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PURCHASE OF POWER GENERATED AT THREE STARKVILLE AREA SOLAR FACILITIES

Oktibbeha County, Mississippi

ENVIRONMENTAL ASSESSMENT

Prepared by:
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CHAPTER 1 – PURPOSE AND NEED FOR ACTION

The Tennessee Valley Authority (TVA) proposes to enter into three power purchase agreements (PPAs) to purchase the electric power generated at three proposed solar facilities in the vicinity of Starkville, Oktibbeha County, Mississippi (Figure 1). The three proposed solar facilities would have direct current (DC) generating capacities of 67 kilowatts (kW), 200 kW, and 1 megawatt (MW) for a combined capacity of 1.267 MW. The PPA would be executed through TVA's Renewable Standard Offer (RSO) program.

TVA produces or obtains electricity from a diverse portfolio of energy sources such as nuclear, fossil, hydro, solar, wind, and biomass. In order to help fulfill the objectives of its 2011 Integrated Resource Plan (IRP; TVA 2011), 2007 Strategic Plan (TVA 2007), and 2008 Environmental Policy (TVA 2008), TVA has undertaken efforts to expand the contribution of renewable and low greenhouse gas-emitting sources in its generation portfolio. The RSO program is one of the mechanisms used by TVA to increase its use of renewable energy, including energy generated by solar photovoltaic (PV) facilities such as the three considered here.

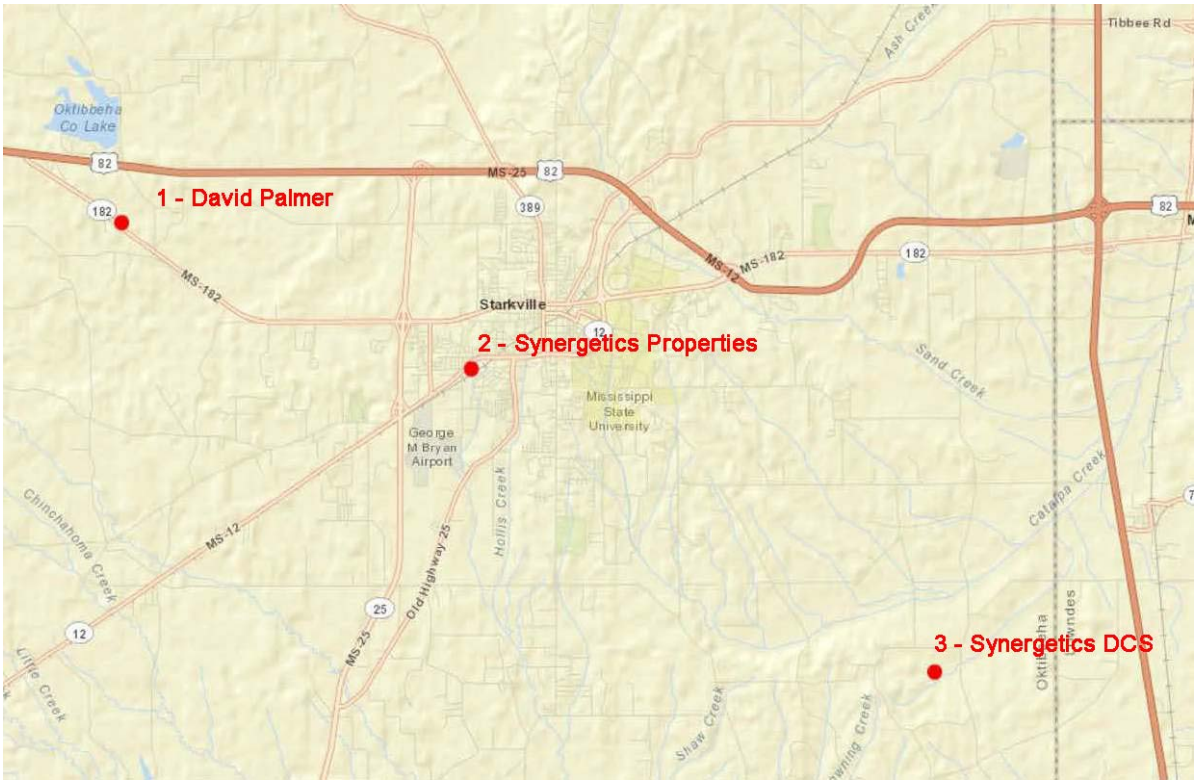

Figure 1. Location of three proposed solar facilities in vicinity of Starkville, Mississippi.

Under the proposed action, TVA would execute the three PPAs that would result in the construction and operation of the following solar facilities:

1. David Palmer, LLC 67kW Solar Array, a ground-mounted facility on a 0.7-acre site near Highway 182 West;

2. Synergetics Properties, LLC 200kW Solar Array, a roof-mounted facility on an existing commercial building on Highway 12 West; and

3. Synergetics DCS, Inc. 1MW Solar Array, a ground-mounted facility on a 3.6-acre site near Chapel Hill Road.

Under the terms of the PPAs, TVA would purchase the electricity generated by the solar farm for a 20-year period. The 67 kW and 1 MW facilities would be connected to the 4-County Electric Power Association distribution network, which in turn would transmit the power to the TVA transmission network. The 200 kW facility would be connected to the Starkville Electric distribution network, which would transmit the power to the TVA network.

TVA has prepared this environmental assessment (EA) under the National Environmental Policy Act (NEPA) and TVA's NEPA procedures in order to assess the potential impacts of entering into the PPAs and the associated impacts of the construction and operation of the proposed solar facilities.

Based on the scope of the anticipated construction activities described below in Chapter 2, none of the proposed solar facilities are anticipated to require any environmental permits.

CHAPTER 2 - ALTERNATIVES

Description of Alternatives

This EA evaluates two alternatives: the No Action Alternative and the Action Alternative. These are described in more detail below.

Alternative A – The No Action Alternative
Under the No Action Alternative, TVA would not purchase power from the three Starkville area solar facilities and the solar facilities would not be constructed and operated. TVA would continue to rely on other sources of electrical power to meet the needs of its customers.

Alternative B – Construction and Operation of Proposed Solar Facilities
Under the Action Alternative, TVA would enter into a three PPAs through the RSO program to purchase the electricity generated from three proposed solar facilities in the Starkville area. The following paragraphs describe the three proposed solar facilities in more detail.

