ILLINOIS DEPARTMENT OF NATURAL RESOURCES

Illinois Department of Natural Resources

One Natural Resources Way Springfield, Illinois 62702-1271
www.dnr.illinois.gov

Bruce Rauner, Governor
Wayne A. Rosenthal, Director

November 17, 2015

Mark Cornell
Hillsboro Energy, LLC
925 South main St
Hillsboro, IL 62049

Re: Permit No. 399. Revision No. 2
Complete

Dear Mr. Cornell:

This letter will serve as notice that the application to revise surface coal mining and reclamation operations permit No. 399 for Deer Run mine submitted under the Surface Coal Mining Land Conservation and Reclamation Act and the promulgated rules and regulations is administratively complete for review, provided the changes below are made prior to filing.

- Complete copies shall provide an updated/current certificate of insurance for the applicant, from an Illinois authorized carrier.
- Complete copies shall provide the most current/ updated ownership and control for the applicant.
- A map, as approved with the draft public notice shall be included with the newspaper notice.

The application number for this submittal is Revision No. 2 to Permit No. 399. Please list this application number in the newspaper advertisement, and with the County Clerk when filing the application.

As per 62 Ill. Adm. Code 1773.13, the applicant is required to place an advertisement in a local newspaper of general circulation in the locality of the proposed surface coal mining and reclamation operation at least once a week for four consecutive weeks. A certificate of publication must be submitted to the Department not later than four weeks after the last date of publication. The draft copy of the public notice submitted with the revision application was reviewed and found to be acceptable.

Please submit two copies of the application to the County Clerk of Montgomery County and have the County Clerk sign form SCML-1a (copy enclosed). Please forward six copies, one with original signature, of the application to this office and forward two copies of the application to Mr. Joe Stitely, Illinois Environmental Protection Agency, 2309 West Main Street, Marion, IL 62959.

Should you have any questions, please contact this office.

Sincerely,

Scott K. Fowler, Supervisor
Land Reclamation Division

SKF:Jsc
Enclosure
cc: C. Johnson
J. Stitely, IEPA

HILLSBORO
ENERGY LLC
DEER RUN MINE
925 SOUTH MAIN STREET, HILLSBORO IL 62049

State of Illinois
DEPARTMENT OF NATURAL RESOURCES
Office of Mines and Minerals
Land Reclamation Division
One Natural Resources Way
Springfield, IL 62702-1271

Application for SURFACE COAL MINING and RECLAMATION OPERATIONS PERMIT – UNDERGROUND OPERATIONS UCM-1

Revision No. 2 to Permit 399
Shadow Area Addition

Deer Run Mine
Montgomery County, Illinois

Parts I - VI

Book 1 of 2

September 14, 2015

HILLSBORO
ENERGY LLC
DEER RUN MINE
925 SOUTH MAIN STREET, HILLSBORO IL 62049

Mr. Scott Fowler
Division Supervisor Land Reclamation
Illinois Department of Mines and Minerals
One Natural Resources Way
Springfield, IL 62702

September 14, 2015

RE: Deer Run Mine
I.D.N.R. Permit No. 399
NPDES Permit No. IL0078727
Revision Application No. 2

Dear Mr. Fowler,

Hillsboro Energy respectfully submits the following package in response to the notice declaring Permit No. 399 Revision No. 2 to not be administratively complete for review by Illinois Department of Natural Resources.

Included in this package, you shall find all ten (10) items deliberately addressed in the incomplete letter. The included package contains the permit application and associated maps in its entirety with the revisions made.

Should you have any questions or need additional information please contact Clayton Cross at (217) 532-7310 x-125, cell (217) 556-0692, email; ccross@pattonmining.com, or fax (217) 532-7321.

Respectfully Submitted,

Mark Cornell

Mark Cornell

Authorized Person

HILLSBORO
ENERGY LLC
DEER RUN MINE
925 SOUTH MAIN STREET, HILLSBORO IL 62049

Mr. Larry Crislip
Manager – Permit Section
IEPA Mine Pollution Control Program
2309 W. Main Street
Marion, IL 62959

September 14, 2015

RE: Deer Run Mine
I.D.N.R. Permit No. 399
NPDES Permit No. IL0078727
Revision Application No. 2

Dear Mr. Stitely,

Hillsboro Energy respectfully submits the following package in response to the notice declaring Permit No. 399 Revision No. 2 to not be administratively complete for review by Illinois Department of Natural Resources.

Included in this package, you shall find all ten (10) items deliberately addressed in the incomplete letter. The included package contains the permit application and associated maps in its entirety with the revisions made.

Should you have any questions or need additional information please contact Clayton Cross at (217) 532-7310 x-125, cell (217) 556-0692, email; ccross@pattonmining.com, or fax (217) 532-7321.

Respectfully Submitted,

Mark Cornell

Mark Cornell

Authorized Person

HILLSBORO
ENERGY LLC
DEER RUN MINE
925 SOUTH MAIN STREET, HILLSBORO IL 62049

RE: Deer Run Mine
I.D.N.R. Permit No. 399
NPDES Permit No. IL0078727
Revision Application No. 2
Response to Incomplete Letter dated April 6, 2015

1. Part I.6.A of the application and 62 Ill. Adm. Code 1778.13(c) requires the applicant to provide a listing of all owners and controllers as defined by 62 Ill. Adm. Code 1773.5 for five years preceding the date of the application. As defined in 62 Ill. Adm. Code 1773.5, Operators are considered as an owner/controller and thus is required to be part of the information provided for Part I.6.A.

Response: Part I.6.A has been updated to show the most current Ownership and Control information.

2. Review of the application found a discrepancy in the description of the section locations provided in Part I.1.F and 11, and draft notice provided, specifically in Township 7 North, Range 3 West. The department is requiring the applicant to correct this information prior to the publication for public participation. Additionally, changes here may require changes to be made to Map I – General Location map and other maps submitted, and shall be updated accordingly.

Response: Section 3 of Township 7 North, Range 3 West has been removed from Part I.1.F and Part I.11. This section was inadvertently included in the description as it will not be affected by the permit revision. No map changes are required.

3. In response to Part II(3) of the UCM-1 Application concerning adjacent underground mining, the Applicant references Attachment II.3 which lists three (3) mines. This table cannot be correlated to the referenced Map 7 U.G. Timing Map. Map 7 U.G. shows 2 to 4 adjacent mines. The only one with a name identifiable on the map is the "Clover Leaf Mine" 1907-1925. Attachment II.3 has no "Clover Leaf Mine". Also, the response references Map 3 as well. Map 3 does not show adjacent mining. Pursuant to 62 Ill. Adm. Code 1783.25, the response and referenced attachments and maps shall be corrected to be true and correct and in agreement.

Response: **Attachment II.3 has been revised to clearly identify the adjacent underground mining. Adjacent underground mining has been added to Map 3 and all associated maps have been revised to clearly label the respective adjacent mining.**

4. In response to Part II(l0)(A) of the UCM-1 Application concerning cultural archeological and historic resources, the Applicant discusses a program to identify standing structures in the shadow area prior to planned subsidence. Pursuant to 62 Ill. Adm. Code 1783.12, the applicant shall follow Operator Memorandum 2006-03 and provide the information requested.

Response: **The response to Part II(10)(A) has been revised to address this item. All standing structures are identified and distinguished between occupied dwellings and other buildings on Map 8. Structures are identified, but not distinguished between occupied dwellings and other building on Maps 2 and 3. A letter has been provided by Ms. Dawn Cobb, IDNR, certifying that herself and Mr. Hal Hassen, IDNR Archaeologist, have reviewed and evaluated the structures within the shadow boundary expansion area. Within this letter, four (4) structures are identified as needing additional documentation if the Applicant elects to demolish in the future. The four (4) structures have been clearly identified on Map 2 and in Attachment II.10.A.**

5. Part II(10)(B) of the UCM-1 Application asks whether there is a substantial likelihood of currently unknown resources which would be eligible for the National Register of Historic Places within the shadow area for planned subsidence. In response, the Applicant says "N/A other than referenced above structures". It can only be assumed the "referenced above structures" is related to Attachment II.10.A. This Attachment lists all structures but does not identify structures relative to their potential eligibility for the National Register of Historic Places. Pursuant to 62 Ill. Adm. Code 1783.12, the response shall be revised to clearly address the question.

Response: **See response to Item No. 4.**

6. In response to Part II(l0)(C) of the UCM-1 Application, the Applicant has responded that no public parks exist in the shadow area. The Cranfill Unit of the Coffeen Lake Fish and Wildlife Area would be considered a park as it is publicly controlled property used for recreation. This was a required correction in Modification No. 53 of the original permit. Therefore, pursuant to 1777.11, the applicant shall revise the response to acknowledge the classification of this property.

Response: **The response to Part II(10)(C) has been corrected accordingly.**

7. In response to Part IV(3)(B)(2) of the UCM-1 Application concerning prediction of planned subsidence areas, the applicant provides Map 8, Post Subsidence Contour Map. This map defines the limits of subsidence with a 0.0 foot isopleth line. The SDPS created isopleth line is labeled as ranging between 34.5 to 36.8 degrees on the map. The angle of draw figure provided in the Part IV Attachments indicates an example angle of draw of 28.2 degrees. In addition, surface monitoring field measurements over the first panel documented the measured angle of draw. Pursuant to 62 Ill. Adm. Code 1784.20(b)(2), the Applicant shall provide further discussion on the variations in the angle of draw presented. The response shall discuss modeling results verses monitoring results and basic subsidence parameter assumptions to provide clarity to the public concerning the anticipated extent of planned subsidence.

Response: The operator has included additional information further explaining that using the SPDS software generates a variable angle of draw and has a greater degree of accuracy versus using a constant angle of draw. Also, the surface movement along this outer edge is negligible and can only be measured by using surveying equipment. The angle of draw example provided in the Part IV attachments has been revised to more accurately represent what has been documented at Deer Run.

8. In response to Part IV(3)(B)(4)(d) of the UCM-1 application concerning locations of features including occupied dwellings, the applicant references Map 3, Pre-Mining Land Use Map and Attachment II.10.A. Occupied dwellings cannot be distinguished from other buildings on the map and the table does not assist in differentiating the specific buildings on this or any map. The approved mapping in the exiting shadow area identified structures with a numbering system to distinguish occupied dwellings from pole barns, grain silos etc. Pursuant to 62 Ill. Adm. Code 1784.20, this system or a similar system of identification is necessary to facilitate technical review.

Response: Structures are identified, but not distinguished between occupied dwellings and other buildings on Maps 2 and 3. All structures have been identified and distinguished on Map 8 where the larger scale provides the opportunity for greater detail.

9. All maps were provided at a scale of 1 inch = 800 feet. Pursuant to 62 Ill. Adm. Code 1777.11, all maps shall be revised as necessary to consistently incorporate all of Panel No. 4 through No. 17.

Response: The respective maps have been adjusted to incorporate all of Panels No. 4 through No. 17.

10. Pursuant to 62 Ill. Adm. Code 1784.20(b)(10), the following revisions shall be made

specific to Map 8, Post Subsidence Contour Map.

a. The post subsidence contour map shall be provided at a larger scale to provide more detail. The map may be split into parts if necessary to provide adequate scale and detail to clearly show all surface structures, and surface drainage impacts.
b. All buildings, structures and facilities need to be identifiable and cross reference to a list that identifies the type of structure.
c. Pre-mitigation ponding of drainage is defined. The applicant shall incorporate expected course of drainage correction for the anticipated mitigation work.
d. It appears that longwall subsidence ponded areas are shown south of the limit of planned subsidence lines. This area shall be removed as no corresponding longwall mining is shown beyond the limits of the defined shadow area boundary.
e. It appears that there are subsidence induced ponding shown where post subsidence contours represent positive drainage (i.e. no permanent ponding of water). If the areas identified represent conditions that may require drainage enhancement to allow fields to drain in a timely manner, the map shall be corrected to differentiate areas of permanent ponding from areas potentially needing drainage enhancement.
f. Profiles along major drainage courses shall be provided to accompany Map 8.

Response: The following revisions have been made:

a. The post subsidence contour map has been adjusted to a scale of 1" = 400' to provide more detail.
b. All buildings, structure, and facilities are identified by type on Map 8.
c. Anticipated drainage mitigation work is now shown on Map 8.
d. Ponded areas outside of the shadow boundary area have been removed.
e. Map 8 has been reviewed and corrected where applicable to differentiate between areas of permanent ponding and those potentially needing drainage enhancements.
f. Profiles along major drainage courses have been included.

HILLSBORO
ENERGY LLC
DEER RUN MINE
925 SOUTH MAIN STREET, HILLSBORO IL 62049

Mr. Scott Fowler
Division Supervisor Land Reclamation
Illinois Department of Mines and Minerals
One Natural Resources Way
Springfield, IL 62702

September 14, 2015

RE: Deer Run Mine
I.D.N.R. Permit No. 399
NPDES Permit No. IL0078727
Revision No. 2 to Permit 399 – Shadow Area Addition

Dear Mr. Fowler,

Hillsboro Energy respectfully requests approval of a revision to Hillsboro Energy, LLC's Deer Run Mine, Permit No. 399 for a shadow area addition. The purpose of this revision is to add approximately 7,731.8 acres to the currently approved shadow area to allow for further mining.

This shadow area addition is for Permit No. 399 and NPDES Permit No. IL0078727.

Should you have any questions or need additional information please contact Clayton Cross at (217) 532-7310 x-125, cell (217) 556-0692, email; ccross@pattonmining.com, or fax (217) 532-7321.

Respectfully Submitted,

Mark Cornell

Mark Cornell

Authorized Person

HILLSBORO
ENERGY LLC
DEER RUN MINE
925 SOUTH MAIN STREET, HILLSBORO IL 62049

Mr. Joseph Stitely
Manager – Permit Section
IEPA Mine Pollution Control Program
2309 W. Main Street
Marion, IL 62959

September 14, 2015

RE: Deer Run Mine
I.D.N.R. Permit No. 399
NPDES Permit No. IL0078727
Revision No. 2 to Permit 399 – Shadow Area Addition

Dear Mr. Stitely,

Hillsboro Energy respectfully requests approval of a revision to Hillsboro Energy, LLC's Deer Run Mine, Permit No. 399 for a shadow area addition. The purpose of this revision is to add approximately 7,731.8 acres to the currently approved shadow area to allow for further mining.

This shadow area addition is for Permit No. 399 and NPDES Permit No. IL0078727.

Should you have any questions or need additional information please contact Clayton Cross at (217) 532-7310 x-125, cell (217) 556-0692, email; ccross@pattonmining.com, or fax (217) 532-7321.

Respectfully Submitted,

Mark Cornell

Mark Cornell

Authorized Person

PART I

General Information

State of Illinois
Department of Natural Resources
Office of Mines and Minerals
Land Reclamation Division
One Natural Resources Way
Springfield, IL 62702-1271

APPLICATION FOR SURFACE COAL MINING AND RECLAMATION OPERATIONS
PERMIT – UNDERGROUND OPERATIONS
UCM-1

PART I

(Application to be submitted 120 days (180 days for NPDES) prior to the desired effective date of the permit)

DATE: September 14, 2014

NOTICE
This state agency is requesting disclosure of information that is necessary to accomplish the statutory purpose as outlined under Ill. Rev. Stat. 1989, ch. 96 1/2, par. 7901 et seq. Disclosure of this information is voluntary, however failure to comply may result in this form not being processed. This form has been approved by the Forms Management Center.

1) A) General Information

(~~I~~) (~~We~~) (The) ***Hillsboro Energy, LLC***
(Name of Company, Corporation, Partnership or Individual)
925 South Main Street, Hillsboro, IL 62049 ***(217) 532-3983***
(Address) (Telephone Number)

hereby submit application # ***399*** for a permit to mine during a permit term of ***5*** years.

Type of Application:

[ ] Underground Mining
[X] Revision No. 2 to Permit No. 399
[X] Shadow Area Addition
[ ] Renewal No._____ to Permit No. _____
[ ] Transfer of Permit No. _____
[ ] Acres to be added under renewal

Applicant's Social Security No. _____ (Voluntary) and/or Federal Employer Identification No. ***20-5231639***

Name of Mine ***Deer Run Mine*** MSHA ID No. ***11-03182***

List the Mine Safety and Health Administration (MSHA) number(s) for all mine associated structures that require MSHA approval.

RESPONSE: *N/A*

I, ***Mark Cornell*** Mark Cornell ***Authorized Person***
Name Signature Title

under penalties of perjury declare that I have examined this application, including accompanying statements and documents and to the best of my knowledge it is true, and correct. (Signee must be at least a vice president or duly authorized representative for NPDES 35 Ill. Adm. Code 309.103(e))

This application is also to be used to apply for a:

IEPA Subtitle D (State) Permit Yes _____ No ***X*** NPDES Yes _____ No ***X***

New _____

Renewal No._____ Date: _____

Renewal No. _____ Date: _____

Modification No. _____ Date: _____

Modification No. _____ Date: _____

If this is an application for a NPDES permit, the Consolidated Permits Program - Application Form 2C (renewal), Form 2D (new), or Form 2E (sanitary) must be completed.

B) I Mark Cornell
(vice president or his duly authorized representative)

hereby waive my right of the 90-day permit issuance deadline as required by the Illinois Environmental Protection Act, Section 39(a)(4) and the Illinois Pollution Control Board Rules and Regulations, 35 Ill. Adm. Code 309.225(c).

C) Who will be the operator of the permit site?
Name ***Patton Mining, LLC***

Pursuant to 62 Ill. Adm. Code 1701.5 an operator is any person engaged in coal mining who removes or intends to remove more than 250 tons of coal.

If the operator is different from the applicant, provide the following information.

1) Operator's address ***925 South Main Street***
Hillsboro, Illinois 62049

2) Operator's telephone No. ***(217) 532-7310***

3) Operator's Social Security No.
(voluntary) and/or Federal Employer Identification No. ***26-4027251***

D) Who will extract coal under this permit?
Name ***Patton Mining, LLC***

If different from applicant or operator provide the following:

1) Address ***N/A***

2) Telephone No. _____
3) Social Security No. (Voluntary) and/or federal employer identification No. _____

E) Who will pay abandoned mine land reclamation fees?
Name **Hillsboro Energy, LLC**

If the person paying the abandoned mine land reclamation fee is different from the applicant, provide the following information.

1) Address ***925 South Main Street, Hillsboro, IL 62049***

2) Telephone No. ***(217) 532-3983***

3) Payee's Social Security No. _____
(voluntary) and/or Federal Employer Identification No. ***20-5231639***

F) The permittee requests a permit on the following area as shown on the permit map.

				Location		
Mine Address	Pit No. or Name	Acres to be Permitted	Sec.	Twp.	Range	County
925 South Main Street (office)	***Proposed South Panels Shadow Area***	***233.3***	***25 and 36***	***T8N***	***R4W***	***Montgomery***
	Proposed South Panels Shadow Area	***360.3***	***1, 12, and 13***	***T7N***	***R4W***	***Montgomery***
	Proposed South Panels Shadow Area	***2,863.6***	***27 thru 34***	***T8N***	***R3W***	***Montgomery***
	Proposed South Panels Shadow Area	***4,274.6***	***4 thru 9, 16 thru 18***	***T7N***	***R3W***	***Montgomery***

Total Acres ***7,731.8***

Refer to Map 1 – General Location Map.

G. Indicate the type of disturbance and associated acreage.

RESPONSE: ***N/A. This application is for a Shadow Boundary Revision. No additional surface disturbance is being proposed by this permit revision. Refer to Page 3 in UCM-1 Part I of Permit 399 and the applicable permit revisions and boundary revisions for information on the types of disturbance and the associated acreages within the Permit 399 permit boundary.***

Acres		Type of Disturbance
		Deep Mine Entries, Ventilation, Air Shafts
		Mine Waste Areas
		Processing Areas & Support Facilities
		Access, Haul Roads, & Transport Facilities
		Soil Storage Areas
		Diversions
		Other
		Not to be Disturbed

H) For each phase (permit) of the proposed surface coal mining and reclamation operation over the life of the mine provide the anticipated or actual starting and termination date and the anticipated number of acres to be affected. Designate the boundaries of each phase on the pre-mining land use map or other designated map.

Phases (Permits)	Starting Date	Termination Date	Acres to be Affected

RESPONSE: Refer to Part I, Page 4 of the approved Permit 399; Revision No. 1 – Supplemental Information, Volume I of III for additional information.

2) A) Provide name and address of every legal or equitable owner of record of the permit area, and the mineral property to be mined.

RESPONSE: Refer to Attachment I.2.A – Surface and Coal Ownership Within and Adjacent to Shadow Area and Map 2 - Identification of Interests for a list of surface owners. Natural Resource Partners L.P., 601 Jefferson Street, Houston, TX 77002 is the mineral owner.

B) Provide name and address of the owner of record for all surface and subsurface areas contiguous to any part of the proposed permit area.

RESPONSE: Refer to Attachment I.2.A – Surface and Coal Ownership Within and Adjacent to Shadow Area and Map 2 – Identification of Interests for the requested information.

C) Show location of owners of record of those lands, both surface and subsurface, included in or contiguous to the permit area on premining land use map or another map, if necessary.

RESPONSE: Refer to Map 2 - Identification of Interests.

3) A) Provide name and address of any holder of record of leasehold interest for the permit area, and the mineral property to be mined.

RESPONSE: Refer to Attachment Part I.2.A – Surface and Coal Ownership Within and Adjacent to Shadow Area and Map 2 - Identification Of Interests for information. Hillsboro Energy, LLC 925 South Main Street, Hillsboro, IL 62049 holds the lease from Natural Resource Partners L.P., 601 Jefferson Street, Houston, TX 77002.

B) Provide a statement of all lands, interest in lands, options or pending bids on interest held or made by the applicant for lands, which are contiguous to the permit area.

RESPONSE: N/A

4) Provide name and address of any purchaser of record under a real estate contract of the property for the permit area.

RESPONSE: ***N/A***

5) A) The applicant is: ___X___ corporation, _____ partnership, _____ single proprietorship, _____association or other business entity.

B) For the resident agent who will accept service of process for the applicant provide the following information.

1) Name of resident agent ***Corporate Service Company***

2) Address ***2711 Centreville Road***
Wilmington, DE 19808

3) Telephone No. _____

4) Social Security No. _____(voluntary) and/or Federal Employer Identification No. ***41-2178049***

6) OWNERSHIP AND CONTROL INFORMATION

Ownership and control is evidenced by being the permittee of a surface coal mining operation, or by being the owner of record of 50 percent or more of an entity controlling a surface coal mining operation or by having any relationship, which gives direct or indirect authority over an entity controlling a surface coal mining operation.

Ownership and control is presumed if an entity is an officer or director; is an operator of a surface coal mining operation; has the authority to commit the financial or real property assets or working resources of an entity; is the owner of record of ten (10) through fifty (50) percent of an entity; is a general partner of a partnership; owns or controls coal to be mined by another entity and has the right to receive that coal after mining; or has the authority to determine how the surface coal mining operations will be conducted.

For an entity to refute a presumed ownership and control relationship, the entity must demonstrate to the satisfaction of the Department that the entity subject to the presumption does not have the authority directly or indirectly to determine the manner in which the relevant surface coal mining operation is conducted.

RESPONSE: ***Hillsboro Energy, LLC, the Applicant, is a Limited Liability Company registered to do business in the State of Illinois. Its business address is 925 South Main Street, Hillsboro, IL 62049.***

One hundred percent of the Membership Interests of Hillsboro Energy, LLC are owned by Foresight Reserves, LP.

Foresight Reserves, LP is a limited partnership in which the voting interest is controlled by Insight Resource, LLC, the General Partner.

Refer to Attachment Part I.6 – Ownership and Control Information.

A) For each entity who owns or controls the applicant provide the following information.

1) Name of entity ***Foresight Reserves, LP***

2) Address _____

3) Social Security No. _____ (voluntary) and/or Federal Employer Identification No._____

4) The entity's specific ownership and control relationship with the applicant ***100% owner of the applicant***

If more than one ownership and control relationship exists, list each relationship separately under this part providing all information requested.

a) Percentage of ownership if any ***N/A***

b) Location in organizational structure ***N/A***

c) Position title ***N/A***

i) Date position was assumed _____

ii) Date of departure from position _____

1) Name of entity ***Foresight Management, LLC***

2) Address _____

3) Social Security No. _____ (voluntary) and/or Federal Employer Identification No._____

4) The entity's specific ownership and control relationship with the applicant ***Manager***

If more than one ownership and control relationship exists, list each relationship separately under this part providing all information requested.

a) Percentage of ownership if any ***N/A***

b) Location in organizational structure ***N/A***

c) Position title ***N/A***

i) Date position was assumed ***July 18, 2006***

ii) Date of departure from position ***N/A***

1) Name of entity ***Insight Resources, LLC***

2) Address ***430 Harper Park Drive, Beckley, WV 25801***

3) Social Security No. _____ (voluntary) and/or Federal Employer Identification No. ***20-1796775***

4) The entity's specific ownership and control relationship with the applicant ***General Partner of Applicant's Owner***

If more than one ownership and control relationship exists, list each relationship separately under this part providing all information requested.

a) Percentage of ownership if any ***N/A***

b) Location in organizational structure ***N/A***

c) Position title ***N/A***

i) Date position was assumed _____

ii) Date of departure from position _____

B) For each surface coal mining and reclamation operation in the United States either presently owned or controlled or owned or controlled within the five (5) years preceding the date of the application by the entity listed in (A) above provide the following information.

RESPONSE: ***N/A***

1) Name _____

2) Address _____

3) Name of regulatory authority _____

4) Identification number:

a) Social security No. _____ (voluntary) and/or federal employer identification No. _____

b) Federal permit No. _____

c) State permit No. _____

d) MSHA No. _____ and date of issuance _____

7) For each surface coal mining operation in the United States owned or controlled by the applicant provide the following information.

a) Name of Operation ***Deer Run Mine***

b) Address of Operation ***12051 9th Avenue***
Hillsboro, IL 62049

c) Name of regulatory authority ***Illinois Department of Natural Resources***

d) Identification number:

i) Social Security No. _____ (voluntary) and/or Federal Employer Identification No. ***20-5231639***

ii) Federal permit No. _____

iii) State Permit No. ***399***

iv) MSHA No. ***11-03182*** and date of issuance ***03/02/2009***

8) A) Has the applicant, any subsidiary, affiliate or entity controlled by or under common control with the applicant had:

1) A State or Federal coal mining permit suspended or revoked in the five (5) years prior to the date of submission of the application?
Yes _____ No ***X***

2) A forfeiture of a performance bond under a coal mining permit?
Yes _____ No ____X____

B) If the response to A)1) or 2) was yes, provide the following information:

1) Provide the identification number of the permit.

