Section M
Stormwater Management Analysis

1. Post Construction Stormwater Management Plan

Status

On November 12, 2010 an application for an NPDES Individual Permit for Discharges of Stormwater Associated with Construction Activities for the Bell Bend Project was submitted to the Luzerne Conservation District and PA Department of Environmental Protection. The application contained a Post Construction Stormwater Management (PCSM) Plan which was also included in the JPA submittal dated June 2011.

PPL submitted a revised NPDES Stormwater permit application on September 15, 2011. A copy of the of the PCSM plan narrative as contained in the September 15, 2011 revised NPDES permit application is provided herein. Any revisions of the September 15, 2011 PCSM plan will be filed for inclusion in this application record when issued by PPL. Final approval of the PCSM plan by the PA Department of Environmental Protection will be filed as part of the application record when received.

The PCSM plan provides that there will be no increase in stormwater leaving the BBNPP site as a result of the plant construction.

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BINDER 2 OF 6

POST CONSTRUCTION STORMWATER MANAGEMENT NARRATIVE

Bell Bend Nuclear Power Plant
Salem Township
Luzerne County, PA

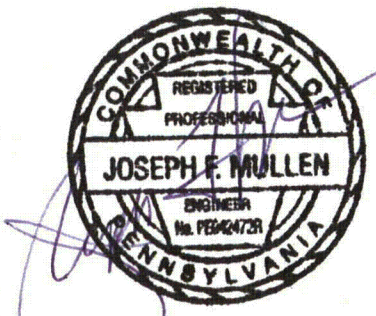
For:
PPL Bell Bend, LLC
38 Bomboy Lane
Suite 2
Berwick, PA 18603

Report Number
PPLS0902-1500-02

Issue Date
November 12th, 2010

Revision Date – Rev 1
September 15th, 2011

PPLS0902



Binder 2 of 6 – Post Construction Stormwater Management Narrative

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I. EXECUTIVE SUMMARY

PPL Bell Bend, LLC is proposing to construct the Bell Bend Nuclear Power Plant (BBNPP) in Salem Township, Luzerne County, Pennsylvania. The proposed site for this project is located north of US 11 and is adjacent to the existing Susquehanna Nuclear Power Plant. See Appendix A for the location map. The drainage areas for the development are adjacent to Walker Run and the Susquehanna River. The project is designed to conform to the requirements of the Act 167 Stormwater Management Plan for Salem Township.

Stormwater runoff is proposed to be conveyed in a closed drainage system consisting of inlets and pipes that ultimately outlet to a total of fourteen (14) underground and three (3) aboveground infiltration and detention basins.

The stormwater design meets the Volume Control Guideline 1 (CG-1) referenced in the Pennsylvania Stormwater BMP Manual. The infiltration basins were designed to infiltrate the increase in volume between the pre and post-development two-year storm events. The intent of the design is to replicate preconstruction stormwater infiltration and runoff conditions so that the post construction stormwater discharges do not degrade the physical, chemical, or biological characteristics of the receiving waters. Also, water quality treatment BMP's will be employed to ensure protection of the existing uses and the level of water quality necessary to protect those existing uses. The stormwater from the intake area, including from the dredging stockpile and the intake structure, will be discharged to the Susquehanna River.

This construction activity and its temporary and permanent stormwater BMP controls are shown on the plans and discussed in this narrative. See the Erosion and Sedimentation plans and narrative for all temporary and permanent E&S BMP controls.

The proposed construction is expected to disturb approximately 687 acres. The sequence of construction and earth disturbance activities on the project will be carried out in conformance with the sequence contained in the E&S narrative and listed on the E&S plan. Compliance with the staging and sequencing within the construction sequence and the methods and materials shown on the plan will accomplish temporary and permanent site stabilization.

II. EXISTING LAND USE AND SITE FEATURES

The PPL Bell Bend NPDES project boundary is proposed on approximately 1,218 acres. It is located in a rural/residential community that contains various types of ground cover such as: wooded areas, paved roadways, agricultural land, grass fields, an existing power plant and numerous wetland areas. There are also approximately 15 acres at the intake area and 17 acres at a construction laydown area located adjacent to the Susquehanna River. See Appendix E for Site Photos. The nearest named waterway is Walker Run which runs through the site. Walker Run is classified as Cold Water Fishery-Migratory Fishery (CWF-MF) by the classifications set forth in Chapter 93 Water Quality Standards, Title 25. A portion of the site drains towards the Susquehanna River which is classified as a Warm Water Fishery-Migratory Fishery (WWF-MF) by the classifications set forth in Chapter 93 Water Quality Standards, Title 25.

The site is comprised of primarily undeveloped parcels of land that contain cultivated fields, forest and wetlands. The past and present land use of the land is a cultivated agriculture. The site is bordered to the north by woods. The existing Susquehanna Nuclear Power Plant is located northeast of the site and cultivated fields border the site to the east, south and west. The existing impervious surfaces on the site are the result of private and public roads and the existing plant. Total existing impervious area is about 151 Acres.

See Appendix B for the soils map. The soils on the site are listed by the United States Department of Agriculture's Natural Resource Conservation Service as:

ASF – Arnot-Rock outcrop complex, Steep – This steep and very steep soil is on convex mountain sides and hillsides. Runoff is rapid, and the hazard of erosion is slight. These soils are low in natural fertility, and content of organic matter is low. Most limitations for non-farm use are related to slope, the stones, the rock outcrop, and the depth to bedrock. The Capability Subclass for this soil is VIIs.

At – Atherton silt loam, gray subsoil variant, 0 to 3 percent slopes – This is a nearly level soil in low lying, uniformly concave positions. Runoff is very slow, ponding is common and the hazard of erosion is slight. These soils are medium in natural fertility, and content of organic matter is moderate. Most limitations for non-farm use are related to the high water table, the slow permeability, and ponding. The Capability Subclass for this soil is IVw.

BrA – Braceville gravelly loam, 0 to 3 percent slopes – This nearly level soil is in smooth, slightly concave positions on glacial outwash terraces. Runoff is slow and the hazard of erosion is slight.

This Braceville soil is medium to low in natural fertility and low in content of organic matter. Most limitations for nonfarm use are related to the seasonal high water table and the moderately slow permeability. The Capability Subclass for this soil is IIw.

BrB – Braceville gravelly loam, 3 to 8 percent slopes – This gently sloping soil is in smooth, slightly concave positions on glacial outwash terraces. Runoff is slow to medium, and the hazard of erosion is moderate. This Braceville soil is medium to low in natural fertility and low in content of organic matter. Most limitations for nonfarm use are related to the seasonal high water table and the moderately slow permeability. The Capability Subclass for this soil is IIw.

BrC – Braceville gravelly loam, 8 to 15 percent slopes – This gently sloping soil is in smooth, slightly concave positions on glacial outwash terraces. Runoff is medium, and the hazard of erosion is moderate. This Braceville soil is medium to low in natural fertility and low in content of organic matter. Most limitations for nonfarm use are related to the seasonal high water table, the moderately slow permeability and slope. The Capability Subclass for this soil is IIIe.

ChA – Chenango gravelly loam, 0 to 3 percent slopes – This nearly level soil is in broad, smooth, slightly convex positions on glacial outwash terraces. Runoff is slow to very slow, and the hazard of erosion is slight. This soil is low in natural fertility and low in content of organic matter. Most limitations for nonfarm use are related to moderately rapid to rapid permeability and the possibility of ground water contamination. The Capability Subclass for this soil is IIs.

ChB – Chenango gravelly loam, 3 to 8 percent slopes – This gently sloping soil is in broad, smooth to slightly undulating, convex positions on glacial outwash terraces. Runoff is slow and the hazard of erosion is moderate. This soil is low in natural fertility and low in content of organic matter. Most limitations for nonfarm use are related to moderately rapid to rapid permeability and the possibility of ground water contamination and the content of coarse fragments. The Capability Subclass for this soil is IIs.

