

Bellefonte Nuclear Plant Units 3 & 4

COL Application

Part 3

Applicant's Environmental Report - Combined License Stage |

Revision 1

**Bellefonte Nuclear Plant, Units 3 & 4
COL Application
Part 3, Environmental Report**

MASTER TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>
CHAPTER 1 INTRODUCTION TO THE ENVIRONMENTAL REPORT		
1.0	INTRODUCTION TO THE ENVIRONMENTAL REPORT	1.0-1
1.1	THE PROPOSED PROJECT	1.1-1
1.1.1	REFERENCES.....	1.1-3
1.2	STATUS OF REVIEWS, APPROVALS, AND CONSULTATIONS	1.2-1
CHAPTER 2 ENVIRONMENTAL DESCRIPTION		
2.0	ENVIRONMENTAL DESCRIPTION.....	2.0-1
2.1	STATION LOCATION	2.1-1
2.1.1	REFERENCES.....	2.1-2
2.2	LAND.....	2.2-1
2.2.1	THE SITE AND VICINITY	2.2-1
2.2.2	TRANSMISSION CORRIDORS AND OFF-SITE AREAS.....	2.2-3
2.2.3	THE REGION	2.2-3
2.2.4	REFERENCES.....	2.2-4
2.3	WATER	2.3-1
2.3.1	HYDROLOGY	2.3-1
2.3.2	WATER USE	2.3-32
2.3.3	WATER QUALITY	2.3-38
2.3.4	REFERENCES	2.3-52
2.4	ECOLOGY	2.4-1
2.4.1	TERRESTRIAL ECOLOGY	2.4-1
2.4.2	AQUATIC ECOLOGY	2.4-17
2.4.3	REFERENCES	2.4-28
2.5	SOCIOECONOMICS	2.5-1
2.5.1	DEMOGRAPHY	2.5-1
2.5.2	COMMUNITY CHARACTERISTICS	2.5-7
2.5.3	HISTORIC PROPERTIES	2.5-21
2.5.4	ENVIRONMENTAL JUSTICE	2.5-32
2.5.5	NOISE	2.5-35
2.5.6	REFERENCES.....	2.5-36
2.6	GEOLOGY	2.6-1
2.6.1	REFERENCES.....	2.6-1
2.7	METEOROLOGY AND AIR QUALITY	2.7-1
2.7.1	REGIONAL CLIMATOLOGY.....	2.7-1
2.7.2	LOCAL METEOROLOGY	2.7-10
2.7.3	SHORT-TERM DIFFUSION ESTIMATES	2.7-18
2.7.4	LONG-TERM DIFFUSION ESTIMATES.....	2.7-20

**Bellefonte Nuclear Plant, Units 3 & 4
COL Application
Part 3, Environmental Report**

MASTER TABLE OF CONTENTS (Continued)

<u>Section</u>	<u>Title</u>	<u>Page</u>
2.7.5	REFERENCES.....	2.7-22
2.8	RELATED FEDERAL PROJECT ACTIVITIES.....	2.8-1
2.8.1	REFERENCES.....	2.8-1

**CHAPTER 3
PLANT DESCRIPTION**

3.0	PLANT DESCRIPTION.....	3.0-1
3.1	EXTERNAL APPEARANCE AND PLANT LAYOUT.....	3.1-1
3.2	REACTOR POWER CONVERSION SYSTEM.....	3.2-1
3.2.1	ENGINEERED SAFETY FEATURES.....	3.2-2
3.2.2	TURBINE GENERATOR.....	3.2-3
3.3	PLANT WATER USE.....	3.3-1
3.3.1	WATER CONSUMPTION.....	3.3-1
3.3.2	WATER TREATMENT.....	3.3-3
3.4	COOLING SYSTEM.....	3.4-1
3.4.1	DESCRIPTION AND OPERATIONAL MODES.....	3.4-1
3.4.2	COMPONENT DESCRIPTIONS.....	3.4-5
3.5	RADIOACTIVE WASTE MANAGEMENT SYSTEM.....	3.5-1
3.5.1	LIQUID RADIOACTIVE WASTE MANAGEMENT SYSTEM.....	3.5-1
3.5.2	GASEOUS RADIOACTIVE WASTE MANAGEMENT SYSTEM.....	3.5-5
3.5.3	SOLID RADIOACTIVE WASTE MANAGEMENT SYSTEM.....	3.5-10
3.5.4	CONFORMANCE TO REGULATORY GUIDE 1.112, REV 1.....	3.5-13
3.6	NONRADIOACTIVE WASTE SYSTEMS.....	3.6-1
3.6.1	EFFLUENTS CONTAINING CHEMICALS OR BIOCIDES.....	3.6-1
3.6.2	SANITARY SYSTEM EFFLUENTS.....	3.6-4
3.6.3	OTHER EFFLUENTS.....	3.6-5
3.6.4	REFERENCE.....	3.6-7
3.7	POWER TRANSMISSION SYSTEM.....	3.7-1
3.7.1	DESIGN PARAMETERS.....	3.7-2
3.7.2	TRANSMISSION LINE RIGHT OF WAY (CORRIDORS).....	3.7-3
3.7.3	NOISE IMPACT.....	3.7-5
3.7.4	REFERENCES.....	3.7-6
3.8	TRANSPORTATION OF RADIOACTIVE MATERIALS.....	3.8-1
3.8.1	TRANSPORTATION ASSESSMENT.....	3.8-1
3.8.2	INCIDENT-FREE TRANSPORTATION IMPACTS ANALYSIS.....	3.8-6
3.8.3	REFERENCES.....	3.8-11