2) Provide the date of permit issuance.

3) Provide the date of permit suspension or revocation and/or the date of bond forfeiture.

4) Provide the name of regulatory authority who suspended or revoked the permit and/or forfeited the bond.

5) Provide a statement of the reason for the suspension, revocation and/or forfeiture action.

6) Provide the current status of the permit and/or bond.

7) For any administrative or judicial proceedings initiated concerning the suspension, revocation, and/or forfeiture provide the following:

a) Date of proceeding,

b) Location of proceeding, and

c) Current status of proceedings.

C) If the response to A)2) was yes, provide information on the applicant's present financial condition to provide assurances satisfactory to the Department that forfeiture will not again be necessary.

9) Violation history

A) For the three (3) year period preceding the date of submission of the application, provide a listing of Notices of Violation received for any provision of the Federal Act or any Federal State law, rule, or regulation pertaining to air or water environmental protection incurred in connection with any surface coal mining operations. The listing shall include the following:

1) Notice of violation number or other identifier.

2) Date of NOV issuance.

3) Permit identification number.

4) MSHA number.

5) Name of entity to whom NOV was written.

6) Name of regulatory authority or agency which issued the NOV.

7) A brief description of the alleged violation.

8) For any administrative or judicial proceedings initiated concerning the violation, provide the following:

   a) Type of proceedings.

   b) Date of proceedings

   c) Location of proceedings.

   d) Current status of proceedings.

9) Actions, if any, to abate the alleged violation.

RESPONSE: ***Refer to Attachment Part I.6 – Ownership and Control Information***

B) For any unabated cessation orders or unabated air and water quality violation notices received prior to the date of submission of the application for any surface coal mining and reclamation operation owned or controlled by the applicant or by any entity which owns or controls the applicant, provide a listing of the unabated cessation orders or violation notices which include the following:

1) Cessation order or notice of violation number or other identifier.

2) Date of CO or NOV issuance.

3) Permit identification number.

4) MSHA number

5) Name of entity to whom CO or NOV was written

6) Name of regulatory authority or agency which issued the CO or NOV.

7) A brief description of the alleged cessation order or violation.

8) For any administrative or judicial proceedings initiated concerning the cessation order or violation, provide the following:

a) Type of proceedings.

b) Date of proceedings

c) Location of proceedings

d) Current status of proceedings.

9) Actions, if any, to abate the alleged cessation order or violation.

RESPONSE: N/A

10) Affidavits, Certifications, Insurance Certificate

A) Complete affidavit regarding applicant's legal right to enter and begin surface coal mining and reclamation operations in the permit area and whether that right is the subject of pending litigation. Identify the documents upon which affidavit is based by type and date of execution and identify specific lands to which each document pertains and explain the legal rights claimed by the applicant (Section 1778.15(a)). If the private mineral estate to be mined has been severed from the private surface estate, provide copies of the documents required under Section 1778.15(B)(1)-(3). On the permit map or other designated map show the boundaries of land within the permit area upon which the applicant has the legal right to enter and begin mining activities.

RESPONSE: Refer to Attachment Part I.10.A – Mining Affidavits

B) Complete certification for engineering aspects of the application. In addition to the general certification, three specific certifications are included which are applicable only if the box in front of each is marked. The first two cover special permit requirements and should be marked only when they occur for the proposed permit. The third certification covers the Illinois Environmental Protection Agency permit requirements. In most cases, an Illinois registered engineer will be required to certify I.E.P.A. permit requirements. Except a otherwise provided all maps, plans and cross-sections included in the permit application shall be prepared by, or under the direction of, and sealed by a qualified registered professional engineer licensed under the Illinois Professional Engineering Act, a qualified registered structural engineer licensed under the Illinois Structural Engineering Act or if authorized by state law, a qualified registered professional land surveyor licensed under the Illinois Land Surveyors Act with assistance from experts in related fields.

RESPONSE: Refer to Attachment Part I.10.B – Engineering Certification

C) A certificate of liability insurance or evidence that the applicant is self-insured is required prior to permit issuance. The certificate may be submitted with the application or when fee and bond are submitted. Minimum insurance coverage required is for bodily injury $300,000 for each occurrence, and $500,000 aggregate and for property damage $300,000 each occurrence, and $500,000 aggregate.

RESPONSE: ***Refer to Attachment Part I.10.C – Insurance Certificate***

11) Provide a draft copy of proposed newspaper notice, and the name of local newspaper of general circulation in which advertisement of the application will be published. Certificate of publication is to be submitted not later than four weeks after the last date of publication.

RESPONSE: ***Refer to Attachment Part I.11 – Draft Public Notice***

12) Areas Designated Unsuitable for Mining

A) Does proposed permit area include and/or shadow area include --

Areas designated unsuitable for surface coal mining and reclamation operations, or under study for designation in an administrative proceeding as unsuitable for surface coal mining and reclamation operations? (Sections 1762 and 1764)
Yes _____ No ___X___

B) Does proposed permit area include and/or shadow area include --

1) Lands within boundaries of the National Park System, National Wildlife Refuge System, the National System of Trails, the National Wilderness Preservation System, the Wild and Scenic Rivers System, and National Recreation Areas, etc. (Section 1761.11(a))?
Yes _____ No ___X___

2) National Forest land?
Yes _____ No ___X___

3) Any land which will adversely affect any publicly-owned park or places included in the National Register of Historic Places, etc. (per Sections 1761.11(c))?
Yes _____ No ___X___

If yes, complete Part II, Section 10, B) and C).

4) Any public roads, which are to be removed, relocated or temporarily closed?
Yes _____ No ___X___

Indicate on the pre-mining land use map or other designated map the location of the public roads and attach a copy of the written agreement from the appropriate authority authorizing the relocation, removal or temporary closure. Describe the measures to be used to insure that the interest of the public and land owners affected will be protected.

C) Within the proposed permit area will Surface Coal Mining and Reclamation operations be located --

1) Within 100 feet of the right-of-way line of any public road?
Yes _____ No ___X___

If yes, explain proposed procedures for complying with regulation Section 1761.14(b), including request for variance, if relevant. Provide location of public roads on pre-mining land use map or other designated map. Describe the measures to be used to insure that the interest of the public and land owners affected will be protected.

2) Within 300 feet measured horizontally from any occupied dwelling?

Yes _____ No ___X___

If so, is waiver provided meeting requirements of Section 1761.12(d)?

3) Within 300 feet measured horizontally of any public building, school, church, community or institutional building or public park?
Yes _____ No ___X___

4) Within 100 feet measured horizontally of a cemetery?
Yes _____ No ___X___

D) Are valid existing rights claimed for any part of the permit area?
Yes _____ No ___X___

If yes, provide documentation to substantiate claim.

ATTACHMENT I.2.A
SURFACE AND COAL OWNERSHIP WITHIN AND ADJACENT TO SHADOW AREA

Attachment I.2.A - Surface and Coal Owners Within and Adjacent to Shadow Area

Parcel	Site Address	City	First Name	Last name	Mailing Address	Address 2	City	State	Zip Code	Land Lot (acre)	Farmland (acre)	Deed Total (acre)	Coal Owner*	Inside Shadow Area	Adjacent to Shadow Area
16-25-100-005	7150 South Illinois Route 127	Hillsboro	Betty	McFarlin	7150 Illinois Route 127	P.O. Box 67	Hillsboro	Illinois	62049	37.51		37.51	NRP	X	
16-25-100-007	400 Rountree Street	Hillsboro	Roger	McFarlin	400 Rountree Street		Hillsboro	Illinois	62049		18.75	18.75	NRP	X	
16-25-200-001	7291 Buckeye Trail	Hillsboro	Joseph	Boas	11091 Brushy Trail		Irving	Illinois	62051		160.00	160.00	Partial		X
16-25-300-005	7140 Illinois Route 127	Hillsboro	Bruce	Finley	7140 Illinois Route 127		Hillsboro	Illinois	62049	1.59	32.31	33.90	NRP	X	
16-25-300-009	11148 North 7th Avenue	Hillsboro	Edward & Susan	Boyd	422 West Fairground Avenue		Hillsboro	Illinois	62049			0.00	NRP	X	
16-25-300-010	7012 Illinois Route 127	Hillsboro	Arlen & Allen	Kasten	13314 Illinois Route 185		Hillsboro	Illinois	62049		24.25	24.25	NRP		X
16-25-300-017	10110 Holloway Trail	Hillsboro	Scott	Strausgaugh	130 Bandor Circle		Hillsboro	Illinois	62049		29.00	29.00	NRP		X
16-25-400-001	123 North Broad	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812		40.00	40.00	NRP	X	
16-25-400-004	7199 Buckeye Trail	Hillsboro	Larry	Schraut	7199 Buckeye Trail		Hillsboro	Illinois	62049	0.28	39.72	40.00	NRP	X	
16-25-400-006	North 7th Avenue	Hillsboro	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019		30.00	30.00	NRP	X	
16-25-400-007	Coffeen Road	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812		0.70	0.70	NRP	X	
16-25-400-008	7th Avenue & Buckeye Trail	Hillsboro	Connie	Garrett	828 CR 3840		Bridgeport	Texas	76426		39.30	39.30	NRP	X	
16-36-100-002	11106 North 7th Avenue	Hillsboro	John & Patricia	Robinson	11106 North 7th Avenue		Hillsboro	Illinois	62049	1.00		1.00	NRP		X
16-36-100-004	11148 North 7th Avenue	Hillsboro	Edward & Susan	Boyd	422 West Fairground Avenue		Hillsboro	Illinois	62049	0.28	17.22	17.50	NRP	X	
16-36-100-008	6252 Illinois Route 127	Hillsboro	Mary	Rikli	6252 Illinois Route 127		Hillsboro	Illinois	62049	1.01	38.99	40.00	NRP	X	
16-36-100-009	North 7th Avenue	Hillsboro	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019		17.00	17.00	NRP	X	
16-36-100-010	11180 North 7th Avenue	Hillsboro	Rhonda	Huber	11180 North 7th Avenue		Hillsboro	Illinois	62049			0.00	NRP		X
16-36-200-001	11228 North 7th Avenue	Hillsboro	David & Carol	Schluckebier	11228 North 7th Avenue		Hillsboro	Illinois	62049	1.16	38.84	40.00	NRP	X	
16-36-200-002	Buckeye Trail	Hillsboro	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019		63.00	63.00	NRP	X	
16-36-200-003	Buckeye Trail	Hillsboro	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019		40.00	40.00	NRP	X	
16-36-200-004	Buckeye Trail	Hillsboro	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019		17.00	17.00	NRP	X	
16-36-300-002	6252 Illinois Route 127	Hillsboro	Daniel	Chappelear	5358 Waveland Road		Hillsboro	Illinois	62049		40.00	40.00	NRP		X
16-36-300-006	11201 North 6th Avenue	Hillsboro	Kenneth & Betty	Weiss	312 West Third North Street		Mt. Olive	Illinois	62069		39.90	39.90	NRP		X
16-36-400-001	6252 Illinois Route 127	Hillsboro	Daniel	Chappelear	5358 Waveland Road		Hillsboro	Illinois	62049		40.00	40.00	NRP		X
16-36-400-002	Buckeye Trail	Hillsboro	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019		40.00	40.00	NRP	X	
16-36-400-005	North 6th Avenue	Hillsboro	Forrest	Delong	P.O. Box 334		Hillsboro	Illinois	62049		30.00	30.00	NRP		X
16-36-400-006	North 6th Avenue	Hillsboro	Kenneth & Betty	Weiss	312 West Third North Street		Mt. Olive	Illinois	62069		50.00	50.00	NRP		X
17-27-100-002	Coffeen Road	Hillsboro	Illinois Department of Natural Resources	c/o Raetta Realty	One Natural Resources Way		Springfield	Illinois	62702		80.00	80.00	NRP	X	
17-27-100-003	Illinois Route 185	Coffeen	Illinois Department of Natural Resources	c/o Raetta Realty	One Natural Resources Way		Springfield	Illinois	62702		13.65	13.65	NRP	X	
17-27-100-004	Illinois Route 185	Coffeen	Illinois Department of Natural Resources		One Natural Resources Way		Springfield	Illinois	62702		66.35	66.35	NRP		
17-27-100-502	Coffeen Road	Hillsboro	Illinois Department of Natural Resources	c/o Gary Laurent	822 Powder Avenue		Donnellson	Illinois	62019		69.33	69.33	NRP		X
17-27-100-503	Illinois Route 185	Hillsboro	Illinois Department of Natural Resources	c/o Gary Laurent	822 Powder Avenue		Donnellson	Illinois	62019		8.79	8.79	NRP	X	
17-27-100-504	Illinois Route 185	Coffeen	Illinois Department of Natural Resources	c/o Gary Laurent	822 Powder Avenue		Donnellson	Illinois	62019		23.90	23.90	NRP	X	X
17-27-200-005	Coffeen Road	Hillsboro	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017		40.00	40.00	NRP		X
17-27-200-006	7225 Coffeen Road	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812		38.47	38.47	NRP	X	
17-27-200-007	Illinois Route 185	Coffeen	Illinois Department of Natural Resources	c/o Raetta Realty	One Natural Resources Way		Springfield	Illinois	62702		22.25	22.25	NRP		X
17-27-200-008			Illinois Department of Natural Resources		One Natural Resources Way		Springfield	Illinois	62702		20.40	20.40	NRP	X	
17-27-200-009	Coffeen Road	Coffeen	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812		25.00	25.00	NRP	X	
17-27-200-010	Coffeen Road	Coffeen	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812		14.60	14.60	NRP	X	
17-27-200-507	Illinois Route 185	Coffeen	Illinois Department of Natural Resources	c/o Gary Laurent	822 Powder Avenue		Donnellson	Illinois	62019		11.69	11.69	NRP		X
17-27-300-001	Illinois Route 185	Coffeen	Illinois Department of Natural Resources		One Natural Resources Way		Springfield	Illinois	62702		51.00	51.00	NRP		X
17-27-300-005	15020 Illinois Route 185	Hillsboro	Elzie	Garrett	1715 Summit Street		Hillsboro	Illinois	62049	0.65	14.02	14.67	NRP	X	
17-27-300-006	Illinois Route 185	Hillsboro	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002	11.48		11.48	NRP		X
17-27-300-011	15116 Illinois Route 185	Hillsboro	New River Royalty, LLC	Rocky & Rebecca Starkey	208 Public Square	4th Floor	Benton	Illinois	62812	1.87		1.87	NRP	X	
17-27-300-012	15056 Illinois Route 185	Hillsboro	Celene	Harrelson	P.O. Box 293		Coffeen	Illinois	62017	5.74		5.74	NRP	X	
17-27-300-013	52 McDavid Cemetery Lane	Coffeen	Celene	Harrelson	P.O. Box 293		Coffeen	Illinois	62017			0.00	NRP	X	
17-27-300-014	15039 Illinois Route 185	Hillsboro	Kenneth & Karen	Blankenship	15039 Illinois Route 185		Hillsboro	Illinois	62049	0.46	43.54	44.00	NRP		x
17-27-300-015	Illinois Route 185	Hillsboro	Randall & Rose	Huber	1201 University		Hillsboro	Illinois	62049	1.77		1.77	NRP		X
17-27-300-016	Illinois Route 185	Hillsboro	Brian	Huber	6653 Majestic Way		Carpentersville	Illinois	60110		8.13	8.13	NRP		X
17-27-300-501	Illinois Route 185	Coffeen	Illinois Department of Natural Resources	c/o Gary Laurent	822 Powder Avenue		Donnellson	Illinois	62019		42.02	42.02	NRP		X
17-27-400-001	15039 Illinois Route 185	Hillsboro	Kenneth & Karen	Blankenship	15039 Illinois Route 185		Hillsboro	Illinois	62049		20.00	20.00	NRP		X
17-27-400-003	Coffeen Road	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812		57.75	57.75	NRP	X	
17-27-400-005	Coffeen Road	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812		40.00	40.00	NRP	X	
17-27-400-006	Illinois Route 185	Hillsboro	Brian	Huber	6653 Majestic Way		Carpentersville	Illinois	60110	12.55		12.55	NRP		X
17-27-400-007	Illinois Route 185	Hillsboro	Matthew	Elam	1465 Country Club Way		Smithboro	Illinois	62284		61.98	61.98	NRP	X	
17-28-100-004	East 14th Road	Hillsboro	Earl	Seltzer	904 Smith Lane	P.O. Box 502	Hillsboro	Illinois	62049		79.53	79.53	NRP	X	
17-28-100-005	14232 Illinois Route 185	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812	0.75		0.75	NRP	X	
17-28-100-006	14107 Illinois Route 185	Hillsboro	New River Royalty, LLC	George Elam	208 Public Square	4th Floor	Benton	Illinois	62812	1.93		1.93	NRP	X	
17-28-100-007	Illinois Route 185	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812		77.40	77.40	NRP	X	
17-28-200-001	East 14th Road	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812		12.73	12.73	NRP	X	

Attachment I.2.A - Surface and Coal Owners Within and Adjacent to Shadow Area

Parcel	Site Address	City	First Name	Last name	Mailing Address	Address 2	City	State	Zip Code	Land Lot (acre)	Farmland (acre)	Deed Total (acre)	Coal Owner*	Inside Shadow Area	Adjacent to Shadow Area
17-28-200-002	East 14th Road	Hillsboro	David & Stephen	Spinner	715 East Union Avenue		Litchfield	Illinois	62056		27.54	27.54	NRP		X
17-28-200-003	Illinois Route 185	Hillsboro	Earl	Seltzer	904 Smith Lane	P.O. Box 502	Hillsboro	Illinois	62049		40.00	40.00	NRP	X	
17-28-200-005	Illinois Route 185	Hillsboro	Earl	Seltzer	904 Smith Lane	P.O. Box 502	Hillsboro	Illinois	62049		79.78	79.78	NRP	X	
17-28-300-004	Illinois Route 185	Hillsboro	Earl	Seltzer	904 Smith Lane	P.O. Box 502	Hillsboro	Illinois	62049		316.60	316.60	NRP	X	
17-28-400-002	14401 Illinois Route 185	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812	2.00		2.00	NRP	X	
17-28-400-003	14329 Illinois Route 185	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812	1.40		1.40	NRP	X	
17-29-100-001	North 7th Avenue	Hillsboro	Larry	Schraut	7199 Buckeye Trail		Hillsboro	Illinois	62049		80.00	80.00	NRP	X	
17-29-100-002	North 7th Avenue	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812		80.00	80.00	NRP	X	
17-29-200-001	13314 Illinois Route 185	Hillsboro	New River Royalty, LLC	Arlen & Patricia Kasten	208 Public Square	4th Floor	Benton	Illinois	62812	0.51	79.49	80.00	NRP	X	
17-29-200-003	Illinois Route 185	Hillsboro	Wright Trust	c/o First National Bank	P.O. Box 40		Vandalia	Illinois	62471		68.75	68.75	NRP	X	
17-29-200-004	Illinois Route 185	Hillsboro	Earl	Seltzer	904 Smith Lane	P.O. Box 502	Hillsboro	Illinois	62049		10.16	10.16	NRP	X	
17-29-300-001	13013 North 7th Avenue	Hillsboro	Larry	Schraut	7199 Buckeye Trail		Hillsboro	Illinois	62049		40.00	40.00	NRP	X	
17-29-300-002	13013 North 7th Avenue	Hillsboro	Larry	Schraut	7199 Buckeye Trail		Hillsboro	Illinois	62049	0.49	119.51	120.00	NRP	X	
17-29-400-004	7170 East 14th Road	Hillsboro	Larry	Schraut	7199 Buckeye Trail		Hillsboro	Illinois	62049		1.00	1.00	NRP	X	
17-29-400-006	7179 East 14th Road	Hillsboro	Larry	Schraut	7199 Buckeye Trail		Hillsboro	Illinois	62049		159.00	159.00	NRP	X	
17-30-100-001	Buckeye Trail	Hillsboro	Joseph	Boas	11091 Brushy Trail		Irving	Illinois	62051		216.00	216.00	NRP		X
17-30-200-001	North 7th Avenue	Hillsboro	Joseph	Boas	11091 Brushy Trail		Irving	Illinois	62051		80.00	80.00	NRP		X
17-30-300-001	7108 Buckeye Trail	Hillsboro	Richard	Elam	7108 Buckeye Trail		Hillsboro	Illinois	62049	0.49	137.51	138.00	NRP	X	
17-30-400-001	Buckeye Trail	Hillsboro	Joseph	Boas	11091 Brushy Trail		Irving	Illinois	62051		40.00	40.00	NRP		X
17-30-400-002	12188 North 7th Avenue	Hillsboro	Gerald	Young	12188 North 7th Avenue		Hillsboro	Illinois	62049		40.00	40.00	NRP		X
17-30-400-003	12188 North 7th Avenue	Hillsboro	Gerald	Young	12188 North 7th Avenue		Hillsboro	Illinois	62049		80.00	80.00	NRP		X
17-31-100-001	7199 Buckeye Trail	Hillsboro	Larry	Schraut	7199 Buckeye Trail		Hillsboro	Illinois	62049		83.73	83.73	NRP	X	
17-31-100-003	12188 North 7th Avenue	Hillsboro	Gerald	Young	12188 North 7th Avenue		Hillsboro	Illinois	62049	1.00	5.00	6.00	NRP		X
17-31-100-004	12188 North 7th Avenue	Hillsboro	Gerald	Young	12188 North 7th Avenue		Hillsboro	Illinois	62049		40.54	40.54	NRP	X	
17-31-200-001	12248 North 7th Avenue	Hillsboro	Gerald	Young	12188 North 7th Avenue		Hillsboro	Illinois	62049	0.79	154.21	155.00	NRP	X	
17-31-200-002	12188 North 7th Avenue	Hillsboro	Gerald	Young	12188 North 7th Avenue		Hillsboro	Illinois	62049		5.00	5.00	NRP	X	
17-31-300-001	Buckeye Trail	Coffeen	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019		17.50	17.50	NRP	X	
17-31-300-002	Buckeye Trail	Coffeen	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019		13.00	13.00	NRP	X	
17-31-300-003	12057 North 6th Avenue	Hillsboro	Jerry & Wanda	Mercer	12057 North 6th Avenue		Hillsboro	Illinois	62049	3.40	27.10	30.50	NRP		X
17-31-300-004	6061 - 6063 Buckeye Trail	Hillsboro	Richard & Margaret	Harms	6063 Buckeye Trail		Hillsboro	Illinois	62049	2.87	56.38	59.25	NRP	X	
17-31-300-005	12179 North 6th Avenue	Hillsboro	Brian Weston	c/o Litchfield Community Savings	P.O. Box 445		Litchfield	Illinois	62056	1.00		1.00	NRP		X
17-31-400-001	6063 Buckeye Trail	Coffeen	Richard & Margaret	Harms	6063 Buckeye Trail		Hillsboro	Illinois	62049		80.00	80.00	NRP	X	
17-31-400-007	6063 Buckeye Trail	Coffeen	Richard & Margaret	Harms	6063 Buckeye Trail		Hillsboro	Illinois	62049		8.87	8.87	NRP	X	
17-31-400-008	North 6th Avenue	Coffeen	Benjamin	Kenny	5250 East 18th Road		Coffeen	Illinois	62017		86.99	86.99	NRP		X
17-31-400-010	North 6th Avenue	Coffeen	Nicholas	Kenny	1402 Kweit Lane		Greenville	Illinois	62246		28.50	28.50	NRP	X	
17-31-400-011	92 McQuern Lane	Hillsboro	Ben	Kenny	13001 North 6th Avenue		Hillsboro	Illinois	62049	0.93	4.11	5.04	NRP		X
17-32-100-002	6265 East 14th Road	Coffeen	Stella	Kasten	6265 East 14th Road		Hillsboro	Illinois	62049		40.00	40.00	NRP		X
17-32-100-003	6265 East 14th Road	Coffeen	Stella	Kasten	6265 East 14th Road		Hillsboro	Illinois	62049		40.00	40.00	NRP		X
17-32-100-004	13030 North 7th Avenue	Hillsboro	New River Royalty, LLC	John Clark	208 Public Square	4th Floor	Benton	Illinois	62812	4.50		4.50	NRP	X	
17-32-100-006	13130 North 7th Avenue	Hillsboro	Brad & Dawn	Young	13130 North 7th Avenue		Hillsboro	Illinois	62049	5.00		5.00	NRP	X	
17-32-100-007	North 7th Avenue	Hillsboro	Brad & Dawn	Young	13130 North 7th Avenue		Hillsboro	Illinois	62049		70.50	70.50	NRP	X	
17-32-200-001	6265 East 14th Road	Coffeen	Stella	Kasten	6265 East 14th Road		Hillsboro	Illinois	62049		80.00	80.00	NRP	X	
17-32-200-002	6265 East 14th Road	Hillsboro	Stella	Kasten	6265 East 14th Road		Hillsboro	Illinois	62049	0.61	79.39	80.00	NRP	X	
17-32-300-004	13253 North 6th Avenue	Hillsboro	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049		74.31	74.31	NRP	X	
17-32-300-005	13253 North 6th Avenue	Hillsboro	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049		36.29	36.29	NRP	X	
17-32-400-001	13253 North 6th Avenue	Hillsboro	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049	0.81	79.19	80.00	NRP	X	
17-32-400-002	13253 North 6th Avenue	Hillsboro	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049		40.00	40.00	NRP	X	
17-32-400-003	13253 North 6th Avenue	Hillsboro	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049		40.00	40.00	NRP	X	
17-33-100-002	East 14th Road	Hillsboro	Earl Seltzer Enterprises		P.O. Box 502		Hillsboro	Illinois	62049		300.00	300.00	NRP	X	
17-33-200-001	Illinois Route 185	Hillsboro	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002		20.00	20.00	NRP		X
17-33-300-001	North 6th Avenue	Coffeen	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049		40.00	40.00	NRP	X	
17-33-300-003	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017		40.00	40.00	NRP		X
17-33-300-004	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017		40.00	40.00	NRP		X
17-33-300-005	North 6th Avenue	Coffeen	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049	1.41	35.13	36.54	NRP	X	
17-33-300-006	14061 North 6th Avenue	Coffeen	Wade Edwards	c/o Corelogic	1 Corelogic Drive		Westlake	Texas	76262		3.46	3.46	NRP	X	
17-33-400-001	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017		47.00	47.00	NRP		X
17-33-400-002	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017		25.00	25.00	NRP		X
17-33-400-003	Rural Lake Area	Coffeen	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002	15.00		15.00	NRP		X
17-33-400-004	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017		15.00	15.00	NRP		X
17-33-400-005	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017		18.00	18.00	NRP		X

