

Britt T. McKinney
Vice President-Nuclear Site Operations

PPL Susquehanna, LLC
769 Salem Boulevard
Berwick, PA 18603
Tel. 570.542.3149, Fax 570.542.1504
btmckinney@pplweb.com



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U. S. Nuclear Regulatory Commission
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Mail Station OP1-17
Washington, DC 20555

**SUSQUEHANNA STEAM ELECTRIC STATION
ANNUAL ENVIRONMENTAL OPERATING
REPORT (NON-RADIOLOGICAL)
PLA-5890**

**Docket Nos. 50-387
and 50-388**

The Susquehanna SES Annual Environmental Operating Report (Non-radiological) is hereby submitted for the calendar year 2004 in accordance with the Environmental Protection Plan.

If you have any questions, please contact Mr. Rocco R. Sgarro at (610) 774-7552.

Sincerely,

B. T. McKinney

Attachments

Copy: NRC Region I
Mr. A. J. Blamey, NRC Sr. Resident Inspector
Mr. R. V. Guzman, NRC Project Manager
Mr. R. Janati, DEP/BRP

JEAS



**Susquehanna Steam Electric Station
Units 1 & 2**

**2004
ANNUAL ENVIRONMENTAL OPERATING REPORT
(NONRADIOLOGICAL)**



**PPL Susquehanna, LLC
Berwick, PA
April 2005**

SUSQUEHANNA STEAM ELECTRIC STATION

ANNUAL ENVIRONMENTAL OPERATING REPORT (NONRADIOLOGICAL)

2004

Prepared by: Curtis H. Saxton Date: 4/14/05
Curtis H. Saxton
Supervisor – Services & Programs

Reviewed by: Bruce E. Rhoads Date: 4/14/05
Bruce E. Rhoads
Manager – Plant Chemistry

Approved by: Robert A. Saccone Date: 4/15/05
Robert A. Saccone
VP – Nuclear Operations



**Susquehanna Steam Electric Station
Units 1 & 2**

**2004
ANNUAL ENVIRONMENTAL OPERATING REPORT
(NONRADIOLOGICAL)**

**Facility Operating License Nos. NPF-14 & NPF-22
Docket Nos. 50-387 & 50-388**

**Prepared by
Plant Chemistry
PPL Susquehanna, LLC
Berwick, PA
April 2005**

FOREWORD

The Susquehanna Steam Electric Station (Susquehanna SES) consists of two boiling water reactors with design electrical ratings of 1220 megawatts electrical (MWE) net for Units 1 and 2, respectively. The site consists of approximately 1,700 acres located in Salem Township, Luzerne County, Pennsylvania, approximately five miles northeast of Berwick, Pennsylvania. An additional 670 acres of PPL recreational land are located on the East Side of the Susquehanna River in Conyngham and Hollenback Townships. Under terms of an agreement finalized in January 1978, 90% of the Susquehanna SES is owned by PPL Susquehanna, LLC (Licensee) and 10% by the Allegheny Electric Cooperative, Inc.

This report discusses environmental commitments and impacts from January 1, 2004 through December 31, 2004. In summary it documents that environmental commitments were met and there was no significant adverse environmental impact from station operation.

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Auditing Organization Chart (2004)

1.0 OBJECTIVE

The Licensee has developed procedures and guidelines to ensure that operation of Susquehanna SES does not adversely affect the environment in the vicinity of the station. Also, these procedures allocate responsibilities and define interfaces necessary to monitor environmental impacts. They include coordination of U.S. Nuclear Regulatory Commission (NRC) requirements with other federal, state, and local requirements for environmental protection.

The objective of this 2004 Annual Environmental Operating Report (Nonradiological) is to provide a summary of both environmental programs and procedures. This report is required by the Final Environmental Statement (FES) for the operation of the Susquehanna SES, Unit 1 and 2, NUREG-0564, June 1981, and Appendix B - Environmental Protection Plan (EPP) to Operating Licenses, No. NPF-14 and No. NPF-22. The 2004 report is the 23rd Annual Environmental Operating Report (Nonradiological) submitted to meet EPP requirements.

