

**Centre County PA Senior Environmental Corps  
Volunteer Water Monitoring Program**

**Study Design for Centre County Watersheds  
2012**

including all or parts of the  
Bald Eagle Creek, Beech Creek,  
Fishing Creek, Little Juniata,  
Moshannon-Mosquito Creek,  
Penns-Middle Creek,  
and Spring Creek Watersheds



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The study of the Centre County Watersheds by the Centre County PA Senior Environmental Corps began in February 2002 as an agreement between the national Environmental Alliance for Senior Involvement (EASI), the State of Pennsylvania Department of Environmental Protection, the Centre County Retired Senior Volunteer Program, and the Centre County Conservation District. Senior citizens were invited to begin a program of water testing in local streams in three watersheds within the county. Volunteers were trained in the use of Hach water testing kits, and sent out in teams to do limited chemical tests and periodic biosurvey samplings in areas of the watershed not already being tested by the Clearwater Conservancy, which was already testing water in parts of the Spring Creek watershed. After 2007 when EASI was dissolved, the Centre County PA Senior Environmental Corps became partners with Clearwater Conservancy. Over the years it also has partnered with the Spring Creek Chapter of Trout Unlimited, the Penns Valley Conservation Association, the Beech Creek Watershed Association, Nature Abounds, and Lock Haven University.

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## **What is the Centre County PA Senior Environmental Corps?**

The Centre County PA Senior Environmental Corps (CCPaSEC) is an organization of senior citizens who volunteer to monitor water in the seven watersheds that are within the county.

## **What is the mission of CCPaSEC?**

The mission of Centre County Pennsylvania Senior Environmental Corps (CCPaSEC) is to develop and support teams of senior citizens who gather and publish data on the quality of water in the streams of Centre County. Through public outreach, with the assistance of the ClearWater Conservancy and the Centre County Conservation District, Nature Abounds, and other environmentally concerned organizations, CCPaSEC seeks to keep the public informed of the importance of clean water and how the management of our civil and natural resources affects the quality of streams in the county

## **How is CCPaSEC organized?**

Currently there are sixty members who are on 12 teams monitoring 30 sites along various streams. The teams monitor physical site conditions, do chemical tests, and record biological data. Members meet monthly for training, quality control instruction, data analysis, and to explore cooperative projects with ClearWater Conservancy, the Centre County Conservation District, Nature Abounds, Lock Haven University, and the PA Department of Environmental Protection.

## **How is the Mission of CCPaSEC implemented?**

Members of CCPaSEC are active with educational presentations, public outreach, and networking with environmental associations. It has recently expanded its reach to include testing of Marcellus Shale areas where Centre County streams may be impacted. While the groups do not do testing for the PA Department of Environmental Protection, any unusual water conditions are reported to the Department should they desire to do any further testing. CCPaSEC's historical records are available through the group's website (<http://ccpasec.centreconnect.org/>), providing up to ten years of records to compare with current conditions. In 2011 CCPaSEC was nominated by the Centre County Conservation District and received the Centre County Watershed Stewardship Award. The Centre County Board of Commissioners commemorated the 10th Anniversary of CCPaSEC on September 18, 2012 at the Commissioners Board Meeting. Accepting the proclamation on behalf of CCPaSEC were president Mick McKay and former president Doug Macneal. The proclamation states in part:

“NOW, THEREFORE, BE IT RESOLVED the Centre County Board of Commissioners recognize the volunteers of Centre County Pennsylvania Senior Environmental Corps as they continue the 10 year tradition of support for the environmental quality of life in our county. Today we commemorate the tenth anniversary of Centre County Pennsylvania Senior Environmental Corps.”

Group members also do sample collections for the PA Department of Environmental Protection's Bacterial Monitoring Project.

### **What are the important features of Centre County watersheds?**

Centre County combines large areas of state forests and private forested land, rich valleys suitable for agriculture, and urban areas, including a standard metropolitan statistical area, some streams of exceptional quality, some of high quality and some that are impaired. See Page 17.

