

# PLAYBOOK

## Decommissioning and Redevelopment Playbook for the Sunbury Generation Power Plant



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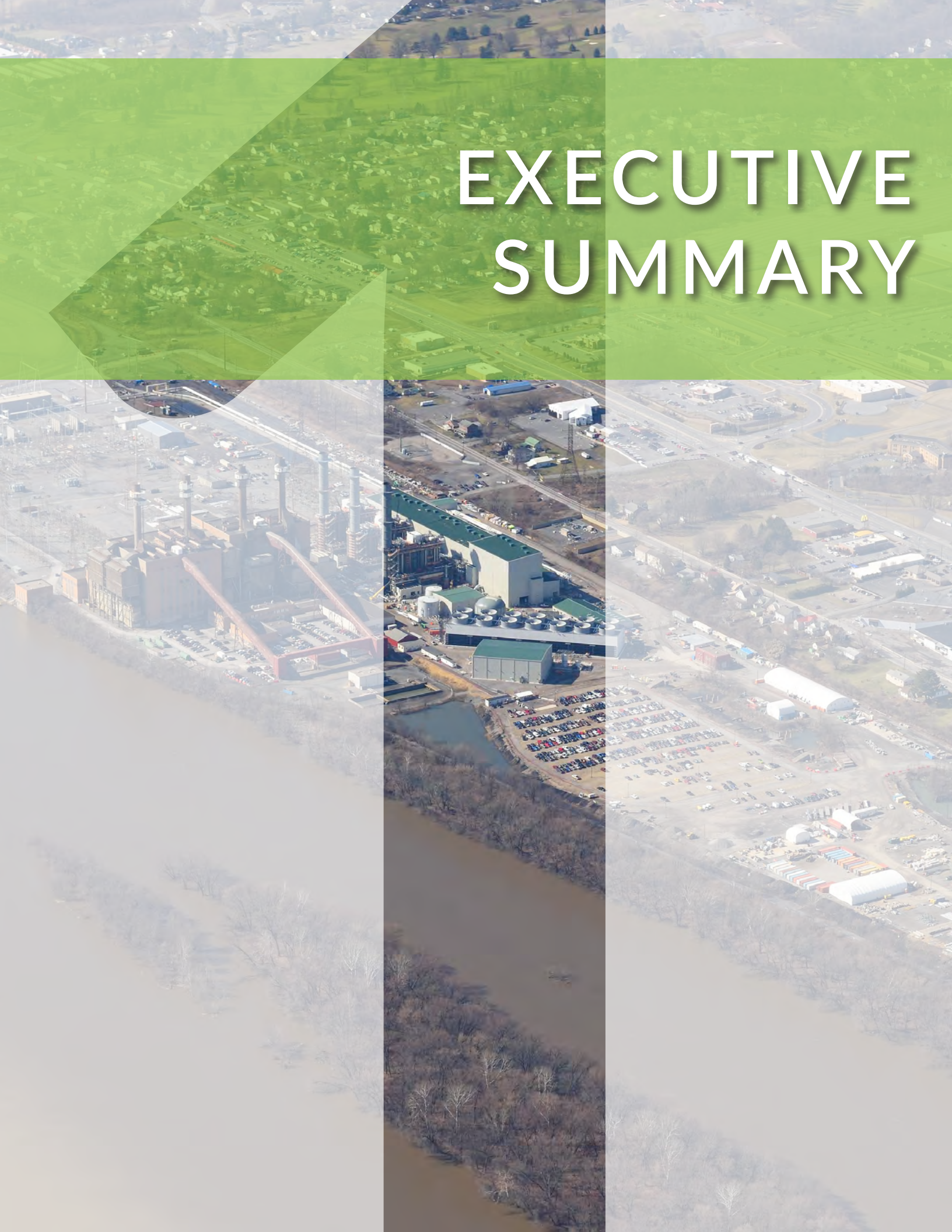
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# EXECUTIVE SUMMARY





## Executive Summary

The Commonwealth of Pennsylvania's Department of Community and Economic Development (DCED) has organized a state-wide effort to explore the feasibility of repurposing a number of decommissioned coal-fired generation plants within the Commonwealth. Among these is the former Sunbury Generation Power Plant located in Shamokin Dam Borough and Monroe Township in Snyder County, Pennsylvania. Pennoni, along with a team of subconsultants, has been engaged to analyze the Sunbury Generation LP power plant location and develop this repurposing playbook.



Sunbury Generation Power Plant

Funding for this project was made possible by the U.S. Economic Development Administration's Partnerships for Opportunity and Workforce and Economic Revitalization (POWER) Initiative. POWER funding is available through competitively awarded grants targeted to help fulfill regional economic development strategies in communities and regions negatively impacted by changes in the coal economy. DCED is implementing this program in Pennsylvania, pursuing development of a proactive business attraction strategy that will serve as a catalyst to attract new businesses to Pennsylvania and other forms of private sector investment and transformational redevelopment for the benefit of the local communities.

The primary purpose of this Playbook and its supporting documents is to provide various redevelopment "Plays" for consideration by industrial site selectors and the development community as they explore opportunities in the Central Pennsylvania region. This Playbook also may serve as a tool for consideration by relevant public and private stakeholders with an interest in successful redevelopment of the Sunbury Generation Power Plant site.



This Playbook analyzes the feasibility and efficacy of six selected redevelopment plays at the Sunbury Generation site:

- A second natural gas-fired electric generation station
- Solar energy facility
- Logistics/Distribution center
- Wood waste recycling facility
- Hydroponic greenhouse or growing facility
- Data center

As part of the implementation of the Playbook, the Pennoni team strongly recommends that DCED continue serving a role in the redevelopment of the Sunbury site. This role involves coordination of permit approvals for multiple federal, state and local agencies, marketing of the site, and supporting public funding opportunities from multiple sources. The Pennoni team has outlined a series of Action Steps that will help with redevelopment.

- ✓ Meet with the Governor's Action Team (GAT) to discuss the Playbook and the energy intensive development opportunities that could occur at the site.
- ✓ Support engineering and design studies to determine the cost and feasibility of improved vehicular access to the site.
- ✓ Develop a multi-phased and multi-layered funding strategy to improve transportation access and foster redevelopment.
- ✓ Coordinate with various state and federal agencies on permit approvals required for redevelopment.
- ✓ Work with regional development entities to prioritize this site for federal funding consideration.

In addition to laying out possible reuse alternatives and recommendations as well as a preferred redevelopment strategy, the Playbook also provides information that may be useful for due diligence efforts. Recognizing that different investors have different priorities and goals, the information contained in this Playbook and its supporting documents is intended to provide a wide range of data and ideas organized and located in one place as a means to stimulate further creative thought by development professionals.

## Project Information

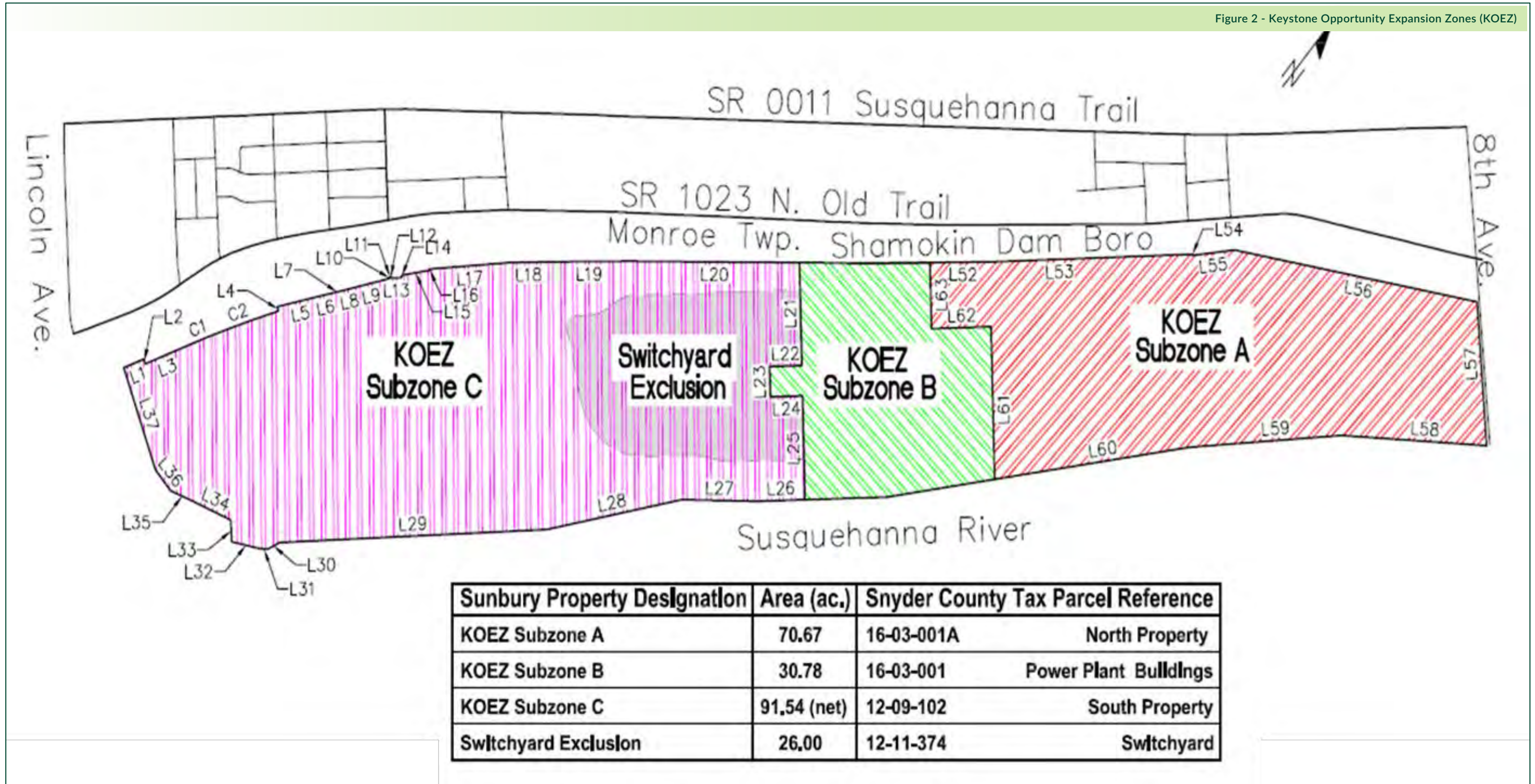
The property houses the former Sunbury Generation LP coal-fired power plant, the new Panda Hummel Station natural-gas-fired power plant, a former coal storage area associated with past operations from Sunbury Generation LP, an electric switchyard operated by PPL Electric Utility, and a closed and capped fly ash impoundment constructed and permitted to contain ash from the Sunbury Generation LP power plant operations.



Figure 1, below, shows the parcels of this property are included for consideration in this Playbook, while certain areas determined by the site owners were off limits to the evaluators. The parcels that house the Panda Hummel Station and the PPL Switchyard were excluded from this Playbook evaluation. The part of the site that houses the existing former Sunbury Generation Station was excluded from the Phase I Environmental Site Assessment, but was included in the overall redevelopment options for the property.

The Sunbury Generation Plant site is in Shamokin Dam, Snyder County; between U.S. Route 11 and the Susquehanna River, identified on tax map as 12-09-102 (former ash impoundment), 16-03-001A (former coal storage area), and 16-03-077 (construction gate for the Panda Hummel station). The former Sunbury Power Station occupies the 219+/- acre tract located at 2384 North Old Trail, Shamokin Dam, Pennsylvania. The property being considered for redevelopment comprises approximately 94 acres on the southern parcel, and approximately 83 acres on the northern parcel. The parcels are divided between the Borough of Shamokin Dam (16-03-001A, 16-03-077) and Monroe Township (12-09-102). The middle parcel depicted as Subzone B, includes the Panda Generation Plant, recently commissioned and producing electricity, along with the former Sunbury Generation plant. The adjacent switchyard also remains in active service. Figure 2, on the next page, identifies the tax parcels.

Figure 2 - Keystone Opportunity Expansion Zones (KOEZ)







# Playbook Guide



## Site Attributes, Assets & Constraints Summary

- ✓ Panda Hummel Station Power Plant is located on the site: 1,124-megawatt combined-cycle generating facility
- ✓ Operational in June 2018
- ✓ Capacity to power more than one million homes
- ✓ The Keystone Opportunity Expansion Zone (KOEZ) overlays the footprint of the retired Coal power plant



## Market Analysis Summary

- ✓ Snyder County has gained a large number of Construction jobs (713) between the Q3 2007 and the Q3 2017, while losing many Manufacturing jobs (-1218)
- ✓ Snyder County's most competitive industries are Manufacturing, Agriculture, Forestry, Fishing, and Hunting, and Construction
- ✓ CSA gained a large number of jobs in the Health Care and Social Assistance Industry (4950), but lost jobs in the Manufacturing (-5801) and Retail Trade (-1327) industries
- ✓ Snyder County's Employment and Wage Location Quotients show robust and competitively paying wood product manufacturing, modular home manufacturing, and logging industries



## Energy Development Summary

- ✓ The former Sunbury Generation site provides numerous opportunities for new generation alternatives. A combination of energy generation and storage capacities could position the Sunbury site as one of the Commonwealth of Pennsylvania's largest/diverse energy hubs.
- ✓ Capacity for an additional natural gas generation facility providing low cost electricity potentially to local Shamokin Dam and Sunbury users
- ✓ Capacity for large-scale photo-voltaic (PV) solar array



## Reuse Strategy Alternatives Summary

- ✓ A wide variety of strategies that will provide solid local economic employment and impact. Strategies that maximize the unique benefits of the site to blend low cost energy with renewable "green" options to attract large international or national firms to Pennsylvania.
- ✓ Energy generation and production
- ✓ Manufacturing
- ✓ High intensity energy users (data centers, hydroponic farming)



## Recommended Actions & Schedule Summary

- ✓ Work with regional development entities to prioritize this site for redevelopment
- ✓ Continue coordination and collaboration with developers
- ✓ Roll-out and market the Playbook and energy-intensive development opportunities
- ✓ Support engineering and design studies to determine the cost and feasibility of improved vehicular access to the site
- ✓ Develop a multi-phased and multi-layered funding strategy to improve transportation access and foster redevelopment
- ✓ Coordinate with various state and federal agencies on permit approvals required for redevelopment

An aerial photograph of a large industrial or construction site. The site is characterized by a large, flat, light-colored area, possibly a construction site or a large parking lot, with various structures and equipment. To the right of the site is a wide river. To the left and in the foreground, there are residential areas with houses and streets. The image is overlaid with a semi-transparent green circular graphic that frames the text.

# SITE ATTRIBUTES, ASSETS, & CONSTRAINTS



# Site Attributes, Assets, & Constraints

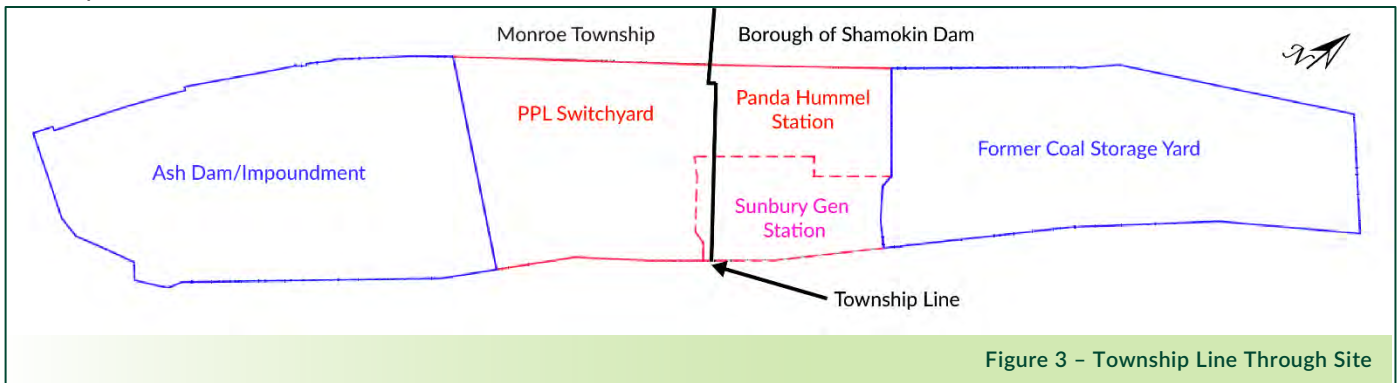
## Site Attributes

### Site Attribute Highlights:

- ✓ Developable land for manufacturing, distribution, and industrial uses
- ✓ Public water is available
- ✓ Public sewer is available
- ✓ Existing pump house and raw water intake / raw water resource (Susquehanna River) on site
- ✓ Electric / PPL switchyard on site
- ✓ High-volume natural gas line on site
- ✓ Telecommunication and fiber optic “highway” connectivity is available
- ✓ Regional transportation network / Near-future CSVT Project
- ✓ Rail access on site
- ✓ Mass transit / rail and air are available regionally
- ✓ Municipal waste services are available
- ✓ Access to primary, secondary, technical, and post-secondary institutions
- ✓ Access to healthcare facilities
- ✓ Emergency services are available
- ✓ Access to parks and recreation



The former Sunbury Power Station occupies a 219± acre industrially zoned tract located at 2384 North Old Trail, Shamokin Dam, Snyder County Pennsylvania. As Figure 3 shows, the southern half of the tract lies within Monroe Township while the northern portion lies within the Borough of Shamokin Dam, while a large developable area (blue outline) exists in each.



The Shamokin Dam portion of the property is zoned **M-1 General Industrial**. Principal permitted uses include, but are not limited to:

- Power generation facilities
- Public utility plants
- Printing, publishing, and binding plants
- Manufacturing facilities
- Processing facilities
- Laboratories
- Contractor yards



A buffer area of 25 feet between zoning uses, with landscaped areas of at least 6 feet high masking the property, is required.

The Monroe Township portion of the property is in an **I – Industrial Zone**. Principal permitted uses in this district include, but are not limited to:

- Agribusiness
- Communication and transmitting facilities
- Contractor yards
- General and light manufacturing
- Park and recreational areas
- Research laboratories
- Wholesale, storage, and warehousing

Conditional uses include, but are not limited to:

- Industrial parks (comprised of business services, medical clinics, and professional centers)
- Natural production uses
- Power generation facilities
- Public utility buildings
- Solid waste processing

Building height is limited to 3 stories (35 feet), and lot coverage to 75%.

### **Water**

Potable water service for existing uses on site, including Panda Hummel Station, the decommissioned Sunbury Generation LP plant, and all existing buildings, is provided by Shamokin Dam Borough's public water supply system. Water supply to the guard house building is provided by a private well. There are currently no plans to connect the guard house to a public water supply.

If a second generation station is developed, Shamokin Dam Borough has already considered and agreed that it will provide this supply of required public water. This supply is also expected to include process water, although a possible backup connection or co-supply arrangement with Aqua Pennsylvania is under consideration. This arrangement depends upon the future water needs of Shamokin Dam LLC, and whether the Borough can reliably supply the required volume.

Raw water resources available for redevelopment include withdrawals from the Susquehanna River and groundwater on portions of the site. Site improvements to the former Sunbury plant included a dam in the river for managing the cooling water needed by the power plant, which is still in service and being used by the Panda Hummel Station for water intake. This system includes four existing intakes and screening bays connected to a common well. Water was originally conveyed from the well via four tunnels to four turbine condensers (now retired); two of the four tunnels returned water to the river. Panda has an easement for use of the intake building and exclusive use of one bay and non-exclusive use of one other bay. The two conveyance tunnels are no longer in use and will be abandoned in place. The two discharge tunnels are located below the dam near an unnamed tributary and will be left in place. Two of the existing intake bays are available to accommodate future river water withdrawals. Each is physically capable of taking about 7 million gallons per day, although the space for installing large pumps is limited.

Groundwater under the former Coal Storage Yard is subject to a Pennsylvania Department of Environmental Protection (DEP) Activity & Use Limitation (AUL) and as such, cannot, under any circumstance, be used as a potable water source for either private or public purposes. An Environmental Covenant outlining the



activity and use limitations, including a site plan depicting the area encumbered by the AUL, is available on the PA AUL Registry website. Links to the document are available on the References page.

**Sanitary Sewer**

Sanitary sewage treatment for uses located in Monroe Township and Shamokin Dam Borough are provided by Eastern Snyder County Regional Sewer Authority (ESCRSA). Hummels Warf Municipal Authority owns and operates the collection system for sewage flows from the Township to ESCRSA’s wastewater treatment plant while Shamokin Dam owns and operates the collection system for sewage from the Borough to the treatment plant. Sanitary sewage from the Sunbury Generation LP building and the Panda Hummel Station is discharged to the Borough of Shamokin Dam’s sanitary sewer collection system. Sanitary sewage from the guard house is discharged to an on-lot system. Presently, there are no plans to connect the guard house to the public wastewater system.

**Electric**

PPL Electric Utilities provides electricity to the region, including 12 kV service available off Old Trail Road. An existing PPL Switchyard is on site. An option for a large power consumer (i.e., 10 megawatts or greater) is to pursue LP-5 Service and connect directly to the switchyard. The LP-5 Rate Schedule is for large general service supplied from available lines of 69,000 volts or higher, with the customer furnishing and maintaining all equipment necessary to transform the energy from the line voltage. It applies to three phase, 60 Hertz service. A direct connection requires an agreement with PPL. This type of arrangement eliminates the distribution portion of electricity charges.

**Gas**

UGI Sunbury, LLC, a subsidiary of UGI Energy Services, LLC, operates a 35-mile, 20-inch diameter lateral pipeline delivering low-cost natural gas produced in the Marcellus Shale region to the Panda Hummel Station on site. Tapping into the MARC 1, Regency Energy Partners, and Transcontinental Energy Corporation services, and extending through Bradford, Lycoming, and Sullivan counties, the pipeline transports up to 200,000 dekatherms per day. In addition to serving the generation plant, the pipeline supplies natural gas and system reinforcement to distribution systems operated by UGI Penn Natural Gas, Inc. and UGI Central Penn Gas, Inc. Capacity is available to serve other industrial uses and/or another power plant. Upgrades to the existing pipeline are required to serve additional users. These upgrades will involve a modest cost per dekatherm.

Natural gas service in the Borough is provided by UGI Penn Natural Gas, Inc.

**Telecommunications**

Shamokin Dam has two main wired telecom providers. Both Verizon High Speed Internet and Service Electric Cablevision offer residential internet access that covers most areas of Shamokin Dam. Additionally, there is Limitless Mobile, which offers fixed wireless internet to most areas of Shamokin Dam. Multiple service plans are available. There are four companies offering business internet services in Shamokin Dam including the following<sup>1</sup>:

**TABLE 1: COMPANIES OFFERING BUSINESS INTERNET SERVICES**

PROVIDER	SERVICE	CITY COVERAGE (%)	FASTEST SPEED (MBPS)
Verizon	High Speed Internet	100	15

<sup>1</sup> <https://broadbandnow.com/Pennsylvania/Shamokin-Dam#show=business>



TABLE 1: COMPANIES OFFERING BUSINESS INTERNET SERVICES

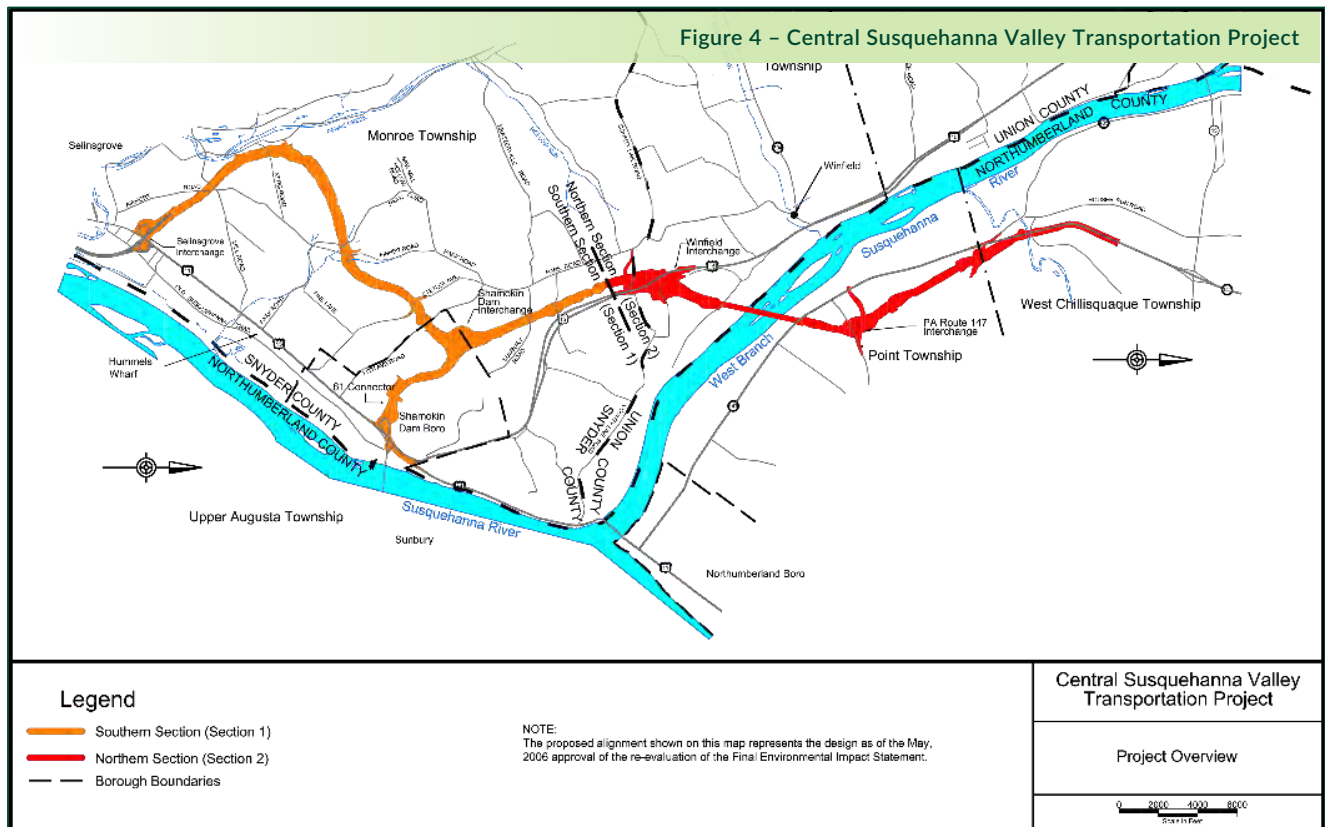
PROVIDER	SERVICE	CITY COVERAGE (%)	FASTEST SPEED (MBPS)
Service Electric Cablevision	Cable	91.2	200
PenTeleData	Cable, Fiber	89.3	1,000
Windstream Business	DSL	29.2	10

Verizon’s Complex Services Group confirmed that Business Class Service of any size can be provided to the site. Costs for typical business services can range from \$500 to \$2,000 per month providing from 10 megabit up to 1 gigabit of speed. One gigabit will support a workforce of 150 to 200 employees.

**Transportation**

Presently the site is accessed from North Old Trail Road at two security-controlled locations. Traveling north on Route 11 and 15, the two access locations may be reached by turning right on Runyan Road and then taking a left onto North Old Trail Road. Susquehanna Trail is a five-lane state route which includes a center turn lane and at various signalized intersections with left hand turn lanes. North Old Trail Road is a two-lane state route. Borough roads connecting the parallel state routes include Stetler Avenue, East Arbogast Avenue, Monroe Avenue, East 11<sup>th</sup> Avenue, and East Eighth Avenue. Township roads connecting the parallel state routes include Lincoln Avenue, East Mill Road, Old School Road, Monroe Street, Brown Street, East Park Road, and Runyan Road. The Borough and Township local roads connecting the two state routes are all two-lane roads (See the References page for links to PennDOT maps: Shamokin Dam Borough Map; Monroe Township Map).

Other major state routes in the vicinity of the site include U.S. Route 522 to the southwest and Interstate 80 to the north.





A significant highway improvement project is also underway that offers potential benefits affecting the Sunbury site. The Pennsylvania Department of Transportation (PennDOT), is completing the **Central Susquehanna Valley Transportation (CSV) Project**, shown in Figure 4, which is a new four-lane limited access highway project, approximately 13 miles long and separated into two sections: a Northern Section that will connect PA 147 south of Montandon to US 15 south of Winfield including a 4,500-ft-long bridge over the West Branch of the Susquehanna River; and a Southern Section that will connect US 15 south of Winfield to US 11/15/ north of Selinsgrove and includes a connector from the new highway to PA 61, Veterans Memorial Bridge<sup>2</sup>. Completion of this infrastructure project is scheduled for 2024.

The Susquehanna River is unnavigable along the northeastern portion of the site because of the existence of the Adam T. Bower Memorial Dam to the north and a low head dam immediately to the south of the existing pump house. To the south of the low head dam, the River is navigable by recreational water craft.

### **Mass Transit**

Rabbittransit (a regional public transportation provider) provides public transportation in the form of Shared Ride within Snyder County. Shared Ride is a bus service that provides consolidated trips between customers' origins and destinations that are not well served by fixed route bus service. Shared Ride operates during limited hours and specific travel areas. There is a required application and reservation process to use the service.

**RAIL:** Rail service in Snyder County is limited to freight service provided by Norfolk Southern. No commuter service or inner-city passenger service is provided in the County. The closest passenger facilities are in Lewistown and Harrisburg. The primary rail line is the Bridge Route Line. This track serves business and industry in Creamer, Selinsgrove, and Shamokin Dam, and connects the County with Harrisburg, Sunbury, and upstate New York Canada, and New England. Principle commodities shipped include grain, lumber, and coal<sup>3,4</sup>.

**AIR:** Penn Valley Airport Authority, located at 100 Airport Road in Selinsgrove, is Snyder County's main aviation facility. The airport is situated approximately 2.5 miles southwest of the former Sunbury Power Plant site and is accessible by U.S. Route 11/15 and U.S. 522. PennDOT's Bureau of Aviation classifies this facility as an advanced aviation facility.<sup>5</sup> The advanced classification criteria include: 4,500-foot main runway; 400 ft and ¾ mile visibility minimums; and MIRLs or HIRLs (i.e., medium or high intensity runway lights). Penn Valley Airport has a dual runway with dimensions of 4,760 by 75 feet and is equipped with edge lights and directional beacons. Services at this facility include major/minor repair, hangar rental, air taxi, charter, instructional services, and rental services. Accommodations include an administration building, restrooms, a restaurant, taxi service, car rental, and it is close to nearby hotels.<sup>6</sup> Penn Valley Airport supports the general aviation needs of the local community and surrounding region.