The Licensee submitted an Environmental Report-Operating License Stage for Susquehanna SES to the NRC in May 1978. This report reviewed the results of the preoperational environmental programs and described the preoperational and proposed operational environmental monitoring programs. The NRC and other agencies reviewed this report and made recommendations for operational environmental monitoring programs which were listed in the FES.

2.0 ENVIRONMENTAL ISSUES

2.1 Aquatic Issues

The aquatic monitoring program for operation of the Susquehanna SES is divided into two parts. Part 1 includes effluent monitoring required by a National Pollutant Discharge Elimination System (NPDES) permit issued by the Pennsylvania Department of Environmental Protection (PaDEP). Monthly discharge monitoring reports are submitted to the PaDEP as part of the permitting requirements. The station's operational NPDES permit No. PA-0047325 was reissued on July 7, 2000, and expires on July 6, 2005. Part 2 of the aquatic monitoring program deals with programs listed in the FES or recommended by the PaDEP or U.S. Fish and Wildlife Service.

The PaDEP is responsible for regulating the water quality permit for the Susquehanna SES. The NPDES permit deals with discharge parameters for the Susquehanna SES Sewage Treatment Plant, Cooling Tower blowdown, and miscellaneous low volume waste discharges. The Cooling Tower blowdown also includes in-plant process streams which discharge to the Susquehanna River. Various low volume waste sumps discharge to the storm sewers which flow into Lake Took-a-while, and eventually into the Susquehanna River. NPDES permit limits were included in the 2000 Annual Report.

American Shad

The Susquehanna Anadromous Fish Restoration Committee continued to administer programs to restore American shad (*Alosa sapadissima*) to the Susquehanna River in 2004. The restoration program is a continuing commitment to return shad and other migratory fishes to historic spawning and nursery waters above major dams in the Susquehanna River.

Throughout the spring of 2004 above average precipitation resulted in higher than normal river flows and rapidly warming water temperatures (Ref.2.1-1). River flows at Holtwood fluctuated between 44,000 cfs and 82,000 cfs from mid-April through May. River temperatures ranged from the upper 50s to mid-60s (F) during the first half of this period, and then rose into the mid-70s for the remainder of May. Typically, fewer migrating shad use fish passage facilities during springs with high river flows because they cannot find the relatively small attraction flows from these facilities.

At Conowingo Dam, the East lift began operations on 12 April intermittently until 21 April and then daily through 31 May. During this period, 109,360 shad were transferred over the dam and into the Conowingo reservoir. An additional 3,426 shad were captured at the Conowingo West lift from 13 to 28 May. Of these, 1,055 were tank spawned on-site and none were transported upriver. The shad population index for the Conowingo tailrace was calculated at approximately 1,000,000 American shad, although this was likely an over estimate.

High river flows and rapidly rising water temperatures noticeably hampered shad passage at each of the three successive upriver fish transfer facilities. The lift at Holtwood passed 3,428 shad (only 3% of those from Conowingo reservoir) for the lowest annual shad passage since lift startup in 1997. At Safe Harbor, 2,109 shad passed through this lift representing 62% of the shad transferred at Holtwood. The fish ladder at York Haven passed 219 shad or 10% of the total at Safe Harbor.

The Pennsylvania Fish and Boat Commission's (PFBC) shad culture facility at the Van Dyke Research Station, Thompsonstown, Pennsylvania, processed 17.3 million shad eggs with a viability of 54% in 2004. Although most shad fry from the hatchery were stocked in the lower Susquehanna and Juniata Rivers, there were stockings upriver from the Susquehanna SES: 480,000 fry about 50 miles upriver at Tunkhannock, Pennsylvania and 828,000 fry 150 miles upriver in New York waters of the Susquehanna and Chemung Rivers.

The Susquehanna SES intake screens were monitored daily for impinged juvenile American shad from 9 August through 30 September 2004. No American shad were found, but 21 other fish of at least 6 species (gizzard shad, smallmouth bass, channel catfish, bluegill, rock bass, and minnow spp.) and 43 crayfish were captured (Table 2.1-1).