### **Why are we monitoring? (Table 1)**

Land use in the county combines forested hills and ridges, agricultural valleys, abandoned mines, and urbanized areas. Large areas are heavily forested and recent activity there drilling for gas in Marcellus Shale has the potential to impact the watershed negatively. Agricultural runoff also has affected area streams negatively in the past. Recent efforts by the Conservation District and area watershed groups have been directed at ameliorating such impacts from farms that line the streams. Abandoned coal and clay mines have created acid conditions in some streams in the upper Beech Creek watershed, which is part of the Moshannon-Mosquito watershed. High quality limestone is quarried in the valley near Bellefonte and Pleasant Gap. The State College Area is the largest urban area in the district, with Bellefonte, Milesburg, and Port Matilda being the next in size. The Pennsylvania State University, surrounded by the State College Area, impacts the watershed with its large population and activities which bring even larger crowds to the area. All of the watersheds in Centre County feed the Susquehanna River and ultimately the Chesapeake Bay. Upstream sources of pollution in the Bay, especially from agricultural runoff and industrial discharges need to be discovered and addressed locally.

### **What do we monitor?**

Each team performs physical tests, including stream average width, depth, velocity, volumetric flow, and temperature. They also do chemical tests, including pH, dissolved oxygen, nitrates, sulfates, phosphates, specific conductivity, total dissolved solids (TDS), and alkalinity. In addition a biosurvey of macro invertebrates is done semi-annually to determine biological stream health.

### **How do we monitor?**

At each site team members record the weather for the day of their visit and the previous day. They identify the stream as straight, meandering/curving, braided, or channelized, or pool/riffle, and the stream banks as V shaped, U shaped, rectangular, or having banks that are undercut. If possible, they give an estimate of the depth of the stream in high water. Water appearance is noted as clear, orange/red, dark brown, green, other, foamy, milky/white, muddy/cloudy, or multi-colored, and it is noted whether the stream is wadable or non-wadable. Stream width is averaged over as many measures as possible depending on the stream, and stream depth is measured

**Table 1: Issues Related to Watersheds in Centre County\***

<b>Watershed</b>	<b>Uses</b>	<b>Current impairment</b>	<b>Source if Polluted</b>	<b>Threats to Watershed</b>	<b>Efforts to Address Threats</b>
<b>Bald Eagle Creek</b>	Agriculture, fishing, recreation	Pesticides from tributaries, nutrients	Chemical industry. Agricultural runoff	Chemical industry. Agricultural runoff	Some riparian buffers and fences have been installed
<b>Beech Creek</b>	Agriculture, mining, Marcellus gas wells, fishing	Metals, low pH, high aluminum concentrations	Acid drainage, forest road erosion	Abandoned mines, Marcellus gas drilling	Some upstream restoration, monitoring
<b>Fishing Creek</b>	Fishing, recreation, agriculture	Nutrient enrichment and siltation	Agricultural runoff	Agriculture, erosion	Some riparian buffers and fences have been installed
<b>Little Juniata River (Halfmoon Creek)</b>	Agriculture	Nutrient enrichment and siltation	Agricultural runoff	Agriculture, erosion	Some riparian buffers and fences have been installed
<b>Moshannon Creek</b>	Mining, fishing, recreation	Acid drainage	Abandoned coal and-clay mines	Abandoned and clay coal mines	Some upstream restoration, monitoring
<b>Penns Creek</b>	Agriculture, fishing, industry	Nutrient enrichment and siltation	Agricultural runoff, industrial waste	Agriculture, industry	Some riparian buffers and fences have been installed, downstream monitoring
<b>Spring Creek</b>	Agriculture, fishing, recreation, industry, education, tourism	Impaired by Mirex, PCB, and pesticides	Industrial discharges, agricultural runoff	Chemical industry, Agriculture	Some riparian buffers and fences have been installed, downstream monitoring
<b>White Deer Creek (not currently monitored)</b>	Agriculture, fishing, industry	Nutrient enrichment and siltation from agriculture	Agricultural runoff, industrial waste	Agriculture, industry	Unknown

\* Efforts at stream remediation have been taken by the Centre County Conservation District, ClearWater Conservancy, and PA DEP. Centre County Pa Senior Environmental Corps mainly monitors and reports.

in the same manner on wadable streams. In some cases six to nine measurements may be taken, or as few as two or three when the environment precludes additional measurements.