Attachment I.2.A - Surface and Coal Owners Within and Adjacent to Shadow Area

Parcel	Site Address	City	First Name	Last name	Mailing Address	Address 2	City	State	Zip Code	Land Lot (acre)	Farmland (acre)	Deed Total (acre)	Coal Owner*	Inside Shadow Area	Adjacent to Shadow Area
17-33-400-006	5263 East 14th Road	Coffeen	William, Cleola, & Cherlyn	Brackett	5204 East 14th Road		Coffeen	Illinois	62017		40.00	40.00	NRP	X	
17-34-100-004	72 McDavid Cemetery Lane	Coffeen	McDavid Point Cemetery		R.R. 1		Hillsboro	Illinois	62049		1.27	1.27	No	X	
17-34-100-005	95 McDavid Cemetery Lane	Coffeen	Kenneth & Linda	Null	95 McDavid Cemetery Lane		Hillsboro	Illinois	62049	0.85	20.75	21.60	NRP	X	
17-34-100-006	15212 Illinois Route 185	Hillsboro	Ralph	Ray	15212 Illinois Route 185		Hillsboro	Illinois	62049	0.51	58.99	59.50	NRP	X	
17-34-200-001	15172 Illinois Route 185	Hillsboro	Shawn & Hope	Titsworth	15172 Illinois Route 185		Hillsboro	Illinois	62049	4.00		4.00	NRP	X	
17-34-200-007	Coffeen Road	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812		12.00	12.00	NRP	X	
17-34-200-008	Coffeen Road	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812		32.14	32.14	NRP	X	
17-34-200-009	15448 Illinois Route 185	Hillsboro	Kenneth & Brenda	Timpe	15323 Irving Road		Irving	Illinois	62051	2.22		2.22	NRP	X	
17-34-200-011	Illinois Route 185	Hillsboro	Arlen	Kasten	13314 Illinois Route 185		Hillsboro	Illinois	62049		6.01	6.01	NRP		X
17-34-200-012	1322 CIPS Trail	Coffeen	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812	1.00		1.00	NRP	X	
17-34-200-015	1255 CIPS Trail	Coffeen	William	Kershaw	1255 CIPS Trail		Coffeen	Illinois	62017	2.50		2.50	NRP		X
17-34-200-019	13314 Illinois Route 185	Hillsboro	Arlen	Kasten	13314 Illinois Route 185		Hillsboro	Illinois	62049		28.26	28.26	NRP		X
17-34-200-020	1335 CIPS Trail	Coffeen	Danny	Lilley	1335 CIPS Trail		Coffeen	Illinois	62017	0.75	4.25	5.00	NRP		X
17-34-200-021	Illinois Route 185	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812		27.90	27.90	NRP	X	
17-34-300-001	Border North Coffeen Lake	Coffeen	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002	203.00		203.00	NRP		X
17-34-300-007	15112 North 6th Avenue	Coffeen	Brooks	Moreland	15112 North 6th Avenue		Coffeen	Illinois	62017		6.00	6.00	NRP	X	
17-34-300-008	15177 North 6th Avenue	Coffeen	Kathy	Turner	15177 North 6th Avenue		Coffeen	Illinois	62017	1.69		1.69	NRP		X
17-34-300-009	CIPS Trail	Coffeen	Robert	Ray	6550 Oleatha		St. Louis	Missouri	63139		55.64	55.64	NRP	X	
17-34-451-008	1057 CIPS Trail	Coffeen	Wade & Natalie	Fuller	1057 CIPS Trail		Coffeen	Illinois	62017	0.51	51.83	52.34	NRP	X	
17-34-451-009	15201 North 6th Avenue	Coffeen	Schylar & Amanda	Fuller	15201 North 6th Avenue		Coffeen	Illinois	62017	3.44		3.44	NRP	X	
20-01-100-008	5338 Illinois Route 127	Hillsboro	Gerald	Zumwalt	5338 Illinois Route 127		Hillsboro	Illinois	62049		9.30	9.30	NRP		X
20-01-100-009	13314 Illinois Route 185	Hillsboro	Arlen	Kasten	13314 Illinois Route 185		Hillsboro	Illinois	62049		17.68	17.68	NRP		X
20-01-100-011	North 6th Avenue	Hillsboro	Karen Funk	c/o Farmers State Bank & Trust	200 West State		Jacksonville	Illinois	62650		52.83	52.83	NRP	X	
20-01-200-003	11202 North 6th Avenue	Hillsboro	Mary June	Koontz	11202 North 6th Avenue		Hillsboro	Illinois	62049	0.55		0.55	NRP		X
20-01-200-005	11400 North 6th Avenue	Hillsboro	Douglas & Brenda	Johnson	11400 North 6th Avenue		Hillsboro	Illinois	62049	7.02		7.02	NRP		X
20-01-200-006	12056 North 6th Avenue	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049		72.98	72.98	NRP	X	
20-01-200-008	North 6th Avenue	Hillsboro	Karen Funk	c/o Farmers State Bank & Trust	200 West State		Jacksonville	Illinois	62650		71.04	71.04	NRP	X	
20-01-200-009	11204 North 6th Avenue	Hillsboro	William & Ruth	Schroeder	11204 North 6th Avenue		Hillsboro	Illinois	62049	0.61	11.35	11.96	NRP	X	
20-01-300-008	Illinois Route 127	Hillsboro	David & Luann	Chappelear	10110 Holloway Trail		Hillsboro	Illinois	62049		1.95	1.95	NRP		X
20-01-300-009	Illinois Route 127	Hillsboro	Rodney	Bergmann	4 Deer Hollow		Litchfield	Illinois	62056		40.00	40.00	NRP		X
20-01-300-011	169 Funk Lane	Hillsboro	Thomas & Mary	Murray	169 Funk Lane		Hillsboro	Illinois	62049	7.41		7.41	NRP	X	
20-01-300-015	5126 Illinois Route 127	Hillsboro	Ronald	Hunshe	12610 Niggli Road		Highland	Illinois	62249		24.34	24.34	NRP		X
20-01-400-010	253 Rock Lane	Hillsboro	Terri	Mackey	253 Rock Lane		Hillsboro	Illinois	62049		32.78	32.78	NRP	X	
20-01-400-012	Rock Lane	Hillsboro	Dolores	Yarbrough	1105 Devonshire Drive		Champaign	Illinois	61821		20.00	20.00	NRP		X
20-01-400-013	Funk Lane	Hillsboro	Karen Funk	c/o Farmers State Bank & Trust	200 West State		Jacksonville	Illinois	62650		30.00	30.00	NRP	X	
20-01-400-014	12056 North 6th Avenue	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049		30.00	30.00	NRP	X	
20-01-400-015	Funk Lane	Hillsboro	Thomas	Boehler	379 South Starr Street		Waggoner	Illinois	62572		12.00	12.00	NRP		
20-01-400-018	266 Rock Lane	Hillsboro	Jean	Snyder	266 Rock Lane		Hillsboro	Illinois	62049	4.99		4.99	NRP	X	
20-01-400-019	259 Rock Lane	Hillsboro	Todd & Alicia	Kelly	8312 North State Route 159		Dorsey	Illinois	62021	9.96		9.96	NRP		X
20-01-400-020	190 Page Lane	Hillsboro	Charles	Page	190 Page Lane		Hillsboro	Illinois	62049	1.26	16.29	17.55	NRP	X	
20-01-400-021	172 Page Lane	Hillsboro	Brian & Edina	Page	P.O. Box 341		Morrisonville	Illinois	62546	2.00		2.00	NRP	X	
20-01-400-022	204 Page Lane	Hillsboro	Charles & Daniel	Page	204 Page Lane		Hillsboro	Illinois	62049	2.00		2.00	NRP	X	
20-12-100-008	Illinois Route 127	Hillsboro	Dennie & Dee	Goedecke	338 Bens Drive		Chatham	Illinois	62629		37.67	37.67	NRP	X	
20-12-100-011	Illinois Route 127	Hillsboro	Roy & Cherlann	Rapien	4292 Illinois Route 127		Hillsboro	Illinois	62049		11.46	11.46	NRP	X	
20-12-100-013	4292 Illinois Route 127	Hillsboro	Roy & Cherlann	Rapien	4292 Illinois Route 127		Hillsboro	Illinois	62049	1.00	12.60	13.60	NRP	X	
20-12-200-002	181 Adams Lane	Hillsboro	Ronald	Cooper	181 Adams Lane		Hillsboro	Illinois	62049	0.38	79.62	80.00	NRP	X	
20-12-200-003	204 Funk Lane	Hillsboro	Charles & Daniel	Page	204 Funk Lane		Hillsboro	Illinois	62049		39.00	39.00	NRP	X	
20-12-200-006	253 Rock Lane	Hillsboro	Norman	Compton	253 Rock Lane		Hillsboro	Illinois	62049	0.51	38.16	38.67	NRP	X	
20-12-300-001	4121 Illinois Route 127	Hillsboro	P & B Trust		4121 Illinois Route 127		Hillsboro	Illinois	62049		39.00	39.00	NRP	X	
20-12-300-005	3538 Illinois Route 127	Hillsboro	Charles & Nancy	McDowell	3538 Illinois Route 127		Hillsboro	Illinois	62049	0.99	9.01	10.00	NRP	X	
20-12-300-011	3570 Illinois Route 127	Hillsboro	Corey	Beatty	502 Pine Street		Hillsboro	Illinois	62049	6.71		6.71	NRP	X	
20-12-300-012	Illinois Route 127	Hillsboro	Rande & Diane	Gibbs	10866 Lake Road		Highland	Illinois	62249		19.79	19.79	NRP	X	
20-12-300-013	4121 Illinois Route 127	Hillsboro	P & B Trust		4121 Illinois Route 127		Hillsboro	Illinois	62049	0.52	39.04	39.56	NRP	X	
20-12-400-001	181 Adams Lane	Hillsboro	Ronald	Cooper	181 Adams Lane		Hillsboro	Illinois	62049		20.00	20.00	NRP		X
20-12-400-002	181 Adams Lane	Hillsboro	Ronald	Cooper	181 Adams Lane		Hillsboro	Illinois	62049		20.00	20.00	NRP		X
20-12-400-003	3127 Illinois Route 127	Hillsboro	Wanda	Bee	3127 Illinois Route 127		Hillsboro	Illinois	62049		40.00	40.00	NRP		X
20-12-400-005	4003 Buckeye Trail	Hillsboro	Earl	Law	4003 Buckeye Trail		Hillsboro	Illinois	62049	0.61	39.39	40.00	NRP		X
20-12-400-006	140 Adams Lane	Hillsboro	Stacey Carroll	c/o Corelogic	1 Corelogic Drive		Westlake	Texas	76262	0.51	19.49	20.00	NRP		X
20-12-400-007	142 Adams Lane	Hillsboro	Gary	Sneed	142 Adams Lane		Hillsboro	Illinois	62049	20.00		20.00	NRP	X	
20-13-100-007	3538 Illinois Route 127	Hillsboro	Charles & Nancy	McDowell	3538 Illinois Route 127		Hillsboro	Illinois	62049		83.78	83.78	NRP	X	

Attachment I.2.A - Surface and Coal Owners Within and Adjacent to Shadow Area

Parcel	Site Address	City	First Name	Last name	Mailing Address	Address 2	City	State	Zip Code	Land Lot (acre)	Farmland (acre)	Deed Total (acre)	Coal Owner*	Inside Shadow Area	Adjacent to Shadow Area
20-13-100-009	3141 Illinois Route 127	Hillsboro	Samual Elizondo	c/o Corelogic	1 Corelogic Drive		Westlake	Texas	76262	0.64	4.65	5.29	NRP	X	
20-13-100-010	Illinois Route 127	Hillsboro	Barbara	Wright	P.O. Box 40		Vandalia	Illinois	62471		21.34	21.34	NRP	X	
20-13-200-002	Illinois Route 127	Hillsboro	Barbara	Wright	P.O. Box 40		Vandalia	Illinois	62471		30.00	30.00	NRP	X	
20-13-200-003	Bear Creek Lane	Hillsboro	Larry	Casarta	2618 Morganfair Lane		Katy	Texas	77450		80.00	80.00	NRP		X
20-13-200-005	3127 Illinois Route 127	Hillsboro	Wanda	Bee	3127 Illinois Route 127		Hillsboro	Illinois	62049	1.00	88.70	89.70	NRP	X	
20-13-300-004	Bear Creek Lane	Donnellson	Barbara	Wright	P.O. Box 40		Vandalia	Illinois	62471		39.45	39.45	NRP	X	
20-13-400-001	Bear Creek Lane	Donnellson	Barbara	Wright	P.O. Box 40		Vandalia	Illinois	62471	0.31	158.59	158.90	NRP		X
21-03-100-002	15034 North 6th Avenue	Coffeen	Robert & Clara	Dale	15034 Noth 6th Avenue		Coffeen	Illinois	62017	0.82		0.82	NRP		X
21-03-100-003	15034 North 6th Avenue	Coffeen	Robert & Clara	Dale	15034 Noth 6th Avenue		Coffeen	Illinois	62017	0.33		0.33	NRP		X
21-03-100-004	15034 North 6th Avenue	Coffeen	Robert & Clara	Dale	15034 Noth 6th Avenue		Coffeen	Illinois	62017	0.33		0.33	NRP		X
21-03-100-005	15010 North 6th Avenue	Coffeen	Mary	Shelbourne	15010 North 6th Avenue		Coffeen	Illinois	62017	0.33		0.33	NRP	X	
21-03-100-007	North 6th Avenue	Coffeen	Terry & Brenda	Young	73 Young Lane		Coffeen	Illinois	62017		22.00	22.00	NRP	X	
21-03-100-008	15010 North 6th Avenue	Coffeen	Mary	Shelbourne	15010 North 6th Avenue		Coffeen	Illinois	62017	0.33		0.33	NRP	X	
21-03-100-009	15034 North 6th Avenue	Coffeen	Robert & Clara	Dale	15034 Noth 6th Avenue		Coffeen	Illinois	62017	0.82		0.82	NRP		X
21-03-100-012	15112 North 6th Avenue	Coffeen	Brooks	Moreland	15112 North 6th Avenue		Coffeen	Illinois	62017	1.56		1.56	NRP	X	
21-03-100-013	15112 North 6th Avenue	Coffeen	Brooks	Moreland	15112 North 6th Avenue		Coffeen	Illinois	62017	0.83		0.83	NRP	X	
21-03-100-014	15138 North 6th Avenue	Coffeen	Kevin & Gena	Lewey	15138 North 6th Avenue		Coffeen	Illinois	62017	1.00		1.00	NRP		X
21-03-100-015	15152 North 6th Avenue	Coffeen	Doris	Graham	15152 North 6th Avenue		Coffeen	Illinois	62017	0.81		0.81	NRP	X	
21-03-100-016	15170 North 6th Avenue	Coffeen	Randy	White	3362 South Spring Street		Springfield	Illinois	62703	4.31		4.31	NRP		X
21-03-100-017	15194 North 6th Avenue	Coffeen	Randy	White	3362 South Spring Street		Springfield	Illinois	62703	2.35		2.35	NRP		X
21-03-300-001	CIPS Trail	Coffeen	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002		311.00	311.00	NRP		X
21-03-300-002	151 Fox Lane	Coffeen	Drury	Emerson	151 Fox Lane		Coffeen	Illinois	62017	1.28	8.72	10.00	NRP	X	
21-04-100-001	North 6th Avenue	Coffeen	Illinois Power Company	c/o Ameren Services	P.O. Box 66149		St. Louis	Missouri	63166	3.30		3.30	NRP		X
21-04-100-002	5264 East 14th Road	Coffeen	Dean	Huber	5264 East 14th Road		Coffeen	Illinois	62017		75.50	75.50	NRP		X
21-04-100-007	14198 North 6th Avenue	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017		17.50	17.50	NRP		X
21-04-100-008	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017	1.35	38.10	39.45	NRP	X	
21-04-100-009	14116 North 6th Avenye	Coffeen	Michael & Cheri	Huber	14116 North 6th Avenue		Coffeen	Illinois	62017	1.50		1.50	NRP	X	
21-04-100-010	North 6th Avenue	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017		14.00	14.00	NRP		X
21-04-200-001	13253 North 6th Avenue	Coffeen	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049		40.00	40.00	NRP	X	
21-04-200-004	Lake Boundary	Coffeen	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002	94.00		94.00	NRP		X
21-04-200-005	14330 North 6th Avenue	Coffeen	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812	3.00		3.00	NRP	X	
21-04-200-007	14358 North 6th Avenue	Coffeen	Bob & Alice	Reynolds	14358 North 6th Avenue		Coffeen	Illinois	62017		47.00	47.00	NRP	X	
21-04-200-008	15010 North 6th Avenue	Coffeen	Mary	Shelbourne	15010 North 6th Avenue		Coffeen	Illinois	62017	1.00		1.00	NRP	X	
21-04-300-003	East 14th Road	Coffeen	Brian	Suhre	8233 Brickyard Hill Road		Worden	Illinois	62097		40.00	40.00	NRP	X	
21-04-300-004	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017		40.00	40.00	NRP	X	
21-04-300-005	6265 East 14th Road	Hillsboro	Stella	Kasten	6265 East 14th Road		Hillsboro	Illinois	62049		40.00	40.00	NRP	X	
21-04-300-006	East 14th Road	Coffeen	Brian	Suhre	8233 Brickyard Hill Road		Worden	Illinois	62097		40.00	40.00	NRP		X
21-04-400-001	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017		70.00	70.00	NRP	X	
21-04-400-002	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017		40.00	40.00	NRP	X	
21-04-400-003	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017		21.00	21.00	NRP	X	
21-04-400-004	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017		13.75	13.75	NRP	X	
21-05-100-003	13253 North 6th Avenue	Hillsboro	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049		16.25	16.25	NRP	X	
21-05-100-004	13253 North 6th Avenue	Hillsboro	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049		16.25	16.25	NRP	X	
21-05-100-005	13214 Flat Avenue	Hillsboro	Mark	Huber	9121 Briarfield Lane		Bunker Hill	Illinois	62014		40.00	40.00	NRP		X
21-05-100-006	North 6th Avenue	Coffeen	Brian, Dacia, & Dean	Brown	12167 North Road		Hillsboro	Illinois	62049		94.25	94.25	NRP		X
21-05-200-001	13253 North 6th Avenue	Hillsboro	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049		39.50	39.50	NRP	X	
21-05-200-002	East 14th Road	Coffeen	Dennis	Dressler	656 Lily Road		Lenzburg	Illinois	62255		39.50	39.50	NRP		X
21-05-200-004	East 14th Road	Coffeen	Dennis	Dressler	656 Lily Road		Lenzburg	Illinois	62255		77.76	77.76	NRP		X
21-05-200-005	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017	1.24		1.24	NRP		X
21-05-300-001	Flat Avenue	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049		40.00	40.00	NRP	X	
21-05-300-003	North 5th Lane	Hillsboro	Bank & Trust		P.O. Box 410		Litchfield	Illinois	62056		75.00	75.00	NRP		X
21-05-300-007	Flat Avenue	Coffeen	Mark	Huber	9121 Briarfield Lane		Bunker Hill	Illinois	62014		38.00	38.00	NRP		X
21-05-300-008	13214 Flat Avenue	Hillsboro	Phyllis	Simonton	13214 Flat Avenue		Coffeen	Illinois	62017	2.00		2.00	NRP	X	
21-05-400-001	13214 Flat Avenue	Coffeen	Mark	Huber	9121 Briarfield Lane		Bunker Hill	Illinois	62014		40.00	40.00	NRP	X	
21-05-400-006	North 5th Lane	Hillsboro	Joyce Brothers	c/o Bank & Trust Company	401 North Madison	P.O. Box 410	Litchfield	Illinois	62056		43.40	43.40	NRP	X	
21-05-400-008	East 14th Road	Coffeen	Dean	Huber	5264 East 14th Road		Coffeen	Illinois	62017		79.52	79.52	NRP		X
21-05-400-009	5073 East 14th Avenue	Coffeen	Bruce	Gucklan	5073 East 14th Road		Coffeen	Illinois	62017	0.48		0.48	NRP	X	
21-05-400-011	North 5th Lane	Hillsboro	Jason Huston	c/o Countrywide Tax Service	P.O. Box 10211		Van Nuys	California	91410	1.60		1.60	NRP		X
21-06-100-003	11400 North 6th Avenue	Hillsboro	Douglas & Brenda	Johnson	11400 North 6th Avenue		Hillsboro	Illinois	62049	3.08		3.08	NRP		X
21-06-100-004	12056 North 6th Avenue	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049	1.59	63.87	65.46	NRP	X	