Biofouling Mollusk Monitoring

The biofouling mollusk-monitoring program continued at the Susquehanna SES in 2004. Currently, the program involves biweekly artificial substrate inspections, both in the river and the Susquehanna SES River Intake Building, from May through November. Additionally, monthly inspections are made of both artificial substrates and the cement shoreline of the Emergency Service Water Spray Pond, as well as an annual scuba inspection of the pond. Finally, natural river substrates are normally examined as part of the program both near Susquehanna SES and at many sites ranging 40 miles above and below the plant. However, high water from summer through fall this year prevented the inspection of river substrates.

To date, no biofoulers have been found in the river near the Susquehanna SES. Zebra mussel young were observed during years past in the Johnson City, New York area, about 150 miles upriver. Asiatic clams adults have been observed in the river near Bloomsburg, Pennsylvania, approximately 18 miles downriver from Susquehanna SES. In 2001, a single Asiatic clam was collected from within the plant, as have a few relic shells since.

2.2 Terrestrial Issues

2.2.1 Studies Previously Completed

Terrestrial environmental studies completed prior to 1989 included Cooling Tower bird impaction and sound level surveys.

2.2.2 Sound Level Survey

An increase in station power generation of 5% was completed during spring 1995. A power uprate sound level survey was conducted in June 1995.

2.2.3 Maintenance of Transmission Line Corridors

Transmission line corridor vegetation maintenance and inspection records are maintained by the Asset Management Group of PPL Electric Utilities and are available upon request. There were no adverse environmental impacts to transmission corridors reported in 2004. Records will be maintained for five years.

2.3 Cultural Resources Issues

Environmental Protection Plan actions required to satisfy Title 36, Code of Federal Regulations Part 800, relating to archeological sites, were completed in 1987. The Advisory Council on Historic Preservation (ACHP), in accordance with 36 CFR 800.6 (a)(1), approved the NRC's determination of "no adverse effect" for archeological sites SES-3, SES-6, SES-8, and SES-11 located on the Licensee's property (NRC letter dated October 28, 1987, to ACHP).

As part of the determination of effect process, the Licensee committed to and is taking appropriate measures to mitigate impacts from plant maintenance and operation to sites SES-3, SES-6, SES-8 and SES-11. There was no impact to these sites from plant maintenance and operation in 2004.

REFERENCES

- 2.1-1 Restoration of American Shad to the Susquehanna River, Annual Progress Report-2004, Susquehanna River Anadromous Fish Restoration Committee, February 2005.

3.0 CONSISTENCY REQUIREMENTS

3.1 Plant Design and Operation

In accordance with the Environmental Protection Plan (EPP), the Licensee shall prepare and record an environmental evaluation of proposed changes in plant design, operation, or performance of any test or experiment which may significantly affect the environment. Before initiating such activities, the Licensee shall provide a written evaluation and obtain prior approval from the Director, Office of Nuclear Reactor Regulation. Criteria for the need to perform an environmental evaluation include: (1) a significant increase in any adverse environmental impact previously evaluated by the NRC or Atomic Safety and Licensing Board, (2) a significant change in effluent or power level, or (3) a matter not previously evaluated which may have a significant adverse environmental impact.

The EPP requires that if an activity meets any of the criteria to perform an environmental evaluation, the NRC will be notified. If the change, test, or experiment does not meet any of these criteria, the Licensee will document the evaluation and allow the activity to occur.

During operation of the Susquehanna SES in 2004, there were five proposed activities that the Licensee reviewed as part of the unreviewed environmental question program. None of these activities were determined to involve an unreviewed environmental question or require prior NRC notification. These activities were:

1. Upgrade to Security Firing Range to incorporate mandatory firing distances and improve the physical range features. Determined not to involve an unreviewed environmental question since involves relatively minor earth disturbance, tree trimming, and drainage adjustments.
2. Installation of Onsite Security Upgrades including towers, delay fencing and relocation of existing security fence and patrol road. Determined not to involve an unreviewed environmental question since impacts were to previously disturbed areas and resulted in no significant changes to aesthetic conditions or land use.