Surface velocity is measured over a ten meter distance several times to produce an average speed across the width of the stream by dropping a standard sized bobber and timing its traverse of the distance with a stop watch. From these measurements stream volumetric flow can be calculated.

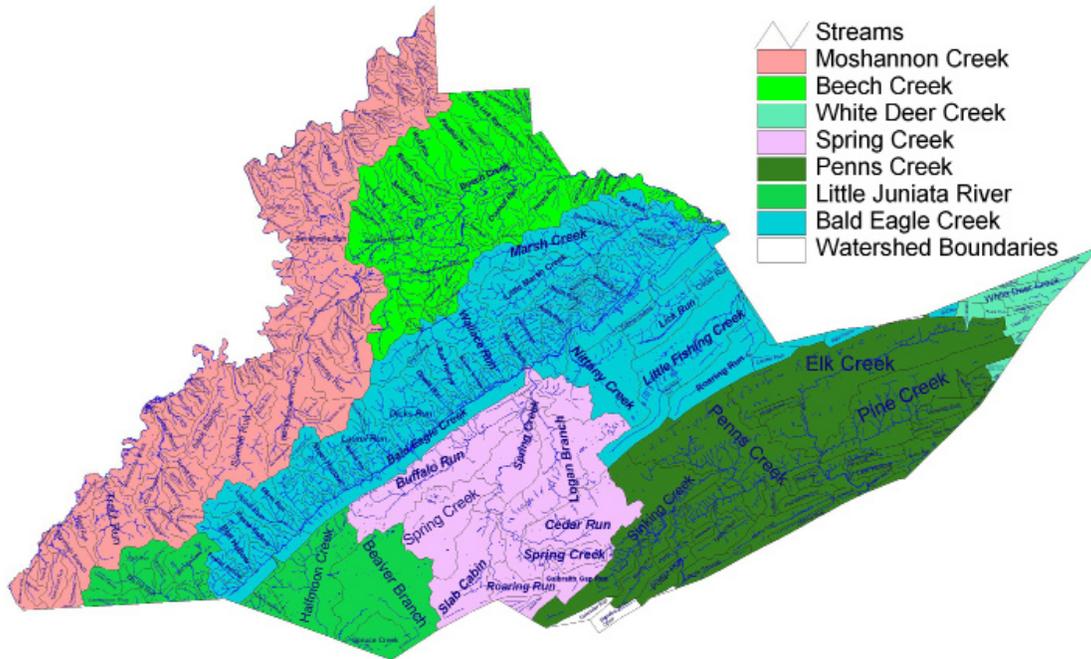
The testers note whether the stream bank is eroded and if so whether it is partial, extensive, or that it has been artificially stabilized. Stream bottoms are cataloged as a percent of organic and inorganic features, such as muck-mud, pulpy peat, detritus, overgrown shrubs and small trees, logs, limbs, marl, or fibrous peat, and bedrock, boulder, cobble, gravel, sand, silt, clay, or other. Space is provided for describing “other” whenever it appears. Inorganic and organic make-up together must total 100%. Team members assess the stream and the land around the stream for any unusual sediments or odors. Some examples of sediment are: sludge, saw dust, leaves, paper fiber, or sand. Unusual water odors might be chlorine, sulfur, musty, moldy, fishy, sewage, earthy, or spicy. Unusual soil odors might include chlorine, sulfur, musty, moldy, other, fishy, sewage, earthy, spicy, or other. Often there are no unusual sediments or odors found. The area surrounding the stream is identified as percent wetlands, forest, cropland, pasture, commercial, industrial, unused or abandoned, overgrown shrubs and small trees, or other.

Conductivity and pH are measured using the Oakton PCSTestr meter. Hach kits are used to determine levels of dissolved oxygen, sulfates, nitrates, alkalinity, and phosphates. As colorimeters are becoming available, they are used for testing nitrate-nitrogen and ortho phosphates and as a field duplicate to compare with other test results. In areas of Marcellus shale gas drilling, total dissolved solids are also measured using the Oakton PCSTestr meter.