Attachment I.2.A - Surface and Coal Owners Within and Adjacent to Shadow Area

Parcel	Site Address	City	First Name	Last name	Mailing Address	Address 2	City	State	Zip Code	Land Lot (acre)	Farmland (acre)	Deed Total (acre)	Coal Owner*	Inside Shadow Area	Adjacent to Shadow Area
21-06-100-005	12198 North 6th Avenue	Hillsboro	Roberta	Meyer	12198 North 6th Avenue		Hillsboro	Illinois	62049	1.29	31.96	33.25	NRP		X
21-06-100-006	North 6th Avenue	Hillsboro	Roberta	Meyer	12198 North 6th Avenue		Hillsboro	Illinois	62049		33.25	33.25	NRP	X	
21-06-200-007	North 6th Avenue	Coffeen	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812	0.68	14.68	15.36	NRP	X	
21-06-200-008	North 6th Avenue	Hillsboro	Austin	Meyer	449 Bobwhite Road		Pocahontas	Illinois	62275		11.24	11.24	NRP	X	
21-06-200-009	North 6th Avenue	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049		108.00	108.00	NRP	X	
21-06-300-002	253 Rock Lane	Hillsboro	Norman	Compton	253 Rock Lane		Hillsboro	Illinois	62049		9.00	9.00	NRP	X	
21-06-300-007	Buckeye Trail	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049		58.92	58.92	NRP	X	
21-06-300-008	188 Rock Lane	Hillsboro	Patrick & Lora	Eck	188 Rock Lane		Hillsboro	Illinois	62049	0.56	14.52	15.08	NRP	X	
21-06-300-009	Buckeye Trail	Hillsboro	Patrick	Jarnagin	4441 Buckeye Trail		Hillsboro	Illinois	62049		56.38	56.38	NRP		X
21-06-300-010	4441 Buckeye Trail	Hillsboro	Carrie	Baron	4441 Buckeye Trail		Hillsboro	Illinois	62049	2.55	7.79	10.34	NRP		X
21-06-400-001	4441 Buckeye Trail	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049		40.00	40.00	NRP	X	
21-06-400-002	4441 Buckeye Trail	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049		40.00	40.00	NRP	X	
21-06-400-003	4441 Buckeye Trail	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049		80.00	80.00	NRP	X	
21-07-100-002	4255 Buckeye Trail	Hillsboro	Andrew Stritzel	c/o National Bank	P.O. Box 310		Hillsboro	Illinois	62049	4.76	0.26	5.02	NRP		X
21-07-100-007	Buckeye Trail	Hillsboro	Travis & Aimee	Klump	17135 Illinois Route 185		Coffeen	Illinois	62017		9.40	9.40	NRP		X
21-07-100-008	Buckeye Trail	Hillsboro	Justin & Brandi	Reynolds	1510 South Main Street		Hillsboro	Illinois	62049		5.33	5.33	NRP	X	
21-07-100-009	Buckeye Trail	Hillsboro	Tracy	Dressler	305 Washington Street		Donnellson	Illinois	62019		5.13	5.13	NRP		X
21-07-100-010	Buckeye Trail	Hillsboro	Klump & Atterberry	c/o Phillip Klump	807 Keller Avenue		Hillsboro	Illinois	62049		38.06	38.06	NRP		X
21-07-100-011	Buckeye Trail	Hillsboro	Terri	Mackey	253 Rock Lane		Hillsboro	Illinois	62049		10.01	10.01	NRP		X
21-07-200-002	Buckeye Trail	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049		184.89	184.89	NRP	X	
21-07-300-003	4201 Buckeye Trail	Hillsboro	John & Edna	Balla	4201 Buckeye Trail		Hillsboro	Illinois	62049	11.97		11.97	NRP		X
21-07-300-007	4201 Buckeye Trail	Hillsboro	John & Edna	Balla	4201 Buckeye Trail		Hillsboro	Illinois	62049		15.82	15.82	NRP		X
21-07-300-012	4121 Buckeye Trail	Hillsboro	Michelle Stritzel	c/o National Bank	P.O. Box 310		Hillsboro	Illinois	62049		5.01	5.01	NRP		X
21-07-300-014	Buckeye Trail	Hillsboro	Larry	Casarta	2618 Morganfair Lane		Katy	Texas	77450		35.07	35.07	NRP		X
21-07-300-015	Buckeye Trail	Hillsboro	Donna	Stritzel	13 Johnson Street		Hillsboro	Illinois	62049		104.61	104.61	NRP		X
21-07-400-002	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017		40.00	40.00	NRP		X
21-07-400-003	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017		40.00	40.00	NRP		X
21-07-400-004	4441 Buckeye Trail	Hillsboro	David, Carol, & Nicholas	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019		40.00	40.00	NRP	X	
21-07-400-005	Buckeye Trail	Hillsboro	Kenneth & Lonna	Durbin	16130 East 7th Avenue		Butler	Illinois	62015		80.00	80.00	NRP	X	
21-08-100-001	4441 Buckeye Trail	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049		40.00	40.00	NRP	X	
21-08-100-002	North 5th Lane	Hillsboro	Joyce Brothers	c/o Bank & Trust Company	401 North Madison	P.O. Box 410	Litchfield	Illinois	62056		40.00	40.00	NRP		X
21-08-100-003	North 5th Lane	Hillsboro	Eldon & Gerald Joyce	c/o Bank & Trust Company	401 North Madison	P.O. Box 410	Litchfield	Illinois	62056		40.00	40.00	NRP		X
21-08-100-004	North 5th Lane	Hillsboro	Joyce Brothers	c/o Bank & Trust Company	401 North Madison	P.O. Box 410	Litchfield	Illinois	62056		40.00	40.00	NRP	X	
21-08-200-001	North 5th Lane	Hillsboro	Eldon & Gerald Joyce	c/o Bank & Trust Company	401 North Madison	P.O. Box 410	Litchfield	Illinois	62056		40.00	40.00	NRP		X
21-08-200-002	East 14th Road	Coffeen	Nancy	Blackburn	899 County Road 800 East		Champaign	Illinois	61822		40.00	40.00	NRP	X	
21-08-200-003	East 14th Road	Coffeen	Nancy	Blackburn	899 County Road 800 East		Champaign	Illinois	61822		40.00	40.00	NRP	X	
21-08-200-004	East 14th Road	Coffeen	Nancy	Blackburn	899 County Road 800 East		Champaign	Illinois	61822		40.00	40.00	NRP		x
21-08-300-001	North 4th Avenue	Donnellson	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017		80.00	80.00	NRP		X
21-08-300-002	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017		20.00	20.00	NRP		X
21-08-300-003	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017		20.00	20.00	NRP		X
21-08-300-004	North 4th Avenue	Donnellson	Robert	Elmore	10724 Burlington Lane		Marion	Illinois	62959		40.00	40.00	NRP	X	
21-08-400-001	13295 North 4th Avenue	Donnellson	Roger	Reeves	605 Hickory		Hillsboro	Illinois	62049	0.72	137.78	138.50	NRP	X	
21-08-400-002	4177 East 14th Road	Hillsboro	Nancy	Blackburn	899 County Road 800 East		Champaign	Illinois	61822	0.62	19.38	20.00	NRP		X
21-09-100-001	Mentors Lane	Coffeen	Brian	Suhre	8233 Brickyard Hill Road		Worden	Illinois	62097		40.00	40.00	NRP	X	
21-09-100-002	Mentors Lane	Coffeen	Nancy	Blackburn	899 County Road 800 East		Champaign	Illinois	61822		40.00	40.00	NRP	X	
21-09-100-003	14171 Mentors Lane	Coffeen	Stella	Kasten	6265 East 14th Road		Hillsboro	Illinois	62049		80.00	80.00	NRP	X	
21-09-200-005	14280 Mentors Lane	Coffeen	William & Cleola	Brackett	14280 Mentors Lane		Coffeen	Illinois	62017		71.40	71.40	NRP		X
21-09-200-006	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017			0.00	NRP		X
21-09-200-008	14243 Mentors Lane	Coffeen	Rose	Beard	14243 Mentors Lane		Coffeen	Illinois	62017	0.98		0.98	NRP		X
21-09-200-010	Mentors Lane	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017		9.97	9.97	NRP	X	
21-09-200-011	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017		25.03	25.03	NRP		X
21-09-200-012	Mentors Lane	Coffeen	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002	2.96		2.96	NRP	X	
21-09-300-001	4178 East 14th Road	Coffeen	Nancy	Blackburn	899 County Road 800 East		Champaign	Illinois	61822		60.00	60.00	NRP		X
21-09-300-003	North 4th Avenue	Coffeen	Michael & Paula	Shelton	14089 Ticky Point Trail		Donnellson	Illinois	62019		89.76	89.76	NRP	X	
21-09-300-004	14171 North 4th Avenue	Donnellson	Michael & Paula	Shelton	14089 Ticky Point Trail		Donnellson	Illinois	62019		6.54	6.54	NRP	X	
21-09-400-001	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017		23.00	23.00	NRP	X	
21-09-400-002	Border Coffeen Lake	Coffeen	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002	0.00		0.00	NRP		X
21-09-400-004	14223 North 4th Avenue	Donnellson	Nathan & Christy	Hemken	14223 North 4th Avenue		Donnellson	Illinois	62019		24.10	24.10	NRP		X
21-09-400-005	14223 North 4th Avenue	Donnellson	Nathan & Christy	Hemken	14223 North 4th Avenue		Donnellson	Illinois	62019		7.00	7.00	NRP		X
21-09-400-006	14261 North 4th Avenue	Coffeen	William Sarginson	c/o Jenni Parish	225A South Main Street		Hillsboro	Illinois	62049	3.03		3.03	NRP	X	

Attachment I.2.A - Surface and Coal Owners Within and Adjacent to Shadow Area

Parcel	Site Address	City	First Name	Last name	Mailing Address	Address 2	City	State	Zip Code	Land Lot (acre)	Farmland (acre)	Deed Total (acre)	Coal Owner*	Inside Shadow Area	Adjacent to Shadow Area
21-09-400-009	14261 North 4th Avenue	Donnellson	Stephen	Castleman	P.O. Box 843		Belleville	Illinois	62220	1.97		1.97	NRP		X
21-09-400-012	14305 North 4th Avenue	Coffeen	Joel	Thacker	14305 North 4th Avenue		Donnellson	Illinois	62019		8.54	8.54	NRP	X	
21-09-400-013	15001 North 4th Avenue	Coffeen	Michael & Candace	Ellington	15001 North 4th Avenue		Donnellson	Illinois	62019		23.94	23.94	NRP	X	
21-09-400-014	North 4th Avenue	Coffeen	Joel	Thacker	14305 North 4th Avenue		Donnellson	Illinois	62019	0.66	5.86	6.52	NRP		X
21-10-100-002	Border Coffeen Lake	Coffeen	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002		543.81	543.81	NRP		X
21-10-300-003	North 4th Avenue	Coffeen	Traylor Cemetery	c/o Dorothy White	325 CIPS Trail		Coffeen	Illinois	62017		1.00	1.00	NRP	X	
21-10-300-004	15001 North 4th Avenue	Coffeen	Michael	Ellington	15001 North 4th Avenue		Donnellson	Illinois	62019	6.00		6.00	NRP	X	
21-10-300-005	15025 North 4th Avenue	Coffeen	William & Deborah	Withers	15025 North 4th Avenue		Coffeen	Illinois	62017	7.00		7.00	NRP		X
21-15-100-001	15020 North 4th Avenue	Coffeen	Joseph & Nancy	Blasko	14392 North 4th Avenue		Donnellson	Illinois	62019		18.64	18.64	NRP		X
21-15-200-001	Border Coffeen Lake	Coffeen	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002	554.00		554.00	Partial	X	
21-16-100-001	14092 North 4th Avenue	Donnellson	Mary Beth Wolf	c/o Sue Lehr	P.O. Box 161		Ramsey	Illinois	62080		160.00	160.00	NRP	X	
21-16-200-003	Walnut Grove Road	Donnellson	Harriet	Gibson	3178 Buckeye Trail		Donnellson	Illinois	62019		62.88	62.88	No	X	
21-16-200-005	14392 North 4th Avenue	Coffeen	Joseph & Nancy	Blasko	14392 North 4th Avenue		Donnellson	Illinois	62019	0.75	4.25	5.00	NRP		X
21-16-200-007	North 4th Avenue	Coffeen	Monroe	Reynolds	14304 North 4th Avenue		Donnellson	Illinois	62019		20.00	20.00	NRP	X	
21-16-200-008	North 4 Avenue	Coffeen	Robert	Coleman	1407 East Clovervield		Greenville	Illinois	62246		40.00	40.00	NRP		X
21-16-200-009	14300 North 4th Avenue	Coffeen	Linda	Mathena	14300 North 4th Avenue		Donnellson	Illinois	62019		15.00	15.00	NRP		X
21-16-300-001	Arrow Trail	Donnellson	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019		80.00	80.00	NRP	X	
21-16-300-002	3095 Walnut Grove Road	Donnellson	Michael & Paula	Shelton	14089 Ticky Point Trail		Donnellson	Illinois	62019		80.00	80.00	NRP	X	
21-16-400-003	3176 Walnut Grove Road	Donnellson	Don & Alta	Betoche	3176 Walnut Grove Road		Donnellson	Illinois	62019		15.53	15.53	NRP		X
21-16-400-005	Walnut Grove Road	Donnellson	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002	129.00		129.00	NRP		X
21-16-400-007	Border Coffeen Lake	Donnellson	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002	0.19		0.19	No	X	
21-16-400-009	3176 Walnut Grove Road	Donnellson	Don & Alta	Betoche	3176 Walnut Grove Road		Donnellson	Illinois	62019	2.42		2.42	No		X
21-17-100-001	North 4th Avenue	Donnellson	David, Carol, & Nicholas	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019		80.00	80.00	NRP	X	
21-17-100-003	3178 Buckeye Trail	Donnellson	Harriet	Gibson	3178 Buckeye Trail		Donnellson	Illinois	62019		155.80	155.80	NRP	X	
21-17-200-002	Arrow Trail	Donnellson	Mary Beth Wolf	c/o Sue Lehr	P.O. Box 161		Ramsey	Illinois	62080		80.00	80.00	NRP		X
21-17-200-003	Arrow Trail	Donnellson	Michael & Paula	Shelton	14089 Ticky Point Trail		Donnellson	Illinois	62019		25.80	25.80	NRP	X	
21-17-200-004	3289 Arrow Trail	Donnellson	Micheal & Paula	Shelton	14089 Ticky Point Trail		Donnellson	Illinois	62019		49.60	49.60	NRP	X	
21-17-400-002	Arrow Trail	Donnellson	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019		20.00	20.00	NRP	X	
21-17-400-003	Arrow Trail	Donnellson	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019		60.00	60.00	NRP	X	
21-17-400-004	14383 East 14th Road	Irving	David	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019		60.00	60.00	NRP	X	
21-17-400-005	North 4th Avenue	Donnellson	Michael & Paula	Shelton	14089 Ticky Point Trail		Donnellson	Illinois	62019		22.50	22.50	NRP	X	
21-18-100-004			Tammy Huffman	c/o Corelogic	1 Corelogic Drive		Westlake	Texas	76262	10.26		10.26	NRP		X
21-18-100-005	North 4th Avenue	Hillsboro	Larry	Casarta	2618 Morganfair Lane		Katy	Texas	77450		46.49	46.49	NRP		X
21-18-200-006	3178 Buckeye Trail	Donnellson	Harriet	Gibson	3178 Buckeye Trail		Donnellson	Illinois	62019		60.00	60.00	NRP	X	
21-18-200-009	North 4th Avenue	Donnellson	David, Carol, & Nicholas	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019		20.00	20.00	NRP	X	
21-18-200-010	North 4th Avenue	Hillsboro	Ben	Kenny	13001 North 6th Avenue		Hillsboro	Illinois	62049		59.51	59.51	NRP		X
21-18-200-011	Buckeye Trail	Donnellson	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019		30.50	30.50	NRP	X	
21-18-200-012	3358 Buckeye Trail	Donnellson	Craig	Foster	3358 Buckeye Trail		Donnellson	Illinois	62019	0.43	9.07	9.50	NRP		X
21-18-300-001	12316 North 3rd Avenue	Donnellson	Scott	Schluckebier	12316 North 3rd Avenue		Donnellson	Illinois	62019		75.00	75.00	NRP	X	
21-18-300-003	12227 North 3rd Avenue	Donnellson	Mildred	Balla	12227 North 3rd Avenue		Donnellson	Illinois	62019		30.00	30.00	NRP		X
21-18-400-005	3177 Buckeye Trail	Donnellson	Harriet	Gibson	3178 Buckeye Trail		Donnellson	Illinois	62019	1.05	162.45	163.50	NRP	X	

*Minerals owned by Natural Resource Partners, L.P.

ATTACHMENT I.6
OWNERSHIP AND CONTROL INFORMATION

BAILEY GLASSER LLP

209 Capitol Street
Charleston, WV 25301
Tel: 304.345.6555
Fax: 304.342.1110

John C. Ailes, Investigator
jailes@baileyglasser.com

MEMORANDUM

TO: **James Schafer, Permit Coordinator**
Land Reclamation Division
Illinois Department of Natural Resources

FROM: **John C. Ailes, Investigator**

DATE: **September 28, 2015**

RE: **Ownership & Control**
Updated Information - Cline Resource and Development Company

Please allow this Memo to serve as a continued update of all ownership and control information for the entities listed in this Memo.

1. Chris Cline
   3801 PGA Boulevard, Suite 903
   Palm Beach Gardens, FL 33410

2. Cline Resource and Development Company, a West Virginia corporation 430 Harper Park Drive, Suite A
   Beckley, WV 25801

   Officers:

   John Dickinson, President
   Donald R. Holcomb, Vice President, Secretary and Chief Financial Officer
   (End Date effective March 31, 2013)
   Robert Keith Varney, Vice President, Secretary and Treasurer
   (Begin Date effective March 12, 2015)
   Chris Cline, Director

3. Insight Resource, LLC, a Nevada limited liability company 3801 PGA Boulevard, Suite 903
   Palm Beach Gardens, FL 33410

Officers:

John F. Dickinson, II, President (Effective August 10, 2012)
Donald R. Holcomb, Chief Financial Officer and Vice President
(Effective August 10, 2012 - End Date effective March 31, 2013)

4. FRLP 2008 No. 2 LLC
3801 PGA Boulevard, Suite 903 Palm
Beach Gardens, FL 33410

Cline Resource and Development Company, Manager

5. Foresight Reserves, LP
3801 PGA Boulevard, Suite 903 Palm
Beach Gardens, FL 33410

Insight Resource, LLC is the General Partner

Board of Managers:

Christopher Cline
E. Bartow Jones
(End date effective January 30, 2015)
John Dickinson

6. Foresight Energy GP LLC
Metropolitan Square Building 211
North Broadway, Suite 2600 St.
Louis, MO 63102

Executive Officers and Directors:

Christopher Cline, Chairman of the Board of Directors and Principal Strategy Advisor
Michael J. Beyer, Director and President & Chief Executive Officer
(End date effective May 30, 2015)
Robert D. Moore, President & Chief Executive Officer
(Begin date effective May 31, 2015)
John F. Dickinson – Director
Hunter Harrison – Director
(End date effective September 10, 2015)
G. Nicholas Casey - Director
(Begin date effective September 10, 2015)
Bartow Jones – Director
(End date effective January 30, 2015)
Oscar A. Martinez – Senior Vice President – Chief Financial Officer

Christopher N. Moravec – Senior Vice President
(End date effective June 12, 2015)
Rashda M. Buttar – Senior Vice President – General Counsel & Corporate Secretary
Daniel S. Hermann, Director
Bennett K. Hatfield, Director
(Begin date effective June 8, 2015)

7. Foresight Energy LP
Metropolitan Square Building
211 North Broadway, Suite 2600
St. Louis, MO 63102

Foresight Energy GP LLC is the General Partner

8. Foresight Energy LLC
Metropolitan Square Building
211 North Broadway, Suite 2600
St. Louis, MO 63102

Foresight Energy LP, Member/Manager

Officers:

Michael J. Beyer, President and Chief Executive Officer
(End date effective May 30, 2015)
Robert D. Moore, President & Chief Executive Officer
(Begin date effective May 31, 2015)
Oscar Martinez, Senior Vice President and Chief Financial Officer
Christopher Moravec, Senior Vice President
(End date effective June 12, 2015)
Homer Drexel Short Jr., Chief Operating Officer
(End date as of February 1, 2014)
Rashda Buttar, Senior Vice President, General Counsel and Corporate Secretary

9. Foresight Energy Services LLC
Metropolitan Square Building 211
North Broadway, Suite 2600 St.
Louis, MO 63102

Foresight Energy LLC, Manager

Officers:

Michael J. Beyer, President and Chief Executive Officer
(End date effective May 30, 2015)

Robert D. Moore, President & Chief Executive Officer
(Begin date effective May 31, 2015)
Oscar Martinez, Senior Vice President and Chief Financial Officer
Christopher Moravec, Senior Vice President
(End date effective June 12, 2015)
Homer Drexel Short Jr., Chief Operating Officer
(End date as of February 1, 2014)
Rashda Buttar, Senior Vice President, General Counsel and Corporate Secretary

10. Foresight Management, LLC
3801 PGA Boulevard, #903
Palm Beach, FL 33410

Cline Resource and Development Company, Manager

Officers:

Homer Drexel Short Jr., Jr., Chief Operating Officer (End date as of August 16, 2011)
John F. Dickinson, II, President (Effective August 10, 2012)
Donald R. Holcomb, Vice President and Chief Financial Officer
(Effective August 10, 2012 - End Date effective March 31, 2013)

11. Gatling LLC
P.O. Box 960
New Haven, WV 25265

Cline Resource and Development Company, Manager

Officers:

Donald Holcomb, Secretary/Treasurer (End Date effective March 31, 2013)
Barry Elliott, VP left the organization with an end date of June 18, 2006

12. Gatling Ohio LLC
P.O. Box 960
New Haven, WV 25265

Cline Resource and Development Company, Manager

13. Hillsboro Energy LLC
Metropolitan Square Building
211 North Broadway, Suite 2600
St. Louis, MO 63102

- and –

12192 Filmore Trail
Hillsboro, Illinois 62049

Foresight Energy Services LLC, Manager

Officers:

Michael J. Beyer, President and Chief Executive Officer
(End date effective May 30, 2015)
Robert D. Moore, President & Chief Executive Officer
(Begin date effective May 31, 2015)
Oscar Martinez, Senior Vice President and Chief Financial Officer
Christopher Moravec, Senior Vice President
(End date effective June 12, 2015)
Homer Drexel Short Jr., Chief Operating Officer
(End date as of February 1, 2014)
Rashda Buttar, Senior Vice President, General Counsel and Corporate Secretary

14. Lower Wilgat, LLC
3801 PGA Boulevard, #903
Palm Beach, FL 33410

Cline Resource and Development Company, Manager

15. Macoupin Energy LLC
Metropolitan Square Building
211 North Broadway, Suite 2600
St. Louis, MO 63102

- and –

14300 Brushy Mound Road
Carlinville, Illinois 62626

Foresight Energy Services LLC, Manager
(Begin date of January 31, 2014)

Officers:

Michael J. Beyer, President and Chief Executive Officer
(End date effective May 30, 2015)
Robert D. Moore, President & Chief Executive Officer
(Begin date effective May 31, 2015)
Oscar Martinez, Senior Vice President and Chief Financial Officer

Christopher Moravec, Senior Vice President
(End date effective June 12, 2015)
Homer Drexel Short Jr., Chief Operating Officer
(End date as of February 1, 2014)
Rashda Buttar, Senior Vice President, General Counsel and Corporate Secretary

*Please note that Macoupin Energy LLC amended its Operating Agreement on January 31, 2014 to replace the Board of Managers (identified previously as Michael J. Beyer, Chief Executive Officer; Oscar A. Martinez, Executive Vice President for Finance; Homer Drexel Short Jr., Chief Operating Officer; and Tony Harris, Chief Financial Officer) with Foresight Energy Services LLC, establishing an end date for the Board of Managers on January 31, 2014.

16. Meigs Point Dock LLC
P.O. Box 960
New Haven, WV 25265

Cline Resource and Development Company, Manager

17. Middle Wilgat, LLC
3801 PGA Boulevard, #903 Palm
Beach, FL 33410

Cline Resource and Development Company, Manager

18. Sugar Camp Energy, LLC
Metropolitan Square Building 211
North Broadway, Suite 2600 St.
Louis, MO 63102

- and –

11351 N. Thompsonville Road
Macedonia, Illinois 62860

Foresight Energy Services LLC, Manager

Officers:

Michael J. Beyer, President and Chief Executive Officer
(End date effective May 30, 2015)
Robert D. Moore, President & Chief Executive Officer
(Begin date effective May 31, 2015)
Oscar Martinez, Senior Vice President and Chief Financial Officer
Christopher Moravec, Senior Vice President
(End date effective June 12, 2015)

Homer Drexel Short Jr., Chief Operating Officer
(End date as of February 1, 2014)
Rashda Buttar, Senior Vice President, General Counsel and Corporate Secretary

19. Williamson Energy, LLC
Metropolitan Square Building
211 North Broadway, Suite 2600
St. Louis, MO 63102

- and –

16468 Liberty School Road
Marion, Illinois 62959

Foresight Energy Services LLC, Manager

Officers:

Michael J. Beyer, President and Chief Executive Officer
(End date effective May 30, 2015)
Robert D. Moore, President & Chief Executive Officer
(Begin date effective May 31, 2015)
Oscar Martinez, Senior Vice President and Chief Financial Officer
Christopher Moravec, Senior Vice President
(End date effective June 12, 2015)
Homer Drexel Short Jr., Chief Operating Officer
(End date as of February 1, 2014)
Rashda Buttar, Senior Vice President, General Counsel and Corporate Secretary

Foresight Reserves, LP Affiliate Entities

1. Foresight Management, LLC

Cline Resource and Development Company, Manager

Officers:

Homer Drexel Short Jr., Chief Operating Officer (End date of August 16, 2011)
John F. Dickinson, II, President (Effective August 10, 2012)
Donald R. Holcomb, Vice President and Chief Financial Officer
(Effective August 10, 2012 - End Date effective March 31, 2013)

Permits: none

Violation: none

2. Akin Energy, LLC

   Foresight Energy Services LLC, Manager

   Because this entity is not a permit-holding entity, please establish an end date as of April 8, 2015.

FRLP 2008 No. 2 LLC Affiliate Entities

1. Middle Wilgat LLC

   Cline Resource and Development Company, Manager

   Permits: none

   Violations: none

2. Lower Wilgat, LLC

   Cline Resource and Development Company, Manager

   Permits: none

   Violations: none

3. Gatling Ohio LLC

   Cline Resource and Development Company, Manager

   Permits:

   - D-2317 Ohio

   Violations:

   - Violation # 19879 issued September 29, 2009 abated January 12, 2010 affected areas outside of permit
   - Violation #28310 issued May 3, 2010 abated August 23, 2011 affected areas outside of permit
   - Violation #29308 issued January 25, 2012 abated February 3, 2012 breached perimeter diversion

4. Gatling LLC

Cline Resource and Development Company, Manager

Permits:

- O-3019-05 WV
- U-3016-05 WV
- O-3013-06 WV

Violations:

- O-3019-05 #1 - Issued April 11, 2006 - abated March 5, 2007 permit conditions
- O-3019-05 #2 - Issued March 10, 2010 - abated March 23, 2010 effluent limits
- U-3016-05 #1 - Issued March 21, 2007 - abated April 5, 2007 Blaster certification
- U-3016-05 #2 - Issued July 20, 2007 - abated July 25, 2007 fly rock
- U-3016-05 #3 - Issued September 28, 2007 - abated October 12, 2007 Fees
- O-3013-06 #1 – Issued August 14, 2014 – Failed to properly prepare and vegetate disturbed area – extended – abated
- U-3016-05 #4 – Issued December 9, 2014 – Failed to submit discharge monitoring reports – abated

5. Meigs Point Dock LLC

Cline Resource and Development Company, Manager

Permits:

- D-2323 Ohio

Violations: None

Foresight Energy LLC Entities

1. Foresight Energy LLC

Foresight Management LLC, Manager Officers:

Michael J. Beyer, President and Chief Executive Officer
(End date effective May 30, 2015)
Robert D. Moore, President & Chief Executive Officer
(Begin date effective May 31, 2015)
Oscar Martinez, Senior Vice President and Chief Financial Officer

Christopher Moravec, Senior Vice President
(End date effective June 12, 2015)
Homer Drexel Short Jr., Chief Operating Officer
(End date as of February 1, 2014)
Rashda Buttar, Senior Vice President, General Counsel and Corporate Secretary

Permits: none

Violations: none

2. Foresight Energy Services LLC

Foresight Energy LLC, Manager

Officers:

Michael J. Beyer, President and Chief Executive Officer
(End date effective May 30, 2015)
Robert D. Moore, President & Chief Executive Officer
(Begin date effective May 31, 2015)
Oscar Martinez, Senior Vice President and Chief Financial Officer
Christopher Moravec, Senior Vice President
(End date effective June 12, 2015)
Homer Drexel Short Jr., Chief Operating Officer
(End date as of February 1, 2014)
Rashda Buttar, Senior Vice President, General Counsel and Corporate Secretary

Permits: none

Violations: none

3. Hillsboro Energy LLC

Foresight Energy Services LLC, Manager

Officers:

Michael J. Beyer, President and Chief Executive Officer
(End date effective May 30, 2015)
Robert D. Moore, President & Chief Executive Officer
(Begin date effective May 31, 2015)
Oscar Martinez, Senior Vice President and Chief Financial Officer
Christopher Moravec, Senior Vice President
(End date effective June 12, 2015)
Homer Drexel Short Jr., Chief Operating Officer
(End date as of February 1, 2014)

Rashda Buttar, Senior Vice President, General Counsel and Corporate Secretary

Permits:

- Permit 399 –Illinois

Violations:

IDNR –

- 38-04-09 issued September 14, 2009 failed to follow approved mining plan – abated.
- 38-04-11 issued February 10, 2011 failed to follow approved mining plan – abated.
- 38-05-11 issued February 10, 2011 failed to report impoundment exam report – abated.
- 38-06-11 issued February 10, 2011 failed to complete field density testing – abated.
- 38-03-11 issued February 10, 2011 failed to maintain ditch 7b – abated.
- 38-12-11 issued June 30, 2011 failed to construct and maintain sediment control – abated.
- 34-01-2013 issued February 27, 2013 – failure to follow approved plan – clean coal stockpile expanded beyond approved protective base – abated on April 18, 2013.
- 38-07-13 issued November 1, 2013 – failed to report surface water discharge excursions within five days of receiving analytical results – abated on November 18, 2013.
- 38-01-2014 issued February 21, 2014 – failure to file renewal application within time frame required by the regulations – application submitted; no additional abatement measures required.
- 38-02-2014 issued April 28, 2014 – failure to follow approved plan, failure to protect topsoil from contamination and route all drainage to a sediment pond – abated on May 30, 2014.
- 68-1-2014 issued August 5, 2014 for failure to pass drainage through a sediment pond – abated December 19, 2014.
- 68-2-2014 issued August 5, 2014 for failure to remove topsoil prior to disturbance – abated December 19, 2014.
- 38-03-14 – issued August 28, 2014 for discharging water in excess of NPDES limits for chlorides and sulfates – corrective action was taken; abated October 29, 2014.
- 38-04-14 – issued on September 12, 2014 for discharging water in excess of NPDES limits for chlorides and sulfates – corrective action was taken; abated October 3, 2014.

