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Attachment 1

Pine Prairie Energy Center, LLC

Supplementary Expansion Project

Erosion Control Plan

SUPPLEMENTARY EXPANSION PROJECT EROSION CONTROL PLAN

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SUPPLEMENTARY EXPANSION PROJECT EROSION CONTROL PLAN

1.0 INTRODUCTION

Pine Prairie Energy Center, LLC (PPEC) has prepared this Erosion Control Plan (ECP) for its routine natural gas pipeline and appurtenance installation projects. The purpose of the ECP is to provide erosion control guidelines to PPEC personnel and contractors for use during construction of the natural gas pipeline projects. Due to the long, linear nature of the project and the anticipated variability of the project area, the erosion control measures specified in the ECP are not site-specific. Instead, a variety of temporary and permanent measures are provided that can be used at the discretion of PPEC and its contractors. It will be the responsibility of PPEC and its contractors to select the appropriate site-specific measure to control erosion in the project area.

1.1 Project Location and Description

PPEC proposes herein to construct, modify and operate projects in Louisiana. The Supplemental Expansion Project consists of:

- Capacity expansion of two of the three previously certificated natural gas storage caverns identified as CW 2 and CW 3;
- Two new storage caverns identified as CW 4 and CW 5;
- Leaching header extensions from CW 3 to a new riser that will be installed at the approximate mid-point between CWs 4 and 5. These extensions will consist of a 20-inch-diameter brine water (BW) pipeline, a 20-inch-diameter raw water (RW) pipeline, a 2-inch-diameter instrument air pipeline, and dual fiber-optic lines;
- A new 24-inch-diameter gas header pipeline from the existing Gas Handling Facility (GHF) to the new riser that will be installed approximately at the mid-point between CWs 4 and 5. This pipeline will merge into a common right-of-way (ROW) with the leaching header extensions that will originate from CW 3;
- New cavern well laterals that will connect each of the proposed CW 4 and CW 5 Sites to the new riser consisting of a 16-inch-diameter BW pipeline, a 16-inch-diameter RW pipeline, a 16-inch-diameter gas header pipeline, a 2-inch-diameter instrument air pipeline, and dual fiber-optic lines;
- New Saltwater Disposal Well 7 (SWD 7) and new Raw Water Well 7 (RW 7) to be located on the existing certificated Saltwater Disposal Well 6 (SWD 6) pad;
- Incremental compression expansion consisting of two Caterpillar G34CM16 engines with compressors (to be installed at the existing GHF building) and four Caterpillar G3616 units with compressors (to be installed within an approximate 20-acre site leased by PPEC at the Contractor Fabrication Area that is located east and adjacent to the existing GHF and has been approved by the Commission for PPEC facilities construction). This

previously approved site will continue to be employed as a storage facility site as required during the Cavern development process;

- Approximately 5.3 miles of 24-inch-diameter natural gas pipeline loop (South Pipeline Corridor Looping Pipeline [Chalk Line Loop]) and associated appurtenances.

The natural gas storage-related elements of the Project (i.e. the Gas Storage Caverns, incremental compression expansion and RW 7 and SWD 7 Wells) will be located at or near the Gas Storage Site. This Gas Storage site will incorporate the Gas Storage Cavern Area and Gas Handling Facility. Cavern Wells 4 and 5 will be located in Section 35, Township 3 South, Range 1 West, in Evangeline Parish, Louisiana on 40 acres of unimproved land owned by an affiliate of PPEC. The land consists primarily of pine forest, native grasses and shrubs. With the exception of occasional timbering, there are no known current uses for the property.

The Gas Handling Facility, incremental compression, and proposed cavern well locations will be located on 120 acres of land (of which 80 acres is leased by PPEC and 40 acres is owned by an affiliate of PPEC) approximately 15 miles north of Eunice and approximately 1 mile west of Easton, in Section 36, Township 3 South, Range 1 West in Evangeline Parish, Louisiana. RW 7 and SWD 7 Wells will be located in Section 3, Township 4 South, Range 1 West, in Evangeline Parish, Louisiana on a 3-acre tract of land that is leased by PPEC and currently houses the SWD 6 well.

Pipeline and related metering and regulation facilities associated with the Project will extend from Acadia Parish in Sections 2 and 11, Township 7 South, Range 2 West (located south of the Gas Storage Site) northward to Evangeline Parish in Sections 13, 24, 25, 35, 36, Township 6 South, Range 2 West. These pipeline facilities will parallel the South Pipeline Corridor existing pipeline and will require little in the way of new right-of-way (ROW).