### **Where does CCPaSEC monitor area waters?**

CCPaSEC has coordinated its water monitoring sites within the county with other conservation groups in the county to avoid duplication of effort. Local water authorities have monitored surface and underground water sources for many years, and the State College Water Authority has cooperated by running tests on waters from some of our test sites to compare readings. Penn State University is active in monitoring some area waters and in research on activities that impact the watershed. The Clearwater Conservancy has been active in the Spring Creek watershed since early 1980. The Centre County Conservation District watershed specialist, Ann Donovan, was instrumental in organizing CCPaSEC and in helping to select which sites would be monitored. The sites which are being monitored are listed below after the watershed in which they are found. Sites which are no longer being monitored are included under a separate heading since there is some information on them on the CCPaSEC web site. In the eastern tip of Centre County there is a very small portion of White Deer Hole Creek Watershed which our organization has not monitored. **Note: Site letters and numbers refer to map markers on page 7.**

## Major Centre County Watersheds



## Centre County PaSEC Monitored Site Locations



Red markers indicate active sites. Blue markers indicate inactive sites. Number-only markers indicate Marcellus Shale Region sites. (Marker icon © Google.com)

## **The Bald Eagle Creek Watershed**

The Bald Eagle Creek watershed covers 769 square miles and is located in the geographical center of Pennsylvania. It includes the Fishing Creek watershed of 181 square miles, the Beech Creek watershed of 172 square miles, and the Spring Creek watershed of 144 square miles. Eight hundred forty-nine streams flow for 1237 miles through the watershed. Underground aquifers, high volume springs, and sinkholes are common in the watershed. Trout are reared by the PA Fish and Boat Commission using water from springs in Benner Township and Pleasant Gap, and fishing in these waters, some of which are Fish and Boat Commission Class A trout waters has a positive economic impact on the surrounding area. In addition to fishing, the Bald Eagle State Park, Bald Eagle State Forest, and state game lands offer additional recreational opportunities. The largest urban area in the watershed is the State College area, home of the Pennsylvania State University. The majority of the land is either forested or agricultural. The watershed feeds into the Susquehanna River and on to the Chesapeake Bay.

### **Active CCPaSEC sites in Bald Eagle Creek Watershed**

#### **Bald Eagle Creek**

*site B:* at Fisher Farm, next to Boggs Township building in Boggs Township

*site C:* above Laurel Run confluence near Julian Bridge in Huston Township

*site D:* at Milesburg above confluence with Spring Creek in Spring Township

*site E:* 1/2 mile above Laurel Run confluence in Port Matilda in Worth Township

*site F:* off Route 220 above the Unionville bridge and the confluence with Dewitt Run in Union Township

#### **Buffalo Run**

*site G:* upstream from bridge in Benner Park in Benner Township

*site H:* at Carson's Corner behind the Unimart intersection rtes. 322 and 550 in Patton Township

*site I:* on Kolln's property on Kolln Lane in Patton Township in Patton Township

#### **Lick Run**

*site P:* at Mill Street extension at bridge to State Park boat launch in Howard Township

#### **Wallace Run**

*site A1:* at rte. 144 Runville Road at site of 2008 stream restoration in Boggs Township

*site Z:* at State Game Lands #103 in Boggs Township

### **Inactive CCPaSEC sites in Bald Eagle Creek Watershed (some data recorded)**

#### **Bald Eagle Creek**

*site A:* ERPA site between Julian and Port Matilda in Worth Township

## **The Beech Creek Watershed**

The Beech Creek watershed is a sub-watershed of the Bald Eagle Creek watershed. It lies in both Centre and Clinton Counties. In western Centre County it runs through parts of the Sproul State Forest where Marcellus shale is being drilled for natural gas. There are many high quality small streams that feed into the watershed and are susceptible to runoff from newly constructed roads and from possible accidental discharges resulting from the drilling process, which uses and discharges large quantities of water. Two CCPaSEC teams monitor nine sites in this area, two of which cross the line into Clinton County.