ChC – Chenango gravelly loam, 8 to 15 percent slopes – This sloping soil is in smooth or rolling, convex positions on glacial outwash terraces. Runoff is medium to very slow and the hazard of erosion is moderate. This soil is low in natural fertility and low in content of organic matter. Most limitations for nonfarm use are related to moderately rapid to rapid permeability and the possibility of ground water contamination and the content of coarse fragments. The Capability Subclass for this soil is IIIe

Ho – Holly silt loam, 0 to 3 percent slopes – This is a nearly level soil on smooth or slightly concave flood plains. Runoff is slow and the hazard of erosion is slight. This soil is subject to frequent flooding. This soil is medium in natural fertility and moderate in content of organic matter. Most limitations for nonfarm use are related to the season high water table and frequent flooding. The Capability Subclass for this soil is IIIw.

OlB – Oquaga and Lordstown channery silt loams, 3 to 8 percent slopes – This gently sloping soil is on convex tops of the hills, knolls and mountain ridges of broad rolling mountaintops and intermountain basins. Runoff is medium, and the hazard of erosion is moderate. This soil is medium in natural fertility and low in content of organic matter. Most limitations for nonfarm use are related to the depth to bedrock. The Capability Subclass for this soil is IIe.

OlC – Oquaga and Lordstown channery silt loams, 8 to 15 percent slopes – This sloping soil is on the convex rounded tops, crests, and sides of and sides of hills, knolls and on the mountain ridges of broad rolling mountaintops and intermountain basins. Runoff is medium to rapid and the hazard of erosion is moderate. This soil is medium in natural fertility and low in content of organic matter. Most limitations for nonfarm use are related to the depth to bedrock and slope. The Capability Subclass for this soil is IIIe.

OlD – Oquaga and Lordstown channery silt loams, 15 to 25 percent slopes – This moderately steep soil is on the sides of hills, knolls, and mountain ridges of broad, rolling mountaintops and intermountain basins. Runoff is rapid, and the hazard of erosion is moderate. This soil is medium in natural fertility and low in content of organic matter.
Most limitations for nonfarm use are related to the depth to bedrock and slope. The Capability Subclass for this soil is IVe.

OpB – Oquaga and Lordstown extremely stony silt loams, 3 to 8 percent slopes – This gently sloping soil is on the convex tops of hills, knolls, and mountain ridges of broad mountaintops and intermountain basins. Runoff is medium, and the hazard of erosion is slight. This soil is medium in natural fertility and moderate in content of organic matter. Most limitations for nonfarm use are related to the depth to bedrock surface stoniness. The Capability Subclass for this soil is VIIs.

OpD – Oquaga and Lordstown extremely stony silt loams, 8 to 25 percent slopes – This sloping and moderately steep soil is on convex, rounded tops, crests and sides of hills; on knolls; and on the mountain ridges of broad rolling mountaintops and intermountain basins. Runoff is medium to rapid, and the hazard of erosion is slight. This soil is medium in natural fertility and moderate in

content of organic matter. Most limitations for nonfarm use are related to the depth to bedrock surface stoniness, and slope. The Capability Subclass for this soil is VIIs.

OXF – Oquaga and Lordstown extremely stony silt loams, steep – This steep and very steep soil is on the sides of hills, mountain ridges, and valleys of broad, rolling mountaintops and intermountain basins. Runoff is rapid to very rapid, and the hazard of erosion is slight. This soil is medium in natural fertility and moderate in content of organic matter. Most limitations for nonfarm use are related to slope, the depth to bedrock and surface stoniness. The Capability Subclass for this soil is VIIs.

Ps – Pope Soils, 0 to 5 percent slopes – These nearly level to gently sloping soils are on smooth, slightly convex high bottom flood plains. Runoff is slow, and the hazard of erosion is none to slight. These soils are high in natural fertility and low in content of organic matter. Most limitations for nonfarm use are related to the flood hazard. The Capability Subclass for this soil is I.

RdA – Rexford loam, 0 to 3 percent slopes – This nearly level soil is in smooth, concave positions on glacial outwash terraces. Runoff is slow and the hazard of erosion is none to slight. This soil is medium to low in natural fertility and low in content of organic matter. Most limitations for nonfarm use are related to the seasonal high water table and slow permeability. The Capability Subclass for this soil is IIIw.

RdB – Rexford Loam, 3 to 8 percent slopes – This gently sloping soil is in smooth, slightly concave positions on glacial outwash terraces. Runoff is slow and the hazard of erosion is slight. This soil is medium to low in natural fertility and low in content of organic matter. Most limitations for nonfarm use are related to the seasonal high water table and slow permeability. The Capability Subclass for this soil is IIIw.

WeB – Weikert and Klinesville channery slit loams, 3 to 8 percent slopes – This gently sloping soil is on the convex tops of hills, knolls and ridges. Runoff is medium, and the hazard of erosion is moderate. This soil low in natural fertility and low in content of organic matter. Most limitations for nonfarm use are related to the depth to bedrock and the content of coarse fragments. The Capability Subclass for this soil is IIIe.

WeC – Weikert and Klinesville channery slit loams, 8 to 15 percent slopes – This sloping soil is on the convex, rounded tops, crests, and sides of hills, knolls and ridges. Runoff is medium to rapid, and the hazard of erosion is moderate. This soil is low in natural fertility and low in content of

organic matter. Most limitations for nonfarm use are related to the depth to bedrock and slope. The Capability Subclass for this soil is IVe.

WeD – Weikert and Klinesville channery slit loams, 15 to 25 percent slopes – This moderately steep soil is on the sides of hills, knolls, and ridges. Runoff is rapid to very rapid, and the hazard of erosion is moderate. This soil is low in natural fertility and low in content of organic matter. Most limitations for nonfarm use are related to the depth to bedrock and slope. The Capability Subclass for this soil is VIe.

WmB – Wellsboro very stony silt loam, 3 to 8 percent slopes – This gently sloping and soil is on smooth, slightly concave uplands of broad, rolling mountaintops and intermountain basins. Runoff is slow, and the hazard of erosion is slight. This soil is medium in natural fertility and moderate in content of organic matter. Most limitations for nonfarm use are related to the seasonal high water table, the slow permeability and the surface stoniness. The Capability Subclass for this soil is VIs.

WyD – Wyoming gravelly loam, 15 to 25 percent slopes – This moderately steep soil is in broad, smooth or hilly, convex positions on the sides of glacial outwash moraines, kames, and eskers. Runoff is medium to rapid, and the hazard of erosion is moderate. This soil is low in natural fertility and low in content of organic matter. Most limitations for nonfarm use are related slope, the rapid permeability, the content of coarse fragments, and the possibility of groundwater contamination. The Capability Subclass for this soil is IVe.

WyF – Wyoming gravelly loam, 25 to 60 percent slopes – This steep to very steep soil is in broad, smooth or complex, convex positions on the sides of glacial outwash moraines, kames, and eskers. Runoff is rapid, and the hazard of erosion is moderate. This soil is low in natural fertility and low in content of organic matter. Most limitations for nonfarm use are related to the slope, the rapid permeability, and the content of coarse fragments. The Capability Subclass for this soil is VIIe.

III. PROPOSED LAND USE AND SITE FEATURES

PPL Bell Bend, LLC is proposing to construct the Bell Bend Nuclear Power Plant (BBNPP). The proposed construction is expected to disturb approximately 687 Ac. The earth moving activities will consist of constructing a main access road off of US 11, other access and security roads, a railroad spur, parking lots, utilities, buildings and two cooling towers that will support the proposed power plant. Additionally, an intake structure for the cooling system will be constructed along the

west bank of the Susquehanna River and east of the proposed plant, and a temporary construction laydown area will be prepared adjacent to the Susquehanna River and northeast of the proposed plant. A large laydown area and permanent spoil site bounded to the north and south by US 11 and the Susquehanna River respectively will be constructed as well. The total proposed impervious area is about 265 Acres. The site will be served by public sewer and water systems.

