.15	0.05	49	2.5	121	-1227.82	1773.52	14.55	6.82	2.27	2228.27
Number of sample Dates	Count	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Max	11110.79	8	493	69	-24	131	1.23	0.92	0.08	153	6	323	-154.78	5082.73	46.81	22.74	6.69	6687.81
	Min	113.78	7.3	216	22	-113	38	0.23	0.09	0.04	49	2.5	121	-3210.15	179.43	0.42	0.21	0.07	150.67
6	Average	3822.96	7.58	295.80	46.40	-50.40	66.00	0.49	0.30	0.05	84.00	3.32	171.00	-1280.91	1925.61	16.53	8.42	2.28	3148.31

Date	BOD (mg/L)	Fecal Col (c/100mL)	BOD (lbs/day)	Fecal Col (#/day)
10/25/2006	3	50	120.1	9.06E+09
1/18/2007	1.5	10	200.6342	6.06E+09
3/8/2007	Frozen	Frozen	Frozen	Frozen
6/20/2007	1.5	500	14.21585	2.15E+10
9/25/2007	1.5	140	2.054594	8.68E+08
1/9/2008	1.5	20	68.2124	4.12E+09
Count	5	5	5	5
Max	3	500	200.6342	2.15E+10
Min	1.5	10	2.054594	8.68E+08
Average	1.8	144	81.04341	8.31E+09


Metal Concentrations for Trib 62, Snyder Run
mg/L
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Dec-07
Jan-08
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-63	Subwatershed Boundry Outline (topography)
B-IN-63	Subwatershed Industrial Influences
B-SO-63	Subwatershed Soils
B-AP-63	Subwatershed Aerial Photography
B-SG-63	Subwatershed Surface Geology

Tributary 63 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Bell Township; Mahaffey Borough, Clearfield County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:

I. Habitat Types: none mapped

II. Quadrangle: Westover, PA (Wetlands Online Mapper used)

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcg	Glenshaw Formation	90.974403	0.142148
Pa	Allegheny Formation	63.805973	0.099697

ACREAGE Sum

154.780376

SQ_MI Sum

0.241844

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
RbF	85.465233	0.133539	General Soils
RcD	17.59702	0.027495	General Soils

SubShedSoilsClearfield.ACREAGE Sum

103.062254

SubShedSoilsClearfield.SQ_MI Sum

0.161035

HYDRIC SOILS			
At	1.324491	0.00207	Hydric Soils
ErB	6.295024	0.009836	Hydric Soils
ErC	15.748385	0.024607	Hydric Soils
WhC	17.981206	0.028096	Hydric Soils

SubShedSoilsClearfield.ACREAGE Sum

41.349105

SubShedSoilsClearfield.SQ_MI Sum

0.064608

PRIME FARMLAND SOILS			
GlB	7.302655	0.01141	Prime Farmland Soils

SubShedSoilsClearfield.ACREAGE Sum

7.302655

SubShedSoilsClearfield.SQ_MI Sum

0.01141

STATEWIDE IMPORTANT SOILS

GlC 3.054783 0.004773 Statewide Important Soils

SubShedSoilsClearfield.ACREAGE Sum

3.054783

SubShedSoilsClearfield.SQ_MI Sum

0.004773

WATER

W 0.011577 0.000018 Water

SubShedSoilsClearfield.ACREAGE Sum

0.011577

SubShedSoilsClearfield.SQ_MI Sum

0.000018

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Low Density Urban	0.606474	0.000948
Hay Pasture	10.873395	0.01699
Row Crops	19.995318	0.031243
Coniferous Forest	11.961383	0.01869
Mixed Forest	0.30003	0.000469
Deciduous Forest	108.064117	0.16885
Quarries	0.221028	0.000345
Transitional	2.102087	0.003285

Acreage Sum

154.123833

SQ_MI Sum

0.240818

G. Pollution Sources: None

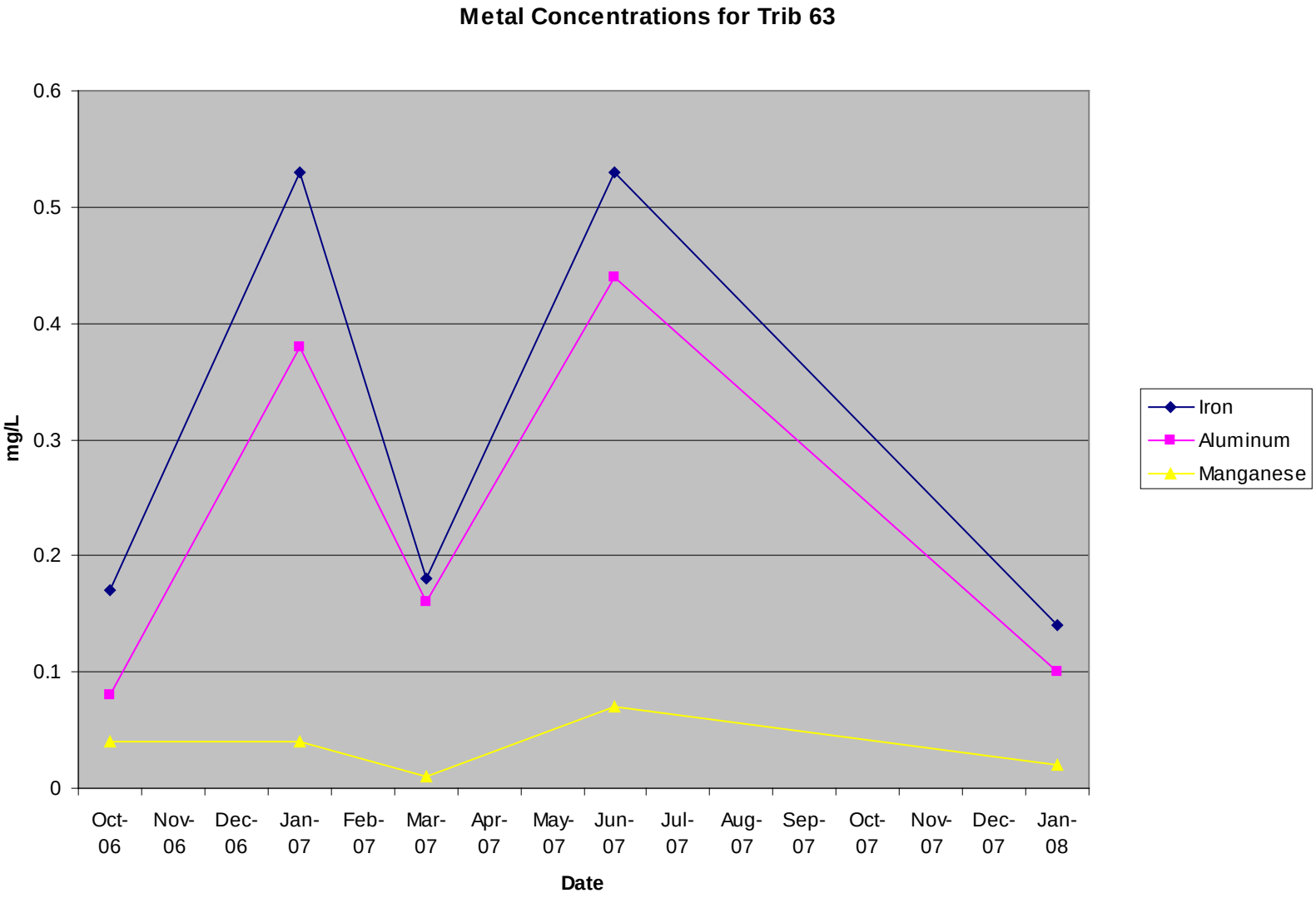
H. Additional Notes: None

Tributary Number 63

Clearfield County; Bell Township, Mahaffey Borough

CCWA Monitoring Point: Trib Number 63																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Bucket)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
10/25/2006	CCWA	77.48	6.6	78	39	1	16	0.17	0.08	0.04	16	8.6	61	0.93	14.92	0.16	0.07	0.04	14.92
1/17/2007	CCWA	2.9	6.4	62	22	3	11	0.53	0.38	0.04	15	7.1	40	0.10	0.38	0.02	0.01	0.00	0.52
3/8/2007	CCWA	42.27	6.7	70	7	5	13	0.18	0.16	0.01	15	2.5	44	2.54	6.62	0.09	0.08	0.01	7.63
6/20/2007	CCWA	5.82	6.5	101	67	-5	24	0.53	0.44	0.07	15	2.5	44	-0.35	1.68	0.04	0.03	0.00	1.05
9/26/2007	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/10/2008	CCWA	82.87	7	77	34	0	14	0.14	0.1	0.02	15	2.5	47	0.00	13.97	0.14	0.10	0.02	14.96
Number of sample Dates	Count	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Max	82.87	7	101	67	5	24	0.53	0.44	0.07	16	8.6	61	2.54	14.92	0.16	0.10	0.04	14.96
	Min	2.9	6.4	62	7	-5	11	0.14	0.08	0.01	15	2.5	40	-0.35	0.38	0.02	0.01	0.00	0.52
6	Average	42.27	6.64	77.60	33.80	0.80	15.60	0.31	0.23	0.04	15.20	4.64	47.20	0.65	7.51	0.09	0.06	0.01	7.82

	BOD	Fecal Col	BOD	Fecal Col
Date	(mg/L)	(c/100mL)	(lbs/day)	(#/day)
10/25/2006	3	10	2.798206	42234162
1/17/2007	1.5	5	0.052367	790391.5
3/8/2007	1.5	5	0.763295	11520638
6/20/2007	1	320	0.070063	1.02E+08
9/26/2007	--	--	--	--
1/10/2008	1.5	10	1.496433	45172238
Count	5	5	5	5
Max	3	320	2.798206	1.02E+08
Min	1	5	0.052367	790391.5
Average	1.7	70	1.036073	40247281


Metal Concentrations for Trib 63
mg/L
0.6
0.5
0.4
0.3
0.2
0.1
0
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Dec-07
Jan-08
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-64	Subwatershed Boundry Outline (topography)
B-IN-64	Subwatershed Industrial Influences
B-SO-64	Subwatershed Soils
B-AP-64	Subwatershed Aerial Photography
B-SG-64	Subwatershed Surface Geology

Tributary 64 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Bell Township, Clearfield County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PUBHh- Palustrine, unconsolidated bottom, permanent, diked/ impounded

II. Quadrangle: Westover, PA (Wetlands Online Mapper used)

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcg	Glenshaw Formation	264.907544	0.413918
Pa	Allegheny Formation	157.971868	0.246831

ACREAGE Sum

422.879412

SQ_MI Sum

0.660749

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
95D	45.047876	0.070387	General Soils
RbF	25.012401	0.039082	General Soils
RcD	36.467434	0.05698	General Soils

SubShedSoilsClearfield.ACREAGE Sum

106.527711

SubShedSoilsClearfield.SQ_MI Sum

0.16645

HYDRIC SOILS			
BrB	6.907039	0.010792	Hydric Soils
ErB	68.016557	0.106276	Hydric Soils
ErC	53.217869	0.083153	Hydric Soils
WhC	22.765885	0.035572	Hydric Soils

SubShedSoilsClearfield.ACREAGE Sum

150.90735

SubShedSoilsClearfield.SQ_MI Sum

0.235793

PRIME FARMLAND SOILS			
GlB	35.568371	0.055576	Prime Farmland Soils

WhB 34.654462 0.054148 Prime Farmland Soils

SubShedSoilsClearfield.ACREAGE Sum

70.222833

SubShedSoilsClearfield.SQ_MI Sum

0.109723

STATEWIDE IMPORTANT SOILS

GlC 91.336854 0.142714 Statewide Important Soils

MoB 3.198408 0.004998 Statewide Important Soils

SubShedSoilsClearfield.ACREAGE Sum

94.535263

SubShedSoilsClearfield.SQ_MI Sum

0.147711

WATER

W 0.68628 0.001072 Water

SubShedSoilsClearfield.ACREAGE Sum

0.68628

SubShedSoilsClearfield.SQ_MI Sum

0.001072

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Low Density Urban	14.027802	0.021918
Hay Pasture	69.978579	0.109342
Row Crops	73.252897	0.114458
Coniferous Forest	13.622365	0.021285
Mixed Forest	3.751997	0.005862
Deciduous Forest	231.728622	0.362076
Quarries	0.221028	0.000345
Transitional	14.069775	0.021984

Acreage Sum

420.653066

SQ_MI Sum

0.65727

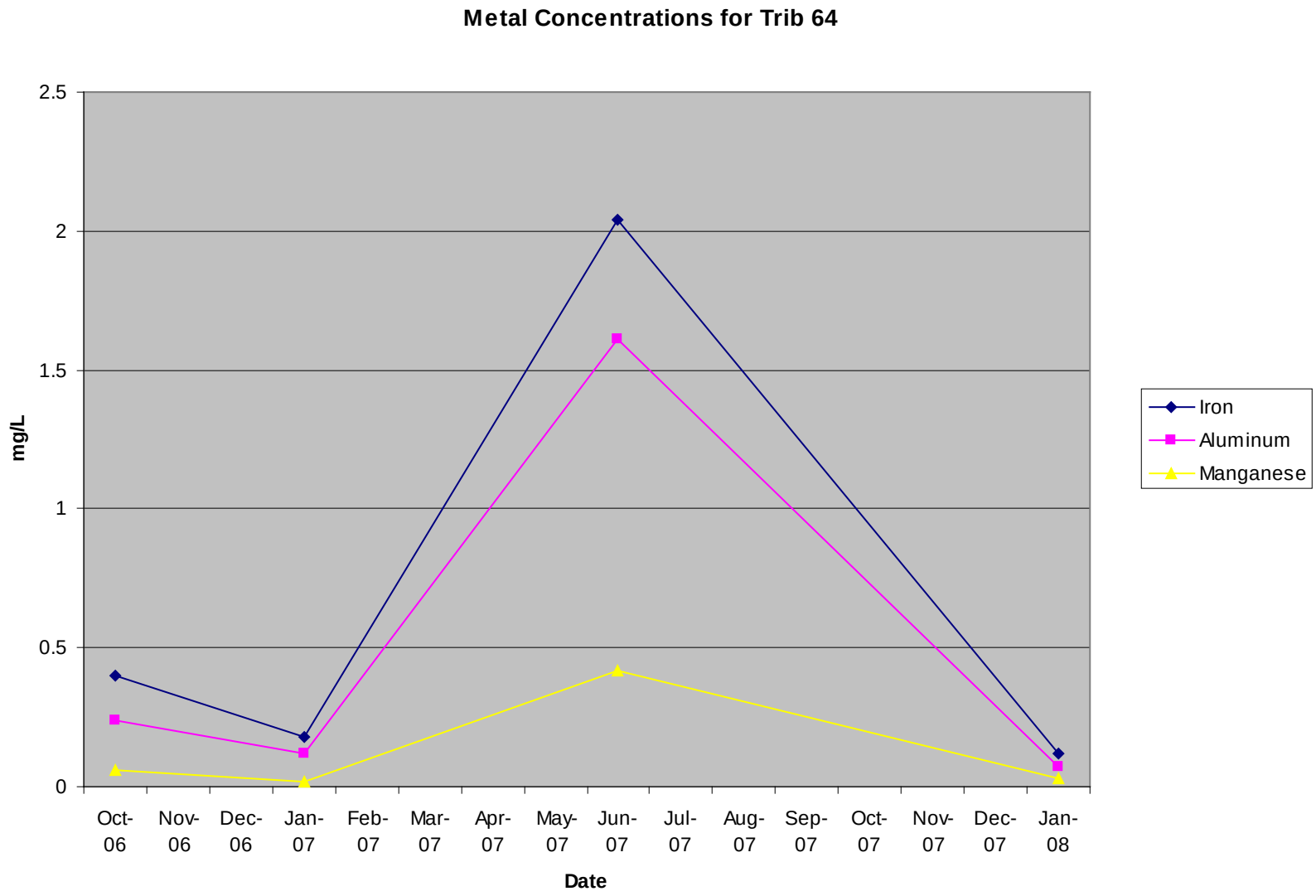
G. Pollution Sources: Sewage Infiltration

H. Additional Notes: This tributary is recommended for remediaition. The tributary shows infiltration of Fecal Coliform which is a Health Hazard and needs to be brought to the attention of the local municipality.

Tributary Number 64
Clearfield County; Bell Township

CCWA Monitoring Point: Trib Number 64																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
		(Method)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
10/26/2006	CCWA	591.69	7.1	89	40	-6	16	0.4	0.24	0.06	15	3.1	56	-42.74	113.97	2.85	1.71	0.43	106.85
1/18/2007	CCWA	1043.35	6.7	76	23	1	11	0.18	0.12	0.02	16	2.5	46	12.56	138.16	2.26	1.51	0.25	200.96
3/8/2007	CCWA	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
6/21/2007	CCWA	24.6	6.8	141	64	-14	34	2.04	1.61	0.42	13	13	85	-4.15	10.07	0.60	0.48	0.12	3.85
9/26/2007	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/16/2008	CCWA	347.17	6.8	81	28	1	11	0.12	0.07	0.03	15	2.5	46	4.18	45.97	0.50	0.29	0.13	62.69
Number of sample Dates	Count	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	Max	1043.35	7.1	141	64	1	34	2.04	1.61	0.42	16	13	85	12.56	138.16	2.85	1.71	0.43	200.96
	Min	24.6	6.7	76	23	-14	11	0.12	0.07	0.02	13	2.5	46	-42.74	10.07	0.50	0.29	0.12	3.85
6	Average	501.70	6.85	96.75	38.75	-4.50	18.00	0.69	0.51	0.13	14.75	5.28	58.25	-7.54	77.04	1.55	1.00	0.23	93.59

	BOD	Fecal Col	BOD	Fecal Col
Date	(mg/L)	(c/100mL)	(lbs/day)	(#/day)
10/26/2006	3	80	21.369	2.58E+09
1/18/2007	1.5	5	18.8404	2.84E+08
3/8/2007	Frozen	Frozen	Frozen	Frozen
6/21/2007	1.5	650	0.444217	8.72E+08
9/26/2007	--	--	--	--
1/16/2008	1.5	470	6.269057	8.89E+09
Count	4	4	4	4
Max	3	650	21.369	8.89E+09
Min	1.5	5	0.444217	2.84E+08
Average	1.875	301.25	11.73067	3.16E+09


Metal Concentrations for Trib 64
mg/L
2.5
2
1.5
1
0.5
0
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Dec-07
Jan-08
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-65	Subwatershed Boundry Outline (topography)
B-IN-65	Subwatershed Industrial Influences
B-SO-65	Subwatershed Soils
B-AP-65	Subwatershed Aerial Photography
B-SG-65	Subwatershed Surface Geology

Tributary 65 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Mahaffey Borough; Bell Township, Clearfield County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:

I. Habitat Types:

PUBF- Palustrine, unconsolidated bottom, semiperminent

II. Quadrangle: Westover, PA (Wetlands Online Mapper used)

D. Geology and Soils:

I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcg	Glenshaw Formation	60.655515	0.094774
Pa	Allegheny Formation	50.147254	0.078355

ACREAGE Sum

110.802768

SQ_MI Sum

0.173129

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
RbF	54.141345	0.084596	General Soils
RcD	17.637466	0.027559	General Soils
WhD	4.215722	0.006587	General Soils

SubShedSoilsClearfield.ACREAGE Sum

75.994533

SubShedSoilsClearfield.SQ_MI Sum

0.118741

HYDRIC SOILS			
At	1.349657	0.002109	Hydric Soils
ErB	1.157529	0.001809	Hydric Soils
ErC	3.94565	0.006165	Hydric Soils
WhC	5.33402	0.008334	Hydric Soils

SubShedSoilsClearfield.ACREAGE Sum

11.786857

SubShedSoilsClearfield.SQ_MI Sum

0.018417

PRIME FARMLAND SOILS			
GlB	14.89738	0.023277	Prime Farmland Soils

SubShedSoilsClearfield.ACREAGE Sum

14.89738

SubShedSoilsClearfield.SQ_MI Sum

0.023277

STATEWIDE IMPORTANT SOILS

GlC 7.716849 0.012058 Statewide Important Soils

SubShedSoilsClearfield.ACREAGE Sum

7.716849

SubShedSoilsClearfield.SQ_MI Sum

0.012058

WATER

W 0.407142 0.000636 Water

SubShedSoilsClearfield.ACREAGE Sum

0.407142

SubShedSoilsClearfield.SQ_MI Sum

0.000636

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Low Density Urban	0.96829	0.001513
Hay Pasture	3.384397	0.005288
Row Crops	9.625525	0.01504
Coniferous Forest	9.060515	0.014157
Mixed Forest	0.663002	0.001036
Deciduous Forest	83.440015	0.130375
Transitional	2.981199	0.004658

Acreage Sum

110.122943

SQ_MI Sum

0.172067

G. Pollution Sources: None

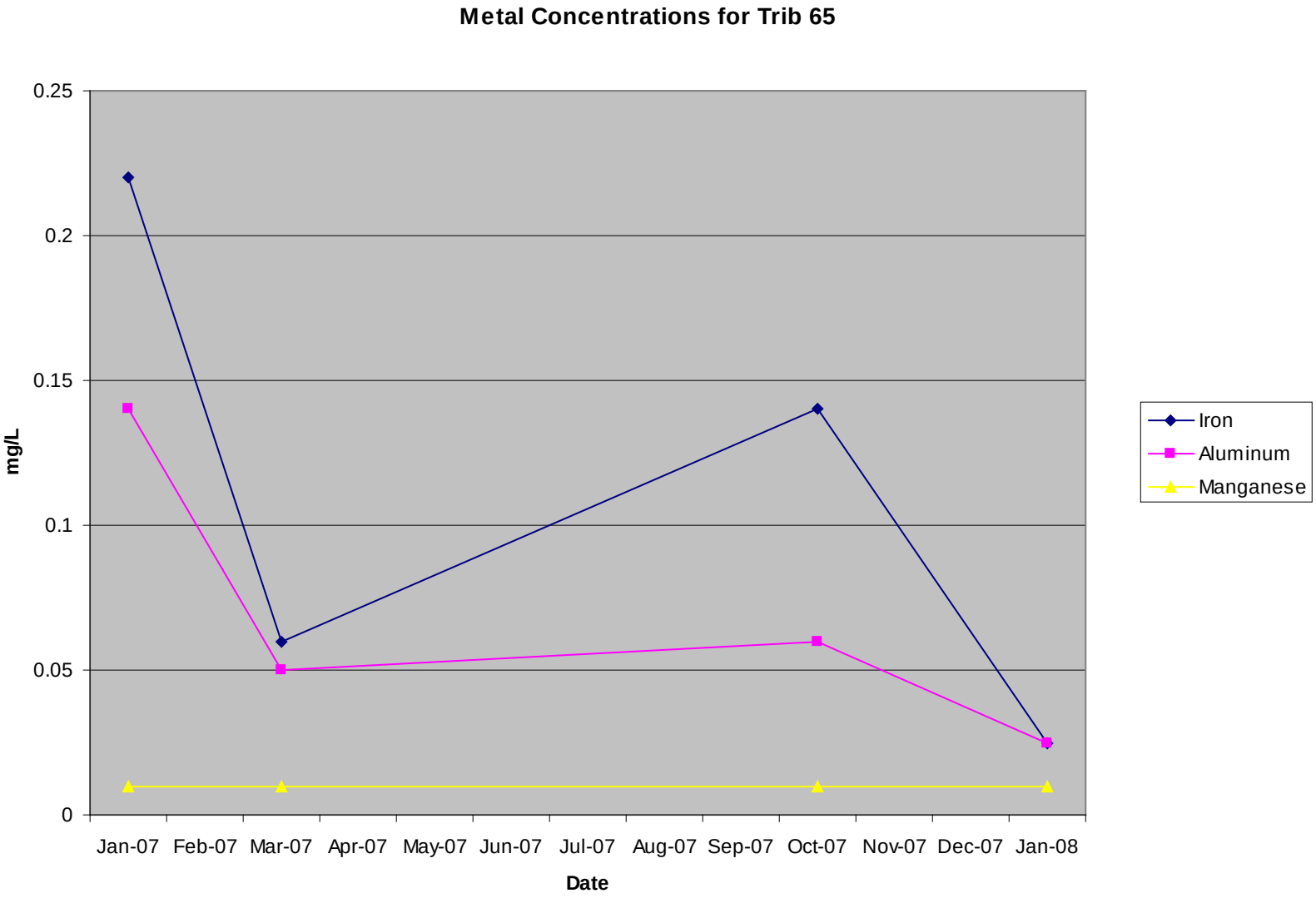
H. Additional Notes: None

Tributary Number 65

Clearfield County; Bell Township, Mahaffey Borough

CCWA Monitoring Point: Trib Number 65																			
Sample		Flow	Lab	Lab	Air	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.	Loading					
		(Method)	pH	Conductivity	Temp			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
10/26/2007	CCWA	32.85	7.5	230	40	-26	36	0.14	0.06	0.01	17	3.1	126	-10.28	14.24	0.06	0.02	0.00	6.72
1/17/2007	CCWA	226.39	6.6	152	23	-1	18	0.22	0.14	0.01	15	3.1	80	-2.73	49.06	0.60	0.38	0.03	40.88
3/8/2007	CCWA	116.28	7	340	7	-8	24	0.06	0.05	0.01	16	2.5	184	-11.20	33.60	0.08	0.07	0.01	22.40
6/21/2007	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9/27/2007	CCWA	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/10/2008	CCWA	89.59	7.4	313	37	-12	26	0.025	0.025	0.01	16	2.5	169	-12.94	28.04	0.03	0.03	0.01	17.26
Number of sample Dates	Count	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	Max	226.39	7.5	340	40	-1	36	0.22	0.14	0.01	17	3.1	184	-2.73	49.06	0.60	0.38	0.03	40.88
	Min	32.85	6.6	152	7	-26	18	0.025	0.025	0.01	15	2.5	80	-12.94	14.24	0.03	0.02	0.00	6.72
6	Average	116.28	7.13	258.75	26.75	-11.75	26.00	0.11	0.07	0.01	16.00	2.80	139.75	-9.29	31.23	0.19	0.13	0.01	21.81