### **Active CCPaSEC sites in Beech Creek Watershed**

#### **Beech Creek**

*site 1:* at Monument in Liberty and Beech Townships (creek divides Centre and Clinton counties)

#### **Council Run**

*site 2:* at the Kato-Orviston Road in Snowshoe Township

#### **Hayes Run**

*site 3:* at Orviston Road in Curtin Township

#### **Little Sandy Run**

*site 4:* at the fish hatchery in Burnside Township

#### **Monument Run**

*site 5:* at the confluence with Beech Creek in Beech Creek Township in Clinton County

#### **Panther Run**

*site 6:* at Clubhouse Road at camp #348 in Burnside Township

#### **Tributary to Council Run**

*site 7:* at Kato-Orviston Road in Snowshoe Township

#### **Wolf Run**

*site 8:* at Panther Road 20 meters below bridge downstream in Burnside Township

*site 9:* at State Line bridge upstream in Burnside Township

## **The Fishing Creek Watershed**

The Fishing Creek watershed is a sub-watershed of the Bald Eagle Creek watershed. It lies in a predominantly rural area with many farms bordering the creek. Nutrient enrichment and siltation from agriculture are concerns as they affect water quality in the Fishing Creek watershed.

## **Active CCPaSEC sites in Fishing Creek Watershed**

### **Little Fishing Creek**

*site N:* at the bridge at Hoy Road in Walker Township

*site O:* at Tice Farm in Walker Township

## **The Little Juniata Watershed**

The Little Juniata Watershed lies mostly in Huntingdon County, but areas of Halfmoon Creek in Centre County have been adversely affected by agricultural runoff. Riparian buffer plantings have been added in this area along stream banks at Weaver Farm to ameliorate agricultural runoff. Along the stream bank of the Bush Llama Farm fencing has been added to keep animals out of the stream.

## **Active CCPaSEC sites in the Little Juniata Watershed**

### **Halfmoon Creek**

*site A2:* upstream of Bush Llama farm in Halfmoon Township

*site A3:* along Marengo Road upstream from bridge over Halfmoon Creek in Ferguson Township

## **The Moshannon-Mosquito Creek Watershed**

The Moshannon-Mosquito Creek watershed lies across parts of Centre and Clearfield Counties, primarily in the Bald Eagle State Forest. The largest urban area in the watershed is the town of Philipsburg in Centre County near the Clearfield County Line, with Oceola Mills, half in Centre and Clearfield counties, second in size. This area has been heavily mined for coal for generations. Lax environmental regulations resulted in abandoned mine drainage polluting many streams. This area is no longer being actively monitored by CCPaSEC, but some data from earlier tests are available

## **Inactive CCPaSEC sites in Moshannon Creek Watershed (some data recorded)**

### **Moshannon Creek**

*site Q:* at the rte. 53 bridge in Snowshoe Township

*site R:* at town park in Oceola Mills, Rush Township

## **The Penns Creek Watershed**

The Penns Creek watershed lies in the north eastern section of Centre County and is marked by wide valleys and large agricultural areas. The towns of Centre Hall and Millheim, both with populations of under 1000 people in the 2010 census are the largest developed areas in the watershed. The main threat to waterways in this area is agricultural runoff. The Penns Valley Conservation Association is active in the

watershed and cooperates with CCPaSEC in testing area waters.

### **Active CCPaSEC sites in Penns Creek Watershed**

#### **Elk Creek**

*site J:* directly below the mill at Centre Mills Bed and Breakfast in Miles Township

*site K:* at the Millheim Narrows by Elk Creek Road Bridge in Miles Township

#### **Sinking Creek**

*site S:* at the park on Barton property in Potter Township

*site T:* at the Ramsey property below the Hanover food processing plant in Potter Township

### **Inactive CCPaSEC sites in Penns Creek Watershed (some data recorded)**

#### **Elk Creek**

*site L:* at Stovers Gap Road one mile from source of Elk Creek in Miles Township

### **The Spring Creek Watershed**

The Spring Creek watershed is a sub-watershed of the Bald Eagle Creek watershed, the site of two famous Class A trout streams, Spring Creek and Slab Cabin Run. In the past, industrial discharges of the pesticides Mirex or PCB produced at a chemical plant near Spring Creek tributaries have polluted parts of Spring Creek and resulted in fish consumption advisories. Agricultural runoff has degraded the groundwater and springs that feed Spring Creek and those that feed Slab Cabin Run. The Clearwater Conservancy is active in this watershed, and the sites monitored by the Centre County PA Senior Environmental Corps were selected to supplement and not duplicate areas already monitored by the Conservancy.