IV. PRE-DEVELOPMENT HYDROLOGY

The pre-development hydrologic analysis was conducted using Bentley's Pondpack software, version V8i, for the plant area and HEC-HMS for the intake area. The peak runoff rates and hydrographs were computed using the SCS unit hydrograph method utilizing TR-55. The TR-55 segmental approach was used to determine time of concentration and therefore storm duration. The peak runoff rates for the drainage areas were calculated for each point of interest throughout the site.

Point of Interest 1

Point of Interest 1 is a culvert which carries Walker Run under a driveway along North Market Street.

Point of Interest 2

Point of Interest 2 is a culvert crossing US 11 near the intersection of Confers Ln and US 11.

Point of Interest 3A

Point of Interest 3A is a point on the north side of the PPL owned railroad along the Susquehanna River. Surveyed topography reveals an existing drainage path to the railroad. A site visit concluded the existence of a drainage path, but no structures that would lead to the Susquehanna River.

Point of Interest 3B

Point of Interest 3B is a limit on the east side of the south laydown property line. This area presently flows off-site to an adjacent property and ultimately discharges to the Susquehanna River.

Point of Interest 3C

Point of Interest 3C is a limit on the east side of the property line just north of US 11. This area presently flows off-site to an adjacent property and ultimately discharges to the Right-of-Way of US 11.

Point of Interest 4

POI 4 is a culvert under Bell Bend Rd, 900' south of the Quarry entrance.

Point of Interest 5

POI 5 is a culvert under Bell Bend Rd., 230' north of the Quarry entrance.

Point of Interest 6

POI 6 is a culvert under US 11, 2130' south of the SSES Plant entrance.

Point of Interest 7

POI 7 is a culvert under Bell Bend Rd., 750' north of the Quarry entrance.

Point of Interest 8

POI 8 is a culvert under Beach Grove Road 1230' east of the intersection of Beach Grove Rd. and Thomas Rd.

Point of Interest 9

POI 9 is a culvert under Beach Grove Road 3600' east of the intersection of Beach Grove Rd. and Confers Ln.

Point of Interest 10

POI 10 is a culvert under US 11, 4040' north of the SSES Plant entrance.

The following points of interest are located in the area of the proposed intake structure.

Point of Interest I-1

Point of Interest I-1 is located at downstream end (entrance to Susquehanna River) of the swale just south of the intake structure.

Point of Interest I-2

Point of Interest I-2 is a drain pipe outlet to Susquehanna River, between the north side of the proposed intake structure and south of the access road of the existing intake structure.

Point of Interest I-3

Point of Interest I-3 is east of proposed dredging stockpile area, along the left bank of the Susquehanna River.

Point of Interest I-4

Point of Interest I-4 is south of the proposed dredging stockpile area and north of the southern boundary of the intake area (by the access road).

Point of Interest I-5

Point of Interest I-5 is the outlet to the Susquehanna River of the diverted flow from the stream. The inlet to the diversion pipe is just east of the access road for the intake structure.

Point of Interest I-6

Point of Interest I-6 is at the depression southeast of the proposed dredging stockpile.

A copy of the pre-development data and detailed runoff computations can be found in Appendix C. The pre-development drainage areas can be seen on MAP 1 for the plant site in Appendix F and Figure 1 on sheet 16 of 19 in Appendix K for the intake area. A summary of the pre-development hydrologic analysis is presented in Table 1.

Table 1 - Summary of Pre-Development Hydrologic Analysis

	Point of Interest	Storm Event			
		2-year	10-year	25-year	100-year
PRE-DEVELOPMENT PEAK FLOWS (CFS)	1	200.07	598.07	1003.90	1955.30
	2	39.83	132.99	231.04	473.21
	3A	16.66	60.88	103.41	202.69
	3B	0.00	0.04	0.22	8.48
	3C	0.00	0.13	1.89	9.42
	4	0.52	14.46	48.60	157.24
	5	2.59	22.64	48.31	115.21
	6	98.29	206.10	295.38	484.85
	7	0.00	0.09	0.54	15.86
	8	65.78	150.08	222.85	381.57
	9	53.10	121.23	179.63	305.85
	10	127.45	302.63	452.94	787.31
	I-1	0.00	0.00	0.00	0.00
	I-2	0.00	0.00	0.00	0.00
	I-3	0.50	2.50	4.20	8.70
	I-4	0.04	0.20	0.30	0.70
	I-5	2.20	9.00	14.70	28.40
	I-6	1.10	3.80	6.30	12.40

V. POST-DEVELOPMENT HYDROLOGY

The post-development hydrologic analysis was conducted using the same procedures and parameters listed above. A copy of the detailed uncontrolled post-development computations can be found in Appendix D. The post-development drainage area map for the plant site can be found in Appendix F and Appendix K for the intake area. A summary of the post development hydrological analysis without controlling measures are presented in Table 2.

Table 2 - Summary of Uncontrolled Post-Development Hydrologic Analysis

Point of Interest		Storm Event			
		2-year	10-year	25-year	100-year
POST-DEVELOPMENT PEAK FLOWS (CFS)	1	359.82	805.33	1190.86	2036.39
	2	103.12	238.08	362.61	645.18
	3A	47.75	140.45	224.39	417.17
	3B	0.00	0.00	0.00	0.00
	3C	0.00	0.05	0.78	4.84
	4	36.63	75.94	120.91	235.34
	5	75.52	148.39	212.56	352.43
	6	98.00	204.76	294.25	484.50
	7	0.00	0.08	0.46	13.38
	8	64.49	146.30	216.82	370.33
	9	67.25	143.90	208.34	348.71
	10	126.82	301.14	450.72	783.79
	I-1	0.70	1.50	2.20	3.70
	I-2	2.20	4.50	6.40	10.50
	I-3	3.30	7.10	10.30	17.50
	I-4	0.04	0.20	0.30	0.70
	I-5	2.60	9.00	14.40	28.10
	I-6	1.80	4.50	7.1	13.20

The total post-development runoff rates for areas 1, 2, 3A, 4, 5 and 9 exceed the specified pre-development rates and therefore stormwater management is required. Although the post-development rates for area 6 have been met for the shown storm events, stormwater management is required to meet the 1-year storm. The 1-yr pre-development runoff rate for POI 6 is 63.63cfs. The 1yr post-development uncontrolled rate is 64.01cfs. The total post-development runoff rates for areas I-1, I-2, I-3, I-5, and I-6 exceed the specified pre-development rates but will not require stormwater management due their location along the bank of the Susquehanna River. All the areas abutting the river will drain directly to it. The total post-development runoff rates for Areas 3B, 3C, 7, 8, and 10 and I-4 will be less than the specified pre-development rates due to the re-direction of stormwater due to the development of the site. Seventeen (17) stormwater infiltration/detention basins are provided to manage stormwater for the project.

VI. STORMWATER MANAGEMENT

A. REQUIREMENTS

The runoff requirements include controlling the post-development to pre-development for the 2, 10, and 25, and 100 year storm events, except for the intake area. Stormwater conveyance facilities are required to convey stormwater runoff from the 25-year design storm.

B. STORMWATER DETENTION

There are 17 infiltration/ detention basins located throughout the site. The stormwater detention goal was to store and control the project site's post-development flows into the basins to the site's pre-development flows as well as infiltrating the 2-year storm volume increase. The infiltration testing report can be found in Appendix J. The Basin designs are as follows:

Point of Interest 1

The area draining to Point of Interest 1 is located on the western side of the site. Point of Interest 1 is a culvert which carries Walker Run under a driveway along North Market Street. Development in the area discharging to this point of interest includes the construction of the North Market Street Stockpile Area, Power Block, and Main Parking Lot.