The closest major airport is Williamsport Regional Airport, which is 40 miles from Shamokin Dam. Other airports include Capital City Airport at 57 miles; Harrisburg International Airport at 62 miles; Baltimore/Washington International at 150 miles; LaGuardia Airport at 154 miles; and Philadelphia International Airport at 166 miles from Shamokin Dam.

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<sup>2</sup> See the Reference page for links to PennDOT maps: Project overview Map; Southern Section Map

<sup>3</sup> Snyder County Hazard Mitigation Plan, Appendix C – Hazard Profile, pages C-1 through C-5

<sup>4</sup> See the Reference page for a link to PennDOT's Pennsylvania Railroad Map

<sup>5</sup> PennDOT Multi-Modal Planning and Implementation Services, 2007 State Aviation System Plan Update, Technical Summary, Final, 2007

<sup>6</sup> Snyder County in the 21<sup>st</sup> Century, A Strategic Comprehensive Plan, Adopted May 29, 2001



### Municipal Waste

Several municipal waste haulers offer services to the residents and businesses located within the Borough. The most commonly used haulers include Waste Management, Hometown Disposal, and Danley’s Disposal. The Borough offers monthly curbside recycling collection which includes aluminum cans, clear, green and brown glass and #1 and #2 plastics.

Monroe Township has two municipal waste haulers including Waste Management and Hometown Disposal. Monroe Township recently opened a Township Recycling Drop Off Center, located off Park Road next to the Township building. The center accepts: newspaper; office paper; chip board; steel cans; magazines; catalogs; glossy inserts; corrugated cardboard; aluminum cans; brown, green, and clear glass bottles and jars; and #1 and #2 plastics. Twice a year the Township hosts Clean Up Days when residents can bring appliances, clothing, books and other items for disposal. This service is free to residents.

### Educational Institutions

Primary and secondary education (i.e., K-5 through 12) is delivered locally by the Selinsgrove School District and the Lewisburg Area School District. The districts participate in the Sun Area Technical Institute, which includes majors in the building trades, health and human services, manufacturing, and technical and transportation industries.

Post-secondary educational institutions within 60 miles of the site include:

**TABLE 2: POST SECONDARY EDUCATIONAL INSTITUTIONS WITHIN 60 MILES**

COLLEGE	LOCATION	DISTANCE FROM SHAMOKIN DAM (MILES)
Triangle Tech Inc	Sunbury	3
Susquehanna University	Selinsgrove	5
Bucknell University	Lewisburg	7
Bloomsburg University of Pennsylvania	Bloomsburg	22
Lycoming College	Williamsport	28
Pennsylvania College of Technology	Williamsport	28
McCann School of Business and Technology	Pottsville	33
Penn State Schuylkill	Schuylkill Haven	38
University of Phoenix Harrisburg Campus	Harrisburg	38
Harrisburg Area Community College	Harrisburg	39
Lock Haven University	Lock Haven	39
Lebanon Valley College	Annville	40
Harrisburg University of Science and Technology	Harrisburg	41
Penn State Hazleton	Hazleton	42
Penn State Harrisburg	Middletown	45
Dickinson College	Carlisle	49
Luzerne County Community College	Nanticoke	49
Messiah College	Grantham	59





### **Health Care**

Health care facilities in the region include UPMC Susquehanna Sunbury in Sunbury, Geisinger Medical Center in Danville, and Evangelical Community Hospital in Lewisburg.

### **Emergency Services**

Emergency services in Monroe Township and Shamokin Dam Borough are covered by four fire companies including Shamokin Dam Fire Company, Hummels Warf Fire Company, Kratzerville Volunteer Fire Company, and Dauntless Hook and Ladder Fire Company. Sunbury has six volunteer fire companies and fire police services. The companies operate under a mutual agreement.

Selinsgrove State Police provide police services in Monroe Township. The Shamokin Dam Police Department provides police service in the Borough. State Police cover the hours from 2:00 AM to 6:00 AM in the Borough.

### **Parks and Recreation**

There are four parks in the Borough including the Jack Treas, Charles Attig, Weller, and Fabridam Parks. Jack Treas Park features children's recreational equipment, a full basketball court, an entertainment pavilion, a dining pavilion with kitchen, picnic table seating and ADA accessible rest rooms. Parking is available on and off site. The Charles Attig park features children's recreational equipment, a pavilion for dining or entertainment with picnic tables, ½ basketball court, and a large open field for volleyball or similar sports. On-site parking is available. There are no kitchen or restroom facilities at Attig Park. Weller field includes a fenced ball field suitable for youth baseball or softball games, children's recreational equipment, dining pavilion with kitchen, picnic table seating, ADA accessible restrooms, and a hiking trail with bridge beside a stream. Fabridam Park offers a spectacular view of the dam and the river. The park includes some children's recreational equipment, open space for games and activities, a pavilion for dining or entertainment and a short "rails to trails" walking path. The park has no restroom facilities.

Monroe Township has four recreation areas including Recreation Park #1, Monroe Manor Park, Recreation Park #3, and Shady Nook Boat Launch. Recreation Park #1 includes children's recreational equipment, tennis courts, a basketball court, two baseball fields, a concession stand pavilion with tables, and restrooms. Monroe Manor Park includes children's recreational equipment, a basketball court, a volleyball court, and a large grass field. There are no restroom facilities at this park. Recreation Park #3 includes a lighted junior baseball and soccer fields, a concession stand, a pavilion with four picnic tables, a walking path and restrooms. Shady Nook Boat Launch includes a public boat launch, picnic pavilion with tables, grills, a swing and portable restroom facilities.

Nearby golf courses include The KaddyShack, a nine-hole golf course in Shamokin Dam, and the Susquehanna Valley Country Club, a private 18-hole golf course with pro shop, swimming pools, and clubhouse facilities located in Selinsgrove.

Shikellamy State Park is a 132-acre Pennsylvania state park located at the confluence of the West Branch Susquehanna River and Susquehanna River. The park is divided into two sections; the 78-acre overlook, and the 54-acre marina located just to the north of Sunbury. A 2,100-foot long inflatable dam is raised in the summer to create 3,000-acre Lake Augusta, which is used for recreation. The dam is operated and maintained by the Pennsylvania Department of Conservation and Natural Resources (DCNR).



### Regional Setting

Snyder County	Bloomsburg-Berwick-Sunbury CSA	Borough of Shamokin Dam	Monroe Township
<ul style="list-style-type: none"> <li>✓ Mostly Rural</li> <li>✓ Most land classified as agricultural or forested</li> <li>✓ County seat is Middleburg, population - 1,557</li> <li>✓ Largest municipality is the Borough of Selinsgrove, population - 5,810</li> </ul>	<ul style="list-style-type: none"> <li>✓ A Combined Statistical Area (CSA) consists of two or more adjacent metropolitan and micropolitan statistical areas (MSA) that have substantial employment interchange</li> <li>✓ Snyder County is part of the Bloomsburg-Berwick-Sunbury CSA</li> <li>✓ The Bloomsburg-Berwick-Sunbury CSA comprises:               <ul style="list-style-type: none"> <li>○ Bloomsburg-Berwick MSA</li> <li>○ Sunbury MSA</li> <li>○ Lewisburg MSA</li> <li>○ Selinsgrove MSA</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>✓ The Borough is governed by a Mayor and a Borough Council consisting of seven members</li> <li>✓ Lies along Routes 11 &amp; 15 just south of the confluence of the west and north branches of the Susquehanna River</li> <li>✓ As of the census of 2000, there were 1,502 people, 688 households, and 436 families residing in the borough</li> </ul>	<ul style="list-style-type: none"> <li>✓ The Township is governed by three Township Supervisors</li> <li>✓ Situated in the northeast corner of Snyder County, along the west shore of the Susquehanna River, just north of Selinsgrove and across the river from Sunbury</li> <li>✓ The Township surrounds three sides of Shamokin Dam Borough</li> <li>✓ Historically, agriculture has been the foundation of the Snyder County economy</li> <li>✓ Many residents today work in Sunbury, Lewisburg, Williamsport, or Harrisburg</li> </ul>

### Existing Environmental Conditions

#### Environmental Phase I Summary

The parts of the subject property included in the Phase I Environmental Site Assessment (ESA) consists of three parcels of land totaling approximately 160 acres:

- Parcel 12-09-102 located at the southern end of the site is the ash impoundment associated with former coal power generation plant
- Parcel 16-03-001A located at the northern end of the site is the former coal storage area associated with the former coal power generation plant
- Parcel 16-03-077 located at the northeastern end of the site is a former residential parcel, now used as for construction access associated with the new Panda Hummel natural gas-powered generation station

The subject property is currently developed with four permanent structures:

- One 3,564 square foot pump house building (in use)
- One 2,040 square foot 2-story former rail service building (used for storage) - *scheduled to be demolished*
- One 16,320 square foot 1-story former rail car thawing building (vacant) - *scheduled to be demolished*
- One 630 square foot 1-story guard house at Gate 1 (in use)

Not included in the scope of this Phase I ESA were the following areas:

- The newly constructed Panda Hummel Power Station
- The PPL Switchyard currently undergoing upgrades



- The former Sunbury Power Generation Turbine Building and associated buildings (The former Sunbury Power Generation Station is scheduled for demolition)

As a result of the Phase I ESA, no recognized environmental conditions (**REC**) or historic RECs (**HREC**) were identified in connection with the subject property; however, the following controlled RECs (**CREC**) were identified in connection with the subject property:

- The former ash impoundment area is in final stages of closure, as of the date of this report. An extension for closure was requested and approved by DEP for completion of the closure by August 31, 2018. Additionally, post closure maintenance will be required. The fly ash contained within the impoundment is considered Coal Combustion Residue (CCR), and therefore regulated by the United States Environmental Protection Agency (EPA). Any remediation activities will require appropriate handling and disposal. The impoundment structure is regulated by the DEP as a High Hazard Dam, therefore any potential impacts or development within the area of the impoundment would require coordination with the DEP Bureau of Dam Safety.
- The former coal storage yard has obtained Act 2 release of liability, as of June 18, 2015, under site specific non-residential standard for groundwater, which includes post attainment maintenance requirements.
- A former aboveground storage tank farm was present on the subject property but was decommissioned and received final closure from DEP. All other tanks present on the subject property are currently registered with the DEP, as required.

The following *de minimis* conditions were identified in connection with the subject property:

- PCBs may be present in fluorescent light fixtures in the buildings
- CFCs may be present in air conditioning units within the Guard House
- Mercury may be present in the lamps and tubes in the four on-site buildings

In addition, the following ASTM Non-Scope Considerations were identified in connection with the subject property:

- Based on the age of the structures on the property, asbestos containing materials (ACM), lead based paint, and hazardous/universal wastes may be present in the four buildings included in this assessment.
- NWI Mapped wetlands are shown on the subject property; however, these areas are related to stormwater management facilities. As long as these facilities are continued to be permitted and maintained, no issue with wetlands are anticipated. Wetlands may also be present along the fringe of the property, depending upon future development, a wetland and watercourse identification should be completed.

Additional environmental concerns beyond the scope of the Phase I ESA that was prepared for the project include the following:

- Presence of a railroad spur along the western side of the property, that has historically been in use since the 1940s, may contain contaminated materials from historic rail usage.
- Subsurface anomalies are present within the area of the former coal fired power plant and coal yard, including tunnels, pits, foundations, and sumps. Consideration will need to give to these subsurface anomalies as part of future design and development alternatives.

### Stormwater

Stormwater runoff from the former Sunbury Generation LP power plant area and coal yard is directed to an on-site wastewater treatment plant. The existing stormwater collection system includes three stormwater management basins connected by culverts and piping to a fourth basin. Three of the basins contain coal residuals,



planned for removal in the future. Sunbury Generation LP is currently operating the onsite industrial wastewater treatment system. Storm water runoff on the southern portion of the site is conveyed by swales and discharged to Rolling Green Run.

Existing permitted stormwater outfalls include the following:

1. Stormwater Outfall 030 has been re-designated 002 and assigned to Panda Hummel Station for their industrial wastewater outfall. Outfall 002 discharges just below the low-head dam.
2. Stormwater Outfall 031 discharges stormwater from the former ash basin. Outfall 031 discharges into Rolling Green Run at the south end of the property.
3. Stormwater Outfall 032 discharges stormwater from the southwest swale (west of the former ash basin). Outfall 032 discharges to Rolling Green Run at the southwest corner of the property.
4. Stormwater Outfall 035 discharges stormwater from the west swale (west of the central part of the former coal yard, including west edge of Hummel) joining with the unnamed tributary at the entrance of the culvert passing through the middle of the property. Outfall 35 discharges at the river below the low-head dam.
5. Stormwater Outfall 036 discharges stormwater runoff from the northwest swale (west of the former coal yard) passing through a culvert along the north end of the property to the Susquehanna River.
6. Stormwater Outfall 130 is the outfall for Sunbury Generation’s industrial wastewater treatment plant which includes all stormwater originating in the former coal yard area, the plant area, and now the Panda Hummel Station area. The discharge is pumped from the industrial wastewater treatment plant to a point to the Susquehanna River just below the low-head dam.

Areas of the site are depicted as Special Flood Hazard Areas Subject to Inundation by the 1% Annual Chance Flood Event areas, Floodway Areas and Other Flood Areas on FIRM Flood Insurance Rate Map Panel 155 of 300. The existing pump house and associated water intake are located within the Floodway<sup>7</sup>.

Groundwater on portions of the site (under the former Coal Storage Yard) is subject to DEP Activity & Use Limitation (AUL) and cannot be used as a potable water source.

### Existing Permits

#### NPDES PERMIT

Permit Number:	PA0008451
Issued:	July 1, 2014
Expire:	June 30, 2019
Renewal Application By:	December 30, 2018
Discharges:	Outfall 030: Once through non-contact cooling water Outfall 031: Bottom ash sluice water Outfall 032: Stormwater Outfall 130: Industrial Stormwater
Issues:	Temperature of discharge – ecological group comments Compliance reports: No violations 2011 – 2016 DMR/Inspection Tracking Forms
Most Recent Inspections:	NPDES 9/22/2016 – No Violations Industrial Waste 10/2/2017 – No Violations
Permit Transfer:	PPL to Talen 7/15/2015 Talen to Sunbury Generation 2000
Pervious Permit:	PAR704805

<sup>7</sup> See the References page for a link to the NFIP Flood Insurance Rate Map (FIRM) search portal to find Map Number 42109C0155D, Panel 155 of 300



Potential Changes:                    Separate Stormwater Permit  
   Appears to have been incorporated into existing NPDES Permit  
   Correspondence regarding incorporating wastes from Panda Hummel Power Plant

**ACT 2 – COAL STORAGE YARD**

Attainment of Site-Specific Standards: June 18, 2015  
Site Specific, Non-Residential Standard for Groundwater  
Post attainment maintenance requirements

**DEP SOLID WASTE – ASH BASIN CLOSURE**

In final stages at time of file review  
Letter on file May 16, 2018 – Requesting extension for completion of closure to August 31, 2018  
Extension approved by Department  
Post Closure maintenance will be required on this project

**DEP DAM PERMIT – ASH BASIN**

Permit Number: D55-052  
Modification to permit – related to basin closure – Increase laydown area  
Mod Date: July 5, 2014 work to be completed by December 31, 2020  
Calls for maintaining a small basin at dam for attenuation of rain runoff.  
Permit – no expiration date  
Usual inspection and reporting apply



## Site Assets

### Site Assets Highlights

- ✓ Developable land for manufacturing, industrial and energy generation uses
- ✓ Public water
- ✓ Public sewer
- ✓ Electric/PPL switchyard
- ✓ Natural gas line
- ✓ Rail access
- ✓ Raw water resource / existing pump house and intake (Susquehanna River)
- ✓ Transportation network / CSVT Project



### Developable Land for Industrial Uses

The total land available for development is shown in Figure 5. The Ash Dam/Impoundment, former power plant, and the coal yard areas represent a cumulative area of approximately 104.8 acres.



Figure 5 - Buildable Acreage available for the Playbook are identified as the Ash Dam/Impoundment, former Sunbury Generation LP Plant site (once demolished), and the former Coal Yard area.

### Public Water

Potable water for future uses may be supplied by either Shamokin Dam Borough’s public water supply system if located within the Borough or by Aqua Pennsylvania if located within Monroe Township. According to the Borough Manager, there is sufficient capacity within the Borough’s existing public water system to provide service for redevelopment of the site. Depending on demand, a storage tank may be necessary. The Borough’s water distribution system includes an 8-inch water main located along North Old Trail Road. Quarterly metered water charges are a minimum rate of \$60.00 for the first 6,500-gallons. Above the minimum, the rate is \$7.00/1,000-gallons. Business and residential rates are the same. Water rates may increase within the next three to five years. Tapping fees are \$250.00 for water service connections. The owner is expected to provide and maintain the water meter and pit for commercial/industrial connections (Shamokin Dam Borough 2018 Water/Sewer Rates).

Aqua Pennsylvania currently has around 450,000 gallons per day of available capacity in its system. Monthly user rates include a charge based on meter size plus usage fees; for example, 2-inch meter for industrial usage using 1 million gallons per month would pay \$127.90 (meter fee) plus \$6,688.00 (\$6.668 per 1,000 gallons). Aqua Pennsylvania’s Engineer provided a ballpark estimate for any main extensions at \$175.00 per linear foot (Aqua Pennsylvania, Inc.).

### Public Sewer

Future uses will either connect to the Borough’s sanitary sewer collection and conveyance system or Monroe Township’s Hummels Warf Municipal Authority collection and conveyance system. A sewer interceptor is located along Old Trail Road. Sanitary sewer discharge is conveyed to the Eastern Snyder County Regional Sewer Authority (ESCRA) Wastewater Treatment Plant for treatment.



According to the Shamokin Dam Borough Manager, there is available capacity in the Borough's sanitary sewer collection and conveyance system to accommodate future development. Connections in the Borough will be conveyed by an existing 10-inch force main in North Old Trail Road. Tapping fees for sewer connections is \$250.00 per connection (Shamokin Dam Borough 2018 Water/Sewer Rates).

Sanitary flows for uses proposed for the former ash basin area of the site comprised of 50.2 acres will likely be connected to the Hummels Warf Municipal Authority collection and conveyance system. According to the Authority Engineer, there is adequate capacity in the collection and conveyance system to accommodate a projected flow of 70,350 gallons per day (gpd). This system is tributary to the ESCRA's system. Sewer Permits are required for all new construction within the HWMA service area. The current tapping fee is \$2,200.00 per equivalent dwelling unit (EDU) plus \$100.00 inspection fee. The current billing rate is \$125.00 per EDU per quarter (Hummels Wharf Municipal Authority).

ESCRA was contacted regarding available capacity in the collection and conveyance system and wastewater treatment plant. According to the Manger, the Authority has capacity available in its collection/conveyance system and at its treatment plant.

### ***Electric/PPL Switchyard***

PPL Electric Utilities provides electricity to the region. 12 kV service is available off Old Trail Road and is accessible to any new user. An existing PPL Switchyard is situated on site, which provides an option for a large power consumer (i.e., 10 megawatts or greater) to acquire LP-5 Service and connect directly to the switchyard. The LP-5 Rate Schedule is for large general service supplied from available lines of 69,000 volts or higher, with three-phase, 60 Hertz service, with the customer furnishing and maintaining all equipment necessary to transform the energy from the line voltage. This service arrangement eliminates the distribution portion of electricity charges and may be advantageous to a large power user.

### ***Natural Gas Line***

The natural gas supplied by the Sunbury Pipeline infrastructure is available to other users on the site. Upgrades to the existing pipeline are required to serve additional users. These upgrades will involve a modest cost per dekatherm.

### ***Rail Access***

The rail spur currently located on-site is under the authority of Norfolk Southern. The spur connects to a railroad bridge at Selinsgrove, where freight is then carried over to the east bank of the Susquehanna River. The Norfolk Southern line on the east bank of the Susquehanna River has direct access to Williamsport to the north, and Harrisburg to the south. Intermodal yards in Harrisburg allow freight to be transferred from rail to truck.

### ***Existing Pump House and Raw Water Intake***

Panda Hummel is using one of four existing intakes from the former Sunbury Power Station currently permitted by the DEP. Two of the existing intake bays are available to accommodate future river water withdrawals. Each is physically capable of taking about 7 million gallons per day although the space for installing large pumps is limited. This presents an opportunity for end-users, such as a hydroponic growing facility, to use the site's existing water intake system.

### ***Transportation Network***

The entire CSVT Project is anticipated to be completed by 2024. The purpose of that project is to separate trucks and through traffic from local traffic to reduce congestion, improve safety and accommodate growth. Given improved site access, the CSVT Project would facilitate truck traffic for Warehousing and other businesses requiring over-the-road transportation.



## Site Constraints and Challenges to Development

### Site Constraints Highlights

- ✓ **Developable land**
  - Environmental issues and restrictions
  - Soil and compaction conditions
  - Road frontage
- ✓ **Electric / PPL LP5 Service Agreement Negotiations**
- ✓ **Natural gas line / UGI Energy Services, LLC service agreement negotiations / pipeline upgrade costs**
- ✓ **Rail Access / Negotiations with Norfolk Southern and Land Owner**
- ✓ **Existing pump house and raw water intake**
  - Lease negotiations with Land Owner
  - Susquehanna River Basin Commission water withdrawal approval
- ✓ **Transportation network**
  - CSVT project
  - Direct site access



### **Environmental Issues and Restrictions**

Act 2 restrictions at Coal Yard limit use of groundwater and soils. The Coal Yard has been determined to meet non-residential soil standards only, and as such, is limited to non-residential use.

Ash Dam solid waste cap and closure is being completed, but post-closure care requirements will remain in place. Any use of the Ash Dam will require a permit modification and acceptance by DEP to the solid waste permit.

Future uses will each need to design stormwater management facilities to manage runoff from the impervious area footprint needed to accommodate development. Stormwater facility design will be required to comply with DEP's National Pollutant Discharge Elimination System (NPDES) Permit for Discharges of Stormwater Associated with Construction Activities. In addition, an erosion and sediment control plan and measures will need to be implemented during construction to comply with the requirements of the Snyder County Conservation District (SCCD). Volume and peak rate controls on runoff will apply. Depending on the nature of the land use activity, an NPDES Permit for discharges of Stormwater associated with Industrial Activities may be required. The site is bordered to the east by the Susquehanna River. The northern part of the site is also bordered by a remnant of the former Pennsylvania Canal System. At this time, it is anticipated each land use will have its own discharge to the remnant canal and/or the Susquehanna River.

Note that the design of future stormwater management facilities on this brownfield site must fully consider the site history with respect to environmental conditions and related remediation activities. All stormwater management options for a conventional land development project may not be available, depending upon site specific conditions and prior remediation efforts<sup>8</sup>.

### **Soil and Compaction Conditions**

In addition to the abovementioned environmental considerations, a related concern that will require attention regards the compaction and soil characteristics throughout the site. In particular, the southern portion that currently includes the coal ash deposits will require careful consideration. Additionally, the fact

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<sup>8</sup> See the References page for a link to the Pennsylvania Stormwater Best Management Practices Manual, December 30, 2006, Chapter 7, Special Management Areas (Brownfields, Highways and Roads, Karst Areas, Mined Lands, Water Supply Well Areas, Surface Water Supplies and Special Protection Waters





that this portion of the site also serves at least partially as a dam, means that some of the land may not be suited for certain types of development.

### Road Frontage

Road frontage is limited. The primary frontage for the site lies along East 8<sup>th</sup> Avenue at the northwest end of the site. Subdividing the site may require flag-shaped lots and the loss of useful acreage to access. Road frontage may be created by acquiring and consolidating a lot (or lots) adjoining a proposed subdivision, creating a connection to Old Trail Road.

### Electric

An option for a large power consumer (i.e., 10 megawatts or greater) is to pursue LP5 Service and connect directly to the switchyard. A direct connection requires an agreement with PPL. The estimated lead time for the application process could take anywhere from 18 months to 2 years, depending upon the size of the electrical loads that will be put on the transmission service, as well as permitting and right-of-way.

### Natural Gas Line

Service agreement negotiations with UGI Energy Services will be required.

### Rail Access

Use of the existing rail siding to the site is subject to arrangement with Sunbury Generation LP and Norfolk Southern.

### Existing Pump House and Raw Water Intake

Because of the historic use of the properties and associated documented recognized environmental conditions, any proposed groundwater withdrawal must be thoroughly tested and analyzed for the proposed use. Water withdrawals, whether surface or groundwater, are subject to approval by DEP and the Susquehanna River Basin Commission (SRBC).

### Transportation Network

Direct access to the site from the regional transportation network is somewhat restricted by the state and local roads in the immediate vicinity of the site. Depending upon the trips generated by site development, local road improvements such as lane and shoulder widening and signalization upgrades and/or additional signals, may be required to accommodate increased traffic. Susquehanna Trail and North Old Trail run parallel and are both state roads. Any improvements within the right-of-way, or otherwise impacting these roads will require Highway Occupancy Permits (HOP) from PennDOT.

One concept for upgrades to the highway access to and from North Old Trail is depicted in Figure 6. In this concept, a connector road would be constructed between Susquehanna Trail and North Old Trail in the general area of the existing entrance to the site. A minor driveway shift and acquisition of properties along the northern side of North Old Trail would be required. Once constructed, left turn signals would allow for improved turning movements and traffic flow



Figure 6 - Concept Roadway Access Improvements for North Old Trail, Nina Road, and US15/US11



along North Old Trail. Construction of the intersection improvements and access road between Susquehanna Trail and North Old Trail is estimated to cost approximately \$990,000, exclusive of Right-of-Way acquisition, existing utility relocations, and construction inspection. A Traffic Impact Study, along with an engineering design would also be required. Funding for these improvements could be obtained through PennDOT District 3-0, Federal and State Grants, and Public Private Partnerships (P3), along with private and local funding.

# MARKET ANALYSIS





## Market Analysis

### Market Analysis Highlights

- ✓ The population in Snyder County, as well as the number of households within Snyder County, continue to rise; while the population of the Bloomsburg-Berwick-Sunbury CSA has been stable.
- ✓ The median household income of Snyder County is lower than those of the state and nation.
- ✓ Snyder County and the CSA have a comparatively large number of residents with a High School Diploma as their highest level of educational attainment.
- ✓ Snyder County has gained a large number of Construction jobs (713) between the 3<sup>rd</sup> Quarter of 2007 and the 3<sup>rd</sup> Quarter of 2017, while losing many Manufacturing jobs (-1218).
- ✓ Snyder County's most competitive industries are Manufacturing, Agriculture, Forestry, Fishing, and Hunting, and Construction.
- ✓ The Bloomsburg-Berwick-Sunbury CSA gained a large number of jobs in the Health Care and Social Assistance Industry (4950) but lost a large number of jobs in the Manufacturing (-5801) and Retail Trade (-1327) industries.
- ✓ In the Bloomsburg-Berwick-Sunbury CSA region at large, the most competitive industries are Agriculture, Forestry, Fishing, and Hunting, Manufacturing, and Management of Companies and Enterprises.
- ✓ Snyder County's Employment and Wage Location Quotients show robust and competitively paying wood product manufacturing, modular home manufacturing, and logging industries.



Snyder County, Pennsylvania is located north of Harrisburg, Pennsylvania along the Susquehanna River. The county is part of the Bloomsburg-Berwick-Sunbury CSA, as shown in Figure 7, which is composed of Columbia, Montour, Northumberland, Snyder, and Union counties. Snyder County is largely rural, with most land being classified as agricultural or forested.

The largest municipality in the county is the Borough of Selinsgrove, with a population of approximately 5,810 residents (according to 2016 American Community Survey (ACS) population estimates). The county seat, Middleburg, has a population of approximately 1,557 residents. The Sunbury Generation LP Plant site is located in both Shamokin Dam Borough and Monroe Township. Shamokin Dam Borough has a population of approximately 1,703 residents, while Monroe Township has a population of approximately 4,037 residents.

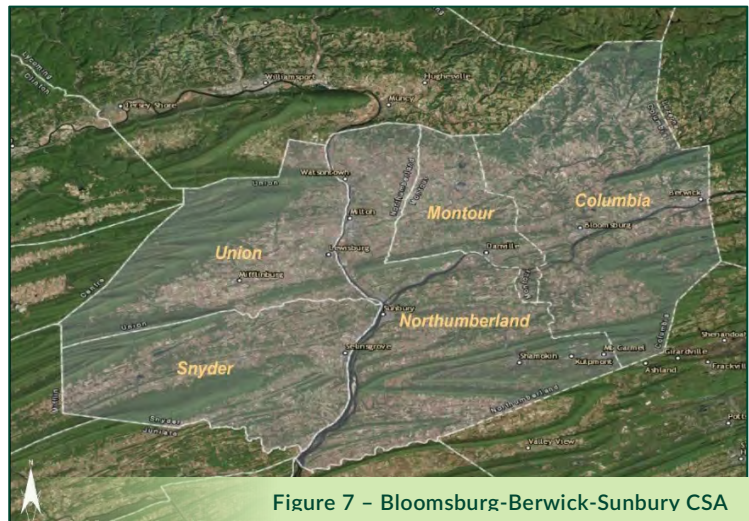


Figure 7 – Bloomsburg-Berwick-Sunbury CSA

Despite the changing economic environment of Snyder County, particularly the loss of manufacturing jobs, its most competitive fields of manufacturing persist in their relevance. Within this economic climate, Snyder County provides robust and competitively paid employment in wood product manufacturing, modular home manufacturing, and logging. However, Snyder County's median household income is lower than both the state and the nation's median incomes. This region could, therefore, benefit from greater employment opportunities, as well as increased access to vocational and educational training in growing fields within Snyder County, such as healthcare. Further, given Snyder County's rich rural history, it is important to honor the community by protecting and cherishing the existing forested and agricultural areas within the county.



## Data Analysis

### Population and Housing

**TABLE 3: POPULATION**

	2010	2012	2016	PERCENT CHANGE BETWEEN 2010 AND 2012	PERCENT CHANGE BETWEEN 2012 AND 2016
SNYDER COUNTY	39,400	39,620	40,246	0.60%	1.60%
BLOOMSBURG-BERWICK-SUNBURY CSA	263,159	264,232	264,190	0.40%	-0.02%
SHAMOKIN DAM BOROUGH	1,931	1,692	1,703	-12.40%	0.70%
MONROE TOWNSHIP	3,877	3,911	4,037	0.90%	3.20%

Source: U.S. Census Bureau American Community Survey

- The populations of Snyder County (+846) and Monroe Township (+160) have steadily been growing between 2010 and 2016.
- The population of the Bloomsburg-Berwick-Sunbury CSA (+1,031) has grown between 2010 and 2016, but not at a steady rate.
- Shamokin Dam Borough (-228) has declined in population between 2010 and 2016, with the bulk of the loss taking place between 2010 and 2012.

