October 11, 2007

**Pollution Prevention Plan Requirements for Gravel Pit Reclamation**
**BBSS's Waugh Chapel Pit 77-SP-0096 and Turner Pit 94-SP-0468**

This revised Pollution Prevention Plan updates the earlier version of this Plan dated April 24, 2000, and supersedes Sections I, II, and IV. The revised requirements for construction of future ash fill areas in Section III do not apply retroactively to ash brought on-site prior to October 1, 2007. Therefore, the April 24, 2000, Pollution Prevention Plan that governed placement requirements for ash brought on-site prior to October 1, 2007, is included in Appendix C to document applicable requirements. Constellation Power Source Generation and BBSS do not plan on placing any additional ash at the site from off-site locations. Therefore, the focus of this plan is on groundwater monitoring and reporting, and also on improved protocols for site inspection and maintenance with the goal of minimizing the environmental impact from ash placement.

## I. MONITORING AND REPORTING REQUIREMENTS

1. Groundwater level and quality monitoring of the ash site shall be performed using the monitoring wells identified in the Site Plan in Appendix A.
2. Groundwater samples shall be taken quarterly from the monitoring wells and analyzed for the inorganic chemicals included in COMAR 26.04.01.06 – Maximum Contaminant Level for Inorganic Chemicals in Drinking Water (not including asbestos). Samples shall also be analyzed for chloride, sulfate, total dissolved solids, and pH, at a minimum.
3. Groundwater action levels requiring response actions to address potential risks to human health and the environment are identified in the Remedial Response Contingency Plan included in Appendix B.
4. If an exceedance of the limits defined in the Remedial Response Contingency Plan occurs in a downgradient perimeter well (MW-3, MW-7, MW-8, MW-9, MW-10, MW-12, MW-13, MW-19, MW-20, MW-21, MW-22, MW-26), the well must be resampled within 30 days of receipt of the exceeding results. If the exceedance recurs with re-sampling, the monitoring and reporting frequency for that well shall be monthly until the Department agrees that the sampling frequency may be reduced.
5. CPSG shall notify MDE within five days of receiving any sample results from an actively utilized downgradient drinking well sampled by CPSG that are above the action levels identified in the Remedial Response Contingency Plan.
6. Surface water samples shall be taken quarterly from designated locations identified in the Site Plan and analyzed for pH, total dissolved solids and sulfate.
7. Groundwater monitoring data with highlighted exceedences shall be submitted to the following agency quarterly by the end of the month following each calendar quarter:
   WMA – Compliance Program
   Maryland Department of the Environment
   1800 Washington Boulevard
   Baltimore, MD 21230-1708
8. The April 30th quarterly report for each year shall include a long term trend analysis and a summary of the status and effectiveness of all treatment systems.

## II. INSPECTION AND MAINTENANCE OF THE COAL ASH FILL

1. A quality assurance and quality control (QA/QC) plan describing a comprehensive site inspection plan for post closure monitoring and maintenance shall be implemented upon MDE approval. This

QA/QC Plan shall be designed to: 1) identify, correct, and prevent grading problems that could allow stormwater to pond in the vicinity of the CCP reclamation, cause wash outs or erosion rivulets to form; and 2) identify and correct any cap and cover deficiencies. The QA/QC Plan shall include enhanced inspection and documentation protocols.

2. Weekly site inspections of inactive ash placement areas shall be conducted. The inspection shall include visual observation and recording of the condition of the cap/cover soils, side slopes, diversion ditches, sediment/remediation ponds, etc. as applicable. Corrective actions needed shall be addressed in a timely manner and documented on the inspection form.
3. In the event that a site inspection reveals the need for repair of the cap and/or cover soils the following requirements apply:
    a. A cover with permeability less than or equal to 10-7 cm/sec shall be placed over the completed ash fill area. If the cover material is soil, it shall be at least 18 inches thick on the top surface of the fill in Waugh Chapel Pit and at least 12 inches thick on top of Turner Pit. A minimum 6 inches of like cover will be placed on all side slopes. The permeability shall be confirmed by a laboratory test on the material compacted to at least 95 percent of maximum dry density based on ASTM D698 (Standard Proctor).
    b. Topsoil shall be placed over the low permeability cover material. The topsoil shall be at least 12 inches thick and shall be stabilized with vegetation.
    c. A drainage system shall be installed to divert storm water away from the fill area.
4. In the event that site work associated with completion of grading or repair involves exposure of ash, the following requirements apply:
    a. The area of exposed coal ash shall be kept to a reasonable minimum area workable by the equipment. No more than 5 acres of ash shall be exposed at any time. All fill areas shall be capped within 30 days of reaching reclamation grade or of completing the site work.
    b. Dust control shall be provided by the cap and cover soil. If ash becomes exposed during maintenance or site grading, a water truck shall be available to add water on site as needed for fugitive dust control.
    c. Alternative capping systems designed to provide equal or greater protection may be used as approved by the Department.
5. Disturbance of the cap, cover soils, and ash fill to accommodate future site development shall be governed by deed restrictions to be submitted to MDE for approval and any other protocol that may be developed to specifically govern construction or site development practices.