Date	BOD (mg/L)	Fecal Col (c/100mL)	BOD (lbs/day)	Fecal Col (#/day)
10/26/2007	3	20	1.186384	35812912
1/17/2007	1.5	60	4.08806	7.4E+08
3/8/2007	1.5	30	2.099738	1.9E+08
6/21/2007	--	--	--	--
9/27/2007	--	--	--	--
1/10/2008	1.5	10	1.61778	48835294
Count	4	4	4	4
Max	3	60	4.08806	7.4E+08
Min	1.5	10	1.186384	35812912
Average	1.875	30	2.247991	2.54E+08


Metal Concentrations for Trib 65
0.25
0.2
0.15
0.1
0.05
0
mg/L
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Dec-07
Jan-08
Date
Iron
Aluminum
Manganese

Chest Creek Watershed Assessment and Restoration Plan

Individual Subwatershed Maps:

Individual subwatershed maps were created for each individual tributary that was monitored during the study and can be found at the front of each individual tributary section. Each individual subwatershed has five maps:

B-66	Subwatershed Boundry Outline (topography)
B-IN-66	Subwatershed Industrial Influences
B-SO-66	Subwatershed Soils
B-AP-66	Subwatershed Aerial Photography
B-SG-66	Subwatershed Surface Geology

Tributary 66 **Refer to pages 142-143 for introduction and reference information for Individual Sections*

A. Location: Mahaffey Borough; Bell Township, Clearfield County

B. Chapter 93 Designation: CWF

C. National Wetlands Inventory Information:
I. Habitat Types: none mapped
II. Quadrangle: Westover, PA (Wetlands Online Mapper used)

D. Geology and Soils:
I. Surface Geology

SYMB	NAME	Acreage	Square Miles
Pcg	Glenshaw Formation	39.996981	0.062495
Pa	Allegheny Formation	65.168768	0.101826

ACREAGE Sum
105.165749
SQ_MI Sum
0.164321

II. Soils

MUSYM	ACREAGE	Square Miles	Soils Classification
GENERAL SOILS			
95D	20.236365	0.031619	General Soils
RbF	28.335645	0.044274	General Soils
RcD	24.389965	0.038109	General Soils

SubShedSoilsClearfield.ACREAGE Sum
72.961975
SubShedSoilsClearfield.SQ_MI Sum
0.114003

HYDRIC SOILS			
ErC	8.627141	0.01348	Hydric Soils
WhC	3.13394	0.004897	Hydric Soils

SubShedSoilsClearfield.ACREAGE Sum
11.761081
SubShedSoilsClearfield.SQ_MI Sum
0.018377

PRIME FARMLAND SOILS			
GlB	4.599312	0.007186	Prime Farmland Soils
Ph	0.206497	0.000323	Prime Farmland Soils
RaB	2.276429	0.003557	Prime Farmland Soils
WhB	2.027994	0.003169	Prime Farmland Soils

SubShedSoilsClearfield.ACREAGE Sum

9.110232

SubShedSoilsClearfield.SQ_MI Sum

0.014235

STATEWIDE IMPORTANT SOILS

GlC	5.776681	0.009026	Statewide Important Soils
MoB	5.555792	0.008681	Statewide Important Soils

SubShedSoilsClearfield.ACREAGE Sum

11.332473

SubShedSoilsClearfield.SQ_MI Sum

0.017707

E. Mining:

I. Mining Permits in Drainage Basin: N/A

* To see locations and information on coal mining operations, abandoned mine lands, and other industrial influences see the subwatershed industrial influences map.

F. Land Use:

Description	Acreage	SQ_MI
Low Density Urban	13.255794	0.020712
Hay Pasture	5.827111	0.009105
Row Crops	2.291518	0.00358
Coniferous Forest	4.257834	0.006653
Mixed Forest	0.221173	0.000346
Deciduous Forest	77.529467	0.12114
Transitional	0.852877	0.001333

Acreage Sum

104.235774

SQ_MI Sum

0.162868

G. Pollution Sources: Sewage Infiltration

H. Additional Notes: This tributary is recommended for remediation. The tributary runs through the middle of town via a pipe. Visable raw sewage was documented on two occasions.

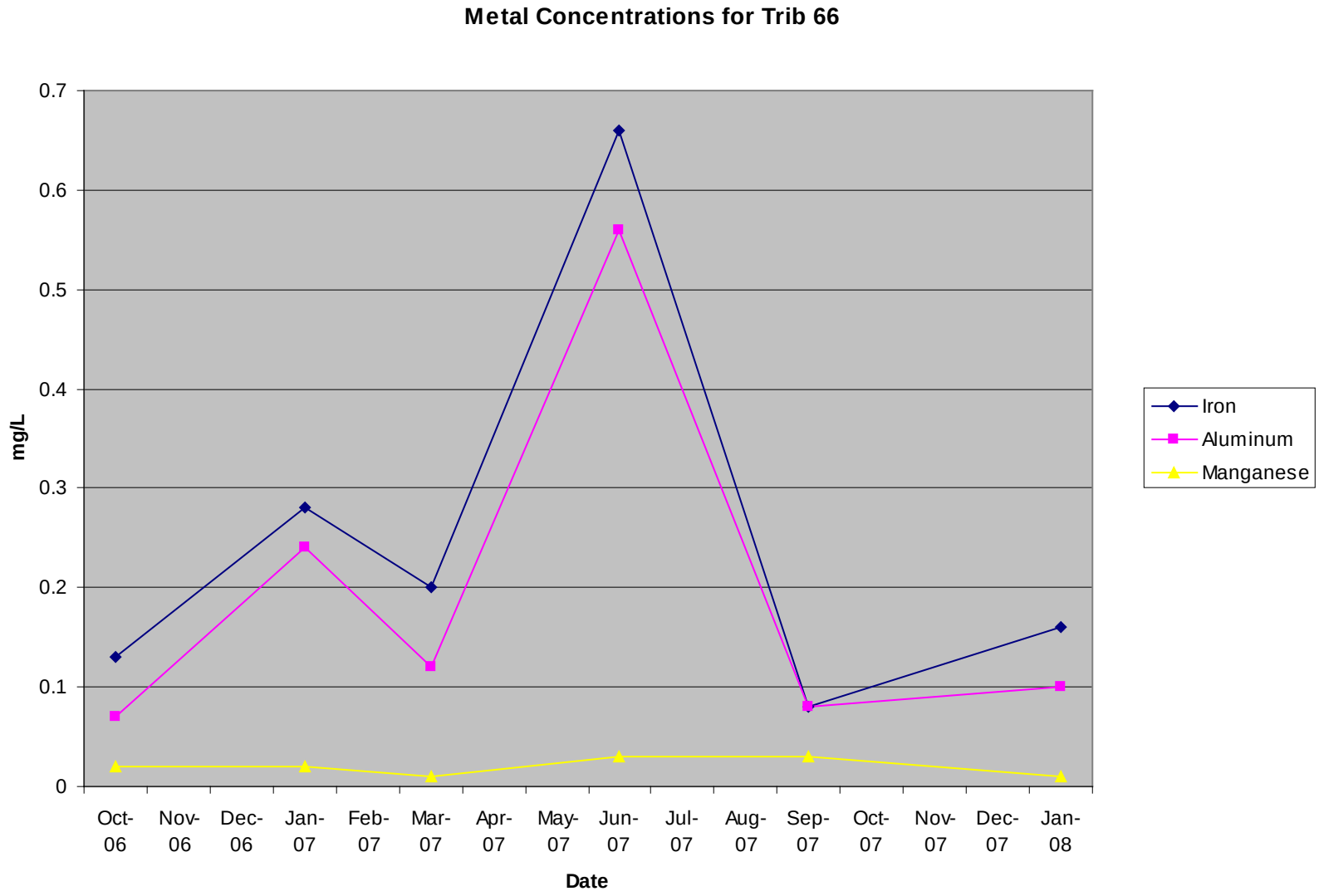
Tributary Number 66

Clearfield County; Bell Township, Mahaffey Borough

CCWA Monitoring Point: Trib Number 66																			
Sample		Flow (Bucket)	Lab pH	Lab Conductivity	Air Temp	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Loading					
														Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Source	(GPM)	(lab)	(umhos/cm)	(F°)	(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)	(lbs/day)
10/25/2006	CCWA	34.2	7.4	233	40	-37	54	0.13	0.07	0.02	57	3.1	156	-15.23	22.23	0.05	0.03	0.01	23.47
1/18/2007	CCWA	486.85	7.4	199	23	-30	44	0.28	0.24	0.02	42	2.5	114	-175.83	257.88	1.64	1.41	0.12	246.16
3/13/2007	CCWA	125.4	7	190	48	-21	36	0.2	0.12	0.01	42	2.5	109	-31.70	54.35	0.30	0.18	0.02	63.40
6/21/2007	CCWA	25.33	7.1	266	66	-35	52	0.66	0.56	0.03	61	2.5	159	-10.67	15.86	0.20	0.17	0.01	18.60
9/27/2007	CCWA	4.09	7.7	455	70	-77	102	0.08	0.08	0.03	95	8	282	-3.79	5.02	0.00	0.00	0.00	4.68
1/16/2008	CCWA	115.53	7.6	490	28	-33	44	0.16	0.1	0.01	48	2.5	273	-45.90	61.20	0.22	0.14	0.01	66.76
Number of sample Dates	Count	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	Max	486.85	7.7	490	70	-21	102	0.66	0.56	0.03	95	8	282	-3.79	257.88	1.64	1.41	0.12	246.16
	Min	4.09	7	190	23	-77	36	0.08	0.07	0.01	42	2.5	109	-175.83	5.02	0.00	0.00	0.00	4.68
6	Average	131.90	7.37	305.50	45.83	-38.83	55.33	0.25	0.20	0.02	57.50	3.52	182.17	-47.19	69.42	0.40	0.32	0.03	70.51

Date	BOD (mg/L)	Fecal Col (c/100mL)	BOD (lbs/day)	Fecal Col (#/day)
10/25/2006	3	10	1.23514	18642338
1/18/2007	1.5	5	8.791343	1.33E+08
3/13/2007	1.5	30	2.264423	2.05E+08
6/21/2007	1	200	0.304933	2.76E+08
9/27/2007	17	2000	0.83703	4.46E+08
1/16/2008	1.5	10	2.086195	62975126
Count	6	6	6	6
Max	17	2000	8.791343	4.46E+08
Min	1	5	0.304933	18642338
Average	4.25	375.8333	2.58651	1.9E+08

Note: 1/18/07, 3/13/07, and 1/16/08 flow data obtained using pigmy buckets.


Metal Concentrations for Trib 66
mg/L
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Dec-07
Jan-08
Date
Iron
Aluminum
Manganese

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By: Roland D. Swoope, Jr.
Published By Richmond-Arnold Publishing Co., Chicagohttp://history.rays-place.com/pa/clear-b-newburg.htm

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Published By Richmond-Arnold Publishing Co., Chicago http://history.rays-place.com/pa/clear-b-mahaffey.htm

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17) **GIS Citations**:

Identification_Information:
Citation:
Citation_Information:
Originator: Eric D. Warner
Publication_Date: 200305
Title: Pennsylvania Land Cover, 2000
Geospatial_Data_Presentation_Form: raster digital data
Publication_Information:
Publication_Place: University Park, PA
Publisher: Penn State University
Online_Linkage: <ftp://www.pasda.psu.edu/pub/pasda/orser/psu-palulc_2000.zip>
Online_Linkage: <http://www.pasda.psu.edu/data/orser/psu-palulc_2000.zip>
Description:
Abstract:
PALULC2000 is a statewide land cover map generated from Enhanced Thematic Mapper satellite data and three other ancillary data sources. It is an update to the MRLC data layer produced for the state in 1992.
Purpose:

State wide land cover will provide a reference for current land use status in the state for tracking changes in urban land as well as serving as an input for hydrologic and non-point pollution modeling and assessment.
Supplemental_Information:
ESRI GRID format layers have been zip compressed to retain directory structure. After downloading file, unzip using the 'retain directory structure' option in your unzip utility. This will create a directory under the current directory named with the grid name, i.e. palulc2000. This directory will contain the GRID layer.
Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 1999
Ending_Date: 2002
Currentness_Reference: ground condition
Status:
Progress: Complete
Maintenance_and_Update_Frequency: None planned
Spatial_Domain:
Bounding_Coordinates:
West_Bounding_Coordinate: -80.627750
East_Bounding_Coordinate: -74.534949
North_Bounding_Coordinate: 42.317831
South_Bounding_Coordinate: 39.640423
Keywords:
Theme:
Theme_Keyword_Thesaurus: None
Theme_Keyword: Land Use/Land Cover
Access_Constraints: None
Use_Constraints:
For educational/demonstration purposes only. The Originator, Publisher and Distributor exclude any and all implied warranties and make no warranty or representation with respect to the data files or accompanying documentation, including quality, performance, merchantability or fitness for a particular purpose. These data files and documentation are provided 'as is' and the User assumes the entire risk as to their quality and performance. These data are not to be redistributed for commercial profit. Reproduction or redistribution of this digital data set without permission of the Originator/Publisher is expressly forbidden. The Originator and Publisher should be clearly cited in any product derived from this data. Any modifications to this data must be described in any digital or hardcopy product derived from this data.
Point_of_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Dr. Eric D. Warner
Contact_Organization:
Office for Remote Sensing of Earth Resources, Penn State University

Contact_Position: Research Associate
Contact_Voice_Telephone: 814-863-3531
Contact_Facsimile_Telephone: 814-865-3378
Contact_Electronic_Mail_Address: edw103@psu.edu

Data_Quality_Information:
Positional_Accuracy:
Horizontal_Positional_Accuracy:
Quantitative_Horizontal_Positional_Accuracy_Assessment:
Horizontal_Positional_Accuracy_Value: 30 meters
Horizontal_Positional_Accuracy_Explanation:
Spatial accuracy varies over extent of coverage, 30 meters is an average error
Lineage:
Source_Information:
Type_of_Source_Media: Enhanced Thematic Mapper Satellite Data
Source_Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 1999
Ending_Date: 2002
Process_Step:
Process_Description:
The land use information was generated from a combination of satellite and vector ancillary data.

Data Layers

Imagery from the Enhanced Thematic Mapper (ETM) instrument, carried on the Landsat 7 platform, served as the primary data source for the land use interpretation. 10 ETM scenes cover Pennsylvania completely, with overlap into neighboring states. ETM scenes are referenced based on a global system whereby each location on earth has a unique path and row identification number. To provide spectral contrast between differing land uses, two ETM scenes were sought for each path and row area in thestate. The scenes were chosen to capture conditions approximately in early to mid-autumnand mid-summer. The actual scenes purchased were sometimes outside these windows due to cloud cover. Cloudiness also made it necessary to acquire data over a three year period. Path/Row and dates of the images used in the interpretation are as follows;

Path/Row Date 14/31 6/11/2002 14/31 9/12/2001 14/32 7/5/1999 14/32 9/12/2001 15/31 7/28/1999 15/31 11/10/2001 15/32 8/2/2001 15/32 11/17/1999 16/31 7/5/2000 16/31 8/25/2001 16/32 8/4/1999 16/32 9/7/2000 17/31 6/13/2001 17/31 9/17/2001 17/32 6/10/2000 17/32 9/17/2001 18/31 8/7/2001 18/31 9/8/2001 18/32 7/6/2001 18/32 9/8/2001

Typical of spectrally based land cover classifications, there was noticeable confusion between certain groups. To sove some of this ambiguity, ancillary data layers were incorporated into the land cover mapping process. Data layers incorporated into the land cover classification include:

1997 GAP Urban Classification Layer 1992 MRLC Classification

Land Cover Mapping Process

1. All ETM images were classified using Dr. Wayne Myer's, Professor of Forestry, Penn State Univ., PSISCAN program into 250 groups, forming a single band image. The single band classified images were also used to create color renderings which were used as backdrops during the visual interpretation process. The visual interpretation yielded land use codes for each of the 250 groups composing a single image. Coding including a single numeric code indicating the land use most frequently represented by a group and and a multi-integer code indicative of all land uses included in a group. Some of the 250 groups had only single integer codes if they were completely unique.

2. After the initial interpretation, land cover classifications were assembled for each path and row area based on codings from two dates of imagery. Comparisons were made between dates of imagery to determine which were best for classifying individual land uses or if the combination of dates provided the best accuracy. Having two dates of imagery also allowed for clouded areas to assume the code of the second date.

3. The coding in #2 was modified with the GAP urban classification layer, which was used to classify areas into either low or high intensity uses. Locations that were classified as grass in the initial classification were left that way, as fields, parks and large lawns commonly occur in urban areas.

4. Once the urban classification was complete, north/south neighboring image areas (image areas with the same path but different row) were merged. These merged layers were compared with neighboring land cover layers to identify discrepancies in the classification process.

5. The 1992 MRLC interpretation was used to assign land use codes in four situations; a. Areas that were cloudy during both image dates for a row/path location, were coded from the 1992 MRLC data. Areas cloudy in both images comprised only 0.000001% of the land area in the state. b. The wetland groups were taken from the MRLC data. The classification of wetlands is not very reliable using spectral information only. Further based on the regulatory goal of zero wetland loss, the area of wetlands should be very close to that seen in 1992. c. Quarry areas and coal mines were assgined from the 1992 MRLC as their extents have not changed much. Coal mine boundaries could have been assigned from a polygon coverage available from the Bureau of Mines. It was decided not

to use the information as comparison of the MRLC and mine boundaries found poor agreement. Had the polygon infromation been used, comparison of the MRLC and the new land use would have generated misleading statistics about the status of mining in Pennsylvania. d. Locations identified as water in the MRLC data were also coded water in the new image. Consistency in the mapping of water removes unlikely land conversion that would be identified through comparison of the 1992 and 2001 land use data sets. Differences in mapping water can result from slight misregistration errors, changes in water level, and confusion with other land use groups.

6. The original MRLC coding was modified so that some groups were not used, these included; probable row crops beach areas

---

Spatial_Data_Organization_Information:
Direct_Spatial_Reference_Method: Raster
Raster_Object_Information:
Raster_Object_Type: Grid Cell
Row_Count: 9730
Column_Count: 16752
Vertical_Count: 1

Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Planar:
Map_Projection:
Map_Projection_Name: Albers Conical Equal Area
Albers_Conical_Equal_Area:
Standard_Parallel: 40.000000
Standard_Parallel: 42.000000
Longitude_of_Central_Meridian: -78.000000
Latitude_of_Projection_Origin: 39.000000
False_Easting: 0.000000
False_Northing: 0.000000
Planar_Coordinate_Information:
Planar_Coordinate_Encoding_Method: row and column
Coordinate_Representation:
Abscissa_Resolution: 30.000000
Ordinate_Resolution: 30.000000
Planar_Distance_Units: meters
Geodetic_Model:
Horizontal_Datum_Name: North American Datum of 1927
Ellipsoid_Name: Clarke 1866
Semi-major_Axis: 6378206.400000
Denominator_of_Flattening_Ratio: 294.978698

Entity_and_Attribute_Information:
Detailed_Description:
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Entity_Type_Label: palu01new
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Unrepresentable_Domain:
Sequential unique whole numbers that are automatically generated.
Attribute:
Attribute_Label: Value
Attribute_Definition: Lanc Dover Classification Code
Attribute_Domain_Values:
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Enumerated_Domain:
Enumerated_Domain_Value: 2
Enumerated_Domain_Value_Definition: Low Density Urban
Enumerated_Domain:
Enumerated_Domain_Value: 3
Enumerated_Domain_Value_Definition: High Density Urban
Enumerated_Domain:
Enumerated_Domain_Value: 4
Enumerated_Domain_Value_Definition: Hay Pasture
Enumerated_Domain:
Enumerated_Domain_Value: 5
Enumerated_Domain_Value_Definition: Row Crops
Enumerated_Domain:
Enumerated_Domain_Value: 6
Enumerated_Domain_Value_Definition: Probably Row Crops
Enumerated_Domain:
Enumerated_Domain_Value: 7
Enumerated_Domain_Value_Definition: Coniferous Forest
Enumerated_Domain:
Enumerated_Domain_Value: 8
Enumerated_Domain_Value_Definition: Mixed Forest
Enumerated_Domain:
Enumerated_Domain_Value: 9
Enumerated_Domain_Value_Definition: Deciduous Forest
Enumerated_Domain:
Enumerated_Domain_Value: 10
Enumerated_Domain_Value_Definition: Woody Wetland
Enumerated_Domain:

Enumerated_Domain_Value: 11
Enumerated_Domain_Value_Definition: Emergent Wetland
Enumerated_Domain:
Enumerated_Domain_Value: 12
Enumerated_Domain_Value_Definition: Quarries
Enumerated_Domain:
Enumerated_Domain_Value: 13
Enumerated_Domain_Value_Definition: Coal Mines
Enumerated_Domain:
Enumerated_Domain_Value: 14
Enumerated_Domain_Value_Definition: Beach
Enumerated_Domain:
Enumerated_Domain_Value: 15
Enumerated_Domain_Value_Definition: Transitional
Attribute:
Attribute_Label: Count
Attribute:
Attribute_Label: Red
Attribute:
Attribute_Label: Green
Attribute:
Attribute_Label: Blue
Overview_Description:

Distribution_Information:
Resource_Description: <ftp://www.pasda.psu.edu/pub/pasda/orser/psu-palulc_2000.zip>
Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Format_Name: ARCG
Format_Information_Content:
ESRI GRID format layers have been zip compressed to retain directory structure. After downloading file, unzip using the 'retain directory structure' option in your unzip utility. This will create a directory under the current directory named with the grid name, i.e. pa1985isaa_ne. This directory will contain the GRID layer.
File_Decompression_Technique: zip
Transfer_Size: 59.505

Metadata_Reference_Information:
Metadata_Date: 20040409
Metadata_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization:
Office for Remote Sensing of Earth Resources, Penn State University

Contact_Person: Dr. Eric D. Warner
Contact_Position: Research Associate
Contact_Voice_Telephone: 814-863-3531
Contact_Facsimile_Telephone: 814-865-3375
Contact_Electronic_Mail_Address: edw103@psu.edu
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998