Overall, cavern well, pipeline, and the metering and regulation facilities associated with the looping aspect of the Project will extend from Acadia Parish in Sections 2 and 11, Township 7 South, Range 2 West (located south of the Gas Storage Site) to Evangeline Parish in Sections 13, 24, 25, 35, 36, Township 6 South, Range 2 West, Sections 35, 36, Township 3 South, Range 1 West, and Section 3, Township 4 South, Range 1 West. The proposed pipeline facilities will parallel the existing pipeline that is located in the South Pipeline Corridor.

As part of post-construction maintenance, a corridor approximately 50-feet wide and centered over the pipeline will be maintained in upland areas. Routine maintenance clearing shall not be performed more frequently than every three years; however a corridor approximately 10-feet in width and centered over the pipeline may be maintained annually in an herbaceous state. In wetland areas, a 10-foot wide corridor centered over the pipeline will be maintained in an herbaceous state. In addition, trees within 15-feet of the pipeline which are greater than 15-feet in height will be selectively removed from the right of way in accordance with the Federal Energy Regulatory Commission (FERC) Upland Erosion Control, Revegetation, and Maintenance Plan (*Plan*) and Wetland and Waterbody Construction and Mitigation Procedures (*Procedures*) (**Attachment 6**).

1.2 Project Owner and Operator Contacts

The Project owner and operator is Pine Prairie Energy Center, LLC. The address is:

Pine Prairie Energy Center, LLC
333 Clay Street, Suite 1300
Houston, TX 77002

The PPEC contact person for the Supplemental Expansion Project is as follows:

Warren D. Fusilier, Director, Environmental and Regulatory Compliance

Telephone: 713.646.4515

PPEC will be responsible for this Project. Contractors will be hired to complete pipeline installation, but PPEC will supervise the work.

1.3 Contractor Certification

An authorized representative for each contractor must sign the certification form prior to commencing any ground-disturbing construction activities. Parties required to sign this form include any company working on this Project whose activities at the construction site:

1. may impact storm water discharges or controls at the construction site along the duration of the Project; and/or
2. involve the handling of fuels, lubricants, and other hazardous substances.

Upon signing this certification, the contractor becomes a co-permittee with the owner and other co-permittee contractors.

1.4 Construction Schedule

Pipeline construction will use one or more spreads. According to the anticipated schedule for the South Pipeline Corridor Looping Pipeline (Chalk Line Loop), construction should begin concurrently with development of CW 5. Overall pipeline construction activities are expected to last 3 months. Construction of the gas storage caverns and saltwater disposal/raw water wells will commence on or about June 1, 2009 and will terminate in the second quarter of 2012. Overall gas storage cavern construction activities are expected to last approximately 32 months.

2.0 CONSTRUCTION TECHNIQUES

The construction techniques used to install the natural gas pipeline and associated facilities will depend on site conditions and regulatory requirements. The preferred and most common method of installing a pipeline is open-cut trenching using a trenching machine or backhoe. Other methods of pipeline installation include blasting, horizontal boring, and horizontal directional drilling. Typically, these latter methods will be used, as appropriate, when conditions are unsuitable for the trenching method.

2.1 General Construction Methods

Pipeline construction occurs in multiple stages. Initially the pipeline centerline and ROW limits are surveyed and staked. This is followed by clearing and grading as necessary, excavation of the trench, hauling and stringing pipe, bending, welding and field coating pipe, lowering in the pipe, backfilling the trench, hydrostatic testing, and finally restoration of the pipeline corridor. In pastures and actively cultivated agricultural lands, topsoil is stripped to its actual depth or 12 inches (whichever is less) and stockpiled separately from the subsoil in the trenching process. A more detailed description of the methods used to cross roads, railroads, waterbodies, and wetlands follows.

2.2 Typical Road/Railroad Crossing Methods

The construction project will cross numerous roads and railroads. In general, paved roads and railroads will be crossed using the horizontal bore technique. If conditions are suitable, unpaved driveways and unpaved roads may be crossed using the trenching method as described in Section 2.1.

Typically, boring will take place from the edge of the road or railroad right-of-way with a temporary workspace on each side of the crossing for equipment and staging. Bore pits will be excavated for the entry and exit points of the drill and excavated material will be stored within the extra workspace and replaced following pipeline installation.