**TABLE 4: HOUSEHOLDS**

	2010	2012	2016	PERCENT CHANGE BETWEEN 2010 AND 2012	PERCENT CHANGE BETWEEN 2012 AND 2016
SNYDER COUNTY	14,258	14,355	14,528	0.70%	1.20%
BLOOMSBURG-BERWICK-SUNBURY CSA	101,649	102,158	102,086	0.50%	-0.07%
SHAMOKIN DAM BOROUGH	814	798	814	-2.00%	2.00%
MONROE TOWNSHIP	1,549	1,606	1,557	3.70%	-3.10%

Source: U.S. Census Bureau American Community Survey

- The number of households in Snyder County have grown at a steady pace between 2010 and 2016 (+270 households).
- The Bloomsburg-Berwick-Sunbury CSA saw a slight increase in the number of households between 2010 and 2016 (+437).
- The number of households in Shamokin Dam Borough remained constant (+0) between 2010 and 2016.
- Monroe Township experienced a very slight increase in the number of households between 2010 and 2016 (+8).

**TABLE 5: FAMILIES**

	2010	2012	2016	PERCENT CHANGE BETWEEN 2010 AND 2012	PERCENT CHANGE BETWEEN 2012 AND 2016
SNYDER COUNTY	10,168	10,284	10,522	1.10%	2.30%
BLOOMSBURG-BERWICK-SUNBURY CSA	68,349	68,326	66,636	-0.03%	-2.50%
SHAMOKIN DAM BOROUGH	504	451	424	-10.50%	-6.00%
MONROE TOWNSHIP	1,184	1,272	1,210	7.40%	-4.90%

Source: U.S. Census Bureau American Community Survey

- The number of families in Snyder County has increased between 2010 and 2016 (+354)



- The Bloomsburg-Berwick-Sunbury CSA saw a drop in the number of families between 2010 and 2016 (-1,713)
- The number of families declined in Shamokin Dam Borough between 2010 and 2016 (-80)
- Monroe Township experienced a slight rise in the number of families between 2010 and 2016 (+26)

### Household Income

The median household income in Snyder County stood at \$51,110 in 2016. This figure was lower than that of Pennsylvania (\$54,895) and the United States (\$55,322) during the same year, but higher than that of the Bloomsburg-Berwick-Sunbury CSA (\$49,670). In inflation-adjusted dollars, the median household income of Snyder County has grown between 2010 and 2016. It stood at \$48,890 in 2010, \$49,190 in 2012, and grew to \$51,110 by 2016. Median household income also increased in the CSA during this period: \$47,370 in 2010, to \$49,670 in 2016. Incomes fell in both Pennsylvania and the United States between 2010 and 2016.

The largest number of Snyder County and CSA residents fall into the \$50,000 to \$74,999 income bracket (21.8% in Snyder County, 20.0% in the CSA). This is followed by the \$35,000 to \$49,999 bracket (16.6% in Snyder County, 15.2% in the CSA), and the \$75,000 to \$99,999 bracket (13.8% in Snyder County, 12.0% in the CSA). The largest number of Shamokin Dam residents (20.6%) fell into the \$15,000 to \$24,999 bracket in 2016, and the largest number of Monroe Township residents (22.2%) fell into the \$50,000 to \$74,999 bracket in the same year. Although Monroe Township median household incomes remained relatively steady from 2010 to 2016, Shamokin Dam’s experienced a large drop (\$47,000 in 2010, to \$34,737 in 2016).

TABLE 6: HOUSEHOLD INCOME, REGIONAL COMPARISON

	SNYDER COUNTY			BLOOMSBURG-BERWICK-SUNBURY CSA			PENNSYLVANIA		
	2010	2012	2016	2010	2012	2016	2010	2012	2016
LESS THAN \$10,000	6.0%	5.2%	4.6%	6.8%	6.2%	6.2%	7.3%	7.0%	6.7%
\$10,000 TO \$14,999	5.4%	5.3%	5.1%	6.8%	6.3%	5.8%	5.9%	5.6%	5.1%
\$15,000 TO \$24,999	12.2%	11.3%	11.3%	13.1%	12.8%	11.6%	11.3%	11.0%	10.5%
\$25,000 TO \$34,999	15.1%	13.6%	11.3%	13.6%	13.2%	11.5%	10.9%	10.6%	10.0%
\$35,000 TO \$49,999	17.7%	17.7%	16.6%	17.0%	15.9%	15.2%	14.3%	13.9%	13.4%
\$50,000 TO \$74,999	19.8%	21.1%	21.8%	19.2%	19.7%	20.0%	19.0%	18.7%	18.3%
\$75,000 TO \$99,999	11.5%	11.9%	13.8%	11.0%	11.3%	12.0%	12.4%	12.5%	12.6%
\$100,000 TO \$149,999	9.0%	10.2%	10.0%	8.2%	9.8%	11.4%	11.7%	12.4%	13.5%
\$150,000 TO \$199,999	2.0%	2.0%	2.1%	2.0%	2.4%	3.0%	3.8%	4.3%	5.0%
\$200,000 OR MORE	1.5%	1.8%	3.4%	2.3%	2.5%	3.3%	3.5%	4.0%	4.9%
MEDIAN HH INCOME (INFLATION ADJUSTED TO 2016 USD)	48,890	49,190	51,110	47,370	47,930	49,670	55,100	54,630	54,895
MEDIAN HOME VALUE (INFLATION ADJUSTED TO 2016 USD)	134,400	139,300	152,500	136,080	139,560	147,480	174,200	172,400	167,700

Source: U.S. Census Bureau American Community Survey



TABLE 7: HOUSEHOLD INCOME, LOCAL COMPARISON

	SNYDER COUNTY			SHAMOKIN DAM			MONROE TOWNSHIP		
	2010	2012	2016	2010	2012	2016	2010	2012	2016
LESS THAN \$10,000	6.0%	5.2%	4.6%	4.1%	4.4%	1.7%	2.8%	1.7%	1.7%
\$10,000 TO \$14,999	5.4%	5.3%	5.1%	7.6%	10.5%	12.5%	2.6%	2.0%	0.9%
\$15,000 TO \$24,999	12.2%	11.3%	11.3%	10.7%	13.4%	20.6%	11.3%	6.6%	8.1%
\$25,000 TO \$34,999	15.1%	13.6%	11.3%	20.6%	10.0%	15.4%	9.9%	15.4%	6.6%
\$35,000 TO \$49,999	17.7%	17.7%	16.6%	17.9%	13.7%	12.5%	14.2%	13.9%	19.5%
\$50,000 TO \$74,999	19.8%	21.1%	21.8%	22.5%	25.8%	17.6%	20.2%	18.8%	22.2%
\$75,000 TO \$99,999	11.5%	11.9%	13.8%	10.1%	8.4%	9.6%	10.0%	12.8%	12.0%
\$100,000 TO \$149,999	9.0%	10.2%	10.0%	5.3%	10.9%	9.1%	17.7%	17.4%	13.6%
\$150,000 TO \$199,999	2.0%	2.0%	2.1%	0.6%	1.8%	1.0%	6.4%	6.4%	4.4%
\$200,000 OR MORE	1.5%	1.8%	3.4%	0.6%	1.1%	0.0%	4.8%	5.0%	11.0%
MEDIAN HH INCOME (INFLATION ADJUSTED TO 2016 USD)	48,890	49,190	51,110	47,000	49,650	34,737	64,160	65,000	66,206
MEDIAN HOME VALUE (INFLATION ADJUSTED TO 2016 USD)	134,400	139,300	152,500	138,860	143,100	153,300	149,680	145,390	166,200

Source: U.S. Census Bureau American Community Survey

### Educational Attainment by Age (25+)

One of the most important characteristics of any region is the level of education attained by its residents. A region with a poorly educated populace typically has lower incomes, less ability to attract new employers, and a greater need for social services. The Census of Population and Housing presents several different measures of educational attainment, the most significant are high school graduation and the attainment of college degrees.

TABLE 8: EDUCATIONAL ATTAINMENT FOR POPULATION 25 YEARS AND OLDER (2016 ACS)

	SNYDER COUNTY	SHAMOKIN DAM	MONROE TOWNSHIP	BLOOMSBURG- BERWICK- SUNBURY CSA	PENNSYLVANIA
LESS THAN 9TH GRADE	7.0%	3.9%	0.5%	4.4%	3.4%
9TH TO 12TH GRADE, NO DIPLOMA	10.2%	3.8%	12.6%	9.2%	7.0%
HIGH SCHOOL GRADUATE (INCLUDES EQUIVALENCY)	45.5%	41.3%	45.0%	46.0%	36.0%
SOME COLLEGE, NO DEGREE	12.5%	20.0%	12.0%	13.8%	16.2%
ASSOCIATE'S DEGREE	8.2%	8.0%	8.3%	7.6%	8.0%
BACHELOR'S DEGREE	10.6%	15.9%	12.5%	11.6%	17.8%
GRADUATE OR PROFESSIONAL DEGREE	6.1%	7.0%	9.2%	7.4%	11.5%

Source: U.S. Census Bureau American Community Survey

In 2016, the highest level of educational attainment for 36.0% of Pennsylvanians was a high school diploma. In Snyder County, this number was 45.5%, representing a slightly less educated workforce than that of Pennsylvania. 12.5% of Snyder County residents have some college education (16.2% in Pennsylvania), 8.2% have an associate degree (8.0% in Pennsylvania), 10.6% have a bachelor's degree (17.8% in Pennsylvania), and 6.1% have a graduate or professional degree (11.5% in Pennsylvania). In terms of the highest level of education



attained, Snyder County falls behind the state and nation. As a whole, Shamokin Dam Borough and Monroe Township tended to have more highly educated residents than the County at large.

In the CSA, 46.0% of residents were high school graduates in 2016. 13.8% have some college education, 7.6% have an associate degree, 11.6% have a bachelor's degree, and 7.4% have a graduate or professional degree. These figures are slightly better than that of Snyder County, but still fall behind the state and the nation.

### Industry Location Quotient

A local **location quotient (LQ)** is used to determine how concentrated the occupation or wage is within the county compared to a reference economy. Any LQ greater than 1.0 indicates that the county has a higher than average concentration of workers or wages than the reference economy. Anything below indicates that the area has a lower than average concentration. For the purposes of this study, the Commonwealth of Pennsylvania has been designated the reference economy. The LQ tool is used to measure the local economy and sectors in which the local economy may be specializing. A community highly specialized in a given industry is likely exporting goods and services. If the local LQ is greater than 1.0, the local area may have a regional advantage in that sector.

### 5-Digit NAICS Code Employment and Wages

The placement and history of this site lends it to industrial uses. Below are selected occupations (by 5-Digit NAICS codes), the number of establishments employing Snyder County residents, the total employment number for three months (Q3 2017), total quarterly wages, average weekly wage, September's employment location quotient, and the quarterly wage location quotient.

In Snyder County, NAICS 32199 "All other wood product manufacturing" had significantly high employment and wage LQs during the Third Quarter of 2017. Examples of products made in this industry include wood dowels, prefabricated wood buildings, mobile homes, wood handles, and wood panels. The employment LQ stood at 141.39, while the total quarterly wage LQ stood at 211.48. This means that Snyder County employs a higher percentage of people in this industry than in the nation as a whole. According to the data, 11 establishments engaged in the "All other wood product manufacturing" sector and employed 1,037 people in Snyder County in September 2017. The average weekly wage for this industry was \$836, or \$41,800 per year based on a 50-week work year.

NAICS 32192 "Wood container and pallet manufacturing" also had high employment and wage LQs during the same period. Some examples of products made in this industry include wood pallets, wood boxes, wood cases, fruit baskets, wood skids, vegetable crates, etc. Four firms employed 162 workers in this industry in September 2017. The September employment LQ totaled 24.01, with the total quarterly wage LQ standing at 38.45. The average weekly wage was \$791, or approximately \$39,550 per year.

NAICS 32739 "Other concrete product manufacturing" also exhibited strong LQs. Examples of products made in this industry include precast concrete wall panels, concrete posts and piles, concrete girders, concrete furniture, burial vaults, etc. Four firms employed 208 workers in this industry in September 2017. The September employment LQ totaled 32.88, with the total quarterly wage LQ standing at 51.63. The average weekly wage was \$1,046, or approximately \$52,300 per year.

The two wood processing and manufacturing industries listed above, among others, have shown to be very competitive within Snyder County. Snyder County has a number of firms in these industries, including Professional Building Systems, Inc. of Middleburg (modular home manufacturer), Custom Building Systems of Middleburg (modular home manufacturer), Icon Legacy Custom Modular Homes of Selinsgrove (modular



**TABLE 9: EMPLOYMENT AND WAGE LOCATION QUOTIENTS FOR SELECTED SNYDER COUNTY INDUSTRIES 3RD QUARTER 2017**

NAICS 5-DIGIT INDUSTRY	QUARTERLY EMPLOYERS	SEPTEMBER EMPLOYMENT	TOTAL QUARTERLY WAGES	AVG. WEEKLY WAGE	SEPTEMBER EMPLOYMENT LQ	TOTAL QUARTERLY WAGE LQ
NAICS 11331 LOGGING	4	10	59,419	857	1.78	1.36
NAICS 31111 ANIMAL FOOD MANUFACTURING	3	97	1,176,017	926	14.25	16.96
NAICS 32191 MILLWORK	3	73	595,796	637	6.3	6.82
NAICS 32192 WOOD CONTAINER AND PALLET MANUFACTURING	4	162	1,676,435	791	24.01	38.45
NAICS 32199 ALL OTHER WOOD PRODUCT MANUFACTURING	11	1037	11,337,837	836	141.39	211.48
NAICS 32739 OTHER CONCRETE PRODUCT MANUFACTURING	4	208	2,909,232	1046	32.88	51.63
NAICS 42372 PLUMBING EQUIPMENT MERCHANT WHOLESALERS	3	71	1,320,258	1411	6.25	10.1
NAICS 48411 GENERAL FREIGHT TRUCKING, LOCAL	5	57	593,386	806	1.99	2.47
NAICS 48412 GENERAL FREIGHT TRUCKING, LONG-DISTANCE	5	42	492,337	909	0.49	0.64
NAICS 48422 OTHER SPECIALIZED TRUCKING, LOCAL	5	16	186,057	933	0.62	0.8
NAICS 48423 OTHER SPECIALIZED TRUCKING, LONG-DISTANCE	8	28	295,781	886	1.85	2.02
NAICS 81131 COMMERCIAL MACHINERY REPAIR AND MAINTENANCE	4	18	191,851	851	0.78	0.79

Source: U.S. Census Bureau Quarterly Workforce Indicators

home manufacturer), Conestoga Wood Specialties of Beavertown (cabinets and furniture), and Bingaman & Son Lumber of Kreamer (lumber and other wood products). As seen in the below table, lumber is a vital piece of Snyder County's economy.

### Snyder County LQ

The leading exporting industry in Snyder County is manufacturing, with a 3<sup>rd</sup> Quarter 2017 LQ of 2.6. The number of workers employed in this industry, however, has decreased by 22.3% between the 3<sup>rd</sup> Quarter of 2007 (Q3 2007) and 3<sup>rd</sup> Quarter of 2017 (Q3 2017).

The second largest exporting industry in Snyder County is the Agriculture, Forestry, Fishing, and Hunting industry, which has a LQ of 2.3. The number of jobs in this industry has risen by 42.5% during the same period. Not far behind is the Construction industry, which has a LQ of 1.8. The number of jobs in the Construction industry has exploded, growing 100.6% between Q3 2007 and Q3 2017.



In terms of employment growth, the Construction industry experienced the largest growth between Q3 2007 and Q3 2017, growing 100.6% to 1,422 jobs in 2017. The Professional, Scientific, and Technical Services industry grew 69.5% to 383 jobs in 2017. The Arts, Entertainment, and Recreation industry grew 65.4% to 258 jobs in 2017.

The Information industry saw the largest percentage decline between Q3 2007 and Q3 2017, with the number of jobs declining -44.1% to 85 jobs by 2017. The Utilities industry saw a similarly large decline, with the number of jobs falling by -42.8% to 91 jobs in 2017. Administration & Support, Waste Management & Remediation saw the third largest percentage decline (-27.2%), with the number of jobs falling to 201 by 2017. There was also a noticeable decline in the manufacturing industry (-22.3%), in which 1,218 jobs were lost between 2007 and 2017. In terms of numbers of jobs lost, the manufacturing industry (-1,218) led all other industries.

In total, the number of jobs in Snyder County has fallen by -1.3% between Q3 2007 and Q3 2017. 16,892 jobs existed in 2007, while 16,680 jobs existed in 2017. This represents a reduction of 212 jobs in 10 years.

**TABLE 10: HISTORIC CHANGE IN EMPLOYMENT BY 2 DIGIT NAICS, 2007 2017, SNYDER COUNTY**

NAICS	INDUSTRY	3RD Q - 2007	3RD Q - 2017	2007 - 2017 CHANGE	2007 - 2017 PERCENT CHANGE	2017 Q3 LOCATION QUOTIENT
11	AGRICULTURE, FORESTRY, FISHING, AND HUNTING	120	171	51	42.50%	2.3
21	MINING	*	*	*	*	*
22	UTILITIES	159	91	-68	-42.80%	0.9
23	CONSTRUCTION	709	1,422	713	100.60%	1.8
31	MANUFACTURING	5,464	4,246	-1,218	-22.30%	2.6
42	WHOLESALE TRADE	860	711	-149	-17.30%	1.1
44	RETAIL TRADE	2,836	2,682	-154	-5.43%	1.5
48	TRANSPORTATION AND WAREHOUSING	203	274	71	35.00%	0.4
51	INFORMATION	152	85	-67	-44.10%	0.3
52	FINANCE AND INSURANCE	236	197	-39	-16.50%	0.3
53	REAL ESTATE AND RENTAL AND LEASING	98	111	13	13.30%	0.6
54	PROFESSIONAL, SCIENTIFIC, AND TECHNICAL SERVICES	226	383	157	69.50%	0.4
55	MANAGEMENT OF COMPANIES AND ENTERPRISES	*	4	*	*	*
56	ADMINISTRATION & SUPPORT, WASTE MANAGEMENT AND REMEDIATION	276	201	-75	-27.20%	0.2
61	EDUCATIONAL SERVICES	1,205	1,133	-72	-6.00%	0.9
62	HEALTH CARE AND SOCIAL ASSISTANCE	2,185	2,400	215	9.80%	0.8
71	ARTS, ENTERTAINMENT, AND RECREATION	156	258	102	65.40%	0.7
72	ACCOMMODATION AND FOOD SERVICES	1,347	1,567	220	16.30%	1.1
81	OTHER SERVICES (EXCLUDING PUBLIC ADMINISTRATION)	300	353	53	17.70%	0.6
90	PUBLIC ADMINISTRATION	360	391	31	8.60%	0.7
<b>TOTAL:</b>		<b>16,892</b>	<b>16,680</b>	<b>-212</b>	<b>-1.30%</b>	

Source: U.S. Census Bureau Quarterly Workforce Indicators



### Bloomsburg-Berwick-Sunbury CSA LQ

Snyder County is part of the U.S. Census’s Bloomsburg-Berwick-Sunbury Combined Statistical Area (CSA). A Combined Statistical Area consists of two or more adjacent metropolitan and micropolitan statistical areas that have substantial employment interchange. The Bloomsburg-Berwick-Sunbury Combined Statistical Area is composed of the Bloomsburg-Berwick Metropolitan Statistical Area (MSA), Sunbury MSA, Lewisburg MSA, and Selinsgrove MSA. In total, the CSA consists of five counties: Columbia, Montour, Northumberland, Snyder, and Union. The Bloomsburg-Berwick-Sunbury CSA offers the opportunity to look at the economy in a regional perspective.

The leading exporting industry in the Bloomsburg-Berwick-Sunbury CSA is the Agriculture, Forestry, Fishing, and Hunting industry, with a Q3 2017 LQ of 2.0. The number of workers in this industry has risen 12.2% to 865 total workers in 2017.

The second largest exporting industry in the CSA is the Manufacturing industry, with a Q3 2017 LQ of 1.5. Like Snyder county, the Manufacturing industry has seen a sizeable decrease in employment. Employment fell -27.7% to 15,168 workers in 2017. That is a decline of 5,801 workers in 10 years. The third largest exporting industry is the Management of Companies and Enterprises industry, with a Q3 2017 LQ of 1.5. This industry employed 3,674 workers in Q3 2017.

In terms of employment growth, the Health Care and Social Assistance industry experienced the largest increase both in terms of percent increase (26.7%) and net job gains of 4,950 between Q3 2007 and Q3 2017. The 2<sup>nd</sup> largest percent gain was experienced in the Finance Insurance industry, where a 20.7% growth rate resulted in 474 new jobs. The Utilities industry grew 13.7%, which resulted in the creation of 93 new jobs.

The largest percentage decline in employment growth was experienced by the Manufacturing sector (-27.7%), which resulted in the loss of 5,801 jobs. The manufacturing industry also led in the number of total jobs lost. The second largest percentage decline was experienced by the Administration & Support, Waste Management and Remediation sector (-11.2%), which resulted in the loss of 271 jobs. The third largest percentage decline was seen in the Retail Trade sector (-11.1%), which resulted in the loss of 1,327 jobs.

In total, the number of jobs in the Bloomsburg-Berwick-Sunbury CSA has risen by 2.5% between Q3 2007 and Q3 2017. 97,353 existed in 2007, while 99,754 jobs existed in 2017. This represents an increase of 2,401 jobs in that 10-year span.

**TABLE 11: HISTORIC CHANGE IN EMPLOYMENT BY 2 DIGIT NAICS, 2007 2017, BLOOMSBURG BERWICK SUNBURY CSA**

NAICS	INDUSTRY	3RD Q - 2007	3RD Q - 2017	2007 - 2017 CHANGE	2007 - 2017 PERCENT CHANGE	2017 Q3 LOCATION QUOTIENT
11	AGRICULTURE, FORESTRY, FISHING, AND HUNTING	771	865	94	12.20%	2
21	MINING	*	*	*	*	*
22	UTILITIES	677	770	93	13.70%	1.2
23	CONSTRUCTION	4,572	4736	164	3.60%	1
31	MANUFACTURING	20,969	15,168	-5,801	-27.70%	1.5
42	WHOLESALE TRADE	3,043	2,901	-142	-4.70%	0.8
44	RETAIL TRADE	11,967	10,640	-1,327	-11.10%	1
48	TRANSPORTATION AND WAREHOUSING	3,573	3,987	414	11.60%	0.9



51	INFORMATION	1,131	*	*	*	*
52	FINANCE AND INSURANCE	2,289	2,763	474	20.70%	0.6
53	REAL ESTATE AND RENTAL AND LEASING	640	653	13	2%	0.6
54	PROFESSIONAL, SCIENTIFIC, AND TECHNICAL SERVICES	2,340	2,138	-202	-8.60%	0.3
55	MANAGEMENT OF COMPANIES AND ENTERPRISES	*	3,674	*	*	1.5
56	ADMINISTRATION & SUPPORT, WASTE MANAGEMENT AND REMEDIATION	2,415	2,144	-271	-11.20%	0.4
61	EDUCATIONAL SERVICES	8,019	8,231	212	2.60%	1.1
62	HEALTH CARE AND SOCIAL ASSISTANCE	18,529	23,479	4,950	26.70%	1.3
71	ARTS, ENTERTAINMENT, AND RECREATION	2,491	2,811	320	12.80%	1.3
72	ACCOMMODATION AND FOOD SERVICES	7,811	8,363	552	7.10%	1
81	OTHER SERVICES (EXCLUDING PUBLIC ADMINISTRATION)	2,419	2,694	275	11.40%	0.8
90	PUBLIC ADMINISTRATION	3,697	3,737	40	1.10%	1.1
<b>TOTAL:</b>		<b>97,353</b>	<b>99,754</b>	<b>2,401</b>	<b>2.50%</b>	

Source: U.S. Census Bureau Quarterly Workforce Indicators

### Shamokin Dam Borough LQ

The Shamokin Dam Borough was assessed to determine the market from a more locality-based perspective. In 2015, Shamokin Dam Borough's highest LQ was in the Utilities industry (5.0), with Accommodation and Food Services (4.7) following closely behind. Shamokin Dam also had high LQs in the Real Estate and Rental and Leasing (2.2), Retail Trade (1.9), and Other Services (1.2) industries.

TABLE 12: SHAMOKIN DAM, PA LOCATION QUOTIENT, 2015

NAICS	INDUSTRY	SHAMOKIN DAM		PENNSYLVANIA		LQ
		JOBS	% OF TOTAL	JOBS	% OF TOTAL	
11	AGRICULTURE, FORESTRY, FISHING, AND HUNTING	0	0.0%	21,210	0.4%	0.0
21	MINING	0	0.0%	32,656	0.6%	0.0
22	UTILITIES	27	3.4%	35,600	0.7%	5.0
23	CONSTRUCTION	2	0.3%	231,889	4.4%	0.1
31	MANUFACTURING	72	9.0%	567,236	10.8%	0.8
42	WHOLESALE TRADE	31	3.9%	218,340	4.1%	0.9
44	RETAIL TRADE	169	21.1%	576,469	10.9%	1.9
48	TRANSPORTATION AND WAREHOUSING	0	0.0%	234,485	4.4%	0.0
51	INFORMATION	0	0.0%	86,537	1.6%	0.0
52	FINANCE AND INSURANCE	29	3.6%	268,031	5.1%	0.7
53	REAL ESTATE AND RENTAL AND LEASING	19	2.4%	58,082	1.1%	2.2
54	PROFESSIONAL, SCIENTIFIC, AND TECHNICAL SERVICES	16	2.0%	335,464	6.4%	0.3
55	MANAGEMENT OF COMPANIES AND ENTERPRISES	0	0.0%	134,728	2.6%	0.0
56	ADMINISTRATION & SUPPORT, WASTE MANAGEMENT AND REMEDIATION	0	0.0%	278,886	5.3%	0.0
61	EDUCATIONAL SERVICES	2	0.3%	457,562	8.7%	0.0
62	HEALTH CARE AND SOCIAL ASSISTANCE	97	12.1%	912,120	17.3%	0.7
71	ARTS, ENTERTAINMENT, AND RECREATION	10	1.3%	69,639	1.3%	0.9



72	ACCOMMODATION AND FOOD SERVICES	279	34.9%	391,667	7.4%	4.7
81	OTHER SERVICES (EXCLUDING PUBLIC ADMINISTRATION)	32	4.0%	174,606	3.3%	1.2
90	PUBLIC ADMINISTRATION	15	1.9%	186,144	3.5%	0.0
<b>TOTAL:</b>		<b>800</b>		<b>5,271,351</b>		

Source: U.S. Census Bureau Quarterly Workforce Indicators

### Monroe Township LQ

A section of the site also rests in Monroe Township. In 2015, Monroe Township's highest LQ was in Retail Trade (3.9), with Accommodation and Food Services (2.6) following behind. Monroe Township also had a high LQ in the Real Estate and Rental and Leasing (1.4). The Manufacturing (1.0) and Arts, Entertainment, and Recreation (1.0) industries were consistent with the state industry LQ of 1.0.

**TABLE 13: MONROE TOWNSHIP LOCATION QUOTIENT, 2015**

NAICS	INDUSTRY	MONROE TOWNSHIP		PENNSYLVANIA		LQ
		JOBS	% OF TOTAL	JOBS	% OF TOTAL	
11	AGRICULTURE, FORESTRY, FISHING, AND HUNTING	0	0.0%	21,210	0.4%	0.0
21	MINING	0	0.0%	32,656	0.6%	0.0
22	UTILITIES	2	0.1%	35,600	0.7%	0.1
23	CONSTRUCTION	91	2.6%	231,889	4.4%	0.6
31	MANUFACTURING	392	11.2%	567,236	10.8%	1.0
42	WHOLESALE TRADE	20	0.6%	218,340	4.1%	0.1
44	RETAIL TRADE	1,506	43.0%	576,469	10.9%	3.9
48	TRANSPORTATION AND WAREHOUSING	34	1.0%	234,485	4.4%	0.2
51	INFORMATION	53	1.5%	86,537	1.6%	0.9
52	FINANCE AND INSURANCE	102	2.9%	268,031	5.1%	0.6
53	REAL ESTATE AND RENTAL AND LEASING	55	1.6%	58,082	1.1%	1.4
54	PROFESSIONAL, SCIENTIFIC, AND TECHNICAL SERVICES	73	2.1%	335,464	6.4%	0.3
55	MANAGEMENT OF COMPANIES AND ENTERPRISES	3	0.1%	134,728	2.6%	0.0
56	ADMINISTRATION & SUPPORT, WASTE MANAGEMENT AND REMEDIATION	43	1.2%	278,886	5.3%	0.2
61	EDUCATIONAL SERVICES	0	0.0%	457,562	8.7%	0.0
62	HEALTH CARE AND SOCIAL ASSISTANCE	299	8.5%	912,120	17.3%	0.5
71	ARTS, ENTERTAINMENT, AND RECREATION	44	1.3%	69,639	1.3%	1.0
72	ACCOMMODATION AND FOOD SERVICES	680	19.4%	391,667	7.4%	2.6
81	OTHER SERVICES (EXCLUDING PUBLIC ADMINISTRATION)	106	3.0%	174,606	3.3%	0.9
90	PUBLIC ADMINISTRATION	2	0.1%	186,144	3.5%	0.0
<b>TOTAL:</b>		<b>3,505</b>		<b>5,271,351</b>		

Source: U.S. Census Bureau Quarterly Workforce Indicators



### Industry Change Comparison

Snyder County saw a total decrease of 212 jobs between Q3 2007 and Q3 2017 (-1.3%), while the Bloomsburg-Berwick-Sunbury CSA experienced a gain of 2,401 jobs (2.5%). When using the Commonwealth of Pennsylvania as a reference economy, Snyder County had a higher LQ in industries such as Agriculture, Forestry, Fishing, and Hunting; Construction; Manufacturing; and the Retail Trade. The Bloomsburg-Berwick-Sunbury CSA had a higher LQ in the Utilities; Finance and Insurance; Administration and Support; Waste Management and Remediation; Educational Services; and Health Care and Social Assistance industries. Snyder County generally tended to be more competitive in the blue-collar trades (lower NAICS codes), while the CSA tended to be more competitive in the white-collar industries (higher NAICS codes).