3. Installation of security upgrade vehicle barrier system. Included review of earth disturbance during construction activity and installation of permanent vehicle barrier system. Determined not to involve an unreviewed environmental question due to use of controls during installation and resulted in no significant impacts to previously disturbed areas.
4. North Storm Drain Environmental Remediation and Erosion Control Restoration. Determined not to involve an unreviewed environmental question based on controls to be utilized during remediation activities and intent of efforts to restore original soil erosion controls and sedimentation capacity. As part of this activity oil impacted soil was removed from the drainage basin. The soil had been contaminated by accumulated oil from the main turbine lube oil mist eliminator discharge. Additional controls and equipment have been put in place to eliminate this oil accumulation in the future. The Pa Dept. of Environmental Protection was contacted prior to this activity and informed of completion of this project.
5. Use of SF6 (Sodium Hexafluoride) in control structure boundary envelope testing. Determined not to involve an unreviewed environmental question based on the very limited amount of tracer gas to be used, 0.062 lbs. There were no regulatory emission restrictions associated with the limited use of this tracer gas for control room boundary envelope testing.

3.2 Reporting Related to NPDES Permits and State Certifications

There were no NPDES permit noncompliances in 2004.

The 2002 Annual Report provided a description of an environmental evaluation completed for oil accumulation around the turbine lube oil system roof vents. The PaDEP was provided with information on this additional source of oil to stormwater outfall 075. In December 2003 corrective action was taken to install cyclone separators on the Unit 1 and Unit 2 roofs to eliminate the small amount of entrained oil from the discharge. Environmental remediation activities in the North Storm Drain, outfall 075, were completed in 2004. Refer to Unreviewed Environmental Question #4 in Section 3.1 of this report .

The Susquehanna SES has an NPDES permit; therefore, state certification pursuant to Section 401 of the Clean Water Act is not required.

3.3 Changes Required for Compliance with Other Environmental Regulations

A water resources registration for utilization of Susquehanna River water and site well system was completed in March 2004 in compliance with Pennsylvania Department of Environmental Protection, Water Resources Planning Act 220.

An EPA Risk Management Plan renewal approval was received in June 2004 for the Hydrogen and Oxygen storage tanks associated with Hydrogen Water Chemistry Treatment.

A revision of the Susquehanna Pollution Prevention and Contingency (PPC) Plan (which incorporates the Spill Prevention Control & Counter-measure (SPCC) Plan) was completed in November 2004 in anticipation of submittal with the NPDES permit renewal in January 2005.

4.0 ENVIRONMENTAL CONDITIONS

4.1 Unusual or Important Environmental Events

During 2004, there were no operating occurrences requiring review as part of the significant environmental event evaluation program. There were no significant or adverse environmental effects related to station operation. There were no EPP noncompliances.

4.2 Environmental Monitoring

4.2.1 General Monitoring

With the exception of aquatic monitoring discussed in Section 2.1 of this report, all monitoring of station operational impacts on aquatic and terrestrial biota listed in the FES and Appendix B of the operating license have been completed.

4.2.2 Maintenance of Transmission Line Corridors

In 2004, the Asset Management group of PPL Electric Utilities maintained transmission line vegetation maintenance and inspection records.

5.0 ENVIRONMENTAL PROTECTION PLAN REPORTING REQUIREMENTS

5.1 Review and Audit

The Licensee has established procedures for an independent group to review and audit compliance with the EPP. Audits of EPP compliance are conducted by Quality Assurance. The Manager-Quality Assurance is responsible for verifying compliance with the EPP. The Vice President-Nuclear Operations is responsible for environmental monitoring and for providing any related support concerning licensing. The Manager – Plant Chemistry is responsible for day-to-day offsite monitoring. The Auditing Organization Chart (Fig. 5.1-1) lists the groups utilized in reviewing and auditing of the Susquehanna SES environmental monitoring programs as well as those responsible for managing these programs. The Director-Environmental Management Department is available to provide auditing support, as needed.

There are periodic audits of the EPP program. An audit of the EPP was initiated in 2004 as part of a Chemistry Program Audit. There were no findings reported as a result of this audit. A recommendation was made to update the EPP to capture fulfillment of previously completed environmental monitoring commitments. This recommendation is being reviewed for applicability and implementation as determined appropriate.

5.2 Records Retention

Records and logs relative to environmental aspects of plant operation and audit activities are retained in the Nuclear Records System. This system provides for a convenient review and inspection of environmental documents, which are available to the NRC upon request.