David Palmer, LLC 67kW Solar Array – This solar facility would occupy a 0.7 acre site near Highway 182 West, 7 miles west-northwest of Starkville (Figure 2). The site is on a 2.9 acre tract owned by the developer and adjacent to an existing road. No road construction would be necessary. Trees would be removed from the partially wooded site, which would then be maintained with a periodically mowed grass cover. The approximately 270 PV panels would be mounted on metal racks supported by poles driven up to three feet into the ground. The racks would be arranged in parallel east-west rows. Electrical cables would connect the rows to a DC to alternating current (AC) power inverter. The inverter would be connected by a buried cable running 500 feet to a pad-mounted transformer, which would be connected to the adjacent 4-County Electric Power Association distribution line.

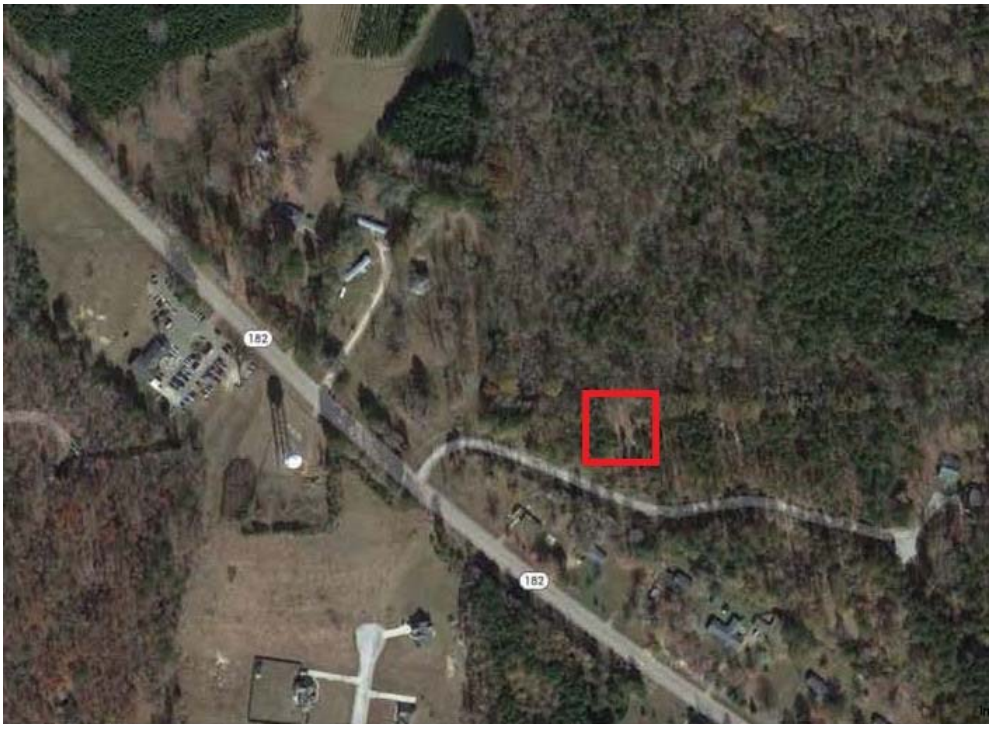

Figure 2. Location of the proposed David Palmer, LLC 67kW Solar Array west-northwest of Starkville.

Synergetics Properties, LLC 200kW Solar Array – This solar facility would be constructed on the roof of an existing commercial building in Starkville and owned by the applicant (Figure 3). PV panels were previously installed on the north half of the building roof; the proposed panels would be installed on the south half of the roof. The facility would consist of approximately 800 PV panels mounted on metal racks fastened to the building roof. The panels would be mounted with a 10° pitch to the south. The panels would be connected to a DC to AC power inverter, which would be connected to the Starkville Electric distribution lines serving the building.

Figure 3. Location of the proposed Synergetics Properties, LLC 200kW Solar Array in Starkville.

Synergetics DCS, Inc. 1MW Solar Array – This solar facility would be constructed on a 3.6-acre site near Chapel Hill Road, 8.4 miles southeast of Starkville. The site is on a 51-acre tract owned by the developer. It is accessible by an existing field road that connects to Chapel Hill Road. Other than the likely addition of gravel to the field road, no road construction would occur. Part of the site, likely less than an acre, would be graded to smooth a small area of irregular terrain. The approximately 4,000 PV panels would be installed on metal racks supported by poles driven up to three feet in the ground. The racks would be arranged in parallel east-west rows. Electric cables would connect the rows to four DC to AC power inverters and a pad-mounted transformer bank. A new power line approximately 2,000 feet in length, would installed on wooden poles to connect the facility to an existing 4-County EPA distribution line. Vegetation would be maintained by periodic mowing, herbicide applications, or grazing.

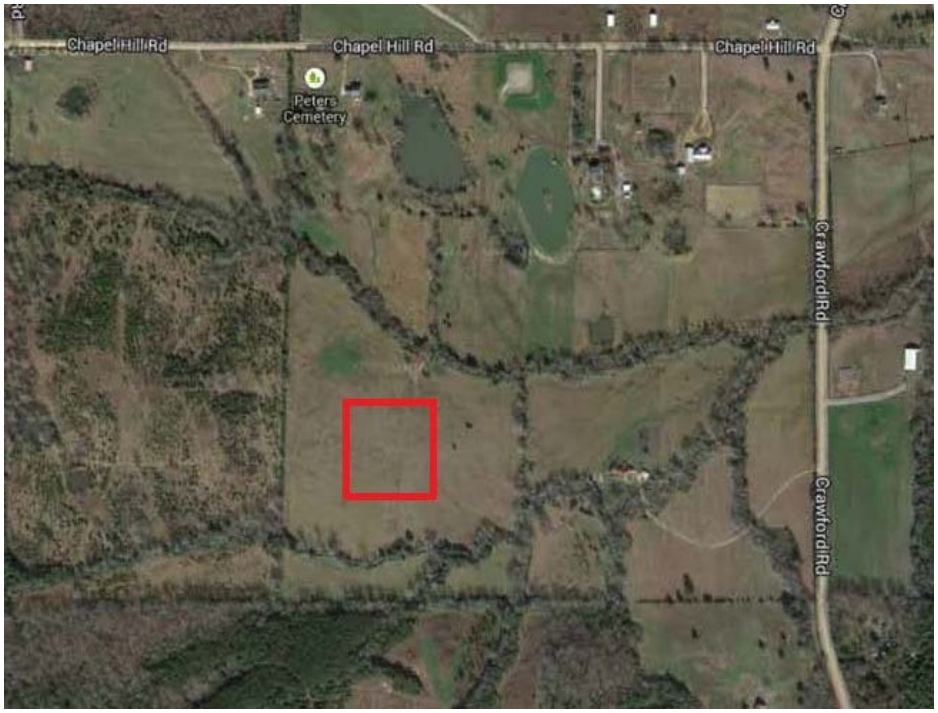

Figure 4. Location of the proposed Synergetics DCS, Inc. 1MW Solar Array southeast of Starkville.