2.3 Typical Waterbody Crossing Methods

The installation of a natural gas pipeline at waterbody (i.e., streams, rivers, and wetlands) crossings will be conducted by open-cut trenching. PPEC may directionally drill large environmentally sensitive waterbodies although none are anticipated for this Project. The actual construction method will be dependent on waterbody conditions and subsurface soil characteristics at the time of construction. Each of these waterbody crossing methods is discussed below. In addition, temporary bridges may be needed at some crossings to move equipment across the stream.

Open-cut Trenching: Open-cut trenching across streams and wetlands will be conducted via a wet trench technique. Intermittent streams will be crossed primarily during dry periods, when practical. Water plugs will remain in place within the trenches where they intersect stream banks to minimize the time the water will be in contact with the open trench. The water plugs will be removed just prior to pipeline placement and will be reinstalled immediately during the backfill process. Disturbed bank areas and stream channels will be restored as close as practicable to preconstruction contours and stabilized upon completion of the in-stream activity. Erosion control matting or rip-rap may be used to stabilize banks and channels as needed. In unsaturated wetlands, topsoil will be stripped at a depth of 12 inches over the trenchline only, and stockpiled separately from the trench spoil. No imported fill material will be used to stabilize the right-of-way. Temporary use of timber riprap may be used if the wetland soils are saturated and prone to rutting impacts from construction equipment. A typical construction drawing illustrating open-cut trenching is provided in **Attachment 5**.

Horizontal Directional Drilling: The HDD method may be used to cross significant waterbodies, such as large rivers, designated trout streams, and deep-water wetlands or ponds or at other locations at the discretion of the contractor when conditions are unsuitable for the

trenching method. This method prevents or minimally disturbs these features. Typically, drilling will take place 100 - 125 feet (50 feet at a minimum) from the top of the streambank with temporary workspaces being located at the drill entry and exit points for equipment and staging operations. Drill pits will be excavated at the HDD entry and exit points and excavated material from drilling operations will be stored on the upland side of the extra workspace. After completion of drilling activities, the remaining excavated material and drilling fluids will be hauled to an off-site disposal area selected by the contractor as authorized by PPEC.

Temporary Bridges: Temporary bridges may be needed for moving equipment across streams where existing bridges are not available and stream conditions warrant their use. Bridges minimize disturbance to the streambed, banks, and surrounding areas, and require little maintenance, can be designed to fit most site conditions, and can be easily removed and reused at other crossings.

3.0 EROSION CONTROL MEASURES

Soil erosion control measures are intended to minimize the amount of soil particles that are carried off a disturbed area and deposited in nearby surface waters. The measures described below include both temporary and permanent best management practices (BMPs). Temporary control measures are used during, and immediately after, construction activities. These measures are removed after permanent erosion control measures are implemented and/or the site has been stabilized. Permanent BMPs are designed to remain in place for years after the construction activities are completed and the site is stabilized.

3.1 Temporary Erosion Control Measures

Temporary erosion control measures will be installed prior to the start of construction activities that involve soil disturbance. These measures will be properly maintained throughout construction and will be reinstalled, as necessary, until permanent measures are installed or the site is stabilized.

The type of temporary erosion control measures to be used during the installation of the natural gas pipeline and associated facilities will be dependent on site conditions and will be initiated under the terms of the FERC Plan and Procedures and the discretion of PPEC. The most common method will be the installation of sediment barriers such as silt fence and straw bale ECDs at appropriate locations along the construction corridor. These measures and other potential temporary erosion controls that may be used by PPEC are described in the following sections.

Silt Fence and Straw Bales: Silt fence and/or straw bale ECDs will be used to reduce the velocity of stormwater runoff from the construction areas and to retain sediment on the Project site. Silt fence and/or straw bale ECDs will be installed at appropriate locations to prevent siltation into adjacent waterbodies and wetlands. Also, silt fence and/or straw bale ECDs will be installed downslope of disturbed areas where there is a potential for sheet and rill erosion. A typical erosion control drawing showing the proper installation of silt fence and straw bale ECDs is provided in **Attachment 5**.

Non-functioning silt fence and straw bale ECDs will be repaired, replaced, or supplemented with functioning structures within 24 hours of discovery. When the depth of sediment reaches a point

where the structure is no longer effective in retaining sediment, the barrier will be replaced or the sediment removed.