Generated by mp version 2.5.2 on Fri Apr 9 12:40:27 2004

APPENDIX B

Chest Creek Watershed Assessment and Restoration Plan

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SECTION 205J-WATERSHED QUESTIONAIRE

1. Survey Number:_____ Date:_____ Watershed:_____

Person Contacted:_____

Location-Directions:_____

Land Owner:_____ Land Operator_____

Address:_____ Address:_____

_____ _____

Total Arces Owned_____ Total Acres Farmed_____

Total Arces Rented_____

Type of Operation_____

2. Water Resources:

Is there a stream on the farm? Yes/No

Do livestock have access to the stream? Yes/No

Primary use of stream?_____

(1=Livestock, 2=recreation, 3=irrigation, 4=none, 5=other_____)

Problems with the stream?_____

(1=flooding, 2=low flooding, 3=poor quality, 4=streambank erosion, 5=other_____)

Approximate distance from edge of livestock holding area to the stream:

0-50 ft_____, 50-100 ft_____, 100-200 ft_____, over 200 ft_____

What is the primary source of drinking water?_____

(1=spring, 2=well, 3=cistern, 4=stream, 5=municipal, 6=other_____)

Has source of water been tested for nitrates? Yes/No

Date: Month, Year_____

Results: (ppm)_____

Was test performed during interview? Yes/No (Put results of stream evaluation form)

Has source of water been tested for coliforms? Yes/No

Date: Month, Year_____

Results: (ppm)_____

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Chest Creek Watershed Assessment and Restoration Plan

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3. Herbicide/Pesticide Use:

Type: _____ Amount:_____
_____ _____
_____ _____
_____ _____
How applied:_____

4. Nutrient Management:

How often is soil tested?
Annually____, Biannually____, Sometimes____, Never____
Who does the soil testing?
Farmer____, Dealer____, CMA____, Other_____
Are the soil test recommendations followed?
Always____, Sometimes____, Never____
How often is manure analyzed?
Annually____, Biannually____, Sometimes____, Never____
Is there a nutrient management program? Yes/No
If so, is the program followed?
Always____, Sometimes____, Never____
Is the value of manure accounted for in the fertilizer program? Yes/No
How far is the manure hauled? Less than 1 mile____, 1-2mi___, 2-5mi____ 5+mi____
Is manure exported/imported from other land owners? Yes/No: How much_____

5. Conservation Practices:

Is there a conservation plan? Yes/No Date of plan:_____
Is the plan implemented? Yes/No
BMP'S which are in use: If yes how much is on:

	Owned Land	Rented Land
Contouring Farming	_____	_____
Stripcropping	_____	_____
Terraces	_____	_____
Diversions	_____	_____
Waterways	_____	_____
Pasture Management	_____	_____
Grass strip along stream	_____	_____
Winter control structure	_____	_____
Animal waste storage	_____	_____

Would the farmer be interested in a conservation plan? Yes/No
Is the farmer interested in any cost-share programs? Yes/No
If so, which ones?_____

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6. Crop Management:

Crops on Owned Land:

Crop	Yield	Acres	Amount of Fertilizer	Commerical Fertiliizer Analysis	Manure Tons	Acres Manured
Corn grain						
Corn silage						
Hay-Alfalfa mix						
Pasture-active						
Idle						
Other						

Order of crop rotation:_____
Alternative crop rotation:_____

Crops on Rented Land:

Crop	Yield	Acres	Amount of Fertilizer	Commercial Fertilizer Analysis	Manure Tons	Acres Manured
Corn grain						
Corn silage						
Small grains						
Hay-Alfalfa Mix						
Pasture-active						
Idle						
Other						

Order of crop rotation:_____
Alternative crop rotation:_____

6. Crop Management, cont.

Is crop residue left on fields over the winter? Yes/No
Corn:_____acres Small Grains:_____acres Other:_____acres
If corn stalks are removed, is a winter cover crop planted? Yes/No
If so, what?_____
Is a grass or legume seeding on your small grain field planted? Yes/No

Tillage:	Corn (acres)		Other crop (acres)	
	Spring	Fall	Spring	Fall
No-till	_____	_____	_____	_____
Minimum Till	_____	_____	_____	_____
Conventional	_____	_____	_____	_____

What equipment is used for minimum tillage? (Check One)
Chisel plow___, Offset disk___, Light disk___, Harrow___
Field Cultivator___, Other___

7. Livestock:

Type	Total Number	Animal Weight	Days On Pasture	%Incorp. within 2days/1week	Manure Type Storage*
Cows: Dairy Heifers					
Beef					
Hogs: Sows Feeders Boars					
Veal					
Poultry: Layers Broilers Turkey					
Other					

*1=Stacker Storage, 2=Above Ground Silo, 3=Earthen Dike
4=Inground Tank, 5=Covered Vertical Walls, 6=Lagoons
7=Bedded Pack, 8=Other(Explain)_____
9=n/a

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THIS PAGE SHOULD BE COMPLETED BEFORE OR AFTER THE INTERVIEW!!!

8. Additional Comments:

A. Observations:

B. Distinctive Problems:

C. BMP"S Needed:

D. Soil Loss, soil characteristics: (use soil loss worksheet)

E. Other:

Appendix C

Historical Instream Water Quality Data

Chest Creek Instream #3, Thomas Mills
Cambria County; Elder Township
E.P. Bender Coal Co.; SMP #4276SM18

CCWA Monitoring Point: CCIS-3																			
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Loading					
														Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
3/12/1987	1202	Bender	--	7.2	162	-5.2	16	1.00	--	0.32	37	3.7	--	--	--	--	--	--	--
6/3/1987	1202	Bender	--	7.4	275	-35	37	0.94	--	0.27	87	7.2	--	--	--	--	--	--	--
9/15/1987	1202	Bender	--	7.8	235	0	49	0.52	--	0.17	62	9.0	--	--	--	--	--	--	--
11/20/1987	1202	Bender	--	7.2	195	0	48	0.49	--	0.20	55	7.7	--	--	--	--	--	--	--
1/7/1988	1202	Bender	--	6.8	201	0	36	0.22	--	0.18	66	4.0	--	--	--	--	--	--	--
4/7/1988	1202	Bender	--	7.0	200	0	34	0.18	--	0.12	40	5.2	--	--	--	--	--	--	--
9/28/1988	1202	Bender	1000+	7.7	225	0	40	0.18	--	0.09	72	4.8	--	--	--	--	--	--	--
11/16/1988	1202	Bender	--	7.2	240	0	36	0.24	--	0.10	70	4.7	--	--	--	--	--	--	--
3/29/1989	1202	Bender	--	7.1	185	0	27	0.19	--	0.11	40	0.4	--	--	--	--	--	--	--
4/27/1989	1202	Bender	--	7.4	195	0	44	0.20	--	0.14	64	4.9	--	--	--	--	--	--	--
8/15/1989	1202	Bender	--	7.7	285	0	52	0.30	--	0.15	75	4.8	--	--	--	--	--	--	--
11/21/1989	1202	Bender	--	7.2	215	0	32	0.40	--	0.15	40	0.3	--	--	--	--	--	--	--
1/29/1990	1202	Bender	--	7.2	250	3	26	0.30	--	0.15	39	5.7	--	--	--	--	--	--	--
4/11/1990	1202	Bender	--	7.3	150	3	25	1.00	--	0.15	40	0.45	--	--	--	--	--	--	--
Number of sample Dates		Count	0	14	14	14	14	14	0	14	14	14	0	0	0	0	0	0	0
		Max	--	7.8	285.00	3.00	52.00	1.00	--	0.32	87.00	9.00	--	--	--	--	--	--	--
		Min	--	6.8	150.00	-35.00	16.00	0.18	--	0.09	37.00	0.30	--	--	--	--	--	--	--
14		Average	--	7.3	215.21	-2.44	35.86	0.44	--	0.16	56.21	4.49	--	--	--	--	--	--	--

Chest Creek Instream #3, CCIS-3
Cambria County; Chest Township
K & J Coal Co.; SMP #11693000

CCWA Monitoring Point: CCIS-3														Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
10/16/1989	780	CCWA	--	7.7	--	0	76	0.48	0.25	0.09	149	--	--	--	--	--	--	--	--
Number of sample Dates		Count	0	1	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0
		Max	--	7.7	--	0.00	76.00	0.48	0.25	0.09	149.00	--	--	--	--	--	--	--	--
		Min	--	7.7	--	0.00	76.00	0.48	0.25	0.09	149.00	--	--	--	--	--	--	--	--
1		Average	--	7.7	--	0.00	76.00	0.48	0.25	0.09	149.00	--	--	--	--	--	--	--	--

Chest Creek Instream #3, CCIS-3
Cambria County; Chest Township
K & J Coal Co., Inc.; SMP #11693000

CCWA Monitoring Point: CCIS-3														Total	Total	Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
5/3/1999	1W	K & J	--	7.5	215	0	36	0.46	0.15	0.12	42	10.7	--	--	--	--	--	--	--
7/20/1999	1W	K & J	--	7.6	427	0	70	0.44	0.29	0.20	101	0.7	--	--	--	--	--	--	--
11/10/1999	1W	K & J	--	7.6	280	0	44	0.87	0.18	0.24	56	2.0	--	--	--	--	--	--	--
1/6/2000	1W	K & J	--	7.6	297	0	38	0.79	0.15	0.21	42	3.7	--	--	--	--	--	--	--
5/1/2000	1W	K & J	--	7.4	239	0	32	0.66	0.07	0.20	42	2.3	--	--	--	--	--	--	--
7/5/2000	1W	K & J	--	7.5	291	0	48	0.93	0.27	0.23	51	8.0	--	--	--	--	--	--	--
10/3/2000	1W	K & J	--	7.7	297	0	54	1.06	0.07	0.22	54	2.0	--	--	--	--	--	--	--
1/4/2001	1W	K & J	--	7.2	299	0	46	1.61	0.39	0.34	53	13.0	--	--	--	--	--	--	--
4/25/2001	1W	K & J	--	7.3	217	0	32	0.80	0.28	0.19	40	4.0	--	--	--	--	--	--	--
7/10/2001	1W	K & J	--	7.6	300	0	56	1.07	0.63	0.20	43	4.0	--	--	--	--	--	--	--
10/9/2001	1W	K & J	--	7.3	540	0	76	0.35	0.05	0.16	107	0.3	--	--	--	--	--	--	--
1/4/2002	1W	K & J	--	7.3	287	0	54	0.82	0.07	0.32	57	2.7	--	--	--	--	--	--	--
Number of sample Dates		Count	0	12	12	12	12	12	12	12	12	12	0	0	0	0	0	0	0
		Max	--	7.70	540.00	0.00	76.00	1.61	0.63	0.34	107.00	13.00	--	--	--	--	--	--	--
		Min	--	7.20	215.00	0.00	32.00	0.35	0.05	0.12	40.00	0.30	--	--	--	--	--	--	--
12		Average	--	7.47	307.42	0.00	48.83	0.82	0.22	0.22	57.33	4.45	--	--	--	--	--	--	--

Chest Creek Instream #4, Westover
Clearfield County; Westover Borough
Cambria Coal Company, SMP #4376SM22

CCWA Monitoring Point: CCIS-4														Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
Apr-79	C23-7	CCC	1000.00	7.1	240	2	14	0.55	--	0.26	32	9.8	--	24.08	168.54	6.62	--	3.13	385.23
1/29/1983	C23-7	CCC	9999.00	6.8	375	11	34	0.34	--	0.45	130	3.0	--	1324.09	4092.65	40.93	--	54.17	15648.36
5/24/1983	C23-7	CCC	9999.00	6.7	178	0	25	0.62	--	0.29	26	21.7	--	0.00	3009.30	74.63	--	34.91	3129.67
8/8/1983	C23-7	CCC	1800.00	6.2	560	1	130	0.36	--	0.32	225	3.2	--	21.67	2816.99	7.80	--	6.93	4875.55
10/19/1983	C23-7	CCC	1000.00	7.1	339	1	34	1.13	--	0.83	134	6.5	--	12.04	409.31	13.60	--	9.99	1613.15
2/20/1984	C23-7	CCC	1000.00	6.5	159	1	16	0.29	--	0.19	40	14.8	--	12.04	192.61	3.49	--	2.29	481.54
6/4/1984	C23-7	CCC	9999.00	7.1	273	1	24	0.62	--	0.50	97	4.9	--	120.37	2888.93	74.63	--	60.19	11676.08
9/5/1984	C23-7	CCC	9999.00	7.6	356	1	51	0.71	--	0.42	110	1.6	--	120.37	6138.97	85.46	--	50.56	13240.92
11/8/1984	C23-7	CCC	10000.00	6.7	196	1	33	0.77	--	0.41	58	2.2	--	120.38	3972.67	92.70	--	49.36	6982.27
2/4/1985	C23-7	CCC	9999.00	7.4	461	1	33	0.70	--	0.88	183	3.9	--	120.37	3972.27	84.26	--	105.93	22028.07
5/15/1985	C23-7	CCC	9999.00	7.6	382	1	32	0.58	--	0.51	143	4.2	--	120.37	3851.90	69.82	--	61.39	17213.19
8/15/1985	C23-7	CCC	9999.00	7.6	689	1	50	0.77	--	0.18	256	4.7	--	120.37	6018.60	92.69	--	21.67	30815.22
11/21/1985	C23-7	CCC	9999.00	6.9	207	1	18	0.56	--	0.32	75	3.9	--	120.37	2166.70	67.41	--	38.52	9027.90
1/22/1986	C23-7	CCC	9999.00	6.6	147	1	13	0.36	--	0.15	35	11.9	--	120.37	1564.84	43.33	--	18.06	4213.02
5/8/1986	C23-7	CCC	9999.00	6.8	225	1	53	2.02	--	0.34	20	10.5	--	120.37	6379.71	243.15	--	40.93	2407.44
8/19/1986	C23-7	CCC	9999.00	9.3	589	1	43	0.42	--	0.25	250	2.8	--	120.37	5175.99	50.56	--	30.09	30092.99
?/12/86	C23-7	CCC	9999.00	6.6	129	1	20	0.47	--	0.25	32	3.0	--	120.37	2407.44	56.57	--	30.09	3851.90
?/24/87	C23-7	CCC	9999.00	6.7	482	0	34	0.84	--	0.84	155	13.0	--	0.00	4092.65	101.11	--	101.11	18657.65
?/6/87	C23-7	CCC	9000.00	6.8	187	0	18	0.42	--	0.09	42	8.0	--	0.00	1950.22	45.51	--	9.75	4550.52
?/2/87	C23-7	CCC	9999.00	7.4	302	0	37	0.99	--	0.27	80	7.0	--	0.00	4453.76	119.17	--	32.50	9629.76
10/23/1987	C23-7	CCC	9999.00	7.4	414	0	39	0.78	--	0.44	144	8.0	--	0.00	4694.51	93.89	--	52.96	17333.56
2/12/1988	C23-7	CCC	9999.00	7.0	352	0	21	0.56	--	0.78	107	19.0	--	0.00	2527.81	67.41	--	93.89	12879.80
5/4/1988	C23-7	CCC	9999.00	7.6	281	0	27	0.45	--	0.37	94	0.5	--	0.00	3250.04	54.17	--	44.54	11314.96
8/4/1988	C23-7	CCC	5000.00	7.3	664	0	46	0.56	--	0.33	294	4.0	--	0.00	2768.83	33.71	--	19.86	17696.45
11/8/1988	C23-7	CCC	9999.00	7.2	235	0	30	0.62	--	0.32	59	7.0	--	0.00	3611.16	74.63	--	38.52	7101.95
1/20/1989	C23-7	CCC	9999.00	6.9	224	0	17	0.41	--	0.22	53	7.0	--	0.00	2046.32	49.35	--	26.48	6379.71
5/11/1989	C23-7	CCC	9999.00	6.5	158	0	16	1.02	--	0.23	40	28.0	--	0.00	1925.95	122.78	--	27.69	4814.88
8/18/1989	C23-7	CCC	9999.00	7.8	602	0	50	0.35	--	0.31	250	6.0	--	0.00	6018.60	42.13	--	37.32	30092.99
10/31/1989	C23-7	CCC	9999.00	7.4	362	0	34	0.71	--	0.34	105	6.0	--	0.00	4092.65	85.46	--	40.93	12639.06
Number of sample Dates		Count	29	29	29	29	29	29	0	29	29	29	0	29	29	29	0	29	29
		Max	10000.00	9.3	689.00	11.00	130.00	2.02	--	0.88	294.00	28.00	--	1324.09	6379.71	243.15	--	105.93	30815.22
		Min	1000.00	6.2	129.00	0.00	13.00	0.29	--	0.09	20.00	0.50	--	0.00	168.54	3.49	--	2.29	385.23
29		Average	8578.55	7.1	336.83	0.93	34.21	0.65	--	0.38	112.72	7.80	--	93.72	3333.10	68.86	--	39.44	11405.99

Chest Creek Instream # 4, Westover
Clearfield County: Chest Township
Hepburnia Coal Company SMP # 17980126

CCWA Monitoring Point: CCIS-4																			
Sample			Flow	Lab	Lab	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total	Loading					
			(Method)	pH	Conductivit			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	umhos/cm	(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)	(lbs/day)
3/9/2006	KR-17	Hep.	N/M	7.5	487	-30	43	0.48	0.17	0.40	127	3.1	--	--	--	--	--	--	--
6/30/2006	KR-17	Hep.	N/M	7.4	357	-36	52	0.79	0.23	0.18	92	3.1	--	--	--	--	--	--	--
8/30/2006	KR-17	Hep.	N/M	7.6	583	-46	57	0.40	0.15	0.10	198	17.1	--	--	--	--	--	--	--
12/29/2006	KR-17	Hep.	N/M	7.2	341	-20	38	0.45	0.15	0.23	97	3.1	--	--	--	--	--	--	--
3/20/2007	KR-17	Hep.	N/M	7.1	243	-7	19	2.06	1.15	0.35	56	36.0	--	--	--	--	--	--	--
6/29/2007	KR-17	Hep.	N/M	7.6	810	-43	62	0.23	0.08	0.17	310	2.5	--	--	--	--	--	--	--
8/29/2007	KR-17	Hep.	N/M	7.6	345	-24	41	0.43	0.11	0.09	93	2.5	--	--	--	--	--	--	--
12/13/2007	KR-17	Hep.	N/M	6.7	266	-9	25	1.04	0.48	0.19	61	23.0	--	--	--	--	--	--	--
Number of		Count	0	8	8	8	8	8	8	8	8	8	0	0	0	0	0	0	0
sample		Max	0.00	7.6	810.00	-7.00	62.00	2.06	1.15	0.40	310.00	36.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dates		Min	0.00	6.7	243.00	-46.00	19.00	0.23	0.08	0.09	56.00	2.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6		Average	#DIV/0!	7.3	429.00	-26.88	42.13	0.74	0.32	0.21	129.25	11.30	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Chest Creek In-Stream Sample Point #4, Westover
Clearfield County; Westover Borough
K & J Coal Co.; SMP #11693000

CCWA Monitoring Point: CCIS-4														Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
10/16/1989	781	K&J	--	7.4	--	0	56	0.32	0.25	0.19	288	--	--	--	--	--	--	--	--
Number of sample Dates		Count	0	1	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0
		Max	--	7.4	--	0.00	56.00	0.32	0.25	0.19	288.00	--	--	--	--	--	--	--	--
		Min	--	7.4	--	0.00	56.00	0.32	0.25	0.19	288.00	--	--	--	--	--	--	--	--
1		Average	--	7.4	--	0.00	56.00	0.32	0.25	0.19	288.00	--	--	--	--	--	--	--	--

Chest Creek In-Stream Sample Point #5, Five Points
Clearfield County; Chest Township
K & J Coal Co.; SMP #11693000

CCWA Monitoring Point: CCIS-5														Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
10/16/1989	782	K&J	--	7.5	--	0	58	0.41	0.25	0.36	363	--	--	--	--	--	--	--	--
Number of sample Dates		Count	0	1	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0
		Max	--	7.5	--	0.00	58.00	0.41	0.25	0.36	363.00	--	--	--	--	--	--	--	--
		Min	--	7.5	--	0.00	58.00	0.41	0.25	0.36	363.00	--	--	--	--	--	--	--	--
1		Average	--	7.5	--	0.00	58.00	0.41	0.25	0.36	363.00	--	--	--	--	--	--	--	--

Chest Creek In-Stream Sample Point #5, Five Points
Clearfield County; Chest Township
Amfire Mining, SMP #17990110

CCWA Monitoring Point: CCIS-5														Loading					
Sample			Flow	Lab	Lab	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total						
			(Weir)	pH	Conductivity			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
5/3/2005	BR5-21	Amfire	--	7.5	506	-32	48	0.50	0.16	0.39	160	10.0	330.0	--	--	--	--	--	--
9/12/2005	BR5-21	Amfire	--	7.6	869	-58	73	0.48	0.12	0.23	378	3.1	616.0	--	--	--	--	--	--
12/9/2005	BR5-21	Amfire	--	7.3	424	-24	40	0.91	0.22	0.55	130	3.1	243.0	--	--	--	--	--	--
3/9/2006	BR5-21	Amfire	--	7.5	500	-25	41	0.71	0.29	0.41	132	3.1	306.0	--	--	--	--	--	--
6/30/2006	BR5-21	Amfire	--	7.5	367	-36	48	1.33	0.48	0.26	97	3.1	244.0	--	--	--	--	--	--
8/30/2006	BR5-21	Amfire	--	7.6	610	-47	56	0.88	0.37	0.24	208	12.9	420.0	--	--	--	--	--	--
12/29/2006	BR5-21	Amfire	--	7.4	344	-20	34	0.75	0.21	0.28	106	7.1	193.0	--	--	--	--	--	--
3/20/2007	BR5-21	Amfire	--	7.0	256	-7	19	1.82	1.13	0.30	61	2.5	136.0	--	--	--	--	--	--
6/29/2007	BR5-21	Amfire	--	7.6	794	-48	62	5.72	2.05	1.53	321	121.0	458.0	--	--	--	--	--	--
8/31/2007	BR5-21	Amfire	--	7.6	362	-30	43	0.46	0.13	0.10	6	5.0	224.0	--	--	--	--	--	--
12/13/2007	BR5-21	Amfire	--	6.6	263	-7	25	0.97	0.68	0.17	58	5.0	157.0	--	--	--	--	--	--
Number of sample Dates		Count	0	11	11	11	11	11	11	11	11	11	11	0	0	0	0	0	0
		Max	--	7.6	869.00	-7.00	73.00	5.72	2.05	1.53	378.00	121.00	616.00	--	--	--	--	--	--
		Min	--	6.6	256.00	-58.00	19.00	0.46	0.12	0.10	6.00	2.50	136.00	--	--	--	--	--	--
11		Average	--	7.4	481.36	-30.36	44.45	1.32	0.53	0.41	150.64	15.99	302.45	--	--	--	--	--	--

Chest Creek In-Stream Sample Point #6, La Jose
Clearfield County; Newburg Borough
K & J Coal Co.; SMP #11693000

CCWA Monitoring Point: CCIS-6														Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
10/16/1989	783	K&J	--	7.6	--	0	66	0.43	0.25	0.23	294	--	--	--	--	--	--	--	--
Number of sample Dates		Count	0	1	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0
		Max	--	7.6	--	0.00	66.00	0.43	0.25	0.23	294.00	--	--	--	--	--	--	--	--
		Min	--	7.6	--	0.00	66.00	0.43	0.25	0.23	294.00	--	--	--	--	--	--	--	--
1		Average	--	7.6	--	0.00	66.00	0.43	0.25	0.23	294.00	--	--	--	--	--	--	--	--

Historical Discharge Water Quality Data

Discharge Number 38-1L, Route 36 Discharge
Cambria County; Elder Township
Bard Mining, Inc.; SMP #11810114