**TABLE 14: COMPARATIVE CHANGE IN EMPLOYMENT BY 2 DIGIT NAICS, 2007 2017**

NAICS	INDUSTRY	2007-2017 CHANGE		2007-2017 % CHANGE		2017 Q3 LOCATION QUOTIENT	
		SNYDER	CSA	SNYDER	CSA	SNYDER	CSA
11	AGRICULTURE, FORESTRY, FISHING, AND HUNTING	51	94	42.5%	12.2%	2.3	2
21	MINING	*	*	*	*	*	*
22	UTILITIES	-68	93	-42.8%	13.7%	0.9	1.2
23	CONSTRUCTION	713	164	100.6%	3.6%	1.8	1
31	MANUFACTURING	-1,218	-5,801	-22.3%	-27.7%	2.6	1.5
42	WHOLESALE TRADE	-149	-142	-17.3%	-4.7%	1.1	0.8
44	RETAIL TRADE	-154	-1,327	-5.4%	-11.1%	1.5	1
48	TRANSPORTATION AND WAREHOUSING	71	414	35.0%	11.6%	0.4	0.9
51	INFORMATION	-67	*	-44.1%	*	0.3	*
52	FINANCE AND INSURANCE	-39	474	-16.5%	20.7%	0.3	0.6
53	REAL ESTATE AND RENTAL AND LEASING	13	13	13.3%	2.0%	0.6	0.6
54	PROFESSIONAL, SCIENTIFIC, AND TECHNICAL SERVICES	157	-202	69.5%	-8.6%	0.4	0.3
55	MANAGEMENT OF COMPANIES AND ENTERPRISES	*	*	*	*	*	1.5
56	ADMINISTRATION & SUPPORT, WASTE MANAGEMENT AND REMEDIATION	-75	-271	-27.2%	-11.2%	0.2	0.4
61	EDUCATIONAL SERVICES	-72	212	-6.0%	2.6%	0.9	1.1
62	HEALTH CARE AND SOCIAL ASSISTANCE	215	4,950	9.8%	26.7%	0.8	1.3
71	ARTS, ENTERTAINMENT, AND RECREATION	102	320	65.4%	12.8%	0.7	1.3
72	ACCOMMODATION AND FOOD SERVICES	220	552	16.3%	7.1%	1.1	1
81	OTHER SERVICES (EXCLUDING PUBLIC ADMINISTRATION)	53	275	17.7%	11.4%	0.6	0.8
90	PUBLIC ADMINISTRATION	31	40	8.6%	1.1%	0.7	1.1
<b>TOTAL:</b>		<b>-212</b>	<b>2401</b>	<b>-1.3%</b>	<b>2.5%</b>		

Source: U.S. Census Bureau Quarterly Workforce Indicators



## Market Analysis Interviews - Key/Recurring Themes

The successful execution of this genre of project demands thorough stakeholder engagement early and often throughout the process. To start, stakeholder interviews were conducted in order to fully grasp the economic climate of the region’s market. These people-focused conversations sought the honest opinions, ideas, and perspectives from the stakeholders to incorporate into the early brainstorming and design stages for this Playbook. The reflective and personal qualitative data garnered from this process gives color to the snapshot quantitative data and allows for better positioned insights for consideration on the use of the site. Listed below are the recurring and unique takeaways from the stakeholder interviews.

### Interview Highlights:

Some key findings from the stakeholder interviews include:

- ✓ Stakeholders would prefer to see the site contain industrial and manufacturing uses, or potentially an energy hub. Residential, commercial, and institutional uses are not preferred. Regional healthcare industry plans make healthcare development on the site unlikely.
- ✓ Many stakeholders would like to see an emphasis on the number of family-sustaining jobs that a potential use could create.
- ✓ Both Shamokin Dam Borough and Monroe Township are willing to extend the KOEZ designation if so needed.
- ✓ Monroe Township and Shamokin Dam are both open to amending municipal boundary lines to separate existing uses. However, Monroe Township is not open to full annexation of the site by Shamokin Dam Borough.
- ✓ Stakeholders see opportunity with the site’s proximity to the proposed Southern Extension of the Central Susquehanna Valley Thruway (CSVT).
- ✓ Stakeholders seem most concerned about the number of jobs potential reuse scenarios will create. The



### Interviewees

- Ed Hovenstine: Shamokin Dam Borough Manager
- Dean Davis: Monroe Township Supervisor
- Bob Garrett: President and CEO of The Greater Susquehanna Valley Chamber of Commerce
- Steve Stumbis: Bucknell University Small Business Development Center
- Lincoln Kaufmann: Snyder County Planning Commission Director
- Jeff Cole: Spokesman for Representative Culver
- James Saylor: Program Director for Transportation of SEDA COG

## Market Analysis Summary

As can be seen in the quantitative data and qualitative stakeholder interviews, the former Sunbury Power Station site has unrivaled potential in terms of access and market potential. Because of the regional nature of prevalent industries near the site, the “market” that can be best tapped for the sale of goods and services produced on-site is the Bloomsburg-Berwick-Sunbury CSA. Based on the site’s attributes and the relative strengths of the local economy, three potentially feasible redevelopment areas have been identified: Energy Production, Manufacturing, and High Intensity Users. To prepare the site for energy production, manufacturing, and high-intensity users, this Playbook outlines next-steps for the site’s redevelopment in the Recommended Actions & Schedule/Highest & Best Use section beginning on page 60. Next steps to redeveloping the site include working with regional development entities to prioritize its redevelopment, continued collaboration with the developer(s), rollout and marketing of this Playbook and the energy-intensive development opportunities, supporting further engineering and design studies and feasibility of site improvements, developing a funding strategy, and coordinating with state and federal agencies on permit approvals to foster redevelopment.

# ENERGY DEVELOPMENT







## Energy Development

Being the location of the former Sunbury Generation Power Plant, it would be appropriate to continue the legacy of electricity generation in a way that is updated, modern, and more relevant to the community's current needs. Further, the operating utility (PPL Electric) has already invested a transmission station on-site, positioning it to potentially be a center of energy that is cost-efficient, historically-situated, and a resiliency asset for the region. Below are listed Energy Options for consideration while designing for the best-use. All options are holistically-focused and consider the unique history and circumstances of the site.

### Energy Development Highlights:

The former Sunbury Generation site provides numerous opportunities for generation alternatives. A combination of energy generation and storage capacities allow for the potential of the Sunbury site to be transformed into one of the Commonwealth's most dynamic energy hubs.

- ✓ Ability to implement separate energy projects on the same site.
- ✓ Capacity for an additional natural gas generation facility providing low cost electricity potentially to local Shamokin Dam and Sunbury users
- ✓ Large-scale photo-voltaic (PV) solar array



## Energy Options

One of the features of the former Sunbury Generation Power Plant site that presents a unique opportunity is the former large-scale coal generation capacities and established utilities infrastructure which collectively present numerous energy generation and distribution opportunities. At its core, this site already includes the recently commissioned Panda Generation station, as described below, and the previously designed large transmission station operated by PPL. Given that the investment for these large utility-scale transmission station assets has already been made, the cost is much lower than would normally be associated with the startup of a new transmission facility of this size. Only a fractional investment will be needed to accommodate new generation options to be described below.

In addition, while not as readily quantifiable, it is noteworthy that residents of Shamokin Dam, the City of Sunbury, and Monroe Township are somewhat accustomed to having a power plant in their community. Discovered during the interviews of stakeholders, a general attitude was observed that many of the interviewees thought that something was missing after operations at the Sunbury Generation facility stopped. These localities are used to serving as a hub for one of Pennsylvania's largest electricity generators, and the resurgence of this sort of purpose would seem to be largely welcomed by its inhabitants.

The following describes three energy scenarios that the Pennoni team has concluded have significant merit, as part of supporting the overall Reuse scenarios, as described in related sections of this playbook.

### **Option 1: Creation of separate energy generation opportunities**

The Pennoni team has identified several individual energy generation opportunities to create electricity that appear promising, based upon various attributes of the Sunbury Generation site and regional considerations. The following forms of generation are either in place already, are being planned, or are feasible, based on the studies and interviews that we have conducted.

**Panda Hummel Station:** This is a natural gas fueled 1,124 MW combined-cycle generating facility that was placed into service in June 2018. Gen Station #1 is in the middle of the overall Sunbury Generation site, adjacent to the transmission station. The generation station replaced one of the largest retired coal-



fired power plants in the U.S. and supplies the power needs of more than 1 million homes in Pennsylvania. The facility helps support a long-term market for Pennsylvania Marcellus Shale gas producers.

**Generation Station #2 (Gen Station #2):** A second natural gas fueled power generation facility is under consideration and would produce significant electricity generation, in the range of 1,100 MW of electricity. This generation facility would likely be located in the former coal yard area, and would occupy approximately 25 acres. Panda Hummel Station is served by Sunbury Pipeline which is a 35-mile interstate

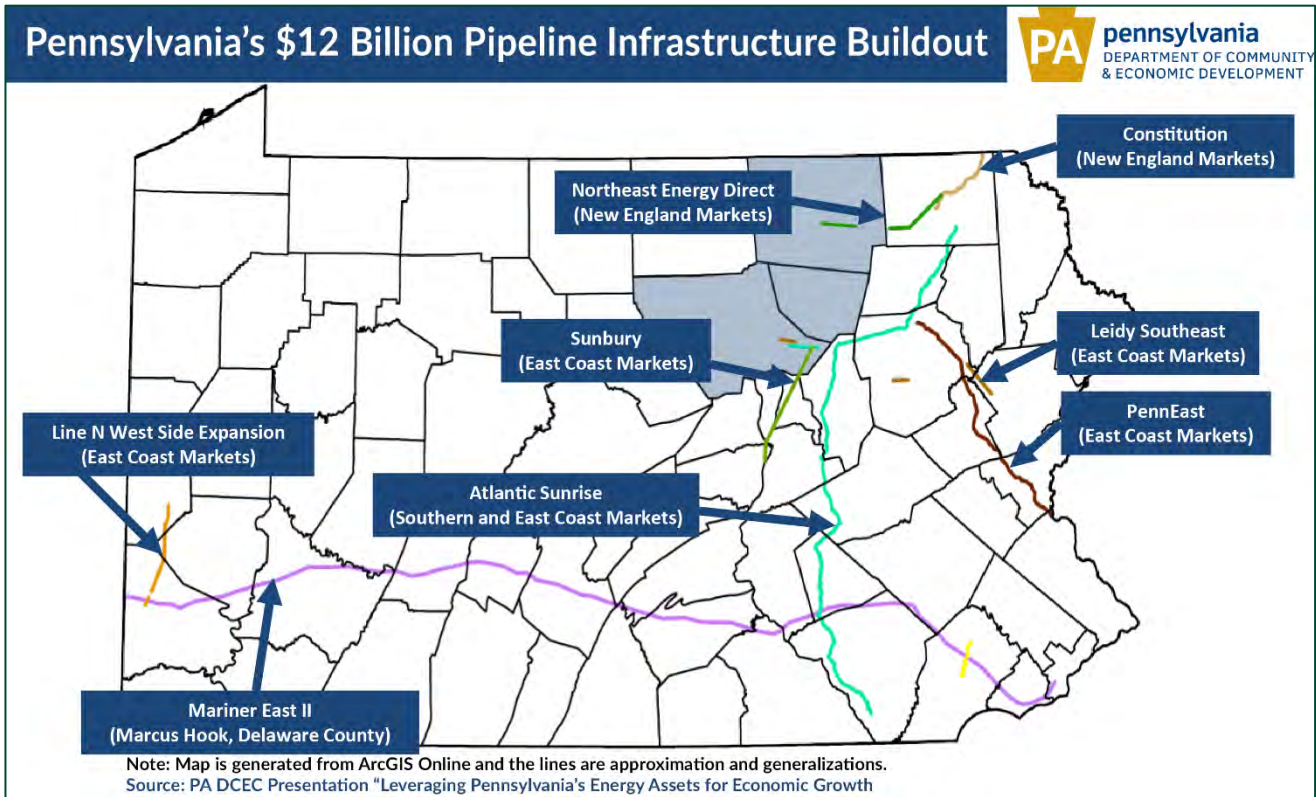


Figure 8 – Pennsylvania's Pipeline Infrastructure

transmission pipeline, owned by UGI Sunbury LLC, a subsidiary of UGI Energy Services, LLC, which interconnects with Transco and Marc 1 pipelines. The majority of the gas delivered to the pipeline is produced in Bradford, Sullivan, and Lycoming counties, shown highlighted in Figure 8.

In this instance, there may be opportunities to allocate some of the low-cost power generation to businesses considering occupancies within the site, which are described in greater detail later.

**Solar PV array(s) on Southern parcel:** Given the fact that the Ash Dam portion of the site is currently occupied by a large impoundment of coal ash and located within a high-hazard dam site regulated by DEP, there are various challenges to certain types of development for this southern parcel.

The possibilities of allocating all or portions of this south parcel to the production of electricity using solar PV technologies were evaluated and it was concluded that this form of generation could be economically feasible, and such a use could also serve to attract certain businesses to the overall site. Many businesses are looking for ways to include the use of direct green energy production, having particular interests in demonstrating a renewable energy source to meet their electric demands.



The preliminary analysis supports that as much as 12 MW of solar production could be achieved on the Southern parcel. See the following Analysis section for more detail concerning the feasibility of this energy generation opportunity.

All of the above energy strategies could be paired with the overall effort to attract the businesses referenced in the Re-Use Strategies, or as part of accomplishing the options described in Option 2 below.

### **Option 2: Creation of the Sunbury Energy Hub**

Given that significant individual energy generation options exist on different locations within the Sunbury site, this development could be positioned, in aggregate, as one of the largest energy hubs anywhere in the state. In particular, the two large generation stations of Panda Hummel Station and Gen Station #2, with combined capacity of 2,200 MW would provide significant, low cost electricity to a variety of on-site and off-site users. In addition, with the potential of up to 12 MW of solar PV, a renewable energy component that could be positioned as a community solar project adds to the attractiveness of the Sunbury Energy Hub concept.

### **Option 3: Creation of a microgrid for On-site and Regional resilience**

Given the potential of the Gen Station #2 and up to 12 MW of solar PV generation there exists an opportunity to configure the Sunbury Energy Hub in a way to provide resilience and alternative energy capacities using the microgrid platform. In particular, town center microgrids are being designed and considered for numerous locations throughout North America, and in particular, along the East Coast, as the costs of power outages associated with more frequently occurring severe storms continues to rise.

A variety of microgrid strategies could be considered for future action as the full potential of the former Sunbury Generation site is examined. The following are examples of microgrid solutions that could be developed:

**Site-wide Sunbury Energy Hub microgrid:** In this scenario, studies would be conducted to determine the feasibility of tying the separate electric generators that are described above, together, and whether some form of energy storage, or additional resilience for the site might also prove advantageous. Under a microgrid platform, the operation of all of the separate forms of generation, storage, and user profiles are optimized to create the lowest overall cost of electricity.

Given that the site is currently under one owner without public rights-of-way intersecting the site, considerable flexibility exists in determining options for a site-wide microgrid alternative.

**Expanded town center utility microgrid:** Significant electric industry advances are occurring around the ability to pair local forms of generation – that may be feasible on the Sunbury Generation site – with the public utility’s distribution system in order to establish strategies to support key public facilities (such as a town hall, library or public school facility) and emergency facilities and functions (such as police, fire, emergency response, and hospital campuses, in the events of large grid outages. This form of resilience should become more important as communities like Shamokin Dam and Monroe Township are likely to face weather events increasing in their frequency, severity, and cost.

A legislative effort to provide public utilities with “rules for engagement” is currently under consideration by the Pennsylvania General Assembly in the form of House Bill 1412. In its current form, the bill would provide the state’s regulated electric utilities with guidance from the Pennsylvania Public Utility Commission on how to propose microgrid pilot projects similar to the one described in this report.

Efforts should be made to engage with local government officials and the local utility provider, PPL, concerning this opportunity, to gauge interest for future study.



### Analysis

**Panda Hummel Station:** Panda Hummel Station is already built and in service providing competitively priced natural gas-based electricity.

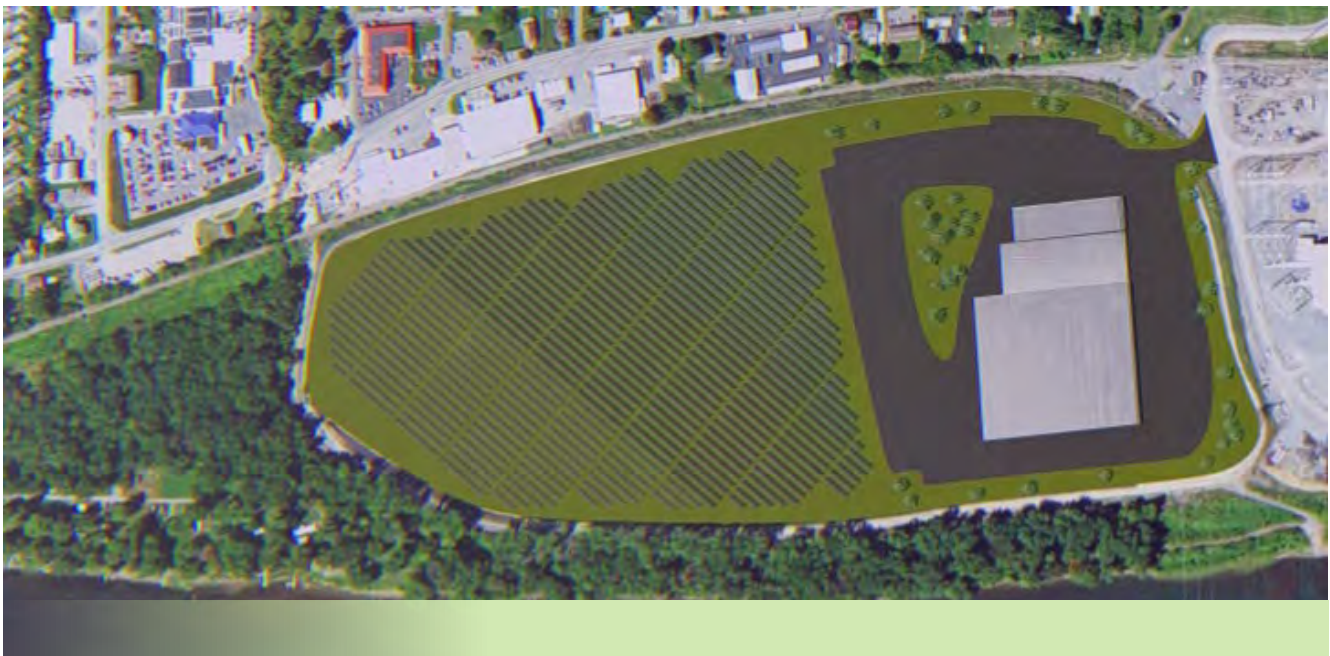
- Currently 100% exported to PJM grid
- Could be opportunity for more localized supply

**Second Gas-fired Gen Station #2:** The opportunity exists to configure a second natural gas fired generating station so that a portion of the electricity generated could be locally distributed for on-site consumption. The power generated throughout the Sunbury site can be configured to act as microgrid with other on-site generation to provide resilient power to tenants.

**Solar PV array on South Parcel:** This could be a great option to offer businesses under a reuse strategy where the business already puts high priority on the consumption of green energy to meet corporate social responsibility mandates; it could also be co-developed with a building for a user wanting to have both a plant facility and the renewable energy.

The following are the results of the **Solar Helioscope Model** that was deployed for this study:

A systems approach was implemented to design the solar photovoltaic (PV) system at Sunbury Generation Station. Under this approach, emphasis was placed on maximizing the solar potential for the location. The PV array's design (Figure 7) minimizes self-shading from the panels and shading from natural and built environment, considers preliminary set-backs from roads and railway tracks, optimizes solar panel tilt angle, and orients panels South to maximize insolation throughout the day.



To optimize the solar design, the tilt angle of the solar panels was calculated at  $35.8^\circ$ , and the azimuth (angle of orientation of each solar panel with respect to true North) was determined to be  $183.3^\circ$  to maximize the specific yield (maximum annual energy production per kW of the system). Lowering the system's tilt angle will increase the system capacity (number of panels per area) by allowing rows to fit closer together because row-to-row shade extends would decrease and increase total annual energy



production of the system. However, this can potentially drive up the total system cost because more material is required, and there will be lower power production due to a less-than-optimum tilt angle. As a result, the specific yield of the system would drop. As mentioned above, the goal of the systems approach to designing a solar PV system at this location is to maximize the solar potential for the client.

Below is a summary of the results with quick facts that can be expected from the PV system:

- Specific Yield (kWh/kW): 1363.2
- Performance Ratio: 84.1%
- Solar Panel Used for Analysis: Trina Solar (320W)
- System's Nameplate DC Size: 12.1 MW (or 12,100 kW)
- Annual energy production: 16,520 MWh (or 16,520,000 kWh)
- This is enough energy generated to meet the energy requirements of 1,600 US households (10,500 kWh per average home per year. Source: EIA)
- With the help of a utility-scale Battery Energy Storage System (BESS) this power plant can meet the peak power demand of approximately 5,500 homes (at 1 MW enough to power 600 homes) at any given time of the year.

# REUSE STRATEGY ALTERNATIVES





# Reuse Strategy Alternatives

## Reuse Strategy Highlights:

The identified reuse strategies fit into three categories as follows:

- ✓ Energy Production
- ✓ Manufacturing
- ✓ High Intensity Energy Users



The purpose of the Highest and Best Use Analysis is to assess feasible and preferred uses for the former Sunbury Generation Plant site, to identify the type of industrial and manufacturing uses that could take advantage of the energy distribution network on the site, and to study options for meeting current and future needs of the region at large. Three potential reuse strategy types were identified: **Energy Production; Manufacturing; and High Intensity Energy Users**, with each shown as a component of the Conceptualized Build-out of the site, in Figure 10.



Figure 10 - Conceptualized Build-Out of Site

## Energy Production

In speaking with local officials and area stakeholders, a collective vision for an energy hub on the site was manifested. From 1949 to 2014, the site housed a 400-MW coal-fired power plant that spanned the entire property. Given Sunbury Generation’s history of power generation, new power uses on the site would build upon the site’s current assets. For example, the PPL switchyard enables power to be transported to markets in Pennsylvania and across the PJM Interconnection footprint, which routes electricity transmission to Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia, and the District of Columbia. A remnant of the former coal-fired power plant, the site also features an existing water-intake system that is currently under-capacity in terms of total intake. The potential to leverage these assets make the site ideal for power generation. The residual effects of power generation facilities, such as the creation of family-sustaining jobs, will also benefit the community and region at-large.

**Option 1**  
A Second Natural Gas Fired Power Plant

**Option 2**  
Solar Energy Facility



## Manufacturing

The Sunbury Generation site is currently connected to the world at-large via rail, and roadway. Upon completion of the Central Susquehanna Valley Thruway (CSVT), the vehicular reach of the site will improve immensely. At present, the site is ready to be serviced by Norfolk Southern railway, which connects to Williamsport to the north, and Harrisburg's intermodal facilities to the south. Given these regional connections, and the amount of developable land present at Sunbury Generation, the site has potential for the inclusion of a logistics/distribution warehouse facility or a wood waste recycling facility.

**Option 3**  
Logistics/  
Distribution Center

**Option 4**  
Wood Waste Recycling  
Facility

## High Intensity Energy Users

Because energy is produced on-site, the site is well-suited to house high intensity energy usage facilities. Affordable energy is a major draw for companies looking to reduce production expenses. The addition of a microgrid to the site would enable prospective tenants to directly harness energy produced on-site. Energy intensive facilities could also use the site's water-intake system for cooling, growing, washing, etc. With these site-specific attributes present, Sunbury Generation is well-suited to house high intensity energy uses.

**Option 5**  
Hydroponic Greenhouse  
or Growing Facility

**Option 6**  
Data Center





# 1

## A Second Natural Gas-Fired Power Plant

Given that significant utility infrastructure is already in place leading into and within the site to service Panda Hummel Station, including another natural gas-fired power plant on the site would appear quite feasible. An adequate distribution network is always a site consideration for energy providers. Sunbury Generation LP currently has that distribution network in place. Panda Hummel Station also makes use of the site's water-intake system, which is currently used under-capacity. Since the community has already demonstrated its acceptance of the power industry, this presents the opportunity for a second natural gas-fired power plant to make similar use of the water-intake system.



### STRATEGY

- ✓ Take advantage of the abundance of natural gas in Pennsylvania
- ✓ Use the excess capacity of the Sunbury pipeline near the site
- ✓ Increase electric resilience opportunities to benefit the local community via development of a microgrid implementation plan
- ✓ Use the current under-capacity water intake system on the site

### EXAMPLES

- ✓ Case Study: Panda Hummel Station, Shamokin Dam Borough, PA  
<http://www.pandafunds.com/invest/hummel>
  - 1,124 MW power facility built on 19 acres
  - Helps support a long-term market for Pennsylvania gas producers and royalty owners.
  - Facility has resulted in 900 construction jobs, 35 direct jobs to operate the plant, and 52 indirect jobs to support the plant
  - Facility uses 97% less water for cooling purposes than its coal-fired predecessor

### ADVANTAGES

- ✓ Inclusion on the site would lend to the energy hub vision for the site
- ✓ Proven technology for the region/site
- ✓ Known implementation, based on Panda Hummel Station

### DISADVANTAGES

- Inclusion of a second natural gas plant alone does not create the image of a diversified energy hub
- Long-term viability of the site will be largely dependent on the market for natural gas

### ACTIONS FOR SPECIFIC ALTERNATE STRATEGY

- ✓ Discuss the feasibility of adding a second natural gas fired generation station with local and statewide public officials
- ✓ Determine required utility supply and public infrastructure requirements to make a second generator plausible
- ✓ Determine with PJM the opportunities and obstacles for addition of a second generator as part of the energy hub



## 2

### Solar Energy Facility

The nation as a whole is striving to produce more power with fewer emissions. For many corporations, the means to realizing this goal is a push to procure renewable clean energy as part of their corporate strategies. With the desire for more renewable clean energy sources, Sunbury Generation is well-positioned to provide a home for a utility-scale, or several smaller, photo-voltaic (PV) solar generation systems. Underlying environmental characteristics of the former ash impoundment on the south end of the property which prohibit traditional development make shallow or ballasted foundations of solar arrays ideal. Once solar arrays are installed, they have little to no impact on surrounding properties. Because this site is adjacent to residential uses, little to no impact uses are preferred. The addition of solar arrays would also contribute to the overall energy hub vision for the site.



#### STRATEGY

- ✓ Increase electric resilience opportunities to benefit the regional community via development of a microgrid implementation plan
- ✓ Complement the community's desire to create an energy hub on the Sunbury Power Plant property
- ✓ Use the environmentally challenged large site; the relatively low weight of solar panels would be well-suited for the site's former fly ash basin
- ✓ Incorporate renewable energy into the overall energy portfolio
- ✓ Create an attractive option for certain businesses
- ✓ Preliminarily strong PV generation capacity is attractive as an alternative energy option
- ✓ Potential to develop as a community solar with peer to peer benefits

#### EXAMPLES

- ✓ Case Study: Maywood Solar, Indianapolis, IN  
<https://semspub.epa.gov/work/03/900106.pdf>



## PLAYBOOK | SUNBURY GENERATION POWER PLANT

- 11 megawatt solar power facility consisting of 36,000 ground-mounted, fixed-tilt solar panels  
[https://www.hanwha-qcells.com/qcells-office/business/power-plant-business/america#references\\_Tab](https://www.hanwha-qcells.com/qcells-office/business/power-plant-business/america#references_Tab)
- Constructed on an 80-acre Superfund site once home to the Reilly Tar & Chemical Corp.
- Power sold to Indianapolis Power & Light (IPL) under a 15-year purchase agreement

### ADVANTAGES

- ✓ Inclusion on the site would lend to the energy hub vision for the site
- ✓ Panels would have minimal impact on surrounding properties
- ✓ Light weight of panels may make the use viable for the former ash impoundment area
- ✓ Investment in green/renewable energy is potential business attraction strategy
- ✓ Low cost option compared to building a data center

### DISADVANTAGES

- A solar array would not create a large number of direct employment opportunities

### ACTIONS FOR SPECIFIC ALTERNATE STRATEGY

- ✓ Complete a detailed structural analysis of geotechnical conditions
- ✓ Determine various solar array configurations
- ✓ Mix and match solar array with building configurations that will minimize the need for structural reinforcement building constraints based on requirements of construction
- ✓ Develop an RFP for power purchase agreement (PPA) structured facility to determine cost points and cost of energy
- ✓ Determine feasibility of aligning solar with an energy storage component



# 3

## Logistics/Distribution Center

With the forthcoming completion of the Central Susquehanna Valley Thruway (CSVT) project, Sunbury Generation will be better connected to the region at-large (Refer to Figure 4). The extension of U.S. Route 15 will enable faster access to U.S. Interstate 80, which connects midwestern and northeastern population centers. The Sunbury Generation site also has the potential to be serviced by Norfolk Southern Railway, which operates rail to truck intermodal facilities in nearby Harrisburg. Federal and state funding is available to connect the site directly to North Susquehanna Trail/U.S. Route 15.



Figure 13- Conceptualized Logistics/Distribution

### STRATEGY

- ✓ The rise of e-commerce has created a need for distribution and warehousing space across the U.S.
- ✓ Sunbury Generation site has ready access to U.S. Route 11 and U.S. Route 522
- ✓ Upon completion of the Central Susquehanna Thruway project, the Shamokin Dam area will have improved access to Interstate 80 via an extended PA 147 to further distribution network
- ✓ Rail access to site presents further opportunity for multi-modal loading/unloading station

### EXAMPLES

- ✓ Case Study: Former Visteon Site, Shelby Township, MI  
<http://www.crainsdetroit.com/article/20170718/news/634256/amazon-plans-distribution-center-in-shelby-township>
  - 207-acre former auto parts plant brownfield site
  - Developer in talks with e-commerce giant Amazon to redevelop 80-acres for a 1,000,000 square foot “logistics optimization center”
  - 1,000 jobs expected for the Amazon site once fully operational

### ADVANTAGES

- ✓ Facility would create numerous family-sustaining jobs
- ✓ Access to the site will improve drastically upon completion of the CSVT Project
- ✓ There is increased demand for logistics/distribution centers with the rise of e-commerce
- ✓ Rail line could be activated to provide high volume delivery of goods to/from site
- ✓ 2 location options on site: Former Coal Yard, and Ash Basin

### DISADVANTAGES

- Former ash impoundment may not be able to support the weight of a logistics/distribution facility, which would require stabilization of ash in the Ash Basin
- Facility would create increased truck traffic along North Old Trail (partially residential)
- There is presently no direct connection from the site to Route 15/11
- Rail crossing at entrance into site area could impede continuous truck flow

### ACTIONS FOR SPECIFIC ALTERNATE STRATEGY

- ✓ Develop collateral to demonstrate value to potential businesses
- ✓ Begin study and engineering for roadway access improvement project
- ✓ Identify the potential need for public subsidy to create necessary site and access improvements



# 4

## Wood Waste Recycling Facility

Snyder County is a regional hub for wood product processing and manufacturing. From lumber, to modular homes, to high-end wood cabinetry, there is an impressive breadth of wood products processed and manufactured in the area. As with any business, these industries create byproducts that must be disposed of. A wood waste recycling facility allows these byproducts to be turned into usable end products, such as heating pellets, mulch, compost, etc. Wood waste recycling is an environmentally responsible way to dispose of processing and manufacturing byproducts.