### **Active CCPaSEC sites in Spring Creek Watershed**

#### **Galbraith Gap Run**

*site M:* just above confluence with Spring Creek in Harris Township

#### **Slab Cabin Run**

*site U:* next to blue water tower along rte. 26 in Ferguson Township

### **Inactive CCPaSEC sites in Spring Creek Watershed (some data recorded)**

#### **Spring Creek**

*site V:* near Commercial Street Bridge in Milesburg

*site W:* at Paradise in Benner Township

*site X:* at Shiloh Road in Benner Township

*site Y:* on Rockview prison property in Benner Township

## **When will you monitor?**

Each team of senior citizens decides when they are best able to monitor their streams. Some streams have difficult access, such as down steep banks or across rough terrain, making them inaccessible when there is heavy rain or slippery conditions, while others are monitored close to highways with easy access. The goal is to monitor each stream once a month as long as weather conditions allow. In addition, biosurveys of macro invertebrates are done twice a year - in spring and fall. CCPaSEC has a dedicated volunteer who works with biosurvey sampling with each team. Usually the teams meet on the same day of the same week each month, such as on the second Monday, or the third Thursday.

## **How will results be recorded and shared?**

At each site the initials of the members of the team who assist with gathering the data and testing, the date and time of testing, as well as monitoring data are recorded on CCPaSEC physical/chemical or macro invertebrate recording sheets. The information is then transferred to the CCPaSEC data base in a timely fashion. If an extreme measure is found during testing, the test is redone for quality assurance. Either one member of the team or a person in the group assigned for this purpose transfers the data from the field sheets to the data base where it can be accessed by anyone interested. The data manager reviews the data for any missing or unusual readings and checks with the team for clarification. If a measure which may be an indication of degradation of the stream is extreme and has been duplicated, the PA Department of Environmental Protection may be alerted. Data accessed through the web site ( <http://ccpasec.centreconnect.org/> ) is available for viewing by the general public.

## **What are our quality assurance measures?**

Data in the data base is used by the quality assurance manager to determine any areas which may need to be reviewed in future meetings. For example, in past meetings the definitions of stream bank formation were discussed in detail. At monthly meetings a different topic is discussed as part of an on-going quality assurance effort. Team leaders take responsibility for calibration of equipment and ensuring adequate and current testing supplies are on hand. The University Area Joint Authority has cooperated by occasional testing duplicate samples of waters collected by teams. Test results have been reassuringly close to those determined in the field. At streams near Marcellus shale drilling, the pH, conductivity, dissolved oxygen, total dissolved solids, salinity, and sulfates tests are done on site. Water samples are taken to a lab at Lock Haven University run by Dr. Md. Khalequzzaman, Professor in the Geology and Physics Department, to be analyzed for additional chemical evidence of Marcellus shale drilling impairment.

Table 2 lists the tests and data quality objectives which can be done at all test sites.