Each of the proposed solar facilities would use 250-watt PV panels each approximately 39 inches wide by 64 inches tall. No night lighting would be installed for any of the facilities. The enclosure of the ground-mounted solar facilities by security fencing is not proposed at this time.

Identification of Mitigation Measures

TVA has not identified the need for any non-routine mitigation measures to further reduce the anticipated impacts of the proposed action.

The Preferred Alternative

TVA's preferred alternative is Alternative B – Construction and Operation of Proposed Solar Facilities. Under this alternative, TVA would enter into the PPAs with the three developers who would then construct and operate the proposed solar facilities.

CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the environmental resources that could be affected by the two alternatives and the effects of the alternatives on those resources. Through scoping of the proposed action, TVA has determined that some environmental resources would not be affected. All three proposed solar facility sites are in upland areas; no wetlands occur on or near the sites and none of the sites, their access roads, or connecting electrical lines are located within a designated floodplain. These resources would not be affected and the proposed action is consistent with Executive Order (EO) 11990 Protection of Wetlands and EO 11988, Floodplain Management. No hazardous wastes would be generated. The proposed facility sites are all on private land and there would be no effects on public recreation facilities or activities. Other environmental resources that could be affected are described below.

Air Quality and Greenhouse Gas Emissions

Affected Environment – Oktibbeha County is in attainment with the National Ambient Air Quality Standards for criteria pollutants established under the Clean Air Act. The system-wide emissions from TVA's electrical generating facilities through 2008/2009 are described in the 2011 IRP EIS (TVA 2011). Since then, TVA has reduced its emissions of criteria pollutants and greenhouse gases through the installation of emission controls at fossil-fueled plants, idling and retirement of coal-fired generating units, increased use of low-emission generating facilities, and increased energy efficiency and demand reduction efforts.

Environmental Consequences – Under the No Action Alternative, the proposed solar facilities would not be constructed and no project-related impacts on air quality or climate change would occur. TVA would continue to rely on other generation sources to meet the needs of its customers and its goal of reducing its greenhouse gas (GHG) emissions.

Under the Action Alternative, minor impacts to air quality would occur. Site grading and other construction activities have the potential to generate fugitive dust (particulate matter, PM). This would be minimized by the use of best management practices and offsite impacts of the fugitive dust would be negligible. The fossil-fueled construction equipment would emit PM, nitrogen oxides, and other pollutants; the total amount of these emissions would be small and would result in negligible impacts. The construction equipment would also emit GHGs (particularly carbon dioxide, CO_2); the impacts of these would also be negligible. The operation of the solar farm would result in a very small reduction in TVA's GHG emission rate because the emissions (including CO_2)-free power generated by the solar farm would displace power that would otherwise be generated in part by fossil fuels. This would result in a minor beneficial impact to air quality.

Water Resources

Affected Environment – Streams in the project area drain to the east to join Tibbee Creek, a tributary to the Tombigbee River. Two unnamed creeks flow within about 0.25 miles of the site of the proposed David Palmer solar facility. Glen Creek flows within about 0.1 mile of the site of the proposed Synergetics Properties rooftop solar facility. Red Bud Creek flows

within about 0.1 mile of the proposed Synergetics DCS solar facility. Several farmponds are located within a half mile of the David Palmer and Synergetics DCS sites. None of the streams in the vicinity of the proposed solar facilities are classified as not meeting applicable water quality standards. No designated aquifer recharge areas or other sensitive groundwater resources occur in the vicinity of the proposed solar facilities. No Wild or Scenic Rivers or streams listed on the National Rivers Inventory occur in the vicinity of the proposed solar facilities.

Environmental Consequences – Under the No Action Alternative, the proposed solar facilities would not be constructed and no project-related impacts to water resources would occur.

Under the Action Alternative, impacts to water resources could occur from the runoff of sediment-laden stormwater from the David Palmer and Synergetics DCS sites, particularly during construction. Due to the small area of anticipated ground disturbance, the potential for adverse impacts is low. The developers would implement appropriate erosion control measures such as the installation of sediment barriers and prompt stabilization and revegetation of graded areas. With implementation of these measures, impacts to surface waters and aquatic life would be insignificant during construction and no long-term impacts are anticipated. No impacts to groundwater are anticipated.

Vegetation and Wildlife

Existing Environment – The proposed solar facilities are located in the Black Prairie region of the East Gulf Coastal Plain physiographic province. This region is characterized by rolling hills forested with hardwoods and pines.

The David Palmer site is partially wooded with loblolly pine, southern red oak, and sweetgum dominating the open-canopied overstory. The understory is relatively open and dominated by common grasses and forbs, likely the result of past grazing and mowing. Wildlife species on the site are those occupying old fields and open woodland such as white-tailed deer, eastern cottontail, wild turkey, red-bellied woodpecker, eastern wood-pewee, northern cardinal, indigo bunting, and eastern towhee. The habitats on the project site are relatively common in the local area and no unusual or rare plant or wildlife communities are present.

The Synergetics DCS site is grassland managed for hay production. Plant and animal diversity is low and no unusual or rare plant or wildlife communities are present.

Environmental Consequences – Under the No Action Alternative, the proposed solar facilities would not be constructed and no project-related impacts to vegetation and wildlife would occur.

Under the Action Alternative, the existing trees would be removed from the 0.7-acre David Palmer site, and parts of the Synergetics DCS site would likely be graded. Multiple rows of PV panels on metal racks would be installed on these sites. These activities would displace most of the wildlife on the site. Although the impacts on plant and animal species on the site would be adverse, these species are common in the region and overall impacts would be insignificant. Following the completion of construction, the sites would be revegetated with grasses and maintained by periodic mowing. Operation of these two solar facilities would not result in any additional adverse impacts to vegetation or wildlife. Construction

and operation of the rooftop Synergetics Properties solar facility would not affect vegetation or wildlife.