### STRATEGY

- ✓ Quarterly Workforce Indicators show a robust wood product manufacturing industry in Snyder County
- ✓ Both industrial, residential, and commercial wood waste can be recycled into products like yard mulch, wood heating pellets, drilling waste absorbent, liquid hazmat sludge stabilizer, etc.
- ✓ Wood waste can also be turned into wood pellets to fuel biomass energy facilities; biomass is a form of renewable energy
- ✓ Complimentary to existing similar businesses in region
- ✓ Well-rounded labor pool for this type of employment
- ✓ Proximity of timber and logging activities in the region

### EXAMPLES

- ✓ Case Study: Willard Brothers Woodcutters, Trenton, New Jersey  
<https://www.willardbrothers.net/index.html>
  - Raw materials for Willard Brothers are 100% urban tree removals
  - Trees are harvested by its tree removal subsidiary, Shear Penn Corporation
  - Willard Brothers Woodcutters creates high-end lumber product supplies for artisans, hobbyists, architects, and homeowners
  - Willard Brothers Woodcutters was created by Shear Penn Corporation to avoid paying wood waste disposal fees. Instead, they discovered the value in reused wood products

### ADVANTAGES

- ✓ Competitive wood manufacturing and construction industries in the region could potentially provide materials for recycling
- ✓ Facility would lend to an environmentally friendly re-visioning of the site

### DISADVANTAGES

- Facility would require increased truck traffic to bring materials to the site
- Necessary to find stable supply chains of recyclable materials

### ACTIONS FOR SPECIFIC ALTERNATE STRATEGY

- ✓ Develop collateral to demonstrate value to potential businesses
- ✓ Identify the potential need for public subsidy to create necessary site and access improvements



# 5

## Hydroponic Greenhouse or Growing Facility



Figure 14 – Conceptualized Hydroponic Greenhouse

### STRATEGY

- ✓ A new and fast-growing industry that could be well positioned in Central Pennsylvania
- ✓ Anchor an energy intensive user seeking low cost energy
- ✓ Leverage other site attributes uniquely beneficial to this type of user
- ✓ Highly sustainable business that is interested in using renewable generation
- ✓ Hydroponic greenhouses are efficient greenhouse facilities built for commercial vegetable production

### EXAMPLES

- ✓ Case Studies: Bright Farms, Culpeper, VA and Gotham Greens, Baltimore, MD
  - BrightFarms' Culpeper, VA hydroponic greenhouses produce 750,000 cases of green leaf produce and 30,000 cases of tomatoes over a 3-year period  
[http://www.richmond.com/business/local/brightfarms-greenhouse-project-set-for-culpeper/article\\_892c9515-ce0c-5b3c-b1a6-262e9ed02ad5.html](http://www.richmond.com/business/local/brightfarms-greenhouse-project-set-for-culpeper/article_892c9515-ce0c-5b3c-b1a6-262e9ed02ad5.html)
  - The BrightFarms facility uses 80% less water, 90% less land, and 95% less shipping fuel than a traditional produce facility
  - BrightFarms invested \$7.35 million to operate two greenhouses and created 24 new jobs
  - Gotham Greens is a hydroponic greenhouse facility proposed for Tradepoint Atlantic, a brownfield redevelopment site in Baltimore, MD. <http://www.baltimoresun.com/business/bs-md-sparrows-point-farm-20180508-story.html>
  - Gotham Greens' 100,000 square foot facility is expected to create sixty (60) full-time jobs

### ADVANTAGES

- ✓ A hydroponic greenhouse or growing facility could take advantage of the site's water intake system.
- ✓ These high-energy uses can benefit from the abundant, cost-competitive energy produced on-site
- ✓ Hydroponic greenhouses are relatively light, which may make it a feasible use for the ash impoundment site



## PLAYBOOK | SUNBURY GENERATION POWER PLANT

- ✓ A hydroponic greenhouse facility has the potential to be a supplier for regional grocery chains, several with headquarters or distribution centers locally

### DISADVANTAGES

- Facility would detract from the energy hub vision for the site by being an energy user, not an energy producer.

### ACTION FOR SPECIFIC ALTERNATIVE STRATEGY

- ✓ Feasibility study to include the related topics:
  - Conduct study of businesses and off-takers that would be interested in this region of Pennsylvania
  - Identify available public funding opportunities
  - Benchmark similar growing facilities under development in neighboring states



# 6

## Data Center

Because of the sheer amount of information processing that takes place within data centers, they are classified as energy intensive facilities. If competitively priced energy produced at the site was made available to an on-site user, it would potentially make the site attractive for data center operators. Data centers can be scaled to meet market demand or built with temporary or permanent foundations depending on the type of facility proposed.



Given the environmental constraints of the southern portion of the site, a data center placed atop a temporary foundation may be feasible, or, one could be in the former Sunbury Generation LP location, once demolition is completed.

### STRATEGY

- ✓ A new and fast-growing industry that could be well positioned in Central Pennsylvania
- ✓ Energy intensive user requiring low-cost energy
- ✓ Leverage other site attributes uniquely beneficial to this type of user
- ✓ Use the high-speed high-volume fiber optic highway within the region
- ✓ Tap into the abundant energy generated on the site
- ✓ Make data center scalable, to adjust to market demands
- ✓ Use and expand the existing Sunbury Generation site security

### EXAMPLES

- ✓ Case Study: Dal1 Data Center, Dallas, TX  
<http://www.ascentcorp.com/DataCenters/DallasDataCenter-DAL1.aspx>
  - 43,300 square foot building with three electrical feeds from two substations
  - The facility is secured and staffed with security personnel
  - Flexible layout allows the facility to host numerous clients

### ADVANTAGES

- ✓ Data centers can be housed in lightweight modular units, which make them potentially feasible for the former ash impoundment. Other site areas are available for consideration
- ✓ Site is partially serviced by 1000 Mbps fiber-optic broadband service
- ✓ Site is already zoned for this type of use
- ✓ Site is already partially secured

### DISADVANTAGES

- Possibly limited job creation

### ACTION FOR SPECIFIC ALTERNATIVE STRATEGY

- ✓ Identify the potential need for public subsidy to create necessary site and access improvements





## Financial Feasibility Analysis Summary

### Costs to make Pad-Ready Constructible Areas

Depending upon redevelopment alternative selections and locations to construct on the Sunbury Generation site, costs to develop a given section of the site are impacted by the costs of site preparation. Estimates for making each area of the site “pad-ready” for construction are presented below. These include:

- Area A – Ash Basin area (further subdivided into 3 subsections)
- Area B – Former Sunbury Power Plant area (once the existing plant is demolished)
- Area C – Former Coal Yard area

Construction costs for pad-ready development of the three areas are presented in TABLE 15 on the following page. The ash in Area A Ash Basin is considered to be contaminated coal-combustion residual (CCR) and regulated under Subtitle D of the Resource Conservation and Recovery Act (RCRA). Additionally, Pennsylvania regulates the beneficial use of coal ash as residual waste under its Solid Waste Management Act, which allows for several applications to reuse coal ash, including structural fill, for reclamation at active surface coal mines, in the manufacture of concrete, as drainage material or pipe bedding and as a stabilized product where physical or chemical characteristics are altered prior to use such that the potential of coal ash constituents to leach is reduced. For this study, reuse of the coal ash is considered an option with further engineering analysis of the ash and the intended use; however, it is not presented as a cost alternative for the Ash Basin, as a specific use would need to be determined and evaluated separately. Thus, this financial feasibility presents a “worst case” remediation option to remove and dispose of the CCR as regulated non-hazardous waste.

Because of the significant cost of remediation of the Ash Basin, mostly from removal and disposal of the CCR ash, the Ash Basin area is subdivided into 3 sections that each may be considered for development independently or cumulatively, and relative costs are presented in TABLE 16, which are based on unit cost assumptions identified in TABLE 17. Option 1 presents the case where no remediation of ash is required; thus, only access and utilities run into the area are accounted for. This may apply to a light load development, such as a PV solar array across the entirety of the Ash Basin. Option 2 presents the first (northernmost “third” of the basin) section, such that only this section is remediated to allow for construction of new full-load-bearing structure(s) whereby the existing ash is regarded as unsuitable for construction. Options 3 and 4 present incremental expansion onto the Ash Basin with remediation costs estimated inclusive of each additional section, to present full remediation of the Ash Basin as Option 4.

As presented earlier on page 17, Figure 5 shows the Buildable Acreages of the site. Of the 50.2 acres identified for the Ash Basin, the Ash Basin area can be further divided into Area 1 (8.5 acres), Area 2 (18.8 acres) and Area 3 (22.9 acres). Cost Option 2 presented below includes the remediation of Area 3 which conceptually can house a manufacturing or high energy use facility, while the remaining Areas 1 and 2 could house PV solar arrays without requiring remediation. The estimates that follow reflect this approach.



Table 15 - Former Sunbury Generation Station Playbook

REDEVELOPMENT AREAS	Area A - Option 1 Ash Basin - No Remediation	Area A - Option 4 Ash Basin Area - Full Remediation	Area B Former SunGen Power Plant Area	Area C Former Coal Yard Area
Project Pre-Planning	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000
<b>Project Document Prep</b>				
Initial Site Investigation & Review	\$ 15,000	\$ 15,000	\$ 15,000	\$ 15,000
Site Plan Preparation & Work Plan	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000
Stormwater E&S Control Plan	\$ 30,000	\$ 30,000	\$ 10,000	\$ 20,000
Project Specs	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000
Ash Basin Remediation Plan	\$ 100,000	\$ 100,000	\$ -	\$ -
Solid Waste Mgmt Permit Modification	\$ 30,000	\$ 30,000	\$ -	\$ -
Project Pre-Planning /Prep Subtotal	\$ 205,000	\$ 205,000	\$ 55,000	\$ 65,000
<b>Site Remediation</b>				
Mobilization/Demob.	\$ -	\$ 90,000	\$ -	\$ -
Excavation	\$ -	\$ 4,300,000	\$ -	\$ -
Off-site disposal	\$ -	\$ 68,000,000	\$ -	\$ -
Hauling	\$ -	\$ 15,000,000	\$ -	\$ -
Site Work	\$ -	\$ 20,000	\$ -	\$ -
Erosion & Sed. Control	\$ -	\$ 20,000	\$ -	\$ -
Stormwater Management	\$ -	\$ 100,000	\$ -	\$ -
Construction Mgmt and Security	\$ -	\$ 100,000	\$ -	\$ -
Site Remediation Subtotal	\$ -	\$ 87,630,000	\$ -	\$ -
<b>Site Restoration</b>				
Backfill Material	\$ -	\$ 21,000,000	\$ -	\$ -
Placement & Compaction	\$ -	\$ 4,000,000	\$ -	\$ -
Sitework / Grading	\$ 400,000	\$ 400,000	\$ -	\$ -
Stormwater Management	\$ 100,000	\$ 100,000	\$ -	\$ -
Site Access Roads (100 FT x 25 FT Wide)	\$ 25,000	\$ 25,000	\$ -	\$ 25,000
Site Restoration Subtotal	\$ 525,000	\$ 25,525,000	\$ -	\$ 25,000
<b>Utilities</b>				
Public Water (6" DIP, 1 Fire Hydrant)	\$ 13,500	\$ 13,500	\$ -	\$ 13,500
Public Sewer (6" HDPE, 1 Manhole)	\$ 15,000	\$ 15,000	\$ -	\$ 15,000
Gas (4" Steel, Gas Meter)	\$ 17,500	\$ 17,500	\$ -	\$ 17,500
Electric Service (4-2" SCH 40 Concrete Encased Duct)	\$ 10,000	\$ 10,000	\$ -	\$ 10,000
Tele/Data Service(4-2" SCH 40 Concrete Encased Duct)	\$ 10,000	\$ 10,000	\$ -	\$ 10,000
Utilities Subtotal	\$ 66,000	\$ 66,000	\$ -	\$ 66,000
<b>Roadway Access</b>				
Engineering Design and Permitting	\$ 178,452	\$ 178,452	\$ -	\$ -
Mobilization	\$ 49,570	\$ 49,570	\$ -	\$ -
Roadway and Traffic Signal Improvements	\$ 991,400	\$ 991,400	\$ -	\$ -
Maintenance and Protection of Traffic During Construction	\$ 69,398	\$ 69,398	\$ -	\$ -
Construction Management and Consultation	\$ 49,570	\$ 49,570	\$ -	\$ -
Construction Inspection	\$ 118,968	\$ 118,968	\$ -	\$ -
Right of Way	\$ 198,280	\$ 198,280	\$ -	\$ -
Utilities	\$ 118,968	\$ 118,968	\$ -	\$ -
Property Acquisition	\$ 350,000	\$ 350,000	\$ -	\$ -
Connecting Trail Construction Area A	\$ -	\$ -	\$ -	\$ 175,000
Roadway Access Subtotal	\$ 2,124,606	\$ 2,124,606	\$ -	\$ 175,000
<b>Project Subtotal</b>				
Project Subtotal	\$ 2,920,606	\$ 115,550,606	\$ 55,000	\$ 331,000
General Conditions (15%)	\$ 438,091	\$ 17,332,591	\$ 8,250	\$ 49,650
Overhead and Profit (20%)	\$ 671,739	\$ 26,576,639	\$ 12,650	\$ 76,130
Bonds and Insurance (2%)	\$ 80,609	\$ 3,189,197	\$ 1,518	\$ 9,136
Contingency (20%)	\$ 822,209	\$ 32,529,807	\$ 15,484	\$ 93,183
<b>Project Total</b>	<b>\$ 4,933,254</b>	<b>\$ 195,178,840</b>	<b>\$ 92,902</b>	<b>\$ 559,099</b>

Notes:

1. Ash Basin Area

Ash Basin - ash is deemed unusable. Must be replaced or stabilized in place for use.  
 Light load only, such as Solar arrays, access roads, can be built on top of ash cap as is. Assume some maintenance will be required annually.  
 Will need to modify PADEP Solid Waste Permit to construct anything on top of Ash Basin cap, or to remediate Ash Basin.  
 Ash Depth (see boring logs SB-6, 7, 8, 9):- 25-29' bgs. Silt, clay, shale beneath.

TABLE 15: COST ESTIMATES FOR REDEVELOPMENT OPTIONS



Table 16 - Former Sunbury Generation Station Playbook

ASH BASIN OPTIONS	Area A - Option 1	Area A - Option 2	Area A - Option 3	Area A - Option 4
	No Remediation	22 Acre Remediation	41.5 Acre Remediation	50 Acre Remediation
	(0 CY)	(991,826 CY)	(1,870,944 CY)	(2,254,149 CY)
<b>Project Pre-Planning</b>	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000
<b>Project Document Prep</b>				
Initial Site Investigation & Review	\$ 15,000	\$ 15,000	\$ 15,000	\$ 15,000
Site Plan Preparation & Work Plan	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000
Stormwater E&S Control Plan	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000
Project Specs	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000
Ash Basin Remediation Plan	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000
Solid Waste Mgmt Permit Modification	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000
<b>Project Pre-Planning /Prep Subtotal</b>	\$ 205,000	\$ 205,000	\$ 205,000	\$ 205,000
<b>Site Remediation</b>				
Mobilization/Demob.	\$ -	\$ 39,600	\$ 74,700	\$ 90,000
Excavation	\$ -	\$ 1,892,000	\$ 3,569,000	\$ 4,300,000
Off-site disposal	\$ -	\$ 29,920,000	\$ 56,440,000	\$ 68,000,000
Hauling	\$ -	\$ 6,600,000	\$ 12,450,000	\$ 15,000,000
Site Work	\$ -	\$ 8,800	\$ 16,600	\$ 20,000
Erosion & Sed. Control	\$ -	\$ 8,800	\$ 16,600	\$ 20,000
Stormwater Management	\$ -	\$ 44,000	\$ 83,000	\$ 100,000
Construction Mgmt and Security	\$ -	\$ 44,000	\$ 83,000	\$ 100,000
<b>Site Remediation Subtotal</b>	\$ -	\$ 38,557,200	\$ 72,732,900	\$ 87,630,000
<b>Site Restoration</b>				
Backfill Material	\$ -	\$ 16,500,000	\$ 31,125,000	\$ 21,000,000
Placement & Compaction	\$ -	\$ 1,760,000	\$ 3,320,000	\$ 4,000,000
Sitework / Grading	\$ 400,000	\$ 400,000	\$ 400,000	\$ 400,000
Stormwater Management	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000
Site Access Roads (100 FT x 25 FT Wide)	\$ 25,000	\$ 25,000	\$ 25,000	\$ 25,000
<b>Site Restoration Subtotal</b>	\$ 525,000	\$ 18,785,000	\$ 34,970,000	\$ 25,525,000
<b>Utilities</b>				
Public Water (6" DIP, 1 Fire Hydrant)	\$ 13,500	\$ 13,500	\$ 13,500	\$ 13,500
Public Sewer (6" HDPE, 1 Manhole)	\$ 15,000	\$ 15,000	\$ 15,000	\$ 15,000
Gas (4" Steel, Gas Meter)	\$ 17,500	\$ 17,500	\$ 17,500	\$ 17,500
Electric Service (4-2" SCH 40 Concrete Encased Duct)	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000
Tele/Data Service (4-2" SCH 40 Concrete Encased Du	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000
<b>Utilities Subtotal</b>	\$ 66,000	\$ 66,000	\$ 66,000	\$ 66,000
<b>Roadway Access</b>				
Engineering Design and Permitting	\$ 178,452	\$ 178,452	\$ 178,452	\$ 178,452
Mobilization	\$ 49,570	\$ 49,570	\$ 49,570	\$ 49,570
Roadway and Traffic Signal Improvements	\$ 991,400	\$ 991,400	\$ 991,400	\$ 991,400
Maint. and Protection of Traffic During Construction	\$ 69,398	\$ 69,398	\$ 69,398	\$ 69,398
Construction Management and Consultatioin	\$ 49,570	\$ 49,570	\$ 49,570	\$ 49,570
Construction Inspection	\$ 118,968	\$ 118,968	\$ 118,968	\$ 118,968
Right of Way	\$ 198,280	\$ 198,280	\$ 198,280	\$ 198,280
Utilities	\$ 118,968	\$ 118,968	\$ 118,968	\$ 118,968
Property Acquisition	\$ 350,000	\$ 350,000	\$ 350,000	\$ 350,000
<b>Roadway Access Subtotal</b>	\$ 2,124,606	\$ 2,124,606	\$ 2,124,606	\$ 2,124,606
<b>Project Subtotal</b>	\$ 2,920,606	\$ 59,737,806	\$ 110,098,506	\$ 115,550,606
General Conditions (15%)	\$ 438,091	\$ 8,960,671	\$ 16,514,776	\$ 17,332,591
Overhead and Profit (20%)	\$ 671,739	\$ 13,739,695	\$ 25,322,656	\$ 26,576,639
Bonds and Insurance (2%)	\$ 80,609	\$ 1,648,763	\$ 3,038,719	\$ 3,189,197
Contingency (20%)	\$ 822,209	\$ 16,817,387	\$ 30,994,931	\$ 32,529,807
<b>Project Total</b>	\$ 4,933,254	\$ 100,904,323	\$ 185,969,588	\$ 195,178,840

TABLE 16: COST ESTIMATES FOR ASH BASIN OPTIONS



Site Remediation			
Excavation			
	Excavation	\$ 2	CY
Off-site disposal			
	Disposal	\$ 30	CY
Hauling			
	Hauling	\$ 7	CY
Site Work			
	Clearing and Grubbing	\$ 1	LS
Erosion & Sed. Control			
	Silt Fence	\$ 5	LF
	Inlet Protection	\$ 420	EA
	24" Filter Sock	\$ 11	LF
Stormwater Management			
	30" RCP	\$ 200	LF
	Manhole	\$ 4,000	EA
	Stormwater Infiltration Pond	\$ 1	EA
Site Restoration			
Backfill Material			
	Backfill	\$ 10	CY
	Hauling	\$ 7	CY
Placement & Compaction			
	Placement	\$ 1	CY
	Compaction	\$ 1	CY
Sitework / Grading			
	Rough Grading	\$ 4,000	ACRE
	Fine Grading	\$ 5,000	ACRE
Stormwater Management			
	30" RCP	\$ 200	LF
	Manhole	\$ 4,000	EA
	Stormwater Infiltration Pond	\$ 1	EA
Site Access Roads (100 FT x 25 FT Wide)			
	Asphalt Pavement (8" Agg Base, 4" Binder, 2" Wearing, Tack Coat, Prime Coat)	\$ 60	SY
	Concrete Curb and Gutter	\$ 12	LF
Utilities			
Public Water (6" DIP, 1 Fire Hydrant)			
	6" DIP	\$ 60	LF
	Fire Hydrant	\$ 5,000	EA
Public Sewer (6" HDPE, 1 Manhole)			
	6" HDPE	\$ 50	LF
	Manhole	\$ 5,000	EA
Gas (4" Steel, Gas Meter)			
	4" Steel	\$ 100	LF
	Gas Meter	\$ 5,000	EA
Electric Service (4-2" SCH 40 Concrete Encased Duct)			
	Ductbank	\$ 70	LF
	Wiring	\$ 5	LF
	Manhole	\$ 5,000	EA
Telephone / Data Service(4-2" SCH 40 Concrete Encased Duct)			
	Ductbank	\$ 70	LF
	Wiring	\$ 5	LF
	Manhole	\$ 5,000	EA

TABLE 17: UNIT COSTS



### **Estimating Methodology**

This cost estimate was prepared in accordance with AACE® International Recommended Practice No. 18R-97 Cost Estimate Classification System by Public Law 95-269. These estimates are consistent with the best estimating practices of the construction industry, FAR 36.203, and are current, accurate, and complete. They reflect the expected cost to the Government to perform the work by contract and include all reasonable costs that a prudent, experienced, and well-equipped contractor might anticipate and include in their bid. This cost estimate is consistent with a Class 5 estimate based on the Maturity Level of Project Definition Deliverables as expressed as a percentage of complete definition. The end usage can be used for concept screening and includes capacity factored, parametric models, judgement, and analogy. The expected accuracy range is L: -20% to -50%; H: +30% - + 100% depending on the construction complexity of the project, appropriate reference information and other risks (after inclusion of an appropriate contingency determination).

### **Assumptions**

Markups applied to this estimate include:

- General Conditions: 15%
- Overhead & Profit: 20%
- Bond and Insurance: 2%
- Design/Estimating Contingencies: 20%

### **Estimate Quality Assurance**

This estimate was prepared using a systematic process that involves a three-tiered quality approach. For the first tier, discipline-specific estimators perform a standard quality control check of their own work including but not limited to: quantity take-offs, material cost notation, and design document reference. Each section of the current working estimate then undergoes a series of quality audits starting with qualified senior estimators trained and knowledgeable in project requirements checking for errors at a discipline specific level. During the second tier, the estimate is reviewed by the Project Manager for overall scope & cost. Finally, during the third tier, an independent peer review is conducted by a Project Manager not associated with the project as a quality-controlled project closeout process is completed.

## **Funding Options**

### **Appalachian Regional Commission (ARC)**

#### **Federal Grant**

*Administering Agency:* Appalachian Regional Commission

*Eligible Applicants:* Public or private nonprofit organizations

*Uses:* Technical assistance projects, industrial site development, local access roads, local government assistance demonstration projects, acquisition and development business incubator or multi-tenant facilities, destination or asset-based tourism, and not-for-profit-entities.

*Amount:* 30%-70% of project cost depending on the county. Snyder: Transitional (50%)

#### **Notes**

The priorities for investment of ARC resources are determined essentially to accomplish five long-term strategic goals for Pennsylvania's economy: GOAL 1: Economic Opportunities Invest in entrepreneurial and business development strategies that strengthen Appalachia's economy. GOAL 2: Ready Workforce Increase the education, knowledge, skills, and health of residents to work and succeed in Appalachia. GOAL 3: Critical Infrastructure Invest in critical infrastructure—especially broadband; transportation, including the Appalachian Development Highway System; and water/wastewater systems. GOAL 4: Natural and Cultural Assets Strengthen Appalachia's community and economic development potential by leveraging the Region's natural and cultural heritage assets. GOAL 5: Leadership and Community Capacity Build the capacity and skills of current and next-generation leaders and organizations to innovate, collaborate, and advance community and economic development.



## **Partnerships for Opportunity and Workforce and Economic Revitalization (POWER) Grant**

### **Federal Grant**

*Administering Agency:* Appalachian Regional Commission

*Eligible Applicants:* Local development districts, states, counties, cities, and other units of government, institutions of higher education, and public/private nonprofit organizations and associations.

*Uses:* ARC's POWER initiative will continue focusing on investments that are regional, strategic, transformational, and maximize economic revitalization in Appalachia's coal-impacted communities.

*Amount:* Grants will range from \$400,000 to no more than \$1.5 million.

### **Notes**

POWER investment priorities include: (A.) Building a competitive workforce; (B.) Enhancing access to and use of broadband services; (C.) Fostering entrepreneurial activities; (D.) Developing industry clusters in communities; (E.) Strengthening substance abuse response.

## **Industrial Site Reuse Program (ISRP)**

### **State Grant & Loan**

*Administering Agency:* Pennsylvania Department of Community and Economic Development (DCED); Pennsylvania Department of Environmental Protection (DEP)

*Eligible Applicants:* Municipalities, counties, municipal authorities, redevelopment authorities, economic development agencies, private companies, and investors/developers.

*Uses:* Funds may be used to conduct Phase 1 Environmental Assessments, Phase II & III Environmental Assessments, for the removal and remediation of hazardous substances and contaminants, and for the remediation of nonhazardous waste and debris.

### **Notes**

The maximum amount to be awarded for any assessment project will not exceed 75% of the total cost of the assessment, or \$200,000, whichever is less, in a single fiscal year. The maximum amount to be awarded for any remediation project will not exceed 75% of the total cost of remediation, or \$1 million for grant recipients, whichever is less, in a single fiscal year. The interest rate on all Industrial Sites Reuse Loans will be 2%. Loans used for assessments shall not exceed 5 years. The term for loans used for remediation will depend on the nature and duration of remediation measures, but will not exceed 15 years.

## **Business in Our Sites Grants/Loans (BOS)**

### **State Grant & Loan**

*Administering Agency:* Pennsylvania Department of Community and Economic Development (DCED)

*Eligible Applicants:* Municipalities, municipal authorities, redevelopment authorities, industrial development agencies, and private developers.

*Uses:* All site development activities that are required to make a site shovel-ready. This program is for speculative projects only. Funds cannot be used for projects that are primarily residential or recreational. Sites must be previously used property or undeveloped property that is planned and zoned for development.

*Amount:* Loans: No minimum or maximum amount. Grants: May not exceed \$4,000,000 or 40% of the total combined grant and loan award.

### **Notes**

Loans will be repaid over a period not to exceed 20 years. The interest rate for the loan will be 2% or 3% depending on the unemployment rate of the county where the project is located when the CFA is in a first lien position. If the CFA is in a subordinate lien position, the interest rate will be 8% or 9% based on the unemployment rate of the county where the project is located.



## **Redevelopment Assistance Capital Program (RACP)**

### **State Grant**

*Administering Agency:* Pennsylvania Office of the Budget

*Eligible Applicants:* Local units of government, public authorities, local development districts, and industrial development agencies.

*Uses:* For the acquisition and construction of regional economic, cultural, civic, recreational, and historical improvement projects.

*Amount:* Total project cost of at least \$1,000,000

### **Notes**

RACP projects are authorized in the Redevelopment Assistance section of a Capital Budget Itemization Act, have a regional or multi-jurisdictional impact, and generate substantial increases or maintain current levels of employment, tax revenues, or other measures of economic activity. RACP projects are state-funded projects that cannot obtain primary funding under other state programs.

## **Multimodal Transportation Fund (MTF)**

### **State Grant**

*Administering Agency:* Pennsylvania Department of Community and Economic Development (DCED); Pennsylvania Department of Transportation (PennDOT)

*Eligible Applicants:* Municipalities, councils of governments, businesses, economic development organizations, public transportation agencies, and rail/freight ports.

*Uses:* Funds may be used for the development, rehabilitation and enhancement of transportation assets to existing communities, streetscape, lighting, sidewalk enhancement, pedestrian safety, connectivity of transportation assets and transit-oriented development.

*Amount:* Grants are available for projects with a total cost of \$100,000 or more. Grants shall not exceed \$3,000,000 for any project.

### **Notes**

The program is intended to provide financial assistance to municipalities, councils of governments, businesses, economic development organizations, public transportation agencies and rail and freight ports to improve transportation assets that enhance communities, pedestrian safety and transit revitalization. The program will be jointly administered by the DCED and PennDOT, under the direction of the Commonwealth Financing Authority (CFA).

## **Business & Industry Loan Guarantees**

### **Federal Loan Guarantee**

*Administering Agency:* United States Department of Agriculture (USDA) Rural Development

*Eligible Applicants:* Federal or state-chartered banks, savings & loan companies, farm credit banks, and credit unions.

*Qualified Businesses:* For-profit businesses, nonprofits, cooperatives, federally-recognized Tribes, public bodies, and individuals.

*Uses:* Business conversion, enlargement, repair, modernization, or development; purchase of land, buildings, and facilities; purchase of equipment, leasehold improvements, machinery, supplies, or inventory; debt refinancing when refinancing improves cash flow and creates or saves jobs; business and industrial acquisitions when the loan will create or save jobs.

*Amount:* Loans: 80% for loans of \$5 million and less; 70% for loans between \$5 and \$10 million; 60% for loans exceeding \$10 million, up to \$25 million maximum.

