ATTACHMENT II-E

GEOLOGY

(880-X-8E-.06(2))

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The Carbon Oak, Inc. - Thunder Oaks mine site is located in central DeKalb County southeast of the town of Sylvania, Alabama in Sections 2, 3, 4, 10 and 11, Township 6 South, Range 8 East, as viewed from the Sylvania Alabama U.S.G.S. 7.5 minute Quadrangle maps (See attached Mine Site Location Map and Hydro-Geo Map). Thunder Oaks mine will occupy approximately 608 acres of which 599 acres will be bonded as mining area and will be disturbed in the mining process. An additional 9 acres will be bonded as incidental acres for the coal stockpile, office area, equipment storage and primary haul road PR-01.

The mine site is located within the Bengis Creek drainage basin of the Cumberland Plateau physiographic section as shown on page 4 of "Hydrology of Area 21, Eastern Coal Province, Alabama". The Cumberland Plateau section is the southernmost section of the Appalachian Plateau's province of the Appalachian Highland Region. The Cumberland Plateau borders the Highland Rim section to the north, the Valley and Ridge province to the southeast and the Coastal Plane section to the southwest and consists of flat-topped high-elevation plateaus separated by deep, steep-sided valleys. (See Figure 1. Taken from "Hydrogeology and Vulnerability to Contamination of Major Aquifers in Alabama: Area 2", Geological Survey of Alabama Circular 199F 2008.) Tops of the plateaus slope gently from the northeast to the southwest. The landforms are the result of differential erosion of the underlying strata with the more resistant rock of the great conglomerate of the Lower Coal Measures of the Appalachian Coal Field forming the ridges and the steep-sided valleys from erosional actions acting upon the softer strata below.