Endangered and Threatened Species

Existing Environment – One plant and two animals listed under the Endangered Species Act (ESA) are known from Oktibbeha County (Table 1). No aquatic species listed under the ESA are known to occur in Oktibbeha County, and no federally or state-listed aquatic species are known or likely to occur in the streams draining the proposed solar facility sites. Price's potato bean occurs in open woods and along woodland edges in limestone areas. Although open woods occurs on the David Palmer site, this area does not have the shallow limestone geology associated with the species. Suitable habitat for the red-cockaded woodpecker, which requires extensive stands of mature to old-growth pines, does not occur on the David Palmer site. No suitable habitat for the either the Price's potato bean or the red-cockaded woodpecker occurs at or in the vicinity of the Synergetics Properties or Synergetics DCS sites.

Table 1. Endangered and threatened species listed under the ESA reported from Oktibbeha County, Mississippi

Common Name	Scientific Name	Federal status	MS State status/rank
Plants			
Price's potato bean	*Apios priceana*	THR	-- /S1
Animals			
American burying beetle	*Nicrophorus americanus*	END	EXT
Red-cockaded woodpecker	*Picoides borealis*	END	END/S1

Source: TVA Heritage database, accessed January 2014, and U.S. Fish and Wildlife Service IPaC data, accessed January 2013.
Status abbreviations: END – Endangered; EXT – Extirpated; THR – Threatened
Rank abbreviations: S1 - Critically imperiled

One additional animal listed as endangered under the ESA, the Indiana bat (*Mytotis sodalis*), and one proposed for listing under the ESA, the northern long-eared bat (*Myotis septentrionalis*) may occur in Oktibbeha County. These two bats occupy caves during the winter and roost in trees, primarily under loose or exfoliating bark or in cavities, during the summer. No caves occur in the area and no trees occur on the Synergetics Properties or Synergetics DCS sites. The David Palmer site is partially wooded; based on the tree species present, the potential for suitable bat summer roost habitat to be present is low and any suitable roost habitat would be considered to be of low quality.

Several species considered to be of conservation concern by the Mississippi Natural Heritage Program occur in Oktibbeha County. Based on the habitats present at the three proposed solar facility sites, the occurrence of any of these species on the sites is unlikely.

Environmental Consequences – Under the No Action Alternative, the proposed solar facilities would not be constructed and no project-related impacts to federally or state-listed endangered or threatened species or other species of conservation concern would occur.

Under the Action Alternative, no federally or state-listed plants or aquatic species would be affected. There is a low potential for summer roost habitat for the Indiana and northern long-eared bats to be present on the David Palmer site; impacts to these bats would be avoided by removing trees from the site between October 15 and April 1, when the bats are hibernating in caves. In response to an inquiry about the Synergetics DCS site, stated that listed endangered or threatened species were not likely to be affected by the development of this solar facility. The rooftop Synergetics Properties facility has no potential affect listed species.

Land Use

Existing Environment – The proposed David Palmer and Synergetics DCS solar facility sites are located in unincorporated areas of Oktibbeha County, which does not have county-wide zoning regulations. The Synergetics Properties site is located within the city limits of Starkville and zoned M-1 Manufacturing. The proposed solar facility is compatible with this zoning and would be constructed adjacent to existing PV panels on the rooftop. Adjacent land uses/zoning include M-1 Manufacturing, C-2 General Business, R-1 Single Family residential to the north across Highway 12, and R-2 Single Family/Duplex residential to the southwest.

The David Palmer site is in a rural-suburban area. The site is presently undeveloped woodland and the majority of the surrounding area is woodland. Houses, mostly on multi-acre lots, occur along Highway 82 and a small subdivision occurs across Highway 182 from the site. Visibility of the site from Highway 82 is low due to intervening trees.

The Synergetics DCS site is located in a rural area with the primary land uses of farming and forest management. The site is presently part of a farm managed for hay production.

Environmental Consequences – Under the No Action Alternative, the proposed solar facilities would not be built and the land uses of the sites would not change.

Under the Action Alternative, there would be no change in land use at the Synergetics Properties site. The development of both the David Palmer and Synergetics DCS solar facilities would result in the conversion of the sites from undeveloped woodland and farmland to rural industrial. This would have little effect on the future land use of adjacent tracts and would not conflict with zoning regulations. Overall impacts to land use would be insignificant.

Soils and Prime Farmland

Existing Environment – The Longview silt loam, 0 to 2 percent slopes, soil type occurs on the 0.7-acre David Palmer site. This soil type is considered prime farmland. The site is presently open woodland and not used for farming.

The Kipling silty clay loam, 2 to 5 percent slopes, eroded, soil type occurs on 2.6 acres of the 3.4-acre Synergetics DCS site (http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx). This soil type is classified as prime farmland. The other two soil types on the site, which together comprise about a quarter of the site, are Kipling silty clay loam, 5 to 8 percent slopes, eroded, and Sumter and Binnsville soils, 5 to 8 percent slopes, eroded. The Kipling 5 to 8 percent slopes soil type is classified as farmland of statewide importance. The Farmland Protection Policy Act

(FPPA) requires Federal agencies to take into account the adverse effects of their actions on prime or unique farmlands, in order to minimize conversion of farmland to nonagricultural uses. Prime farmland is land that is the most suitable for economically producing sustained high yields of food, feed, fiber, forage, and oilseed crops.

Environmental Consequences – Under the No Action Alternative, here would be no project-related impacts to soils on or in the immediate vicinity of the proposed solar farm site.

Under the Action Alternative, the construction and operation of the proposed rooftop Synergetics Properties solar facility would have no effect on soils and prime farmland. The construction and operation of the proposed David Palmer and Synergetics DCS facilities would result in disturbance of the soils on about 4.1 acres. Appropriate erosion control measures would be used to minimize sedimentation. Due to the limited amount of grading and excavation, effects on soil productivity would be minimal. Although the soils on the Synergetics DCS site have limitations for certain types of construction activities due to their shrink-swell characteristics (http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx), this does not impose constraints on construction of the solar facility.

The impacts of developing the 0.7 acres of prime farmland on the David Palmer site would be minimal due to the very small area, absence of farming on the site in recent years, and presence of non-farm development and urban support services in the immediate vicinity. The proposed Synergetics DCS site would affect 3.4 acres of prime farmland on a 51-acre tract of farmland adjacent to and near other farmland. In accordance with FPPA evaluation procedures, U.S. Department of Agriculture Farmland Conversion Impact Rating Form AD-1006 was completed by Natural Resources Conservation Service personnel and TVA. This form assigns a numerical rating between 0 and 260 based on the area of prime farmland to be disturbed, the total area of farmland in the affected county, and other criteria. The rating for the Synergetics DCS site is 150, below the threshold score of 160 indicating potential adverse impacts to prime farmland and the need for evaluation of alternative sites. Based on this rating, the impacts to prime farmland from developing the Synergetics DCS site would be insignificant, and overall effects on soils, including prime farmland, from the three proposed solar facilities would be insignificant.