CCWA Monitoring Point: 38-1L														Loading					
Sample			Flow	Lab	Lab	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total						
			(Method)	pH	Conductivity			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
12/6/1989	SP-6	Bard	15.00	3.3	1253	112	0	5.47	No Report	4.16	380	4.0	No Report	20.22	0.00	0.99	#VALUE!	0.75	68.62
1/15/1990	SP-6	Bard	40.00	3.4	1611	136	0	3.89	No Report	7.52	735	1.0	No Report	65.49	0.00	1.87	#VALUE!	3.62	353.93
2/21/1990	SP-6	Bard	120.00	3.3	1869	122	0	1.96	No Report	6.62	970	1.0	No Report	176.24	0.00	2.83	#VALUE!	9.56	1401.27
3/22/1990	SP-6	Bard	60.00	3.4	1800	152	0	2.23	No Report	6.46	1264	1.0	No Report	109.79	0.00	1.61	#VALUE!	4.67	912.99
4/25/1990	SP-6	Bard	100.00	3.3	2000	130	0	1.90	No Report	6.67	1055	1.0	No Report	156.50	0.00	2.29	#VALUE!	8.03	1270.05
5/16/1990	SP-6	Bard	150.00	3.3	1998	144	0	2.72	No Report	7.33	1095	13.0	No Report	260.03	0.00	4.91	#VALUE!	13.24	1977.31
6/21/1990	SP-6	Bard	100.00	3.3	2000	138	0	2.50	No Report	8.03	1264	2.0	No Report	166.13	0.00	3.01	#VALUE!	9.67	1521.65
7/27/1990	SP-6	Bard	150.00	3.5	1695	194	0	2.02	No Report	7.45	925	1.0	No Report	350.32	0.00	3.65	#VALUE!	13.45	1670.33
8/27/1990	SP-6	Bard	100.00	3.6	1753	142	0	1.88	No Report	7.82	1055	1.0	No Report	170.95	0.00	2.26	#VALUE!	9.41	1270.05
9/12/1990	SP-6	Bard	40.00	3.5	1807	146	0	1.91	No Report	7.12	1264	1.0	No Report	70.30	0.00	0.92	#VALUE!	3.43	608.66
10/18/1990	SP-6	Bard	75.00	3.2	1770	144	0	3.14	No Report	8.03	1030	1.0	No Report	130.01	0.00	2.84	#VALUE!	7.25	929.97
11/7/1990	SP-6	Bard	75.00	3.5	1793	140	0	2.05	No Report	7.78	990	1.0	No Report	126.40	0.00	1.85	#VALUE!	7.02	893.85
12/20/1990	SP-6	Bard	200.00	3.4	1606	128	0	3.47	No Report	6.24	1095	2.0	No Report	308.18	0.00	8.35	#VALUE!	15.02	2636.41
1/16/1991	SP-6	Bard	100.00	3.6	1497	118	0	1.63	No Report	6.59	1030	1.0	No Report	142.05	0.00	1.96	#VALUE!	7.93	1239.96
2/18/1991	SP-6	Bard	100.00	3.2	1650	120	0	2.33	No Report	6.44	1095	1.0	No Report	144.46	0.00	2.80	#VALUE!	7.75	1318.20
3/4/1991	SP-6	Bard	120.00	3.3	1726	122	0	1.86	No Report	6.66	1095	3.0	No Report	176.24	0.00	2.69	#VALUE!	9.62	1581.85
Number of sample Dates		Count	16	16	16	16	16	16	0	16	16	16	0	16	16	16	0	16	16
		Max	200.00	3.6	2000.00	194.00	0.00	5.47	0.00	8.03	1264.00	13.00	0.00	350.32	0.00	8.35	#VALUE!	15.02	2636.41
		Min	15.00	3.2	1253.00	112.00	0.00	1.63	0.00	4.16	380.00	1.00	0.00	20.22	0.00	0.92	#VALUE!	0.75	68.62
16		Average	96.56	3.4	1739.25	136.75	0.00	2.56	#DIV/0!	6.93	1021.38	2.19	#DIV/0!	160.83	0.00	2.80	#VALUE!	8.15	1228.44

Discharge Number 50-2R, Northcamp #2
Clearfield County; Chest Township
Compass Coal Co., Inc., SMP #17010102

CCWA Monitoring Point: Discharge Number 50-2R														Loading					
Sample			Flow (Method)	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
3/27/2006	MP-47	Compass	94.25	6.95	1410	0	58	16.38	--	8.28	986.3	24.0	--	0.00	65.81	18.59	--	9.39	1119.07
5/26/2006	MP-47	Compass	94.25	7.60	1600	9.7	64.5	17.93	0.05	8.88	1004.1	18.0	--	11.01	73.18	20.34	0.06	10.08	1139.27
8/16/2006	MP-47	Compass	70.21	6.96	1563	37	64.4	19.93	0.05	8.70	1011	26.0	--	31.27	54.43	16.85	0.04	7.35	854.51
10/5/2006	MP-47	Compass	81.70	6.36	1641	119.3	92.3	20.05	0.05	8.75	931.4	20.0	--	117.34	90.78	19.72	0.05	8.61	916.07
3/23/2007	MP-47	Compass	193.48	6.21	1270	72.9	69.3	6.10	0.11	3.26	658.3	12.0	--	169.80	161.41	14.21	0.26	7.59	1533.31
5/23/2007	MP-47	Compass	236.35	6.46	1207	36	70.2	7.14	0.11	3.41	590.2	2.0	--	102.43	199.74	20.32	0.31	9.70	1679.28
8/3/2007	MP-47	Compass	193.48	6.29	1445	66.5	74.2	13.05	0.05	6.74	778	16.0	--	154.89	172.83	30.40	0.12	15.70	1812.11
10/16/2007	MP-47	Compass	94.25	6.83	1548	21.1	67.9	16.48	0.05	8.57	850.9	12.0	--	23.94	77.04	18.70	0.06	9.72	965.45
Number of sample Dates		Count	8	8	8	8	8	8	7	8	8	8	0	8	8	8	7	8	8
		Max	236.35	7.6	1641.00	119.30	92.30	20.05	0.11	8.88	1011.00	26.00	0.00	169.80	199.74	30.40	0.31	15.70	1812.11
		Min	70.21	6.2	1207.00	0.00	58.00	6.10	0.05	3.26	590.20	2.00	0.00	0.00	54.43	14.21	0.04	7.35	854.51
8		Average	132.25	6.7	1460.50	45.31	70.10	14.63	0.07	7.07	851.28	16.25	--	76.33	111.90	19.89	0.13	9.77	1252.38

Discharge Number 50-4R
Clearfield County; Chest Township
Compass Coal Co., Inc., SMP #17010102

CCWA Monitoring Point: Discharge Number 50-4R														Loading					
Sample			Flow (Method)	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
1/13/2006	MP-2	Compass	3.83	7.95	1487	9.1	187.2	0.65	0.05	2.37	684.4	2.0	1320.0	0.42	8.63	0.03	0.00	0.11	31.56
2/6/2006	MP-2	Compass	21.60	7.79	1430	0	177	0.25	0.02	1.93	820.4	2.0	1366.0	0.00	46.03	0.07	0.01	0.50	213.33
3/27/2006	MP-2	Compass	21.68	7.69	1430	0	184	0.42	0.02	3.05	913.2	2.0	--	0.00	48.02	0.11	0.01	0.80	238.34
4/20/2006	MP-2	Compass	16.66	7.19	1510	0	190	0.61	0.05	3.79	913.5	3.0	--	0.00	38.11	0.12	0.01	0.76	183.21
5/4/2006	MP-2	Compass	21.68	7.66	1500	0	153	0.77	0.05	3.97	907.4	2.0	--	0.00	39.93	0.20	0.01	1.04	236.82
6/21/2006	MP-2	Compass	12.41	7.96	1708	15.9	198.3	1.80	0.05	5.21	891.4	4.0	1570.0	2.38	29.63	0.27	0.01	0.78	133.17
7/10/2006	MP-2	Compass	12.41	8.24	1652	17.6	197.1	2.01	0.05	4.99	889.2	6.0	1280.0	2.63	29.45	0.30	0.01	0.75	132.84
8/15/2006	MP-2	Compass	3.83	7.28	1646	61.2	188.4	2.77	0.05	6.51	882.5	12.0	1300.0	2.82	8.69	0.13	0.00	0.30	40.69
9/8/2006	MP-2	Compass	1.07	6.78	1582	72.8	189.8	1.76	0.05	6.01	838.2	10.0	1270.0	0.94	2.44	0.02	0.00	0.08	10.80
10/2/2006	MP-2	Compass	2.19	6.77	1552	75.3	196	2.03	0.12	5.67	796	2.0	1210.0	1.99	5.17	0.05	0.00	0.15	20.99
11/9/2006	MP-2	Compass	3.83	6.90	1512	83.9	209.6	2.19	0.05	4.29	716.9	2.0	1260.0	3.87	9.66	0.10	0.00	0.20	33.05
12/29/2006	MP-2	Compass	8.89	6.75	1619	57.3	215.4	1.08	0.05	3.11	388.4	2.0	1420.0	6.13	23.05	0.12	0.01	0.33	41.57
1/22/2007	MP-2	Compass	81.70	6.98	1491	51.5	208.3	0.26	0.05	1.65	705	4.0	1190.0	50.65	204.87	0.26	0.05	1.62	693.39
2/13/2007	MP-2	Compass	21.68	7.17	1619	34.9	210.6	1.05	0.27	2.26	779.6	6.0	1330.0	9.11	54.97	0.27	0.07	0.59	203.47
3/26/2007	MP-2	Compass	155.66	6.91	1363	22	201.9	0.02	0.05	0.93	631	1.0	1210.0	41.23	378.34	0.04	0.09	1.74	1182.43
4/13/2007	MP-2	Compass	41.78	6.86	1523	64.9	182.3	0.54	0.12	2.71	756.2	8.0	1270.0	32.64	91.69	0.27	0.06	1.36	380.34
5/11/2007	MP-2	Compass	41.78	6.61	1563	50.3	177.6	0.81	0.44	3.19	768.3	2.0	1380.0	25.30	89.33	0.41	0.22	1.60	386.43
6/4/2007	MP-2	Compass	21.68	6.56	1731	70.4	188.2	1.12	0.05	4.57	905.6	2.0	1720.0	18.37	49.12	0.29	0.01	1.19	236.35
7/20/2007	MP-2	Compass	3.83	6.74	1821	63.6	181	3.30	0.05	7.31	979.5	14.0	1690.0	2.93	8.35	0.15	0.00	0.34	45.16
8/3/2007	MP-2	Compass	1.07	6.56	1716	81.3	162.7	5.46	0.05	10.59	940	4.0	1710.0	1.05	2.10	0.07	0.00	0.14	12.11
9/5/2007	MP-2	Compass	1.07	7.30	1542	52.9	169.2	1.46	0.05	8.88	791.1	6.0	1520.0	0.68	2.18	0.02	0.00	0.11	10.19
10/3/2007	MP-2	Compass	3.83	7.43	1540	24.4	202.2	2.06	0.05	6.44	736.9	2.0	1150.0	1.13	9.32	0.09	0.00	0.30	33.98
11/16/2007	MP-2	Compass	3.83	6.78	1446	56.5	214.7	3.34	0.05	6.41	643.5	2.0	1080.0	2.61	9.90	0.15	0.00	0.30	29.67
12/4/2007	MP-2	Compass	3.83	6.82	1420	159.3	218.7	2.52	0.05	5.99	595.8	6.0	1290.0	7.34	10.08	0.12	0.00	0.28	27.47
1/4/2008	MP-2	Compass	6.05	7.84	1440	8	194.7	1.09	0.05	2.06	634.4	2.0	1180.0	0.58	14.18	0.08	0.00	0.15	46.20
2/14/2008	MP-2	Compass	59.75	7.08	1468	50.6	198.1	0.83	0.05	2.51	659.3	2.0	1250.0	36.40	142.49	0.60	0.04	1.81	474.23
Number of sample Dates		Count	26	26	26	26	26	26	26	26	26	26	23	26	26	26	26	26	26
		Max	155.66	8.2	1821.00	159.30	218.70	5.46	0.44	10.59	979.50	14.00	1720.00	50.65	378.34	0.60	0.22	1.81	1182.43
		Min	1.07	6.6	1363.00	0.00	153.00	0.02	0.02	0.93	388.40	1.00	1080.00	0.00	2.10	0.02	0.00	0.08	10.19
26		Average	22.22	7.2	1550.42	45.53	192.15	1.55	0.08	4.48	775.68	4.23	1346.35	9.66	52.14	0.17	0.02	0.67	195.30

Historical Tributary Water Quality Data

Tributary Number 10
Cambria County; East Carroll Township
Lawrence Resources; SMP #11813014

CCWA Monitoring Point: Trib Number 10														Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
11/28/1986	#32	Lawrence	--	6.64	128	0	32	0.03	--	0.03	26.79	1.2	--	--	--	--	--	--	--
3/19/1987	#32	Lawrence	--	6.90	162	0	48	0.03	--	0.03	21.67	1.2	--	--	--	--	--	--	--
6/29/1987	#32	Lawrence	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9/28/1987	#32	Lawrence	--	7.03	205	0	66.4	0.03	--	0.03	24.7	2.2	--	--	--	--	--	--	--
12/22/1987	#32	Lawrence	--	7.38	136	0	38	0.03	--	0.03	20.2	0.6	--	--	--	--	--	--	--
3/31/1988	#32	Lawrence	--	6.98	167	0	56	0.04	--	0.03	23	2.0	--	--	--	--	--	--	--
6/28/1988	#32	Lawrence	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9/27/1988	#32	Lawrence	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11/18/1988	#32	Lawrence	--	6.97	184	0	60	0.16	--	0.04	25.9	1.2	--	--	--	--	--	--	--
Number of sample Dates		Count	0	6	6	6	6	6	0	6	6	6	0	0	0	0	0	0	0
		Max	--	7.4	205.00	0.00	66.40	0.16	--	0.04	26.79	2.20	--	--	--	--	--	--	--
		Min	--	6.6	128.00	0.00	32.00	0.03	--	0.03	20.20	0.60	--	--	--	--	--	--	--
6		Average	--	7.0	163.67	0.00	50.07	0.05	--	0.03	23.71	1.40	--	--	--	--	--	--	--

Tributary Number 13, Laurel Lick Run
Cambria County; East Carroll Township, Cambria Township
Lawrence Resources; SMP #11813014

CCWA Monitoring Point: Trib Number 13, Laurel Lick Run														Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
11/28/1986	#12	Lawrence	5300.00	6.01	135	6	8	0.10	--	0.17	33.85	4.8	--	382.82	510.43	6.38	--	10.85	2159.75
3/19/1987	#12	Lawrence	2500.00	6.39	160	0	12	0.13	--	0.18	40.56	1.4	--	0.00	361.15	3.91	--	5.42	1220.69
6/29/1987	#12	Lawrence	1000.00	6.64	150	0	26	0.33	--	0.06	24.20	4.6	--	0.00	313.00	4.00	--	0.72	291.33
9/28/1987	#12	Lawrence	3000.00	6.72	155	0	19	0.05	--	0.05	31.70	2.8	--	0.00	686.19	1.81	--	1.81	1144.85
12/22/1987	#12	Lawrence	10000.00	6.73	157	0	11	0.12	--	0.12	34.60	4.6	--	0.00	1324.22	14.45	--	14.45	4165.29
3/31/1988	#12	Lawrence	2500.00	6.64	160	0	15	0.10	--	0.03	32.90	6.8	--	0.00	451.44	3.01	--	0.90	990.16
6/28/1988	#12	Lawrence	1000.00	7.12	200	0	66	0.58	--	0.08	36.20	4.0	--	0.00	794.53	6.98	--	0.96	435.79
9/27/1988	#12	Lawrence	2000.00	6.60	260	0	26	0.21	--	0.12	82.60	1.4	--	0.00	626.00	5.06	--	2.89	1988.74
11/18/1988	#12	Lawrence	5000.00	6.40	166	0	14	0.20	--	0.08	37.20	2.8	--	0.00	842.69	12.04	--	4.82	2239.14
Number of sample Dates		Count	9	9	9	9	9	9	0	9	9	9	0	9	9	9	0	9	9
		Max	10000.00	7.1	260.00	6.00	66.00	0.58	--	0.18	82.60	6.80	--	382.82	1324.22	14.45	--	14.45	4165.29
		Min	1000.00	6.0	135.00	0.00	8.00	0.05	--	0.03	24.20	1.40	--	0.00	313.00	1.81	--	0.72	291.33
9		Average	3588.89	6.6	171.44	0.67	21.89	0.20	--	0.10	39.31	3.69	--	42.54	656.63	6.40	--	4.76	1626.19

Tributary Number 30, Little Chest Creek
Cambria County; Carrolltown Borough, East Carroll Township, Patton Borough
E. P. Bender Coal Co.; SMP #11823013

CCWA Monitoring Point: Trib Number 30, Little Chest Creek																		
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Loading					
														Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
10/13/1989	2806	Bender	125.00	7.1	320	0	64	0.06	--	0.02	57	2.0	--	0.00	96.31	0.09	--	0.03	85.77
2/27/1990	2806	Bender	375.00	7.2	310	1	40	0.10	--	0.04	46	4.3	--	4.51	180.58	0.45	--	0.18	207.66
6/21/1990	2806	Bender	270.00	7.5	280	1	52	0.17	--	0.04	49	1.3	--	3.25	169.02	0.55	--	0.13	159.27
Number of sample Dates		Count	3	3	3	3	3	3	0	3	3	3	0	3	3	3	0	3	3
		Max	375.00	7.5	320.00	1.00	64.00	0.17	--	0.04	57.00	4.30	--	4.51	180.58	0.55	--	0.18	207.66
		Min	125.00	7.1	280.00	0.00	40.00	0.06	--	0.02	46.00	1.30	--	0.00	96.31	0.09	--	0.03	85.77
3		Average	256.67	7.3	303.33	0.67	52.00	0.11	--	0.03	50.67	2.53	--	2.59	148.63	0.36	--	0.11	150.90

Tributary Number 33
Cambria County; Chest Township
Hepburnia; SMP #11683027

CCWA Monitoring Point: Trib Number 33																			
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Loading					
														Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
9/20/1985	2	Hep.	10.00	8.3	235	0	70	0.01	--	0.01	27	0.3	--	0.00	8.43	0.00	--	0.00	3.25
12/20/1985	2	Hep.	25.00	7.3	116	2	22	0.04	--	0.01	38	2.7	--	0.60	6.62	0.01	--	0.00	11.44
3/1/1986	2	Hep.	45.00	7.1	122	6	20	0.13	--	0.01	40	4.0	--	3.25	10.83	0.07	--	0.01	21.67
4/11/1986	2	Hep.	20.00	7.4	125	4	22	0.04	--	0.01	41	3.3	--	0.96	5.30	0.01	--	0.00	9.87
8/28/1986	2	Hep.	1.00	7.5	240	0	68	0.01	--	0.01	78	4.3	--	0.00	0.82	0.00	--	0.00	0.94
11/10/1986	2	Hep.	125.00	7.1	96	6	24	0.01	--	0.02	38	2.3	--	9.03	36.12	0.02	--	0.03	57.18
2/25/1987	2	Hep.	75.00	7.4	135	0	26	0.01	--	0.01	36	2.7	--	0.00	23.47	0.01	--	0.01	32.50
6/23/1987	2	Hep.	25.00	7.0	163	4	36	0.10	--	0.08	38	2.3	--	1.20	10.83	0.03	--	0.02	11.44
7/27/1987	2	Hep.	12.00	8.1	183	0	74	0.14	--	0.01	31	3.0	--	0.00	10.69	0.02	--	0.00	4.48
11/20/1987	2	Hep.	20.00	7.3	178	0	42	0.23	--	0.09	31	5.3	--	0.00	10.11	0.06	--	0.02	7.46
2/17/1988	2	Hep.	30.00	6.9	123	6	26	0.10	--	0.04	31	3.0	--	2.17	9.39	0.04	--	0.01	11.20
6/20/1988	2	Hep.	2.50	7.9	175	0	60	0.01	--	0.05	21	0.3	--	0.00	1.81	0.00	--	0.00	0.63
9/28/1988	2	Hep.	2.00	7.7	260	0	60	0.06	--	0.04	40	1.3	--	0.00	1.44	0.00	--	0.00	0.96
12/20/1988	2	Hep.	20.00	7.3	145	4	30	0.05	--	0.09	58	3.0	--	0.96	7.22	0.01	--	0.02	13.96
3/22/1989	2	Hep.	165.00	7.1	135	3	20	0.01	--	0.02	28	0.3	--	5.96	39.73	0.02	--	0.04	55.62
4/27/1989	2	Hep.	40.00	7.1	138	2	25	0.02	--	0.06	24	3.0	--	0.96	12.04	0.01	--	0.03	11.56
Number of sample Dates		Count	16	16	16	16	16	16	0	16	16	16	0	16	16	16	0	16	16
		Max	165.00	8.3	260.00	6.00	74.00	0.23	--	0.09	78.00	5.30	--	9.03	39.73	0.07	--	0.04	57.18
		Min	1.00	6.9	96.00	0.00	20.00	0.01	--	0.01	21.00	0.30	--	0.00	0.82	0.00	--	0.00	0.63
16		Average	38.59	7.4	160.56	2.31	39.06	0.06	--	0.04	37.50	2.57	--	1.57	12.18	0.02	--	0.01	15.89

Tributary Number 33
Cambria County: Chest Township
K&J Coal Co, Inc. SMP # 11693000

CCWA Monitoring Point: Trib Number 33													Total	Total	Loading					
Sample			Flow	Lab	Lab	Acidity	Alkalinity	Total	Total	Total	Total		Susp.	Dissolv.						
			(Method)	pH	Conductivit			Fe	Al	Mn	Sulfate		Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	umhos/cm	(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)	(lbs/day)
5/3/1999	6W	K&J	30.00	7.5	185	0	32	0.13	0.07	0.03	31		0.3	--	0.00	11.56	0.05	0.03	0.01	11.20
7/20/1999	6W	K&J	--	--	--	--	--	--	--	--	--		--	--	--	--	--	--	--	--
11/10/1999	6W	K&J	20.00	7.6	233	0	46	0.13	0.14	0.03	47		0.7	--	0.00	11.08	0.03	0.03	0.01	11.32
1/6/2000	6W	K&J	60.00	7.5	247	0	28	0.06	0.07	0.03	35		0.3	--	0.00	20.22	0.04	0.05	0.02	25.28
5/1/2000	6W	K&J	60.00	7.4	175	0	28	0.12	0.07	0.03	24		2.0	--	0.00	20.22	0.09	0.05	0.02	17.34
7/5/2000	6W	K&J	15.00	7.5	251	0	60	0.31	0.29	0.05	40		6.7	--	0.00	10.83	0.06	0.05	0.01	7.22
10/3/2000	6W	K&J	7.00	7.7	250	0	54	0.23	0.07	0.06	52		2.3	--	0.00	4.55	0.02	0.01	0.01	4.38
1/4/2001	6W	K&J	30.00	7.3	209	0	30	0.06	0.07	0.03	34		0.3	--	0.00	10.83	0.02	0.03	0.01	12.28
4/25/2001	6W	K&J	150.00	7.2	185	0	26	0.13	0.10	0.03	27		3.0	--	0.00	46.95	0.23	0.18	0.05	48.76
7/10/2001	6W	K&J	20.00	7.5	258	0	50	0.35	0.67	0.03	37		12.7	--	0.00	12.04	0.08	0.16	0.01	8.91
10/9/2001	6W	K&J	--	--	--	--	--	--	--	--	--		--	--	--	--	--	--	--	--
1/4/2002	6W	K&J	15.00	7.3	229	0	38	0.07	0.04	0.01	50		1.7	--	0.00	6.86	0.01	0.01	0.00	9.03
Number of		Count	10	10	10	10	10	10	10	10	10		10	0	10	10	10	10	10	10
sample		Max	150.00	7.7	258.00	0.00	60.00	0.35	0.67	0.06	52.00		12.70	0.00	0.00	46.95	0.23	0.18	0.05	48.76
Dates		Min	7.00	7.2	175.00	0.00	26.00	0.06	0.04	0.01	24.00		0.30	0.00	0.00	4.55	0.01	0.01	0.00	4.38
6		Average	40.70	7.5	222.20	0.00	39.20	0.16	0.16	0.03	37.70		3.00	#DIV/0!	0.00	15.52	0.06	0.06	0.01	15.57