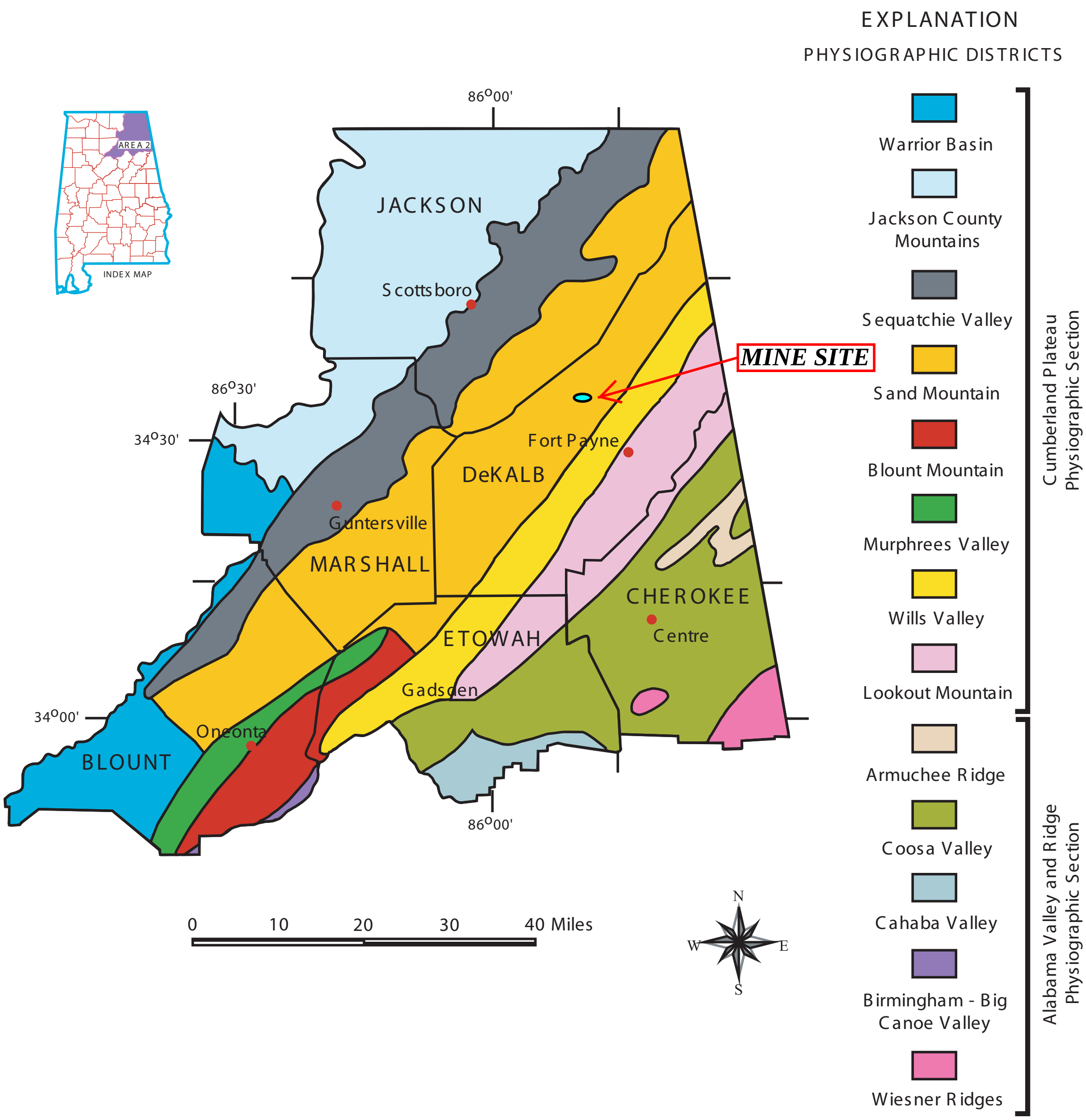

Figure 1. Physiography of Northeast Alabama. Modified from Bossong (1989).

The Cumberland Plateau is the southern part of the Appalachian Plateau that includes much of Eastern Kentucky, part of Tennessee, and a small portion of northern Alabama and northwest Georgia. The landforms are the result of differential erosion of the underlying Paleozoic rock which range from Cambrian to Pennsylvanian in age (approximately 550 to 290 million years before the present). The erosional/weathering resistant sandstones act as a barrier and form the ridges. Pennsylvanian sandstones belonging to the Pottsville Formation underlie the major plateaus. The valleys cut through softer shale, limestone and dolomite. Of these, limestone is the most easily weathered and eroded with the deepest valleys cut through this rock type. The plateaus of Lookout Mountain and Sand Mountain developed on down arches of rock layers of synclines. The Wills, Murphrees and Sequatchie Valleys developed where the presence of anticlines, which are up-arch folds of the rock layers, have exposed the more easily eroded rock. (See Figure 2 for a generalized cross-section of the Cumberland Plateau stratigraphy. Taken from "Hydrogeology and Vulnerability to Contamination of Major Aquifers in Alabama: Area 2", Geological Survey of Alabama Circular 199F 2008.)

The proposed Thunder Oaks Mine is located near the middle of Sand Mountain, a synclinal mountain which parallels the adjoining Sequatchie Anticline as they both trend toward the northeast corner of the state (Adans and others, 1926) and is underlain by the Pottsville Formation of Pennsylvanian age of the Plateau coal field. The sandstone cap rock of the great conglomerate has preserved the Pottsville formation from geologic forces and erosional actions and hence the coal deposits of the Plateau coal field. The strata of the Pottsville Formation are comprised of alternating beds of sandstone, conglomerate, shale and siltstone with beds of underclay and coal as described on page 12 of "Hydrology of Area 21, Eastern Coal Province,