**Bellefonte Nuclear Plant, Units 3 & 4
COL Application
Part 3, Environmental Report**

MASTER TABLE OF CONTENTS (Continued)

<u>Section</u>	<u>Title</u>	<u>Page</u>
CHAPTER 4		
ENVIRONMENTAL IMPACTS OF CONSTRUCTION		
4.0	ENVIRONMENTAL IMPACTS OF CONSTRUCTION	4.0-1
4.1	LAND-USE IMPACTS	4.1-1
4.1.1	THE SITE AND VICINITY	4.1-1
4.1.2	TRANSMISSION CORRIDORS AND OFF-SITE AREAS	4.1-4
4.1.3	HISTORIC PROPERTIES	4.1-5
4.1.4	REFERENCES	4.1-10
4.2	WATER-RELATED IMPACTS	4.2-1
4.2.1	HYDROLOGIC ALTERATIONS	4.2-1
4.2.2	WATER-USE IMPACTS	4.2-8
4.2.3	REFERENCES	4.2-11
4.3	ECOLOGICAL IMPACTS	4.3-1
4.3.1	TERRESTRIAL ECOSYSTEMS	4.3-1
4.3.2	AQUATIC ECOSYSTEMS	4.3-6
4.3.3	REFERENCES	4.3-10
4.4	SOCIOECONOMIC IMPACTS	4.4-1
4.4.1	PHYSICAL IMPACTS	4.4-1
4.4.2	SOCIAL AND ECONOMIC IMPACTS	4.4-8
4.4.3	ENVIRONMENTAL JUSTICE IMPACTS	4.4-18
4.4.4	REFERENCES	4.4-21
4.5	RADIATION EXPOSURE TO CONSTRUCTION WORKERS	4.5-1
4.5.1	SITE LAYOUT	4.5-1
4.5.2	RADIATION SOURCES	4.5-1
4.5.3	CONSTRUCTION WORKER DOSE ESTIMATES	4.5-1
4.5.4	COMPLIANCE WITH DOSE REGULATIONS	4.5-2
4.5.5	COLLECTIVE DOSES TO BLN UNIT 4 WORKERS	4.5-3
4.5.6	RADIATION PROTECTION AND ALARA PROGRAM	4.5-3
4.6	MEASURES AND CONTROLS TO LIMIT ADVERSE IMPACTS DURING CONSTRUCTION	4.6-1
4.7	CUMULATIVE IMPACTS RELATED TO CONSTRUCTION ACTIVITIES	4.7-1
4.7.1	CUMULATIVE ENVIRONMENTAL IMPACTS	4.7-1
4.7.2	IDENTIFICATION OF CUMULATIVE IMPACTS ASSOCIATED WITH THE PROPOSED ACTION AND PAST AND PRESENT ACTIONS	4.7-1
4.7.3	IDENTIFICATION OF CUMULATIVE IMPACTS ASSOCIATED WITH FUTURE KNOWN FEDERAL, NONFEDERAL, AND PRIVATE ACTIONS	4.7-2
4.7.4	REFERENCES	4.7-3
4.8	SEPARATION OF "CONSTRUCTION" AND "PRECONSTRUCTION" IMPACTS	4.8-1

**Bellefonte Nuclear Plant, Units 3 & 4
COL Application
Part 3, Environmental Report**

MASTER TABLE OF CONTENTS (Continued)