Visual Resources

Existing Environment – The proposed solar Synergetics Properties solar facility would be on an existing rooftop, adjacent to existing PV panels. Due to the height of the building, elevations of the surrounding terrain, and existing treelines, it would be largely invisible from nearby viewing points.

The David Palmer site is located in a rural/suburban area surrounded by woodland, including some actively managed as a tree plantation and by low and medium density residential areas. The two-lane Highway 182 runs southeast to northwest a short distance south of the site and a water tower and church with associated cemetery are located on the opposite side of Highway 182 a short distance to the west. Scenic attractiveness (a measure of human perceptions of landscape beauty and sense of place) of the area is common and scenic integrity (a measure of the degree of intactness or wholeness of the landscape character) is moderate to low. The surrounding terrain is relatively flat.

The Synergetics DCS site is located in a rural area surrounded by farmland (primarily hayfields and pasture) and managed forest. The terrain is rolling with relatively gentle

slopes; shallow valleys formed by intermittent streams are short distances north, east, and south of the site. Lightly traveled gravel public roads are located about 0.4 mile north and east of the site, and portions of the site are likely visible from these roads. Scenic attractiveness is common and scenic integrity is moderate.

Environmental Consequences – Under the No Action Alternative, the proposed solar farm would not be built and there would be no project-related changes to the visual character of the area.

Under the Action Alternative, the construction and operation of the rooftop Synergetics Properties solar facility would in minimal, if any, visual impacts.

The construction and operation of the David Palmer solar facility would result in visual impacts from the removal of trees and clearing of the site, and from the installation of the PV panels and associated equipment. This would be visible from the driveway adjacent to the site but partially screened by trees from houses along nearby Highway 82 and travelers on Highway 82. Given the existing screening, the small size of the solar facility, its low profile, and the presence of other development along Highway 82, the visual impacts of the facility would be insignificant.

The construction and operation of the Synergetics DCS solar facility would result in visual impacts from the limited amount of site grading and the installation of the PV panels and associated equipment, including the connecting power line. This would change the character of the site from pasture to multiple rows of PV panels supported by low metal racks. The glass-faced PV panels would face to the south, away from any public roads or nearby residences. Part of the facility would likely be visible from the nearest residence, located about 1,000 feet to the east. This view would be of the ends of the rows of PV panels and largely be of low metal structures. The solar facility would not dominate this view from the house given the distance and scattered intervening trees. Portions of the facility would also likely be visible from the public roads located east and north of the facility. These views would be of the end of the rows of PV panels and of the back side of the facility, which would appear as low metal structures. Given the distance and partial screening by intervening trees, the impact of the facility on views from these roads would be insignificant. Overall visual impacts of the three proposed solar facilities would be insignificant.

Noise

Existing Environment – The proposed rooftop Synergetics Properties solar facility is in a developed commercial area adjacent to a major highway and a railroad, with nearby residential areas. The major sources of noise would be traffic on the highway and other nearby roads, the railroad, and operational noise from the commercial facilities.

The proposed David Palmer solar facility is in a rural-suburban area close to a two-lane highway. Major sources of noise would be traffic on the highway, residential lawn equipment, wind, wildlife, and similar sounds. Noise levels in rural areas typically range from 45 to 55 dBA. dBA (A-weighted decibels) is a measure of noise level; a day-night average sound level of 55 dBA is commonly used as a threshold level for noise levels which could result in adverse impacts, and prolonged exposure to levels above 65 dBA is considered unsuitable for residential areas. Noise levels in the vicinity of the David Palmer

site would likely be in the upper part of the 45 to 55 dBA range due to the presence of Highway 82.

The proposed Synergetics DCS site is in a rural area where the major sources of noise would be farm equipment, wind, wildlife, and occasional traffic on the nearby gravel roads. Typical noise levels would likely be in the 45 to 55 dBA range.

Environmental Consequences – Under the No Action Alternative, no noise would be produced by the construction or operation of the proposed solar farm and there would be no project-related changes to noise levels in the area.

Under the Action Alternative, construction activities would generate noise; no noise would be generated by the operation of the solar facilities. Construction of the rooftop Synergetics Properties solar facilities would generate relatively little noise as there would be no land clearing or grading and no use of impact-type equipment. Construction noise would likely not be perceptible to anyone located off of the facility site.

Noise would be generated during the construction of the David Palmer facility during the removal of trees, and by the installation of the ground-mounted PV panel support racks. Maximum noise levels produced by the construction equipment are in the range of 80 to 85 dBA at a distance of 50 feet from the equipment. The nearest occupied house is about 350 feet from the site of the construction activities. Nearby residents could experience elevated noise levels caused by construction equipment, but construction noise would be of very short duration, during normal work hours on weekdays, and likely not exceed the 65 dBA noise level at nearby houses for prolonged periods.

Noise would be generated during the construction of the Synergetics DCS facility from the limited site grading and the installation of the ground-mounted PV panel support racks. At the nearest sensitive noise receptor, an occupied house about 1,000 feet from the facility site, construction noise could be perceptible above background noise but would not exceed the 65 dBA noise level. Periodic noise would also be produced at the David Palmer and Synergetics DCS facilities by maintenance activities, primarily mowing. This noise would be similar to existing noises in the vicinity of these sites. Overall noise impacts resulting from the Action Alternative would be insignificant.

Cultural Resources

Existing Environment – Cultural resources include prehistoric and historic archaeological sites, districts, buildings, structures, and objects, as well as locations of important historic events. Cultural resources that are listed on, or considered eligible for listing on, the National Register of Historic Places (NRHP) maintained by the National Park Service are called historic properties. As a Federal agency, TVA is required by the National Historic Preservation Act (NHPA) to evaluate the potential effects of its actions on historic properties. When a TVA action would adversely affect a historic property, TVA must, in consultation with State Historic Preservation officers (SHPOs), federally-recognized Indian tribes, and others, consider ways to avoid or minimize the adverse effect, and, if avoidance or minimization are not feasible, to mitigate the adverse effect. The area of potential effects (APE) for evaluating the impacts on archaeological resources was defined as the proposed solar facility sites, and for historic architectural resources (e.g., buildings, districts, sites), as the area in a 0.5-mile radius of the proposed solar facilities.