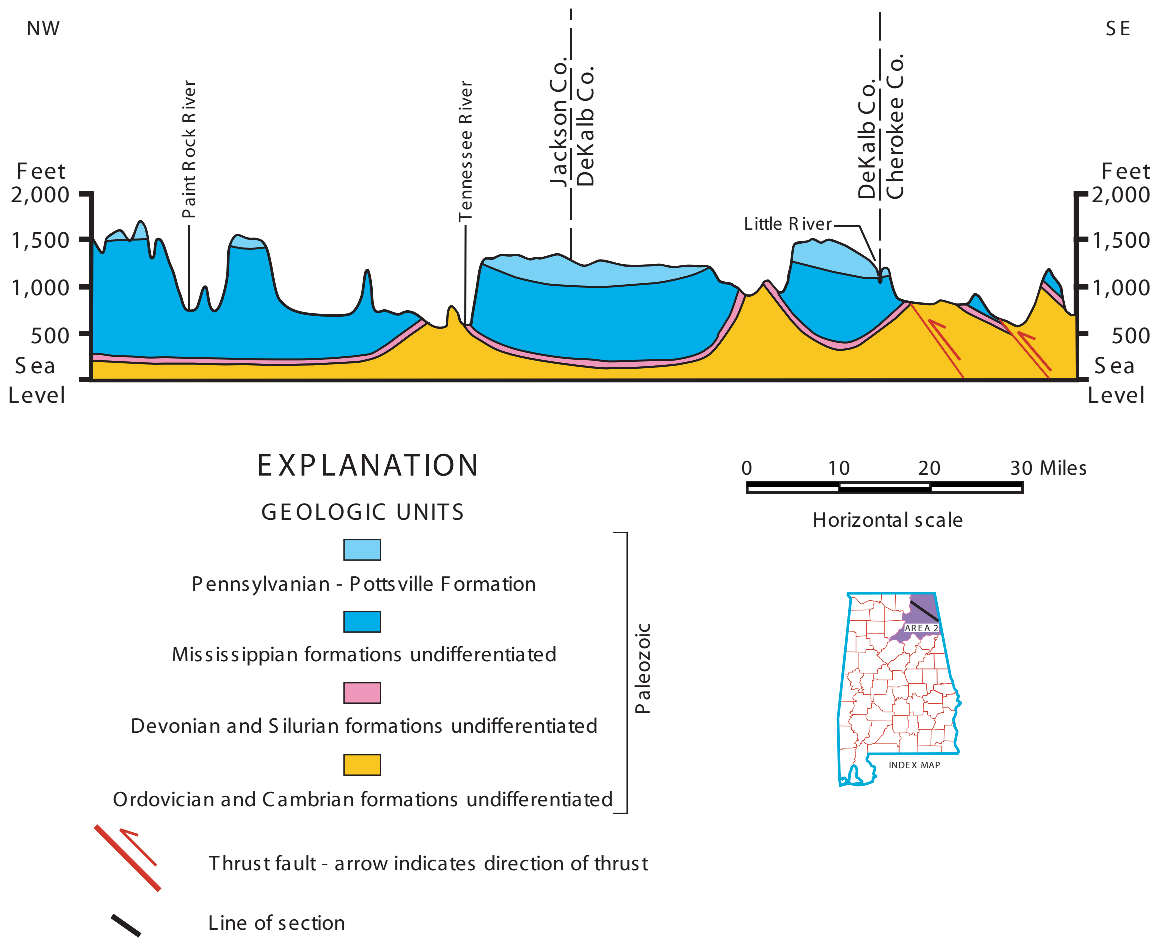

Figure 2.–Generalized geologic section through Jackson, DeKalb, and Cherokee Counties in northeastern part of Area 2. Modified from Bossong (1989).

Alabama". The seams to be mined are the Uppercliff #1, Uppercliff #2 and the Uppercliff #3 coal beds. The Uppercliff coal zone lies immediately below the upper conglomerate and is comprised of dark gray shale containing from one (1) to three (3) coal seams and numerous thin lenses of siltstones and fine-grained sandstones.

The general geology of DeKalb County, Alabama consists of rocks of the Paleozoic Era of Cambrian to Pennsylvanian ages. Stratigraphy consists of consolidated sedimentary rock (i.e., limestones, dolomites, shales, siltstones, sandstones, conglomerates, and chert). The geology of the immediate area is complex in which the strata are folded and faulted to form northeast/southwest trending anticlines and synclines whose axes are generally parallel to the Appalachian Range and are dipping to the southwest. The high mountain-type structures are generally synclines (e.g., Sand Mountain, Lookout Mountain) and the valleys are eroded anticlines (e.g., Wills Valley, Sequatchie Valley). All the coal beds are found in the Pottsville (Pennsylvanian) strata that cap Sand Mountain and Lookout Mountain. (See Figure 1.)

Anticlinal uplift, which are up-arch folds, has impaired the structural integrity of the overlying conglomerate cap rock thus exposing the softer shales, limestones and dolomites of the older underlying Paleozoic strata and the corresponding erosional weathering has resulted in the formation of the topographic lows of Sequatchie and Wills valleys. (See Figure 2.) These forces caused the uplift of the Sequatchie Valley Anticline and the Wills Valley Anticline while the corresponding troughs (depressions) of down-arch folds have resulted in the formation of the synclinal structures of Sand Mountain that has left the erosion-resistant sandstone cap rock of the Cumberland Plateau in place protecting the coal measures of the Pottsville Formation.