There are eleven underground basins within Point of Interest 1. Basins 1.1, 1.2, 1.3, and 1.5 are located in the Main Parking lot. Basin 1.1, 1.2, and 1.3 are utilized for rate control, volume control, and water quality. Basin 1.5 is used for rate control. Basin 1.1 is 4.5' deep with an applied infiltration rate of 0.274 in/hr. Basin 1.2 is 5' deep with an applied infiltration rate of 2.14in/hr. Basin 1.3 is 5' deep with an applied infiltration rate of 2.25 in/hr.

Two basins are located in the area of the North Market Street Stockpile Area. Basin 8 and Basin 9 are both underground basins used for rate control, volume control, and water quality. Basin 8 is 3' deep and has an applied infiltration rate of 1.51 in/hr. Basin 9 is 3' deep and has an applied infiltration rate of 3.33 in/hr.

The remaining five basins are located in and around the Power Block. Basin 10.1 is 5' deep and has an applied infiltration rate of 1.71 in/hr. Basin 10.4 is 4' deep and has an applied infiltration rate of 3.71 in/hr. Basin 13.1 is 4' deep and has an applied infiltration rate of 0.26 in/hr. Basin 12 is 3' deep and has an applied infiltration rate of 10.0 in/hr. Basin 22 is 3' deep and has an applied infiltration rate of 1.82 in/hr.

The total post-development flows for the 2, 10, 25, and 100 year storm events are less than the required pre-development total flows. See Table 3-1. Detailed computations supporting the results shown in Table 3-1 can be found in Appendix C, D, G and H.

Table 3-1 - Stormwater Management Results- Point of Interest 1

Storm Event	Total Pre-Development (CFS)	Total Post-Development Controlled (CFS)
2-year	200.07	183.80
10-year	598.07	490.18
25-year	1003.90	767.31
100-year	1955.30	1391.31

Point of Interest 2

Point of Interest 2 is a culvert crossing US 11 near the intersection of Confers Ln and US 11. Development within Point of Interest 2 includes the construction associated with the Main Parking Lot, Met Tower/Construction Buildings, and laydown space along SUPP Rd, the main access off of US 11.

There are two basins located within POI 2. Basin 3.1 is an underground basin that is 5' deep and is used for peak flow reduction. Basin 3.2 is an aboveground basin with a depth of 11.5' and an applied infiltration rate of 0.51 in/hr.

The total post-development flows for the 2, 10, 25, and 100 year storms are less than the required pre-development total flows. See Table 3-2. Detailed computations supporting the results shown in Table 3-2 can be found in Appendix C, D, G and H.

Table 3-2 - Stormwater Management Results- Point of Interest 2

Storm Event	Total Pre-Development (CFS)	Total Post-Development Controlled (CFS)
2-year	39.83	33.76
10-year	132.99	119.56
25-year	231.04	207.84
100-year	473.21	394.50

Point of Interest 3A

The area draining to Point of Interest 3A is located on the south side of US 11 at the PPL owned railroad along the Susquehanna River. The northern portion of the site will drain to the proposed basin, Basin 21. The remaining area, By Basin 21, will drain uncontrolled to Point of Interest 3A. Basin 21 is an aboveground basin used for rate control, volume control, and water quality. The basin will be used as a sediment basin during construction and converted to a permanent basin once the area is stabilized. Conversion will consist of the removal of the top two (2) feet of the basin bottom. The basin is 11' deep with a bottom elevation of 529'. Using an average infiltration rate of 10.00 in/hr. the increase in runoff between the 2-year pre and post-development storms is infiltrated.

The total post-development flows for the 2, 10, 25, and 100 year storms are less than the required pre-development total flows. See Table 3-3. Detailed computations supporting the results show in Table 3-3 can be found in Appendix C, D, G and H.

Table 3-3 - Stormwater Management Results- Point of Interest 3A

Storm Event	Total Pre-Development (CFS)	Total Post-Development Controlled (CFS)
2-year	16.66	0.01
10-year	60.88	1.25
25-year	103.41	3.71
100-year	202.69	22.72

Point of Interest 4

Point of Interest 4 is a culvert beneath Bell Bend Rd, 900' south of the Quarry entrance. Development within Point of Interest 4 includes the construction associated with the Main Parking Lot, Met Tower/Construction Buildings, and laydown space along SUPP Rd, the main access off of US 11.

There are no constructed basins within POI 4. An existing wetland adjacent to the Met Tower will serve as additional storage for the development in POI 4 due to modifications in the surrounding elevations.

The total post-development flows for the 2, 10, 25, and 100 year storms are less than the required pre-development total flows. See Table 3-4. Detailed computations supporting the results shown in Table 3-4 can be found in Appendix C, D, G and H.

Table 3-4 - Stormwater Management Results- Point of Interest 4

Storm Event	Total Pre-Development (CFS)	Total Post-Development Controlled (CFS)
2-year	0.52	0.12
10-year	14.46	2.65
25-year	48.60	20.33
100-year	157.24	90.19

Point of Interest 5

Point of Interest 5 is located at a culvert beneath Bell Bend Rd., 230' north of the Quarry entrance. Development in the area discharging to this point of interest includes the construction associated with the Quarry, Construction Buildings, Laydown Space, and Batch Plant.

Runoff will be collected in an underground basin, Basin 6. The remaining area not collected in the basin will drain uncontrolled to this Point of Interest. Basin 12 is an underground basin used for rate control, volume control, and water quality. The basin is 5' deep with a bottom elevation of 630.00. An average infiltration rate of 2.50 in/hr. was applied to the calculations.

The total post-development flows for the 2, 10, 25, and 100 year storms are less than the required pre-development total flows. See Table 3-5. Detailed computations supporting the results shown in Table 3.-5 can be found in Appendix C, D, G and H.

Table 3-5 - Stormwater Management Results- Point of Interest 5

Storm Event	Total Pre-Development (CFS)	Total Post-Development Controlled (CFS)
2-year	2.59	0.02
10-year	22.64	4.17
25-year	48.31	13.96
100-year	115.21	35.47

Point of Interest 6

Point of Interest 6 is located at a culvert beneath US 11, 2130' south of the SSES Plant entrance. Development in the area discharging to this point of interest includes portion of construction associated with the Batch Plant and railroad.

Runoff will be collected in an aboveground basin, Basin 18. The remaining areas not collected in the basin will drain uncontrolled to this Point of Interest. Basin 18 is an aboveground basin used

for volume control and water quality. The basin is 7' deep with a bottom elevation of 619.00. An average infiltration rate of 1.39 in/hr. was applied.

The total post-development flows for the 1, 2, 10, 25, and 100 year storms are less than the required pre-development total flows. See Table 3-6. Detailed computations supporting the results shown in Table 3-6 can be found in Appendix C, D, G and H.

Table 3-6 - Stormwater Management Results- Point of Interest 6

Storm Event	Total Pre-Development (CFS)	Total Post-Development Controlled (CFS)
1-year	63.63	63.10
2-year	98.29	96.55
10-year	206.10	200.99
25-year	295.38	288.76
100-year	484.85	477.75

Point of Interest 9

This area is located at the north portion of the site and ultimately discharges to this Point of Interest at the center of the southern boundary of the drainage area along Beach Grove Road. Development in the area discharging to this point of interest includes construction associated with the New 500kV Switch Yard.