IEPA –

- VN W-2010-30248 – failed to submit DMR's at the required frequency – CCA submitted and frequency being maintained.
- W-2014-50161 – discharge of contaminants, offensive conditions, unauthorized discharge, creating a water pollution hazard, failure to apply for a construction permit and failure to comply with NPDES permit – all water based issues have been corrected. CCA approved on January 12, 2015.
- A-2014-00319 – issued January 14, 2015 – violations of permit conditions and failure to apply for and obtain construction permit to allow for modification of crushing and screening operations – CCA approved on April 27, 2015.

4. Macoupin Energy LLC
Foresight Energy Services LLC, Manager

Permits:

- Permit #56 Illinois
- Permit #209 Illinois
- Permit #265 Illinois
- Permit #291 Illinois
- Permit # 302 Illinois
- Permit # 419 Illinois

Violations:

IDNR –

- 38-03-12 issued April 16, 2012 failed to file renewal application public notice within the timeframe to conduct a hearing and allow for issuance of renewal decision – abated
- 38-05-12 issued July 2, 2012 failed to conduct non-MSHA quarterly exam for sediment pond 003 – abated.
- 38-06-13 issued July 1, 2013 for failure to conduct surface coal mining and reclamation operation as described in the approved application. The operator installed an access road on the permit area without obtaining approval from the Department. Violation is abated, no penalty assessed.

IEPA –

- VN W-2011-00040 – exceed ground water standards – CCA approved September 12, 2011

5. Sugar Camp Energy LLC

Foresight Energy Services LLC, Manager

Officers:

Michael J. Beyer, President and Chief Executive Officer
(End date effective May 30, 2015)
Robert D. Moore, President & Chief Executive Officer
(Begin date effective May 31, 2015)
Oscar Martinez, Senior Vice President and Chief Financial Officer
Christopher Moravec, Senior Vice President
(End date effective June 12, 2015)
Homer Drexel Short Jr., Chief Operating Officer
(End date as of February 1, 2014)
Rashda Buttar, Senior Vice President, General Counsel and Corporate Secretary

Permits:

- Permit #382 Illinois

Violations:

IDNR -

- 19-01-09 – issued April 27, 2009 failed to construct siltation structure prior to disturbance – abated.
- 19-02-09 – issued June 2, 2009 failed to follow approved operations plan – abated.
- 57-02-11 – issued July 27, 2011 failed to notify IDNR of non-compliant surface water samples – abated.
- 57-03-11 – issued August 25, 2011 failed to follow approved plan – abated.
- 19-1-11 – issued March 9, 2011 failed to comply with required surface water sampling parameters –abated.
- 19-2-11 – issued March 9, 2011 failed to comply with required ground water sampling parameters – abated.
- 57-01-13 – issued March 5, 2013 – discharging water from Outfall 008 with a chloride excursion of 874.6 mg/L – abated.
- 57-3-13 – issued July 25, 2013 – failure to notify Department of noncompliance surface water sample with five day reporting period. Required letter submitted. Abated August 31, 2013.
- 57-02-14 – issued on July 9, 2014 for failure to follow approved plan, placement of coal slurry in experimental Geotubes in an unapproved location – abated on August 1, 2014.
- 57-04-14 – issued October 23, 2014. Abated December 18, 2014.

IEPA –

- VN: W-2013-50008 issued April 25, 2013 – exceeding effluent limits and unpermitted mixing, dilution and discharge –CCA approved July 8, 2014.
- VN: W-2013-50133 issued April 30, 2013 – exceeding effluent limits – CCA approved July 8, 2014.
- VN: W-2014-50014 issued March 14, 2014 - violation of Chloride water quality standards on September 18, 2013 and November 26, 2013 –CCA approved July 8, 2014.
- VN: A-2014-00284 issued July 31, 2014 – failure to submit an Annual Emissions Report for calendar year 2013 – CCA accepted November 7, 2014.
- VN: M-2014-02002 issued October 23, 2014 – failure to comply with effluent conditions of NPDES permit, discharge of contaminants and offensive conditions – CCA approved March 24, 2015.

6. Williamson Energy LLC

Foresight Energy Services LLC, Manager

Officers:

Michael J. Beyer, President and Chief Executive Officer
(End date effective May 30, 2015)
Robert D. Moore, President & Chief Executive Officer
(Begin date effective May 31, 2015)
Oscar Martinez, Senior Vice President and Chief Financial Officer
Christopher Moravec, Senior Vice President
(End date effective June 12, 2015)
Homer Drexel Short Jr., Chief Operating Officer
(End date as of February 1, 2014)
Rashda Buttar, Senior Vice President, General Counsel and Corporate Secretary

Permits:

- Permit # 375

Violations:

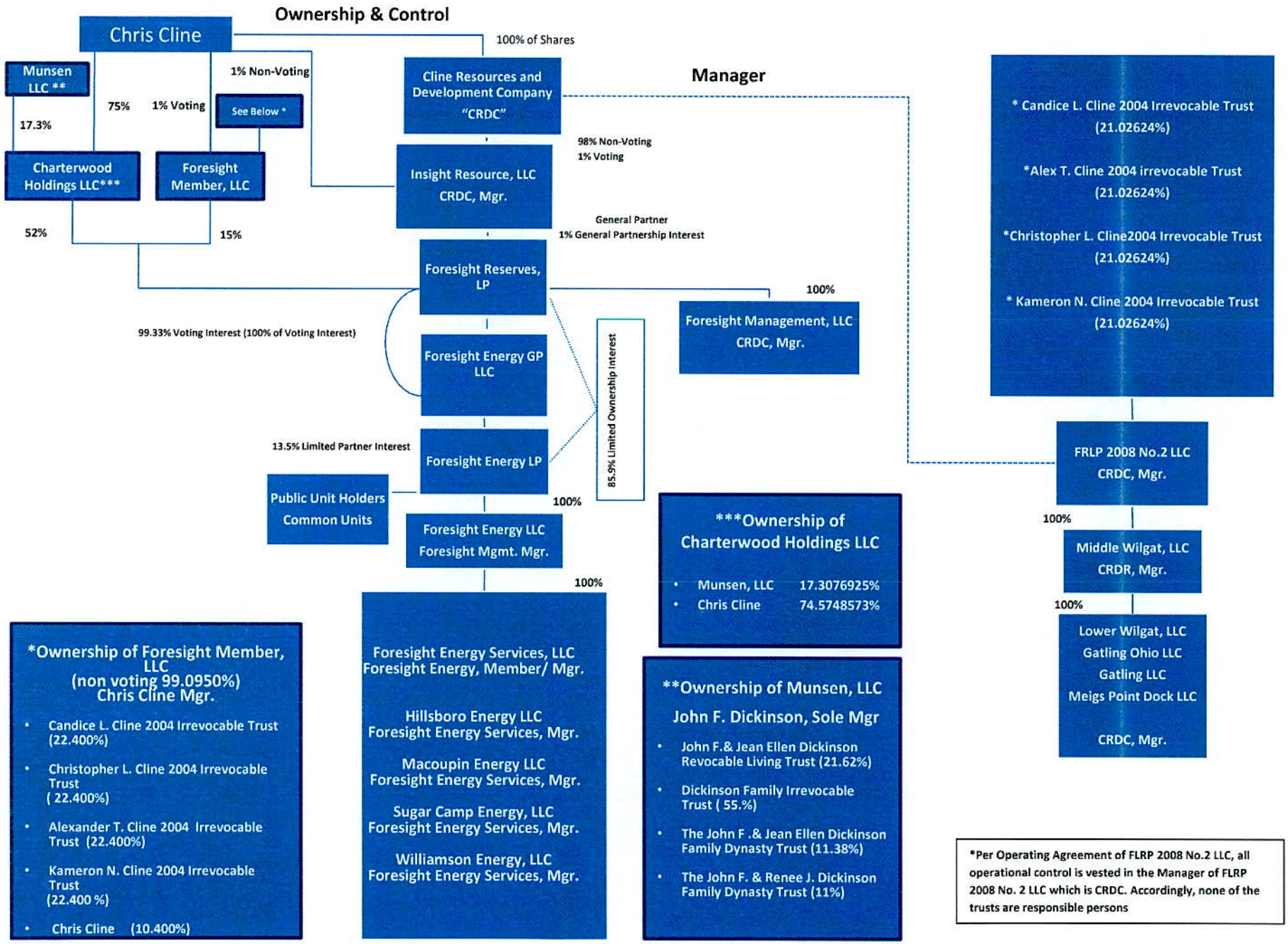
IDNR –

- 26-1-09 issued April 3, 2009 failed to follow approve plan – abated.
- 26-2-09 issued April 8, 2009 failed to submit fourth quarter subsidence control plan report – abated.

- 26-3-09 issued April 17, 2009 failed to provide survey for buildings greater than 40 years old – abated.
- 28-01-09 issued September 9, 2009 drainage leaving permit without passing through a sediment control structure – abated.
- 47-2-10 issued March 9, 2010 disturbed within 100 feet of cemetery – abated.
- 47-5-10 issued May 13, 2010 failed to maintain freeboard in sediment basin – abated.
- 47-4-10 issued May 13, 2010 discharge from disturbed area did not pass through a siltation structure before leaving the permit – abated.
- 47-6-10 issued November 8, 2010 surface drainage flowing off permit without reporting to a sediment control structure – abated.
- 47-2-11 issued April 27, 2011 petroleum based contaminant observed on water surface in sediment basin 004 – abated.
- 43-3-11 issued April 27, 2011 failed to maintain adequate freeboard in a sediment basin – abated.
- 47-06-13 issued June 12, 2013 failed to submit site specific minimization of damage to structures plan – abated.
- 62-1-14 issued March 20, 2014 for failure to report discharge excursions to the Department and failure to submit DMR's and groundwater reports for the 3rd and 4th quarters of 2013 – abated.
- 62-2-14 issued May 1, 2014 for failure to report a non-compliant discharge – abated.

IEPA –

- A-2014-00285 issued July 31, 2014 for failure to submit an Annual Emissions Report ("AER") to the Illinois Environmental Protection Agency for calendar year 2013 – AER submitted on August 29, 2014. CCA letter returned October 15, 2014.


Ownership & Control
Chris Cline
100% of Shares
Munsen LLC **
1% Non-Voting
75%
1% Voting
See Below *
17.3%
Cline Resources and Development Company "CRDC"
Manager
98% Non-Voting
1% Voting
Charterwood Holdings LLC***
Foresight Member, LLC
Insight Resource, LLC
CRDC, Mgr.
52%
15%
General Partner
1% General Partnership Interest
Foresight Reserves, LP
100%
Foresight Management, LLC
CRDC, Mgr.
99.33% Voting Interest (100% of Voting Interest)
Foresight Energy GP LLC
85.9% Limited Ownership Interest
13.5% Limited Partner Interest
Foresight Energy LP
Public Unit Holders
Common Units
100%
Foresight Energy LLC
Foresight Mgmt. Mgr.
100%
Foresight Energy Services, LLC
Foresight Energy, Member/ Mgr.
Hillsboro Energy LLC
Foresight Energy Services, Mgr.
Macoupin Energy LLC
Foresight Energy Services, Mgr.
Sugar Camp Energy, LLC
Foresight Energy Services, Mgr.
Williamson Energy, LLC
Foresight Energy Services, Mgr.
*Ownership of Foresight Member, LLC
(non voting 99.0950%)
Chris Cline Mgr.
Candice L. Cline 2004 Irrevocable Trust (22.400%)
Christopher L. Cline 2004 Irrevocable Trust (22.400%)
Alexander T. Cline 2004 Irrevocable Trust (22.400%)
Kameron N. Cline 2004 Irrevocable Trust (22.400 %)
Chris Cline (10.400%)
***Ownership of Charterwood Holdings LLC
Munsen, LLC 17.3076925%
Chris Cline 74.5748573%
**Ownership of Munsen, LLC
John F. Dickinson, Sole Mgr
John F.& Jean Ellen Dickinson Revocable Living Trust (21.62%)
Dickinson Family Irrevocable Trust (55.%)
The John F .& Jean Ellen Dickinson Family Dynasty Trust (11.38%)
The John F. & Renee J. Dickinson Family Dynasty Trust (11%)
* Candice L. Cline 2004 Irrevocable Trust (21.02624%)
*Alex T. Cline 2004 irrevocable Trust (21.02624%)
*Christopher L. Cline2004 Irrevocable Trust (21.02624%)
* Kameron N. Cline 2004 Irrevocable Trust (21.02624%)
FRLP 2008 No.2 LLC
CRDC, Mgr.
100%
Middle Wilgat, LLC
CRDR, Mgr.
100%
Lower Wilgat, LLC
Gatling Ohio LLC
Gatling LLC
Meigs Point Dock LLC
CRDC, Mgr.
*Per Operating Agreement of FLRP 2008 No.2 LLC, all operational control is vested in the Manager of FLRP 2008 No. 2 LLC which is CRDC. Accordingly, none of the trusts are responsible persons

ATTACHMENT I.10.A
MINING AFFIDAVITS

Attachment I.10.A

(I) (~~We~~) **Mark Cornell**
(Individual or Individuals)

under penalties of perjury declare on behalf of the applicant, **Hillsboro Energy, LLC** that said applicant has valid documents which bestow upon the applicant a legal right to enter and commence surface coal mining and reclamation operations upon lands contained in the proposed permit area, and the shadow area, and such legal right is not in any way the subject of pending court litigation.

Dated this 16 day of September, 20 15.

Mark Cornell — Signature

Authorized Person — Title

Sworn to and subscribed before me
this 16th day of September, 20 15.

Monica S. Reiher
Notary Public

My Commission Expires: 12-7-15

OFFICIAL SEAL
Monica S. Reiher
Notary Public, State of Illinois
COMMISSION #759127
My Commission Expires 12/07/2015

PLANNED SUBSIDENCE AFFIDAVIT
(Required by 62 Ill. Adm. Code 1778.15(f))

I, Mark Cornell, under penalties of perjury, declare on behalf of the applicant, Hillsboro Energy, LLC, that said applicant has or will possess, prior to mining, each particular parcel documents which bestow upon the applicant a legal right to conduct planned subsidence coal mining and reclamation operations within the approved and proposed areas of planned subsidence. Documents in support of granting the rights herein claimed by the applicant will be provided to the Department upon request.

Date 9-16-2015

Signature Mark Cornell Title Authorized Person

Sworn to and subscribed before me

this 16th day of September, 2015.

Monica S. Reiher
Notary Public

My Commission Expires: 12-7-15

OFFICIAL SEAL
Monica S. Reiher
Notary Public, State of Illinois
COMMISSION #759127
My Commission Expires 12/07/2015

UNDERGROUND MINING AFFIDAVIT
(Required by 62 Ill. Adm. Code 1778.15(f))

I, Mark Cornell, under penalties of perjury, declare on behalf of the applicant, Hillsboro Energy, LLC, that said applicant has or will possess, prior to mining each particular parcel, documents which bestow upon the applicant all necessary rights to conduct underground mining operations within the approved and proposed shadow area. Documents in support of granting the rights herein claimed by the applicant will be provided to the Department upon request.

Date 9-16-2015

Signature Mark Cornell Title Authorized Person

Sworn to and subscribed before me

this 16th day of September, 20 15

Monica S. Reiher
Notary Public

My Commission Expires: 12-7-15

OFFICIAL SEAL
Monica S. Reiher
Notary Public, State of Illinois
COMMISSION #759127
My Commission Expires 12/07/2015

RIGHT OF ENTRY AFFIDAVIT
(Required by 62 Ill. Adm. Code 1778.15(f))

I, Mark Cornell, under penalties of perjury, declare on behalf of the applicant, Hillsboro Energy, LLC, that said applicant has or will possess, prior to planned subsidence impacting drainage, documents which bestow upon the applicant a legal right and all regulatory approvals to enter upon all surface property with the purpose to correct subsidence impacts to said drainage. Documents in support of granting the rights herein claimed by the applicant will be provided to the Department upon request.

Date 9-16-2015

Signature Mark Cornell Title Authorized Person

Sworn to and subscribed before me

this 16th day of September, 20 15.

Monica S. Reiher
Notary Public

My Commission Expires: 12-7-15

OFFICIAL SEAL
Monica S. Reiher
Notary Public, State of Illinois
COMMISSION #759127
My Commission Expires 12/07/2015

ATTACHMENT I.10.B
ENGINEERING CERTIFICATION

ATTACHMENT I.10.B

ENGINEERING CERTIFICATION

I hereby certify the engineering design used in preparation of this application, attachments, and supplements was done by me or under my direct supervision.

I further certify to the best of my knowledge all such design is in accordance with all applicable local, state and federal laws, rules and regulations. I have placed an "X" in the box below if that item is relevant.

	Whereas the Reclamation Plan calls for an alternative land use, I also certify the plans to conform to applicable accepted standards for adequate land stability, drainage, vegetative cover, and aesthetic design appropriate for the post-mining use of the site.
	Whereas the operation proposes disposal of spoil or waste materials in areas other than mining workings or excavations, I also certify such fills are designed in accordance with recognized professional standards and all applicable laws.
X	Certification of Illinois Environmental Protection Agency-35 Ill. Adm. Code 405.104(a) Permit. In my professional judgment, the plans and specifications submitted as part of this application describe an operation which will meet all applicable effluent and water quality standards. I certify that I am familiar with all of the plans, specifications, reports, and maps submitted as part of this application and that said plans, etc. are accurate insofar as they represent existing conditions.

Roy Simon Stepp
Name

062-062236
Illinois Registration Number (Seal)

Signature

09/19/2015
Date

ATTACHMENT I.10.C
INSURACE CERTIFICATE

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 12/30/2013

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER MCGRIFF, SEIBELS & WILLIAMS, INC. P.O. Box 10265 Birmingham, AL 35202	**CONTACT NAME:** **PHONE (A/C, No, Ext):** 800-476-2211 **FAX (A/C, No):** **E-MAIL ADDRESS:**
INSURED Foresight Energy, LLC including Hillsboro Energy, LLC 211 North Broadway Suite 2600 St. Louis, MO 63102	**INSURER(S) AFFORDING COVERAGE** / **NAIC #** **INSURER A :** Houston Specialty Insurance Company **INSURER B :** **INSURER C :** **INSURER D :** **INSURER E :** **INSURER F :**

COVERAGES **CERTIFICATE NUMBER:** MA2WUTBW **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	**GENERAL LIABILITY**			MNG880434-01	12/31/2013	12/31/2014	EACH OCCURRENCE	$ 1,000,000
	[X] COMMERCIAL GENERAL LIABILITY						DAMAGE TO RENTED PREMISES (Ea occurrence)	$ 100,000
	[ ] CLAIMS-MADE [X] OCCUR						MED EXP (Any one person)	$ 5,000
							PERSONAL & ADV INJURY	$ 1,000,000
							GENERAL AGGREGATE	$ 2,000,000
	GEN'L AGGREGATE LIMIT APPLIES PER:						PRODUCTS - COMP/OP AGG	$ 2,000,000
	[X] POLICY [ ] PRO-JECT [ ] LOC							$
	AUTOMOBILE LIABILITY						COMBINED SINGLE LIMIT (Ea accident)	$
	[ ] ANY AUTO						BODILY INJURY (Per person)	$
	[ ] ALL OWNED AUTOS [ ] SCHEDULED AUTOS						BODILY INJURY (Per accident)	$
	[ ] HIRED AUTOS [ ] NON-OWNED AUTOS						PROPERTY DAMAGE (Per accident)	$
								$
	[ ] **UMBRELLA LIAB** [ ] OCCUR						EACH OCCURRENCE	$
	[ ] **EXCESS LIAB** [ ] CLAIMS-MADE						AGGREGATE	$
	[ ] DED [ ] RETENTION $							$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y / N						[ ] WC STATU-TORY LIMITS [ ] OTH-ER	
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? [ ] **(Mandatory in NH)**	N / A					E.L. EACH ACCIDENT	$
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE	$
							E.L. DISEASE - POLICY LIMIT	$
								$ $ $ $ $

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

Evidence of Insurance as repects to any and all permits held by Hillsboro Energy, LLC.
No exclusion for blasting or subsidence.

CERTIFICATE HOLDER

IL Dept of Natural Resources
Land Reclamation Division
Office of Mines & Minerals
One Natural Resources Way
Springfield, IL 62702-1271

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

ATTACHMENT I.11
DRAFT PUBLIC NOTICE

Attachment Part I.11

PUBLIC NOTICE

Pursuant to the Surface Coal Mining Land Conservation and Reclamation Act (PA-81-1015, as amended) and the Rules and Regulations of the Act, Hillsboro Energy LLC, 925 South Main Street, Hillsboro, IL 62049, hereby gives notice that Significant Permit Revision No. 2 to Permit No. 399, Deer Run Mine, was determined to be complete by the Illinois Department of Natural Resources, Office of Mines and Minerals, Land Reclamation Division, One Natural Resources Way, Springfield, IL 62702-1271 to conduct underground coal mining operations under Permit 399.

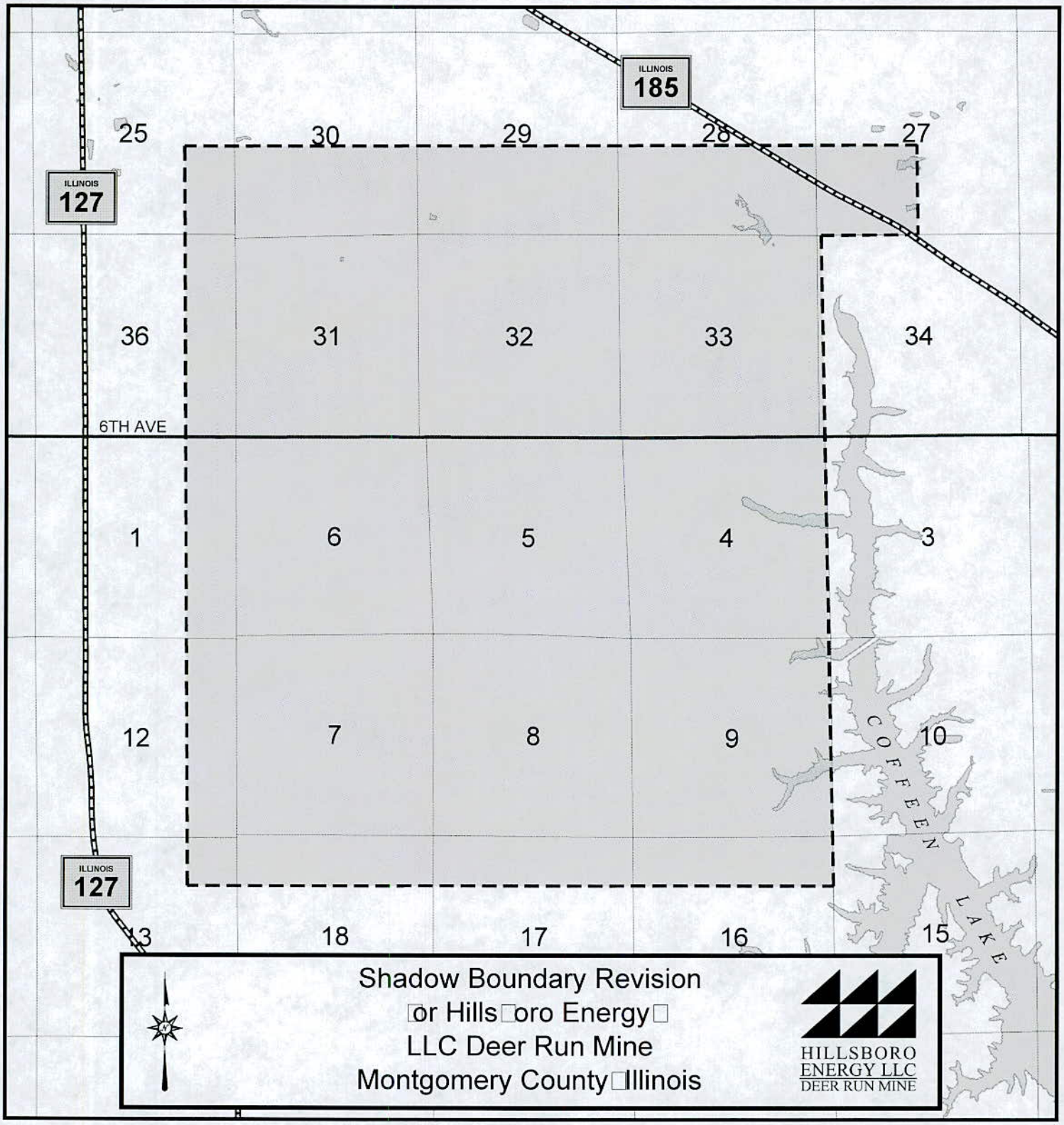
The additional Shadow Area is located in Montgomery County as follows:

T8N, R4W, Sections 25 & 36, T7N, R4W, Sections 1, 12, & 13, T8N, R3W, Sections 27, 28, 29, 30, 31, 32, 33, 34, T7N, R3W, Sections 4, 5, 6, 7, 8, 9, 16, 17, 18

Copies of the application are on file at the County Clerk's Office, Montgomery County Courthouse, #1 Courthouse Square, Hillsboro, IL 62049 and the Illinois Department of Natural Resources, Office of Mines and Minerals, Land Reclamation Division, One Natural Resources Way, Springfield, IL 62702-1271.