Tributary Number 33
Cambria County; Chest Township
K & J Coal Co., Inc.; SMP #11960103

CCWA Monitoring Point: Trib Number 33														Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
10/1/1998	SW-15	K & J	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2/22/1999	SW-15	K & J	3.00	7.00	209.00	0.00	20.00	0.03	0.07	0.03	63.00	3.70	--	0.00	0.72	0.00	0.00	0.00	2.28
5/3/1999	SW-15	K & J	5.00	7.30	222.00	0.00	22.00	0.07	0.07	0.03	68.00	0.30	--	0.00	1.32	0.00	0.00	0.00	4.09
7/20/1999	SW-15	K & J	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11/10/1999	SW-15	K & J	20.00	7.60	233.00	0.00	46.00	0.13	0.14	0.03	47.00	0.70	--	0.00	11.08	0.03	0.03	0.01	11.32
1/6/2000	SW-15	K & J	60.00	7.50	247.00	0.00	28.00	0.06	0.07	0.03	35.00	0.30	--	0.00	20.22	0.04	0.05	0.02	25.28
5/1/2000	SW-15	K & J	60.00	7.40	175.00	0.00	28.00	0.12	0.07	0.03	24.00	2.00	--	0.00	20.22	0.09	0.05	0.02	17.34
7/5/2000	SW-15	K & J	15.00	7.50	251.00	0.00	60.00	0.31	0.29	0.05	40.00	6.70	--	0.00	10.83	0.06	0.05	0.01	7.22
10/3/2000	SW-15	K & J	7.00	7.70	250.00	0.00	54.00	0.23	0.07	0.06	52.00	2.30	--	0.00	4.55	0.02	0.01	0.01	4.38
1/4/2001	SW-15	K & J	30.00	7.30	209.00	0.00	30.00	0.06	0.07	0.03	34.00	0.30	--	0.00	10.83	0.02	0.03	0.01	12.28
Number of sample Dates		Count	8	8	8	8	8	8	8	8	8	8	0	8	8	8	8	8	8
		Max	60	7.7	251	0	60	0.31	0.29	0.06	68	6.7	--	0.00	20.22	0.09	0.05	0.02	25.28
		Min	3	7	175	0	20	0.03	0.07	0.03	24	0.3	--	0.00	0.72	0.00	0.00	0.00	2.28
10		Average	25.00	7.41	224.50	0.00	36.00	0.13	0.11	0.04	45.38	2.04	--	0.00	9.97	0.03	0.03	0.01	10.52

Tributary Number 34

Clearfield County; Burnside Township, Westover Borough

E. P. Bender Coal Co.; SMP #4277SM5

CCWA Monitoring Point: Trib Number 34														Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
6/3/1987	1203	Bender	--	7.4	275	-35	37	0.94	--	0.27	87	7.2	--	--	--	--	--	--	--
9/15/1987	1203	Bender	--	7.8	235	0	49	0.52	--	0.17	62	9.0	--	--	--	--	--	--	--
11/20/1987	1203	Bender	--	7.2	195	0	48	0.49	--	0.20	55	7.7	--	--	--	--	--	--	--
1/27/1988	1203	Bender	--	6.8	201	0	36	0.22	--	0.18	66	4.0	--	--	--	--	--	--	--
4/7/1988	1203	Bender	--	7.0	200	0	34	0.18	--	0.12	40	5.2	--	--	--	--	--	--	--
9/28/1988	1203	Bender	1000+	7.7	225	0	40	0.18	--	0.09	72	4.8	--	--	--	--	--	--	--
11/16/1988	1203	Bender	--	7.2	240	2	36	0.24	--	0.10	70	4.7	--	--	--	--	--	--	--
3/29/1989	1203	Bender	--	7.1	185	0	27	0.19	--	0.11	40	0.4	--	--	--	--	--	--	--
4/27/1989	1203	Bender	--	7.4	195	0	44	0.20	--	0.14	72	4.9	--	--	--	--	--	--	--
Number of sample Dates		Count	0	9	9	9	9	9	0	9	9	9	0	0	0	0	0	0	0
		Max	1000+	7.8	275.00	2.00	49.00	0.94	--	0.27	87.00	9.00	--	--	--	--	--	--	--
		Min	1000+	6.8	185.00	-35.00	27.00	0.18	--	0.09	40.00	0.40	--	--	--	--	--	--	--
10		Average	--	7.3	216.78	-3.67	39.00	0.35	--	0.15	62.67	5.32	--	--	--	--	--	--	--

Note: 9/28/1988 Loading data cannot be calculated as Flow measurment is not a usable number.

Tributary Number 34

Clearfield County; Burnside Township, Westover Borough

E. P. Bender Coal Company; SMP #4276SM18

CCWA Monitoring Point: Trib Number 34														Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
7/29/1993	1203	Bender	3.00	7.6	459	0	60	0.03	--	0.10	231	2.3	--	0.00	2.17	0.00	--	0.00	8.34
10/5/1993	1203	Bender	15.00	7.4	370	0	36	0.04	--	0.01	110	0.3	--	0.00	6.50	0.01	--	0.00	19.86
3/10/1994	1203	Bender	42.00	6.5	390	0	16	0.01	--	0.08	131	6.0	--	0.00	8.09	0.01	--	0.04	66.24
4/25/1994	1203	Bender	20.00	7.2	303	0	42	0.03	--	0.10	83	0.3	--	0.00	10.11	0.01	--	0.02	19.98
8/3/1994	1203	Bender	0.50	7.5	360	0	70	0.65	--	0.15	76	56.0	--	0.00	0.42	0.00	--	0.00	0.46
11/10/1994	1203	Bender	49.00	7.3	218	0	58	0.01	--	0.02	51	1.7	--	0.00	34.21	0.01	--	0.01	30.08
2/2/1995	1203	Bender	25.00	7.2	244	0	34	0.01	--	0.14	38	0.3	--	0.00	10.23	0.00	--	0.04	11.44
5/30/1995	1203	Bender	20.00	7.7	243	0	50	0.03	--	0.01	36	1.7	--	0.00	12.04	0.01	--	0.00	8.67
8/3/1995	1203	Bender	120.00	7.0	202	0	36	0.11	--	0.04	34	17.7	--	0.00	52.01	0.16	--	0.06	49.12
10/10/1995	1203	Bender	5.00	7.5	355	0	70	0.01	--	0.01	50	0.3	--	0.00	4.21	0.00	--	0.00	3.01
Number of sample Dates		Count	10	10	10	10	10	10	0	10	10	10	0	10	10	10	0	10	10
		Max	120.00	7.7	459.00	0.00	70.00	0.65	--	0.15	231.00	56.00	--	0.00	52.01	0.16	--	0.06	66.24
		Min	0.50	6.5	202.00	0.00	16.00	0.01	--	0.01	34.00	0.30	--	0.00	0.42	0.00	--	0.00	0.46
10		Average	29.95	7.3	314.40	0.00	47.20	0.09	--	0.07	84.00	8.66	--	0.00	14.00	0.02	--	0.02	21.72

Tributary Number 35, Whiskey Run
Cambria County; Chest Township
Hepburnia; SMP #11683027

CCWA Monitoring Point: Trib Number 35, Whiskey Run														Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
9/20/1985	4	Hep.	150.00	8.2	445	0	62	0.01	--	0.01	109	7.7	--	0.00	111.96	0.02	--	0.02	196.83
12/20/1985	4	Hep.	175.00	7.7	410	0	50	0.02	--	0.30	236	4.0	--	0.00	105.34	0.04	--	0.63	497.19
3/1/1986	4	Hep.	150.00	7.6	310	2	40	0.09	--	0.21	78	5.3	--	3.61	72.23	0.16	--	0.38	140.85
4/11/1986	4	Hep.	100.00	7.6	230	0	36	0.01	--	0.20	70	4.7	--	0.00	43.34	0.01	--	0.24	84.27
8/28/1986	4	Hep.	15.00	7.5	300	2	66	0.13	--	0.15	92	5.3	--	0.36	11.92	0.02	--	0.03	16.61
11/10/1986	4	Hep.	200.00	7.5	174	8	42	0.72	--	0.13	63	57.3	--	19.26	101.12	1.73	--	0.31	151.68
2/25/1987	4	Hep.	100.00	7.8	200	0	58	0.10	--	0.16	83	2.7	--	0.00	69.82	0.12	--	0.19	99.92
6/23/1987	4	Hep.	45.00	7.2	200	0	50	0.21	--	0.34	81	4.3	--	0.00	27.09	0.11	--	0.18	43.88
7/27/1987	4	Hep.	20.00	7.9	220	0	58	0.24	--	0.24	68	10.3	--	0.00	13.96	0.06	--	0.06	16.37
11/20/1987	4	Hep.	40.00	7.4	185	0	46	0.50	--	0.29	57	4.3	--	0.00	22.15	0.24	--	0.14	27.45
2/17/1988	4	Hep.	40.00	7.6	340	0	76	0.24	--	1.05	210	3.7	--	0.00	36.60	0.12	--	0.51	101.12
6/28/1988	4	Hep.	16.00	7.9	260	0	62	0.01	--	0.19	81	0.3	--	0.00	11.94	0.00	--	0.04	15.60
9/28/1988	4	Hep.	10.00	7.7	240	0	58	0.07	--	0.03	48	9.0	--	0.00	6.98	0.01	--	0.00	5.78
12/20/1988	4	Hep.	35.00	7.7	260	0	56	0.12	--	0.22	74	3.0	--	0.00	23.60	0.05	--	0.09	31.18
3/22/1989	4	Hep.	75.00	7.4	250	0	42	0.06	--	0.08	74	0.3	--	0.00	37.92	0.05	--	0.07	66.81
4/27/1989	4	Hep.	70.00	7.3	340	0	36	0.13	--	0.13	100	6.7	--	0.00	30.34	0.11	--	0.11	84.27
Number of sample Dates		Count	16	16	16	16	16	16	0	16	16	16	0	16	16	16	0	16	16
		Max	200.00	8.2	445.00	8.00	76.00	0.72	--	1.05	236.00	57.30	--	19.26	111.96	1.73	--	0.63	497.19
		Min	10.00	7.2	174.00	0.00	36.00	0.01	--	0.01	48.00	0.30	--	0.00	6.98	0.00	--	0.00	5.78
16		Average	77.56	7.6	272.75	0.75	52.38	0.17	--	0.23	95.25	8.06	--	1.45	45.39	0.18	--	0.19	98.74

Tributary Number 35, Whiskey Run
Cambria County; Chest Township
K & J Coal Co., Inc.; SMP #11693000

CCWA Monitoring Point: Trib Number 35 Whiskey Run														Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
5/3/1999	TW	K & J	40.00	7.4	188	0	32	0.09	0.07	0.03	28	0.3	--	0.00	15.41	0.04	0.03	0.01	13.48
7/20/1999	TW	K & J	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11/10/1999	TW	K & J	100.00	7.2	378	0	20	0.22	0.17	0.07	161	1.0	--	0.00	24.08	0.26	0.20	0.08	193.82
1/6/2000	TW	K & J	80.00	7.6	345	0	24	0.15	0.07	0.29	137	0.3	--	0.00	23.11	0.14	0.07	0.28	131.94
5/1/2000	TW	K & J	--	7.3	421	0	22	0.62	0.19	0.50	169	6.0	--	--	--	--	--	--	--
7/5/2000	TW	K & J	75.00	7.2	479	0	28	0.35	0.15	0.12	209	0.3	--	0.00	25.28	0.32	0.14	0.11	188.70
10/3/2000	TW	K & J	30.00	7.3	484	0	26	0.33	0.07	0.11	236	1.3	--	0.00	9.39	0.12	0.03	0.04	85.23
1/4/2001	TW	K & J	60.00	7.3	429	0	30	0.14	0.07	0.22	180	0.3	--	0.00	21.67	0.10	0.05	0.16	130.01
4/25/2001	TW	K & J	200.00	7.1	379	0	20	0.53	0.24	0.53	170	5.0	--	0.00	48.15	1.28	0.58	1.28	409.31
7/10/2001	TW	K & J	35.00	7.2	486	0	28	0.54	0.58	0.24	214	3.3	--	0.00	11.80	0.23	0.24	0.10	90.17
10/9/2001	TW	K & J	10.00	7.0	620	0	26	0.04	0.01	0.02	287	0.3	--	0.00	3.13	0.00	0.00	0.00	34.55
1/4/2002	TW	K & J	25.00	7.0	398	0	22	0.07	0.02	0.06	181	0.7	--	0.00	6.62	0.02	0.01	0.02	54.47
Number of sample Dates		Count	10	11	11	11	11	11	11	11	11	11	0	10	10	10	10	10	10
		Max	200.00	7.6	620.00	0.00	32.00	0.62	0.58	0.53	287.00	6.00	--	0.00	48.15	1.28	0.58	1.28	409.31
		Min	10.00	7.0	188.00	0.00	20.00	0.04	0.01	0.02	28.00	0.30	--	0.00	3.13	0.00	0.00	0.00	13.48
12		Average	65.50	7.2	418.82	0.00	25.27	0.28	0.15	0.20	179.27	1.71	--	0.00	18.86	0.25	0.13	0.21	133.17

Tributary Number 36, Rock Run
Cambria County; Chest Township
K & J Coal Co., Inc.; SMP #11693000

CCWA Monitoring Point: Trib Number 36, Rock Run														Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
4/20/1999	4W	K & J	500.00	6.7	735	0	12	0.41	--	3.29	354	13.0	--	0.00	72.23	2.47	--	19.80	2130.80
8/3/1999	4W	K & J	100.00	7.0	1020	0	32	0.73	0.52	1.43	456	53.0	--	0.00	38.52	0.88	0.63	1.72	548.95
11/16/1999	4W	K & J	600.00	7.3	842	0	28	0.18	0.16	1.49	381	2.7	--	0.00	202.25	1.30	1.16	10.76	2751.98
1/6/2000	4W	K & J	600.00	7.2	647	0	18	0.14	0.13	1.49	324	0.3	--	0.00	130.01	1.01	0.94	10.76	2340.26
5/2/2000	4W	K & J	--	6.8	1040	0	12	0.33	1.21	4.34	503	11.7	--	--	--	--	--	--	--
7/6/2000	4W	K & J	--	7.3	1090	0	34	0.19	0.19	0.78	503	2.3	--	--	--	--	--	--	--
10/3/2000	4W	K & J	--	7.5	847	0	36	0.18	0.07	0.66	482	2.0	--	--	--	--	--	--	--
1/4/2001	4W	K & J	--	7.1	842	0	24	0.14	0.13	1.11	400	0.3	--	--	--	--	--	--	--
4/19/2001	4W	K & J	--	6.7	536	0	12	0.22	0.87	2.16	272	3.3	--	--	--	--	--	--	--
7/9/2001	4W	K & J	--	7.3	1150	0	28	0.25	0.36	1.00	582	0.3	--	--	--	--	--	--	--
10/3/2001	4W	K & J	--	7.3	1130	0	40	0.69	0.06	0.17	563	3.3	--	--	--	--	--	--	--
1/10/2002	4W	K & J	--	6.5	1040	0	20	0.10	0.06	0.45	483	0.3	--	--	--	--	--	--	--
Number of sample Dates		Count	4	12	12	12	12	12	11	12	12	12	0	4	4	4	3	4	4
		Max	600.00	7.5	1150.00	0.00	40.00	0.73	1.21	4.34	582.00	53.00	--	0.00	202.25	2.47	1.16	19.80	2751.98
		Min	100.00	6.5	536.00	0.00	12.00	0.10	0.06	0.17	272.00	0.30	--	0.00	38.52	0.88	0.63	1.72	548.95
12		Average	450.00	7.1	909.92	0.00	24.67	0.30	0.34	1.53	441.92	7.71	--	0.00	110.75	1.41	0.91	10.76	1943.00

Tributary Number 37
Cambria County; Chest Township
E. P. Bender Coal Co.; SMP #4277SM9

CCWA Monitoring Point: Trib Number 37														Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
1979	8	Bender	100.00	7.5	No Report	-11.0	17.0	0.16	--	0.19	245	7.6	--	-13.24	20.47	0.19	--	0.23	294.94
Number of sample Dates		Count	1	1	0	1	1	1	0	1	1	1	0	1	1	1	0	1	1
		Max	100.00	7.5	--	-11.00	17.00	0.16	--	0.19	245.00	7.60	--	-13.24	20.47	0.19	--	0.23	294.94
		Min	100.00	7.5	--	-11.00	17.00	0.16	--	0.19	245.00	7.60	--	-13.24	20.47	0.19	--	0.23	294.94
1		Average	100.00	7.5	--	-11.00	17.00	0.16	--	0.19	245.00	7.60	--	-13.24	20.47	0.19	--	0.23	294.94

Tributary Number 37
Cambria County; Chest Township
K & J Coal Co.; SMP #11920104

CCWA Monitoring Point: Trib Number 37														Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
4/11/1991	DR-1	K&J	300.00	8.00	1410	0.0	196.0	0.05	0.18	0.06	886.0	1.3	--	0.00	707.86	0.18	0.65	0.22	3199.81
5/28/1991	DR-1	K&J	300.00	7.80	1450	0.0	182.0	0.01	0.03	0.06	886.0	3.0	--	0.00	657.30	0.04	0.11	0.22	3199.81
6/28/1991	DR-1	K&J	60.00	8.20	1420	0.0	186.0	0.01	--	0.05	919.0	3.7	--	0.00	134.35	0.01	--	0.04	663.80
7/22/1991	DR-1	K&J	60.00	7.80	1500	0.0	164.0	0.07	0.04	0.11	858.0	15.3	--	0.00	118.46	0.05	0.03	0.08	619.74
8/22/1991	DR-1	K&J	35.00	7.90	1400	0	148	0.01	0.06	0.09	886	10.0	--	0.00	62.36	0.00	0.03	0.04	373.31
9/11/1991	DR-1	K&J	40.00	8.00	1475	0	140	0.03	0.03	0.12	960	3.3	--	0.00	67.42	0.01	0.01	0.06	462.27
10/3/1991	DR-1	K&J	30.00	7.40	1500	0	134	0.01	--	0.08	1100	3.0	--	0.00	48.39	0.00	--	0.03	397.27
11/27/1991	DR-1	K&J	30.00	7.90	1550	0	148	0.01	0.09	0.01	1050	1.3	--	0.00	53.45	0.00	0.03	0.00	379.21
12/20/1991	DR-1	K&J	150.00	7.70	1450	0	122	0.09	0.04	0.05	886	2.3	--	0.00	220.30	0.16	0.07	0.09	1599.90
4/3/1992	DR-1	K&J	600.00	7.97	1158	0	108	0.12	0.43	0.04	540.78	7.60	--	0.00	780.09	0.87	3.11	0.29	3906.08
1/22/1999	DR-1	K&J	150.00	8.0	1550	0	164	0.05	0.07	0.03	755	14.7	--	0.00	296.14	0.09	0.13	0.05	1363.35
4/5/1999	DR-1	K&J	100.00	8.1	1780	0	214	0.03	0.11	0.05	925	0.7	--	0.00	257.62	0.04	0.13	0.06	1113.55
7/1/1999	DR-1	K&J	100.00	7.9	1900	0	224	0.06	0.26	0.07	922	1.3	--	0.00	269.66	0.07	0.31	0.08	1109.94
11/17/1999	DR-1	K&J	50.00	8.0	1920	0	208	0.04	0.07	0.03	1018	2.0	--	0.00	125.20	0.02	0.04	0.02	612.75
1/27/2000	DR-1	K&J	50.00	8.1	1730	0	202	0.24	0.07	0.07	986	0.3	--	0.00	121.59	0.14	0.04	0.04	593.49
4/14/2000	DR-1	K&J	80.00	8.1	1690	0	224	0.05	0.07	0.03	908	0.3	--	0.00	215.73	0.05	0.07	0.03	874.47
7/13/2000	DR-1	K&J	40.00	8.0	1890	0	188	0.20	0.07	0.09	985	3.7	--	0.00	90.53	0.10	0.03	0.04	474.31
10/4/2000	DR-1	K&J	10.00	8.0	1300	0	102	0.23	0.12	0.18	1128	4.3	--	0.00	12.28	0.03	0.01	0.02	135.79
1/9/2001	DR-1	K&J	20.00	7.9	1890	0	178	0.56	0.07	0.03	1015	0.3	--	0.00	42.86	0.13	0.02	0.01	244.38
4/19/2001	DR-1	K&J	125.00	7.9	1570	0	234	0.10	0.29	0.03	866	2.0	--	0.00	352.12	0.15	0.44	0.05	1303.16
7/10/2001	DR-1	K&J	30.00	7.9	2050	0	180	0.08	0.58	0.09	1098	0.3	--	0.00	65.01	0.03	0.21	0.03	396.54
10/9/2001	DR-1	K&J	2.00	7.7	1990	0	168	0.78	0.27	0.09	1124	2.3	--	0.00	4.04	0.02	0.01	0.00	27.06
1/14/2002	DR-1	K&J	20.00	7.8	1810	0	162	0.05	0.02	0.02	968	0.7	--	0.00	39.00	0.01	0.00	0.00	233.06
Number of sample Dates		Count	23	23	23	23	23	23	21	23	23	23	0	23	23	23	21	23	23
		Max	600.00	8.2	2050.00	0.00	234.00	0.78	0.58	0.18	1128.00	15.30	--	0.00	780.09	0.87	3.11	0.29	3906.08
		Min	2.00	7.4	1158.00	0.00	102.00	0.01	0.02	0.01	540.78	0.30	--	0.00	4.04	0.00	0.00	0.00	27.06
23		Average	103.57	7.9	1625.35	0.00	172.87	0.13	0.14	0.06	942.16	3.64	--	0.00	206.16	0.10	0.26	0.07	1012.31

Tributary Number 38, Brubaker Run

Cambria County; Elder Township, Susquehanna Township, Hastings Borough

E. P. Bender Coal Co.; SMP #1179112

CCWA Monitoring Point: Trib Number 38, Brubaker Run														Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
9/8/1987	1433	Bender	No Report	7.8	570	0	42	0.18	--	0.99	314	32.7	--	--	--	--	--	--	--
10/27/1987	1433	Bender	600.00	7.3	800	2	44	0.20	--	1.15	384	5.0	--	14.45	317.81	1.44	--	8.31	2773.65
1/27/1988	1433	Bender	N/M	6.7	510	2	34	0.42	--	0.94	359	13.0	--	--	--	--	--	--	--
5/12/1988	1433	Bender	N/M	7.2	550	2	40	0.32	--	0.81	321	3.0	--	--	--	--	--	--	--
7/28/1988	1433	Bender	600.00	7.0	600	8	32	0.15	--	0.72	526	6.0	--	57.78	231.14	1.08	--	5.20	3799.32
Number of sample Dates		Count	2	5	5	5	5	5	0	5	5	5	0	2	2	2	0	2	2
		Max	600.00	7.8	800.00	8.00	44.00	0.42	--	1.15	526.00	32.70	--	57.78	317.81	1.44	--	8.31	3799.32
		Min	600.00	6.7	510.00	0.00	32.00	0.15	--	0.72	314.00	3.00	--	14.45	231.14	1.08	--	5.20	2773.65
5		Average	600.00	7.2	606.00	2.80	38.40	0.25	--	0.92	380.80	11.94	--	36.12	274.48	1.26	--	6.75	3286.48

Tributary Number 38, Brubaker Run
Cambria County; Elder Township
R.J. Coal Company; SMP #11070101