### **Notes**

Loan terms vary by use of loan funds. The maximum term on real estate is 30 years, while the maximum term on machinery or equipment is its useful life OR 15 years, whichever is less. The maximum term on



working capital is not to exceed 7 years. Loans must be fully amortized; balloon payments are not permitted. Interest-only payments may be scheduled in the first 3 years.

### **Distributed Generation Energy Project Financing**

#### **Federal Loan & Loan Guarantee**

*Administering Agency:* United States Department of Agriculture (USDA) Rural Development

*Eligible Applicants:* Energy project developers for distributed energy projects; Electric Program borrowers or other utilities that serve rural areas.

*Uses:* For projects loans, there are (3) typical situations: (1.) Existing borrower (cooperative) owns and operates the project. (2.) A project developer builds and operates the project that has PPA's to serve rural customers such as existing RUS borrowers and/or other off-takers. (3.) A wholly-owned subsidiary of an existing RUS borrower owns and operates the project and has a PPA with the RUS borrower to take the entire output. If an existing borrower (cooperative) owns and operates the project, the situation is treated just like a traditional system loan where the cooperative owns the project and it is in an addition to its utility plant.

#### **Notes**

Scenario: If a project developer builds and operates the project that has a PPA to serve rural customers such as an existing RUS borrower and/or other off-takers, the project developer/owner is the RUS borrower and the loan underwriting and security requirements include special conditions. Such conditions include (1.) Equity: RUS requires a minimum of 25% cash equity at the start of the project, and 25% to 30% through the life of the project (over the 10 years LRFF). The maximum RUS loan amount may be up to 75% of the total project costs. (2.) Long-Term Financing: RUS does not provide construction lending. An RUS project loan is permanent financing that takes out short-term construction financing. (3.) Typical Loan Tenure: 20 years for solar and interest rates are low (about Treasury \*1/8).

### **Electric Infrastructure Loan & Loan Guarantee Program**

#### **Federal Loan & Loan Guarantee**

*Administering Agency:* United States Department of Agriculture (USDA) Rural Utilities Service

*Eligible Applicants:* State and local government entities, federally-recognized Tribes, nonprofits including cooperatives and limited dividend or mutual associations, and for-profit businesses (must be a corporation or LLC).

*Uses:* Maintenance, upgrades, expansion, replacement of distribution, sub-transmission and headquarters (service or warehouse) facilities, energy efficiency, and renewable energy systems.

*Amount:* Loan guarantees of up to 100% allow the Federal Financing Bank (FFB) to extend credit to qualified borrowers in rural areas. 100% of the construction work can be financed. Hardship loans may also be used, at the discretion of the RUS, to assist applicant in rural areas that are either economically distressed or recovering from an unavoidable event, such as a natural disaster.

#### **Notes**

Loan Guarantees and Treasury Rate Loans are fixed at the time of each advance based on rates established daily by the United States Treasury plus 1/8<sup>th</sup> of 1%. Hardship Loan interest rates are fixed at a rate of 5% for up to 35 years. All facilities receiving federal financing must be used for public purpose. Partnerships with other federal, state, local, private, and non-profit entities are encouraged.

### **Waste & Waste Disposal Loan & Grant Program**

#### **Federal Grant & Loan**

*Administering Agency:* United States Department of Agriculture (USDA) Rural Development

*Eligible Applicants:* Most state and local government entities, private nonprofits, and federally-recognized Tribes.





Uses: Funds may be used to finance the acquisition, construction, or improvement of: Drinking water sourcing, treatment, storage, and distribution; sewer collection, transmission, treatment, and disposal; solid waste collection, disposal, and closure; storm water collection, transmission, and disposal. In some cases, funding may also be available for related activities such as legal and engineering fees, land acquisition, water and land rights, permits, equipment, start-up operations and maintenance, interest occurred during construction, purchase of facilities to improve service or prevent loss of service, and other costs determined to be necessary for completion of the project.

Notes

There is an up to 40-year payback period, based on the useful life of the facilities financed. Interest rates are fixed and determined based on the need for the project and the median household income of the area to be served. All facilities receiving federal financing must be used for a public purpose. Partnerships with other federal, state, local, private, and nonprofit entities that offer financial assistance are encouraged. Projects must also be financially sustainable.

Economic & Fiscal Impacts Analysis Summary

As can be seen in below Table 18, the reuse strategy creating the most direct permanent jobs is a Logistics/Distribution Center (205.0). This strategy will also result in the most total economic output for the region (\$45,532,039). In terms of total economic output, a 2nd natural gas plant comes in second place, with a total economic output of \$39,085,436. It is important to note, however, that this reuse strategy will result in the creation of far fewer direct permanent jobs (35.0). The reuse option with the lowest total economic output is a Wood Waste Recycling Facility, with a total economic output of \$3,788,917. This reuse strategy will result in the creation of 10 permanent direct jobs.

- The reuse strategy with the highest job creation and total economic output figures was a Logistics/Distribution Center (205 jobs; \$45,532,039)
• The Second Natural Gas Plant reuse strategy also resulted in significant economic output (\$39,085,436)
• The reuse strategy with the lowest economic output was the Wood Waste Recycling Facility (\$3,788,917)

Table with 5 columns: Category, Direct, Indirect, Induced Effect, Total. It contains three sub-tables for '2ND NATURAL GAS PLANT', 'SOLAR ENERGY', and 'LOGISTICS/DISTRIBUTION CENTER', each with rows for Jobs, Labor Income, and Total Output. Source: IMPLAN.



JOBS	205.0	26.0	95.0	326.0
LABOR INCOME	\$13,100,172	\$1,921,675	\$4,700,862	\$19,722,708
TOTAL OUTPUT	\$26,250,000	\$5,598,631	\$13,683,407	\$45,532,039

SOURCE: IMPLAN

**HYDROPONIC GREENHOUSE OR GROWING FACILITY**

	DIRECT	INDIRECT	INDUCED EFFECT	TOTAL
JOBS	36.0	8.7	10.1	54.81
LABOR INCOME	\$1,216,626	\$385,458	\$496,531	\$2,098,615
TOTAL OUTPUT	\$2,796,984	\$921,602	\$1,445,848	\$5,164,434

SOURCE: IMPLAN

**DATA CENTER**

	DIRECT	INDIRECT	INDUCED EFFECT	TOTAL
JOBS	24.0	26.0	23.5	73.52
LABOR INCOME	\$2,131,867	\$1,559,880	1,156,167	\$4,847,914
TOTAL OUTPUT	\$6,508,879	\$4,106,859	\$3,367,293	\$13,983,031

SOURCE: IMPLAN

**WOOD WASTE RECYCLING FACILITY**

	DIRECT	INDIRECT	INDUCED EFFECT	TOTAL
JOBS	10.0	5.6	6.0	21.55
LABOR INCOME	\$542,992	\$400,620	294,214	\$1,237,827
TOTAL OUTPUT	\$1,867,402	\$1,064,697	\$856,818	\$3,788,917

SOURCE: IMPLAN

In terms of annual tax revenue (Table 1) created by the proposed reuse strategies, a second Natural Gas Plant would create the most yearly tax revenue (\$2,572,120). A Logistics/Distribution Center would create the second highest amount of total yearly tax revenue (\$1,543,009). Every other proposed reuse would result in a total yearly tax revenue in the mid-low six-figure range, with a Wood Waste Recycling Facility creating the least tax revenue (\$113,100).

- The reuse strategy with the highest total yearly tax revenue is a second Natural Gas Plant (\$2,572,120)
- A Logistics/Distribution Center would result in the second highest total yearly tax revenue (\$1,543,009)
- The reuse strategy with the lowest total yearly tax revenue is a Wood Waste Recycling Facility (\$113,100)

**TABLE 19: ESTIMATED ANNUAL TAX REVENUE AT FULL BUILDOUT**

	EMPLOYEE COMPENSATION	PROPRIETOR INCOME	TAX ON PRODUCTION AND IMPORTS	HOUSEHOLDS	CORPORATIONS	TOTAL
NATURAL GAS PLANT	\$5,516	\$0	\$2,156,278	\$348,704	\$61,622	\$2,572,120
SOLAR ENERGY	\$357	\$0	\$221,482	\$28,494	\$11,581	\$261,914

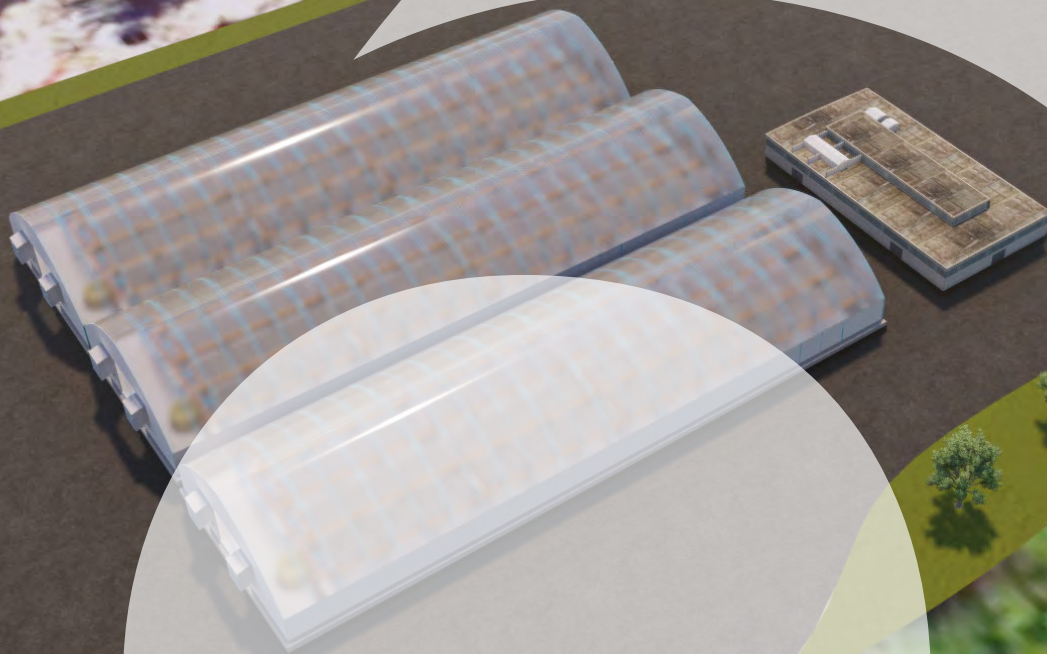


## PLAYBOOK | SUNBURY GENERATION POWER PLANT

LOGISTICS/DISTRIBUTION CENTER	\$9,804	\$0	\$898,310	\$534,402	\$100,493	\$1,543,009
WOOD WASTE RECYCLING FACILITY	\$573	\$0	\$72,214	\$33,712	\$6,601	\$113,100
HYDROPONIC GREENHOUSE OR GROWING FACILITY	\$855	\$0	\$124,966	\$57,637	\$9,868	\$193,326
DATA CENTER	\$2,446	\$0	\$293,248	\$131,212	\$22,330	\$449,236

Source: IMPLAN

# RECOMMENDED ACTIONS & SCHEDULE HIGHEST & BEST USE





## Recommended Actions & Schedule Highest & Best Use

### DCED & Local Community Economic Development Action Steps

As part of the implementation of the Playbook, the Pennoni team strongly recommends that DCED continue serving a lead role in the redevelopment of the Sunbury site. This role involves coordination of permit approvals for multiple federal, state and local agencies, marketing of the site, and supporting public funding opportunities from multiple sources. Action Steps that will help with redevelopment involve:

- ✓ **Work with regional development entities to prioritize this site for redevelopment.** DCED can work with local and regional entities to advocate priority consideration for federal and state funding.
- ✓ **Continue coordination and collaboration with developer(s).** Market this facility as a premier opportunity to prospective developers and facilitate cooperation between prospects, owner and regulatory agencies.
- ✓ **Roll-out and market the Playbook and the energy-intensive development opportunities.** This Playbook presents real and opportunistic development of the energy sector, manufacturing and intensive energy users that will be attractive to prospective developers.
- ✓ **Support engineering and design studies, to determine the cost and feasibility of site improvements.** There is further engineering and design required to determine the magnitude of transportation access and site development required to get the Sunbury site ready for development. The study and analysis are required to secure various state and federal funding resources.
- ✓ **Coordinate with various state and federal agencies on permit approvals required for redevelopment.** Because portions of the site were used to store coal and bury fly ash, PADEP is a key stakeholder for permit approval. DCED should facilitate coordination of agency reviews and permitting as development opportunities require.
- ✓ **Develop a multi-phased and multi-layered funding strategy to improve transportation access and foster redevelopment.** Although a list of sources and uses of funding for the Sunbury site has been developed, these funding opportunities will change based on timing and development opportunities. DCED can play a lead role in the coordination of potential funding resources and requirements. DCED can also help elevate the site's standing with federal funding audiences. The Pennoni team has identified several funding resources to assist with development. These include the following:
  - Appalachian Regional Commission (ARC) Access Road Grant
  - ARC POWER Grant
  - DCED Business in our Sites (BIOS) Grant or Loan
  - DCED Multimodal Transportation Grant
  - DCED Industrial Site Reuse Program (ISRPP)
  - PennDOT Multimodal Transportation Grant
  - PA Redevelopment Assistance Capital Grant (RACP)
  - USDA Rural Development Business and Industry Loan Guarantees
  - USDA Rural Development Distributed Generation Energy Project Financing
  - USDA Rural Development Electric Infrastructure Loan and Loan Guarantee Program
  - USDA Rural Development Water and Waste Disposal Loan and Grant Program

# APPENDICES





## Appendices

### Appendix A - References

#### References

NFIP Flood Insurance Rate Map, Map Number 42109C0155D, Effective Date November 16, 2007

<https://msc.fema.gov/portal/search>

Type **Hummels Wharf, Pennsylvania** into the address search box

Click **Map Image**

A new window will appear with a Read Me document as well as a PNG file. Click the PNG file to open the FIRM

#### Public Water Service

*Environmental Covenant, Sunbury Generation LP, Grantor/Grantee, PIN 16-03-001A*

*Shamokin Dam Borough 2018 Water / Sewer Rates*

*Aqua Pennsylvania, Inc. GIS Viewer Facility Map*

*Aqua Pennsylvania, Inc. Schedule of Rates, Effective: June 8, 2012*

*Aqua Pennsylvania, Inc. Schedule of Meter Rates, Effective: July 1, 2014*

#### Public Wastewater Services

*Shamokin Dam Borough 2018 Water / Sewer Rates*

*Map of Hummels Wharf Municipal Authority Comprehensive Map of Sanitary Sewers, April 2016*

*Map of Selinsgrove Municipal Authority Wastewater Collection System, February 1975*

*Eastern Snyder County Regional Authority, Rules and Regulations, Snyder County, PA*

*Hummels Wharf Municipal Authority, Rates, Rules, and Regulations*

*Hummels Wharf Municipal Authority, Map of Sanitary Sewers*

*Pennsylvania Stormwater Best Management Practices Manual, December 30, 2006*

*Chapter 7, Special Management Areas (Brownfields, Highways and Roads, Karst Areas, Mined Lands, Water Supply Well Areas, Surface Water Supplies and Special Protection Waters)*

<http://pecpa.org/wp-content/uploads/Stormwater-BMP-Manual.pdf>

#### Environmental Covenant for Sunbury Generation LP

<http://www.depgis.state.pa.us/AulJavascript/pdfHandler.ashx?Doc=MjE4MDA5&ext=PDF>

<http://www.depgis.state.pa.us/AulJavascript/pdfHandler.ashx?Doc=MjE5NzE1&ext=PDF>

#### Highway Network

- Central Susquehanna Valley Transportation Project
  - Project Overview Map  
<http://www.csvt.com/maps/pdfs/Project-Overview.pdf>
  - Southern Section Map  
[http://www.csvt.com/maps/pdfs/58758\\_Board13-EastAlt-04\\_May2018.pdf](http://www.csvt.com/maps/pdfs/58758_Board13-EastAlt-04_May2018.pdf)
- PennDOT Shamokin Dam Borough Map  
[http://www.dot7.state.pa.us/BPR\\_pdf\\_files/Maps/Type5/54405.pdf](http://www.dot7.state.pa.us/BPR_pdf_files/Maps/Type5/54405.pdf)
- PennDOT Monroe Township Map  
[http://www.dot7.state.pa.us/BPR\\_pdf\\_files/Maps/Type5/54208.pdf](http://www.dot7.state.pa.us/BPR_pdf_files/Maps/Type5/54208.pdf)

#### Railroad Network

PennDOT Pennsylvania Railroad Map

[http://www.dot7.state.pa.us/BPR\\_PDF\\_FILES/MAPS/Statewide/parail.pdf](http://www.dot7.state.pa.us/BPR_PDF_FILES/MAPS/Statewide/parail.pdf)



## **Appendix B - Phase I Environmental Site Assessment**

Excerpts from the Phase I Environmental Site Assessment are presented in this report. Included are the environmental assessment narrative report, Figures (Appendix A), and Photographs (Appendix B). The full Phase I Environmental Site Assessment document (789 pages) will be made available upon request.



# PHASE I ENVIRONMENTAL SITE ASSESSMENT

*Former Sunbury Power Generation  
2384 North Old Trail Road  
Shamokin Dam Borough and Monroe Township, Pennsylvania 17876*



*Submitted To:*

**Commonwealth of Pennsylvania**  
Department of Community and Economic Development  
400 North Street, 4th Floor | Harrisburg, PA 17120-0225

*Submitted By:*

**Pennoni Associates Inc.**  
1215 Manor Drive, Suite 100  
Mechanicsburg, Pennsylvania 17055



Richard C. Mance, PG  
Project Environmental Scientist



Daniel C. Leandri, PE  
Environmental Division Manager

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## EXECUTIVE SUMMARY

On behalf of the Commonwealth of Pennsylvania Department of Community and Economic Development (Client), Pennoni Associates Inc. (Pennoni) has performed a Phase I Environmental Site Assessment (ESA) of select portions of Sunbury Power Generation, located on North Old Trail Road in Shamokin Dam Borough and Monroe Township, Snyder County, Pennsylvania (subject property). The subject property consists of three (3) parcels of land totaling approximately 160 acres;

- Parcel 12-09-102 located at the southern end of the site is the ash impoundment associated with former coal power generation plant;
- Parcel 16-03-001A located at the northern end of the site is the former coal storage area associated with the former coal power generation plant;
- Parcel 16-03-077 located at the northeastern end of the site is a former residential parcel, now utilized as for construction access associated with the new Panda Hummel natural gas powered generation station.

The subject property is currently developed with four (4) permanent structures:

- One (1) 3,564 square foot pump house building (in use);
- One (1) 2,040 square foot 2-story former rail service building (used for storage);
- One (1) 16,320 square foot 1-story former rail car thawing building (vacant); and
- One (1) 630 square foot 1-story guard house at Gate 1 (in use).

Not included in the scope of this Phase I ESA were the following areas;

- The newly constructed Panda Hummel Power Station;
- The PP&L Switch Yard currently undergoing upgrades;
- The former Sunbury Power Generation Turbine Building and associated buildings (The former Sunbury Power Generation Station is scheduled for demolition).

Pennoni conducted the ESA in general conformance with the scope and limitations of the American Society for Testing and Materials (ASTM) Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, Designation E 1527-13. ASTM E 1527-13 is a voluntary consensus standard that constitutes “all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice.” The procedures included in the ASTM E 1527-13 standard comply with the United States Environmental Protection Agency (USEPA) 40 CFR Part 312, Standards and Practices for All Appropriate Inquiries; Final Rule.

The primary objective of the Phase I ESA was to identify **recognized environmental conditions (RECs)** in connection with the subject property. A **REC** is defined as the presence or likely presence of any hazardous substance or petroleum products in, on, or at a property: (1) due to release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. An additional objective of a Phase I ESA is to identify **controlled recognized environmental conditions (CRECs)** and **historic recognized environmental conditions (HRECs)**. A **CREC** is defined as a REC resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority, with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls. An **HREC** is defined as a past release of any hazardous substances or petroleum products that has occurred in connection with the property and has been addressed to

the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria established by a regulatory authority, without subjecting the property to any required controls.

To identify RECs, CRECs, and HRECs in connection with the subject property, Pennoni’s Phase I ESA included a records review, site reconnaissance, interviews with owners, operators, and occupants of the subject property, interviews with local government officials, review of regulatory records held by state and federal agencies, a review of information provided by the User (i.e., the party seeking to complete an environmental site assessment of the subject property), and preparation of a report presenting Pennoni’s findings, opinions, conclusions and supporting documentation. The Phase I ESA for the subject property did not include any testing or sampling of materials (e.g., soil, water, air, building materials).

Our findings, opinions, and conclusions regarding RECs, CRECs, and HRECs in connection with the subject property are summarized below. Results of our evaluation of de minimis and non-scope considerations including wetlands, and radon are also summarized below.

**Findings and Opinion**

The key findings of Pennoni’s Phase I ESA for the subject property are presented in the table below.

**FINDINGS SUMMARY TABLE**

Area of Concern	Not Identified/No Significant Finding	<i>De minimis</i>	ASTM Non-Scope	REC/HREC/CREC	Further Action Needed
Historical Review				X	No
On-Site Industrial Operations				X	No
User Provided Information				X	No
Adjoining Properties of Concern	X				No
Regulatory Agency Review				X	No
Hazardous Substances		X			No
Storage Tanks	X				No
Floor Drains/Sumps	X				No
Other Issues – stains and corrosion, drains, sumps, stressed vegetation, solid waste, septic systems, etc.				X	No
PCBs		X			No

Area of Concern	Not Identified/No Significant Finding	<i>De minimis</i>	ASTM Non-Scope	REC/HREC/CREC	Further Action Needed
Potential Vapor Migration Pathways	X				No
Asbestos-Containing Materials			X		Yes
Lead-Based Paint			X		Yes
Lead in Drinking Water	X				No
Wetlands			X		No
Radon	X				No
Mold	X				No

### Conclusions

This assessment has identified no RECs or HRECs in connection with the subject property; however, Pennoni has identified the following CRECs in connection with the subject property:

- The former ash impoundment area is in final stages of closure, as of the date of this report. An extension for closure was requested and approved by PADEP for completion of the closure by August 31, 2018. Additionally, post closure maintenance will be required. The fly ash contained within the impoundment is considered Coal Combustion Residue (CCR), and therefore regulated by US EPA. Any remediation activities will require appropriate handling and disposal. The impoundment structure is regulated by the PADEP as a High Hazard Dam, therefore any potential impacts or development within the area of the impoundment would require coordination with the PADEP Bureau of Dam Safety.
- The former coal storage yard has obtained Act 2 release of liability, as of June 18, 2015, under site specific non-residential standard for groundwater, which includes post attainment maintenance requirements.
- A former aboveground storage tank farm was present on the subject property, but was decommissioned and received final closure from PADEP. All other tanks present on the subject property are currently registered with the PADEP, as required.

Pennoni has identified the following de minimis conditions in connection with the subject property:

- PCBs may be present in fluorescent light fixtures in the buildings
- CFCs may be present within air conditioning units in the Guard House
- Mercury may be present in the lamps and tubes in the four (4) onsite buildings.

In addition, Pennoni has identified the following ASTM Non-Scope Consideration in connection with the subject property:

- Based on the age of the structures on the subject property, asbestos containing materials (ACM), lead based paint, and hazardous/universal wastes may be present in the four (4) buildings included in this assessment.
- NWI Mapped wetlands are shown on the subject property; however, these areas are related to stormwater management facilities. As long as these facilities are continued to be permitted and maintained, no issue with wetlands are anticipated. Wetlands may also be present along the fringe of the property, depending upon future development, a wetland and watercourse identification should be completed.

## 1.0 INTRODUCTION

On behalf of the Commonwealth of Pennsylvania Department of Community and Economic Development (Client), Pennoni Associates Inc. (Pennoni) has performed a Phase I Environmental Site Assessment (ESA) of select portions of former Sunbury Power Generation, located on North Old Trail Road in Shamokin Dam Borough and Monroe Township, Snyder County, Pennsylvania (subject property). The subject property consists of three (3) parcels of land totaling approximately 160 acres;

- Parcel 12-09-102 located at the southern end of the site is the ash impoundment associated with former coal power generation plant;
- Parcel 16-03-001A located at the northern end of the site is the former coal storage area associated with the former coal power generation plant;
- Parcel 16-03-077 located at the northeastern end of the site is a former residential parcel, now utilized as for construction access associated with the new Panda Hummel natural gas powered generation station.

The subject property is developed with four (4) permanent structures: one (1) 3,564 square foot pump house building, still in use by the Panda Hummel Station, one (1) 2,040 square foot 2-story former rail service building currently used for storage; one (1) 16,320 square foot 1-story former rail car thawing building, not in use, and one (1) 630 square foot guard house at Gate 1, currently in use.

Not included in this ESA were the following areas;

- The newly constructed Panda Hummel Power Station;
- The PP&L Switch Yard, currently undergoing upgrades;
- The former Sunbury Power Generation Turbine Building and associated buildings. The former Sunbury Power Generation Station is scheduled for demolition. Environmental assessment and remediation of this area is to be performed under a separate project.

Pennoni conducted the Phase I ESA in general conformance with the scope and limitations of the American Society for Testing and Materials (ASTM) Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, Designation E 1527-13. The procedures included in the ASTM E 1527-13 standard comply with the United States Environmental Protection Agency (USEPA) 40 CFR Part 312, Standards and Practices for All Appropriate Inquiries; Final Rule.

ASTM E 1527-13 is a voluntary consensus standard that constitutes “all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice.” The ASTM practice is intended to permit a User (i.e., the party seeking to complete an environmental site assessment of the subject property, in this case, the Client) to satisfy one of the requirements to qualify for the innocent landowner, contiguous property owner, or bona fide prospective purchaser limitations on Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) liability (i.e., landowner liability protections or LLPs). The practice does not address whether requirements in addition to all appropriate inquiry have been met in order to qualify for LLPs (e.g., continuing obligations not to impede the integrity and effectiveness of activity and use limitations (AULs), the duty to take reasonable steps to prevent releases, or the duty to comply with legally required release reporting obligations).

ASTM E 1527-13 does not include any testing or sampling of materials (e.g., soil, water, air, building materials).



This report presents the findings, opinions, and conclusions, and supporting documentation for the Phase I ESA of the subject property, completed by Pennoni as of the date of this report. Information made available to Pennoni after this date, which would change the conclusions of this report, will be forwarded upon receipt.

### 1.1 PURPOSE

The purpose of the assessment was to identify recognized environmental conditions (RECs), controlled environmental conditions (CRECs) and historic environmental conditions (HRECs) in connection with the subject property. A **REC** is defined as the presence or likely presence of any hazardous substance or petroleum products in, on, or at a property: (1) due to release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. A **CREC** is defined as a REC resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority, with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls. An **HREC** is defined as a past release of any hazardous substances or petroleum products that has occurred in connection with the property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria established by a regulatory authority, without subjecting the property to any required controls.

### 1.2 SCOPE OF WORK

Pennoni's Phase I ESA for the subject property included a records review, site reconnaissance, interviews with owners, operators, and occupants of the subject property, interviews with local, state, and federal government officials, review of information provided by the User, and preparation of this report presenting Pennoni's findings, opinions, conclusions and supporting documentation.

The environmental professionals responsible for the preparation of this Report have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. The Report was reviewed by Mr. Daniel C. Leandri, PE, Environmental Division Manager of Pennoni Associates Inc. Mr. Leandri was supported by various staff, including Richard Mance, Project Environmental Scientist with Pennoni who conducted the site reconnaissance and prepared this report. Mr. Leandri meets the definition of an "Environmental Professional" as defined in the ASTM standard and AAI regulation. The Environmental Professional statement and signature are presented in Section 10.0 of this report.

### 1.3 LIMITATIONS, EXCEPTIONS, SPECIAL TERMS AND CONDITIONS

Pennoni conducted a Phase I ESA of the subject property in general conformance with the scope and limitations of ASTM Standard E 1527-13. The Phase I ESA for the subject property did not deviate from this standard. Data gaps that would affect the ability of the environmental professional to identify conditions indicative of releases or threatened releases of pollutants, contaminants, petroleum and petroleum products are identified in Section 9.0 of this report.

This Phase I ESA is presumed to be valid provided it has been completed less than 180 days prior to the acquisition of the subject property or the date of the intended transaction. Recognizing that the passage

of time affects the information provided in the reports; our opinions relating to site conditions are based upon information that existed at the time our conclusions were formulated.

#### **1.4 USER RELIANCE**

This Report and findings, conclusions, and recommendations contained herein, are furnished for the sole use and benefit of the Client to aid in understanding the environmental conditions and potential liabilities of the subject property. This Report may not be assigned, quoted, reproduced, relied upon, or otherwise used without the express prior written consent of Pennoni.

All documents prepared by Pennoni Associates Inc. are the instruments of service in respect of the project. They are not intended or represented to be suitable for reuse by owner or others on extensions of the project or on any other project.

Any reuse without the written verification or adaptation by Pennoni Associates Inc. for the specific purpose intended will be at owner's sole risk and without liability or legal exposure to Pennoni Associates and owner shall indemnify and hold harmless Pennoni Associates Inc. from all claims, damages, losses, and expenses arising out of or resulting there from.

## 2.0 SUBJECT PROPERTY DESCRIPTION

The following paragraphs provide a description of the subject property including its location, general characteristics, and current use. Current uses of adjoining properties and properties in the surrounding area are also described below.

### 2.1 PROPERTY LOCATION AND LEGAL DESCRIPTION

The subject property is located within Shamokin Dam Borough (northern portion) and Monroe Township (southern portion), Snyder County, Pennsylvania along the southern side of North Old Trail Road at its intersection with East 8<sup>th</sup> Avenue. The property can be found on the United States Geological Survey (USGS) 7.5-minute topographic quadrangle for Sunbury, Pennsylvania, at map coordinates longitude - 76.8269530 West, latitude 40.8367630 North. A copy of the topographic map is provided in Appendix A.

The subject property is identified on the Snyder County GIS website as the following tax parcels:

- 12-09-102 (Monroe Township)
- 16-03-001A (Shamokin Dam Borough)
- 16-03-077 (Shamokin Dam Borough)

A copy of a tax parcel map depicting the subject property, from information on the Snyder County GIS website is included in Appendix A.

### 2.2 SUBJECT PROPERTY CHARACTERISTICS

The following describe the general characteristics of the subject property, including its current use and a description of structures, roads, and other improvements (i.e., heating/cooling system, sewage disposal, source of potable water, etc.) on the subject property.