Comments, objections, or requests for informal conferences or public hearings may be submitted to the Illinois Department of Natural Resources, Office of Mines and Minerals, Land Reclamation Division, One Natural Resources Way, Springfield, IL 62702-1271.

Note: The above is to be published in "The Journal-News", 431 South Main Street, P.O. Box 100, Hillsboro, IL 62049


ILLINOIS
185
ILLINOIS
127
ILLINOIS
127
6TH AVE
25
30
29
28
27
36
31
32
33
34
1
6
5
4
3
12
7
8
9
10
13
18
17
16
15
COFFEEN LAKE
Shadow Boundary Revision
for Hillsboro Energy
LLC Deer Run Mine
Montgomery County Illinois
HILLSBORO
ENERGY LLC
DEER RUN MINE

PART II

Premining Information

PART II

PREMINING INFORMATION

Premining information is to be displayed on premining land use map unless otherwise indicated.

1) Describe how the permit area perimeter will be marked and discuss the method or system employed to locate permit area perimeter and set markers along it. Designate a reference point outside the permit area. Provide a description of the reference point and a sketch relating the reference point to the permit area perimeter.

RESPONSE: ***N/A. This application is to expand the shadow area. No surface disturbance is proposed.***

2) Provide slope measurements to represent existing land surface configuration of proposed permit area. A soils map of medium intensity prepared to NRCS specifications or a contoured aerial photo may be submitted to meet this requirement.

RESPONSE: ***N/A. This application is to expand the shadow area. No surface disturbance is proposed.***

3) A) Has previous mining activity occurred within the permit area and/or adjacent areas?

Yes ___X___ No _____

If yes, provide the following information, if available:

1) Type of mining, surface, underground, or both?

RESPONSE: ***Underground***

2) What coal seam or other mineral(s) were extracted?

RESPONSE: ***Herrin No. 6 Seam***

3) What was the extent of coal or other mineral(s) removed? Delineate on the pre-mining land use map, or other designated map, the areas disturbed by previous mining activities, including active, inactive or abandoned underground mine work along with any mine opening to the surface.

RESPONSE: ***Refer to Attachment II.3 – Previous Mining Within and Adjacent to Permit Area for a listing of all coal mines within the proposed shadow area and adjacent areas, including the type of mining, and approximate date of***

operation. Refer to Map 3 – Pre-mining Land Use Map included in this revision application for the location of the underground mines located adjacent to the Deer Run Mine.

Identify for each area, the type of mining and the approximate date of extraction.

RESPONSE: ***Refer to Map 7 – Underground Timing Map for the areas and dates of underground mining.***

4) Identify on all maps submitted with the application areas where surface coal mining operations were conducted prior to August 3, 1977; after August 3, 1977 and prior to May 3, 1978; after May 3, 1978 and prior to February 1, 1983; and any permanent regulatory program permit issued after February 1, 1983.

RESPONSE: ***There are no other surface coal mining operations adjacent to the permit area.***

5) Identify the land uses preceding mining.

RESPONSE: ***N/A. This application is to expand the shadow area. No surface disturbance is proposed.***

4) Give the acreage of each land use within the proposed permit area, employing land use categories of Section 1701.5 listed below, and delineate on premining land use map existing land uses in the proposed permit area and within 1,000 feet adjacent to it. Include on the premining land use map the location of all buildings and identify the current use of these buildings.

Cropland
Pasture land
Grazing land
Forestry
Residential
Industrial/Commercial
Recreation
Fish and Wildlife Habitat
Developed Water Resources
Undeveloped land or no current use or land management

RESPONSE: ***N/A. This application is to expand the shadow area. No surface disturbance is proposed.***

5) Have any of the land uses changed within the last five years?
Yes _____ No__*X*____

If yes, indicate the acreage and changes of land uses.

RESPONSE: ***N/A. This application is to expand the shadow area. No surface disturbance is proposed.***

6) A) Provide a narrative of land capability and productivity of the proposed permit area prior to mining which shall provide an analysis of:

1) The capability of the land to support a variety of uses, giving consideration to soil and foundation characteristics, topography, vegetative cover and hydrology;

RESPONSE: ***N/A. This application is to expand the shadow area. No surface disturbance is proposed.***

2) The productivity of the total area expressed as average yield of food, fiber, forage, or wood products under high level management.

RESPONSE: ***N/A. This application is to expand the shadow area. No surface disturbance is proposed.***

B) Where the narrative of land capability and productivity employs the U.S.D.A Natural Resources Conservation Service (NRCS) Land-Capability Classification (Agriculture Handbook No. 210) in conjunction with the soil information provided under Part II 12) of this part, soil interpretation sheets or published soil survey or complete soil information chart for productivity from Circular 1156 are to be submitted for each soil type occurring in the permit area.

RESPONSE: ***N/A. This application is to expand the shadow area. No surface disturbance is proposed.***

7) Provide a description of the existing land uses and land classifications under local law, if any, for the proposed permit and adjacent areas.

RESPONSE: ***N/A. This application is to expand the shadow area. No surface disturbance is proposed.***

8) Provide fish and wildlife resource information for the proposed permit area and any adjacent areas. Prior to initiation of studies to obtain fish and wildlife resource information, the applicant must contact the Department for a determination of what fish and wildlife resources information will be required. Pursuant to 62 Ill. Adm. Code 1784.21(a)(1) and (2), the Department will determine the level of detail and the

areas of study. Site-specific resource information will be required by the Department if either the permit area or adjacent area is likely to include threatened or endangered species or their critical habitats or habitats of unusually high value for fish and wildlife.

The applicant should complete the description of plant communities within the permit area and adjacent area, requested in Part II 9), below, prior to contacting the Department for a determination of the fish and wildlife resource information.

RESPONSE: ***N/A. This application is to expand the shadow area. No surface disturbance is proposed.***

9) Give a description of the plant communities within the proposed permit area and delineate on a vegetation map the vegetative types occurring within the proposed permit area and within any proposed reference area. Where a map or aerial photograph is required, provide coverage of sufficient adjacent areas to allow evaluation of vegetation as important habitat for fish and wildlife for those species of fish and wildlife identified under Section 1784.21. The description shall include information adequate to predict the potential for reestablishing vegetation.

RESPONSE: ***N/A. This application is to expand the shadow area. No surface disturbance is proposed.***

10) A) Pursuant to 62 Ill. Adm. Code 1783.12(a), provide a description of the cultural, archeological and historic resources listed or eligible for listing on the National Register of Historic Places and any known archeological features within the proposed permit, adjacent areas, and shadow area (for planned subsidence). The description of the cultural, historic and archeological resources occurring within the permit area and adjacent areas shall be based upon available data, including data of State and local archeological, historical and cultural preservation agencies.

RESPONSE: ***A program to identify standing structures within the proposed shadow areas subject to longwall mining that may be eligible for inclusion in the National Register of Historic Places will begin in advance of longwall mining.***

The program will be structured to identify all standing structures within the proposed shadow areas subject to longwall mining. The identification will start immediately in the shadow area that has not been previously inventoried.

Prior to longwall mining occurring in an area, a canvas of the structures will be made to identify the type of construction and the general age of the structure. Two categories will be created. The first will be for more modern structures that would not be considered for listing in the National Register of Historic Places. The second category would list the structures that are older and their construction may indicate that the structure is significant and should be documented.

The listings would be provided to the Department for review. From this review, the Applicant would seek to perform a more detailed study of identified structures and ascertain the history of the structure and document the construction methods used. Documentation could be in the form of photographs and/or line drawings.

Information for the proposed Shadow Boundary Area has been reviewed by Mr. Hal Hassen, IDNR Cultural Resources Coordinator, and Ms. Dawn Cobb, IDNR Office of Realty and Environmental Planning. A total of four structures were identified as needing additional documentation if the Applicant elects to demolish in the future. Refer to Map 2 - Identification of Interests for the location of all structures within the proposed shadow boundary area. Refer to Attachment II.10.A – Identification of Structures for a listing of all structures currently within the proposed shadow boundary area. The four structures which need additional information prior to demolition are identified on Map 2, as well as highlighted on Attachment II.10.A. Refer to Attachment II.10.A.2 – IDNR Identified Structures for documentation.

B) 1) Pursuant to 62 Ill. Adm. Code 1783.12(b):

a) State whether there is a substantial likelihood of currently unknown resources which would be eligible for the National Register of Historic places within the proposed permit, or adjacent areas or shadow area (for planned subsidence).

RESPONSE: ***N/A. Other than the structures referenced in Attachment II.10.A.2 – IDNR Identified Structures, it is unlikely that any other unknown resources exist within the Revision No. 2 Shadow Area.***

b) Provide a plan detailing the manner in which additional information will be gathered by the applicant to enable the Department to identify and evaluate such resources.

RESPONSE: ***N/A.***

2) Please Note: If the Department determines that the Part II 10) A) resource information is not adequate to make the required finding under 62 Ill. Adm. Code 1773.15(c)(12) because information available to the Department indicates a substantial likelihood of currently unknown resources within the permit area or adjacent areas which would be eligible for the National Register of Historic Places, the Department will require the applicant to submit additional information to enable the Department to identify and evaluate the potential resources. Such information might include the results of field investigations of the permit area and adjacent area if it is determined by the Department, in consultation with the Illinois

C) For the permit area and/or shadow area (for planned subsidence), locate on the vegetation map or the land use map the following:

The boundaries of any publicly owned parks, locations of any cultural resources, historical resources listed or eligible for listing on the National Register of Historic Places.

RESPONSE: ***The Cranfill Unit of the Coffeen Lake Fish and Wildlife Area is a public park based on the definition for public parks in the permit regulations. There are no known locations of any cultural resources, historical resources listed or eligible for listing on the National Register of Historic Place known to be within the proposed shadow area.***

D) Provide a map showing the location of know/Archeological site(s) listed on or eligible for listing on the National Register of Historic Places. Provide identifying field markings to be employed to insure that the site(s) will not be disturbed by surface coal mining and reclamation operations. The map is to be submitted in separate cover from the rest of the application. The Department will hold the map as a confidential document.

RESPONSE: ***N/A. There are no known Archeological site(s) listed on or eligible for listing on the National Register of Historic Places within the proposed shadow area.***

E) Provide a plan for publicly owned park(s), or place(s) identified above in paragraph(c) that may be adversely affected by the proposed operation describing the measures to be employed:

RESPONSE: ***The Cranfill Unit of the Coffeen Lake Fish and Wildlife Area is a public park based on the definition for public parks in the permit regulations. Minimal subsidence is planned within this area; however, the subsidence is not anticipated to create adverse impacts as the public park land is for recreational hunting purposes. Mitigation shall occur to restore proper drainage to these areas.***

1) To prevent adverse impacts caused by underground mining related activities including, but not limited to, loss or destruction of historic artifacts and damage to historic structures or property; or

RESPONSE: ***N/A.***

2) If valid existing rights exist or joint agency approval is to be obtained under 62 Ill. Adm. Code 1761.12(e), to minimize adverse impacts.

RESPONSE: ***N/A.***

11) For the permit area and/or shadow area (for planned subsidence) locate on the vegetation map or land use map the boundaries of any public or private cemeteries or Indian burial grounds.

RESPONSE: ***The locations of public and private cemeteries are shown on Map 2 - Identification of Interests. There are no known Indian burial grounds.***

12) A) Provide the location of surface and subsurface man-made features within, passing through, or passing over the proposed permit and shadow areas on the pre-mining land use map or other designated map.

Such features should include but are not limited to major electric transmission lines, pipelines, agricultural drainage tile fields, gas and oil wells, and water wells. For gas, oil and water wells provide the depth, if available, of the well.

RESPONSE: ***Refer to Map 3 – Pre-mining Land Use Map for the respective information.***

Existing field drainage tiles are not shown on the maps, but the following discussion details how drainage tiles will be dealt with.

Prior to subsidence in the Shadow Area visual inspections and/or discussions with landowners and tenant farmers will be used to determine drainage tile installations. If subsidence damages drainage tiles, these tiles will be repaired, replaced, or rerouted as necessary to maintain drainage in farming and crop areas, and non-crop areas.

In areas where no drainage tiles are currently installed, but subsidence profiles change drainage such that the installation of tile is determined as the method to correct areas where water pools. Drainage tiles will be installed to return the land to its premining capability.

B) Provide the elevation and location of all monitoring stations used to gather data for water quality and quantity, fish and wildlife, and air in preparation of the application.

RESPONSE: ***N/A.***

13) Soils Information Map

A) Does the submitted soils map represent a map developed by the Natural Resources Conservation Service?
Yes _____ No _____

If no, explain. If SCS map has been modified, explain (Example - photographically enlarged; soil map units recorrelated; area affected after initial mapping). Soil map scale must be 1" = 400' unless otherwise approved by the Department.

RESPONSE: ***N/A. This application is to expand the shadow area. No surface disturbance is proposed.***

B) Are any of the identified map units correlated as prime farmland by SCS criteria? Yes _____ No _____

If yes, provide acreage by completing soil information chart.

RESPONSE: ***N/A. This application is to expand the shadow area. No surface disturbance is proposed.***

C) Submit, by completing soils information chart, acreage totals of each map unit (soil type and slope classification) and land use capability classes in the permit area and the percent slope range of each lettered slope classification used on the soil map.

RESPONSE: ***N/A. This application is to expand the shadow area. No surface disturbance is proposed.***

D) Indicate the average topsoil thickness of each of the soil map units to be affected. Locate on soils map the test holes for soil horizon thickness sampling. The topsoil replacement thickness (inches) will be _____.

RESPONSE: ***N/A. This application is to expand the shadow area. No surface disturbance is proposed.***

E) List the soil types and acreages of areas that will require the B and/or portions of the C horizon to be removed and replaced in order to establish the root medium necessary to achieve soil productivity consistent with the proposed post-mining land use.

Alternatively, a narrative description explaining why specific soil type acres information for reclamation plan achievement is not necessary may be provided instead.

RESPONSE: ***N/A. This application is to expand the shadow area. No surface disturbance is proposed.***

F) Are selected overburden materials proposed to be used in lieu of or as a supplement to the A-horizon?

Yes _____ No _____

If yes, provide the appropriate information required under Section 1785.21(b). Also, identify source of the substitute materials and the topsoils to be substituted away from on a separate soils map unless the Department grants permission to describe the area in narrative form or to use the soils map provided in Part II 13(A). Explain why the proposed plan will provide the best available material of equal or better quality than present topsoil or surface existing material. This section must be addressed when reaffecting previously disturbed areas.

RESPONSE: ***N/A. This application is to expand the shadow area. No surface disturbance is proposed.***

ATTACHMENT II.3
PREVIOUS MINING WITHIN AND ADJACENT TO PERMIT AREA

Hillsboro Energy
Attachment II.3
Previous Mining Within or Adjacent to the Permit Area

									Location		
ISGS Index	Company Name	Mine Name	Mine No.	Mine Type	Method	Years Operated	Seam Mined	County	TWP	RGE	SEC
77	Montgomery County Coal Co.	Taylor Spring	1	Shaft	RPP	1908-1912	Herrin	Montgomery	8N	4W	23
77	Peabody Coal Co.	Peabody	15	Shaft	RPP	1912-1915	Herrin	Montgomery	8N	4W	23
77	C. & E. I. Coal Properties	C. & E. I.	15	Shaft	RPP	1917-1918	Herrin	Montgomery	8N	4W	23
77	Illinois Coal Properties	Taylor Spring	15	Shaft	RPP	1918-1919	Herrin	Montgomery	8N	4W	23
77	Indiana & Illinois Coal Corp	Indiana & Illinois	15	Shaft	RPP	1919-1923	Herrin	Montgomery	8N	4W	23
442	Clover Leaf Coal Mng. Co.	Clover Leaf	2	Shaft	RPP	1906-1916	Herrin	Montgomery	7N	3W	3
442	Coffeen Coal Mng. Co.	Coffeen	2	Shaft	RPP	1916-1920	Herrin	Montgomery	7N	3W	3
442	Clover Leaf Coal Co.	Clover Leaf	4	Shaft	RPP	1920-1924	Herrin	Montgomery	7N	3W	3
871	Truax Traer Coal Co.	Hillsboro		Shaft	RPP	1964-1970	Herrin	Montgomery	7N	3W	14
871	Consolidation CC, Midwest Div	Hillsboro		Shaft	RPP	1971-1983	Herrin	Montgomery	7N	3W	14
3001	Coffeen Coal & Coke Co.	Coffeen		Shaft	RPB	1889-1901	Herrin	Montgomery	8N	3W	35
3001	Clover Leaf Coal Co.	Clover Leaf	1	Shaft	RPB	1901-1908	Herrin	Montgomery	8N	3W	35

Mining Methods

RPB Room & Pillar; irregular panels, typical of old mines

RPP Room and Pillar Panel; similar to Modified Room & Pillar

ATTACHMENT II.10.A
IDENTIFICATION OF STRUCTURES

Attachment II.10.A - Identification of Structures

Parcel	Site Address	City	First Name	Last name	Mailing Address	Address 2	City	State	Zip Code	Inhabited Residence	Vacant Residence	Inhabited Mobile Home	Vacant Mobile Home	Garage	Barn/Shed	Grain Bin/Silo	Other	Pond	Water Well Present
16-25-100-005	7150 South Illinois Route 127	Hillsboro	Betty	McFarlin	7150 Illinois Route 127	P.O. Box 67	Hillsboro	Illinois	62049	X		X						X	
16-25-100-007	400 Rountree Street	Hillsboro	Roger	McFarlin	400 Rountree Street		Hillsboro	Illinois	62049										
16-25-200-001	7291 Buckeye Trail	Hillsboro	Joseph	Boas	11091 Brushy Trail		Irving	Illinois	62051						X				
16-25-300-005	7140 Illinois Route 127	Hillsboro	Bruce	Finley	7140 Illinois Route 127		Hillsboro	Illinois	62049	X		X						X	
16-25-300-009	11148 North 7th Avenue	Hillsboro	Edward & Susan	Boyd	422 West Fairground Avenue		Hillsboro	Illinois	62049										
16-25-300-010	7012 Illinois Route 127	Hillsboro	Arlen & Allen	Kasten	13314 Illinois Route 185		Hillsboro	Illinois	62049										
16-25-300-017	10110 Holloway Trail	Hillsboro	Scott	Strausgaugh	130 Bandor Circle		Hillsboro	Illinois	62049						X			X	
16-25-400-001	123 North Broad	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812										
16-25-400-004	7199 Buckeye Trail	Hillsboro	Larry	Schraut	7199 Buckeye Trail		Hillsboro	Illinois	62049	X				X	X				Well 203
16-25-400-006	North 7th Avenue	Hillsboro	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019										
16-25-400-007	Coffeen Road	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812										
16-25-400-008	7th Avenue & Buckeye Trail	Hillsboro	Connie	Garrett	828 CR 3840		Bridgeport	Texas	76426										
16-36-100-002	11106 North 7th Avenue	Hillsboro	John & Patricia	Robinson	11106 North 7th Avenue		Hillsboro	Illinois	62049	X					X				Well VV
16-36-100-004	11148 North 7th Avenue	Hillsboro	Edward & Susan	Boyd	422 West Fairground Avenue		Hillsboro	Illinois	62049				X		X				Well 210
16-36-100-008	6252 Illinois Route 127	Hillsboro	Mary	Rikli	6252 Illinois Route 127		Hillsboro	Illinois	62049	X					X	X	X		Well SS
16-36-100-009	North 7th Avenue	Hillsboro	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019										
16-36-100-010	11180 North 7th Avenue	Hillsboro	Rhonda	Huber	11180 North 7th Avenue		Hillsboro	Illinois	62049	X						X			
16-36-200-001	11228 North 7th Avenue	Hillsboro	David & Carol	Schluckebier	11228 North 7th Avenue		Hillsboro	Illinois	62049	X					X		X		
16-36-200-002	Buckeye Trail	Hillsboro	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019										
16-36-200-003	Buckeye Trail	Hillsboro	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019										
16-36-200-004	Buckeye Trail	Hillsboro	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019										
16-36-300-002	6252 Illinois Route 127	Hillsboro	Daniel	Chappelear	5358 Waveland Road		Hillsboro	Illinois	62049										
16-36-300-006	11201 North 6th Avenue	Hillsboro	Kenneth & Betty	Weiss	312 West Third North Street		Mt. Olive	Illinois	62069										
16-36-400-001	6252 Illinois Route 127	Hillsboro	Daniel	Chappelear	5358 Waveland Road		Hillsboro	Illinois	62049										
16-36-400-002	Buckeye Trail	Hillsboro	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019										
16-36-400-005	North 6th Avenue	Hillsboro	Forrest	Delong	P.O. Box 334		Hillsboro	Illinois	62049	X					X			X	
16-36-400-006	North 6th Avenue	Hillsboro	Kenneth & Betty	Weiss	312 West Third North Street		Mt. Olive	Illinois	62069										
17-27-100-002	Coffeen Road	Hillsboro	Illinois Department of Natural Resources	c/o Raetta Realty	One Natural Resources Way		Springfield	Illinois	62702										
17-27-100-003	Illinois Route 185	Coffeen	Illinois Department of Natural Resources	c/o Raetta Realty	One Natural Resources Way		Springfield	Illinois	62702										
17-27-100-004	Illinois Route 185	Coffeen	Illinois Department of Natural Resources		One Natural Resources Way		Springfield	Illinois	62702										
17-27-100-502	Coffeen Road	Hillsboro	Illinois Department of Natural Resources	c/o Gary Laurent	822 Powder Avenue		Donnellson	Illinois	62019										
17-27-100-503	Illinois Route 185	Hillsboro	Illinois Department of Natural Resources	c/o Gary Laurent	822 Powder Avenue		Donnellson	Illinois	62019										
17-27-100-504	Illinois Route 185	Coffeen	Illinois Department of Natural Resources	c/o Gary Laurent	822 Powder Avenue		Donnellson	Illinois	62019										
17-27-200-005	Coffeen Road	Hillsboro	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017										
17-27-200-006	7225 Coffeen Road	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812	X				X	X				
17-27-200-007	Illinois Route 185	Coffeen	Illinois Department of Natural Resources	c/o Raetta Realty	One Natural Resources Way		Springfield	Illinois	62702										
17-27-200-008			Illinois Department of Natural Resources		One Natural Resources Way		Springfield	Illinois	62702										
17-27-200-009	Coffeen Road	Coffeen	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812										
17-27-200-010	Coffeen Road	Coffeen	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812									X	
17-27-200-507	Illinois Route 185	Coffeen	Illinois Department of Natural Resources	c/o Gary Laurent	822 Powder Avenue		Donnellson	Illinois	62019									X	
17-27-300-001	Illinois Route 185	Coffeen	Illinois Department of Natural Resources		One Natural Resources Way		Springfield	Illinois	62702										
17-27-300-005	15020 Illinois Route 185	Hillsboro	Elzie	Garrett	1715 Summit Street		Hillsboro	Illinois	62049	X									
17-27-300-006	Illinois Route 185	Hillsboro	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002										
17-27-300-011	15116 Illinois Route 185	Hillsboro	New River Royalty, LLC	Rocky & Rebecca Starkey	208 Public Square	4th Floor	Benton	Illinois	62812	X				X					
17-27-300-012	15056 Illinois Route 185	Hillsboro	Celene	Harrelson	P.O. Box 293		Coffeen	Illinois	62017			X			X				
17-27-300-013	52 McDavid Cemetery Lane	Coffeen	Celene	Harrelson	P.O. Box 293		Coffeen	Illinois	62017										
17-27-300-014	15039 Illinois Route 185	Hillsboro	Kenneth & Karen	Blankenship	15039 Illinois Route 185		Hillsboro	Illinois	62049	X				X	X			X	Well MM
17-27-300-015	Illinois Route 185	Hillsboro	Randall & Rose	Huber	1201 University		Hillsboro	Illinois	62049										
17-27-300-016	Illinois Route 185	Hillsboro	Brian	Huber	6653 Majestic Way		Carpentersville	Illinois	60110										
17-27-300-501	Illinois Route 185	Coffeen	Illinois Department of Natural Resources	c/o Gary Laurent	822 Powder Avenue		Donnellson	Illinois	62019										
17-27-400-001	15039 Illinois Route 185	Hillsboro	Kenneth & Karen	Blankenship	15039 Illinois Route 185		Hillsboro	Illinois	62049										
17-27-400-003	Coffeen Road	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812										
17-27-400-005	Coffeen Road	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812										
17-27-400-006	illlinois Route 185	Hillsboro	Brian	Huber	6653 Majestic Way		Carpentersville	Illinois	60110	X					X				
17-27-400-007	Illinois Route 185	Hillsboro	Matthew	Elam	1465 Country Club Way		Smithboro	Illinois	62284										
17-28-100-004	East 14th Road	Hillsboro	Earl	Seltzer	904 Smith Lane	P.O. Box 502	Hillsboro	Illinois	62049										
17-28-100-005	14232 Illinois Route 185	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812	X					X				
17-28-100-006	14107 Illinois Route 185	Hillsboro	New River Royalty, LLC	George Elam	208 Public Square	4th Floor	Benton	Illinois	62812	X									
17-28-100-007	Illinois Route 185	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812						X	X			
17-28-200-001	East 14th Road	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812										