Temporary Seeding: Due to the short nature of the proposed construction activities, it is not likely that temporary stabilization methods will be required. However, temporary stabilization will be implemented if construction halts for more than 14 days and if construction will not resume within 21 days. If unfavorable conditions preclude permanent seeding or unused disturbed areas are created during site preparation, these areas may be seeded with spring oats or barley at a broadcast rate of 15 pounds pure live seed (PLS) per acre to provide a temporary vegetative cover. This temporary seeding will occur within 7 days of completion of site preparation or within the time limits specified by the applicable permits. Wetlands will not be seeded with temporary seed mix unless specified by the local land managing agency or by permit conditions.

Mulch and Erosion Control Blankets: Straw, hydromulch, or erosion control blankets or fabric may be used on steep slopes, stream banks, and ditches where additional slope protection is needed. Generally, these temporary control measures are installed after fertilization and permanent seeding (see Section 3.2). Mulch will not be used in wetlands.

Diversion Berms: Temporary slope breakers or diversion berms may be used on steep slopes where large areas of the right-of-way have been disturbed by construction activities. These diversion berms are intended to reduce runoff velocity and to divert runoff from the construction right-of-way to adjacent well-vegetated areas. The berms can be constructed with soil, silt fence, staked straw bales, or sandbags.

Gravel Construction Access: Gravel construction entrances will be installed, as required by local planning and zoning authorities, for equipment access from a public roadway to the construction corridor. Typically, a construction entrance consists of a graveled area or pad located at a point where vehicles enter and exit a construction site.

The gravel entrances will be maintained in a condition that prevents or minimizes mud or sediment from leaving the site. These areas will be inspected for evidence of off-site tracking onto paved road surfaces. Tracked sediment will be removed from the road by shoveling or sweeping at the end of each working day or as needed for safety requirements.

3.2 Permanent Erosion Control Measures

Permanent erosion control measures will be installed during site stabilization and restoration in all disturbed, unvegetated areas affected by construction. The two primary permanent erosion control measures will include revegetation and stream bank stabilization.

Revegetation: After the natural gas pipeline or associated facilities have been installed, disturbed areas will be restored to original contours and conditions. Within 14 days of completion of final grading or within time limits specified in the applicable permits, graded areas and other disturbed areas will be seeded to establish a permanent vegetative cover. Revegetation in agricultural lands will be conducted at the direction of the landowner. Depending on site conditions, revegetation may include fertilizing, seeding, and mulching as described below.

Fertilizing: After final grade, the top 4 to 6 inches of upland soils will receive lime at a rate of 2 tons/acre and fertilizer at a rate of 400 lbs/acre of 10-20-20 or equivalent, or in accordance with recommendations from the landowner. The fertilizer will be incorporated into the upper two inches of the soil during seedbed preparation using a disk harrow, spring-toothed harrow, or other suitable field implement.

Seeding: Disturbed areas requiring revegetation will be prepared for seeding during the final grading and restoration of the Project area. In areas where topsoil was segregated from the subsoil in agricultural lands during installation of the pipeline, the topsoil will be replaced and spread to a uniform depth to the extent practicable. If the ground has experienced compaction during construction, the soil surface will be loosened by disking, raking, or harrowing, or other acceptable means. Seedbed preparation should not be undertaken when excessively wet soil conditions exist. After a relatively smooth seedbed has been prepared, seed will be applied at the direction of the landowner to all areas with exposed soils using a broadcast spreader or a seed drill.

The seed mixes and seeding rates will be followed as recommended by the appropriate Parish Extension Office, unless otherwise specified by the landowner or permit conditions. Due to the summer construction schedule, a blend containing orchard grass, red clover, and smooth brome grass will be utilized for restoration of the right-of-way outside of agricultural areas.

Wetlands will not be seeded with a permanent seed mix, unless otherwise specified by the local land management agency or by permit conditions. Wetlands will be allowed to revegetate naturally using the seedbank retained in the wetland soils. As specified in Section 3.1, unsaturated wetlands will be seeded with annual ryegrass to provide a temporary vegetative cover.

Mulching: Mulch or erosion control blankets (e.g., Excelsior mats, erosion control matting, jute netting, bonded fiber matrix, etc.) will be applied to all seeded areas to keep surficial soils and seed in place, retain soil moisture, and moderate temperatures. Weed-free straw mulch will be spread uniformly over the areas at a rate of 1½ to 2 tons per acre. Mulch will be anchored immediately after placement by mechanical crimping, spraying with a liquid tackifier, or other appropriate anchoring method. No mulching will be used in wetlands.