A majority of the area will bypass the basin and drain uncontrolled to this Point of Interest. The area in the 500kV Switch Yard will drain into Basin 15.3, an underground basin, used for rate control, volume control, and water quality. Basin 15.3 is 5' deep with a bottom elevation of 1020.00. An average infiltration rate of 0.250 in/hr. was applied.

The total post-development flows for the 2, 10, 25, and 100 year storms are less than the required pre-development total flows. See Table 3-7. Detailed computations supporting the results shown in Table 3-7 can be found in Appendix C, D, G and H.

Table 3-7 - Stormwater Management Results- Point of Interest 9

Storm Event	Total Pre-Development (CFS)	Total Post-Development Controlled (CFS)
2-year	53.10	44.57
10-year	121.23	109.29
25-year	179.63	167.59
100-year	305.85	294.61

C. INFILTRATION AND VOLUME ANALYSIS

Infiltration testing was performed in accordance with the methodology specified in the Pennsylvania DEP BMP Manual Appendix C. The locations for each test were strategically selected based on the proposed site layout, site features, and planned stormwater management locations. Testing results can be found in Appendix J of this report. The locations of the tests are shown on the PCSM plan set. Per the PA BMP manual Appendix C, 4-6 tests/acre of BMP area is the recommended guideline. The number of tests used for infiltration design rate calculation was 108 tests. There is 26.79 Acres of infiltration basin bottom area. These values provide a ratio of over 4 tests/acre.

The design infiltration rate was established by calculating the geometric mean for the relevant sample at each proposed basin site and applying a safety factor of 2. See Table I.1 in Appendix I for more detailed information on rates, locations, and stormwater management items.

Volume reductions for each Point of Interest were calculated in Table I.2 and summarized in Table I.3 in Appendix I. Although the volume reductions vary positively and negatively for each POI, as seen in Table I.3, the site has an overall reduction in runoff volume.

D. 2-YEAR STORM EVENT RUNOFF VOLUME FOR INTAKE AREA

For the intake area, no stormwater detention is provided, because runoff will be discharged directly to Susquehanna River via protected outlet structures. Instead, the 2-year runoff volumes for pre- and post-development are compared. The estimated pre- and post-development runoff volumes are 23,360 and 38,682 cubic-feet, respectively. The 2-Year runoff volume increase at the intake area is 16,588 cubic-feet. See Appendix K for full Intake area report.

VII. STORMWATER CONVEYANCE

Culvert, and swale flows were calculated using the rational method for the 25-year design storm in PennDOT Region 5. Swales were designed using North American Green Software NAG Version 4.31. Culverts were designed using HY-8 version 7.2.

VIII. STORMWATER BEST MANAGEMENT PRACTICES

Stormwater BMP's are proposed for the site that will provide a total decrease in stormwater volume between the pre and post-development two-year storm event. The systems include a series of structural BMP's including infiltration basins and vegetated swales. The systems will combine to provide water quality treatment that meets the requirements of the Pennsylvania DEP.

Infiltration testing was performed on the site in the areas of proposed stormwater management. See Appendix J for infiltration results performed by Pennoni Associates.

Proposed structural BMP's that will reduce volume, include a series of surface infiltration/detention basins and subsurface infiltration basins. Additional water quality BMP's include: level spreaders, grass-lined swales, and Snout inlet inserts to be installed in inlets prior to the infiltration basins.

Control Guideline 1 for runoff volume control will be met with the implementation of a series of structural BMP's as listed above. They will all combine to limit the effects of the post construction stormwater discharges degradation of the physical, chemical, or biological characteristics of the receiving waters.

IX. ANITDEGRADATION ANALYSIS

Non Discharge Alternatives

Non-discharge alternatives were evaluated before implementing any Antidegradation Best Available Combination Technologies (ABACT) measures. All existing site features were evaluated and used for post-construction management and erosion and sedimentation control. The following are descriptions of all non-discharge alternatives that were evaluated.

E&S Plan

Alternate Siting

- Avoidance of disturbance to wetlands and streams, along with minimization of unavoidable impacts to those features, was a key factor in the current siting of BBNPP. Details of how impacts were reduced to the maximum practicable extent are provided herein to demonstrate the Project's compliance with the "avoid, minimize, mitigate" policy endorsed by the ACOE and PADEP.

  The current project design includes approximately 2.57 acres of permanent impact to wetlands and 997 feet of impacts to streams. The current design also includes 6.8 acres of wetland enhancement, 8.23 acres of creation and 2,213 feet of stream creation/enhancement. Forested wetlands created or converted will total 14.60 acres, exceeding the amount cleared. This level of impact is considered to represent the least impact to wetland and streams possible while fulfilling the Project's overall purpose and need. The current project design also eliminates 100 acres of wetland disturbance from the original design location in 2008 through relocation of site development.

  Since the initiation of the planning and design of BBNPP, PPL has advanced numerous iterations of the layout and design of BBNPP with the goal of avoiding the wetlands and stream features. Pre-application meetings with regulatory agencies and input on required avoidance and minimization measures were considered carefully in the design effort for BBNPP. Once the determination was made that the proposed site was in the preferred location for the construction of BBNPP, PPL investigated numerous options to avoid direct, indirect and reasonably foreseeable cumulative impacts to wetlands and streams. The current BBNPP layout represents the results of this process.

Limited Disturbed Areas

- On a project this large, all efforts will take place to limit the amount of earth disturbance.

Limit Extent and Duration of Disturbance

- On a project this large, all efforts will take place to limit the extent and duration of disturbance.

Vegetated Riparian Buffers

- It was not possible to achieve 100 foot buffers along the entire watercourses and wetlands due to the layout of the project. But, preservation of a 50' buffer zone to the extent practical around wetlands and streams in the Walker Run watershed is proposed to preserve existing riparian zones and undeveloped lands adjacent to wetlands. This measure is expected to significantly reduce secondary impacts to wetland and streams on the BBNPP Site.

PCSM Plan

Alternate Siting

- Avoidance of disturbance to wetlands and streams, along with minimization of unavoidable impacts to those features, was a key factor in the current siting of BBNPP. Details of how impacts were reduced to the maximum practicable extent are provided herein to demonstrate the Project's compliance with the "avoid, minimize, mitigate" policy endorsed by the ACOE and PADEP.

  The current project design includes approximately 2.57 acres of permanent impact to wetlands and 997 feet of impacts to streams. The current design also includes 6.8 acres of wetland enhancement, 8.23 acres of creation and 2,213 feet of stream creation/enhancement. Forested wetlands created or converted will total 14.60 acres, exceeding the amount cleared. This level of impact is considered to represent the least impact to wetland and streams possible while fulfilling the Project's overall purpose and need. The current project design also eliminates 100 acres of wetland disturbance from the original design location in 2008 through relocation of site development.

  Since the initiation of the planning and design of BBNPP, PPL has advanced numerous iterations of the layout and design of BBNPP with the goal of avoiding the wetlands and stream features. Pre-application meetings with regulatory agencies and input on required avoidance and minimization measures were considered carefully in the design effort for BBNPP. Once the determination was made that the proposed site was the preferred location for the construction of BBNPP, PPL investigated numerous options to avoid direct, indirect and reasonably foreseeable cumulative impacts to wetlands and streams. The current BBNPP layout represents the results of this process.

Low Impact Development

- Adoption of low impact development (LID) practices are proposed that include siting stormwater discharges outside of wetlands and within heavily vegetated buffer areas, reduction in impervious surfaces, and construction of bridges in lieu of culverts.

Vegetated Riparian Buffers

- It was not possible to achieve 100 foot buffers along the entire watercourses and wetlands due to the layout of the project. But, preservation of a 50' buffer zone to the extent practical around wetlands and streams in the Walker Run watershed is proposed to preserve existing riparian zones and undeveloped lands adjacent to wetlands. This measure is expected to significantly reduce secondary impacts to wetland and streams on the BBNPP Site.