Parcel	Site Address	City	First Name	Last name	Mailing Address	Address 2	City	State	Zip Code	Inhabited Residence	Vacant Residence	Inhabited Mobile Home	Vacant Mobile Home	Garage	Barn/Shed	Grain Bin/Silo	Other	Pond	Water Well Present
17-28-200-002	East 14th Road	Hillsboro	David & Stephen	Spinner	715 East Union Avenue		Litchfield	Illinois	62056										Well NN
17-28-200-003	Illinois Route 185	Hillsboro	Earl	Seltzer	904 Smith Lane	P.O. Box 502	Hillsboro	Illinois	62049										
17-28-200-005	Illinois Route 185	Hillsboro	Earl	Seltzer	904 Smith Lane	P.O. Box 502	Hillsboro	Illinois	62049										
17-28-300-004	Illinois Route 185	Hillsboro	Earl	Seltzer	904 Smith Lane	P.O. Box 502	Hillsboro	Illinois	62049						X	X		X	
17-28-400-002	14401 Illinois Route 185	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812	X					X				
17-28-400-003	14329 Illinois Route 185	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812	X									
17-29-100-001	North 7th Avenue	Hillsboro	Larry	Schraut	7199 Buckeye Trail		Hillsboro	Illinois	62049										
17-29-100-002	North 7th Avenue	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812										
17-29-200-001	13314 Illinois Route 185	Hillsboro	New River Royalty, LLC	Arlen & Patricia Kasten	208 Public Square	4th Floor	Benton	Illinois	62812	X				X					
17-29-200-003	Illinois Route 185	Hillsboro	Wright Trust	c/o First National Bank	P.O. Box 40		Vandalia	Illinois	62471										
17-29-200-004	Illinois Route 185	Hillsboro	Earl	Seltzer	904 Smith Lane	P.O. Box 502	Hillsboro	Illinois	62049										
17-29-300-001	13013 North 7th Avenue	Hillsboro	Larry	Schraut	7199 Buckeye Trail		Hillsboro	Illinois	62049										
17-29-300-002	13013 North 7th Avenue	Hillsboro	Larry	Schraut	7199 Buckeye Trail		Hillsboro	Illinois	62049	X					X	X	X	X	Well LL
17-29-400-004	7170 East 14th Road	Hillsboro	Larry	Schraut	7199 Buckeye Trail		Hillsboro	Illinois	62049						X	X			
17-29-400-006	7179 East 14th Road	Hillsboro	Larry	Schraut	7199 Buckeye Trail		Hillsboro	Illinois	62049										
17-30-100-001	Buckeye Trail	Hillsboro	Joseph	Boas	11091 Brushy Trail		Irving	Illinois	62051										
17-30-200-001	North 7th Avenue	Hillsboro	Joseph	Boas	11091 Brushy Trail		Irving	Illinois	62051										
17-30-300-001	7108 Buckeye Trail	Hillsboro	Richard	Elam	7108 Buckeye Trail		Hillsboro	Illinois	62049	X				X	X			X	Well XX
17-30-400-001	Buckeye Trail	Hillsboro	Joseph	Boas	11091 Brushy Trail		Irving	Illinois	62051										
17-30-400-002	12188 North 7th Avenue	Hillsboro	Gerald	Young	12188 North 7th Avenue		Hillsboro	Illinois	62049						X				
17-30-400-003	12188 North 7th Avenue	Hillsboro	Gerald	Young	12188 North 7th Avenue		Hillsboro	Illinois	62049										
17-31-100-001	7199 Buckeye Trail	Hillsboro	Larry	Schraut	7199 Buckeye Trail		Hillsboro	Illinois	62049										
17-31-100-003	12188 North 7th Avenue	Hillsboro	Gerald	Young	12188 North 7th Avenue		Hillsboro	Illinois	62049	X					X				
17-31-100-004	12188 North 7th Avenue	Hillsboro	Gerald	Young	12188 North 7th Avenue		Hillsboro	Illinois	62049										
17-31-200-001	12248 North 7th Avenue	Hillsboro	Gerald	Young	12188 North 7th Avenue		Hillsboro	Illinois	62049						X	X	X	X	
17-31-200-002	12188 North 7th Avenue	Hillsboro	Gerald	Young	12188 North 7th Avenue		Hillsboro	Illinois	62049										
17-31-300-001	Buckeye Trail	Coffeen	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019										
17-31-300-002	Buckeye Trail	Coffeen	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019										
17-31-300-003	12057 North 6th Avenue	Hillsboro	Jerry & Wanda	Mercer	12057 North 6th Avenue		Hillsboro	Illinois	62049	X				X				X	Well 215
17-31-300-004	6061 - 6063 Buckeye Trail	Hillsboro	Richard & Margaret	Harms	6063 Buckeye Trail		Hillsboro	Illinois	62049	X		X			X	X			Well OO
17-31-300-005	12179 North 6th Avenue	Hillsboro	Brian Weston	c/o Litchfield Community Savings	P.O. Box 445		Litchfield	Illinois	62056	X				X					
17-31-400-001	6063 Buckeye Trail	Coffeen	Richard & Margaret	Harms	6063 Buckeye Trail		Hillsboro	Illinois	62049							X		X	
17-31-400-007	6063 Buckeye Trail	Coffeen	Richard & Margaret	Harms	6063 Buckeye Trail		Hillsboro	Illinois	62049										
17-31-400-008	North 6th Avenue	Coffeen	Benjamin	Kenny	5250 East 18th Road		Coffeen	Illinois	62017										
17-31-400-010	North 6th Avenue	Coffeen	Nicholas	Kenny	1402 Kweit Lane		Greenville	Illinois	62246										
17-31-400-011	92 McQuern Lane	Hillsboro	Ben	Kenny	13001 North 6th Avenue		Hillsboro	Illinois	62049	X					X		X		Well JJ
17-32-100-002	6265 East 14th Road	Coffeen	Stella	Kasten	6265 East 14th Road		Hillsboro	Illinois	62049										
17-32-100-003	6265 East 14th Road	Coffeen	Stella	Kasten	6265 East 14th Road		Hillsboro	Illinois	62049						X	X			
17-32-100-004	13030 North 7th Avenue	Hillsboro	New River Royalty, LLC	John Clark	208 Public Square	4th Floor	Benton	Illinois	62812	X					X	X			
17-32-100-006	13130 North 7th Avenue	Hillsboro	Brad & Dawn	Young	13130 North 7th Avenue		Hillsboro	Illinois	62049										
17-32-100-007	North 7th Avenue	Hillsboro	Brad & Dawn	Young	13130 North 7th Avenue		Hillsboro	Illinois	62049										
17-32-200-001	6265 East 14th Road	Coffeen	Stella	Kasten	6265 East 14th Road		Hillsboro	Illinois	62049										
17-32-200-002	6265 East 14th Road	Hillsboro	Stella	Kasten	6265 East 14th Road		Hillsboro	Illinois	62049	X					X	X	X	X	
17-32-300-004	13253 North 6th Avenue	Hillsboro	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049										
17-32-300-005	13253 North 6th Avenue	Hillsboro	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049										
17-32-400-001	13253 North 6th Avenue	Hillsboro	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049	X					X		X		
17-32-400-002	13253 North 6th Avenue	Hillsboro	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049										
17-32-400-003	13253 North 6th Avenue	Hillsboro	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049										
17-33-100-002	East 14th Road	Hillsboro	Earl Seltzer Enterprises		P.O. Box 502		Hillsboro	Illinois	62049										
17-33-200-001	Illinois Route 185	Hillsboro	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002										
17-33-300-001	North 6th Avenue	Coffeen	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049										
17-33-300-003	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017										
17-33-300-004	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017										
17-33-300-005	North 6th Avenue	Coffeen	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049						X				
17-33-300-006	14061 North 6th Avenue	Coffeen	Wade Edwards	c/o Corelogic	1 Corelogic Drive		Westlake	Texas	76262	X									
17-33-400-001	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017										
17-33-400-002	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017										
17-33-400-003	Rural Lake Area	Coffeen	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002										
17-33-400-004	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017										
17-33-400-005	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017										

Parcel	Site Address	City	First Name	Last name	Mailing Address	Address 2	City	State	Zip Code	Inhabited Residence	Vacant Residence	Inhabited Mobile Home	Vacant Mobile Home	Garage	Barn/Shed	Grain Bin/Silo	Other	Pond	Water Well Present
17-33-400-006	5263 East 14th Road	Coffeen	William, Cleola, & Cherlyn	Brackett	5204 East 14th Road		Coffeen	Illinois	62017										
17-34-100-004	72 McDavid Cemetery Lane	Coffeen	McDavid Point Cemetery		R.R. 1		Hillsboro	Illinois	62049										
17-34-100-005	95 McDavid Cemetery Lane	Coffeen	Kenneth & Linda	Null	95 McDavid Cemetery Lane		Hillsboro	Illinois	62049	X				X	X		X		
17-34-100-006	15212 Illinois Route 185	Hillsboro	Ralph	Ray	15212 Illinois Route 185		Hillsboro	Illinois	62049	X					X				
17-34-200-001	15172 Illinois Route 185	Hillsboro	Shawn & Hope	Titsworth	15172 Illinois Route 185		Hillsboro	Illinois	62049	X									
17-34-200-007	Coffeen Road	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812										
17-34-200-008	Coffeen Road	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812										
17-34-200-009	15448 Illinois Route 185	Hillsboro	Kenneth & Brenda	Timpe	15323 Irving Road		Irving	Illinois	62051						X				Well PP
17-34-200-011	Illinois Route 185	Hillsboro	Arlen	Kasten	13314 Illinois Route 185		Hillsboro	Illinois	62049										
17-34-200-012	1322 CIPS Trail	Coffeen	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812										
17-34-200-015	1255 CIPS Trail	Coffeen	William	Kershaw	1255 CIPS Trail		Coffeen	Illinois	62017	X					X				
17-34-200-019	13314 Illinois Route 185	Hillsboro	Arlen	Kasten	13314 Illinois Route 185		Hillsboro	Illinois	62049										
17-34-200-020	1335 CIPS Trail	Coffeen	Danny	Lilley	1335 CIPS Trail		Coffeen	Illinois	62017	X					X			X	Well RR
17-34-200-021	Illinois Route 185	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812										
17-34-300-001	Border North Coffeen Lake	Coffeen	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002										
17-34-300-007	15112 North 6th Avenue	Coffeen	Brooks	Moreland	15112 North 6th Avenue		Coffeen	Illinois	62017						X		X		
17-34-300-008	15177 North 6th Avenue	Coffeen	Kathy	Turner	15177 North 6th Avenue		Coffeen	Illinois	62017	X				X					Well QQ
17-34-300-009	CIPS Trail	Coffeen	Robert	Ray	6550 Oleatha		St. Louis	Missouri	63139										Well 212
17-34-451-008	1057 CIPS Trail	Coffeen	Wade & Natalie	Fuller	1057 CIPS Trail		Coffeen	Illinois	62017										
17-34-451-009	15201 North 6th Avenue	Coffeen	Schylar & Amanda	Fuller	15201 North 6th Avenue		Coffeen	Illinois	62017	X									
20-01-100-008	5338 Illinois Route 127	Hillsboro	Gerald	Zumwalt	5338 Illinois Route 127		Hillsboro	Illinois	62049	X					X		X		Well C
20-01-100-009	13314 Illinois Route 185	Hillsboro	Arlen	Kasten	13314 Illinois Route 185		Hillsboro	Illinois	62049										
20-01-100-011	North 6th Avenue	Hillsboro	Karen Funk	c/o Farmers State Bank & Trust	200 West State		Jacksonville	Illinois	62650						X				
20-01-200-003	11202 North 6th Avenue	Hillsboro	Mary June	Koontz	11202 North 6th Avenue		Hillsboro	Illinois	62049	X					X				
20-01-200-005	11400 North 6th Avenue	Hillsboro	Douglas & Brenda	Johnson	11400 North 6th Avenue		Hillsboro	Illinois	62049	X								X	
20-01-200-006	12056 North 6th Avenue	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049						X			X	
20-01-200-008	North 6th Avenue	Hillsboro	Karen Funk	c/o Farmers State Bank & Trust	200 West State		Jacksonville	Illinois	62650										
20-01-200-009	11204 North 6th Avenue	Hillsboro	William & Ruth	Schroeder	11204 North 6th Avenue		Hillsboro	Illinois	62049	X								X	Well F
20-01-300-008	Illinois Route 127	Hillsboro	David & Luann	Chappelear	10110 Holloway Trail		Hillsboro	Illinois	62049						X				
20-01-300-009	Illinois Route 127	Hillsboro	Rodney	Bergmann	4 Deer Hollow		Litchfield	Illinois	62056										Well ZZ
20-01-300-011	169 Funk Lane	Hillsboro	Thomas & Mary	Murray	169 Funk Lane		Hillsboro	Illinois	62049	X					X				Well A
20-01-300-015	5126 Illinois Route 127	Hillsboro	Ronald	Hunshe	12610 Niggli Road		Highland	Illinois	62249										Well L
20-01-400-010	253 Rock Lane	Hillsboro	Terri	Mackey	253 Rock Lane		Hillsboro	Illinois	62049										
20-01-400-012	Rock Lane	Hillsboro	Dolores	Yarbrough	1105 Devonshire Drive		Champaign	Illinois	61821										
20-01-400-013	Funk Lane	Hillsboro	Karen Funk	c/o Farmers State Bank & Trust	200 West State		Jacksonville	Illinois	62650										
20-01-400-014	12056 North 6th Avenue	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049										
20-01-400-015	Funk Lane	Hillsboro	Thomas	Boehler	379 South Starr Street		Waggoner	Illinois	62572										Well D
20-01-400-018	266 Rock Lane	Hillsboro	Jean	Snyder	266 Rock Lane		Hillsboro	Illinois	62049	X					X	X			Well B
20-01-400-019	259 Rock Lane	Hillsboro	Todd & Alicia	Kelly	8312 North State Route 159		Dorsey	Illinois	62021										
20-01-400-020	190 Page Lane	Hillsboro	Charles	Page	190 Page Lane		Hillsboro	Illinois	62049										
20-01-400-021	172 Page Lane	Hillsboro	Brian & Edina	Page	P.O. Box 341		Morrisonville	Illinois	62546										
20-01-400-022	204 Page Lane	Hillsboro	Charles & Daniel	Page	204 Page Lane		Hillsboro	Illinois	62049										Well 233
20-12-100-008	Illinois Route 127	Hillsboro	Dennie & Dee	Goedecke	338 Bens Drive		Chatham	Illinois	62629									X	
20-12-100-011	Illinois Route 127	Hillsboro	Roy & Cherlann	Rapien	4292 Illinois Route 127		Hillsboro	Illinois	62049										
20-12-100-013	4292 Illinois Route 127	Hillsboro	Roy & Cherlann	Rapien	4292 Illinois Route 127		Hillsboro	Illinois	62049	X				X	X			X	
20-12-200-002	181 Adams Lane	Hillsboro	Ronald	Cooper	181 Adams Lane		Hillsboro	Illinois	62049	X					X	X	X	X	Well 238
20-12-200-003	204 Funk Lane	Hillsboro	Charles & Daniel	Page	204 Funk Lane		Hillsboro	Illinois	62049										
20-12-200-006	253 Rock Lane	Hillsboro	Norman	Compton	253 Rock Lane		Hillsboro	Illinois	62049	X									
20-12-300-001	4121 Illinois Route 127	Hillsboro	P & B Trust		4121 Illinois Route 127		Hillsboro	Illinois	62049										Well EE
20-12-300-005	3538 Illinois Route 127	Hillsboro	Charles & Nancy	McDowell	3538 Illinois Route 127		Hillsboro	Illinois	62049									X	
20-12-300-011	3570 Illinois Route 127	Hillsboro	Corey	Beatty	502 Pine Street		Hillsboro	Illinois	62049										
20-12-300-012	Illinois Route 127	Hillsboro	Rande & Diane	Gibbs	10866 Lake Road		Highland	Illinois	62249										
20-12-300-013	4121 Illinois Route 127	Hillsboro	P & B Trust		4121 Illinois Route 127		Hillsboro	Illinois	62049										
20-12-400-001	181 Adams Lane	Hillsboro	Ronald	Cooper	181 Adams Lane		Hillsboro	Illinois	62049										
20-12-400-002	181 Adams Lane	Hillsboro	Ronald	Cooper	181 Adams Lane		Hillsboro	Illinois	62049										
20-12-400-003	3127 Illinois Route 127	Hillsboro	Wanda	Bee	3127 Illinois Route 127		Hillsboro	Illinois	62049										
20-12-400-005	4003 Buckeye Trail	Hillsboro	Earl	Law	4003 Buckeye Trail		Hillsboro	Illinois	62049									X	Well 244 & E
20-12-400-006	140 Adams Lane	Hillsboro	Stacey Carroll	c/o Corelogic	1 Corelogic Drive		Westlake	Texas	76262	X									
20-12-400-007	142 Adams Lane	Hillsboro	Gary	Sneed	142 Adams Lane		Hillsboro	Illinois	62049	X					X			X	Well CC
20-13-100-007	3538 Illinois Route 127	Hillsboro	Charles & Nancy	McDowell	3538 Illinois Route 127		Hillsboro	Illinois	62049										

Parcel	Site Address	City	First Name	Last name	Mailing Address	Address 2	City	State	Zip Code	Inhabited Residence	Vacant Residence	Inhabited Mobile Home	Vacant Mobile Home	Garage	Barn/Shed	Grain Bin/Silo	Other	Pond	Water Well Present
20-13-100-009	3141 Illinois Route 127	Hillsboro	Samual Elizondo	c/o Corelogic	1 Corelogic Drive		Westlake	Texas	76262										
20-13-100-010	Illinois Route 127	Hillsboro	Barbara	Wright	P.O. Box 40		Vandalia	Illinois	62471										
20-13-200-002	Illinois Route 127	Hillsboro	Barbara	Wright	P.O. Box 40		Vandalia	Illinois	62471										
20-13-200-003	Bear Creek Lane	Hillsboro	Larry	Casarta	2618 Morganfair Lane		Katy	Texas	77450										
20-13-200-005	3127 Illinois Route 127	Hillsboro	Wanda	Bee	3127 Illinois Route 127		Hillsboro	Illinois	62049						X			X	
20-13-300-004	Bear Creek Lane	Donnellson	Barbara	Wright	P.O. Box 40		Vandalia	Illinois	62471										
20-13-400-001	Bear Creek Lane	Donnellson	Barbara	Wright	P.O. Box 40		Vandalia	Illinois	62471		X				X		X		
21-03-100-002	15034 North 6th Avenue	Coffeen	Robert & Clara	Dale	15034 Noth 6th Avenue		Coffeen	Illinois	62017										Well H
21-03-100-003	15034 North 6th Avenue	Coffeen	Robert & Clara	Dale	15034 Noth 6th Avenue		Coffeen	Illinois	62017										
21-03-100-004	15034 North 6th Avenue	Coffeen	Robert & Clara	Dale	15034 Noth 6th Avenue		Coffeen	Illinois	62017										
21-03-100-005	15010 North 6th Avenue	Coffeen	Mary	Shelbourne	15010 North 6th Avenue		Coffeen	Illinois	62017										
21-03-100-007	North 6th Avenue	Coffeen	Terry & Brenda	Young	73 Young Lane		Coffeen	Illinois	62017										Well I
21-03-100-008	15010 North 6th Avenue	Coffeen	Mary	Shelbourne	15010 North 6th Avenue		Coffeen	Illinois	62017	X					X				
21-03-100-009	15034 North 6th Avenue	Coffeen	Robert & Clara	Dale	15034 Noth 6th Avenue		Coffeen	Illinois	62017	X				X		X			Well G
21-03-100-012	15112 North 6th Avenue	Coffeen	Brooks	Moreland	15112 North 6th Avenue		Coffeen	Illinois	62017										
21-03-100-013	15112 North 6th Avenue	Coffeen	Brooks	Moreland	15112 North 6th Avenue		Coffeen	Illinois	62017	X									
21-03-100-014	15138 North 6th Avenue	Coffeen	Kevin & Gena	Lewey	15138 North 6th Avenue		Coffeen	Illinois	62017	X				X					Well YY
21-03-100-015	15152 North 6th Avenue	Coffeen	Doris	Graham	15152 North 6th Avenue		Coffeen	Illinois	62017										
21-03-100-016	15170 North 6th Avenue	Coffeen	Randy	White	3362 South Spring Street		Springfield	Illinois	62703	X				X					Well J
21-03-100-017	15194 North 6th Avenue	Coffeen	Randy	White	3362 South Spring Street		Springfield	Illinois	62703	X					X				Well K
21-03-300-001	CIPS Trail	Coffeen	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002										
21-03-300-002	151 Fox Lane	Coffeen	Drury	Emerson	151 Fox Lane		Coffeen	Illinois	62017	X				X	X		X	X	
21-04-100-001	North 6th Avenue	Coffeen	Illinois Power Company	c/o Ameren Services	P.O. Box 66149		St. Louis	Missouri	63166										
21-04-100-002	5264 East 14th Road	Coffeen	Dean	Huber	5264 East 14th Road		Coffeen	Illinois	62017						X	X			
21-04-100-007	14198 North 6th Avenue	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017						X			X	
21-04-100-008	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017						X				Wells M,N,O,P
21-04-100-009	14116 North 6th Avenye	Coffeen	Michael & Cheri	Huber	14116 North 6th Avenue		Coffeen	Illinois	62017	X									Well 218
21-04-100-010	North 6th Avenue	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017										
21-04-200-001	13253 North 6th Avenue	Coffeen	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049										
21-04-200-004	Lake Boundary	Coffeen	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002										
21-04-200-005	14330 North 6th Avenue	Coffeen	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812	X				X	X				
21-04-200-007	14358 North 6th Avenue	Coffeen	Bob & Alice	Reynolds	14358 North 6th Avenue		Coffeen	Illinois	62017	X					X				
21-04-200-008	15010 North 6th Avenue	Coffeen	Mary	Shelbourne	15010 North 6th Avenue		Coffeen	Illinois	62017										
21-04-300-003	East 14th Road	Coffeen	Brian	Suhre	8233 Brickyard Hill Road		Worden	Illinois	62097										
21-04-300-004	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017										
21-04-300-005	6265 East 14th Road	Hillsboro	Stella	Kasten	6265 East 14th Road		Hillsboro	Illinois	62049										
21-04-300-006	East 14th Road	Coffeen	Brian	Suhre	8233 Brickyard Hill Road		Worden	Illinois	62097										
21-04-400-001	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017										
21-04-400-002	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017										
21-04-400-003	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017										Well Q
21-04-400-004	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017										
21-05-100-003	13253 North 6th Avenue	Hillsboro	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049										
21-05-100-004	13253 North 6th Avenue	Hillsboro	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049										
21-05-100-005	13214 Flat Avenue	Hillsboro	Mark	Huber	9121 Briarfield Lane		Bunker Hill	Illinois	62014										
21-05-100-006	North 6th Avenue	Coffeen	Brian, Dacia, & Dean	Brown	12167 North Road		Hillsboro	Illinois	62049										
21-05-200-001	13253 North 6th Avenue	Hillsboro	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049										
21-05-200-002	East 14th Road	Coffeen	Dennis	Dressler	656 Lily Road		Lenzburg	Illinois	62255										
21-05-200-004	East 14th Road	Coffeen	Dennis	Dressler	656 Lily Road		Lenzburg	Illinois	62255										
21-05-200-005	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017	X				X					Well T
21-05-300-001	Flat Avenue	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049						X	X	X		
21-05-300-003	North 5th Lane	Hillsboro	Bank & Trust		P.O. Box 410		Litchfield	Illinois	62056										
21-05-300-007	Flat Avenue	Coffeen	Mark	Huber	9121 Briarfield Lane		Bunker Hill	Illinois	62014										
21-05-300-008	13214 Flat Avenue	Hillsboro	Phyllis	Simonton	13214 Flat Avenue		Coffeen	Illinois	62017	X					X	X	X		Well S
21-05-400-001	13214 Flat Avenue	Coffeen	Mark	Huber	9121 Briarfield Lane		Bunker Hill	Illinois	62014	X				X	X		X		
21-05-400-006	North 5th Lane	Hillsboro	Joyce Brothers	c/o Bank & Trust Company	401 North Madison	P.O. Box 410	Litchfield	Illinois	62056										
21-05-400-008	East 14th Road	Coffeen	Dean	Huber	5264 East 14th Road		Coffeen	Illinois	62017						X	X			
21-05-400-009	5073 East 14th Avenue	Coffeen	Bruce	Guckian	5073 East 14th Road		Coffeen	Illinois	62017	X									
21-05-400-011	North 5th Lane	Hillsboro	Jason Huston	c/o Countrywide Tax Service	P.O. Box 10211		Van Nuys	California	91410	X					X				
21-06-100-003	11400 North 6th Avenue	Hillsboro	Douglas & Brenda	Johnson	11400 North 6th Avenue		Hillsboro	Illinois	62049										Well V
21-06-100-004	12056 North 6th Avenue	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049	X					X				Well 216