Sand Mountain is a broad synclinal structure with its axis lying near the center of the mountain and trending parallel to its general topographic lineation (Wilson 1975) (See Figure 1.) The top of the mountain is capped by sandstones of Pennsylvanian age and Mississippian aged rock. The contact between the two strata is difficult to identify, but is considered to be the top of the Pennington Formation or the bottom of the Pottsville Formation. The lithology is characterized by massive, interbedded, basal conglomeratic sandstones, siltstones and coal-bearing carbonaceous shales containing abundant plant debris. The predominant surface material of Sand Mountain in DeKalb County is derived from outcrops of the Upper Conglomerate, a coarse-grained, sugary textured, basal sandstone conglomerate. It contains numerous well-rounded, milky-white quartz pebbles that average ½ inch in diameter. Locally the base is heavily conglomeratic with abundant angular shale inclusions. This section weathers to a conspicuous vesicular rock that is easily identified. The sandstone is usually thin-bedded and heavily cross-bedded. Below the Upper Conglomerate is the Uppercliff Coal Zone which is comprised of dark gray shale containing from one (1) to three (3) coal seams and numerous thin lenses of siltstone and fine-grained sandstones. These seams are identified as the Uppercliff Zone and are generally identified as follows:

Uppercliff #1 - normally occurs directly beneath the overlying sandstone of the Upper Conglomerate. It ranges in thickness from 0 to 12 inches, but is usually displaced by the sandstone of the Upper Conglomerate causing lenticular[1] coal thicknesses. Seam is generally erratic and is not considered minable in any sufficient quantities.

Uppercliff #2 - occurs approximately twenty (20) feet below the Uppercliff #1 and ranges from 0 to 14 inches in thickness and normally is present throughout the extents of the Uppercliff areal extents. Seam can also exhibit lenticular[1] coal thicknesses but is considered recoverable in some areas.

Uppercliff #3 - occurs approximately twenty (20) to thirty (30) feet below the Uppercliff #2 and ranges from 6 to 36 inches. It is the most consistent and productive coal seam of the Uppercliff group on both Sand and Lookout Mountains. The Uppercliff #3 seam can also exhibit lenticular[1] coal thicknesses.

Below the Uppercliff Zone occurs the Underwood Coal Zone. It consists of two (2) distinct shale layers below a massive sandstone layer referred to as the Underwood Sandstone Interval. This sandstone unit generally occurs within ten (10) feet to directly below the Uppercliff #3 seam and is approximately forty (40) feet thick and is believed to be a split of the underlying Lower Conglomerate. It is a coarse to fine grained, crossbedded, poorly soiled conglomerate. It is thin-bedded and poorly cemented and weathers readily into a moderate soil covering where it outcrops and is exposed to weathering/erosional actions. The Underwood Coal Zone consists of two (2) shale layers separated by the three (3) Underwood coal seams. Due to the increasing depth of the synclinal structure at the proposed Thunder Oaks Mine, only the seams of the Uppercliff Coal Zone are accessible by surface mining methods and none of the exploration drill holes penetrated far enough below the bottom elevation of the Uppercliff #3 seam to determine the presence, depth and corresponding thicknesses of the coal seams of the Underwood Coal Zone.

Below the Underwood Coal Zone occurs the Lower Conglomerate. This sandstone is coarse-grained and locally conglomeratic. The Upper and Lower Conglomerate are generally present and defined with all other measures of the Plateau Field. The Lower Conglomerate is the predominate cliff-forming unit along Sand Mountain in DeKalb County. The strata within the proposed permit area of Thunder Oaks Mine belong to the Upper Conglomerate and the Uppercliff Zone immediately below and consist of sandstones, shales and siltstones. These units are of highly varying thicknesses and are typical of an interdistributary deltaic depositional environment. This system produces lenticular[1] bedded coal bodies with varying analytical qualities. All coal deposits of the Uppercliff Zone exhibit lensing characteristics as a result of the deltaic depositional actions where the coal seam can show substantial variation of thickness and/or be completely absent over a short lateral extent.