<u>Section</u>	<u>Title</u>	<u>Page</u>
CHAPTER 5		
ENVIRONMENTAL IMPACTS OF STATION OPERATION		
5.0	ENVIRONMENTAL IMPACTS OF STATION OPERATION	5.0-1
5.1	LAND-USE IMPACTS	5.1-1
5.1.1	THE SITE AND VICINITY	5.1-1
5.1.2	TRANSMISSION CORRIDORS AND OFF-SITE AREAS.....	5.1-2
5.1.3	HISTORIC PROPERTIES	5.1-2
5.1.4	REFERENCES.....	5.1-6
5.2	WATER-RELATED IMPACTS	5.2-1
5.2.1	HYDROLOGIC ALTERATIONS AND PLANT WATER SUPPLY.....	5.2-1
5.2.2	WATER-USE IMPACTS.....	5.2-5
5.2.3	REFERENCES.....	5.2-13
5.3	COOLING SYSTEM IMPACTS.....	5.3-1
5.3.1	INTAKE SYSTEM	5.3-1
5.3.2	DISCHARGE SYSTEM	5.3-6
5.3.3	HEAT-DISCHARGE SYSTEM	5.3-10
5.3.4	IMPACTS TO MEMBERS OF THE PUBLIC.....	5.3-16
5.3.5	REFERENCES.....	5.3-17
5.4	RADIOLOGICAL IMPACTS OF NORMAL OPERATION.....	5.4-1
5.4.1	EXPOSURE PATHWAYS	5.4-1
5.4.2	RADIATION DOSES TO MEMBERS OF THE PUBLIC.....	5.4-3
5.4.3	IMPACTS TO MEMBERS OF THE PUBLIC.....	5.4-5
5.4.4	IMPACTS TO BIOTA OTHER THAN MEMBERS OF THE PUBLIC.....	5.4-6
5.4.5	REFERENCES.....	5.4-9
5.5	ENVIRONMENTAL IMPACTS OF WASTE	5.5-1
5.5.1	NONRADIOACTIVE WASTE-SYSTEM IMPACTS	5.5-2
5.5.2	MIXED-WASTE IMPACTS.....	5.5-6
5.5.3	REFERENCES.....	5.5-8
5.6	TRANSMISSION SYSTEM IMPACTS	5.6-1
5.6.1	TERRESTRIAL ECOSYSTEMS	5.6-2
5.6.2	AQUATIC ECOSYSTEMS	5.6-4
5.6.3	IMPACTS TO MEMBERS OF THE PUBLIC.....	5.6-4
5.6.4	REFERENCES.....	5.6-6
5.7	URANIUM FUEL CYCLE EFFECTS.....	5.7-1
5.7.1	LAND USE	5.7-4
5.7.2	WATER USE.....	5.7-4
5.7.3	FOSSIL FUEL EFFECTS	5.7-4
5.7.4	CHEMICAL EFFLUENTS.....	5.7-5
5.7.5	RADIOACTIVE EFFLUENTS.....	5.7-5
5.7.6	RADIOACTIVE WASTES.....	5.7-7
5.7.7	OCCUPATIONAL DOSE.....	5.7-8
5.7.8	TRANSPORTATION	5.7-8
5.7.9	CONCLUSION	5.7-8

**Bellefonte Nuclear Plant, Units 3 & 4
COL Application
Part 3, Environmental Report**

MASTER TABLE OF CONTENTS (Continued)

<u>Section</u>	<u>Title</u>	<u>Page</u>
5.7.10	REFERENCES.....	5.7-8
5.8	SOCIOECONOMIC IMPACTS.....	5.8-1
5.8.1	PHYSICAL IMPACTS OF STATION OPERATION	5.8-1
5.8.2	SOCIAL AND ECONOMIC IMPACTS OF STATION OPERATION	5.8-6
5.8.3	ENVIRONMENTAL JUSTICE IMPACTS	5.8-13
5.8.4	REFERENCES.....	5.8-15
5.9	DECOMMISSIONING	5.9-1
5.10	MEASURES AND CONTROLS TO LIMIT ADVERSE IMPACTS DURING OPERATION.....	5.10-1
5.10.1	REFERENCES.....	5.10-2

**CHAPTER 6
ENVIRONMENTAL MEASUREMENTS AND MONITORING PROGRAMS**

6.0	ENVIRONMENTAL MEASUREMENTS AND MONITORING PROGRAMS.....	6.0-1
6.0.1	REFERENCES.....	6.0-2
6.1	THERMAL MONITORING.....	6.1-1
6.1.1	PREAPPLICATION MONITORING.....	6.1-2
6.1.2	PREOPERATIONAL MONITORING	6.1-2
6.1.3	OPERATIONAL MONITORING	6.1-3
6.1.4	REFERENCES.....	6.1-4
6.2	RADIOLOGICAL MONITORING.....	6.2-1
6.2.1	INTRODUCTION.....	6.2-1
6.2.2	BLN RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM	6.2-1
6.3	HYDROLOGICAL MONITORING	6.3-1
6.3.1	PREAPPLICATION MONITORING.....	6.3-1
6.3.2	CONSTRUCTION MONITORING	6.3-4
6.3.3	PREOPERATIONAL MONITORING	6.3-6
6.3.4	OPERATIONAL MONITORING	6.3-6
6.3.5	REFERENCES.....	6.3-7
6.4	METEOROLOGICAL MONITORING	6.4-1
6.4.1	ON-SITE METEOROLOGICAL MEASUREMENTS PROGRAM 1975 – 1983	6.4-1
6.4.2	ON-SITE METEOROLOGICAL MEASUREMENTS PROGRAM 2006 – 2007	6.4-2
6.4.3	METEOROLOGICAL DATA PROCESSING.....	6.4-3
6.4.4	METEOROLOGICAL INSTRUMENTATION INSPECTION AND MAINTENANCE	6.4-5
6.4.5	REFERENCES.....	6.4-5
6.5	ECOLOGICAL MONITORING	6.5-1
6.5.1	TERRESTRIAL ECOLOGY AND LAND USE	6.5-1
6.5.2	AQUATIC ECOLOGY	6.5-2
6.5.3	REFERENCES.....	6.5-5
6.6	CHEMICAL MONITORING	6.6-1
6.6.1	PREAPPLICATION MONITORING.....	6.6-2