Infiltration

- Numerous infiltration basins are proposed throughout the site in order to infiltrate the difference between the 2-year predevelopment and 2-year post development volumes.

Water Reuse

- This was not an option due to the project's intricate and pre-determined design. The proposed non-discharge alternatives will dramatically increase volume reduction, groundwater recharge, peak rate control, and improve water quality before any structural BMP's are implemented.

Antidegradation Best Available Combination Technologies (ABACT)

The following are a description of ABACT measures considered and implemented on this site:

E&S Plan

Treatment BMP's

- A series of sediment basins with skimmers are proposed in various areas on the site to collect and treat the sediment laden runoff from the site. The basins were designed with a ratio of 4:1 or greater. Some of the sediment basins will also have 4-7 day detention times. Sediment basins will be cleaned and converted to an infiltration/detention, where possible, basin once construction is complete.

Land Disposal

- The preservation of a 50' buffer zone around wetlands in the Walker Run watershed is proposed to the greatest extent possible to preserve existing riparian zones and undeveloped lands adjacent to wetlands. This measure is expected to significantly reduce secondary impacts to wetland and streams on the BBNPP Site

- All disturbed areas must be quickly stabilized as discussed in the E&S plans

- A series of vegetated and rock-lined swales are proposed on the site.

PCSM Plan

Treatment BMP's

- Numerous surface and subsurface infiltration basins are proposed for the site to infiltrate the difference between the two year pre-development and post-development storm volumes.
- A series of vegetated and rock-lined swales are proposed on the site.
- Numerous Snout inlet inserts are proposed on the site. The snouts will provide water quality treatment prior to the infiltration basins.

Land Disposal

- The preservation of a 50' buffer zone around wetlands in the Walker Run watershed is proposed to preserve existing riparian zones and undeveloped lands adjacent to wetlands. This measure is expected to significantly reduce secondary impacts to wetland and streams on the BBNPP Site

Pollution Prevention

- PPC plan will be available on site.
- Many non-structural BMP's are to be used on site, ie: protection of sensitive and special value features such as waterbodies, riparian areas, wetlands, woodlands, natural drainage ways and steep slopes.

X. THERMAL IMPACT ANAYLSIS

The potential sources of thermal impact for this development include runoff from the proposed access drives, parking lots and buildings. Runoff from the warm impervious areas will be mitigated by routing the stormwater through a series of grass-lined swale and deep, low sloping pipes before draining into a series of subsurface infiltration/detention basins. The infiltration/detention basins will provide for permanent storage of the first flush storms, thus limiting the discharge of the warmer waters. Many of the basins will discharge via level spreaders to existing wetlands and other vegetated areas before entering the adjacent watercourses. These features will combine to mitigate any thermal impacts and allow the runoff to return to ambient temperature.

For the intake area, most of the discharge from the impervious areas will flow over grassed slopes before discharging into the river. This reduces the thermal impact of warm runoff emanating from impervious areas.

XI. MAINTENANCE OF STORMWATER FACILITIES

Structural BMP's

1. Subsurface Infiltration Basins
    a. All catch basins and inlets should be inspected and cleaned periodically, as required.
    b. The overlying vegetation of Subsurface Infiltration Basin features should be maintained in good condition, and any bare spots re-vegetated as soon as possible.
    c. Remove accumulated sediment from basin as required. Restore original cross section and infiltration rate. Properly dispose of sediment.

2. Snout Inlet Inserts
    a. Normal yearly maintenance consists of:
        i. Routine inspection and rinsing with a hose or pressure washer during the cleaning sequence of the catch basin.
        ii. Flushing the anti-siphon with water or air to verify that it is clear.
        iii. Vacuuming the snout inlet and properly disposing of sediment.
    b. Contact an engineering consultant familiar with BMP design if the inlet is clean of sediment and debris and does not drain properly.

3. Vegetated Swales
    a. Inspect and correct erosion problems, damage to vegetation, and sediment and debris accumulation.
        i. Address when greater than 3-in. at any spot or when covering vegetation. Dispose of accumulated sediment in appropriate locations. Accumulated debris should be disposed of appropriately as well.
    b. Inspect vegetation on side slopes for erosion and formation of rills or gullies, correct as needed.
    c. Inspect for pools of standing water
        i. Dewater and discharge to an approved location and restore to design grade.
    d. Mow and trim vegetation to ensure safety, aesthetics, proper swale operation, or to suppress weeds and invasive vegetation. Swale vegetation shall not be managed as lawn and grass; they shall be allowed to grow tall.
        i. Dispose of cuttings in a local composting facility.
        ii. Mow only when swale is dry to avoid rutting.
    e. Inspect for litter
        i. Remove prior to mowing.
    f. Inspect for uniformity in cross-section and longitudinal slope, correct as needed.
    g. Inspect swale inlet (curb cuts, pipes, etc.) and outlet for signs or erosion or blockage.
        i. Correct as needed.
    h. Plant alternative grass species in the event of unsuccessful establishment

i. Reseed bare area; install appropriate erosion control measures when native soils are exposed or erosion channels are forming.
j. Rototill and replant swale if drawdown time is more than 48 hours.
k. Water during dry periods, fertilize and apply pesticide only when absolutely needed
l. Inspect swale immediately after spring melt, remove residuals and replace damaged vegetation without disturbing remaining vegetation
m. If roadside or parking lot runoff is directed to swale, mulching and/or soil aeration/manipulation may be required in the spring to restore soil structure and moisture capacity and to reduce the impacts of deicing agents.
n. Use non-toxic, organic deicing agents. Applied either as blended, magnesium chloride-based liquid products or as pretreated salt.
o. Use salt tolerant vegetation in swales.

4. Street Sweeping
    a. Bi-annual street sweeping of all parking lots and access drive should be performed.

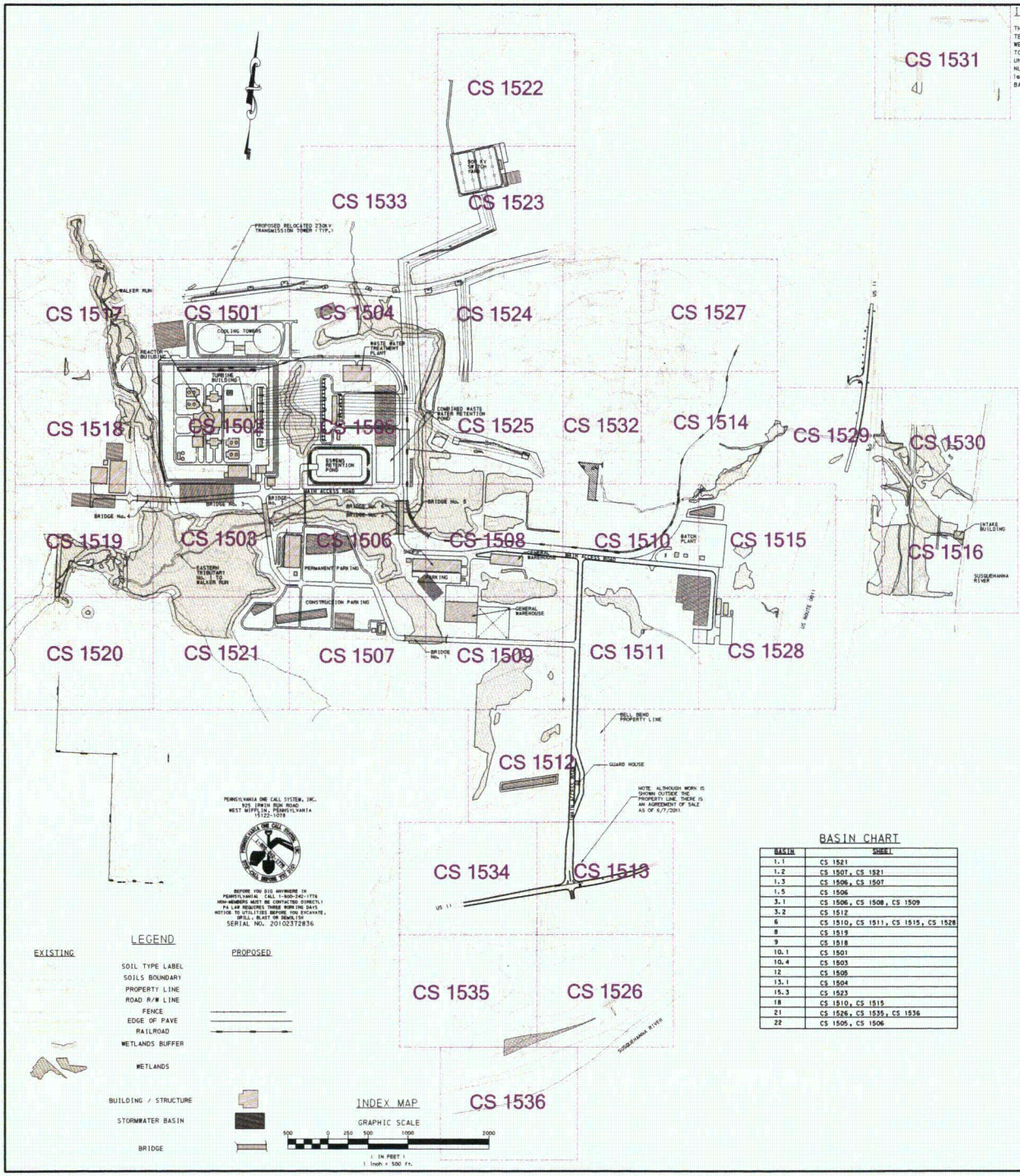
Table 4 summarizes the potential stormwater related problems, their proposed resolutions and responsible parties. (see next page)