## III. CONSTRUCTION OF FUTURE COAL ASH FILL AREAS

This section regarding future ash placement is included for compliance with the Consent Decree executed by the Maryland Department of the Environment on October 1, 2007, and for completeness of the record in order to document minimum requirements should ash placement resume in the future. However, as stated above, current placement of new ash from off-site locations has been halted and there are no plans to resume this activity.

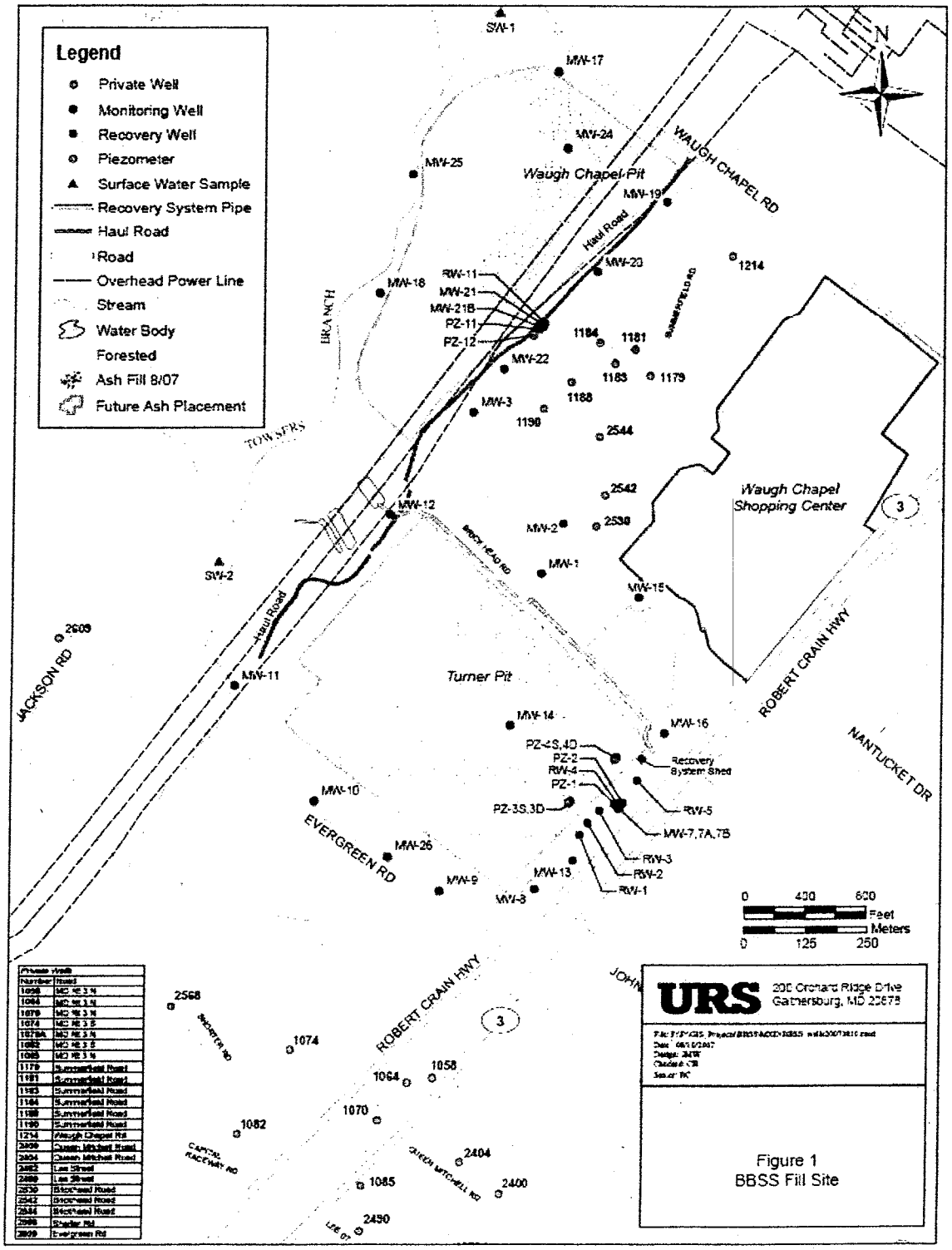
1. Chemical characteristics of the coal ash shall be analyzed by performing a quarterly TCLP analysis. The analysis shall include inorganic constituents only because organic constituents are not expected to be detected in this combustion by-product. Coal ash containing any constituent at a level exceeding the TCLP toxicity limits defined in 40 CFR 261.24 shall not be used in reclamation of the site.
2. A 100-foot buffer zone shall be maintained between the ash fill and any property line.
3. A prepared sub-base at least 18 inches thick must be placed below the liner system. Clayey or silty soil (or approved synthetic equivalent) shall be used, with permeability no greater than $1x10^{-5}$ cm/sec when compacted to at least 95% of maximum dry density as determined by ASTM D698