CCWA Monitoring Point: Trib Number 38, Brubaker Run														Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
8/17/2007	MP-70	R.J.Coal	625.00	7.7	732.00	2.20	102.50	0.02	--	0.02	244.60	1.00	--	16.55	771.21	0.15	--	0.15	1840.37
10/16/2007	MP-70	R.J.Coal	640.00	7.6	844.00	2.70	54.40	0.53	0.05	0.07	302.10	2.00	452.00	20.80	419.13	4.08	0.39	0.54	2327.55
Number of sample Dates		Count	2	2	2	2	2	2	1	2	2	2	1	2	2	2	1	2	2
		Max	640.00	7.66	844.00	2.70	102.50	0.53	0.05	0.07	302.10	2.00	452.00	20.80	771.21	4.08	0.39	0.54	2327.55
		Min	625.00	7.63	732.00	2.20	54.40	0.02	0.05	0.02	244.60	1.00	452.00	16.55	419.13	0.15	0.39	0.15	1840.37
2		Average	632.50	7.65	788.00	2.45	78.45	0.28	0.05	0.05	273.35	1.50	452.00	18.68	595.17	2.12	0.39	0.34	2083.96

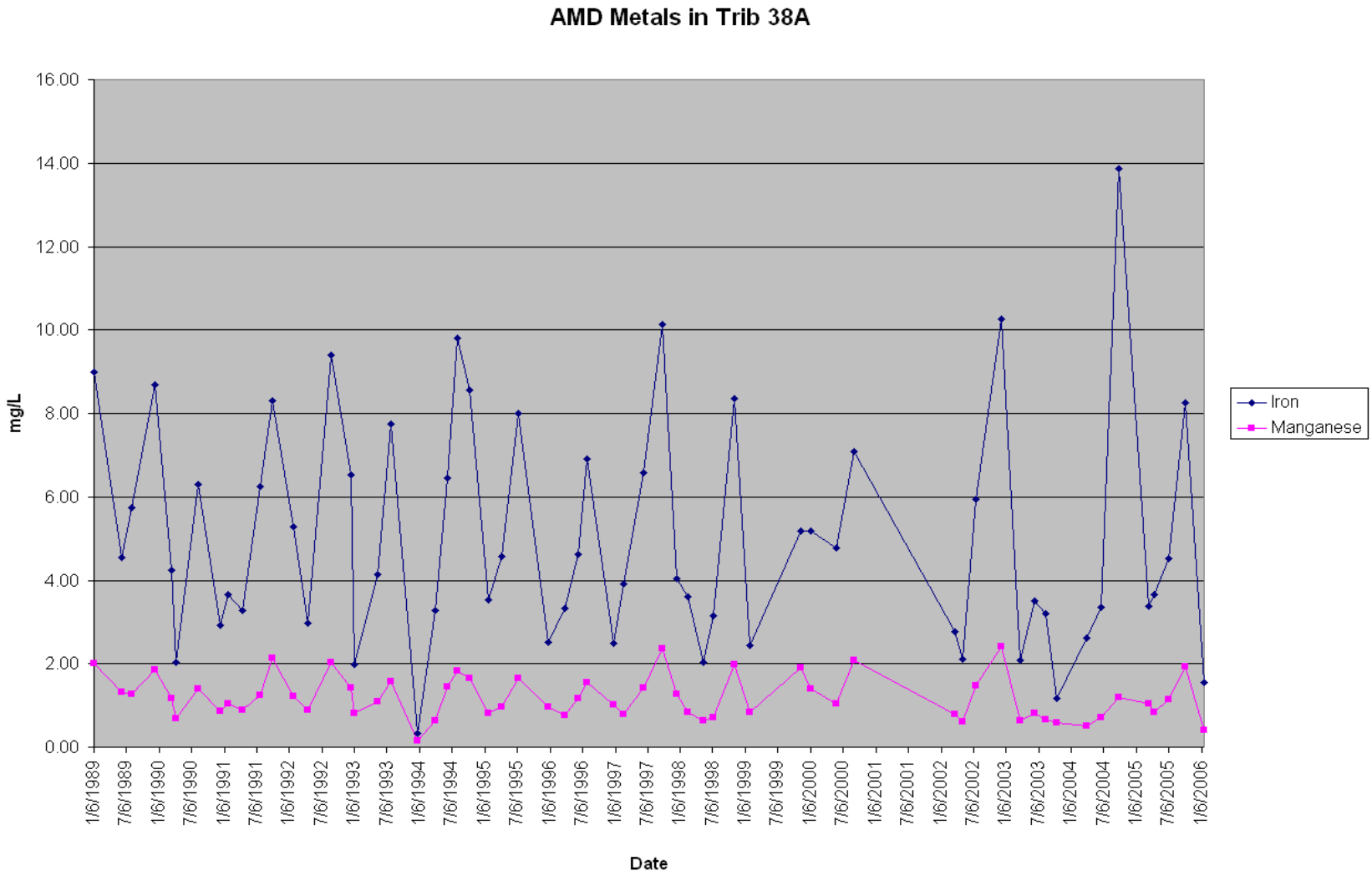
Tributary Number 38 and 38A Combo
Cambria County; Elder Township
E.P. Bender Coal Co.; SMP #11840102

CCWA Monitoring Point: Trib Number 38 and 38A Combo														Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
10/27/1987	3404	Bender	1000+	7.2	810	2	44	1.25	--	1.57	526	5.0	--	--	--	--	--	--	--
1/27/1988	3404	Bender	--	7.1	520	0	32	1.97	--	1.12	314	9.0	--	--	--	--	--	--	--
5/12/1988	3404	Bender	--	6.9	545	0	38	1.12	--	0.72	329	4.3	--	--	--	--	--	--	--
7/28/1988	3404	Bender	750+	7.3	900	0	30	1.35	--	1.48	663	13.3	--	--	--	--	--	--	--
10/13/1988	3404	Bender	300+	7.1	1000	4	22	2.50	--	2.06	489	11.7	--	--	--	--	--	--	--
2/1/1989	3404	Bender	--	7.1	560	0	24	1.01	--	1.35	336	9.7	--	--	--	--	--	--	--
6/15/1989	3404	Bender	--	6.8	500	6	26	1.15	--	1.12	307	29.7	--	--	--	--	--	--	--
7/31/1989	3404	Bender	--	7.1	505	4	42	0.48	--	0.76	294	14.0	--	--	--	--	--	--	--
11/6/1989	3404	Bender	1000+	7.0	780	1	38	2.16	--	1.63	458	9.7	--	--	--	--	--	--	--
Number of sample Dates		Count	0	9	9	9	9	9	0	9	9	9	0	0	0	0	0	0	0
		Max	1000+	7.3	1000.00	6.00	44.00	2.50	--	2.06	663.00	29.70	--	--	--	--	--	--	--
		Min	300+	6.8	500.00	0.00	22.00	0.48	--	0.72	294.00	4.30	--	--	--	--	--	--	--
9		Average	--	7.1	680.00	1.89	32.89	1.44	--	1.31	412.89	11.82	--	--	--	--	--	--	--

Note: Flow values expressed in the form "x+" are not usable in loading calculations.

Tributary Number 38A, Little Brubaker Run
Cambria County; Susquehanna Township, Elder Township
M. B. Energy, Inc.; SMP #11823004

CCWA Monitoring Point: Trib Number 38A, Little Brubaker Run														Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
1/6/1989	MP-A	MBE	2376.00	6.38	760	7.8	17.3	8.98	--	2.01	430.8	22	--	223.11	494.84	256.86	--	57.49	12322.28
6/9/1989	MP-A	MBE	1742.00	7.06	675	7.0	34.2	4.54	--	1.31	310.5	16	--	146.80	717.20	95.21	--	27.47	6511.46
8/3/1989	MP-A	MBE	3861.00	7.36	821	4.0	44.1	5.73	--	1.28	282.1	12	--	185.92	2049.78	266.33	--	59.49	13112.08
12/15/1989	MP-A	MBE	1735.00	6.78	772	7.6	24.7	8.69	--	1.86	336.6	30	--	158.74	515.90	181.50	--	38.85	7030.44
3/15/1990	MP-A	MBE	2653.00	7.11	628	6.2	29.9	4.24	--	1.16	178.7	18	--	198.01	954.94	135.42	--	37.05	5707.30
4/13/1990	MP-A	MBE	6755.00	7.04	373	4.2	21.4	2.04	--	0.69	147.2	14	--	341.54	1740.23	165.89	--	56.11	11970.21
8/14/1990	MP-A	MBE	3160.00	7.57	766	1.8	47.0	6.29	--	1.39	363.2	16	--	68.47	1787.94	239.28	--	52.88	13816.62
12/15/1990	MP-A	MBE	5535.00	7.18	444	4.1	30.4	2.92	--	0.86	202.8	14	--	273.19	2025.63	194.57	--	57.30	13513.08
1/25/1991	MP-A	MBE	3757.00	6.79	538	4.1	31.8	3.65	--	1.03	267.8	10	--	185.44	1438.26	165.08	--	46.59	12112.13
4/19/1991	MP-A	MBE	5872.00	6.85	547	5.4	42.2	3.28	--	0.89	233.8	18	--	381.72	2983.10	231.86	--	62.91	16527.20
7/23/1991	MP-A	MBE	2758.00	7.49	897	2.4	50.3	6.24	--	1.24	469.9	26	--	79.68	1670.06	207.18	--	41.17	15601.58
10/4/1991	MP-A	MBE	1667.00	6.43	952	8.9	16.1	8.30	--	2.14	563.5	30	--	178.61	323.10	166.56	--	42.95	11308.33
1/30/1992	MP-A	MBE	--	6.64	581	4.9	18.0	5.27	--	1.22	256.0	18	--	--	--	--	--	--	--
4/20/1992	MP-A	MBE	--	7.17	599	2.1	24.8	2.98	--	0.90	211.0	8	--	--	--	--	--	--	--
8/25/1992	MP-A	MBE	3538.00	6.61	849	18.0	13.0	9.39	--	2.03	439.5	46	--	766.65	553.69	399.94	--	86.46	18719.12
12/16/1992	MP-A	MBE	--	6.63	655	11.9	21.2	6.52	--	1.41	296.6	14	--	--	--	--	--	--	--
1/4/1993	MP-A	MBE	--	6.69	353	3.4	19.6	1.99	--	0.82	132.9	20	--	--	--	--	--	--	--
5/13/1993	MP-A	MBE	--	6.94	677	6.4	34.9	4.14	--	1.09	301.5	26	--	--	--	--	--	--	--
7/27/1993	MP-A	MBE	--	7.14	935	5.5	45.9	7.75	--	1.57	475.4	20	--	--	--	--	--	--	--
12/21/1993	MP-A	MBE	450.00	7.95	425	1.6	66.4	0.32	--	0.16	144.9	2	--	8.67	359.71	1.73	--	0.87	784.96
3/30/1994	MP-A	MBE	--	6.11	358	4.3	4.8	3.28	--	0.63	163.5	30	--	--	--	--	--	--	--
6/10/1994	MP-A	MBE	6.80	6.85	825	7.1	30.2	6.44	--	1.46	355.7	36	--	0.58	2.47	0.53	--	0.12	29.12
8/3/1994	MP-A	MBE	980.00	6.55	956	8.1	27.2	9.80	--	1.82	469.3	38	--	95.56	320.90	115.62	--	21.47	5536.63
10/14/1994	MP-A	MBE	--	6.75	744	4.4	17.5	8.57	--	1.66	347.2	34	--	--	--	--	--	--	--
1/26/1995	MP-A	MBE	--	6.53	485	7.6	27.7	3.52	--	0.81	203.1	20	--	--	--	--	--	--	--
4/7/1995	MP-A	MBE	800.00	6.74	589	5.5	33.2	4.58	--	0.97	234.6	14	--	52.97	319.74	44.11	--	9.34	2259.37
7/10/1995	MP-A	MBE	900.00	6.82	839	5.6	40.0	8.01	--	1.65	385.0	42	--	60.67	433.38	86.78	--	17.88	4171.31
12/27/1995	MP-A	MBE	--	7.21	682	2.5	35.5	2.51	--	0.97	334.0	12	--	--	--	--	--	--	--
3/29/1996	MP-A	MBE	--	6.95	527	7.2	34.5	3.33	--	0.77	217.5	22	--	--	--	--	--	--	--
6/11/1996	MP-A	MBE	--	7.16	764	5.6	60.3	4.62	--	1.16	350.0	32	--	--	--	--	--	--	--
8/2/1996	MP-A	MBE	--	7.40	749	5.5	47.8	6.91	--	1.54	335.3	30	--	--	--	--	--	--	--
12/29/1996	MP-A	MBE	--	7.08	658	1.9	60.4	2.49	--	1.01	299.1	14	--	--	--	--	--	--	--
2/20/1997	MP-A	MBE	--	6.58	518	3.3	51.5	3.90	--	0.79	208.4	1	--	--	--	--	--	--	--
6/15/1997	MP-A	MBE	--	7.57	837	3.8	70.0	6.58	--	1.43	356.7	30	--	--	--	--	--	--	--
9/23/1997	MP-A	MBE	--	6.64	955	4.8	23.2	10.14	--	2.35	488.3	36	--	--	--	--	--	--	--
12/16/1997	MP-A	MBE	--	7.49	571	12.4	44.6	4.05	--	1.28	242.4	30	--	--	--	--	--	--	--
2/16/1998	MP-A	MBE	--	7.61	519	7.5	46.3	3.60	--	0.85	197.7	2	--	--	--	--	--	--	--
5/12/1998	MP-A	MBE	--	7.20	375	3.1	43.3	2.03	--	0.63	123.5	12	--	--	--	--	--	--	--
7/9/1998	MP-A	MBE	--	7.03	432	3.9	44.5	3.15	--	0.72	146.6	22	--	--	--	--	--	--	--
11/2/1998	MP-A	MBE	--	7.38	937	5.1	58.4	8.35	--	1.98	431.2	18	--	--	--	--	--	--	--
2/1/1999	MP-A	MBE	--	7.25	397	3.5	36.8	2.44	--	0.83	149.7	12	--	--	--	--	--	--	--
11/10/1999	MP-A	MBE	--	7.29	868	4.8	45.5	5.18	--	1.91	406.5	24	--	--	--	--	--	--	--
1/3/2000	MP-A	MBE	675.00	7.01	699	6.0	47.2	5.19	--	1.40	313.1	6	--	48.76	383.54	42.17	--	11.38	2544.23
5/26/2000	MP-A	MBE	2000.00	7.14	634	4.5	59.5	4.78	--	1.03	279.7	22	--	108.35	1432.57	115.09	--	24.80	6734.28
9/7/2000	MP-A	MBE	300.00	7.24	919	4.4	48.5	7.09	--	2.08	444.5	20	--	15.89	175.16	25.61	--	7.51	1605.32
3/25/2002	MP-A	MBE	--	6.77	457	3.7	47.6	2.78	--	0.78	196.5	6	--	--	--	--	--	--	--
5/3/2002	MP-A	MBE	--	7.01	355	2.8	40.1	2.10	--	0.61	123.9	6	--	--	--	--	--	--	--
7/21/2002	MP-A	MBE	70.00	7.59	859	4.3	71.9	5.94	--	1.48	250.9	14	--	3.62	60.59	5.01	--	1.25	211.43
12/11/2002	MP-A	MBE	--	6.77	831	15.1	60.7	10.25	--	2.42	357.8	20	--	--	--	--	--	--	--
3/24/2003	MP-A	MBE	1000.00	7.00	384	3.6	37.4	2.07	--	0.64	146.9	20	--	43.34	450.24	24.92	--	7.70	1768.44
6/16/2003	MP-A	MBE	--	7.92	581	3.1	65.2	3.50	--	0.82	229.4	98	--	--	--	--	--	--	--
8/13/2003	MP-A	MBE	--	6.77	395	5.9	46.6	3.21	--	0.67	155.3	36	--	--	--	--	--	--	--
10/17/2003	MP-A	MBE	--	7.27	604	8.3	79.6	1.16	--	0.59	221.3	16	--	--	--	--	--	--	--
3/30/2004	MP-A	MBE	--	7.24	396	4.9	42.7	2.61	--	0.52	151.0	1	--	--	--	--	--	--	--
6/18/2004	MP-A	MBE	--	7.40	481	5.6	56.7	3.36	--	0.72	180.6	24	--	--	--	--	--	--	--
9/30/2004	MP-A	MBE	--	6.92	721	8.9	77.6	13.87	--	1.20	290.5	54	--	--	--	--	--	--	--
3/17/2005	MP-A	MBE	975.00	7.37	601	3.6	72.4	3.39	--	1.03	235.5	8	--	42.25	849.79	39.79	--	12.09	2764.17
4/14/2005	MP-A	MBE	--	7.50	563	2.7	61.8	3.66	--	0.84	223.3	38	--	--	--	--	--	--	--
7/1/2005	MP-A	MBE	875.00	7.68	833	17.6	66.0	4.51	--	1.15	380.4	24	--	185.39	695.22	47.51	--	12.11	4006.98
10/3/2005	MP-A	MBE	425.00	7.16	890	2.7	35.9	8.25	--	1.93	431.1	24	--	13.81	183.68	42.21	--	9.87	2205.65
1/18/2006	MP-A	MBE	--	7.39	342	3.7	39.5	1.54	--	0.40	108.2	20	--	--	--	--	--	--	--
Number of sample Dates		Count	26	61	61	61	61	61	0	61	61	61	0	26	26	26	0	26	26
		Max	6755.00	8.0	956.00	18.00	79.60	13.87	--	2.42	563.50	98.00	--	766.65	2983.10	399.94	--	86.46	18719.12
		Min	6.80	6.1	342.00	1.60	4.80	0.32	--	0.16	108.20	1.00	--	0.58	2.47	0.53	--	0.12	29.12
61		Average	2110.22	7.1	645.52	5.68	42.19	5.02	--	1.19	282.13	22.10	--	148.76	881.60	126.80	--	30.89	7418.22


AMD Metals in Trib 38A
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
mg/L
1/6/1989
7/6/1989
1/6/1990
7/6/1990
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7/6/2002
1/6/2003
7/6/2003
1/6/2004
7/6/2004
1/6/2005
7/6/2005
1/6/2006
Date
Iron
Manganese

Tributary Number 41
Clearfield and Cambria Counties; Chest Township, Westo
K & J Coal Co., Inc.; SMP #17950110

CCWA Monitoring Point: Trib Number 41														Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
4/20/1999	F-10	K & J	300.00	7.2	1070	0	28	0.17	0.15	0.15	585	2.0	--	0.00	101.12	0.61	0.54	0.54	2112.74
7/14/1999	F-10	K & J	50.00	7.2	1540	0	30	0.35	0.46	0.19	790	1.3	--	0.00	18.06	0.21	0.28	0.11	475.52
11/15/1999	F-10	K & J	30.00	7.2	849	0	28	0.03	0.07	0.05	405	1.3	--	0.00	10.11	0.01	0.03	0.02	146.27
1/25/2000	F-10	K & J	60.00	7.1	700	0	22	0.25	0.07	0.06	342	0.3	--	0.00	15.89	0.18	0.05	0.04	247.03
4/20/2000	F-10	K & J	200.00	7.2	539	0	20	0.18	0.07	0.04	234	2.3	--	0.00	48.15	0.43	0.17	0.10	563.40
7/12/2000	F-10	K & J	50.00	7.2	1210	0	26	0.16	0.07	0.08	658	3.3	--	0.00	15.65	0.10	0.04	0.05	396.06
10/11/2000	F-10	K & J	40.00	7.3	724	0	30	0.09	0.07	0.07	352	2.0	--	0.00	14.45	0.04	0.03	0.03	169.50
2/7/2001	F-10	K & J	150.00	7.2	537	0	24	0.04	0.07	0.03	234	0.7	--	0.00	43.34	0.07	0.13	0.05	422.55
4/23/2001	F-10	K & J	200.00	7.2	887	0	34	0.34	0.18	0.08	464	3.3	--	0.00	81.86	0.82	0.43	0.19	1117.16
7/16/2001	F-10	K & J	35.00	7.0	1500	0	28	0.64	0.61	0.14	844	16.0	--	0.00	11.80	0.27	0.26	0.06	355.61
10/4/2001	F-10	K & J	15.00	7.1	1180	0	32	0.47	0.46	0.12	678	16.3	--	0.00	5.78	0.08	0.08	0.02	122.43
1/3/2002	F-10	K & J	20.00	7.0	852	0	22	0.13	0.06	0.04	421	0.3	--	0.00	5.30	0.03	0.01	0.01	101.36
Number of sample Dates		Count	12	12	12	12	12	12	12	12	12	12	0	12	12	12	12	12	12
		Max	300.00	7.3	1540.00	0.00	34.00	0.64	0.61	0.19	844.00	16.30	--	0.00	101.12	0.82	0.54	0.54	2112.74
		Min	15.00	7.0	537.00	0.00	20.00	0.03	0.06	0.03	234.00	0.30	--	0.00	5.30	0.01	0.01	0.01	101.36
12		Average	95.83	7.2	965.67	0.00	27.00	0.24	0.20	0.09	500.58	4.09	--	0.00	30.96	0.24	0.17	0.10	519.14

Tributary Number 43, Ashcraft Run
Clearfield County; Burnside Township, Westover Borough
Cambria Coal Company, SMP #4376SM22

CCWA Monitoring Point: Trib Number 43, Ashcraft Run														Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
Apr-81	517402 C23-4	CCC	100.00	7.0	77	2	8	0.16	--	0.05	17	3.4	--	2.41	9.63	0.19	--	0.06	20.47
1/29/1983	517402 C23-4	CCC	200.00	6.0	305	17	32	0.54	--	0.50	85	8.0	--	40.93	77.05	1.30	--	1.20	204.65
?/24/83	517402 C23-4	CCC	300.00	6.4	127	0	15	0.38	--	0.50	17	5.3	--	0.00	54.17	1.37	--	1.81	61.40
8/8/1983	517402 C23-4	CCC	175.00	6.4	676	2	250	0.24	--	2.62	265	0.7	--	4.21	526.68	0.51	--	5.52	558.28
10/19/1983	517402 C23-4	CCC	100.00	7.2	382	2	35	0.61	--	1.50	187	3.5	--	2.41	42.13	0.73	--	1.81	225.12
2/6/1984	517402 C23-4	CCC	250.00	6.6	238	2	20	0.40	--	1.12	107	1.5	--	6.02	60.19	1.20	--	3.37	322.03
6/4/1984	517402 C23-4	CCC	200.00	6.8	249	2	13	0.59	--	2.01	103	1.2	--	4.82	31.30	1.42	--	4.84	247.99
9/7/1984	517402 C23-4	CCC	200.00	7.3	457	2	35	0.26	--	1.45	255	0.1	--	4.82	84.27	0.63	--	3.49	613.96
11/8/1984	517402 C23-4	CCC	200.00	6.5	245	2	29	0.55	--	1.06	120	0.1	--	4.82	69.82	1.32	--	2.55	288.92
1/29/1985	517402 C23-4	CCC	150.00	7.2	487	2	28	0.58	--	2.55	217	57.0	--	3.61	50.56	1.05	--	4.60	391.85
5/15/1985	517402 C23-4	CCC	200.00	7.4	441	2	23	0.30	--	2.30	195	4.2	--	4.82	55.38	0.72	--	5.54	469.50
8/15/1985	517402 C23-4	CCC	20.00	8.3	956	2	70	0.25	--	0.35	474	4.8	--	0.48	16.85	0.06	--	0.08	114.12
11/21/1985	517402 C23-4	CCC	200.00	6.7	169	6	13	0.20	--	0.36	60	0.1	--	14.45	31.30	0.48	--	0.87	144.46
1/22/1986	517402 C23-4	CCC	250.00	6.4	119	4	8	0.13	--	0.36	43	76.6	--	12.04	24.08	0.39	--	1.08	129.41
5/8/1986	517402 C23-4	CCC	100.00	6.6	400	2	20	0.23	--	1.40	181	1.8	--	2.41	24.08	0.28	--	1.69	217.90
7/24/1986	517402 C23-4	CCC	200.00	6.7	227	2	19	0.46	--	0.76	90	1.6	--	4.82	45.75	1.11	--	1.83	216.69
11/12/1986	517402 C23-4	CCC	200.00	6.4	105	2	8	0.28	--	0.29	25	4.2	--	4.82	19.26	0.67	--	0.70	60.19
2/11/1987	517402 C23-4	CCC	200.00	6.5	331	0	17	1.36	--	1.76	124	27.0	--	0.00	40.93	3.27	--	4.24	298.55
5/6/1987	517402 C23-4	CCC	250.00	6.6	193	0	9	0.18	--	0.73	58	5.0	--	0.00	27.09	0.54	--	2.20	174.56
9/2/1987	517402 C23-4	CCC	125.00	7.7	458	0	38	0.48	--	0.69	203	6.0	--	0.00	57.18	0.72	--	1.04	305.47
10/23/1987	517402 C23-4	CCC	200.00	7.5	513	0	44	0.46	--	1.11	203	4.0	--	0.00	105.94	1.11	--	2.67	488.76
2/11/1988	517402 C23-4	CCC	200.00	6.8	337	0	13	0.34	--	1.98	121	7.0	--	0.00	31.30	0.82	--	4.77	291.33
4/26/1988	517402 C23-4	CCC	175.00	7.5	455	0	26	0.34	--	2.21	198	5.0	--	0.00	54.77	0.72	--	4.66	417.13
8/4/1988	517402 C23-4	CCC	25.00	7.9	855	0	63	0.14	--	0.49	445	3.0	--	0.00	18.96	0.04	--	0.15	133.93
11/8/1988	517402 C23-4	CCC	150.00	7.5	328	0	37	0.44	--	1.02	136	28.0	--	0.00	66.81	0.79	--	1.84	245.58
1/20/1989	517402 C23-4	CCC	200.00	6.9	215	0	17	0.14	--	0.50	75	3.0	--	0.00	40.93	0.34	--	1.20	180.58
5/11/1989	517402 C23-4	CCC	400.00	6.3	128	0	8	0.21	--	0.42	40	7.0	--	0.00	38.52	1.01	--	2.02	192.61
8/18/1989	517402 C23-4	CCC	150.00	7.8	789	0	40	0.22	--	1.48	414	4.0	--	0.00	72.23	0.40	--	2.67	747.58
10/31/1989	517402 C23-4	CCC	300.00	7.8	572	0	44	0.37	--	0.90	247	6.0	--	0.00	158.91	1.34	--	3.25	892.05
Number of sample Dates		Count	29	29	29	29	29	29	0	29	29	29	0	29	29	29	0	29	29
		Max	400.00	8.3	956.00	17.00	250.00	1.36	--	2.62	474.00	76.60	--	40.93	526.68	3.27	--	5.54	892.05
		Min	20.00	6.0	77.00	0.00	8.00	0.13	--	0.05	17.00	0.10	--	0.00	9.63	0.04	--	0.06	20.47
29		Average	186.90	7.0	373.59	1.83	33.86	0.37	--	1.12	162.24	9.62	--	4.06	66.76	0.85	--	2.47	298.45