All records concerning modifications of plant structures, systems and components which are determined to potentially affect the continued protection of the environment, are retained for the life of the plant. All other records, data, and logs relating to the environmental programs and monitoring are retained for at least five years or, where applicable, in accordance with the requirements of other agencies. Transmission line corridor vegetation maintenance records are maintained by PPL Electrical Utilities per section 2.2.3 of this report.

5.3 Changes in Environmental Protection Plan

No changes were made to the EPP during 2004.

5.4 Plant Reporting Requirements

5.4.1 Routine Reports

This Annual Environmental Operating Report (Nonradiological) was prepared to meet routine reporting requirements of the EPP for 2004. It provides summaries and analyses of environmental protection activities required in Subsection 4.2 of the EPP for the reporting period.

5.4.2 Nonroutine Reports

There were no unusual or Important Environmental Events as identified in the Environmental Protection Plan that required reporting in 2004.

6.0 ATTACHMENTS

Table 2.1-1

2004 Shad Impingement Monitoring Program

Figure 5.1-1

Auditing Organization Chart (2004)

**TABLE 2.1-1
2004 SHAD IMPINGEMENT PROGRAM**

Date		Time		Items Found on Trash Bar/Traveling Screen			
2004		Shad		Fish		Other	
9 Aug	1330	Nets set to begin sampling.					
10 Aug	1430	0	1 channel catfish, 3 minnow spp.				
11 Aug	1420	0	1 channel catfish			1 crayfish	
12 Aug	1400	0	0				
13 Aug	1400	0	1 channel catfish, 1 minnow sp.			1 crayfish	
14 Aug	Nets not checked.						
15 Aug	1515	0	1 bluegill			2 crayfish	
16 Aug	1505	0	0			4 crayfish	
17 Aug	1430	0	1 rock bass			2 crayfish	
18 Aug	1430	0	1 channel catfish			4 crayfish	
19 Aug	1420	0	0			3 crayfish	
20 Aug	1400	0	0				
21 Aug	1310	0	0				
22 Aug	1530	0	0			1 crayfish	
23 Aug	1330	0	1 minnow sp.			2 crayfish	
24 Aug	1430	0	0			1 crayfish	
25 Aug	1415	0	0			2 crayfish	
26 Aug	1400	0	0				
27 Aug	1405	0	2 smallmouth bass			1 crayfish	
28 Aug	Nets not checked.						
29 Aug	1345	0	0			1 crayfish	
30 Aug	1430	0	0			1 crayfish	
31 Aug	1425		1 smallmouth bass			3 crayfish	
1 Sep	2030	0	0			5 crayfish	
2 Sep	0900					1 crayfish	
3 Sep	1045	0	0				
4 Sep	Nets not checked.						
5 Sep	1000	0	0				
6 Sep	Nets not checked.						
7 Sep	1100					3 crayfish	
8 Sep	1105	0	0				
9 Sep	Nets not checked.						
10 Sep	0845	0	0			1 crayfish	
11 Sep	1300	0	0				
12 Sep	1330	0	0				

Table 2.1.1 (cont.)

Date		Time	Items Found on Trash Bar/Traveling Screen	
2004		Shad	Fish	Other
13 Sep	1430	0	0	
14 Sep	1415	0	0	
15 Sep	1345	0	1 channel catfish	1 crayfish
16 Sep	1030	0	1 channel catfish	
17 Sep	Nets not checked.			
18 Sep	1000	River level on the rise from rains due to Hurricane Ivan. Nets were full of leaves and debris. Nets were placed in a non-fishing condition until more favorable conditions occur.		
19 Sep				
20 Sep				
21 Sep				
22 Sep				
23 Sep				
24 Sep				
25 Sep				
26 Sep				
27 Sep	1400	Nets reset.		
28 Sep	1500	0	1 channel catfish, 1 bluegill	1 crayfish
29 Sep	1205	0	1 gizzard shad	2 crayfish
30 Sep	1145	0	1 gizzard shad, 1 bluegill	
TOTAL		0	21 fish – 6 species 2 gizzard shad 7 channel catfish 3 smallmouth bass 3 bluegill 1 rock bass 5 minnow spp.	43 crayfish

FIGURE 5.1-1

AUDITING ORGANIZATION CHART

(2004)