**Bellefonte Nuclear Plant, Units 3 & 4
COL Application
Part 3, Environmental Report**

MASTER TABLE OF CONTENTS (Continued)

<u>Section</u>	<u>Title</u>	<u>Page</u>
6.6.2	CONSTRUCTION MONITORING	6.6-4
6.6.3	PREOPERATIONAL MONITORING	6.6-4
6.6.4	OPERATIONAL MONITORING	6.6-5
6.6.5	REFERENCES.....	6.6-6
6.7	SUMMARY OF MONITORING PROGRAMS	6.7-1
6.7.1	SITE PREPARATION AND CONSTRUCTION MONITORING.....	6.7-1
6.7.2	PREOPERATIONAL MONITORING	6.7-3
6.7.3	OPERATIONAL MONITORING	6.7-5
6.7.4	REFERENCES.....	6.7-7

**CHAPTER 7
ENVIRONMENTAL IMPACTS OF POSTULATED ACCIDENTS
INVOLVING RADIOACTIVE MATERIALS**

7.0	ENVIRONMENTAL IMPACTS OF POSTULATED ACCIDENTS INVOLVING RADIOACTIVE MATERIALS	7.0-1
7.1	DESIGN BASIS ACCIDENTS	7.1-1
7.1.1	SELECTION OF ACCIDENTS	7.1-1
7.1.2	EVALUATION METHODOLOGY	7.1-1
7.1.3	SOURCE TERMS	7.1-2
7.1.4	RADIOLOGICAL CONSEQUENCES.....	7.1-3
7.1.5	REFERENCES.....	7.1-3
7.2	SEVERE ACCIDENTS.....	7.2-1
7.2.1	INTRODUCTION.....	7.2-1
7.2.2	APPLICABILITY OF EXISTING GENERIC SEVERE ACCIDENT STUDIES	7.2-1
7.2.3	EVALUATION OF POTENTIAL SEVERE ACCIDENT RELEASES.....	7.2-2
7.2.4	CONCLUSION	7.2-6
7.2.5	REFERENCES.....	7.2-7
7.3	SEVERE ACCIDENT MITIGATION DESIGN ALTERNATIVES	7.3-1
7.3.1	THE SAMA ANALYSIS PROCESS	7.3-1
7.3.2	THE AP1000 SAMDA ANALYSIS	7.3-2
7.3.3	MONETIZATION OF THE BLN BASE CASE	7.3-4
7.3.4	REFERENCES	7.3-4
7.4	TRANSPORTATION ACCIDENTS	7.4-1
7.4.1	TRANSPORTATION OF UNIRRADIATED FUEL	7.4-1
7.4.2	TRANSPORTATION OF SPENT FUEL.....	7.4-1
7.4.3	NONRADIOLOGICAL IMPACTS	7.4-2
7.4.4	CONCLUSION	7.4-3
7.4.5	REFERENCES.....	7.4-3

**Bellefonte Nuclear Plant, Units 3 & 4
COL Application
Part 3, Environmental Report**

MASTER TABLE OF CONTENTS (Continued)

<u>Section</u>	<u>Title</u>	<u>Page</u>
CHAPTER 8		
NEED FOR POWER		
8.0	NEED FOR POWER	8.0-1
8.1	DESCRIPTION OF POWER SYSTEM	8.1-1
8.2	POWER DEMAND	8.2-1
8.2.1	POWER AND ENERGY REQUIREMENTS	8.2-1
8.2.2	FACTORS AFFECTING GROWTH OF DEMAND.....	8.2-5
8.2.3	REFERENCES.....	8.2-11
8.3	POWER SUPPLY	8.3-1
8.4	ASSESSMENT OF NEED FOR POWER	8.4-1
APP. 8A	PRESENT AND PLANNED CAPACITY	8A-1

CHAPTER 9
ALTERNATIVES TO THE PROPOSED ACTION

9.0	ALTERNATIVES TO THE PROPOSED ACTION	9.0-1
9.1	NO-ACTION ALTERNATIVE	9.1-1
9.2	ENERGY ALTERNATIVES	9.2-1
9.2.1	ALTERNATIVES THAT DO NOT REQUIRE NEW GENERATING CAPACITY	9.2-2
9.2.2	ALTERNATIVES REQUIRING NEW GENERATING CAPACITY.....	9.2-9
9.2.3	ASSESSMENT OF REASONABLE ALTERNATIVE ENERGY SOURCES AND SYSTEMS	9.2-24
9.2.4	CONCLUSION	9.2-42
9.2.5	REFERENCES.....	9.2-42
9.3	ALTERNATIVE SITES	9.3-1
9.3.1	THE SITE-COMPARISON PROCESS.....	9.3-1
9.3.2	DATA DEVELOPMENT AND EVALUATION	9.3-2
9.3.3	ALTERNATIVE SITE REVIEW	9.3-17
9.3.4	REFERENCES.....	9.3-44
9.4	ALTERNATIVE PLANT AND TRANSMISSION SYSTEMS.....	9.4-1
9.4.1	HEAT DISSIPATION SYSTEMS.....	9.4-1
9.4.2	CIRCULATING WATER SYSTEM	9.4-16
9.4.3	TRANSMISSION SYSTEMS.....	9.4-27
9.4.4	REFERENCES.....	9.4-29