#### 2.2.1 CURRENT USE OF THE SUBJECT PROPERTY

The subject property consists of three (3) parcels of land totaling approximately 160 acres developed with three (3) structures.

A majority of the subject property is open land; with the southern parcel including the ash impoundment associated with the former Sunbury coal fire generation plant. The impoundment is currently being upgraded with a cap under the Pennsylvania Department of Environmental Protection's Solid Waste Management Division. The northern parcel is the former coal storage/hopper area for the former Sunbury coal fire generation plant. A large majority of the coal has been removed and gravel lanes added. Historic stormwater ponds may contain residual coal and coal fines within this area. The area is currently used as a laydown area for equipment and materials for construction of the Panda Hummel Power Station. Reportedly, tunnels for coal movement remain under the area. The tunnels are not within the scope of this Phase I ESA, and thus were not accessed; therefore, size or condition of the tunnels was not determined. The

northeastern parcel is a former residential parcel, now utilized as for construction access associated with the new Panda Hummel natural gas powered generation station

### 2.2.2 SITE STRUCTURES

The land is improved with four (4) structures. Three (3) of the buildings are located on parcel 16-03-001A and include:

- One (1) 3,564 square foot pump house building, recently refurbished with new pumping equipment and water gates;
- One (1) 2,040 square foot 2-story former rail service building currently used for storage of construction materials; and
- One (1) 16,320 square foot 1-story former rail car thawing building, currently vacant.

One (1) structure located on parcel 12-09-102 includes a 630 square foot Guard House currently in use at Gate 1.

### 2.2.3 SITE UTILITIES

Utilities currently in service at the subject property were not investigated. Sewage is reportedly collected by an onsite septic system for the Gate 1 Guard Building.

## 2.3 CURRENT USES OF ADJOINING PROPERTIES AND PROPERTIES IN THE SURROUNDING AREA

Adjoining properties, and properties and roads in the area surrounding the subject property, are identified below.

- North – Residential houses and commercial properties are to the north, with wooded land to the adjacent north of the subject property;
- South – Shady Nook residential housing is to the adjacent south of the subject property.
- East – The Susquehanna River is to the east of the subject property. A remnant of a historic canal runs parallel between the river and subject property.
- West – Residential houses and commercial properties are to the west of the subject property.

### 3.0 USER PROVIDED INFORMATION

#### 3.1 ENVIRONMENTAL LIENS AND/OR ACTIVITY AND USE LIMITATIONS

Mr. Joe Zokaites, Arcova Development LLC, is not aware of any environmental liens that are filed or recorded against the subject property. Furthermore, he is aware of activity and use limitations (AULs) (e.g., engineering controls, land use restrictions, or institutional controls) that are in place on the ash impoundment area of the subject property, restricting residential development, that have been filed or recorded in a registry under federal, tribal, state, or local law. Pennoni reviewed the current deed lien searches for the subject property as part of this Phase I ESA; based upon this review, Pennoni has concluded that the subject property is not subject to environmental liens; however, AULs are in place in association with Parcels 12-09-102 and 16-03-001A.

#### 3.2 SPECIALIZED KNOWLEDGE OR EXPERIENCE OF THE USER

Mr. Zokaites has specialized knowledge and experience related to the subject property. Since the 1940s, electricity has been produced from coal fired generators, first as Sunbury Steam Electric, and since 1996, as Sunbury Generation LP. Mr. Zokaites reported that the coal storage area was reclaimed under Act 2 compliance. The ash impoundment is undergoing closure through the PADEP Solid Waste Program. Closure is approximately 90% complete.

#### 3.3 ACTUAL KNOWLEDGE OF THE USER

Mr. Zokaites has knowledge of Activity Use Limitations (AULs) encumbering ash impoundment on the southern portion of the subject property.

#### 3.4 VALUATION REDUCTION FOR ENVIRONMENTAL ISSUES

Mr. Zokaites did not disclose the prospective purchase price for the subject property; therefore, Pennoni is unable to comment on whether the purchase price being paid for subject property reasonably reflects the fair market value of the subject property.

#### 3.5 COMMONLY KNOWN OR REASONABLY ASCERTAINABLE INFORMATION

Mr. Zokaites has reported commonly known or reasonably ascertainable information about the property that would help the Environmental Professional to identify conditions indicative of releases or threatened releases.

#### 3.6 DEGREE OF OBVIOUSNESS

Based on his knowledge and experience related to the subject property, Mr. Zokaites is not aware of any obvious indicators that point to the presence or likely presence of major contamination at the subject property.

### 3.7 PURPOSE OF THE PHASE I ESA

The purpose of this Phase I ESA is to qualify for a Landowner Liability Protection (LLP) to Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) liability.

## 4.0 PHYSICAL SETTING

### 4.1 TOPOGRAPHY/REGIONAL DRAINAGE

The subject property is located on the Sunbury, Pennsylvania 7.5-minute USGS topographic quadrangle at an approximate elevation of 465 feet above mean sea level. Surface water on the subject property is expected to drain into the pervious portions and into stormwater ponds, which discharge to the Susquehanna River, located adjacent, to the east of the subject property.

### 4.2 SOILS

A review of the United States Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS) *Web Soil Survey* revealed that the predominant soils (89.3 present on the subject property) consist of Urban Land (Ur) – typically human transported materials so altered by earth moving or so obscured by buildings and other structures, that original soils cannot be identified. Soils on the subject property include:

- Urban Land – 89.3% of the subject property including the northern portion of the ash impoundment, the power station and switchyard, and the coal storage area.
- Basher Soils – 1.2% of the subject property on the western property line.
- Barbour-Linden Complex – 0.3% of the subject property on the western property line,
- Water – 9.2% of the subject property on the southern portion of the ash impoundment and one of the stormwater ponds on the northern portion of the subject property.

### 4.3 UNDERLYING FORMATION

Based on published data, the underlying rock on the subject property is classified as the Devonian Age Hamilton Group, Devonian Age Onondaga and Old Port Formations; where undivided, and the Devonian and Silurian Age Keyser and Tonoloway Formations; where undivided.

The Hamilton Group is divided into the Marcellus and Mahantango Formations. The Marcellus formation consists of black carbonaceous shales with rare thin limestone beds and concretions found in the lower portion of the formation. Bedding is mostly well developed and is fissile to thin. The limestone layers are more thickly bedded, and limestone concretions tend to be massive, disrupting bedding in their location. Joints are poorly formed, moderately abundant, closely spaced, open and steeply dipping. Some joints are occupied by calcite. Joint, fault and bedding plane openings provide a secondary porosity of low magnitude. The permeability of the Marcellus Formation is low.

The Mahantango Formation is composed of olive to tan shale, argillaceous limestone, siltstone, fine grained sandstone and calcareous claystone. Bedding is more variable than in the Marcellus Formation, with most bedding being well developed with thin to medium bedding. The shales and siltstones tend to be thinly bedded, while the limestones and sandstones show thicker bedding. Joints and fractures are well developed, steeply dipping and open. Joint and bedding openings provide a secondary porosity of low to moderate magnitude. The permeability of the Mahantango Formation is low.

The Onondaga Formation consists of olive green weathered, medium gray limestone and calcareous shale. Claystone is present in the lower portion of the formation. Bedding within the formation is flaggy to thick and well developed. Jointing is fairly well developed, moderately abundant to closely spaced, and are open and vertical. The formation has good surface drainage. Joint and bedding openings provide a secondary porosity of moderate magnitude. The permeability of the formation is low to moderate.

The Old Port Formation consists of fine to very coarse-grained light gray sandstone; dark gray to black chert gray-brown silty to very sandy shale, siltstone and medium to dark gray calcareous shale with interbedded light-medium gray limestone. The formation is well bedded, with beds ranging from thin to massive. Joints are well developed, highly abundant, closely to moderately spaced, and open and filled with calcite. The formation has good surface drainage. In part of the formation, porosity may be greater than 20%. Permeability of the formation is high.

The Tonoloway Formation consists of medium gray limestone containing interbedded zones of gray to olive gray shale and siltstone. The Keyser Formation overlies the Tonoloway Formation and consists of dark gray, highly fossiliferous, crystalline to nodular limestone. The rocks in both formations are well bedded and flaggy to thick. Joints have a platy pattern, are moderate to highly abundant and exhibit regular spacing. Fractures are open and steeply dipping. Joint and bedding openings provide a secondary porosity of moderate magnitude. The formations have low to moderate permeabilities.

#### **4.4 GROUNDWATER**

Groundwater is expected to flow to the east, parallel to the surface gradient. Deep groundwater would be expected to be located in the joints and fractures of the underlying formation. In order to further determine groundwater conditions on the subject property; however, a property-specific hydrogeologic investigation would be necessary.

#### **4.5 WATER MIGRATORY PATHWAYS**

Potential migratory pathways for surface water and groundwater entering and exiting the subject property are important in establishing the potential for surrounding areas to impact the subject property or for the subject property to impact neighboring properties that are downgradient. Local topography slopes to the south and east. Surface water and groundwater, therefore, are expected to migrate from the properties located to the north and west and into swales located along the western edge of the subject property. Storm drainage and surface water flow, drain into the pervious portions of the subject property and stormwater ponds, discharging into the Susquehanna River, located adjacent, to the east of the subject property.



## 5.0 HISTORICAL RECORDS

The purpose of consulting historical records is to develop a history of the previous uses of the subject property and surrounding area in order to help identify the likelihood of past uses having led to RECs in connection with the subject property.

ASTM E 1527-13 requires identification of all obvious uses of the subject property from the present, back to the subject property's first developed use (including agricultural uses and placement of fill dirt), or back to 1940, whichever is earlier. As such, Pennoni reviewed as many of the standard historical sources (i.e., aerial photographs, fire insurance maps, property tax files, recorded land title records, USGS topographic maps, local street directories, building department records, zoning/land use records, etc.) as were necessary and both reasonably ascertainable and practically reviewable (i.e., publicly available, obtainable from its source within reasonable time and cost constraints). In addition, the historical sources must be determined to be sufficiently useful by the environmental professional.

### 5.1 HISTORIC MAPS

A historical map (i.e., Sanborn Fire Insurance Maps) inquiry was placed with Environmental Data Resources, Inc. (EDR) of Milford, Connecticut for the subject property. However, Sanborn Fire Insurance Maps were not available for the subject property. A copy of documentation stating that there is no Sanborn Fire Insurance Map coverage for the subject property is included in Appendix C.

### 5.2 HISTORICAL AERIAL PHOTOGRAPHS

Available aerial photographs were obtained from Environmental Data Resources, Inc. (EDR) of Milford, Connecticut, in an effort to determine past uses and conditions of the subject property. Aerial photographs were reviewed for the years 1938, 1957, 1959, 1963, 1969, 1970, 1973, 1983, 1988, 1993, 1999, 2005, 2010, and 2015 with varying scales. Copies of the aerial photographs reviewed by Pennoni are included in Appendix A. The following is a brief narrative of the aerial photographs reviewed:

- 1938 – The subject property is observed to be a mixture of farm land with some wooded land. Scattered residential development is shown on North Old Trail Road.
- 1957 – The subject property has been developed with the coal fired power station, switchyard, and coal storage to the north. The ash impoundment area shows little activity.
- 1959 – No changes to the subject property with the exception of the ash impoundment; ash movement appears, with a pond added in the southernmost portion of the ash impoundment area. West of the subject property shows increased development.
- 1963 – No significant changes to the subject property from the 1959 photograph; additional development west of the subject property.
- 1969 – No significant changes to the subject property from the 1963 photograph; additional development west of the subject property.

- 1970 – No significant changes to the subject property or surrounding areas were observed from the 1969 photograph.
- 1973 – No significant changes to the subject property were observed from the 1970 photograph; additional development west of the subject property.
- 1983 – No significant changes to the subject property were observed from the 1973 photograph; additional development west of the subject property.
- 1988 – No significant changes to the subject property or surrounding areas were observed from the 1983 photograph.
- 1993 – No significant changes to the subject property or surrounding areas were observed from the 1988 photograph.
- 1999 – No significant changes to the subject property or surrounding areas were observed from the 1993 photograph.
- 2005 – No significant changes to the subject property or surrounding areas were observed from the 1999 photograph.
- 2010 – No significant changes to the subject property observed from the 2005 photograph. A large mall appears to the west of the subject property in what was once farmland.
- 2015 – The coal stored on the northern portion of the subject property appears to have been removed; the area appears to have been graded flat. The ash impoundment on the southern portion of the subject property appears to have been regraded, and the pond at the southernmost property removed.

### 5.3 PROPERTY TAX FILES

Property tax files including records of past ownership, appraisals, maps, sketches, photos, or other information pertaining to the property were reviewed by Pennoni and not determined to be reasonably ascertainable, practically reviewable, and/or sufficiently useful.

Pennoni obtained a current online parcel aerial views for the subject property from the Snyder County Assessment Office; a copy of a parcel map from the information retrieved from the Snyder County website is included in Appendix A. The subject property tax parcel numbers are listed in Section 5.4.

### 5.4 RECORDED LAND TITLE RECORDS

Recorded land title records including records of historical fee ownership, including leases, land contracts, and AULs on or of the subject property were reviewed by Pennoni. Pennoni obtained recorded land title records for the subject property from EDR as part of their Environmental Lien Search Report. Copies of the land title records reviewed by Pennoni are included in Appendix C.

## 5.5 HISTORICAL TOPOGRAPHICAL MAPS

Pennoni obtained historic topographical maps from EDR to review past uses and activities associated with the subject property. Historic topographical maps for the Sunbury, Pennsylvania quadrangle, which includes the subject property, were reviewed for the years 1893, 1943, 1953, 1965, 1973, 1984, 1987, 1999, and 2013.

The 1893 topographic map shows a canal running between the subject property and the Susquehanna River. The 1943 topographic map shows Hummel's Wharf on the southern portion of the subject property. The 1953 topographic map shows the power station main building. A cemetery is shown near the southwestern edge of the subject property, adjacent to the current Gate 1 entrance. The 1965 topographic map identifies the power station, industrial waste pond, and conveyors on the subject property. The 1973, 1984, 1987, 1999 and 2013 topographic maps show no additional features on the subject property. Copies of the historical topographical maps reviewed by Pennoni are included in Appendix A.

## 5.6 LOCAL STREET DIRECTORIES

Local street directories showing ownership and/or use the subject property and surrounding properties by use of street address were obtained from EDR to review past uses and activities associated with the subject property and adjacent properties. Pennoni reviewed city directories for North Old Trail Road for the years 1977, 1982, 1987, 1992, 1995, 2000, 2005, 2010, and 2014. Sunbury Generation LP is listed only on the 2014 directory, along with residential properties and a church. The remaining listings for the years 1977, 1982, 1987, 1992, 1995, 2000, 2005, and 2010 show only residential and commercial properties. Copies of the local street directories reviewed by Pennoni are included in Appendix C.

## 5.7 BUILDING DEPARTMENT RECORDS

Pennoni submitted a written request, in a letter dated May 25, 2018 to the Shamokin Dam Borough and Monroe Township Records Officers for information regarding environmental concerns at the subject property. Copies of the letters are contained in Appendix C. Shamokin Dam Borough responded in a phone call that they have no records regarding Sunbury Generation. Monroe Township has not responded as of the writing of this report. Information received which changes the findings of this report will be forward to you upon receipt. A copy of the letters is attached in Appendix C.

## 5.8 ZONING/LAND USE RECORDS

Pennoni submitted a written request, in a letter dated May 25, 2018 to the Shamokin Dam Borough and Monroe Township Records Officers for information regarding environmental concerns at the subject property. Copies of the letters are contained in Appendix C. Shamokin Dam Borough responded in a phone call that they have no records regarding Sunbury Generation. Monroe Township has not responded as of the writing of this report. Information received which changes the findings of this report will be forwarded to the client upon receipt. A copy of the letters is attached in Appendix C.

## 5.9 EMERGENCY MANAGEMENT RECORDS

Pennoni submitted a written request, in a letter dated May 25, 2018 to the Monroe Township EMS. A copy of the letter is contained in Appendix C. As of the writing of this report, Pennoni has receive no responses from the department. Information received which changes the findings of this report will be forward to you upon receipt. A copy of the letter is attached in Appendix C.

## 5.10 PREVIOUS ENVIRONMENTAL REPORTS

A previous Phase I Environmental Assessment report pertaining to the entire Sunbury Generation Station was provided by Arcova Development LLC for review. This report is not included in this report.

## 6.0 REGULATORY AGENCY RECORDS REVIEW

As part of the Phase I ESA for the subject property, Pennoni reviewed both standard and additional environmental record sources for the subject property and surrounding area. Our environmental records review consisted of a review of the following:

- the EDR Radius Map Report (EDR Report) for the subject property provided by EDR;
- information requested from the United States Environmental Protection Agency (USEPA), Region III; and,
- information requested from the Pennsylvania Department of Environmental Protection (PADEP).

### 6.1 STANDARD ENVIRONMENTAL RECORD SOURCES, FEDERAL AND STATE

Pennoni contracted the services of Environmental Data Resources (EDR) to search both state and federal environmental databases in an attempt to identify potential concerns associated with either the subject site or surrounding properties. The EDR Report provided listings, accompanied by a map, of facilities and operations with reported environmental concerns within the ASTM E 1527-13 specified search radius around the subject property.

The federal databases searched by the EDR Report included the following:

- Federal National Priorities List (NPL) site list;
- Federal Delisted NPL site list;
- Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) list;
- Federal CERCLIS No Further Remedial Action Planned (NFRAP) site list;
- Federal Resource Conservation and Recovery Act (RCRA) Corrective Action (CORRACTS) facilities list;
- Federal Treatment, Storage, and Disposal (RCRA TSD) facilities list;
- Federal RCRA (RCRA GEN) generators list;
- Federal Institutional Control/Engineering Control (IC/EC) registries; and
- Federal Emergency Response Notification System (ERNS) list.

The EDR Report also searched the following state database files:

- State Hazardous Waste Sites (SHWS) list;
- State Solid Waste Facility/Landfill (SWF/LF) site list;
- State Leaking Underground Storage Tank (LUST) site list;
- State Registered Underground and Aboveground Storage Tank (REG UST/AST) site list;
- State Institutional Control/Engineering Control (IC/EC) registries;
- State Voluntary Cleanup Program (VCP) sites list; and
- State Brownfields sites list.

The EDR Report is presented in Appendix B. Complete listings and descriptions of the each of the databases search are included in the EDR Report.

#### **6.1.1 SUBJECT PROPERTY**

The subject property was identified in the following databases included in the EDR Radius Report;

- FINDS (Facility Index System)
- ECHO (Enforcement Compliance History Online)
- ICIS (Integrated Compliance Information System)
- RCRA-SQG (Small Quantity Generator)
- RCRA-LQG (Large Quantity Generator)
- US AIRS (Air Permit and Emissions Inventory Data)
- MANIFEST – (Waste Manifests)
- ARCHIVE UST, ARCHIVE AST (Archive Underground and Above Ground Storage Tanks)
- RGA LUST (Recovered Government Archive Leaking Underground Storage Tank)
- NPDES (National Pollution Discharge Elimination System)
- LAST (Leaking Above Ground Storage Tanks)
- AST (Above Ground Storage Tanks)
- AUL, VCP (Activity Use Limitations, Voluntary Cleanup Program)
- COAL ASH EPA

A review of the EDR information for each of the above listed programs is summarized as follows:

FINDS

Asbestos abatement at the subject property reported.

ECHO

Sunbury Waste Water Treatment System information available on ECHO.

ICIS

Actions for Penalty under the Clean Air Act (CAA) and Clean Water Act (CWA) reported.

RCRA-LQG and SQG

Generation of hazardous waste including: ignitable waste, corrosive waste, waste not defined, chromium, lead, silver, mercury, and spent halogenated solvents.

Notice of Violations were reported by State agencies in 1986, 1988, 1989, 1990, 1991, 1992, and 1993 during site compliance evaluation and inspections. For the 1991 violation, a \$2,500 penalty was given. Violation type was listed in some cases as generator – general. Resolutions to the violations were not reported.

US AIRS

Air emissions under Maximum Achievable Control Technology (MACT – 40 CFR 63), State Implementation Plan, under the National Primary and Secondary Ambient Air Quality Standards (NPSAAQS) and Title V were reported.

Enforcement Actions for the years 1998, 2000, 2002, 2006, 2010, and 2012 were reported under each of the air programs. Each action was reported as resolved or final order issued.

MANIFEST

Manifest details reported included the used of TSD facilities for storage, transportation and disposal of D001 wastes – ignitable, D009 waste – mercury and P120 vanadium oxide/pentoxide waste.

ARCHIVE UST, ARCHIVE AST, AST

EDR reported UST's and AST's and their statuses as follows:

- 1 UST containing diesel fuel listed as out of use;
- 1 AST containing sodium hydroxide listed as closed in place;
- 1 AST containing petroleum listed and removed;
- 1 AST containing diesel listed as removed;
- 4 AST's containing sodium hypochlorite listed as removed;
- 2 AST's containing sulfuric acid listed as closed in place and removed;
- 3 AST's containing heating oil listed as exempt;
- 2 AST's containing lubricating oil listed as closed in place;
- 2 AST's containing used oil listed as exempt;
- 1 AST containing insulating oil closed in place

#### RGA LUST

No information given.

#### NPDES

The EDR reported a Notice of Violation, Clean Water Act Class II penalties; no dates were reported.

#### LAST

EDR reported two (2) sulfuric acid AST leaks and spills in 1989 and 2003, with clean-ups completed for each incident.

#### AUL, VCP

EDR reported an AUL under the Land Recycling and Clean-up Program as an AUL code of Environmental Covenant. A date of 2015 was given, with an action as DEP Signed.

Under VCP, EDR reported soil and groundwater remediation to site specific standards, under Completed Sites in 2015. No other information was reported.

#### COAL ASH EPA

EDR reported No deficiencies identified for the Residual Waste Ash Basin. No other information was reported.

The above EDR database information was for the Sunbury Generation Station in total. The subject property for this Phase I ESA did not include the Hummel Panda Station, the former Sunbury Power Station buildings, nor the PP&L Switchyard.

### **6.1.2 VICINITY PROPERTIES -- FACILITIES OF POTENTIAL CONCERN**

The EDR Report identified three (3) facilities located adjacent to or in close proximity (< 1/8 mile) to the subject property.



- Keen Leasing  
1600 Old Trail Road  
RCRA NON-GEN, FINDS, ECHO

This site is at a lower that the subject property, with no violations reported.

- Ink Spot Printing  
10 East Park Road  
RCRA SQG

This site is at a lower that the subject property, with no violations reported.

- Quick Stop 6  
3013 North Susquehanna Trail  
UST

This site is at a higher elevation than the subject property, with two (2) 6,000-gasoline, one (1) 6,000-gallon diesel, and one (1) 2,000-gallon kerosene UST's currently in use; no violations reported.

Sites reported 1/8 to 1/4 of a mile from the subject property listed in this report are as follows:

- Turkey Hill 309  
1980 North Susquehanna Trail  
UST

This site is at a higher elevation than the subject property with one (1) 20,000-gallon gasoline, one (1) 8,000-gallon gasoline, and one (1) 10,000-gallon diesel UST currently in use with no violations.

- U-Haul of Shamokin  
Routes 11 and 15  
RCRA SQG

This site is at a higher elevation than the subject property; no violations reported.

- Pep Boys 302  
1597 North Susquehanna Trail  
RCRA NON GEN

This site is at a lower elevation than the subject property; no violations reported

- Aspen Dental  
1597 North Susquehanna Trail  
RCRA CESQG

This site is at a lower elevation than the subject property; no violations reported

- Aubrey Alexander Toyota  
1324 North Susquehanna Trail  
VCP

This site is at a lower elevation than the subject property, with remediation of unknown substance to site specific standards

None of the adjacent sites are not expected to impact the subject property, based upon their distance, elevations, and/or regulatory compliance status.

### 6.1.3 ORPHAN SITES

The unfiltered EDR Report identified eight (8) orphan sites, which could not be mapped due to inadequate address information. Four (4) are not associated with the Sunbury Generation site. Four (4) are listed as PPL Sunbury SES. One (1) is listed as Hummel Stat LLC/Sunbury Nat Gas Plant.

## 6.2 REGULATORY AGENCY FILE AND RECORDS REVIEW

### 6.2.1 PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Pennoni submitted an electronic request dated May 25, 2018 to the PADEP for information regarding environmental concerns at the subject property. A copy of the submission is contained in Appendix C. A response to this inquiry was received by Pennoni indicating that the numerous files were available to be reviewed at the PADEP North Central Office. In addition, Pennoni accessed the PADEP online database, *e-FACTS*, on May 25, 2018, to review information available for the subject property. Numerous listings pertaining to the subject property were located in the *e-FACTS* database search.

The PADEP file review revealed a number of permit and compliance files for the subject property. Records show compliance with active permit conditions. Records show that all environmental releases, spills, or other incidents have been remediated to the satisfaction of regulatory agencies.

Below is a summary of the permit documents that were available for review:

**NPDES Permit**

Permit Number: PA0008451  
Issued: July 1, 2014  
Expire: June 30, 2019  
Renewal Application By: December 30, 2018  
Discharges: Outfall 030: Once through non-contact cooling water  
Outfall 031: Bottom ash sluice water  
Outfall 032: Stormwater  
Outfall 130: Industrial Stormwater

Issues: Temperature of discharge – ecological group comments  
Compliance reports: No violations 2011 – 2016 DMR/Inspection Tracking Forms

Most Recent Inspections: NPDES 9/22/2016 – No Violations  
Industrial Waste 10/2/2017 – No Violations

Permit Transfer: PPL to Talen 7/15/2015  
Talen to Sunbury Generation 2000

Pervious Permit: PAR704805  
Separate Stormwater Permit  
Appears to have been incorporated into existing NPDES Permit

Potential Changes: Correspondence regarding incorporating wastes from Panda Hummel Power  
Plant

**Act 2 – Coal Storage Yard**

Attainment of Site Specific Standards: June 18, 2015  
Site Specific, Non-Residential Standard for Groundwater  
Post attainment maintenance requirements

**PADEP Solid Waste – Ash Basin Closure**

In final stages at time of file review  
Letter on file May 16, 2018 – Requesting extension for completion of closure to August 31, 2018  
Extension approved by Department  
Post Closure maintenance will be required on this project

**PADEP Dam Permit – Ash Basin**

Permit Number: D55-052  
Modification to permit – related to basin closure – Increase laydown area

Modification Date: July 5, 2014 work to be completed by December 31, 2020  
Calls for maintaining a small basin at dam for attenuation of rain runoff.  
Permit – no expiration date  
Usual inspection and reporting applies

**PPC Plan**

Written 1992  
Updates: 1998, 2006  
Revision probably will be needed to address new development onsite

**Waste Management Bonding File**

Certificates of Insurance for Sunbury Generation LP, Corona Power LLC  
Current: September 1, 2017 – September 1, 2018  
Bonding/Letters of Credit Info in file

**UST/AST**

March 3, 2004 – Penn Environmental and Restoration: Closure of AST Tank Farm  
Act 2 submission and attainment  
DEP Acceptance of Closure: March 24, 2004  
Spill History: Sodium Hydroxide Release: November 10, 2003  
Fuel Oil Release: 1999  
Sulfuric Acid Release: 1998

**Air Permit**

No files presented for review  
ECHO shows a State Only – Synthetic Minor  
Permit Number: PA0004612  
No compliance designation – Shows program “Under Development”  
Inspection logs – Show compliance

**6.2.2 UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

A request was submitted online to the United States Environmental Protection Agency (USEPA), *MyPropertyInfo and Enviro Facts* website on May 14, 2018, to search federal files for any information regarding the subject property, and any instances of illegal waste discharges, Notices of Violations, and the current regulatory status of the subject property. According to the database, the subject property was not identified. A copy of the response is contained in Appendix C.

## 7.0 SITE RECONNAISSANCE

Pennoni personnel completed a site reconnaissance of the subject property on May 31, 2018 to visually inspect the property for evidence of RECs. During the site visit, Richard Mance of Pennoni was escorted by Mr. Joe Zokaites of Arcova Development LLC. Areas accessed included the ash impoundment area, the former coal storage/hopper area, the Pump House Building, the former Rail Service Building, the exterior of the former Rail Car Thaw Building, and the Gate 1 Guard House.

### Methodology

The subject property was observed by visually walking areas of the property included in the Phase I scope of work and included interior portions of the Pump House Building, former Rail service Building, and the Gate 1 Guard House. The former Rail Car Thaw Building was not accessible.

### Limitations

Access to the Rail Car Thaw Building was not provided. The subject property visit and observations were slightly limited in this respect.

## 7.1 GENERAL OBSERVATIONS – EXTERIOR AREAS

The subject property consists of three (3) parcels of land totaling approximately 160 acres;

- Parcel 12-09-102 located at the southern end of the site is the ash impoundment associated with former coal power generation plant;
- Parcel 16-03-001A located at the northern end of the site is the former coal storage area associated with the former coal power generation plant;
- Parcel 16-03-077 located at the northeastern end of the site is a former residential parcel, now utilized as for construction access associated with the new Panda Hummel natural gas powered generation station.

The subject property is developed with four (4) permanent structures:

- One (1) 3,564 square foot pump house building;
- One (1) 2,040 square foot 2-story former rail service building;
- One (1) 16,320 square foot 1-story former rail car thawing building; and
- One (1) 630 square foot 1-story guard house at Gate 1.

Not included in this ESA were the following areas;

- The newly constructed Panda Hummel Power Station;
- The PP&L Switch Yard currently undergoing upgrades;
- The former Sunbury Power Generation Turbine Building and associated buildings. The former Sunbury Power Generation Station is scheduled for demolition.

## 7.2 GENERAL OBSERVATIONS – INTERIOR AREAS

### Pump House Building

The Pump House Building; located to the east of the former Sunbury Turbine Building, has recently undergone replacement of pumping and gate equipment. New flooring and grating was observed. The building is currently in use by the Panda Hummel Power Station.

### Former Rail Service Building

The Former Rail Service Building; located adjacent to the north of the Panda Hummel Power Station, is a metal sided building currently used for storage. The exterior siding is considered suspect asbestos containing material (ACM). In addition, there are numerous interior building postings indicating that ACM is present inside the building as well. Reportedly, the demolition of the building is not planned during demolition of the former Sunbury Power Station.

### Former Rail Car Thaw Building

The former Rail Car Thaw Building; located in the west central portion of the coal storage area is a block building with a suspected asphalt roof. The building was locked and inaccessible. Reportedly, the demolition of the building is not planned during demolition of the former Sunbury Power Station.