Table 4 – Maintenance of Stormwater Facilities

Facility	Potential Problem	Remedy	Responsible Party
Outlet Protection	Dislodged Stones	Replace with larger stones.	Owner
	Erosion below outlet	Enlarge riprap apron; or Line receiving channel below outlet	
	Outlet Scour	Install proper filter fabric or graded bedding beneath riprap apron	
Detention Basin	Obstructed Outlet	Remove debris.	Owner
	Basin not dewatering between storms	Clear orifice and check outlet pipes for debris and sediment. Clean inlet box grate.	Owner
	Outlet Erosion	Make sure outlet is flush with ground and on level grade. Install, extend, or repair riprap apron as required.	Owner
Pipes	Clogged Pipe	Flush pipe.	Owner
Inlets	Silt and Debris	Remove silt and debris.	Owner
Swales	Water Quality	Vegetation in swales should remain uncut to promote the settlement of sediment and evapotranspiration once all swales are fully vegetated. (Applies to swales not adjacent to roads)	Owner

XII. CONCLUSION

The site is designed to safely convey the 25-year storm through a series of inlets, pipes and infiltration/ detention basins. The project site's post development 2, 10, 25, and 100 year storm runoff rates are released from the site below their respective pre-development storm runoffs rates, except for the intake area located directly on the banks of Susquehanna River. The intake area will not require stormwater management due its location along the bank of the Susquehanna River. All the areas abutting the river will drain directly to it in an effort to allow storm run off to pass through the waterway prior to the peak event. The site's cumulative runoff volume for the 2-year storm in post-development conditions will be less than pre-development conditions. The construction of the project will not cause physical degradation of the receiving waters.



PENNSYLVANIA ONE CALL SYSTEM, INC.
925 SOUTH RUN ROAD
WEST NEWTON, PENNSYLVANIA
1-800-242-1776

BEFORE YOU DIG ANYWHERE IN PENNSYLVANIA, CALL 1-800-242-1776. NON-MEMBERS MUST BE CONTACTED DIRECTLY. PA LAW REQUIRES THREE WORKING DAYS NOTICE TO UTILITIES BEFORE YOU EXCAVATE, DRILL, BLAST OR DEMOLISH.
SERIAL NO. 20102372836

LEGEND

EXISTING	PROPOSED
SOIL TYPE LABEL	
SOILS BOUNDARY	
PROPERTY LINE	
ROAD R/W LINE	
FENCE	
EDGE OF PAVE	
RAILROAD	
WETLANDS BUFFER	
WETLANDS	
BUILDING / STRUCTURE	
STORMWATER BASIN	
BRIDGE	

INDEX MAP

GRAPHIC SCALE
500 0 250 500 1000 2000
1 IN FEET
1 inch = 500 ft.

BASIN CHART

BASIN	SHEET
1.1	CS 1521
1.2	CS 1507, CS 1521
1.3	CS 1506, CS 1507
1.5	CS 1506
3.1	CS 1506, CS 1508, CS 1509
3.2	CS 1512
6	CS 1510, CS 1511, CS 1515, CS 1528
8	CS 1519
9	CS 1518
10.1	CS 1501
10.4	CS 1503
12	CS 1505
13.1	CS 1504
15.3	CS 1523
18	CS 1510, CS 1515
21	CS 1526, CS 1535, CS 1536
22	CS 1505, CS 1506

INFILTRATION NUMBERING:

THE INITIAL TEST NUMBERS CORRELATE TO A PRELIMINARY CONCEPT PLAN BASIN NUMBERING SCHEME. THE FOLLOW UP ROUND OF TESTING WAS COMPLETED AFTER ALL POINTS OF INTEREST WERE IDENTIFIED. THE NUMBERING SCHEME FOR THE FOLLOW UP ROUNDS WERE ORGANIZED IN THE 200 AND 300 SERIES TO SIGNIFY THE SECOND AND THIRD ROUNDS. ALL TENS AND ONES UNITS RELATE TO THE BASIN NUMBER, AND EACH BASIN NUMBER IS RELATED TO THE POINT OF INTEREST IN WHICH IT IS LOCATED. ANY TENTHS UNITS DIFFERENTIATE BETWEEN MULTIPLE BASINS WITHIN THE SAME POINT OF INTEREST. ANY ALPHA DIGITS IN THE TEST NUMBER ARE USED TO NOTE ADDITIONAL TESTS WITHIN THE SAME BASIN.
i.e. 203.1.A SIGNIFIES THE FIRST TEST IN THE FOLLOW UP ROUND OF INFILTRATION TESTING, IN POINT OF INTEREST 3, IN BASIN 3.1.

INITIAL TESTS INFILTRATION TEST PITS

TEST No.	TEST ELEV.	EXISTING ELEV.	TEST DEPTH
1A.1	713.2	760	46.8'
1A.2	713.2	791.4	78.2'
1B.1	713.6	675	-38.6'
1B.2	713.6	680	-33.6
2.1	713.6	785	71.4'
2.2	713.6	750	36.4'
3.1	685	690	5'
3.2	685	687	2'
4.1	657	665	8'
4.2	657	660	3'
5.1	706.4	720	13.6'
5.2	706.4	715	8.6'
6.1	714	722.5	8.5'
6.2	714	721	7'
7.1	712.3	715	2.7'
7.2	712.3	715	2.7'
8.1	687	695	8'
8.2	687	N/A	N/A
9.1	663	670	7'
9.2	663	665.7	2.7'
10.1	669	672.6	3.6'
10.2	669	673.5	4.5'
11.1	660	670	10'
11.2	660	665	5'
12A.1	676	680	4'
12A.2	676	680	4'
12B.1	678.4	670.6	-7.8
12B.2	678.4	670	-8.4
13.1	667	659.3	-7.7
13.2	667	651.9	-15.1
14.1	652	655	3'
14.2	652	655	3'
15.1	630	635	5'
15.2	630	635	5'
16.1	663	668.3	5.3'
16.2	663	668.3	5.3'
17.1	657	665	8'
17.2	657	665	8'
18.1	-	-	-