CHAPTER 10
ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION

10.0	ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION	10.0-1
10.1	UNAVOIDABLE ADVERSE ENVIRONMENTAL IMPACTS	10.1-1

**Bellefonte Nuclear Plant, Units 3 & 4
COL Application
Part 3, Environmental Report**

MASTER TABLE OF CONTENTS (Continued)

<u>Section</u>	<u>Title</u>	<u>Page</u>
10.1.1	ADVERSE ENVIRONMENTAL CONSTRUCTION IMPACTS	10.1-1
10.1.2	UNAVOIDABLE ADVERSE ENVIRONMENTAL OPERATIONAL IMPACTS	10.1-3
10.1.3	SUMMARY OF UNAVOIDABLE ADVERSE CONSTRUCTION AND OPERATIONS IMPACTS	10.1-6
10.1.4	REFERENCES	10.1-11
10.2	IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES	10.2-1
10.2.1	IRREVERSIBLE ENVIRONMENTAL COMMITMENTS	10.2-1
10.2.2	IRRETRIEVABLE ENVIRONMENTAL COMMITMENTS	10.2-3
10.2.3	REFERENCES	10.2-5
10.3	RELATIONSHIP BETWEEN SHORT-TERM USES AND LONG-TERM PRODUCTIVITY OF THE HUMAN ENVIRONMENT	10.3-1
10.3.1	SHORT-TERM USES AND BENEFITS	10.3-1
10.3.2	MAINTENANCE AND ENHANCEMENT OF LONG-TERM ENVIRONMENTAL PRODUCTIVITY	10.3-2
10.3.3	SUMMARY OF RELATIONSHIP BETWEEN SHORT-TERM USES AND LONG-TERM PRODUCTIVITY	10.3-4
10.3.4	REFERENCES	10.3-5
10.4	BENEFIT-COST BALANCE	10.4-1
10.4.1	BENEFITS	10.4-1
10.4.2	COSTS	10.4-6
10.4.3	SUMMARY	10.4-11
10.4.4	REFERENCES	10.4-13

**APPENDIX A
AGENCY CONSULTATION LETTERS AND RESPONSES**

**Bellefonte Nuclear Plant, Units 3 & 4
COL Application
Part 3, Environmental Report**

UNITS OF MEASURE ABBREVIATIONS (Sheet 1 of 5)

Abbreviation	Unit of Measurement
A	ampere
ac.	acre
ac.-ft.	acre-feet
bbl.	barrel
bl.	bale
Btu	British thermal unit
bu.	bushel
C	Celsius, Centigrade
CDD	cooling degree-day
cfs	cubic feet per second
Ci	curies
cm	centimeter
cm ³	cubic centimeter
cm/s	centimeters per second
cu.	cubic
cu. ft.	cubic foot (feet)
cu. in.	cubic inch
cu. yd.	cubic yard
cwt.	hundredweight
dBA	decibels on the A scale
F, F.	Fahrenheit
fl. oz.	fluid ounce
fpm	feet per minute

**Bellefonte Nuclear Plant, Units 3 & 4
COL Application
Part 3, Environmental Report**

UNITS OF MEASURE ABBREVIATIONS (Sheet 2 of 5)

Abbreviation	Unit of Measurement
fps	feet per second
ft.	foot (feet)
ft/min	feet per minute
ft/sec	feet per second
ft ²	square feet
ft ³	cubic feet
ft ³ /sec	cubic feet per second
g	gram
gal.	gallon
gal/day	gallons per day
gal/min	gallons per minute
gal/sec	gallons per second
gpd	gallons per day
gpm	gallons per minute
gps	gallons per second
gr.	grain
GWe	gigawatts electric
GWh	gigawatthour
h	hour (in metric expression)
ha	hectare
HDD	heating degree-day
hp	horsepower
hr.	hour (in text and w / English units)

**Bellefonte Nuclear Plant, Units 3 & 4
COL Application
Part 3, Environmental Report**

UNITS OF MEASURE ABBREVIATIONS (Sheet 3 of 5)

Abbreviation	Unit of Measurement
Hz	hertz
in.	inch
J	joule
K	Kelvin
kg	kilogram
kl	kiloliter
km	kilometer
kV	kilovolt
kVA	kilovoltampere
kW	kilowatt
kWh	kilowatthour
l	liter
L	Liter
lb.	pound
lpd	liters per day
Lpd	liters per day
lpm	liters per minute
Lpm	liters per minute
LT, L.T.	long ton
m	minute (time)
m	meter
m ²	square meter
m ³	cubic meter
m/s	meters per second