### Gate 1 Guard House

The Gate 1 Guard House is located just outside of the northwest fenced ash impoundment. The guard house is used for check-in to the site. Reportedly, a septic system is adjacent to the building for sewage waste from the building.

## 7.3 HAZARDOUS SUBSTANCES IN CONNECTION WITH IDENTIFIED USES

Based on database information, the Sunbury Power Station used and generated hazardous substance during its operation.

## 7.4 STORAGE TANKS

Numerous Aboveground Storage Tanks (ASTs) were observed on the Sunbury Power Station portions of the site; however, no permanent AST's or UST's were observed in the areas included in this assessment. Portable AST's associated with Construction contractors were observed in the equipment/materials laydown area now occupying the former coal storage area.

## 7.5 FLOOR DRAINS AND/OR SUMPS

No floor drains or sumps were observed inside the buildings during the site reconnaissance.

**7.6 OTHER OBSERVATIONS**

Two (2) separate groundwater monitoring well systems were observed in the subject property. One (1) system is associated with the ash impoundment within the southern portion of the subject property and the second system is associated with the coal storage area within the northern portion of the subject property. In addition, it was reported that the berm on the southernmost end of the ash impoundment was inspected by the PADEP and determined to be a high hazard dam, which is permitted.

Based on the site reconnaissance, review of records, and historical usage of the subject property, Pennoni has identified the following conditions that may impact future development of this property or present the potential for future environmental liability.

Stains or Corrosion	Not Observed
Pits, Ponds or Lagoons	Observed – Stormwater
Stained Soil or Pavement	Not Observed
Stressed Vegetation	Not Observed
Fill Material	Observed – Ash Impoundment
Municipal Solid Waste	Not Observed
Regulated Waste Disposal	Not Observed
Biomedical Waste Disposal	Not Observed
Waste Water	Not Observed
Wells	Observed – Groundwater Monitoring
Septic Systems	Reported – Not Observed
Current/Past Agricultural Activity	Not Observed
Odors	Not Observed
Pools of Liquid	Not Observed
Drums/Containers	Observed – Construction of Panda Hummel
Unidentified Chemicals	Not Observed
Past Mining Activity	Not Observed

## 7.7 POLYCHLORINATED BIPHENYLS (PCBS)

PCBs are a class of compounds that were developed in the 1930s and became widely used in industry from the mid-1900s to the late 1970s.

The flame resistance of PCBs made them ideal for use in electrical equipment and they did not break down or react with other chemicals, even under extreme conditions of high temperature and pressure.

PCBs were commonly used, therefore, in hydraulic fluids, lubricating oils, and transformers, electric motors, switches, and capacitors (including fluorescent lighting ballasts), as well as in paints, plastics, and other household items.

Because PCBs persist in the environment and, because they are fat-soluble, they bio-accumulate in the food chain, the elimination of PCBs from distribution in commerce was mandated in federal legislation in the late 1970s. For economic reasons, however, the use of PCBs in existing equipment was allowed to continue for the useful or normal life of the equipment, as long as specific conditions were met. At present, many industrial facilities continue to rely upon PCB-containing equipment and transformers, while many commercial and residential structures continue to use lighting fixtures, switches, and other articles that contain some level of PCBs.

### 7.7.1 TRANSFORMERS AND CAPACITORS

No transformers were observed on the subject property.

### 7.7.2 FLUORESCENT LIGHT BALLASTS

Fluorescent light ballasts contain capacitors that may be filled with PCB-containing dielectric fluid. Fluorescent light ballasts were observed in the buildings on the subject property.

### 7.7.3 ELEVATORS AND HYDRAULIC EQUIPMENT

No elevator or other equipment observed.

## 7.8 POTENTIAL VAPOR MIGRATION PATHWAYS

A review of regulatory records for the subject property and surrounding areas did not reveal the presence of a potential groundwater plume or area of subsurface soil contaminated with Volatile Organic Compounds (VOCs).

Therefore, potential vapor migration into the structure(s) on the subject property is not expected to be a concern.



## 7.9 NON-SCOPE CONSIDERATIONS

### 7.9.1 ASBESTOS-CONTAINING MATERIAL (ACM)

Asbestos is a naturally occurring mineral that has been used for centuries for variety of applications. Asbestos is a very stable crystalline mineral that forms fibers and withstands high temperature extremely well. Because of this physical and chemical property, commercial and industrial applications and usage of asbestos increased dramatically during the early 1900s.

Asbestos was commonly known as a type of insulation, but it was also as a stabilizer and strengthening material in plaster, cement, and other composite materials.

As such, asbestos was commonly used in building materials such as insulation, plaster, vinyl surfacing materials, and roofing and roof flashings, as well as in brake linings, caulking, and gaskets for ovens and furnaces. Because asbestos is a mineral, it can also be found in the soils of some areas around the world.

Once commercially milled, asbestos fibers are typically found at sizes that are measured in microscopic, micron particle sizes. Uncontrolled releases of asbestos fibers can remain airborne for an extended time and the particles tend to by-pass most of the defense mechanisms of the respiratory tract. As such, asbestos fibers have the ability to reach the inner portions of the lungs where they can become lodged and cause significant scarring and damage on a cellular level. Diseases attributable to asbestos exposure include asbestosis, mesothelioma, and lung cancer. Occupational exposure to asbestos is, therefore, highly regulated in the workplace.

The mere presence of ACM in a building is not necessarily cause for significant concern. So long as asbestos is not disturbed or accessible to damage or contact and does not become airborne, it poses little health risk and management of ACM in-place is considered a safe and acceptable practice. The U.S. EPA and OSHA have issued substantial guidance regarding proper procedures for the operations and maintenance of asbestos in the workplace. The U.S. EPA has also issued guidelines for home and building owners who have ACM insulation and surfacing materials such as flooring and roofing in their houses. Consequently, while most commercial production and use of asbestos was discontinued in the late 1970s and early 1980s, ACM remain in-place and in use in many commercial, industrial, and residential structures.

Asbestos regulations govern issues such as asbestos exposure and materials handling, transportation, and disposal and they place obligations upon building owners and operators to make notification to building occupants, tenants, visitors, contractors, and employees who may come in contact with the ACM.

Building owners, in particular, are responsible to make notifications regarding the presence and location of ACM.

Additionally, all suspect materials are required by law to be “presumed” to be asbestos containing materials (PACM). PACM must be handled and treated as ACM until proven otherwise to be non-ACM.

Policies and procedures relating to the on-going management of PACM and ACM in occupied buildings are typically presented in written asbestos Operations and Maintenance (O&M) Plans. O&M Plans outline the various building owner responsibilities and procedures relating to the asbestos and serve as a tool to ensure consistent and proper management practices.

If a building containing ACM is to be demolished, the asbestos is typically removed prior to the demolition activities.

Pursuant to the federal EPA National Emissions Standards for Hazardous Air Pollutants (NESHAP) regulations in 40 CFR 61, subpart M, ACM and asbestos-containing wastes must be removed, handled, and disposed in a manner that does not allow visible and/or uncontrolled emissions of asbestos to the environment.

Also, pursuant to the OSHA General Industry Standards 29 CFR 1910.1001 and the Construction Standards in 29 CFR 1926.1101, employers of employees who may encounter ACM are responsible to ensure that the employees are not exposed to airborne concentrations in excess of permissible exposure limits (PELs) that are based upon a time-weighted average exposure.

Additionally, the employees must be properly trained so that they can recognize hazards and avoid unacceptable exposure.

Suspect ACM associated with the Guard House, Rail Service Building, Rail Car Thaw Building, and Pump House was observed. Only miscellaneous materials, i.e. non friable siding, roofing, window caulking and glazing was observed. Additional surfacing and thermal system insulations may be present as well. Prior to renovation or demolition of the buildings, an assessment for ACM must be performed.

### **7.9.2 LEAD-BASED PAINT**

Lead is commonly added to paints because of its characteristic to resist corrosion. LBP was used substantially for industrial applications; it is also commonly encountered in older commercial and residential properties.

Oral ingestion may represent a major route of exposure in contaminated workplaces and houses. Lead poisoning can cause permanent damage to the brain and many other organs and causes reduced intelligence and behavioral problems. Lead can also cause abnormal fetal development in pregnant women.

The U.S. EPA estimates that approximately three quarters of the nation’s housing (i.e., roughly 64 million dwellings) contain some LBP. When properly maintained and managed, this paint poses little risk. However, 1.7 million children have blood-lead levels above safe limits, mostly due to exposure to LBP hazards.

According to the Housing and Urban Development (HUD) Authority, lead-based paint LBP is defined as paint on surfaces with lead in excess of 1.0-milligrams per square centimeter (mg/cm<sup>2</sup>), as measured by a x-ray fluorescence (XRF) detector of 0.5 percent by weight.

Use of LBP in construction was banned in 1978 and Congress passed legislation in 1992 requiring the disclosure of known information on LBP and LBP hazards before the sale or lease of most housing built before 1978. Consequently, LBP was generally phased out in commercial buildings, as well.

Similar to asbestos, OSHA has also established worker protection standards for exposure to lead. Unlike the case with asbestos, however, LBP does not need to be removed from a structure prior to demolition so long as the issue of worker exposure and adequate protection can be addressed.

If waste materials from the demolition contain sufficient quantities of LBP, it may meet the definition of a hazardous waste under the U.S. EPA's Resources Conservation and Recovery Act (RCRA) found in 40 CFR 260 - 279. Therefore, the need for pre-demolition abatement of LBP must be evaluated on a case-by-case basis to determine if the abatement is warranted.

Pursuant to applicable OSHA regulations, the party that is contracting for services to perform work in the structure is required to provide notice to the contractor or employer that LBP is likely present. Most contractors will likely need to know specific locations of the paint such that many owners and managers of buildings containing LBP opt to have a survey performed so that information that is more specific is available and the matter does not delay renovation and construction projects.

Given the ages of the structures present on the subject property, Pennoni believes that lead based paint may exist.

### **7.9.3 LEAD IN DRINKING WATER**

The subject property is provided water by PA American Water. No information was obtained or provided regarding the condition of the drinking water.

### **7.9.4 WETLANDS**

The U.S. Fish & Wildlife Service National Wetlands Inventory (NWI) database was reviewed to determine if wetland areas have been mapped on the subject property. The U.S. Fish & Wildlife Service showed the following:

- The southern portion of the subject property is bordered by Rolling Green Run;
- Two (2) freshwater ponds were noted on the southern portion of the subject property on the ash impoundment;
- One (1) freshwater pond was noted on the northern portion of the subject property on the former coal storage area.
- The subject property is bordered by the Susquehanna River.

The freshwater ponds identified on the NWI database are stormwater management ponds. A formal wetlands survey should be performed prior to any future site development.

#### **7.9.5 RADON GAS**

Radon gas is a naturally occurring radioactive gas found in soils and rocks. It is generated by the decay of naturally occurring uranium as a colorless and odorless gas. Radon gas can accumulate once inside an enclosed space such as an office building or home. There is an increased risk of developing lung cancer when exposed to elevated levels of radon gas. In general, the risk increases as the concentration of radon gas and the length of exposure increases. The USEPA has established 4 picoCuries per liter (pCi/L) of radon gas in indoor air as a guidance level for residences, while readings above 20 pCi/L are considered an actionable level.

According to the data obtained from the USEPA, the subject property lies within an area with an average indoor air radon concentration of greater than 4 pCi/L.

Statistics maintained by the USEAP for previous radon testing in Snyder County revealed that 49.48% of the tests yielded radon levels of less than 4 pCi/L, 24.44% of the tests yielded radon levels of less than 4-10 pCi/L, 8.49% of the tests yielded radon levels of 10-20 pCi/L, 9.84% of the tests yielded radon levels of 20-50 pCi/L, 6.56% of the tests yielded radon level of 50-100 pCi/L, and 1.19% yielded radon level of greater than 100 pCi/L.

If the subject property is to be developed with sub-grade living or working space, health risk due to radon concentration would be a concern. Actual radon concentrations can only be determined by on-site measurement.

#### **7.9.6 MOLD**

No visual evidence of significant microbial growth was observed within the structures on the subject property.

## 8.0 INTERVIEWS

### 8.1 INTERVIEWS WITH PAST AND PRESENT OWNERS AND OCCUPANTS

#### 8.1.1 INTERVIEW WITH KEY SITE MANAGER

Mr. Joe Zokaites of Arcova Development LLC was interviewed by Pennoni during our May 31, 2018 site visit. Mr. Zokaites also completed the Environmental Questionnaire found in Appendix C.

#### 8.1.2 INTERVIEW WITH SITE OCCUPANT

Mr. Joe Zokaites of Arcova Development LLC was interviewed by Pennoni during our May 31, 2018 site visit.

#### 8.1.3 INTERVIEWS WITH PAST OWNERS, OPERATORS AND OCCUPANTS

Past owners of the parcel were not interviewed as part of this Phase I Environmental Assessment.

### 8.2 INTERVIEWS WITH STATE AND/OR LOCAL GOVERNMENT OFFICIALS

#### 8.2.1 SHAMOKIN DAM BOROUGH AND MONROE TOWNSHIP

Pennoni submitted a written request, in letters dated May 25, 2018 to the Shamokin Dam Borough and Monroe Township Records Officers for information regarding environmental concerns at the subject property. Copies of the letters are contained in Appendix C. Shamokin Dam Borough responded in a phone call that they have no records regarding Sunbury Generation. Monroe Township has not responded as of the writing of this report. Information received which changes the findings of this report will be forward to you upon receipt. Copies of the letters are attached in Appendix C.

#### 8.2.2 LOCAL BUILDING DEPARTMENTS/TOWNSHIP OPEN RECORDS REQUEST

Pennoni submitted a written request, in letters dated May 25, 2018 to the Shamokin Dam Borough and Monroe Township Records Officers for information regarding environmental concerns at the subject property. Copies of the letters are contained in Appendix C. Shamokin Dam Borough responded in a phone call that they have no records regarding Sunbury Generation. Monroe Township has not responded as of the writing of this report. Information received which changes the findings of this report will be forward to you upon receipt. Copies of the letters are attached in Appendix C.

## 9.0 DATA GAPS AND DEVIATIONS

According to the Standards and Practices for All Appropriate Inquiries, Phase I Environmental Assessments must identify data gaps that would affect the ability of the environmental professional to identify conditions indicative of releases or threatened releases of pollutants, contaminants, petroleum and petroleum products, and controlled substances on the subject properties and to explain the significance of these data gaps. The following issues represent instances when either the investigation was hindered in some way, or where some issue was identified as a potential for concern, but insufficient information was available to draw a conclusion or rule out that the issue did not represent a recognized environmental condition.

1. No property valuation was provided for review; therefore, Pennoni is unable to comment on whether the purchase price being paid for subject property reasonably reflects the fair market value of the subject property. Pennoni does not consider this data gap to be a significant constraint on our ability to provide an opinion regarding RECs on the subject property.
2. Pennoni was unable to interview previous former owners of the subject property; however, the previous uses of the subject property are documented in the historical sources reviewed by Pennoni. Therefore, Pennoni does not consider this data gap to be a significant constraint on our ability to provide an opinion regarding RECs on the subject property.

#### 10.0 ENVIRONMENTAL PROFESSIONAL STATEMENT AND SIGNATURE

I declare that, to the best of my professional knowledge and belief, I meet the definition of an “environmental professional” as defined at 40 C.F.R. §312.10. I have the specific qualifications based on education, training, and experience to assess a property of the nature, history and setting of the subject property. I have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 C.F.R. Part 312.



Daniel C. Leandri, PE  
Environmental Division Manager

## 11.0 REFERENCES

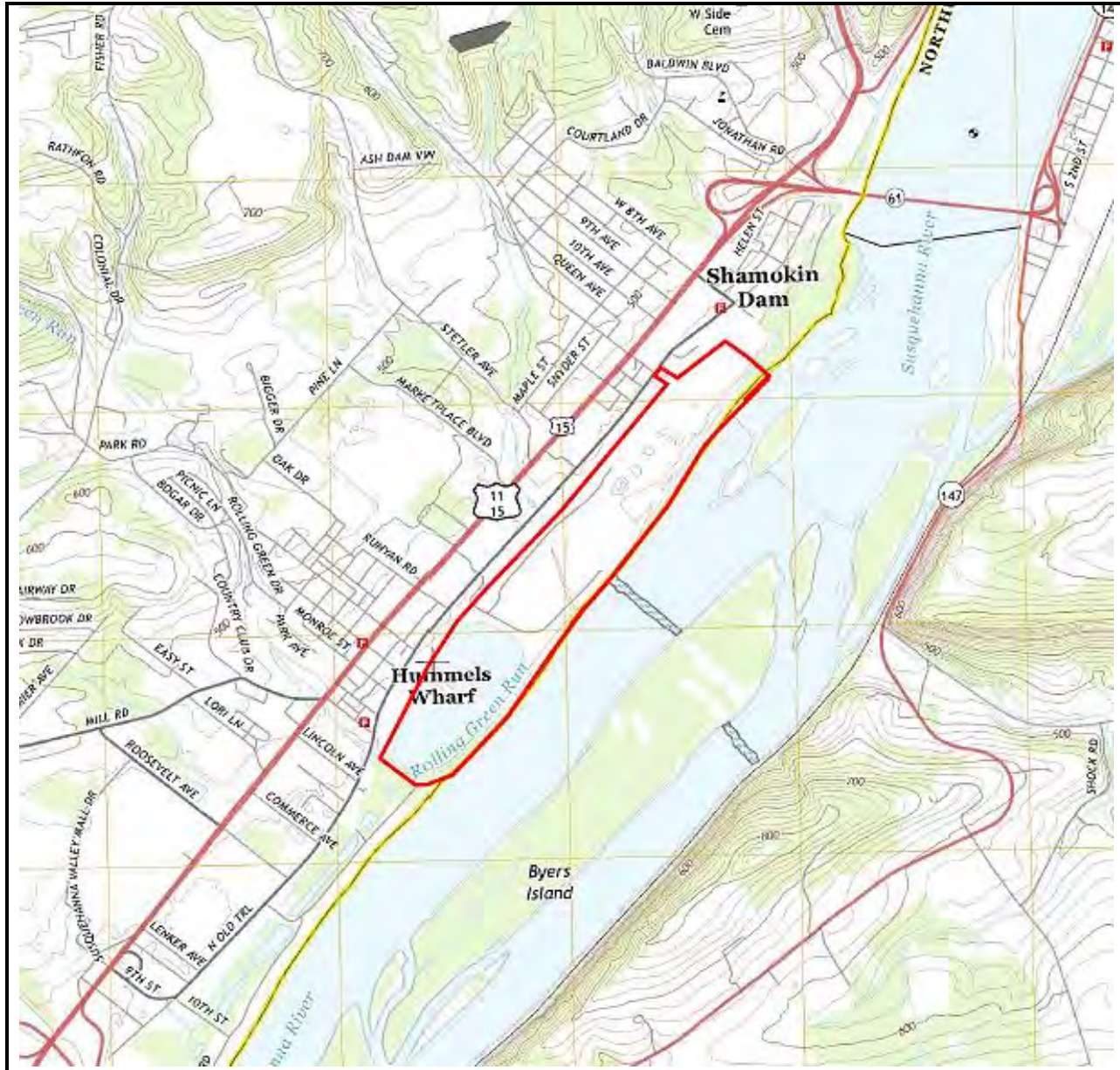
The following documents, publications, maps, etc. were used as source materials for this Phase I Environmental Site Assessment:



- USEPA 40 CFR Part 312 Standards and Practices for All Appropriate Inquiries; Final Rule, November 1, 2005.
- ASTM Standards on Environmental Site Assessments for Commercial Real Estate (E 1527-13), Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, 2013.
- Sunbury, Pennsylvania, USGS, 7.5-minute topographic quadrangle, 2013.
- Wetlands Online Mapper website published by the United States Fish and Wildlife Service. Available on-line at: <http://wetlandsfws.er.usgs.gov/wtlnds/launch.html>
- Web Soil Survey website published by the United States Department of Agriculture Natural Resources Conservation Service (USDA-NRCS). Available on-line at: <http://websoilsurvey.nrcs.usda.gov/app/>.
- EDR Radius Map Report, Report No. 530501.2s, May 24, 2018, obtained from Environmental Data Resources, Inc.
- EDR Certified Sanborn Map Report, Report No. 530501.3, May 24, 2018, obtained from Environmental Data Resources, Inc.
- EDR Historical Topographic Map Report, Report No. 530501.4, May 24, 2018, obtained from Environmental Data Resources, Inc.
- EDR Aerial Photo Decade Package, Report No. 530501.11, May 25, 2018, obtained from Environmental Data Resources, Inc.
- EDR Vapor Encroachment Screen Report, Report No. 530501.2s, May 14, 2018, obtained from Environmental Data Resources, Inc.
- EDR City Directory Image Report, Report No. 530501.5, May 30, 2018, obtained from Environmental Data Resources, Inc.
- EDR Environmental Lien and AUL Search Report, Report No. 5310501.7, June 13, 2018, obtained from Environmental Data Resources, Inc.

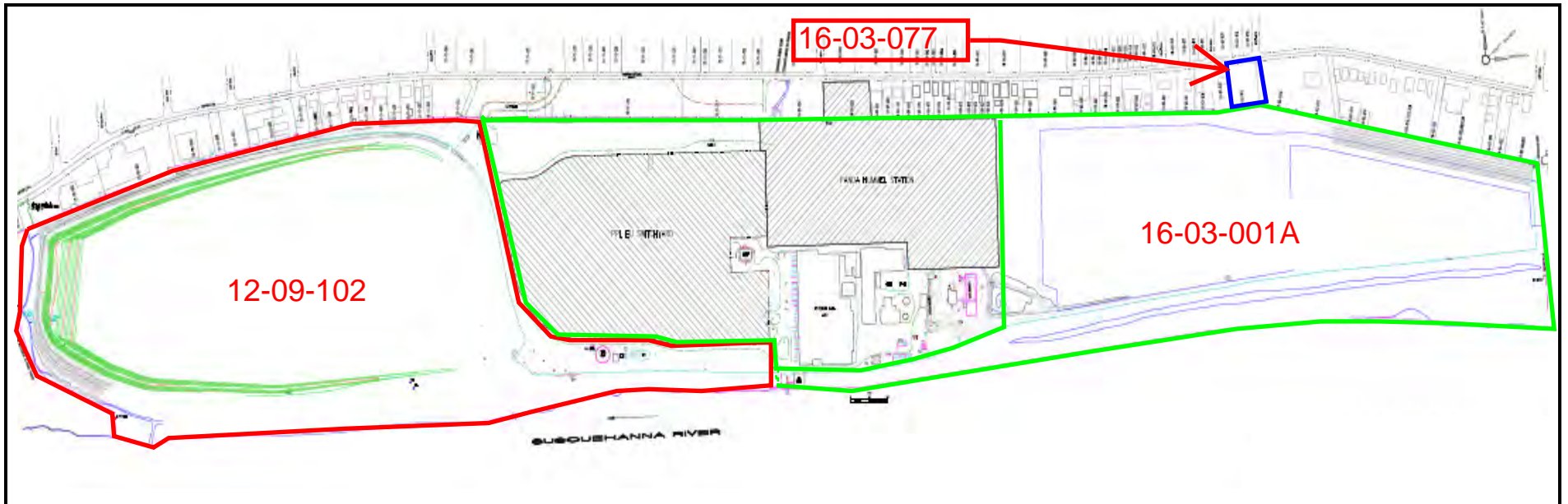



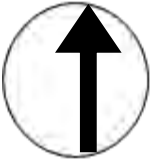
## APPENDICES

**APPENDIX A**  
Figures



 <p><b>Pennoni</b> PENNONI ASSOCIATES INC. CONSULTING ENGINEERS</p>	<p>PENNONI ASSOCIATES INC. 1215 MANOR DRIVE SUITE 100 MECHANICSBURG, PA 17055</p>	<p>PHASE I ENVIRONMENTAL SITE ASSESSMENT</p> <p>Sunbury Generation 2384 N. Old Trail Road Shamokin Dam, PA 17876</p>	 <p>NORTH</p>
<p>JOB No.: PDCED 18001</p>	<p>SCALE: NOT TO SCALE</p>	<p>FIGURE 1: Subject Property Location Map SOURCE: EDR</p>	



 PENNONI ASSOCIATES INC. CONSULTING ENGINEERS	PENNONI ASSOCIATES INC. 1215 MANOR DRIVE SUITE 100 MECHANICSBURG, PA 17055	PHASE I ENVIRONMENTAL SITE ASSESSMENT		 NORTH
		Sunbury Generation 2384 N. Old Trail Road Shamokin Dam, PA 17876		
JOB No.: PDCED 18001	SCALE: NOT TO SCALE	FIGURE 2: Tax Map SOURCE: Snyder County Assessment		

**APPENDIX B**  
Photographs




**Photograph 1:** View of the new Panda Hummel and former Sunbury Generation Stations, excluded from this project, looking north.



**Photograph 2:** View of the ash impoundment area on the subject property, looking north.



**Photograph 3:** View of the north/middle portion of the ash impoundment on the subject property, looking west.

	<b>PENNONI ASSOCIATES INC.</b> 1215 MANOR DRIVE SUITE 100 MECHANICSBURG, PA 17055	PHASE I ENVIRONMENTAL SITE ASSESSMENT
		<b>Sunbury Generation</b> <b>2384 North Old Trail Road</b> <b>Shamokin Dam, PA</b>
Job No. PDCED 18001	Date Taken: May 31, 2018	SITE PHOTOGRAPHS




**Photograph 4:** View of the stormwater management swale surrounding the western, southern, and eastern portions of the ash impoundment area on the subject property.



**Photograph 5:** View of the dam at the southern end of the ash impoundment area on the subject property, looking west.



**Photograph 6:** View of ongoing grading activities associated with the ash impoundment area on the subject property.

	<b>PENNONI ASSOCIATES INC.</b> 1215 MANOR DRIVE SUITE 100 MECHANICSBURG, PA 17055	PHASE I ENVIRONMENTAL SITE ASSESSMENT
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Job No. PDCEd 18001	Date Taken: May 31, 2018	SITE PHOTOGRAPHS




**Photograph 7:** View of the northern end of the ash impoundment area on the subject property, looking southwest.



**Photograph 8:** View of Gate 1 Guard House on the subject property, located adjacent north of the ash impoundment area, looking east.



**Photograph 9:** View the former Rail Service Building on the subject property, located adjacent to the north of the Panda Hummel Station on the former coal storage area.

	<b>PENNONI ASSOCIATES INC.</b> 1215 MANOR DRIVE SUITE 100 MECHANICSBURG, PA 17055	PHASE I ENVIRONMENTAL SITE ASSESSMENT
		<b>Sunbury Generation</b> <b>2384 North Old Trail Road</b> <b>Shamokin Dam, PA</b>
Job No. PDCED 18001	Date Taken: May 31, 2018	SITE PHOTOGRAPHS






**Photograph 10:** View of the former Rail Car Thaw Building, located on the western/central portion of the coal storage area on the subject property, looking northeast.



**Photograph 11:** View of the Pump House on the subject property, located east of the Sunbury Turbine Building. The Pump House is newly renovated and in use by the Panda Hummel Station.



**Photograph 12:** View of oil fired generators, not on the subject property, south of the Pump House Building.

	<b>PENNONI ASSOCIATES INC.</b> 1215 MANOR DRIVE SUITE 100 MECHANICSBURG, PA 17055	PHASE I ENVIRONMENTAL SITE ASSESSMENT
		<b>Sunbury Generation</b> 2384 North Old Trail Road Shamokin Dam, PA
Job No. PDCED 18001	Date Taken: May 31, 2018	SITE PHOTOGRAPHS




***Photograph 13:*** View of the switchyard, not on the subject property, north of the ash impoundment area. The switchyard is currently undergoing upgrades.



***Photograph 14:*** View of the southern end of the former coal storage area on the subject property, now Panda Hummel construction parking, looking south.



***Photograph 15:*** View of the southern portion of the former coal storage area on the subject property. The area is now used for Panda Hummel construction materials. Photo looking south.

	<b>PENNONI ASSOCIATES INC.</b> 1215 MANOR DRIVE SUITE 100 MECHANICSBURG, PA 17055	PHASE I ENVIRONMENTAL SITE ASSESSMENT
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Job No. PDCED 18001	Date Taken: May 31, 2018	SITE PHOTOGRAPHS




**Photograph 16:** View of the northern end of the former coal storage area on the subject property, looking north. The area is used for Panda Hummel construction materials.



**Photograph 17:** View of the eastern portion of the former coal storage areas on the subject property; access road and stored construction materials for the Panda Hummel plant, looking south.



**Photograph 18:** View of one, of two, coal hopper tunnel openings on the southern portion of the former coal storage area on the subject property. The tunnel openings are secured by fencing.

	<b>PENNONI ASSOCIATES INC.</b> 1215 MANOR DRIVE SUITE 100 MECHANICSBURG, PA 17055	PHASE I ENVIRONMENTAL SITE ASSESSMENT
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**Photograph 19:** View of one of the western stormwater retention ponds on the former coal storage area on the subject property. Coal residue seen in and around the pond.



**Photograph 20:** View of residual coal around the stormwater retention pond on the western portion of the former coal storage area on the subject property.



**Photograph 21:** View of temporary fuel AST's for the Panda Hummel construction, located on the eastern portion for the former coal storage area on the subject property, looking east.

	<b>PENNONI ASSOCIATES INC.</b> 1215 MANOR DRIVE SUITE 100 MECHANICSBURG, PA 17055	PHASE I ENVIRONMENTAL SITE ASSESSMENT
		<b>Sunbury Generation</b> 2384 North Old Trail Road Shamokin Dam, PA
Job No. PCED 18001	Date Taken: May 31, 2018	SITE PHOTOGRAPHS




***Photograph 22:*** View of Pandal Hummel construction materials and rail road ties on the northern portion of the former coal storage area on the subject property.



***Photograph 23:*** View of parcel 16-03-77 purchased for construction access to the Pandal Hummel Station, now Gate 3, looking west.



***Photograph 24:*** View of the historic canal located between the subject property and the Susquehanna River, looking south.

	<b>PENNONI ASSOCIATES INC.</b> 1215 MANOR DRIVE SUITE 100 MECHANICSBURG, PA 17055	PHASE I ENVIRONMENTAL SITE ASSESSMENT
		<b>Sunbury Generation</b> 2384 North Old Trail Road Shamokin Dam, PA
Job No. PDCEd 18001	Date Taken: May 31, 2018	SITE PHOTOGRAPHS

**APPENDIX C**  
Environmental Database Report

**APPENDIX D**  
Supporting Documentation