The proposed permit area lies within the east central portion of Sand Mountain and is located adjacent (North, Northeast) to Bengis Creek and adjacent (South, Southwest) of Wolf Branch. The outcrop of the permit area has been previously mined and reclaimed along the synclinal structure of Sand Mountain. There are three (3) coal seams of the Uppercliff Zone present within the proposed permit area, the Uppercliff #1 and Uppercliff #2 are non-continuous to such as extent that neither exhibit economic mining for the site other than small localized areas. The Uppercliff #3 seam is relatively consistent across the extent of the proposed permit and presents the conditions favorable for surface coal mining operations. While all three (3) seams of the Uppercliff Coal Zone exhibit periodic lenticular[1] bedding, the geology of the site is complex with the presence of two (2) areas of intrusion of what appears to be the Underwood Sandstone Interval through the host strata of the Uppercliff Coal Zone and the Upper Conglomerate of Sand Mountain. (See Hydro-Geo Map.) These areas of devoid of coal deposits and are composed of massive dark grey sandstones with periodic layers of rounded, weathered quartzite creek pebbles. In addition there are three (3) faults that are present trending from the southwest to the north, northeast that represent the boundaries of major changes in the geology of the site. Fault #1 represents the location of the first intrusion boundary of the Underwood Sandstone Interval. No coal deposits are present to the northwest of this fault boundary and by the nature of this deposit no displacement can accurately be determined. Fault #2 is trending generally parallel to Fault #1 and is a normal fault with a displacement of approximately forty (40) feet upward on the southeastern side. Fault #3 is also trending generally parallel to Fault #2, is a normal fault with a displacement of approximately thirty-five (35) feet downward on the southeastern side. In addition the lower extents of Fault #3 correlate to the location of the second intrusion boundary of the Underwood Sandstone Interval. No coal deposits are present within this area of intrusion. These local faults have resulted in three (3) distinct areas of coal deposits.

The area between Fault #1 and Fault #2 represents the best area for minable coal deposits from the Uppercliff #1 seam. The Uppercliff #1 is present from a high elevation of 1288.45 in exploration hole DK-17 to a low elevation of 1275.07 in exploration hole DK-26 and varies from a maximum thickness of twenty-four (24) inches in hole DK-24 to a minimum thickness of six (6) inches in hole DK-17 and follows the general trend of the synclinal host rock of Sand Mountain. The Uppercliff #2 seam lies approximately twenty-three (23) feet below the Uppercliff #1 and is a four (4) inch marker present at elevation 1257.04 in exploration hole DK-24. None of the other exploration holes in the area between Fault #1 and Fault #2 shows the presence of the Uppercliff #2. The Uppercliff #3 seam is present approximately forty-one (41) feet below the Uppercliff #2 marker and occurs from a high elevation of 1239.00 in exploration hole DK-23 with a thickness of eighteen (18) inches to a low elevation of 1215.20 in exploration hole DK-24. Exploration hole DK-23, located at the apparent outcrop, showed weathered coal smut with several partings and was not included within the permit boundary. The Uppercliff #3 varies from a maximum thickness of thirty (30) inches in hole DK-24 to a minimum thickness of four (4) inches in hole DK-26 and thins near the boundary of Fault #1.

The area between Fault #2 and Fault #3 has been displaced upward by geologic normal faulting actions approximately forty (40) feet but because of the lenticular[1] bedding of the Uppercliff #1 and the Uppercliff #2 these coal seams do not exhibit minable thicknesses. Due to the uplift/displacement of these normal faults, outcrops of the Uppercliff #1 and Uppercliff #2 have been exposed along the southern part of Increment No. 5 in the SE¼ of SE¼ of Section 4 and the SW¼ of SW¼ of Section 3, Township 6 South, Range 8 West. The Uppercliff #1 is present from a high elevation of 1304.91 in exploration hole DK-31 to a low elevation of 1276.76 in MW-1 and is present as a marker seam with a maximum thickness of five (5) inches in exploration hole DK-01 and is not present in exploration hole DK-25. The Uppercliff #2 lies approximately twenty-six (26) feet below the Uppercliff #1 and is present from a high elevation of 1295.55 in exploration hole DK-25 to a low elevation of 1274.78 in exploration hole DK-01 and is also present but classified as a marker seam with a maximum thickness of eight (8) inches in exploration hole DK-25 and is not present in exploration holes DK-12, DK-31 and MW-1. Due to the erratic thicknesses of these seams, neither the Uppercliff #1 and Uppercliff #2 are considered minable in the area between Fault #2 and Fault #3. The Uppercliff #3 lies approximately thirty-six (36) feet below the Uppercliff #2 with a high elevation of 1278.87 in exploration hole DK-12 to a low elevation of 1242.47 in exploration hole DK-01 and is present with a maximum thickness of forty-two (42) inches in MW-1 and a minimum thickness of twenty-four (24) inches in exploration hole DK-12. Other than the upward displacement, all three (3) seams follow the same trends as the synclinal host rock of Sand Mountain.