**Bellefonte Nuclear Plant, Units 3 & 4
COL Application
Part 3, Environmental Report**

UNITS OF MEASURE ABBREVIATIONS (Sheet 4 of 5)

Abbreviation	Unit of Measurement
m ³ /s	cubic meters per second
M	mega
mcg	microgram
mg	milligram
Mgd	million gallons per day
MHz	megahertz
mi.	mile
ml	milliliter
Mld	million liters per day
mm	millimeter
MMBtu	million British thermal units
mp	melting point
mph	miles per hour
mrem/yr	millirem per year
msl	above mean sea level
MT	metric ton
MTU	metric ton uranium
mW	milliwatt
MW	megawatt
MWd	megawatt-days
MWd/MTU	megawatt days/metric tons of uranium
MWe	megawatts electric
MWh	megawatthours
MWt	megawatts thermal

**Bellefonte Nuclear Plant, Units 3 & 4
COL Application
Part 3, Environmental Report**

UNITS OF MEASURE ABBREVIATIONS (Sheet 5 of 5)

Abbreviation	Unit of Measurement
oz.	ounce
pcf	pounds per cubic foot
pci	pounds per cubic inch
psi	pounds per square inch
rem	roentgen equivalent man
rem/yr	rem per year
rpm	revolutions per minute
s	second (in metric expression)
sec.	second (w / English units)
sp gr	specific gravity
sq.	square
st	short ton
STP	standard temperature and pressure
t	metric ton
T.	ton
µg	microgram
V	volt
VA	voltampere
W	watt
Wh	watthour
yr	year
yd.	yard

**Bellefonte Nuclear Plant, Units 3 & 4
COL Application
Part 3, Environmental Report**

ACRONYMS (Sheet 1 of 12)

Acronym	Definition
7Q10	lowest flow over 7 consecutive days that occurs once every 10 years
AADT	annual average daily traffic
ADCNR	Alabama Department of Conservation and Natural Resources
ADECA	Alabama Department of Economic and Community Affairs
ADEM	Alabama Department of Environmental Management
AEA	Atomic Energy Act
AEC	U.S. Atomic Energy Commission
ALARA	As Low As Reasonably Achievable
AOAR	Alabama Office of Archaeological Research
AP1000	Westinghouse's Advanced Passive pressurized water reactor
APE	area of potential effect
ARLH	Alabama Register of Landmarks and Heritage
ASE	alternate site evaluation
ASS	auxiliary steam system
AVT	all-volatile treatment
BACT	best available control technology
BCA	benefit-cost analysis
BDS	blowdown system
BEIR	Biological Effects of Ionizing Radiation
BLN	Bellefonte Nuclear Plant, Units 3 and 4
BMP	best management practice
BOD	biochemical oxygen demand
BTI	Breakthrough Technologies Institute
BWR	boiling water reactor
C	candidate
CAA	Clean Air Act

**Bellefonte Nuclear Plant, Units 3 & 4
COL Application
Part 3, Environmental Report**

ACRONYMS (Sheet 2 of 12)

Acronym	Definition
CAIR	Clean Air Interstate Rule
CCS	component cooling water system
CDC	Centers for Disease Control and Prevention
CDF	core damage frequency
CD-ROM	compact disc – read only memory
CEDE	Committed Effective Dose Equivalent
CESQG	Conditionally Exempt Small-Quantity Generator
CFC	chlorinated fluorocarbon
CFR	Code of Federal Regulations
CFS	turbine island chemical feed system
CG	cloud-to-ground (lightning)
C & I	commercial and industrial (sector)
COD	chemical oxygen demand
COL	combined license
CORMIX	Cornell Mixing Zone Expert System
CPI	Consumer Price Index
CPP	continuing planning process
CSP	Concentrating Solar Power
CVS	chemical and volume control system
CWA	Clean Water Act (Federal Water Pollution Control Act)
CWS	circulating water system
DAW	Dry Active Waste
DBA	design basis accident
DCD	design control document
DCL	Direct Load Control
DDE	Deep Dose Equivalent

**Bellefonte Nuclear Plant, Units 3 & 4
COL Application
Part 3, Environmental Report**

ACRONYMS (Sheet 3 of 12)

Acronym	Definition
delta-T	temperature difference
DF	decontamination factor
DG	diesel generator
DHR	Department of Human Resources
DO	dissolved oxygen
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
D/Q	deposition factor
DSM	Demand Side Management
DSN	discharge serial number
DTS	demineralized water treatment system
DWS	demineralized water transfer and storage system
E	east
EAB	exclusion area boundary
EC	Energy Commission
EDA	Economic Development Authority
EDE	Effective Dose Equivalent
EDI	electrodeionization
EDS	Environmental Data Station
EI	exposure Index
EIA	Energy Information Administration
EIS	environmental impact statement
EJ	environmental justice
EMA	Emergency Management Agency
EMF	electromagnetic fields
ENE	east-northeast