## What are our quality objectives?

Table 2: Data Quality Objectives for Analysis

Indicator	Where tested	Max. Holding Time	Method Reference	Method	Units	Precision	Accuracy	Completeness
Temperature	Field mid-stream	N/A	PaSEC protocol	Thermometer	°C	± 20%	±5°C	50-80%
pH	Field mid-stream	N/A	Oakton PCSTestr35	Electrometric	pH units	± 20% RPD*	75-125% recovery**	50-80%
Dissolved Oxygen	Field mid-stream	Immediate	Colorimeter DR850 or Hach	AccuVac ampule or Winkler Titration	mg/L	± 20% RPD*	90-110% recovery**	50-80%
Conductivity	Field mid-stream	Immediate	Oakton PCSTestr35	Electrometric	µmhos/cm	± 20% RPD*	±10 µmhos/cm	50-80%
Nitrate	Field mid-stream	Immediate	Colorimeter DR850 or Hach	Cadmium reduction	mg/L	± 20% RPD*	75-125% recovery**	50-80%
OrthoPhosphate	Field mid-stream	Immediate	Colorimeter DR850	Ascorbic acid	mg/L	± 20% RPD*	75-125% recovery**	50-80%
Alkalinity	Field mid-stream	Immediate	Hach procedure	Sulfuric acid titration	mg/L	± 20% RPD*	75-125% recovery**	50-80%
Sulfate	Field mid-stream	Immediate	Colorimeter DR850 or Hach	Turbidimetric	mg/L	75-125% recovery**	75-125% recovery**	50-80%
Total dissolved solids	Field mid-stream	Immediate	Oakton PCSTestr35	Electrometric	mg/L	RPD*	±20%	50-80%
Macroinvertebrates	Stream Bottom	Immediate	Kick net/rake PA DEP charts	Visual ID	N/A	N/A	N/A	50-80%

\* RPD (Relative Percent Difference) =  $\frac{X_s - X_d}{[(X_s + X_d)/2]} \times 100$  Where  $X_s$  + result for sample and  $X_d$  = result for duplicate sample.  
 \*\*Percent recovery = measured value/calibration standard value x 100.

In streams near Marcellus drilling Total Suspended Solids (TSS) in mg/L is also done on site using the Oakton PCSTestr35. In addition, the following tests are done at the Lock Haven University geology lab and results are recorded in the data base for the Marcellus area sites:

1. ORP or Eh (mV)
2. "Total Suspended Solids (TSS) in mg/L using Spectrophotometer"
3. Total Hardness as CaCO<sub>3</sub> mg/L using sequential titration
4. Ca Hardness as CaCO<sub>3</sub> in mg/L using sequential titration
5. Mg Hardness as CaCO<sub>3</sub> in mg/L using sequential titration
6. Ca calculated from Ca Hardness (mg/L)
7. "Barium (mg/L) using Spectrophotometer"
8. Sodium using Salinity or ISE (mg/L)
9. "Total Iron (mg/L) using Spectrophotometer"
10. "Manganese (mg/L) using Spectrophotometer"
11. Arsenic using single test kit (mg/L)
12. "Chloride (mg/L) using Titration or Spectrophotometer"
13. "Sulfate in mg/L using Spectrophotometer"
14. "MBAS (surfactant) using Spectrophotometer"
15. "TOC (mg/L) using COD Reactor and Spectrophotometer"
16. Bacteria using Biology Lab in counts/100 ml
17. "Lead (Pb) in mg/L using Spectrophotometer"
18. "Copper (Cu) in mg/L using Spectrophotometer"
19. Strontium (mg/L)
20. Mercury (mg/L)
21. "Bromide (mg/L)"
22. "Beryllium (mg/L) using Titration or Spectrophotometer"

### **How will you manage, analyze and report the data?**

At each site the initials of the members of the team who assist with gathering the data and testing, the date and time of testing, as well as monitoring data are recorded on CCPaSEC physical/chemical or macroinvertebrate recording sheets. The information is then transferred to the CCPaSEC data base in a timely fashion. If an extreme measure is found during testing, the test is redone for quality assurance. Either one member of the team or a person in the group assigned for this purpose transfers the data from the field sheets to the data base where it can be accessed by anyone interested. The data manager reviews the data for any missing or unusual readings and checks with the team for clarification. If a measure which may be an indication of degradation of the stream is extreme and has been duplicated, the PA Department of Environmental Protection may be alerted. Data accessed through the web site ( <http://ccpasec.centreconnect.org/> ) is available for viewing by the general public.

## What are the tasks and who will do them?

A leader is chosen for each team. Each team may divide responsibilities of gathering and recording information within their team as they see fit. One person is responsible for transferring the information gathered on each monitoring activity to the CCPaSEC data base. The following tables depict the major tasks associated with CCPaSEC and who will perform them.