(Standard Proctor). The permeability shall be confirmed by a laboratory test (ASTM D5084 or approved equivalent). Individual particle sizes shall not exceed 0.5" in this material.

4. A clay liner at least 6 inches thick with a permeability no greater than $1x10^{-7}$ cm/sec when compacted to at least 95% of maximum dry density as determined by ASTM D698 (Standard Proctor) shall be placed above the prepared sub-base. The permeability shall be confirmed by a laboratory test (ASTM D5084 or approved equivalent). A 60 mil HDPE (or equivalent synthetic) liner designed to collect leachate shall be placed above the clay liner. Alternative sub-base and lining systems designed to provide equal or greater protection may be used if approved by the MDE.
5. A leachate collection system shall be installed to collect and remove leachate from the fill.
6. The leachate from lined cells shall be managed in a manner consistent with applicable environmental laws and regulations. Leachate shall be treated on-site to ensure that discharges from the treatment system meet NPDES discharge requirements or the leachate will be disposed of at an approved disposal facility.
7. A drainage layer at least 18 inches thick shall be above the liner and below the ash to prevent water accumulation within the ash fill.
8. The base of the ash shall be separated from the groundwater table by a minimum of 4 feet. The elevation of the groundwater table is to be contoured from the highest groundwater levels historically observed in nearby site monitoring wells.
9. To ensure structural integrity for future development, the coal ash shall be placed in loose lifts no thicker than 12 inches and compacted.
10. Dust control shall be provided by moisture-conditioning the ash before it leaves the Constellation plants, and by spreading and compacting ash upon its arrival at the site (with no storage of uncompacted ash on site). A water truck shall be available to add water on site as needed for fugitive dust control.
11. Precipitation shall be routed off and around the ash through sediment traps to existing stormwater management basins. Rainwater shall not be allowed to pond on top of or around the base of the ash fill.
12. Fill areas shall be capped with a permanent cap within 30 days of reaching final grade or an approved temporary cap if an incomplete area remains inactive for 30 days.
13. Completed ash fill areas shall be capped with at least 12 inches of cover material with a permeability of less than or equal to $10^{-7}$ cm/sec or alternative material with similar permeability. Six inches of sand shall be placed over the clay cap for drainage. At least 24" of earthen cover shall be placed above the drainage layer and stabilized with vegetation. The surface shall be graded to prevent ponding of water on top of the ash.
14. Alternative capping systems designed to provide equal or greater protection may be used as approved by the Department.
15. Daily oversight during active ash placement activities shall be provided to ensure that all applicable requirements included in this document are met.

APPENDIX A – Site Plan
APPENDIX B – Remedial Response Contingency Plan
APPENDIX C - Former Pollution Prevention Plan

# APPENDIX A – Site Plan



APPENDIX B

# REMEDIAL RESPONSE CONTINGENCY PLAN
## Coal Ash Fill Site - B.B.S.S. Sand and Gravel Mine
## Millersville, Maryland

## 1.0 INTRODUCTION

Excavated portions of a sand and gravel mine in Millersville, Maryland, owned by B.B.S.S., Inc., and operated by Reliable Contracting Co., Inc., and Constellation Power Source Generation, Inc. (CPSG), were reclaimed by controlled placement of coal ash produced by CPSG. Coal ash is a by-product of combustion of coal for electricity generation, and is beneficially utilized throughout the U.S. for a cement additive, highway base course, blasting grit, anti-skid material, structural fills, mine reclamation, and other uses. The U.S. Environmental Protection Agency (EPA) ruled in 1993 and confirmed in 2000 that coal ash should not be regulated as a hazardous waste.