The area east of Fault #3 apparently correlates in relative elevation with the area between Fault #1 and Fault #2 and also follows the same trends of the synclinal host rock. The Uppercliff #1 seam is non-continuous throughout the area but is present at a high elevation of 1290.35 in exploration hole DK-03 to a low elevation of 1164.27 in exploration hole DK-32 and is present with a maximum thickness of eighteen (18) inches in exploration hole DK-30 and also is present with a thickness of ten (10) inches in exploration holes DK-14 and DK-27 but is not present in exploration holes DK-18, DK-19, DK-20, DK-22, DK-29 and MW-3. The Uppercliff #2 seam is likewise non-continuous throughout the area and lies approximately nineteen (19) feet below the Uppercliff #1 and is present at a high elevation of 1264.27 in exploration hole DK-29 to a low elevation of 1151.44 in exploration hole DK-32 and is present with a maximum thickness of twenty (20) inches with partings in hole DK-29 but is not present in exploration holes DK-10, DK-13, DK-18, DK-19, DK-20, DK-22, DK-30 and MW-3. Due to the erratic thicknesses of the Uppercliff #1 and Uppercliff #2 most areas east of Fault #3 will not carry minable coals but there may be some isolated areas where both seams will be exhibit minable thicknesses but these areas will occur on a random basis. The Uppercliff #3 lies approximately forty (40) feet below the Uppercliff #2 with a high elevation of 1250.00 in exploration hole DK-28 and a low elevation of 1151.44 in exploration hole DK-32 and is present with a maximum thickness of forty-two (42) inches and a minimum thickness of eighteen (18) inches in exploration hole DK-10. Exploration holes DK-03 and DK-08 did not show any thickness of the Uppercliff #3 seam. DK-03 apparently was not drilled deep enough to penetrate the seam and DK-08 was extremely wet,

producing excessive amounts of water during the drilling process with the coal cutting washing away left the driller unable to locate or measure the seam to obtain any meaningful data.
(Note - All low elevations in the areas east of Fault #3 occur at exploration hole DK-32 which represents the lowest sample point of the Uppercliff Coal Zone in the synclinal host rock of Sand Mountain located east of Bengis Creek.)

To more accurately describe the lithology of the proposed permit area, two (2) geologic fence diagrams (cross-sections) have been developed at strategic locations. The locations of these geologic cross-sections of the mine area are shown on the Hydro-Geo Map and are designated as Geologic Section A-A' and Geologic Section B-B' and are generated by the digital geologic model as described in the following text.

Initial exploration and overburden sample drilling was performed during February and May of 2011 with a final exploration hole drilled in August, 2011. Due to the size of the project and the scarcity of data in the area, four (4) additional overburden holes were drilled during the period from May 31, 2013 through June 04, 2013 at the request of the Regulatory Authority. All four (4) holes were sampled and three (3) were cased and capped to be utilized as ground water monitoring wells. The results of testing of the overburden cuttings are incorporated into the data for this permit and groundwater sampling was performed for an additional six (6) months on both the new wells and the existing wells to be used as a basis for this analysis.

[1] Lenticular bedding is a sedimentary bedding pattern displaying alternating layers of mud, sand and coal. Formed during periods of slack water, mud suspended in the water is deposited on top of small formations of sand or over lagoons of carbonaceous deposits once the water's velocity has reached zero. The sand and/or coal formations formed within the pool and/or lagoons cause the bedding to display a "lens-like" shape, giving the pattern its respected name. These deposits are commonly found in high-energy environments such as intertidal and/or supratidal zones.

The lithology description was developed as a composite of the seven (7) overburden sample drill holes contracted by Carbon Oak, Inc. and drilled by James Mill Drilling Inc. using a 450 WS Schramm utilizing a 5½ down-the-hole hammer drill bit and by twenty-nine (29) exploratory rotary drill holes drilled by James Mill Drilling Inc. and under the supervision of TASK Engineering Management Inc utilizing the same equipment. (See drawings entitled Overburden Columns for geologic columns of these seven (7) overburden samples and Drillhole Columns Sheet 1 of 4, Sheet 2 of 4, Sheet 3 of 4 and Sheet 4 of 4 for geologic columns of the twenty-nine (29) exploratory drill holes.)