In response to inquiries about the Synergetics Properties and Synergetics DCS sites, the Mississippi Department of Archives and History (MDAH) in letters dated August 6 and August 19, 2013 (Appendix) stated that no cultural resources would likely be affected by the development of these two solar facilities. In order to more thoroughly assess the potential impacts to cultural resources, a Phase I cultural resource survey was conducted for the David Palmer and Synergetics DCS sites in November 2013. A total of 39 shovel tests were excavated within the two tracts with no archaeological sites identified and no artifacts recovered. One previously recorded architectural resource, 105-STK-5004, is located within the architectural APE for the Synergetics DCS site. This property, a two-story Greek Revival house constructed in the 1860s, was recommended in 1990 as potentially eligible for the NRHP, if restored. No additional architectural resources were identified during the 2013 survey. The 1860s house, located about 1,600 feet northeast of the solar facility site, was determined to be ineligible for inclusion in the NRHP due to extensive modern alterations and rehabilitation efforts following its extensive deterioration in the late twentieth century. TVA has consulted with the MDAH (SHPO) and federally recognized Indian tribes regarding this determination.

Environmental Consequences – Under the No Action Alternative, there would be no project-related impacts to cultural resources.

Under the Action Alternative, construction and operation of the three proposed solar facilities would not affect historic properties. Because of its limited visibility from surrounding properties, TVA has determined that the construction and operation of the proposed rooftop Synergetics Properties solar facility has no potential to affect historic properties. Based on the results of the surveys of the David Palmer and Synergetics DCS sites, TVA finds that the construction and operation of these two solar facilities would not affect historic properties. In accordance with Section 106 of the NHPA, TVA has consulted with the MDAH (SHPO) and with federally recognized Indian tribes on this finding (Appendix).

Socioeconomics and Environmental Justice

Existing Environment – The three proposed solar facilities are located in the vicinity of Starkville, Oktibbeha County, Mississippi. The 2012 population estimates were 24,360 for Starkville and 48,192 for Oktibbeha County (US Census Bureau State & County QuickFacts). Minorities made up 41 percent of the county population and 40 percent of the state population in 2012. The proportion of the population classified as low income in 2012 was 34.2 percent for the county and 22.3 percent for the state. County and state per capita incomes were $20,050 and $20, 670, respectively.

The proposed Synergetics Properties facility is in a developed urban area; within a half mile of the site in 2012, 37 percent of the population was minority, primarily black, and the per capita personal income was $20,383.

The proposed David Palmer site is in a rural/suburban area. In 2012, 54 percent of the population within a half mile of the site was minority and the per capita income in the same area was $17,133.

The proposed Synergetics DCS site is in a sparsely populated rural area. Within a half mile of the site, 70 percent of the 2012 population was minority, primarily black, and the per capita income was $22,020.

Environmental Consequences – Under the No Action Alternative, there would be no project-related impacts on the socioeconomics or low-income or minority populations in the project area.

Under the Action Alternative, a small crew (less than 10) of workers would be employed for a few weeks to construct the proposed solar facilities. These workers would be based in the local area and would have little impact on the local economy. No workers would be need for the normal day-to-day operation of the solar facilities. Periodic maintenance activities, primarily mowing, would be done by local workers and would not result in an increase in employment. There would be increases in property tax payments to Starkville for the Synergetics Properties facility and to Oktibbeha County for all three facilities due to the increased value of the sites once the facilities are completed.

Executive Order 12898 on Environmental Justice directs federal agencies to consider the impacts of their actions on minority and low-income populations and to avoid disproportionate impacts to those populations. The proportion of minority and low income populations in the vicinity of the three proposed solar facilities is approximately equal to or greater than the proportions for the county and state. The overall impacts of the solar facilities, most of which would occur during the short construction period, would be minor and off-site impacts (i.e., to surrounding properties) would be negligible. Consequently, there would be no disproportionately adverse impacts to minority and low-income populations.

Cumulative Impacts

Based on the level of anticipated impacts to the resources described above and the absence of other ongoing or proposed major construction or other projects in the surrounding area, TVA has determined that the proposed action would not result in any adverse cumulative impacts.

CHAPTER 4 – SUPPORTING INFORMATION

EA Preparers

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Involvement: NEPA Compliance and Document Preparation

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Involvement: Cultural Resources

Literature Cited

Tennessee Valley Authority (TVA). 2007. TVA's Strategic Plan, Serving the Valley. Available at: http://www.tva.gov/stratplan.

_____. 2008. TVA's 2008 Environmental Policy. Available at: http://www.tva.gov/enviroment/policy.

_____. 2011. Integrated Resource Plan, TVA's Environmental & Energy Future. Available at: http://www.tva.com/environment/reports/irp/index.htm.

Appendix

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Mississippi Field Office
6578 Dogwood View Parkway, Suite A
Jackson, Mississippi 39213

August 1, 2013

Mr. David Palmer
Synergetics
Post Office Box 80264
Starkville, Mississippi 39759

Dear Mr. Palmer:

The Fish and Wildlife Service (Service) recently received your correspondence dated July 29, 2013, requesting information regarding the potential presence of federally listed species on a site in Oktibbeha County, Mississippi. Your company proposes the construction of a solar array on agricultural lands south east of the City of Starkville. Our comments are provided in accordance with the Endangered Species Act (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

The Service supports renewable energy development, but strongly encourages it to proceed in a manner that is also protective of fish and wildlife species and their habitats. Our records indicate no listed endangered or threatened species are likely to be effected by the proposed project. Therefore, based on the best information available at this time, we believe that the requirements of section 7 of the ESA are fulfilled.

However, we recommend implementation of any necessary pre and post construction erosion control measures to prevent runoff, sediment, or chemicals from entering any nearby streams or water bodies that might support protected species and or offsite wetlands.

Thank you for the opportunity to review this project. If you need additional information, please feel free to contact this office (601) 218-4298.