**Bellefonte Nuclear Plant, Units 3 & 4
COL Application
Part 3, Environmental Report**

ACRONYMS (Sheet 4 of 12)

Acronym	Definition
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EPACT	Energy Policy Act of 2005
EPRI	Electric Power Research Institute
EPT	Ephemeroptera, Plecoptera, and Trichoptera
EPZ	emergency planning zone
Eq Pers	equivalent persons
ER	environmental report
ESA	Endangered Species Act
ESE	east-southeast
ESP	Early Site Permit
ESRI	Environmental Systems Research Institute
ESRP	environmental standard review plan
EUW	End Use Wholesale
FAA	Federal Aviation Administration
FAC	Free Available Chlorine
FBC	fluidized bed combustion
FEIS	final environmental impact statement
FERC	Federal Energy Regulatory Commission
FFCA	Federal Facilities Compliance Act
FONSI	Finding of No Significant Impact
FPS	fire protection system
FR	Federal Register
FSAR	final safety analysis report
FWPCA	Federal Water Pollution Control Act
GDP	Gross Domestic Product

**Bellefonte Nuclear Plant, Units 3 & 4
COL Application
Part 3, Environmental Report**

ACRONYMS (Sheet 5 of 12)

Acronym	Definition
GEIS	Generic Environmental Impact Statement
GFD	ground flash density
GIS	geographic information system
GNIS	Geographic Names Information System
GRP	Gross Regional Product
HEPA	High-Efficiency Particulate
HIC	High Integrity Container
HLOLE	Hourly Loss of Load Expectation
HRCQ	Highway Route Controlled
HRM	Holston River mile
HUC	hydrologic unit code
HUD	U.S. Department of Housing and Urban Development
HVAC	heating, ventilation, and air conditioning
HVN	Hartsville Nuclear Plant
ICRP	International Council on Radiation Protection
ID	identification number
IGCC	Integrated Gasification Combined Cycle
I & I	irreversible and irretrievable
INEEL	Idaho National Engineering and Environmental Laboratory
IPS	intake pumping station
IRWST	in-containment refueling water storage tank
ISO	Insurance Services Office Inc.
JCM	Jackson County Mountains
lbm	nominal secondary water mass
LC25	lethal concentration 25 percent
LCA	load carrying ability

**Bellefonte Nuclear Plant, Units 3 & 4
COL Application
Part 3, Environmental Report**

ACRONYMS (Sheet 6 of 12)

Acronym	Definition
Ldn	day-night average noise levels
LE	listed endangered
Leq	average equivalent noise levels
LLW	low-level waste
LOCA	Loss-of-Coolant Accident
LPZ	low population zone
LT	listed threatened
LWR	light water reactor
MACCS2	Melcor Accident Consequence Code System
MCHI	macroinvertebrate community health index
MCL	maximum contaminant level
MCR	main control room
MCWMA	Mud Creek Wildlife Management Area
MH	Murphy Hill
MIT	Massachusetts Institute of Technology
MM	Modified Mercalli (scale)
MOA	memorandum of agreement
MSW	municipal solid waste
N	north
NAAQS	National Ambient Air Quality Standards
NAD 83	North American Datum 1983
NAGPRA	National American Graves Protection and Repatriation Act
NAIC	North American Industry Code
NANRC	National Academy National Research Council
NAS	National Academy of Sciences
NASS	U.S. Department of Agriculture, National Agricultural Statistics Service

**Bellefonte Nuclear Plant, Units 3 & 4
COL Application
Part 3, Environmental Report**

ACRONYMS (Sheet 7 of 12)

Acronym	Definition
NCA	Noise Control Act
NCDC	National Climatic Data Center
NCRP	National Council on Radiation Protection
NCI	National Cancer Institute
NDCT	natural draft cooling tower
NE	northeast
NEDSIS	National Environmental Data, Satellite and Information Service
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Council
NESC	National Electrical Safety Code
NFPA	National Fire Protection Association
NHD	U.S. Geological Survey, National Hydrography Dataset
NHPA	National Historic Preservation Act
NHS	normal plant heat sink
NLDN	National Lightning Detection Network
NNE	north-northeast
NNW	north-northwest
NOAA	National Oceanic & Atmospheric Administration
NOR	Notice of Registration
NPDES	National Pollutant Discharge Elimination System
NRC	U.S. Nuclear Regulatory Commission
NRHP	National Register of Historic Places
NSPS	New Source Performance Standard
NSRC	Norfolk Southern Railway Company
NSSS	Nuclear Steam Supply System

**Bellefonte Nuclear Plant, Units 3 & 4
COL Application
Part 3, Environmental Report**

ACRONYMS (Sheet 8 of 12)