Incorporating these exploration drillhole data, overburden sample drillhole data and surface contour data, a digital model of the entire proposed mine site has been developed using Carlson Mining 2013 with AutoCad 2013 computer software. The methodology of this software constructs a geologic model of the mine site by constructing a surface grid file on 20' X 20' spacing to determine the top limits of the said geologic model. Strata grid files are then developed to correspond to the same 20' X 20' grid spacing for the bottom elevation of each strata layer from the top limit elevation surface grid to the bottom elevation grid of the Uppercliff #1, Uppercliff #2 and Uppercliff #3 Coal seams. (Note that all drillhole and/or overburden column drawings are shown in the drawings with the legend and descriptions of the corresponding strata grid files.) These surface and strata grid files are correlated from the top elevation (ground surface) to the bottom elevation of the coal seam (bottom of Uppercliff #3 coal) and are defined by a Pre-Calculated Grid file which constitutes the geologic model for the site. All grid files other that the surface (top) grid are based on the drillhole data developed from exploration drilling at the site.

Once the geologic model has been constructed, geologic fence diagrams, cross-sections and volumetric calculations can be constructed as required. (See OB-1/MW-1, OB-2/MW-2, OB-3/MW-3, OB-4/MW-4, OB-5/MW-5, OB-6/MW-6 and OB-7 for detailed drawings showing the overburden sequences/lithology of the overburden sample holes as well as specific data on the wellhead appliances installed in each overburden sample/monitoring well hole.) Overburden lithology remains constant across the extent of the proposed mine site. See enclosed drawings of these exploratory drill columns for geologic details of the overburden and exploratory drill holes shown by Overburden Columns and Drillhole Columns Sheet 1 of 4, Sheet 2 of 4, Sheet 3 of 4 and Sheet 4 of 4. (See Drill Logs for drilling data.) The following table lists the historical drillhole data and personnel in charge of drilling operations corresponding to the graphical exploration drill columns below in Exhibit 2.1.

EXHIBIT 2.1		
Drill Hole ID	**Drilling Supervisor**	**Drill Date**
MW-1(OB-1)	TASK Engineering	02/18/2011
MW-2(OB-2)	TASK Engineering	02/23/2011
MW-3(OB-3)	TASK Engineering	02/24/2011
MW-4(OB-4)	TASK Engineering	06/04/2013
MW-5(OB-5)	TASK Engineering	05/31/2013
MW-6(OB-6)	TASK Engineering	06/04/2013
OB-7	TASK Engineering	06/04/2013

DK-01	TASK Engineering	02/19/2011
DK-02	TASK Engineering	02/19/2011
DK-03	TASK Engineering	02/19/2011
DK-07	TASK Engineering	02/21/2011
DK-08	TASK Engineering	02/21/2011
DK-09	TASK Engineering	02/23/2011
DK-10	TASK Engineering	02/22/2011
DK-11	TASK Engineering	02/18/2011
DK-12	TASK Engineering	02/19/2011
DK-13	TASK Engineering	02/22/2011
DK-14	TASK Engineering	02/22/2011
DK-15	TASK Engineering	02/23/2011
DK-16	TASK Engineering	02/23/2011
DK-17	TASK Engineering	02/24/2011
DK-18	TASK Engineering	05/09/2011
DK-19	TASK Engineering	05/09/2011
DK-20	TASK Engineering	05/09/2011
DK-21	TASK Engineering	05/10/2011
DK-22	TASK Engineering	05/10/2011
DK-23	TASK Engineering	05/11/2011
DK-24	TASK Engineering	05/11/2011
DK-25	TASK Engineering	05/11/2011

DK-26	TASK Engineering	05/12/2011
DK-27	TASK Engineering	05/12/2011
DK-28	TASK Engineering	05/12/2011
DK-29	TASK Engineering	05/12/2011
DK-30	TASK Engineering	05/13/2011
DK-31	TASK Engineering	05/13/2011
DK-32	TASK Engineering	05/17/2011
DK-43	TASK Engineering	08/15/2011

According to the "Hydrologic Assessment, Eastern Coal Province Area 21, Alabama", the regional dip of the Pottsville formation is to the southwest but due to the complex geological structures that have been subjected to folding and faulting, the local strike is approximately N 53° 46' 35" E and the strata dips to the southeast at S 47° 42' 21" E.

The total sulfur percentages of the coal seam to be mined at this proposed site is listed below. These totals are based on core samples taken during the exploration drilling process.