Sincerely,

For Stephen M. Ricks
Field Supervisor

MISSISSIPPI DEPARTMENT of ARCHIVES AND HISTORY

MDAH

PO Box 571, Jackson, MS 39205-0571
601-576-6850 • Fax 601-576-6975
mdah.state.ms.us
H.T. Holmes, Director

August 19, 2013

Mr. David Palmer
Synergetics
Post Office Box 80264
Starkville, Mississippi 39759

RE: Proposed solar array adjacent to 4114 Chapel Hill Road, Starkville, in S35, T18N, R15E, MDAH Project Log #07-135-13, Oktibbeha County

Dear Mr. Palmer

We have reviewed your request for a cultural resources assessment, received on July 30, for the above referenced project in accordance with our responsibilities under Section 106 of the National Historic Preservation Act and 36 CFR Part 800. After reviewing the information provided, it is our determination that no cultural resources are likely to be affected. Therefore, we have no objection with the propcsed undertaking.

Should there be additional work in connection with the project, or any changes in the scope of work, please let us know in order that we may provide you with appropriate comments in compliance with the above referenced regulations.

If you have any questions, please do not hesitate to contact us at (601) 576-6940.

Sincerely,

Hal Bell

Hal Bell
Review and Compliance Assistant

FOR: Greg Williamson
Review and Compliance Officer

MISSISSIPPI DEPARTMENT of ARCHIVES AND HISTORY

MDAH

PO Box 571, Jackson, MS 39205-0571
601-576-6850 • Fax 601-576-6975
mdah.state.ms.us
H.T. Holmes, Director

August 6, 2013

Mr. David Palmer
Synergetics
Post Office Box 80264
Starkville, Mississippi 39759

RE: Proposed solar array on roof of office building at 501 Highway 12 West, Starkville, MDAH Project Log #07-135-13, Oktibbeha County

Dear Mr. Palmer:

We have reviewed your request for a cultural resources assessment, received on July 30, for the above referenced project in accordance with our responsibilities under Section 106 of the National Historic Preservation Act and 36 CFR Part 800. After reviewing the information provided, it is our determination that no cultural resources are likely to be effected. Therefore we have no objection with the proposed undertaking.

Should there be additional work in connection with the project, or any changes in the scope of work, please let us know in order that we may provide you with appropriate comments in compliance with the above referenced regulations.

If you have any questions, please do not hesitate to contact us at (601) 576-6940

Sincerely,

Hal Bell
Review and Compliance Assistant

FOR: Greg Williamson
Review and Compliance Officer

Tennessee Valley Authority, 400 West Summit Hill Drive, Knoxville, TN 37902

February 7, 2014

Mr. Jim Woodrick, Director
Mississippi Department of Archives and History
Historic Preservation Division
Post Office Box 571
Jackson, Mississippi 39205-0521

Dear Mr. Woodrick:

TVA, STARKVILLE AREA PHOTOVOLTAIC PROJECTS, PHASE I CULTURAL RESOURCES SURVEY, OKTIBBEHA COUNTY

TVA proposes to enter into two power purchase agreements (PPAs) through the Renewable Standard Offer (RSO) and Solar Solutions Initiative (SSI) programs for the construction, operation, and maintenance of two photovoltaic power projects in the Starkville, Mississippi area. TVA's RSO program offers pre-set prices (the "standard offer") and terms and conditions for power generated by selected renewable energy technologies. TVA's SSI program provides incentive payments (an additional amount per kilowatt hour that TVA would pay for the generated power) for mid-size solar projects in the RSO program that use local installers. Synergetics DCS, Inc. and David Palmer, LLC have been tentatively accepted into the RSO and SSI programs. TVA would enter into a PPA with David Palmer, LLC for a 67 kilowatt (kW) Solar Array on a 0.7-acre site near Highway 182 west of Starkville. TVA would enter into a PPA with Synergetics DCS, Inc. for a 1 megawatt (MW) Solar Array on a 3.4-acre site near Chapel Hill Road, southeast of Starkville. TVA has determined that these two proposed PPAs together constitute an undertaking (as defined at 36 CFR § 800.16(y)) that has the potential to cause effects on historic properties. In this letter, we are initiating consultation on the proposed Starkville Area Photovoltaic Power Systems.

Both proposed photovoltaic power systems would utilize a ground-mounted photovoltaic array (i.e., solar panels). The solar panels would be installed on metal racks supported by poles driven up to three feet into the ground, and the racks would be arranged in parallel rows. Construction of each system would include vegetation clearing, installing the photovoltaic array, installing underground wiring in trenches, building an access road, and installing an electrical line to connect the system's transformers to the 4-County Electric Power Association distribution network. At the Chapel Hill Road project, some grading (< 1 acre) would also be required. Operation and maintenance would require minimal human labor during periodic site visits, and no full-time employees would be required on site. TVA has determined that the area of potential effects (APE) for archaeological resources consists of both proposed project sites for a total of 4.1 acres, and that the APE for historic architectural resources consists of the area within a half-mile radius surrounding each of the two proposed project sites. Synergetics DCS contracted

with Tennessee Valley Archaeological Research (TVAR), of Huntsville, Alabama, to perform a phase I cultural resources survey of the APE. Enclosed are three copies of the draft report titled, *A Phase I Cultural Resources Survey of the Proposed Photovoltaic Power Systems in Oktibbeha County, Mississippi*, along with three CDs containing digital copies of the report.

TVAR's background study, conducted prior to the field study, indicated there are no previously recorded archaeological sites in either portion of the archaeological APE. The survey identified no archaeological sites in the APE. The background study noted that one historic architectural resource has been recorded previously in the architectural APE: 105-STK-5004, a house constructed ca. 1868 by John Easter Stiles. This resource is located approximately 480 meters (0.3 mi) northeast of the Chapel Hill Road project area. TVAR recommends that this resource is ineligible for listing in the National Register of Historic Places due to extensive modern alterations, which resulted in the loss of much of the historic integrity of the building. No other historic architectural resources were identified during the survey. TVAR recommends that no additional cultural resources investigations are necessary within the APE prior to the initiation of the undertaking.

TVA has reviewed the enclosed report and agrees with the findings and recommendations of the authors. TVA finds that the proposed Starkville Area Photovoltaic Power Systems Project would affect no properties listed in, or eligible for listing in, the National Register of Historic Places.

Pursuant to 36 CFR Part 800.4(d)(1), we are seeking your concurrence with TVA's finding that no historic properties would be affected by the proposed undertaking.

Pursuant to 36 CFR Part 800.3(f)(2), TVA is consulting with federally recognized Indian tribes regarding historic properties within the proposed project's APE that may be of religious and cultural significance and are eligible for the NRHP.

Should you have any questions or comments, please contact Richard Yarnell in Knoxville at wryarnel@tva.gov or (865) 632-3463.