FOLLOW UP TESTS INFILTRATION TEST PITS

TEST No.	TEST ELEV.	EXISTING ELEV.	TEST DEPTH
18.2	-	-	-
201.A	663	668.7	5.7'
201.B	663	671	8'
202.A	670	678	8'
202.B	670	676	6'
203.1.A	674	679	5
203.1.B	674	678	4'
203.2.A	648.5	649	0.5'
203.2.B	648.5	653.5	5'
204.2.A	671.4	-	-
204.2.B	671.4	-	-
206.A	630	-	-
206.B	630	-	-
208.A	660	665	5'
208.B	660	666	6'
209.A	663	-	-
209.B	663	-	-
210.1.A	685	-	-
210.1.B	685	-	-
210.4.A	660	667	7'
210.4.B	660	665	5'
212.A	685	712	27'
212.B	685	715	30'
213.1.A	714	718	4'
213.1.B	714	723	9'
213.2.A	-	-	-
213.2.B	-	-	-
215.1.A	990	1011	21'
215.1.B	990	1011	21'
215.2.A	990	1004	14'
215.2.B	990	1004	14'
215.C	990	999	9'
251.D	990	999	9'
218.A	619	625	6'
218.B	619	622	3'
220.A	648	651	3'
220.B	648	649.3	1.3'
221.A	603	607	4'
221.B	603	608	5'
301.1.A	664	667.0	3.0
301.1.B	664	664.5	0.5
301.1.C	664	666.9	2.9
301.2.A	683	685.4	NA
301.2.B	690.8	692.8	2.0
301.2.C	683	688.0	5.0
301.2.D	690.6	693.1	2.5
301.2.E	683	689.1	6.0
301.3.A	682	684.0	2.0

FOLLOW UP TESTS INFILTRATION TEST PITS

TEST No.	TEST ELEV.	EXISTING ELEV.	TEST DEPTH
301.3.B	687.2	689.2	2.0
301.3.C	690.2	692.2	2.0
301.3.D	686.3	688.3	2.0
301.3.E	685.4	687.4	2.0
301.3.F	689.6	692.6	3.0
301.3.G	686.5	692.5	6.0
301.4.A	673	674.6	NA
301.4.B	673	679.4	NA
301.4.C	673	676.0	NA
301.4.D	673	681.6	NA
301.4.E	673	677.1	NA
301.5.C	680	684.0	NA
301.5.D	680	682.2	NA
301.5.E	680	691.7	NA
301.5.F	680	686.0	NA
301.5.G	680	681.2	NA
301.5.H	680	690.0	NA
301.5.I	680	686.0	NA
301.5.J	680	682.0	NA
301.5.K	680	691.0	NA
301.5.L	680	684.0	NA
303.2.A	648.5	649.4	0.9
303.2.B	648.5	650.3	1.8
303.2.C	648.5	655.0	6.5
306.A	630	639.5	9.5
306.B	630	639.1	9.1
306.C	630	640.5	10.5
306.D	630	637.3	7.3
306.E	630	635.9	5.9
306.F	630	637.6	7.6
306.G	630	640.5	10.5
306.H	630	633.7	3.7
306.I	630	638.7	8.7
306.J	630	641.3	11.3
306.K	630	635.2	5.2
306.L	630	632.6	2.6
306.M	630	634.7	4.7
306.N	630	638.2	8.2
306.O	630	639.4	9.4
306.P	630	641.1	11.1
308.A	664	666.8	2.8
308.B	664	666.1	2.1
308.C	664	665.5	1.5
308.D	664	666.4	2.4
308.E	664	666.3	2.3
308.F	664	665.7	1.7
308.G	664	666.7	2.7
308.H	664	664.4	0.4
309.A	667.9	670.4	2.5
309.B	663.5	669.5	6.0
309.C	663	666.2	3.0
3.1	685	690.0	5.0
3.2	685	687.0	2.0
3101.1.A	685	689.3	4.3
3101.1.B	685	687.6	2.6
3101.1.C	685	685.7	0.7
3101.1.D	685	690.0	5.0
3101.1.E	685	688.1	3.1
3101.1.F	685	688.7	3.7
3101.1.G	685	690.0	5.0
3101.1.H	685	693.3	8.3
3101.1.I	685	692.0	7.0
3101.1.J	685	697.0	12.0
310.4.A	660	660.7	NA
310.4.B	660	661.0	NA
310.4.C	660	662.0	NA
310.4.D	660	662.0	NA
310.4.E	660	662.8	NA
310.4.F	664	668.5	4.5
310.4.G	664	668.0	4.0
310.4.H	664	668.5	4.5
310.4.I	664.5	669.5	5.0
310.4.J	664.0	670.0	6.0
310.4.K	664	666.5	2.5
310.4.L	664	667.5	3.5
310.4.M	664	667.0	3.0
310.4.N	664	668.2	4.2
310.4.O	664	669.0	5.0
310.4.P	664	664.2	0.2
310.4.Q	664	668.0	4.0
310.4.R	664	665.5	1.5
310.4.S	664	664.0	0.0
310.4.T	664	666.5	2.5
312.A	685	689.8	4.8
313.1.A	718	718.1	0.1
313.1.B	718	720.4	2.4
313.1.C	718	723.0	5.0

FOLLOW UP TESTS INFILTRATION TEST PITS

TEST No.	TEST ELEV.	EXISTING ELEV.	TEST DEPTH
315.3.A	1030	1041.0	NA
315.3.B	1030	1034.9	NA
315.3.C	1030	1036.7	NA
315.3.D	1030	1041.5	NA
315.3.E	1030	1038.0	NA
315.3.F	1030	1035.5	NA
315.3.G	1030	1035.1	NA
315.3.H	1030	1030.8	NA
315.3.I	1030	1031.8	NA
315.3.A ALT	1020	1022.0	2.0
315.3.B ALT	1020	1031.0	11.0
315.4.A	1018	1029.2	NA
315.4.B	1018	1018.9	NA
315.4.C	1018	1028.8	NA
315.4.D	1018	1018.5	NA
315.4.E	1018	1028.9	NA
315.4.F	1018	1021.3	NA
318.A	619	629.9	10.9
318.B	619	619.0	0.0
321.A	536.0	541.0	5.0
321.B	536.4	540.9	4.5
321.C	529	529.6	0.6
321.D	529	539.0	10.0
321.E	529	539.3	10.0
321.F	529	532.9	3.9
321.G	529	539.5	10.5
321.H	529	536.9	7.9
322.A	677	681.0	4.0
322.B	677	678.0	1.0

DRAWING LIST

Pennoni Associates Inc.
Engineers • Surveyors • Planners • Landscape Architects
100 M. Wilkes-Barre Boulevard
Wilkes-Barre, PA 18702 (570) 824-2200

Pennoni

NO.	DATE	REVISIONS	BY
1	9/15/11	ORDER ENFORCEMENT REDUCTION OF LOD COMMENTS	LGB

ALL UNDERGROUND MUST BE VERIFIED BY CONTRACTOR PRIOR TO CONSTRUCTION. REPORT ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK.

BELL BEND NUCLEAR POWER PLANT
SALEM TOWNSHIP, PENNSYLVANIA
PCSM INDEX PLAN
PPL BELL BEND, LLC
38 BOWMANSTOWN ROAD, SUITE 2
BOWMANSTOWN, PA 18030

JOB NO. PPLS0902
SHEET 1 OF 43

SCALE 1"=500'
DRAWN BY LGB
DATE 9/15/2011
APPROVED JFM
DRAWING NO. CS 1401 PCSM