Seam	Percent Sulfur (Dry)
Uppercliff #1	1.39
Uppercliff #2	1.73
Uppercliff #3	1.18

CHEMICAL ANALYSIS OF OVERBURDEN

Per the requirements of Section 880-X-8E-.06(2) chemical analysis of the geologic strata to be disturbed in the mining process were conducted. Methodology is described as follows:

(1) Seven (7) overburden drill holes have been drilled at the proposed mine site to document the chemical properties of the overburden materials and for acid base accounting purposes. These drill holes were drilled with a 450 WS Schramm rotary air drill and the overburden cuttings generated by the process were collected in five (5) foot intervals, logged, labeled and prepared for laboratory analysis. Due to nature of the Sand Mountain Syncline and the general presence of ground water, the drillholes were drilled utilizing compressed air until ground water was encountered. At that point cuttings were removed by water injection and the cuttings were collected using a screen at the hole collar. The cuttings were sampled in minimum five (5) foot increments and at each change of the lithology of the overburden materials. In some instances due to drilling constraints and to maintain continuity the five (5) foot interval may not be maintained but these instances are rare and generally the required sample intervals have been maintained. The geologic properties of the overburden strata are noted in the geologic logs listed in Exhibit 2.2 and a graphical representation of the lithology at each overburden testing site is depicted by the drawing entitled Overburden Columns.

(2) Samples collected in the field were then packed in chronological order, packed and shipped for analysis to Standard Laboratories, Inc. located in Whitesburg, Kentucky. Chemical analysis was performed on each lithologic unit by a laboratory test for the total sulfur of that unit. Using industry standard methodology the total sulfur is converted to

potential acidity by multiplying total sulfur percent by 31.25. The results of these analyses determine potential acidity and are reported in tons of calcium carbonate equivalent per 1000 tons of material. Any overburden with a potential acidity less than zero (0) tons calcium carbonate equivalent per 1000 tons of overburden material is considered acid or toxic-forming. The final laboratory reports from Standard Laboratories, Inc reported Acid Base Accounts of each strata interval. This Acid Base Account reported Potential Acidity, Paste pH, Total Sulfur (Dry Basis), Neutralization Potential and Net Potential Surplus/Deficiency (+/-) Results of all chemical analysis for each strata sampled are listed by drill hole in Exhibit 2.3.

(3) Neutralization potential is the ability of strata units to neutralize acid material and is reported in tons of calcium carbonate equivalent per 1000 tons of material. The results of overburden analyses for this parameter are listed in Exhibit 2.3.

(4) Acid-base account is a mathematical determination developed by calculating the neutralization potential minus potential acidity. This parameter is the results of these calculations reported as a deficiency (-) or excess (+) for each geologic column interval.

(5) From the chemical data determined by Standard Laboratories, Inc. the composite results of all overburden intervals have been tabulated using the industry standard spreadsheet program designed by the Pennsylvania Department of Environmental Resources, Bureau of Mining and Reclamation.

(6) Areas of influence for each overburden hole have been determined by the construction of a Theisson Polygon Map for said overburden sample drillholes.

(7) According to the results of the overburden analysis spreadsheets each overburden hole and corresponding area of influence shows an excess of native alkaline materials to neutralize any acid forming strata. See Exhibit 2.4 for spreadsheet outputs for each overburden hole. The following table shows the mass-weighted averages for each overburden hole.

Drill Hole ID	Percent Sulfur	Neutralization Potential	Acid-Base Account	Tons/Acre Excess CaCO3
MW-1/OB-1	0.0379	8.4052	7.2220	1213
MW-2/OB-2	0.0459	12.3590	10.9255	1933
MW-3/OB-3	0.0570	14.3467	12.5654	3242
MW-4/OB-4	0.0453	5.4975	4.0832	792
MW-5/OB-5	0.0410	5.3636	4.0822	841
MW-6/OB-6	0.1420	3.6288	-0.8085	68
OB-7	0.0643	7.3414	5.3334	884

The Geology sections of this permit application were prepared by Jerry W. Williams who is licensed by the State of Alabama as a Professional Engineer. I certify that the information in this section is correct and accurate to the best of my knowledge and belief.

ALABAMA REGISTERED No. 12739 PROFESSIONAL ENGINEER JERRY W. WILLIAMS

Jerry W. Williams,
Alabama Reg. No. 12739

03-20-2014
Date