Sincerely,

Clinton E. Jones
Senior Manager
Biological and Cultural Compliance
Environmental Permits and Compliance
WT 11B-K

Enclosures

Tennessee Valley Authority, 400 West Summit Hill Drive, Knoxville, TN 37902

February 11, 2014

To Those Listed:

TENNESSEE VALLEY AUTHORITY (TVA), STARKVILLE AREA PHOTOVOLTAIC PROJECTS, PHASE I CULTURAL RESOURCES SURVEY, OKTIBBEHA COUNTY

TVA proposes to enter into two power purchase agreements (PPAs) through the Renewable Standard Offer (RSO) and Solar Solutions Initiative (SSI) programs for the construction, operation, and maintenance of two photovoltaic power projects in the Starkville, Mississippi area. TVA's RSO program offers pre-set prices (the "standard offer") and terms and conditions for power generated by selected renewable energy technologies. TVA's SSI program provides incentive payments (an additional amount per kilowatt hour that TVA would pay for the generated power) for mid-size solar projects in the RSO program that use local installers. Synergetics DCS, Inc. and David Palmer, LLC have been tentatively accepted into the RSO and SSI programs. TVA would enter into a PPA with David Palmer, LLC for a 67 kilowatt (kW) Solar Array on a 0.7-acre site near Highway 182 west of Starkville. TVA would enter into a PPA with Synergetics DCS, Inc. for a 1 megawatt (MW) Solar Array on a 3.4-acre site near Chapel Hill Road, southeast of Starkville. TVA has determined that these two proposed PPAs together constitute an undertaking (as defined at 36 CFR § 800.16(y)) that has the potential to cause effects on historic properties. In this letter, we are initiating consultation on the proposed Starkville Area Photovoltaic Power Systems.

Both proposed photovoltaic power systems would utilize a ground-mounted photovoltaic array (i.e., solar panels). The solar panels would be installed on metal racks supported by poles driven up to three feet into the ground, and the racks would be arranged in parallel rows. Construction of each system would include vegetation clearing, installing the photovoltaic array, installing underground wiring in trenches, building an access road, and installing an electrical line to connect the system's transformers to the 4-County Electric Power Association distribution network. At the Chapel Hill Road project, some grading (< 1 acre) would also be required. Operation and maintenance would require minimal human labor during periodic site visits, and no full-time employees would be required on site. TVA has determined that the area of potential effects (APE) for archaeological resources consists of both proposed project sites for a total of 4.1 acres, and that the APE for historic architectural resources consists of the area within a half-mile radius surrounding each of the two proposed project sites. Synergetics DCS contracted with Tennessee Valley Archaeological Research (TVAR), of Huntsville, Alabama, to perform a phase I cultural resources survey of the APE. Enclosed, please find a copy of the draft report titled, *A Phase I Cultural Resources Survey of the Proposed Photovoltaic Power Systems in Oktibbeha County, Mississippi.*

TVAR's background study, conducted prior to the field study, indicated there are no previously recorded archaeological sites in either portion of the archaeological APE. The survey identified

no archaeological sites in the APE. The background study noted that one historic architectural resource has been recorded previously in the architectural APE: 105-STK-5004, a house constructed ca. 1868 by John Easter Stiles. This resource is located approximately 480 meters (0.3 mi) northeast of the Chapel Hill Road project area. TVAR recommends that this resource is ineligible for listing in the National Register of Historic Places (NRHP) due to extensive modern alterations, which resulted in the loss of much of the historic integrity of the building. No other historic architectural resources were identified during the survey. TVAR recommends that no additional cultural resources investigations are necessary within the APE prior to the initiation of the undertaking.

TVA has reviewed the enclosed report and agrees with the findings and recommendations of the authors. TVA finds that the proposed Starkville Area Photovoltaic Power Systems Project would affect no properties listed in, or eligible for listing in, the NRHP.

Pursuant to 36 CFR Part 800.3(f)(2), TVA is consulting with the following federally recognized Indian tribes regarding historic properties within the proposed project's APE that may be of religious and cultural significance and eligible for listing in the NRHP: The Chickasaw Nation, Choctaw Nation of Oklahoma, Jena Band of Choctaw Indians, and Mississippi Band of Choctaw Indians.

By this letter, TVA is providing notification of these findings and is seeking your comments regarding this undertaking and any properties that may be of religious and cultural significance and may be eligible for listing in the NRHP pursuant to 36 CFR Part 800.2(c)(2)(ii), 800.3(f)(2), and 800.4(a)(4)(b).

Please respond no later than March 11, 2014, if you have any comments on the proposed project. If you have any questions, please contact me at (865) 632-6461 or by email at pbezzell@tva.gov.

Sincerely,

Pat Bernard Ezzell

Patricia Bernard Ezzell
Tribal Liaison and Corporate Historian
Public Relations and Corporate Information
Communications
WT 7D-K

PBE:CSD
Enclosures

IDENTICAL LETTER MAILED TO THE FOLLOWING ON FEBRUARY 11, 2014:

Governor Bill Anoatubby
The Chickasaw Nation
Post Office Box 1548
Ada, Oklahoma 72821-1548

Ms. LaDonna Brown
Tribal Historic Preservation Officer
Department of Homeland Affairs
The Chickasaw Nation
Post Office Box 1548
Ada, Oklahoma 72821-1548

Mr. Kenneth Carleton
Tribal Historic Preservation
Officer/Archaeologist
Mississippi Band of Choctaw Indians
Post Office Box 6257
Choctaw, Mississippi 39350

Ms. Dana Masters
Tribal Historic Preservation Officer
Jena Band of Choctaw Indians
Post Office Box 14
Jena, Louisiana 71342

Mr. Kirk Perry
Administrator
Department of Homeland Affairs
The Chickasaw Nation
Post Office Box 1548
Ada, Oklahoma 72821-1548

cc: Ms. Virginia (Gingy) Nail
Assistant THPO
Department of Homeland Affairs
The Chickasaw Nation
Post Office Box 1548
Ada, Oklahoma 72821-1548

Ms. Amber Jarrett
Preservation & Repatriation Mgr.
Department of Homeland Affairs
The Chickasaw Nation
P.O. Box 1548
Ada, OK 74821-1548

Dr. Ian Thompson
Tribal Historic Preservation Officer
Choctaw Nation of Oklahoma
Post Office Drawer 1210
Durant, Oklahoma 74702

cc: Ms. Caren Johnson
Cultural Resources Office
Choctaw Nation of Oklahoma
Post Office Drawer 1210
Durant, Oklahoma 74702