At this site, numerous measures are incorporated in the site design to minimize potential for impacts on groundwater quality related to the placement of the coal ash structural fill. Monitoring will be conducted to confirm that the control measures are performing properly. However, in the event of an impact to groundwater, the operators are prepared to implement appropriate response actions. This plan describes response actions that will be implemented in the event of detection of impacts to groundwater quality.

## 2.0 GROUNDWATER MONITORING PROGRAM

Groundwater quality at the site is monitored in a network of wells shown on the Site Plan. Groundwater samples from the wells are collected at least quarterly and analyzed for the constituents listed in Table 1. In addition to the sampling for chemical analysis, water levels are measured in the monitoring wells at the initiation of each sampling event, to verify groundwater flow directions and seasonal variation of groundwater levels.

## 3.0 RESPONSE ACTION LEVELS AND REMEDIAL ACTIONS

Action levels trigger an assessment of whether a potential threat to human health or the environment exists, and whether such threat is associated with ash placement, and whether actions to mitigate that threat are necessary. The responses described below will be implemented if action levels are exceeded in groundwater.

For this project, action levels for groundwater are listed in Table 1. If an exceedance of any of these action levels is detected in a perimeter well, resampling of that well will be performed within 30 days of receipt of the laboratory results in which the exceedance was identified. Monthly monitoring will be continued for that well until MDE notifies CPSG in writing that it is no longer required. An evaluation will be performed to identify whether any sources other than the ash fill may be responsible for the exceedance. When an exceedance is confirmed and sufficient data has been analyzed to confirm that an adverse trend exists (related to the ash fill), remedial response actions will be taken.

There are several remedial response actions that could feasibly be employed. The best available technology or combination of technologies will be selected based on actual exceedences that occur. The details of the response action design (location, depth, extent, etc.) will depend on the location, nature, and extent of the exceedences. Some of the feasible remedial options applicable to groundwater are as follows:

- Provision of a water treatment system, an alternate water supply, or replacement well.
- Containment by a slurry cut-off wall.

- Extraction by pumping wells, with subsequent treatment.
- Collection by interceptor trenches, with subsequent treatment.
- Combinations of the above.

* * *

**TABLE 1**

**Monitoring Parameters and Action Levels for Groundwater**

**Reliable Ash Fill Site**

| Monitoring Parameter | Action Level (mg/L) | Rationale |
|---|---|---|
| Antimony | 0.006 | State of Maryland drinking water standard |
| Arsenic | 0.01 | State of Maryland drinking water standard |
| Barium | 2 | State of Maryland drinking water standard |
| Beryllium | 0.004 | State of Maryland drinking water standard |
| Cadmium | 0.005 | State of Maryland drinking water standard |
| Chromium | 0.1 | State of Maryland drinking water standard |
| Cyanide | 0.2 | State of Maryland drinking water standard |
| Fluoride | 4 | State of Maryland drinking water standard |
| Mercury | 0.002 | State of Maryland drinking water standard |
| Nitrate as Nitrogen | 10 | State of Maryland drinking water standard |
| Nitrite as Nitrogen | 1 | State of Maryland drinking water standard |
| Total Nitrate + Nitrite | 10 | State of Maryland drinking water standard |
| Selenium | 0.05 | State of Maryland drinking water standard |
| Thallium | 0.002 | State of Maryland drinking water standard |
| Sulfate | 250 | 40 CFR 143.3 |
| Chloride | Not Applicable | |
| Total Dissolved Solids | Not Applicable | |
| pH | Not Applicable | |

# APPENDIX C

## Former Pollution Prevention Plan

# Pollution Prevention Requirements for Gravel Pit Reclamation with Coal Ash B.B.S.S.'s Waugh Chapel Pit 77-SP-0096 and Turner Pit 94-SP-0468

## I. SITE CONDITIONS

1. The area proposed for ultimate reclamation with coal ash under these permits is shown on the attached Site Plans. The Department may revise the area proposed for ash fill or specific design requirements after review of groundwater analysis.

2. A 100-foot buffer zone shall be maintained between the ash fill and any property line. The Department may revise the width of the required buffer in the portion of the site still to be reclaimed after review of groundwater analysis.

3. A minimum separation of 4 feet shall be maintained between the base of the ash fill and the groundwater table. The elevation of the groundwater table for this purpose shall be defined during the groundwater analyses described in item IV.2 below.

4. The groundwater analysis shall include identification of water supply wells within approximately 5000 feet of the ash fill site, through review of records available at the Department.