**Table 3a. Officers of Centre County Pa Senior Environmental Corps**

Office	Office holder	Paid Position? (Y or N)	Term of Service
President	Mick McKay	N	2 years
Vice-President	Louis Mayer	N	2 years
Secretary	Ella Bashore	N	1 year
Treasurer	Diana Hershberger	N	1 year

**Table 3b. Major Project Tasks and Who Will Carry Them Out.**

Major Project Task	Position or Title	Paid Position? (Y or N)	Personnel
Stream monitoring	CCPaSEC volunteers	N	see attached list
DEP Bacterial sample collection	CCPaSEC volunteers	N	“
Marcellus shale drill site stream monitoring	CCPaSEC volunteers	N	“
Watershed cleanup	CCPaSEC volunteers	N	“
Others	CCPaSEC volunteers	N	“

**Table 3c. Technical Committee**

Member Name	Area of Expertise	Member Information
Genieve Robine	Macro invertebrates	see attached list
Ralph Locklin	Membership/training	“
Dan Delotto	Supplies	“
Ken Johnson	Quality Assurance	“
Joyce McKay	Database, Website Manager	“

**Table 3d. Team Leaders**

<b>Team</b>	<b>Team Leader</b>	<b>Leader Information</b>
Team 1	Carolyn Hatley	see attached list
Team 2	Genie Robine	“
Team 3	John Winnett	“
Team 4	Julia Hix	“
Team 5	Doug Macneal	“
Team 7	Larry Hutchinson	“
Team 8	Joyce McKay	“
Team 9	Louis Mayer	“
Team 12	Terry Agona	“
Team 13	Dan Delotto	“
Team 14	Ken Johnson	“
Team 15	Lynn Hutcheson	“

## **Stream Designation by the State of Pennsylvania DEP**

The following streams in Centre County have been designated in the Integrated Water Quality Monitoring and Assessment List, or Integrated List for short, as exceptional value (EV), or high quality (HQ) streams:

### **EV:**

- Laurel Run at Julian, source to Bald Eagle Creek
- Wallace Run, source to and including the unnamed tributary at Gum Stump
- Rock Run
- Panther Run
- Two Rock Run
- Hayes Run
- Middle Branch Big Run
- East Branch Big Run (part)
- West Branch Big Run
- Roaring Run source to Krislund Camp

### **HQ:**

- Spring Creek
- Gailbraith Gap Run
- Markles Gap Run
- McBrides Run
- Slab Cabin Run, source to PA Route 26 at River Mile 9.0
- Buffalo Run, source to T-942 at River Mile 0.66
- Lick Run
- Stinktown Run
- Monument Run (in Clinton County, but monitored by CCPaSEC)
- Little Fishing Creek

## **Water Quality Impairment**

Several categories of impairment are listed for the subbasin on the Integrated List:

- Metals and low pH from abandoned mine drainage in the Beech Creek and Moshannon Creek watersheds. Many discharges have high concentrations of aluminum.
- Nutrient enrichment and siltation from agriculture in Fishing Creek watershed.
- Industrial discharges: Pesticides in Bald Eagle Creek and fish consumption advisories due to the pesticides Mirex or PCB in Spring Creek watershed have been lifted, but degraded the stream for many years. Logan Branch also had PCBs from the Cerro Metal plant, which has gone out of business.

## Sources

- 1) NRCS, United States Department of Agriculture, Natural Resources Conservation Service Bald Eagle Watershed, 2012, @ <http://www.pa.nrcs.usda.gov/>
- 2) State Water Plan Subbasin 09C Bald Eagle Creek Watershed ..
- 3) The Pennsylvania Organization for Watersheds & Rivers
- 4) US Environmental Protection Agency
- 5) Indiana County PaSEC Watersheds Monitoring Program, 2011, John Dudash and JoAnne Ferraro
- 6) Study Design for Bald Eagle Creek, 2003, Robert Rightmyer, Ginny Robine et al.
- 7) Study Design for Elk Creek, 2003, Douglas Macneal, Al Henry, et al.
- 8) Study Design for Galbraith Gap Run and Slab Cabin Run, 2003, Carolyn and Elwood Hatley et al.
- 9) Study Design for Moshannon Creek, 2003, Stan and Carolyn Lembeck et al.