Tributary Number 43, Ashcraft Run
Clearfield County; Burnside Township, Westover Borough
K & J Coal Co.; SMP #17830117

CCWA Monitoring Point: Trib Number 43, Ashcraft Run														Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
7/17/1989	733	K&J	--	6.0	--	6	10	0.15	0.25	0.025	20	--	--	--	--	--	--	--	--
Number of sample Dates		Count	0	1	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0
		Max	--	6.0	--	6.00	10.00	0.15	0.25	0.03	20.00	--	--	--	--	--	--	--	--
		Min	--	6.0	--	6.00	10.00	0.15	0.25	0.03	20.00	--	--	--	--	--	--	--	--
1		Average	--	6.0	--	6.00	10.00	0.15	0.25	0.03	20.00	--	--	--	--	--	--	--	--

Tributary Number 45
Clearfield County; Westover Borough
Cambria Coal Company, SMP #4376SM22

CCWA Monitoring Point: Trib Number 45																			
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Loading					
														Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
Apr-79	537401 C23-6	CCC	20.00	6.9	144	1	17	0.81	--	0.13	23	18.4	--	0.24	4.09	0.20	--	0.03	5.54
1/29/1983	537401 C23-6	CCC	75.00	6.3	220	18	32	1.13	--	0.33	35	6.0	--	16.25	28.89	1.02	--	0.30	31.60
?/24/83	537401 C23-6	CCC	100.00	6.6	132	0	25	0.53	--	0.17	31	14.7	--	0.00	30.10	0.64	--	0.20	37.32
8/8/1983	537401 C23-6	CCC	40.00	7.6	297	1	229	4.41	--	0.82	14	13.0	--	0.48	110.27	2.12	--	0.39	6.74
10/19/1983	537401 C23-6	CCC	75.00	6.9	250	1	36	1.42	--	0.59	69	8.2	--	0.90	32.50	1.28	--	0.53	62.30
1/25/1984	537401 C23-6	CCC	175.00	6.0	160	1	11	0.47	--	0.24	18	16.9	--	2.11	23.17	0.99	--	0.51	37.92
6/4/1984	537401 C23-6	CCC	75.00	7.1	165	1	31	0.73	--	0.22	24	0.8	--	0.90	27.99	0.66	--	0.20	21.67
9/5/1984	537401 C23-6	CCC	50.00	7.4	238	1	76	2.16	--	0.66	50	3.5	--	0.60	45.75	1.30	--	0.40	30.10
11/8/1984	537401 C23-6	CCC	50.00	6.7	164	1	38	0.93	--	0.35	30	6.4	--	0.60	22.87	0.56	--	0.21	18.06
2/4/1985	537401 C23-6	CCC	125.00	7.7	269	1	43	1.98	--	0.52	47	14.8	--	1.50	64.71	2.98	--	0.78	70.73
5/15/1985	537401 C23-6	CCC	20.00	7.4	221	1	55	1.66	--	0.58	25	6.3	--	0.24	13.24	0.40	--	0.14	6.02
8/15/1985	537401 C23-6	CCC	3.00	8.3	572	1	205	6.45	--	0.82	2.5	38.0	--	0.04	7.40	0.23	--	0.03	0.09
11/21/1985	537401 C23-6	CCC	100.00	6.8	139	1	19	0.43	--	0.13	20	1.1	--	1.20	22.87	0.52	--	0.16	24.08
1/22/1986	537401 C23-6	CCC	75.00	6.5	138	1	13	0.26	--	0.08	30	5.3	--	0.90	11.74	0.23	--	0.07	27.09
5/8/1986	537401 C23-6	CCC	25.00	6.9	393	1	32	0.44	--	0.44	150	1.4	--	0.30	9.63	0.13	--	0.13	45.14
8/19/1986	537401 C23-6	CCC	5.00	7.8	417	1	147	5.15	--	0.84	16	15.5	--	0.06	8.85	0.31	--	0.05	0.96
11/12/1986	537401 C23-6	CCC	100.00	6.5	151	1	17	0.20	--	0.13	46	11.1	--	1.20	20.47	0.24	--	0.16	55.38
2/11/1987	537401 C23-6	CCC	50.00	6.7	270	0	29	1.10	--	0.20	27	63.0	--	0.00	17.46	0.66	--	0.12	16.25
5/6/1987	537401 C23-6	CCC	50.00	6.8	149	0	17	0.45	--	0.02	21	11.0	--	0.00	10.23	0.27	--	0.01	12.64
9/2/1987	537401 C23-6	CCC	50.00	7.4	219	0	39	1.30	--	0.27	28	7.0	--	0.00	23.47	0.78	--	0.16	16.85
10/23/1987	537401 C23-6	CCC	50.00	7.3	247	0	61	1.89	--	0.46	24	12.0	--	0.00	36.72	1.14	--	0.28	14.45
2/12/1988	537401 C23-6	CCC	50.00	6.9	265	0	23	0.52	--	0.12	24	10.0	--	0.00	13.84	0.31	--	0.07	14.45
5/4/1988	537401 C23-6	CCC	140.00	7.4	186	0	25	0.82	--	0.19	20	2.0	--	0.00	42.13	1.38	--	0.32	33.71
8/4/1988	537401 C23-6	CCC	15.00	7.2	514	0	114	4.01	--	0.72	21	10.0	--	0.00	20.59	0.72	--	0.13	3.79
11/8/1988	537401 C23-6	CCC	40.00	7.2	229	0	32	0.74	--	0.31	45	8.0	--	0.00	15.41	0.36	--	0.15	21.67
1/20/1989	537401 C23-6	CCC	75.00	7.0	185	0	21	0.55	--	0.12	20	6.0	--	0.00	18.96	0.50	--	0.11	18.06
5/11/1989	537401 C23-6	CCC	125.00	6.8	132	0	18	1.02	--	0.09	22	36.0	--	0.00	27.09	1.53	--	0.14	33.11
8/18/1989	537401 C23-6	CCC	20.00	7.4	467	0	117	5.52	--	1.01	14	22.0	--	0.00	28.17	1.33	--	0.24	3.37
10/31/1989	537401 C23-6	CCC	50.00	7.4	202	0	30	1.23	--	0.33	25	7.0	--	0.00	18.06	0.74	--	0.20	15.05
Number of sample Dates		Count	29	29	29	29	29	29	0	29	29	29	0	29	29	29	0	29	29
		Max	175.00	8.3	572.00	18.00	229.00	6.45	--	1.01	150.00	63.00	--	16.25	110.27	2.98	--	0.78	70.73
		Min	3.00	6.0	132.00	0.00	11.00	0.20	--	0.02	2.50	0.80	--	0.00	4.09	0.13	--	0.01	0.09
29		Average	63.03	7.1	246.03	1.14	53.52	1.67	--	0.38	31.78	12.94	--	0.95	26.09	0.81	--	0.21	23.59

Tributary Number 46
Clearfield County; Chest Township
K & J Coal Co.; SMP #17830117

CCWA Monitoring Point: Trib Number 46													Total	Total	Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate		Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
6/28/1999	10	K&J	10.00	7.3	324	0	60	3.56	2.46	0.21	82		24.7	--	0.00	7.22	0.43	0.30	0.03	9.87
7/22/1999	10	K&J	1.00	7.7	535	0	116	1.00	0.77	0.11	139		7.0	--	0.00	1.40	0.01	0.01	0.00	1.67
12/16/1999	10	K&J	5.00	7.5	282	0	52	0.16	0.14	0.03	63		3.0	--	0.00	3.13	0.01	0.01	0.00	3.79
3/2/2000	10	K&J	25.00	7.7	279	0	50	0.29	0.28	0.03	88		4.3	--	0.00	15.05	0.09	0.08	0.01	26.48
6/1/2000	10	K&J	5.00	7.9	443	0	88	0.52	0.31	0.05	125		4.3	--	0.00	5.30	0.03	0.02	0.00	7.52
7/18/2000	10	K&J	1.00	7.9	671	0	150	0.72	0.51	0.10	238		8.7	--	0.00	1.81	0.01	0.01	0.00	2.87
10/16/2000	10	K&J	5.00	7.8	519	0	110	0.18	0.30	0.03	155		3.0	--	0.00	6.62	0.01	0.02	0.00	9.33
1/23/2001	10	K&J	4.00	7.6	514	0	96	0.21	0.15	0.03	157		5.0	--	0.00	4.62	0.01	0.01	0.00	7.56
4/24/2001	10	K&J	20.00	7.6	337	0	62	0.86	0.78	0.08	103		12.0	--	0.00	14.93	0.21	0.19	0.02	24.80
7/12/2001	10	K&J	2.00	8.0	716	0	160	0.55	0.40	0.03	232		6.0	--	0.00	3.85	0.01	0.01	0.00	5.59
10/1/2001	10	K&J	1.00	7.6	720	0	156	0.28	0.29	0.03	254		6.7	--	0.00	1.88	0.00	0.00	0.00	3.06
1/23/2002	10	K&J	5.00	7.7	547	0	96	0.05	0.02	0.01	172		0.3	--	0.00	5.78	0.00	0.00	0.00	10.35
Number of sample Dates		Count	12	12	12	12	12	12	12	12	12		12	0	12	12	12	12	12	12
		Max	25.00	8.0	720.00	0.00	160.00	3.56	2.46	0.21	254.00		24.70	--	0.00	15.05	0.43	0.30	0.03	26.48
		Min	1.00	7.3	279.00	0.00	50.00	0.05	0.02	0.01	63.00		0.30	--	0.00	1.40	0.00	0.00	0.00	1.67
12		Average	7.00	7.7	490.58	0.00	99.67	0.70	0.53	0.06	150.67		7.08	--	0.00	5.97	0.07	0.05	0.01	9.41

Tributary Number 47, Pine Run
Clearfield County; Chest Township
K & J Coal Co.; SMP #17830117

CCWA Monitoring Point: Trib Number 47, Pine Run														Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
7/17/1989	735	K&J	--	6.4	--	0	36	0.15	0.25	0.05	173	--	--	--	--	--	--	--	--
Number of sample Dates		Count	0	1	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0
		Max	--	6.4	--	0.00	36.00	0.15	0.25	0.05	173.00	--	--	--	--	--	--	--	--
		Min	--	6.4	--	0.00	36.00	0.15	0.25	0.05	173.00	--	--	--	--	--	--	--	--
1		Average	--	6.4	--	0.00	36.00	0.15	0.25	0.05	173.00	--	--	--	--	--	--	--	--

Tributary Number 47, Pine Run
Clearfield County; Chest Township
K & J Coal Co.; SMP #17830117

CCWA Monitoring Point: Trib Number 47, Pine Run														Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
3/14/2000	4	K&J	--	7.3	326	0	32	0.10	0.07	0.03	116	1.7	--	--	--	--	--	--	--
6/1/2000	4	K&J	--	7.5	348	0	36	0.20	0.08	0.04	112	1.3	--	--	--	--	--	--	--
7/18/2000	4	K&J	--	7.6	501	0	64	0.22	0.14	0.10	215	0.3	--	--	--	--	--	--	--
10/16/2000	4	K&J	--	7.6	346	0	42	0.40	0.33	0.13	113	0.3	--	--	--	--	--	--	--
1/23/2001	4	K&J	--	7.3	383	0	36	0.04	0.07	0.03	145	1.3	--	--	--	--	--	--	--
4/24/2001	4	K&J	--	7.4	337	0	32	0.19	0.16	0.05	119	3.0	--	--	--	--	--	--	--
7/12/2001	4	K&J	--	7.7	517	0	64	0.11	0.07	0.03	187	1.7	--	--	--	--	--	--	--
10/1/2001	4	K&J	--	7.5	551	0	72	0.07	0.04	0.03	205	1.3	--	--	--	--	--	--	--
1/23/2002	4	K&J	--	7.0	329	0	34	0.04	0.02	0.01	105	0.3	--	--	--	--	--	--	--
Number of sample Dates		Count	0	9	9	9	9	9	9	9	9	9	0	0	0	0	0	0	0
		Max	--	7.7	551.00	0.00	72.00	0.40	0.33	0.13	215.00	3.00	--	--	--	--	--	--	--
		Min	--	7.0	326.00	0.00	32.00	0.04	0.02	0.01	105.00	0.30	--	--	--	--	--	--	--
9		Average	--	7.4	404.22	0.00	45.78	0.15	0.11	0.05	146.33	1.24	--	--	--	--	--	--	--

Tributary Number 48, Kings Run
Clearfield County; Burnside Township, Chest Township
Hepburnia Coal Co., SMP #17980126

CCWA Monitoring Point: Trib Number 48, Kings Run														Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
3/9/2006	KR-19	Hepburnia	--	7.7	523	-60	79	3.00	2.53	1.54	134	20.0	--	-	--	--	--	--	--
6/30/2006	KR-19	Hepburnia	--	7.5	418	-52	70	2.98	2.21	1.40	116	17.1	--	--	--	--	--	--	--
8/30/2006	KR-19	Hepburnia	--	7.8	509	-95	106	1.51	0.47	1.00	125	3.1	--	--	--	--	--	--	--
12/29/2006	KR-19	Hepburnia	--	7.4	434	-26	40	2.38	2.42	1.48	145	3.1	--	--	--	--	--	--	--
3/20/2007	KR-19	Hepburnia	--	6.0	260	6	7	1.99	2.04	0.74	90	14.0	--	--	--	--	--	--	--
6/29/2007	KR-19	Hepburnia	100+	7.8	565	-90	117	2.27	0.76	1.15	135	10.0	--	--	--	--	--	--	--
8/29/2007	KR-19	Hepburnia	100.00	8.0	520	-90	108	2.42	0.86	1.14	137	6.0	--	-108.35	130.01	2.91	1.04	1.37	164.93
12/11/2007	KR-19	Hepburnia	--	6.6	290	-4	24	1.54	1.54	0.91	95	15.0	--	--	--	--	--	--	--
Number of sample Dates		Count	1	8	8	8	8	8	8	8	8	8	0	1	1	1	1	1	1
		Max	100+	8.0	565.00	6.00	117.00	3.00	2.53	1.54	145.00	20.00	--	-108.35	130.01	2.91	1.04	1.37	164.93
		Min	100.00	6.0	260.00	-95.00	7.00	1.51	0.47	0.74	90.00	3.10	--	-108.35	130.01	2.91	1.04	1.37	164.93
8		Average	100.00	7.4	439.88	-51.38	68.88	2.26	1.60	1.17	122.13	11.04	--	-108.35	130.01	2.91	1.04	1.37	164.93

Note: Flow values expressed in the form "x+" are not usable in loading calculations.

Tributary Number 50, North Camp Run
Clearfield County; Chest Township
K & J Coal Co.; SMP #17830117

CCWA Monitoring Point: Trib Number 50, North Camp Run														Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
7/17/1989	737	K&J	--	6.6	--	0	58	0.15	0.25	2.72	600	--	--	--	--	--	--	--	--
Number of sample Dates		Count	0	1	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0
		Max	--	6.6	--	0.00	58.00	0.15	0.25	2.72	600.00	--	--	--	--	--	--	--	--
		Min	--	6.6	--	0.00	58.00	0.15	0.25	2.72	600.00	--	--	--	--	--	--	--	--
1		Average	--	6.6	--	0.00	58.00	0.15	0.25	2.72	600.00	--	--	--	--	--	--	--	--

Tributary Number 50, Northcamp Run
Clearfield County; Chest Township
Amfire Mining, SMP #17990110

CCWA Monitoring Point: Trib Number 50, North Camp Run														Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
5/3/2005	MP-30	Amfire	--	7.7	861	-48	64	0.09	0.025	0.39	348	2.9	624.0	--	--	--	--	--	--
9/12/2005	MP-30	Amfire	--	7.7	1290	-63	77	0.07	0.025	0.05	632	3.1	987.0	--	--	--	--	--	--
12/9/2005	MP-30	Amfire	--	7.6	789	-43	59	0.21	0.06	0.73	340	3.1	536.0	--	--	--	--	--	--
3/9/2006	MP-30	Amfire	--	7.7	888	-46	60	0.09	0.025	0.48	441	3.1	629.0	--	--	--	--	--	--
6/30/2006	MP-30	Amfire	--	7.5	663	-46	62	0.22	0.11	0.20	279	3.1	469.0	--	--	--	--	--	--
8/30/2006	MP-30	Amfire	--	7.4	875	-52	59	1.54	0.72	0.58	356	305.7	656.0	--	--	--	--	--	--
12/29/2006	MP-30	Amfire	--	7.4	374	-22	35	0.27	0.08	0.54	141	10.0	226.0	--	--	--	--	--	--
3/20/2007	MP-30	Amfire	--	7.4	402	-22	35	0.85	0.32	0.41	133	7.0	253.0	--	--	--	--	--	--
6/29/2007	MP-30	Amfire	100+	7.7	1120	-53	66	0.10	0.025	0.13	526	5.0	845.0	--	--	--	--	--	--
8/31/2007	MP-30	Amfire	--	7.7	1030	-49	64	0.11	0.025	0.11	486	2.5	792.0	--	--	--	--	--	--
12/13/2007	MP-30	Amfire	--	6.6	480	-19	36	1.39	0.28	1.12	178	2.5	309.0	--	--	--	--	--	--
Number of sample Dates		Count	0	11	11	11	11	11	11	11	11	11	11	0	0	0	0	0	0
		Max	100+	7.7	1290.00	-19.00	77.00	1.54	0.72	1.12	632.00	305.70	987.00	--	--	--	--	--	--
		Min	100+	6.6	374.00	-63.00	35.00	0.07	0.03	0.05	133.00	2.50	226.00	--	--	--	--	--	--
11		Average	--	7.5	797.45	-42.09	56.09	0.45	0.15	0.43	350.91	31.63	575.09	--	--	--	--	--	--

Tributary Number 50, North Camp Run
Clearfield County; Chest Township
Hepburnia Coal Co., SMP #17050104

CCWA Monitoring Point: Trib Number 50, North Camp Run														Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
2/20/2006	22	Hepburnia	N/A	7.5	794	-44	57	0.38	0.16	1.00	324	3.1	--	--	--	--	--	--	--
6/8/2006	22	Hepburnia	1400.00	7.7	845	-43	55	0.17	0.03	0.18	349	3.1	--	-724.71	926.96	2.87	0.42	3.03	5881.96
8/30/2006	22	Hepburnia	N/A	7.7	1060	-50	61	0.16	0.03	0.51	479	7.1	--	--	--	--	--	--	--
12/29/2006	22	Hepburnia	N/A	7.4	128	-17	27	0.17	0.07	0.04	27	3.1	--	--	--	--	--	--	--
3/20/2007	22	Hepburnia	N/A	7.0	125	-7	19	1.72	1.52	0.14	29	6.0	--	--	--	--	--	--	--
6/29/2007	22	Hepburnia	N/A	7.4	955	-44	63	0.19	0.06	0.57	412	2.5	--	--	--	--	--	--	--
8/29/2007	22	Hepburnia	N/A	7.8	1140	-44	62	0.11	0.03	0.59	529	2.5	--	--	--	--	--	--	--
12/11/2007	22	Hepburnia	N/A	7.5	769	-35	45	0.27	0.05	1.23	302	2.5	--	--	--	--	--	--	--
Number of sample Dates		Count	1	8	8	8	8	8	8	8	8	8	0	1	1	1	1	1	1
		Max	1400.00	7.8	1140.00	-7.00	63.00	1.72	1.52	1.23	529.00	7.10	--	--	--	--	--	--	--
		Min	1400.00	7.0	125.00	-50.00	19.00	0.11	0.03	0.04	27.00	2.50	--	--	--	--	--	--	--
8		Average	1400.00	7.5	727.00	-35.50	48.63	0.40	0.24	0.53	306.38	3.74	--	--	--	--	--	--	--

Tributary Number 52 Upstream
Clearfield County; Chest Township
Amfire Mining, SMP #17990110

CCWA Monitoring Point: Trib Number 52 Upstream														Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
5/3/2005	BR-3-12	Amfire	35.00	8.0	1080	-168	188	0.17	0.03	0.20	403	5.7	806.0	-70.79	79.21	0.07	0.01	0.08	169.80
9/12/2005	BR-3-12	Amfire	2.00	8.1	1200	-186	203	0.42	0.14	0.09	529	3.1	949.0	-4.48	4.89	0.01	0.00	0.00	12.74
12/9/2005	BR-3-12	Amfire	41.00	7.9	1020	-126	142	0.10	0.07	0.15	381	3.1	730.0	-62.19	70.09	0.05	0.03	0.07	188.05
3/9/2006	BR-3-12	Amfire	170.00	8.1	1100	-158	173	0.10	0.03	0.11	486	10.0	819.0	-323.35	354.05	0.20	0.05	0.23	994.61
6/30/2006	BR-3-12	Amfire	30.00	8.0	979	-160	176	0.79	0.49	0.24	330	3.1	707.0	-57.78	63.56	0.29	0.18	0.09	119.18
8/30/2006	BR-3-12	Amfire	15.00	7.8	704	-96	109	23.00	42.80	0.90	233	182.9	513.0	-17.34	19.68	4.15	7.73	0.16	42.07
12/29/2006	BR-3-12	Amfire	40.00	8.0	1000	-149	162	0.19	0.12	0.23	366	3.1	696.0	-71.75	78.01	0.09	0.06	0.11	176.24
3/20/2007	BR-3-12	Amfire	360.00	7.7	779	-95	108	1.48	1.30	0.24	278	6.0	487.0	-411.71	468.05	6.41	5.63	1.04	1204.80
6/29/2007	BR-3-12	Amfire	15.00	8.2	1140	-176	191	0.78	0.32	0.29	423	2.5	732.0	-31.78	34.49	0.14	0.06	0.05	76.38
8/31/2007	BR-3-12	Amfire	30.00	8.2	1170	-161	178	0.23	0.10	0.19	482	2.5	895.0	-58.15	64.29	0.08	0.04	0.07	174.08
12/13/2007	BR-3-12	Amfire	90.00	7.3	674	-71	91	3.83	1.64	0.40	264	14.0	482.0	-76.93	98.59	4.15	1.78	0.43	286.03
Number of sample Dates		Count	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
		Max	360.00	8.2	1200.00	-71.00	203.00	23.00	42.80	0.90	529.00	182.90	949.00	-4.48	468.05	6.41	7.73	1.04	1204.80
		Min	2.00	7.3	674.00	-186.00	91.00	0.10	0.03	0.09	233.00	2.50	482.00	-411.71	4.89	0.01	0.00	0.00	12.74
11		Average	75.27	7.9	986.00	-140.55	156.45	2.83	4.28	0.28	379.55	21.45	710.55	-107.84	121.36	1.42	1.42	0.21	313.09