Erosion control blankets may be used in place of mulch in steep-sloped areas and drainage ditches to prevent soil erosion after permanent seeding. The blankets will be installed and anchored according to manufacturer's specifications.

Stream Bank Stabilization: Another type of permanent erosion control measure for restoration of project areas will be the use of erosion control blankets or riprap for channel and stream bank stabilization. Placement and use of these measures will be dependent on stream conditions at the crossing, including stream flow and stream bank gradient, and permit requirements. A typical erosion control drawing showing stream bank stabilization methods is provided in **Attachment 5**.

3.3 Maintenance and Inspection

All erosion and sediment control devices will be will be routinely inspected as follows:

- on a weekly basis in all active and non-active construction areas;
- within 24 hours after rainfall events of 0.5-inch or greater rainfall event that result in runoff leaving the construction site or entering surface waters.

Maintenance inspection reports will be completed after each inspection and included in the Project file. A copy of the forms that will be completed by the Environmental Inspector(s) are included in **Appendix A**. If inspection results indicate a need for revision to this plan, the plan will be revised, and implemented as appropriate, within seven calendar days following the inspection. The inspection reports will identify any incidents of non-compliance.

Non-functional or ineffective temporary erosion control measures will be identified and will be repaired or replaced within 24 hours. When the depth of sediment behind a silt fence or straw bale reaches a point where the structure is no longer effective in retaining sediment, the barrier will be replaced or the sediment removed. The sediment will be redistributed onto the construction right-of-way and stabilized.

Temporary erosion control devices will remain in place until the site is permanently stabilized with vegetation (i.e., at least 70 percent vegetative cover). Following the completion of restoration and seeding activities, the Environmental Inspector will conduct periodic inspections to monitor revegetation of the seeded areas. If vegetative cover is determined to be inadequate, additional measures, such as overseeding, mulching, or the use of erosion control blankets, will be implemented, as appropriate. PPEC's environmental inspection personnel will be trained in soil erosion and sediment control techniques.

4.0 STORMWATER MANAGEMENT

Runoff volumes and runoff quality from the Project site will be the same as existing conditions because the right-of-way will be restored to pre-construction land use conditions and contours. The runoff coefficient before and after construction will be approximately equivalent. Therefore, additional stormwater management procedures will not be required.

Drainage patterns will not be substantially altered as the result of construction activities. As discussed in Section 3.1, diversion berms may be used on select sloped areas to divert stormwater runoff to adjacent vegetated areas.

5.0 SITE RESTORATION

After installation of the natural gas pipeline, the construction right-of-way will be restored to pre-construction conditions to the maximum extent practicable. Construction-related debris and extraneous material, including trash, excess rock and soil piles, timber, and slash will be removed and properly disposed of at a PPEC-approved off-site facility licensed to handle such wastes. Disturbed areas will be final graded to restore pre-construction contours and to prepare a seedbed. Upland areas with exposed soils will be revegetated with a permanent seed mix as specified in Section 3.2. Additional landscaping (sodding, planting of trees and shrubs, etc.) in the right-of-way may be conducted at the request of the landowner. In addition, fences, drain tiles, roads, driveways, and other structures damaged during construction will be repaired.



SWPPP Inspection Form

Date: _____

Inspector: _____

Date of _____

BMP Inspected:

Location: _____ Damaged: Y _____ N _____

Location: _____ Damaged: Y _____ N _____

Location: _____ Damaged: Y _____ N _____

Location: _____ Damaged: Y _____ N _____

Repairs:

Location: _____ Scheduled Date: _____

Location: _____ Repaired Date: _____

Location: _____ Scheduled Date: _____

Location: _____ Repaired Date: _____

Notes: _____

I certify under penalty of law that I am knowledgeable in the principles of erosion and sediment control, possess the skills to evaluate conditions at the above construction site that could impact stormwater quality, and am knowledgeable in the correct installation of erosion and sediment controls. I certify that I am able to assess the effectiveness of any sediment and erosion control measures selected in the SWPPP to control the quality of stormwater discharges from the construction site. Additionally, I certify that I have reviewed the LPDES Stormwater General Permit Associated with Construction Activity Greater than 5 Acres and SWPPP that was prepared by the owner of this site.