Acronym	Definition
NTAD	U.S. Department of Transportation, National Transportation Atlas Databases
NW	northwest
NWI	National Wetland Inventory
NWS	National Weather Service
NWSRS	National Wild and Scenic River System
ODCM	Offsite Dose Calculation Manual
OECD	Organization for Economic Co-operation and Development
OSHA	Occupational Safety and Health Administration
OWR	Office of Water Resources
PBN	Phipps Bend Nuclear Plant
PCA	primary coolant activity
PCB	polychlorinated biphenyl
PCCS	Passive Containment Cooling System
PE	probability of exceedance
PFBC	pressurized fluidized bed combustion
PFO1	palustrine, forested, broad-leaved deciduous
PGA	peak ground acceleration
PM	particulate matter
PM-10	particulate matter with an aerodynamic diameter of up to 10 microns
PM-2.5	particulates having a diameter of less than 2.5 microns
PMF	probable maximum flood
PMP	probable maximum precipitation
PPC	Public Protection Classification
PPE	plant parameter envelope
PRA	probabilistic risk assessment

**Bellefonte Nuclear Plant, Units 3 & 4
COL Application
Part 3, Environmental Report**

ACRONYMS (Sheet 9 of 12)

Acronym	Definition
PSD	Prevention of Significant Deterioration
PWR	pressurized water reactor
PWS	potable water system
RADTRAN	Transportation Risk Assessment Computer Code
RCA	radiologically controlled areas
RCRA	Resource Conservation and Recovery Act
RCS	reactor coolant system
RELFRC	release fractions
REMP	Radiological Environmental Monitoring Program
RFAI	Reservoir Fish Assemblage Index
RNS	normal residual heat removal system
RO	reverse osmosis
ROI	region of interest
ROW	right-of-way
RRC	Regional Reliability Council
RRS	Reliability Review Subcommittee
RRY	reactor reference year
RTD	Platinum Wire Resistance Detector
RV	recreational vehicle
RWS	raw water system
S	south
SACTI	Seasonal/Annual Cooling Tower Impact Prediction Code
SAMA	severe accident mitigation alternative
SAR	Sensitive Area Review
SCDHEC	South Carolina Department of Health and Environmental Control
SCR	selective catalytic reduction

**Bellefonte Nuclear Plant, Units 3 & 4
COL Application
Part 3, Environmental Report**

ACRONYMS (Sheet 10 of 12)

Acronym	Definition
SDS	sanitary drainage system
SE	southeast
SERC	Southeastern Electric Reliability Council
SG	steam generator
SHPO	State Historic Preservation Office
SIC	Standard Industrial Classification
SIP	state implementation plan
SM	Sand Mountain
SPCCP	spill prevention, control and countermeasure plan
SQG	Small Quantity Generator
SQV	Sequatchie Valley
SRP	standard review plan
SSE	south-southeast
SSURGO	U.S. Department of Agriculture, Natural Resources Conservation Service, Soil Survey Geographic (data/databases)
SSW	south-southwest
SW	southwest
SWCT	service water cooling tower
SWPPP	stormwater pollution prevention plan
SWS	service water system
T & E	threatened and endangered
TCP	traditional cultural property
TCS	turbine building closed cooling water system
TEDE	Total Effective Dose Equivalent
THPO	Tribal Historic Preservation Officer
TKN	Kjeldahl Nitrogen

**Bellefonte Nuclear Plant, Units 3 & 4
COL Application
Part 3, Environmental Report**

ACRONYMS (Sheet 11 of 12)

Acronym	Definition
TMDL	total maximum daily load
TPS-TOM	Transmission and Power Supply – Transmission Operations and Maintenance
TRAGIS	Transportation Routing Analysis Geographic Information System
TRB	Tennessee River Basin
TRC	total residual chlorine
TRC	TRC Inc. (Nashville office)
TRM	Tennessee River mile
TRU	transuranics
TSC	technical support center
TSD	thunderstorm days
TSD	treatment, storage, and disposal facility
TSI	trophic status index
TVA	Tennessee Valley Authority
TWRA	Tennessee Wildlife Resource Agency
U-235	uranium-235
U-238	uranium-238
U ₃ O ₈	uranium oxide
UAB	University of Alabama, Birmingham
UC	University of Chicago
UF ₆	uranium hexafluoride
UFC	uranium fuel cycle
UHS	ultimate heat sink
UO ₂	uranium dioxide
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture

**Bellefonte Nuclear Plant, Units 3 & 4
COL Application
Part 3, Environmental Report**

ACRONYMS (Sheet 12 of 12)

Acronym	Definition
USEC	U.S. Enrichment Corporation
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	underground storage tank
VACAR	Virginia-Carolinas Area
VAS	auxiliary/annex building exhaust
VCS	Containment Recirculation Cooling System
VFS	containment air filtration system
VM	vegetation management
VS	Vital Signs
W	west
WCF	Widows Creek Fossil Plant
WD	Wind Direction
WEC	Westinghouse Electric Company
WGS	gaseous radwaste system
WLS	liquid radwaste system
WMA	wildlife management agency
WNW	west-northwest
WS	Wind Speed
WSS	solid waste management system
WSW	west-southwest
WWRB	wastewater retention basin
WWS	wastewater system
χ/Q values	atmospheric dispersion factors
YCN	Yellow Creek Nuclear Plant