Tributary Number 52 Downstream
Clearfield County; Chest Township
Amfire Mining, SMP #17990110

CCWA Monitoring Point: Trib Number 52 Downstream														Loading					
Sample			Flow	Lab	Lab	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total						
			(Weir)	pH	Conductivity			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
5/3/2005	MP-31	Amfire	200.00	8.1	1160	-152	166	0.16	0.11	0.20	420	7.1	887.0	-365.97	399.67	0.39	0.26	0.48	1011.23
9/12/2005	MP-31	Amfire	5.00	8.1	1410	-154	181	0.48	0.23	0.25	595	3.1	1071.0	-9.27	10.89	0.03	0.01	0.02	35.81
12/9/2005	MP-31	Amfire	10.00	8.0	959	-103	117	1.73	1.06	0.37	342	17.1	669.0	-12.40	14.08	0.21	0.13	0.04	41.17
3/9/2006	MP-31	Amfire	200.00	8.2	1140	-138	153	0.26	0.15	0.22	489	3.1	814.0	-332.26	368.38	0.63	0.36	0.53	1177.36
6/30/2006	MP-31	Amfire	37.00	8.0	907	-124	138	1.02	0.66	0.40	315	3.1	674.0	-55.23	61.47	0.45	0.29	0.18	140.31
8/30/2006	MP-31	Amfire	35.00	7.8	706	-100	112	18.10	33.10	0.79	234	208.6	536.0	-42.13	47.19	7.63	13.95	0.33	98.59
12/29/2006	MP-31	Amfire	80.00	8.0	1010	-122	142	0.28	0.18	0.33	381	15.7	736.0	-117.49	136.76	0.27	0.17	0.32	366.93
3/20/2007	MP-31	Amfire	--	7.8	714	-71	83	1.21	0.70	0.27	261	9.0	505.0	--	--	--	--	--	--
6/29/2007	MP-31	Amfire	70.00	8.3	1530	-187	204	0.54	0.39	0.14	610	2.5	1150.0	-157.58	171.91	0.46	0.33	0.12	514.04
8/31/2007	MP-31	Amfire	65.00	8.2	1210	-141	157	0.31	0.19	0.16	498	2.5	913.0	-110.33	122.85	0.24	0.15	0.13	389.68
12/13/2007	MP-31	Amfire	--	6.8	576	-41	59	2.87	2.06	0.37	216	27.0	387.0	--	--	--	--	--	--
Number of sample Dates		Count	9	11	11	11	11	11	11	11	11	11	11	9	9	9	9	9	9
		Max	200.00	8.3	1530.00	-41.00	204.00	18.10	33.10	0.79	610.00	208.60	1150.00	-9.27	399.67	7.63	13.95	0.53	1177.36
		Min	5.00	6.8	576.00	-187.00	59.00	0.16	0.11	0.14	216.00	2.50	387.00	-365.97	10.89	0.03	0.01	0.02	35.81
11		Average	78.00	7.9	1029.27	-121.18	137.45	2.45	3.53	0.32	396.45	27.17	758.36	-133.63	148.13	1.14	1.74	0.24	419.46

Tributary Number 52 Headwaters
Clearfield County; Chest Township
M. B. Energy, SMP #17970109

CCWA Monitoring Point: Trib Number 52 Headwaters														Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
2/11/1997	BS-34	MBE	--	6.45	88	1.9	4.3	0.02	0.05	0.01	25.5	1.0	--	--	--	--	--	--	--
3/20/1997	BS-34	MBE	--	5.80	85	2.4	5.6	0.06	0.05	0.01	23.9	1.0	--	--	--	--	--	--	--
Number of sample Dates		Count	0	2	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0
		Max	0.00	6.5	88.00	2.40	5.60	0.06	0.05	0.01	25.50	1.00	--	--	--	--	--	--	--
		Min	0.00	5.8	85.00	1.90	4.30	0.02	0.05	0.01	23.90	1.00	--	--	--	--	--	--	--
2		Average	#DIV/0!	6.1	86.50	2.15	4.95	0.04	0.05	0.01	24.70	1.00	--	--	--	--	--	--	--

Tributary Number 52 Effluent
Clearfield County; Chest Township
M. B. Energy, SMP #17970109

CCWA Monitoring Point: Trib Number 52, Effluent														Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
2/11/1997	BS-35	MBE	--	6.73	90	2.0	8.6	0.19	0.18	0.03	24.1	28.0	--	--	--	--	--	--	--
3/20/1997	BS-35	MBE	--	5.94	85	3.1	9.0	0.02	0.05	0.01	24.3	1.0	--	--	--	--	--	--	--
Number of sample Dates		Count	0	2	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0
		Max	--	6.7	90.00	3.10	9.00	0.19	0.18	0.03	24.30	28.00	--	--	--	--	--	--	--
		Min	--	5.9	85.00	2.00	8.60	0.02	0.05	0.01	24.10	1.00	--	--	--	--	--	--	--
		Average	--	6.3	87.50	2.55	8.80	0.11	0.12	0.02	24.20	14.50	--	--	--	--	--	--	--

Tributary Number 52 Downstream
Clearfield County; Chest Township
M. B. Energy, SMP #17860146

CCWA Monitoring Point: Trib Number 52 Downstream														Loading					
Sample			Flow	Lab	Lab	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.						
			(Method)	pH	Conductivity			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
2005	SW-7	MBE	195.0	7.42	930	2.3	149.6	0.19	0.38	0.13	418.9	4	--	5.40	351.18	0.45	0.89	0.31	983.36
2005	SW-7	MBE	150.0	7.87	958	5.7	133.8	0.02	0.05	0.10	400.4	2	--	10.29	241.61	0.04	0.09	0.18	723.03
2005	SW-7	MBE	55.0	7.53	1098	14.7	175.3	0.22	0.05	0.19	418.1	1	--	9.73	116.07	0.15	0.03	0.13	276.83
2005	SW-7	MBE	3.0	8.18	1023	0.5	158.6	0.31	0.05	0.26	388.4	1	--	0.02	5.73	0.01	0.00	0.01	14.03
2006	SW-7	MBE	385.0	7.89	749	5.9	107.6	0.50	0.05	0.13	304	1	--	27.35	498.70	2.32	0.23	0.60	1408.97
2006	SW-7	MBE	225.0	7.88	900	0	139	0.09	--	0.10	393.5	3	--	0.00	376.50	0.24	--	0.27	1065.85
2006	SW-7	MBE	125.0	8.17	1100	8.6	138.9	0.28	0.05	0.52	537.4	20	--	12.94	209.02	0.42	0.08	0.78	808.68
2006	SW-7	MBE	165.0	7.52	1267	5.8	58.9	0.82	1.08	2.17	683.1	18	--	11.52	117.00	1.63	2.15	4.31	1356.87
2007	SW-7	MBE	325.0	7.80	986	5.9	163.6	0.15	0.05	0.12	411.1	1	--	23.08	640.08	0.59	0.20	0.47	1608.42
2007	SW-7	MBE	275.0	7.68	1269	5.5	122.3	0.24	0.26	0.38	557.4	2	--	18.21	404.88	0.79	0.86	1.26	1845.31
2007	SW-7	MBE	75.0	8.06	1136	3.9	180.3	0.10	0.05	0.13	481.9	1	--	3.52	162.79	0.09	0.05	0.12	435.10
2007	SW-7	MBE	75.0	7.85	1250	9.2	190.2	0.10	0.05	0.13	545.4	1	--	8.31	171.73	0.09	0.05	0.12	492.43
Number of sample Dates		Count	12	12	12	12	12	12	11	12	12	12	0	12	12	12	11	12	12
		Max	385.00	8.2	1269.00	14.70	190.20	0.82	1.08	2.17	683.10	20.00	--	27.35	640.08	2.32	2.15	4.31	1845.31
		Min	3.00	7.4	749.00	0.00	58.90	0.02	0.05	0.10	304.00	1.00	--	0.00	5.73	0.01	0.00	0.01	14.03
12		Average	171.08	7.8	1055.50	5.67	143.18	0.25	0.19	0.36	461.63	4.58	--	10.86	274.61	0.57	0.42	0.71	918.24

Note: Dates were only partially visible on original data sheet

Tributary Number 57, Wilson Run
Clearfield County; Chest Township, Ferguson Township, Newburg Borough
K & J Coal Co.; SMP #11693000

CCWA Monitoring Point: Trib Number														Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
10/16/1989	784	CCWA	--	7.3	--	0	52	0.15	0.25	0.07	158	--	--	--	--	--	--	--	--
Number of sample Dates		Count	0	1	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0
		Max	--	7.3	--	0.00	52.00	0.15	0.25	0.07	158.00	--	--	--	--	--	--	--	--
		Min	--	7.3	--	0.00	52.00	0.15	0.25	0.07	158.00	--	--	--	--	--	--	--	--
1		Average	--	7.3	--	0.00	52.00	0.15	0.25	0.07	158.00	--	--	--	--	--	--	--	--

Tributary Number 57, Wilson Run

Clearfield County; Chest Township, Ferguson Township, Newburg Borough

River Hill Coal Co., Inc., SMP #17020103

CCWA Monitoring Point: Trib Number 57, Wilson Run														Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
10/11/2001	T-2	River	--	7.5	461	0	70	0.40	0.06	0.22	146	1.7	--	--	--	--	--	--	--
11/20/2001	T-2	River	--	7.4	475	0	62	0.41	0.05	0.33	155	1.0	--	--	--	--	--	--	--
12/20/2001	T-2	River	--	6.8	195	0	20	0.32	0.15	0.19	48	0.3	--	--	--	--	--	--	--
1/17/2002	T-2	River	--	7.0	270	0	26	0.36	0.11	0.27	71	0.3	--	--	--	--	--	--	--
2/14/2002	T-2	River	--	6.7	211	0	16	0.41	0.15	0.21	46	4.3	--	--	--	--	--	--	--
3/11/2003	T-2	River	--	7.1	238	0	26	0.28	0.11	0.24	68	1.3	--	--	--	--	--	--	--
Number of sample Dates		Count	0	6	6	6	6	6	6	6	6	6	0	0	0	0	0	0	0
		Max	--	7.5	475.00	0.00	70.00	0.41	0.15	0.33	155.00	4.30	--	--	--	--	--	--	--
		Min	--	6.7	195.00	0.00	16.00	0.28	0.05	0.19	46.00	0.30	--	--	--	--	--	--	--
6		Average	--	7.1	308.33	0.00	36.67	0.36	0.11	0.24	89.00	1.48	--	--	--	--	--	--	--

Tributary Number 57, Wilson Run Upstream
Clearfield County; Chest Township, Ferguson Township, Newburg Borough
Sky Haven Coal, Inc., SMP #17860101

CCWA Monitoring Point: Trib Number 57, Wilson Run Upstream														Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
2/27/2007	4	Sky Haven	323.00	6.5	320	5	39	0.68	--	0.58	119	0.5	--	19.44	151.65	2.64	--	2.26	462.72
4/23/2007	4	Sky Haven	942.00	6.5	320	4	23	0.47	--	0.66	138	9.0	--	45.36	260.82	5.33	--	7.48	1564.94
8/7/2007	4	Sky Haven	121.00	6.6	340	4	50	0.21	--	0.19	107	0.5	--	5.83	72.83	0.31	--	0.28	155.86
11/15/2007	4	Sky Haven	201.00	6.6	280	7	45	0.16	--	0.28	113	0.5	--	16.94	108.89	0.39	--	0.68	273.43
Number of sample Dates		Count	4	4	4	4	4	4	0	4	4	4	0	4	4	4	0	4	4
		Max	942.00	6.6	340.00	7.00	50.00	0.68	--	0.66	138.00	9.00	--	45.36	260.82	5.33	--	7.48	1564.94
		Min	121.00	6.5	280.00	4.00	23.00	0.16	--	0.19	107.00	0.50	--	5.83	72.83	0.31	--	0.28	155.86
4		Average	396.75	6.6	315.00	5.00	39.25	0.38	--	0.43	119.25	2.63	--	21.89	148.55	2.17	--	2.67	614.24

Tributary Number 57, Wilson Run Downstream
Clearfield County; Chest Township, Ferguson Township, Newburg Borough
Sky Haven Coal, Inc., SMP #17860101

CCWA Monitoring Point: Trib Number 57, Wilson Run Downstream														Loading					
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
2/27/2007	6	Sky Haven	1029	6.5	300	2	39	0.31	--	0.22	86	3.0	--	24.78	483.11	3.84	--	2.73	1065.33
4/23/2007	6	Sky Haven	3634	6.5	220	4	28	0.47	--	0.30	76	25.0	--	174.99	1224.93	20.56	--	13.12	3324.81
8/7/2007	6	Sky Haven	445	6.8	340	5	64	0.39	--	0.32	102	5.0	--	26.79	342.85	2.09	--	1.71	546.42
11/15/2007	6	Sky Haven	1003	6.4	240	4	40	0.38	--	0.25	67	0.5	--	48.30	482.98	4.59	--	3.02	808.99
Number of sample Dates		Count	4	4	4	4	4	4	0	4	4	4	0	4	4	4	0	4	4
		Max	3634.00	6.8	340.00	5.00	64.00	0.47	--	0.32	102.00	25.00	--	174.99	1224.93	20.56	--	13.12	3324.81
		Min	445.00	6.4	220.00	2.00	28.00	0.31	--	0.22	67.00	0.50	--	24.78	342.85	2.09	--	1.71	546.42
4		Average	1527.75	6.6	275.00	3.75	42.75	0.39	--	0.27	82.75	8.38	--	68.71	633.47	7.77	--	5.15	1436.39

Tributary Number 59

Clearfield County; New Washington Borough, Newburg Borough

Hepburnia Coal Co., SMP #17950105

CCWA Monitoring Point: Trib Number 59														Loading					
Sample			Flow	Lab	Lab	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total						
			(Meter)	pH	Conductivity			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
9/3/2002	MP-84	Hepburnia	28.00	7.5	368	0	52	0.13	0.06	0.04	119	2.3	--	0.00	17.53	0.04	0.02	0.01	40.11
12/10/2002	MP-84	Hepburnia	75.00	7.0	331	0	40	0.07	0.03	0.02	102	0.5	--	0.00	36.12	0.06	0.03	0.02	92.09
6/30/2003	MP-84	Hepburnia	125.00	7.3	309	0	41	0.04	0.09	0.04	97	4.3	--	0.00	61.70	0.06	0.14	0.06	145.97
Number of sample Dates		Count	3	3	3	3	3	3	3	3	3	3	0	3	3	3	3	3	3
		Max	125.00	7.5	368.00	0.00	52.00	0.13	0.09	0.04	119.00	4.30	--	0.00	61.70	0.06	0.14	0.06	145.97
		Min	28.00	7.0	309.00	0.00	40.00	0.04	0.03	0.02	97.00	0.50	--	0.00	17.53	0.04	0.02	0.01	40.11
3		Average	76.00	7.3	336.00	0.00	44.33	0.08	0.06	0.03	106.00	2.37	--	0.00	38.45	0.06	0.06	0.03	92.72

Historical Miscellaneous Water Quality Data

Point Draining to Tributary 13
Cambria County: East Carroll Township
RNS Services, Inc. SMP # 11890701

CCWA Monitoring Point: N/A														Loading					
Sample			Flow	Lab	Lab	Acidity	Alkalinity	Total	Total	Total	Total	Total	Total						
			(Method)	pH	Conductivit			Fe	Al	Mn	Sulfate	Susp. Solids	Dissolv. Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	umhos/cm	(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)	(lbs/day)
3/24/2005	SW-44	RNS	350.00	7.0	163	-14	20	0.27	0.41	0.05	25.66	12.8		-58.99	84.27	1.14	1.73	0.21	108.12
6/6/2005	SW-44	RNS	8.00	7.5	370	-357	357	0.38	1.45	0.13	56.36	2.8		-34.38	34.38	0.04	0.14	0.01	5.43
8/15/2005	SW-44	RNS	1.00	7.7	480	-62	72	0.29	0.39	0.12	173.86	0.8		-0.75	0.87	0.00	0.00	0.00	2.09
11/21/2005	SW-44	RNS	60.00	7.4	330	-26	34	0.06	0.01	0.14	93.8	1.6		-18.78	24.56	0.04	0.01	0.10	67.75
3/9/2006	SW-44	RNS	25.00	7.3	490	-12	28	0.03	0.09	0.23	80.26	3.2		-3.61	8.43	0.01	0.03	0.07	24.16
5/24/2006	SW-44	RNS	100.00	7.6	300	-24	34	0.12	0.14	0.08	38.56	2.4		-28.89	40.93	0.14	0.17	0.10	46.42
8/24/2006	SW-44	RNS	1.00	7.6	505	-62	80	0.01	0.08	0.13	195.33	0.8		-0.75	0.96	0.00	0.00	0.00	2.35
11/29/2006	SW-44	RNS	75.00	7.8	332	-29	35	0.15	0.05	0.13	59.39	1.2		-26.18	31.60	0.14	0.05	0.12	53.62
3/14/2007	SW-44	RNS	150.00	7.5	256	-6	18	0.76	0.74	0.06	47.74	12.8		-10.83	32.50	1.37	1.34	0.11	86.21
5/22/2007	SW-44	RNS	50.00	7.7	379	-37	49	0.13	0.05	0.06	51.28	1.6		-22.27	29.49	0.08	0.03	0.04	30.87
8/15/2007	SW-44	RNS	10.00	7.5	324	-44	64	0.10	0.05	0.04	29.41	2.4		-5.30	7.70	0.01	0.01	0.00	3.54
12/14/2007	SW-44	RNS	70.00	7.2	272	-9	29	0.25	0.25	0.05	30.25	4.0		-7.58	24.44	0.21	0.21	0.04	25.49
Number of		Count	12	12	12	12	12	12	12	12	12	12	0	12	12	12	12	12	12
sample		Max	350.00	7.8	505.00	-6.00	357.00	0.76	1.45	0.23	195.33	12.80	0.00	-0.75	84.27	1.37	1.73	0.21	108.12
Dates		Min	1.00	7.0	163.00	-357.00	18.00	0.01	0.01	0.04	25.66	0.80	0.00	-58.99	0.87	0.00	0.00	0.00	2.09
6		Average	75.00	7.5	350.08	-56.83	68.33	0.21	0.31	0.10	73.49	3.87	#DIV/0!	-18.19	26.68	0.27	0.31	0.07	38.00

Tributary Number 52 Upstream
Clearfield County: Chest Township
M. B. Energy, SMP #17860146

CCWA Monitoring Point: Trib Number 52 Upstream																		
Sample			Flow	Lab pH	Lab Conductivity	Acidity	Alkalinity	Total Fe	Total Al	Total Mn	Total Sulfate	Total Susp. Solids	Total Dissolv. Solids	Loading					
														Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
2005	SW-6	MBE	175	6.50	925	8.4	157.5	0.02	--	0.01	424.3	4	--	17.70	331.81	0.04	--	0.02	893.88
2005	SW-6	MBE	125	7.88	1010	7.7	175.7	0.62	--	0.01	411.9	1	--	11.59	264.39	0.93	--	0.02	619.83
2005	SW-6	MBE	45.0	7.08	1084	20.8	179.7	0.75	--	0.07	413.6	4	--	11.27	97.35	0.41	--	0.04	224.06
2005	SW-6	MBE	10.0	7.87	1045	7.4	156.2	0.13	--	0.10	372.5	1	--	0.89	18.80	0.02	--	0.01	44.84
2006	SW-6	MBE	225	7.33	1017	10.9	158.6	0.04	--	0.01	405.6	2	--	29.52	429.59	0.11	--	0.03	1098.62
2006	SW-6	MBE	175	7.64	920	0.0	197.0	0.05	--	0.04	388.1	2	--	0.00	415.02	0.11	--	0.08	817.62
2006	SW-6	MBE	75	7.42	1070	55.3	192.7	0.02	--	0.01	480.6	2	--	49.93	173.98	0.02	--	0.01	433.92
2006	SW-6	MBE	85	6.54	1153	121.6	185.5	0.09	0.05	0.01	475.3	1	--	124.43	189.82	0.09	0.05	0.01	486.36
2007	SW-6	MBE	225	6.44	1041	94.6	175.6	0.02	0.05	0.01	426.4	1	--	256.24	475.64	0.05	0.14	0.03	1154.96
2007	SW-6	MBE	220	6.47	915	64.6	164.9	0.11	--	0.05	339.1	1	--	171.09	436.73	0.29	--	0.13	898.09
2007	SW-6	MBE	45	6.48	1027	113.3	183.3	0.12	--	0.08	372.5	1	--	61.38	99.30	0.07	--	0.04	201.79
2007	SW-6	MBE	50	6.94	1053	43.3	214.5	0.14	--	0.08	412.6	1	--	26.06	129.11	0.08	--	0.05	248.35
Number of sample Dates		Count	12	12	12	12	12	12	2	12	12	12	0	12	12	12	2	12	12
		Max	225.00	7.9	1153.00	121.60	214.50	0.75	0.05	0.10	480.60	4.00	--	256.24	475.64	0.93	0.14	0.13	1154.96
		Min	10.00	6.4	915.00	0.00	156.20	0.02	0.05	0.01	339.10	1.00	--	0.00	18.80	0.02	0.05	0.01	44.84
12		Average	121.25	7.0	1021.67	45.66	178.43	0.18	0.05	0.04	410.21	1.75	--	63.34	255.13	0.18	0.09	0.04	593.53

Note: Dates were only partially visible on original data sheet

Sky Haven Blowout
Ferguson Township; Clearfield County
Sky Haven Coal, Inc., SMP #17860101

CCWA Monitoring Point: N/A														Loading					
Sample			Flow	Lab	Lab	Acidity	Alkalinity	Total	Total	Total	Total	Total Susp.	Total Dissolv.						
			(Flume)	pH	Conductivity			Fe	Al	Mn	Sulfate	Solids	Solids	Acidity	Alkalinity	Fe	Al	Mn	Sulfate
Date	Name	Source	(GPM)	(lab)	(umhos/cm)	(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)	(lbs/day)
2/27/2007	10	Sky Haven	Frozen	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4/23/2007	10	Sky Haven	371	5.2	180	9	7	0.05	--	0.25	63	7.0	--	40.20	31.26	--	--	1.12	281.37
8/7/2007	10	Sky Haven	2	5.7	180	6	8	0.05	--	0.13	51	0.5	--	0.14	0.19	--	--	0.00	1.23
11/15/2007	10	Sky Haven	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Number of sample Dates		Count	2	2	2	2	2	2	0	2	2	2	0	2	2	0	0	2	2
		Max	371.00	5.7	180.00	9.00	8.00	0.05	--	0.25	63.00	7.00	--	40.20	31.26	--	--	1.12	281.37
		Min	2.00	5.2	180.00	6.00	7.00	0.05	--	0.13	51.00	0.50	--	0.14	0.19	--	--	0.00	1.23
4		Average	186.50	5.5	180.00	7.50	7.50	0.05	--	0.19	57.00	3.75	--	20.17	15.73	--	--	0.56	141.30