## II. MONITORING REQUIREMENTS

1. Chemical characteristics of the coal ash shall be analyzed by performing a TCLP analysis of the coal ash once every three months. The analysis shall include inorganic constituents only, because organic constituents are not expected to be detected in this combustion by-product. Coal ash containing any constituent at a level exceeding the TCLP toxicity limits defined in 40 CFR 261.24 shall not be used in reclamation of this site.

2. Groundwater quality monitoring of the ash site shall be performed. A minimum of one upgradient monitoring well (serving as background) and a minimum of two monitoring wells downgradient of the proposed ash fill area are required. The need for additional wells shall be addressed during the groundwater analysis to be reviewed and approved by the Department, based on size of the ash fill area, groundwater flow direction, and locations of nearby drinking water wells. Locations of monitoring wells are shown on the attached Site Plan.

3. Groundwater samples shall be taken quarterly from the monitoring wells and analyzed for the 15 inorganic chemicals included in COMAR 26.04.01.06 – Maximum Contaminant Level for Inorganic Chemicals in Drinking Water (not including asbestos). Samples shall also be analyzed for chloride, sulfate, total dissolved solids and pH. After one year, the Department will review these results to determine if the sampling parameters or the sampling frequency need to be increased or decreased.

4. Groundwater action levels requiring response actions to protect human health and the environment shall be identified in a contingency plan, as described in item IV.3 below.

5. Surface water quality samples shall be taken quarterly from the surface water sampling locations shown on the Site Plan. Samples shall be analyzed for pH, TDS, and sulfate. The Department shall review the results and determine if the sampling parameters or the sampling frequency need to be increased or decreased.

## III. CONSTRUCTION OF THE COAL ASH FILL

1. To minimize leachate generation, the coal ash shall be placed in layers and compacted to at least 95% of its maximum dry density based on ASTM D698 (Standard Proctor), or to a permeability of less than $10^{-5}$ cm/sec. Thickness of each layer shall not be greater than 12 inches.

2. A cover with permeability less than or equal to $10^{-7}$ cm/sec shall be placed over the completed ash fill area. If the cover material is soil, it shall be at least 18 inches thick on the top surface of the fill in Waugh Chapel pit as well as the 11.9 acre parcel in Turner pit. In the remaining areas of Turner Pit at least 12 inches on the top surface will be used. A minimum 6 inches of like cover will be placed on all side slopes. The permeability shall be confirmed by a laboratory test on the material compacted to at least 95 percent of maximum dry density based on ASTM D698 (Standard Proctor).

3. Topsoil shall be placed over the low permeability cover material. The topsoil shall be at least 12 inches thick and shall be stabilized with vegetation.

4. A drainage system shall be installed to divert storm water away from the fill area, as shown on the Site Plan.

5. The area of exposed coal ash shall be kept to a minimum area workable by the equipment. No more than 10 acres of ash shall be exposed at any time. All fill areas shall be capped within 30 days of reaching reclamation grade. If an incomplete area is to be unused for 30 days, it shall be stabilized temporarily to minimize water infiltration into the ash.

6. A base drainage layer at least 24 inches thick shall be placed at the base of the ash fill, to prevent water accumulation within the ash fill. The material in the base drainage layer shall have permeability greater than or equal to $10^{-5}$ cm/sec. If this material is bottom ash, the base of the bottom ash layer shall be separated from the groundwater table by at least 4 feet, as discussed above. If the base drainage material is soil, it can be considered part of the 4-foot separation.

7. Dust control shall be provided by moisture-conditioning the ash before it leaves the BGE plants, and by spreading and compacting ash upon its arrival at the site (with no storage of uncompacted ash on site). A water truck shall be available to add water on site as needed for fugitive dust control.

## IV. ADMINISTRATIVE PROCEDURES

1. The owner or operator of the site shall prepare a site plan and construction specifications to ensure that the above requirements are met. A copy of the proposed site plan and construction specifications shall be forwarded to the Department.

2. The owner or operator of the ash site shall conduct groundwater analysis. The purpose of the analysis is to identify subsurface stratigraphy, groundwater levels, groundwater flow direction and velocity, and existing groundwater quality.

3. The owner or operator of the coal ash site shall prepare a contingency plan to implement measures to protect human health and the environment from adverse impacts from the ash fill, if site monitoring indicates the potential for such impacts. The plan shall include identification of action levels that would trigger response actions, and a description of potential response actions. This plan shall be submitted to the Department within 60 days of the date of this permit modification.

4. The owner or operator shall oversee the daily operation of the coal ash site to ensure that all applicable requirements included in this document are met.