Parcel	Site Address	City	First Name	Last name	Mailing Address	Address 2	City	State	Zip Code	Inhabited Residence	Vacant Residence	Inhabited Mobile Home	Vacant Mobile Home	Garage	Barn/Shed	Grain Bin/Silo	Other	Pond	Water Well Present
21-06-100-005	12198 North 6th Avenue	Hillsboro	Roberta	Meyer	12198 North 6th Avenue		Hillsboro	Illinois	62049	X				X	X		X		Well W
21-06-100-006	North 6th Avenue	Hillsboro	Roberta	Meyer	12198 North 6th Avenue		Hillsboro	Illinois	62049										
21-06-200-007	North 6th Avenue	Coffeen	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812										
21-06-200-008	North 6th Avenue	Hillsboro	Austin	Meyer	449 Bobwhite Road		Pocahontas	Illinois	62275										
21-06-200-009	North 6th Avenue	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049							X			Well DD
21-06-300-002	253 Rock Lane	Hillsboro	Norman	Compton	253 Rock Lane		Hillsboro	Illinois	62049										
21-06-300-007	Buckeye Trail	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049										
21-06-300-008	188 Rock Lane	Hillsboro	Patrick & Lora	Eck	188 Rock Lane		Hillsboro	Illinois	62049	X				X					Well 228
21-06-300-009	Buckeye Trail	Hillsboro	Patrick	Jarnagin	4441 Buckeye Trail		Hillsboro	Illinois	62049										
21-06-300-010	4441 Buckeye Trail	Hillsboro	Carrie	Baron	4441 Buckeye Trail		Hillsboro	Illinois	62049	X					X				Well 234
21-06-400-001	4441 Buckeye Trail	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049										
21-06-400-002	4441 Buckeye Trail	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049										
21-06-400-003	4441 Buckeye Trail	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049										
21-07-100-002	4255 Buckeye Trail	Hillsboro	Andrew Stritzel	c/o National Bank	P.O. Box 310		Hillsboro	Illinois	62049	X					X				
21-07-100-007	Buckeye Trail	Hillsboro	Travis & Aimee	Klump	17135 Illinois Route 185		Coffeen	Illinois	62017						X				
21-07-100-008	Buckeye Trail	Hillsboro	Justin & Brandi	Reynolds	1510 South Main Street		Hillsboro	Illinois	62049										
21-07-100-009	Buckeye Trail	Hillsboro	Tracy	Dressler	305 Washington Street		Donnellson	Illinois	62019										
21-07-100-010	Buckeye Trail	Hillsboro	Klump & Atterberry	c/o Phillip Klump	807 Keller Avenue		Hillsboro	Illinois	62049										
21-07-100-011	Buckeye Trail	Hillsboro	Terri	Mackey	253 Rock Lane		Hillsboro	Illinois	62049										
21-07-200-002	Buckeye Trail	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049						X	X		X	
21-07-300-003	4201 Buckeye Trail	Hillsboro	John & Edna	Balla	4201 Buckeye Trail		Hillsboro	Illinois	62049	X				X				X	Well Y
21-07-300-007	4201 Buckeye Trail	Hillsboro	John & Edna	Balla	4201 Buckeye Trail		Hillsboro	Illinois	62049										
21-07-300-012	4121 Buckeye Trail	Hillsboro	Michelle Stritzel	c/o National Bank	P.O. Box 310		Hillsboro	Illinois	62049	X									
21-07-300-014	Buckeye Trail	Hillsboro	Larry	Casarta	2618 Morganfair Lane		Katy	Texas	77450										
21-07-300-015	Buckeye Trail	Hillsboro	Donna	Stritzel	13 Johnson Street		Hillsboro	Illinois	62049										
21-07-400-002	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017										
21-07-400-003	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017									X	
21-07-400-004	4441 Buckeye Trail	Hillsboro	David, Carol, & Nicholas	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019										
21-07-400-005	Buckeye Trail	Hillsboro	Kenneth & Lonna	Durbin	16130 East 7th Avenue		Butler	Illinois	62015						X		X		
21-08-100-001	4441 Buckeye Trail	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049										
21-08-100-002	North 5th Lane	Hillsboro	Joyce Brothers	c/o Bank & Trust Company	401 North Madison	P.O. Box 410	Litchfield	Illinois	62056										
21-08-100-003	North 5th Lane	Hillsboro	Eldon & Gerald Joyce	c/o Bank & Trust Company	401 North Madison	P.O. Box 410	Litchfield	Illinois	62056						X	X			
21-08-100-004	North 5th Lane	Hillsboro	Joyce Brothers	c/o Bank & Trust Company	401 North Madison	P.O. Box 410	Litchfield	Illinois	62056										
21-08-200-001	North 5th Lane	Hillsboro	Eldon & Gerald Joyce	c/o Bank & Trust Company	401 North Madison	P.O. Box 410	Litchfield	Illinois	62056										
21-08-200-002	East 14th Road	Coffeen	Nancy	Blackburn	899 County Road 800 East		Champaign	Illinois	61822										
21-08-200-003	East 14th Road	Coffeen	Nancy	Blackburn	899 County Road 800 East		Champaign	Illinois	61822										
21-08-200-004	East 14th Road	Coffeen	Nancy	Blackburn	899 County Road 800 East		Champaign	Illinois	61822										
21-08-300-001	North 4th Avenue	Donnellson	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017										Well U
21-08-300-002	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017										
21-08-300-003	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017										
21-08-300-004	North 4th Avenue	Donnellson	Robert	Elmore	10724 Burlington Lane		Marion	Illinois	62959										
21-08-400-001	13295 North 4th Avenue	Donnellson	Roger	Reeves	605 Hickory		Hillsboro	Illinois	62049										Well Z
21-08-400-002	4177 East 14th Road	Hillsboro	Nancy	Blackburn	899 County Road 800 East		Champaign	Illinois	61822										
21-09-100-001	Mentors Lane	Coffeen	Brian	Suhre	8233 Brickyard Hill Road		Worden	Illinois	62097										
21-09-100-002	Mentors Lane	Coffeen	Nancy	Blackburn	899 County Road 800 East		Champaign	Illinois	61822										
21-09-100-003	14171 Mentors Lane	Coffeen	Stella	Kasten	6265 East 14th Road		Hillsboro	Illinois	62049						X	X			
21-09-200-005	14280 Mentors Lane	Coffeen	William & Cleola	Brackett	14280 Mentors Lane		Coffeen	Illinois	62017								X		
21-09-200-006	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017								X		Well R
21-09-200-008	14243 Mentors Lane	Coffeen	Rose	Beard	14243 Mentors Lane		Coffeen	Illinois	62017	X				X					
21-09-200-010	Mentors Lane	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017										
21-09-200-011	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017										
21-09-200-012	Mentors Lane	Coffeen	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002										
21-09-300-001	4178 East 14th Road	Coffeen	Nancy	Blackburn	899 County Road 800 East		Champaign	Illinois	61822						X	X	X		Well AA
21-09-300-003	North 4th Avenue	Coffeen	Michael & Paula	Shelton	14089 Ticky Point Trail		Donnellson	Illinois	62019										
21-09-300-004	14171 North 4th Avenue	Donnellson	Michael & Paula	Shelton	14089 Ticky Point Trail		Donnellson	Illinois	62019								X		
21-09-400-001	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017										
21-09-400-002	Border Coffeen Lake	Coffeen	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002										
21-09-400-004	14223 North 4th Avenue	Donnellson	Nathan & Christy	Hemken	14223 North 4th Avenue		Donnellson	Illinois	62019	X					X			X	Well 246
21-09-400-005	14223 North 4th Avenue	Donnellson	Nathan & Christy	Hemken	14223 North 4th Avenue		Donnellson	Illinois	62019										
21-09-400-006	14261 North 4th Avenue	Coffeen	William Sarginson	c/o Jenni Parish	225A South Main Street		Hillsboro	Illinois	62049		X								

Parcel	Site Address	City	First Name	Last name	Mailing Address	Address 2	City	State	Zip Code	Inhabited Residence	Vacant Residence	Inhabited Mobile Home	Vacant Mobile Home	Garage	Barn/Shed	Grain Bin/Silo	Other	Pond	Water Well Present
21-09-400-009	14261 North 4th Avenue	Donnellson	Stephen	Castleman	P.O. Box 843		Belleville	Illinois	62220				X						
21-09-400-012	14305 North 4th Avenue	Coffeen	Joel	Thacker	14305 North 4th Avenue		Donnellson	Illinois	62019										
21-09-400-013	15001 North 4th Avenue	Coffeen	Michael & Candace	Ellington	15001 North 4th Avenue		Donnellson	Illinois	62019										
21-09-400-014	North 4th Avenue	Coffeen	Joel	Thacker	14305 North 4th Avenue		Donnellson	Illinois	62019	X									Well X
21-10-100-002	Border Coffeen Lake	Coffeen	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002										
21-10-300-003	North 4th Avenue	Coffeen	Traylor Cemetery	c/o Dorothy White	325 CIPS Trail		Coffeen	Illinois	62017										
21-10-300-004	15001 North 4th Avenue	Coffeen	Michael	Ellington	15001 North 4th Avenue		Donnellson	Illinois	62019	X					X				Well BB
21-10-300-005	15025 North 4th Avenue	Coffeen	William & Deborah	Withers	15025 North 4th Avenue		Coffeen	Illinois	62017	X							X		Wells 247 & 248
21-15-100-001	15020 North 4th Avenue	Coffeen	Joseph & Nancy	Blasko	14392 North 4th Avenue		Donnellson	Illinois	62019						X				
21-15-200-001	Border Coffeen Lake	Coffeen	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002										
21-16-100-001	14092 North 4th Avenue	Donnellson	Mary Beth Wolf	c/o Sue Lehr	P.O. Box 161		Ramsey	Illinois	62080						X	X			
21-16-200-003	Walnut Grove Road	Donnellson	Harriet	Gibson	3178 Buckeye Trail		Donnellson	Illinois	62019										
21-16-200-005	14392 North 4th Avenue	Coffeen	Joseph & Nancy	Blasko	14392 North 4th Avenue		Donnellson	Illinois	62019	X					X				
21-16-200-007	North 4th Avenue	Coffeen	Monroe	Reynolds	14304 North 4th Avenue		Donnellson	Illinois	62019	X					X				
21-16-200-008	North 4 Avenue	Coffeen	Robert	Coleman	1407 East Cloverfield		Greenville	Illinois	62246										
21-16-200-009	14300 North 4th Avenue	Coffeen	Linda	Mathena	14300 North 4th Avenue		Donnellson	Illinois	62019	X					X				Well 250
21-16-300-001	Arrow Trail	Donnellson	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019										
21-16-300-002	3095 Walnut Grove Road	Donnellson	Michael & Paula	Shelton	14089 Ticky Point Trail		Donnellson	Illinois	62019										Well HH
21-16-400-003	3176 Walnut Grove Road	Donnellson	Don & Alta	Betoche	3176 Walnut Grove Road		Donnellson	Illinois	62019										
21-16-400-005	Walnut Grove Road	Donnellson	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002										
21-16-400-007	Border Coffeen Lake	Donnellson	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002										
21-16-400-009	3176 Walnut Grove Road	Donnellson	Don & Alta	Betoche	3176 Walnut Grove Road		Donnellson	Illinois	62019	X									Well 256
21-17-100-001	North 4th Avenue	Donnellson	David, Carol, & Nicholas	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019										
21-17-100-003	3178 Buckeye Trail	Donnellson	Harriet	Gibson	3178 Buckeye Trail		Donnellson	Illinois	62019										
21-17-200-002	Arrow Trail	Donnellson	Mary Beth Wolf	c/o Sue Lehr	P.O. Box 161		Ramsey	Illinois	62080										
21-17-200-003	Arrow Trail	Donnellson	Michael & Paula	Shelton	14089 Ticky Point Trail		Donnellson	Illinois	62019										
21-17-200-004	3289 Arrow Trail	Donnellson	Micheal & Paula	Shelton	14089 Ticky Point Trail		Donnellson	Illinois	62019						X	X			Well GG
21-17-400-002	Arrow Trail	Donnellson	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019										
21-17-400-003	Arrow Trail	Donnellson	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019										
21-17-400-004	14383 East 14th Road	Irving	David	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019										
21-17-400-005	North 4th Avenue	Donnellson	Michael & Paula	Shelton	14089 Ticky Point Trail		Donnellson	Illinois	62019										
21-18-100-004			Tammy Huffman	c/o Corelogic	1 Corelogic Drive		Westlake	Texas	76262	X					X			X	
21-18-100-005	North 4th Avenue	Hillsboro	Larry	Casarta	2618 Morganfair Lane		Katy	Texas	77450										
21-18-200-006	3178 Buckeye Trail	Donnellson	Harriet	Gibson	3178 Buckeye Trail		Donnellson	Illinois	62019									X	
21-18-200-009	North 4th Avenue	Donnellson	David, Carol, & Nicholas	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019										
21-18-200-010	North 4th Avenue	Hillsboro	Ben	Kenny	13001 North 6th Avenue		Hillsboro	Illinois	62049						X	X			
21-18-200-011	Buckeye Trail	Donnellson	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019										
21-18-200-012	3358 Buckeye Trail	Donnellson	Craig	Foster	3358 Buckeye Trail		Donnellson	Illinois	62019	X					X		X		Well II
21-18-300-001	12316 North 3rd Avenue	Donnellson	Scott	Schluckebier	12316 North 3rd Avenue		Donnellson	Illinois	62019										
21-18-300-003	12227 North 3rd Avenue	Donnellson	Mildred	Balla	12227 North 3rd Avenue		Donnellson	Illinois	62019										
21-18-400-005	3177 Buckeye Trail	Donnellson	Harriet	Gibson	3178 Buckeye Trail		Donnellson	Illinois	62019	X					X		X		Well 254

*Minerals own by Natural Rsource Partners, L.P.

Highlighted yellow indicates potential historic structure as identified by Ms. Dawn Cobb and Mr. Hal Hassen of IDNR

ATTACHMENT II.10.A.2
IDNR IDENTIFIED STRUCTURES

Illinois Department of
Natural Resources
One Natural Resources Way Springfield, Illinois 62702-1271
www.dnr.illinois.gov

Bruce Rauner, Governor
Wayne A. Rosenthal, Director

27 May 2015

Chad Fuson
Hillsboro Energy, LLC
925 South Main Street
Hillsboro, Illinois 62049

Dear Chad,

Hal Hassen, IDNR Archaeologist, and I reviewed the shadow boundary expansion area with you for Deer Run Mine, Montgomery County on December 3, 2014. The shadow boundary expansion area includes Panels 7 to 17 (P399, Shadow Boundary Rev. 2 map). We conducted a visual survey from the road of 21 properties to evaluate if the houses and barns warranted documentation prior to planned subsidence. Based on our preliminary survey, four structures will need additional documentation if the mine plans to proceed with demolition in the future. Each is listed below with attached photographs.

• Phyllis Simonton	#5 on aerial map	Parcel 21-05-300-008	b/w Panels 12 and 13
• Jason Hustin	#6 on aerial map	Parcel 21-05-400-011	Panel 14
• Joel/Edward Thacker	#10 on aerial map	Parcel 21-09-400-012	Panel 17, SE corner
• Craig Foster/ Pamela Ott	#13 on aerial map	Parcel 21-18-200-012	South of Panel 17 in buffer zone

If you have questions, please feel free to contact me.

Sincerely,

Dawn Cobb

Dawn Cobb
Office of Realty and Environmental Planning
IL Department of Natural Resourcess

21-05-300-008 Phyllis Simonton

5

1896
1938 addition

house
- check
recent.
- small
barn

21-05-400-011 Jason Huston C-O County Wide Tax Serv

(6)

(1900)

2 barn
- brick Fou
- chen & Dete

✓

21-05-400-011 Jason Huston C-O County Wide Tax Serv

Joel & Edward Thacker

(10)

1430 S. 4th Ave.
Donnellson / Coffeen

check tax records

brick Foundation

(1900)

21-18-200-012 Craig A Foster & Pamela Ott

13

3358 Buckeye Tr.
Donnellson, IL 62019

(check tax records

~~old~~?

old?

1910

assessed out building

21-18-200-~~013~~ 012 Craig A Foster & Pamela Ott

PART III

Hydrogeologic Information

PART III

HYDROGEOLOGIC INFORMATION

1) Regional Hydrogeologic Characteristics

As described in Illinois State Geological Survey Circulars 192, 198, 207, 212, 222, 225, 232, 248, Coop 1, etc., other sources or personal knowledge provide the following required hydrogeologic information.

A) Describe the major and minor surficial aquifers of the permit area and adjacent areas.

RESPONSE: ***Major surficial aquifers – None***
Minor surficial aquifers – Scattered and discontinuous sand and gravel deposits occur throughout the shadow area in northeast to southeast trending belts.

B) List the major and minor drift, bedrock valley, and buried bedrock valley aquifers of the area.

RESPONSE: ***Major drift aquifers - None.***

Minor drift aquifers – Drift filled valleys associated with East Fork Shoal Creek and its larger tributaries have been found to contain thicker sand and gravel deposits. Drift deposits to the west and south east are generally thin with minimal water yields contained within the glacial till.

Major bedrock valley aquifers - None.

Minor bedrock valley aquifers – None.

Major buried bedrock valley aquifers – None.

Minor buried bedrock valley aquifers – None.

C) List the major and minor bedrock aquifers in the area.

RESPONSE: ***Major bedrock aquifers - None.***

Minor bedrock aquifers – Pennsylvanian sandstones have been a source of water for small domestic and farm supply throughout the central and south central portions of the county.

D) List the generalized water yield, supply, and potential use of these aquifers.

RESPONSE: ***The proposed mine is located in the glaciated upland area of south-central Montgomery County. It is situated at the headwaters of the major drainage systems of the region. In this area, no specific geologic unit has been identified as a major surficial aquifer. According to Illinois State Geological Survey (ISGS) Circular 225, the best potential sources of groundwater are sand and gravel deposits in the major valley systems. However, many of the surficial sand and gravel deposits throughout the county are narrow and discontinuous. The bottomlands of the East Fork Shoal Creek drainage system have been found to contain thicker deposits and have produced sufficient yields for communities such as Nokomis to the north. Drift aquifers are generally thin with low yields throughout the permit area. The Pennsylvanian age sandstone bedrock aquifers can usually provide only enough water for individual domestic and farm supplies. Yields from wells completed in these formations are usually less than 10 gallons per minute with yields less than 5 gallons per minute common. The low permeability of the Pennsylvanian System rocks causes the water in the deeper formations to be highly mineralized. Therefore, some deeper bedrock aquifers may contain water whose quality is unsatisfactory without expensive treatment and, generally, are not developed. Recharge to these bedrock aquifers is primarily from precipitation which percolates into and through the overlying unconsolidated materials.***

2) Area Specific Hydrogeologic Characteristics

A) 1) Provide a description of the areal and structural geology of the permit, shadow area and adjacent areas for the deeper of either the stratum immediately below the lowest coal seam to be mined, or any aquifer below the lowest coal seam to be mined which may be adversely impacted by mining. Provide logs showing the lithologic characteristics including physical properties and thickness of each stratum and the location of groundwater where encountered. Provide location and elevations of test borings or core samplings on pre-mining land use map or other designated map.

RESPONSE: ***The mine is located in the west-central part of the Illinois Basin. The principal coal seam with mineable thickness is the Herrin No. 6, and is a part of the Carbondale Formation of the Middle Pennsylvanian Age. All overlying strata up to the unconsolidated soils also belong to the Pennsylvanian System. The soils materials were deposited during the Pleistocene and range from 110 to 190 feet. The soils zone consists of clays, gravels, and discontinuous sand deposits and does not perform reliably as an aquifer.***

There are no major aquifers in the mine area or in the adjacent area. The shallower Pennsylvanian sandstones and limestones may be considered as minor aquifers with low permeability and porosity and are more mineralized

with depth. Yields are low in the range of 1 to 10 gallons per minute. Use of these resources has been limited to small domestic and farm supplies.

Regional dip for the Herrin No. 6 seam is to the east and southeast at less than one percent. However, variations occur locally in the strata as evidence from the borings and surrounding mines in the No. 6 Seam. The depth to the No. 6 Seam ranges from 450 vertical feet to 525 vertical feet with seam floor elevations ranging from 165 feet above mean sea level (MSL) in the northwest corner of the shadow area and an elevation of 64 feet above MSL in the east.

The Herrin No. 6 seam is overlain by a black shale regionally identified as the Anna Shale. The thickness of the Anna Shale is zero to 6 feet as found in the corehole data. The Brereton Limestone is found as the next unit above the Anna Shale. This limestone is described as hard. It ranges in thickness from zero to 16 feet.

The immediate floor of the Herrin No. 6 seam is described as claystone or underclay. This material is clay rich and is non-calcareous. The thickness ranges from 0 to 3 feet. Beneath this material, the floor material grades to claystone with limestone nodules and then limestone.

The locations of the boreholes drilled within the proposed shadow boundary area and the previously approved shadow boundary area are shown on Map 4 – Hydro-Geological Map. The boreholes were drilled and logged by Goff and Pruitt Drilling, Inc., Magnum Drilling Services, Inc. and Hawkey & Kline Coring & Drilling, Inc. Lithological logs are shown in Attachment III.2.A.1 – Boring Logs.

2) Provide chemical analyses of each stratum down to and including the deeper of either the stratum immediately below the lowest coal seam to be mined or any aquifer below the lowest coal seam to be mined which may be adversely impacted by mining.

   The analyses shall identify those strata that may contain acid or toxic-forming or alkalinity-producing materials and determine their content.

RESPONSE: *A detailed acid/base account has been generated from Corehole 08-03-17-04. Corehole 08-03-17-04 was drilled in the adjacent shadow area. The results are shown in Attachment III.2.A.2 – Acid Base Accountability.*

3) Provide coal seam(s) name and number and an analysis of the coal seam(s) as to total sulfur and pyritic sulfur. On the pre-mining land use, operation, or other designated map show all coal crop lines and the strike and dip of the coal to be mined.

RESPONSE: ***The coal seam to be mined is the Herrin No. 6 Seam. Corehole 08-03-17-04 coal quality yielded the following results.***

Herrin No. 6 Seam Sulfur Analysis	
Pyritic Sulfur	***2.14% Dry***
Organic Sulfur	***1.97% Dry***
Sulfate Sulfur	***0.19% Dry***
Total Sulfur	***4.03% Dry***

Refer to Attachment III.2.A.3 - Sulfur Forms Result Sheet from Appalachian Laboratories, Inc. for analysis data sheets and more information. Refer to Map 11 – Coal Seam Structure Base Map for the coal seam contours and the strike and dip of the coal to be mined. No coal crop lines of the Herrin No. 6 Seam are located within the mine reserve area.

4) For room and pillar mining operations, the thickness and engineering properties of clay or soft rocks such as clayshale, if any, in the stratum immediately above and below each coal seam to be mined.

RESPONSE: ***N/A. The Deer Run Mine is a longwall mining operation.***

5) Applicants may request that the Department waive in whole or in part the information required under questions 2 thru 4 above. Waiver requests should be submitted to the Department for review prior to submission of an application. Applications containing unapproved waiver requests may result in prolonging the application review or in application denial.

RESPONSE: ***N/A. A waiver of the above information is not being requested.***

B) Ground Water Information

1) Provide the location on the hydrologic or other designated map, and ownership of existing wells, springs, and other ground water resources for the permit area and adjacent area.

RESPONSE: ***Refer to Map 4 – Hydro-Geological Map for the location of known existing wells, springs, and other ground water resources within the proposed shadow boundary area and within ½ mile of the proposed shadow boundary area.***

Refer to Attachment III.2.B.1 – Surface Owners Water Well Survey in this application for a list of well owners and pertinent well information within the proposed shadow boundary area and within ½ mile of the proposed shadow boundary area. A water well survey has been conducted for every known surface land owner within the ½ mile outside the shadow boundary area. Information collected from the individual landowners as received from this survey is included in this chart. Locations of the wells can be correlated from this chart to Map 4 – Hydro-Geological Map by using the Key ID numbers. Landowners can also be identified by referencing the Parcel ID numbers in the chart to Map 2 – Identification of Interests.

2) Provide a description of seasonal ground water quality including at a minimum the following:

pH
total dissolved solids
hardness
alkalinity
acidity
sulfates
total iron
total manganese
total chlorides

RESPONSE: ***Refer to Attachment III.2.B.2 – Groundwater Quality Summary for a summary of groundwater quality results that were collected and analyzed at the nearby surface facilities site of the Deer Run Mine. This is a collection of groundwater quality data that has been required to be monitored as per the requirements of Permit No. 399.***

3) Provide a description of seasonal ground water quantity including at a minimum the appropriate rates of discharge or usage and the elevation of potentiometric surface of the coal to be mined, and in each water-bearing stratum above the coal to be mined, and in each water-bearing stratum below the coal to be mined which may be potentially impacted.

RESPONSE: ***The seasonal ground water quantity for the proposed Revision No. 2 Shadow Area will be very similar to the seasonal ground water quantity in the shadow area as approved in the original Permit No. 399. The vast majority of residents within the proposed shadow boundary area and the adjacent areas receive their primary water supply from rural and municipal water systems.***

Water quantity present within the Herrin No. 6 Coal Seam is minimal and the quality is as such that it is not suitable for potable purposes. Seasonal groundwater quantity including the elevation of the potentiometric surface of the coal seam was determined in three piezometer wells that were installed in

October and November 2008 within the Deer Run Mine shadow area. The wells were screened within the Herrin No. 6 coal seam. Groundwater level measurements were then recorded. A table summarizing the water level measurements recorded is included in Attachment III.2.B.3 – Coal Seam Wells Report. Based on the assimilated data, it appears that the flow gradient within the Herrin No. 6 Coal Seam in the area of the Deer Run Mine is generally West to East, to Southeast. Given the delayed response to well recharge, this information suggests and/or confirms that the Herrin No. 6 Coal Seam has very limited potential as a potable water source. Copies of the well completion reports and a map identifying the well locations are included in the report.

A possible water bearing strata above the Herrin No. 6 Coal Seam could be the Trivoli Sandstone located approximately 70 to 160 feet vertically above the No. 6 Seam. There are known water supply wells that are drilled into the Trivoli Sandstone. They are not, however, located within the proposed shadow boundary area. The locations of the wells are east of the proposed shadow area and are shown on Map 4 – Hydro-Geological Map. The Trivoli Sandstone is identified on Map 5 – Trivoli Sandstone Map. The Trivoli Sandstone appears as the only identifiable sandstone in the geologic column. ISGS data for the region indicates that the potential of water production is minimal and the potential for groundwater recharge is limited due to the extent of impermeable shales found above and below the sandstones and coal beds.

The primary water bearing unit within the unconsolidated deposits located above the bedrock stratum is a saturated sand layer that is generally encountered within 20 feet to 25 feet of the ground surface. Intermittent and discontinuous granular outwash deposits are present at deeper depths. These deposits are generally confined within a hard basal till.

C) Surface Water Information

1) Provide the name, location, ownership, and description of all surface water bodies, lakes, streams, impoundments, and springs within and adjacent to the proposed permit and shadow areas. Provide the location of any discharge or drainage into any surface water bodies listed above.

RESPONSE: *The location of the proposed mining area is within the upper reaches of larger watersheds and provide varied physical relief. The physical ground survey of the shadow area as well as the review of aerial photographs of the area indicates that one impoundment of more than 20-acre feet is located over the area planned for subsidence. The water reservoir, known as Coffeen Lake, is located over the Eastern edge of the projected mine panels. Refer to Map 2 – Identification of Interests for ownership information. The lake is utilized as a cooling reservoir for the nearby Coffeen Power Station. This body of water does not serve as a significant water source for any public water supply system.*

Streams above the proposed shadow areas are considered to be intermittent and are charged by runoff from precipitation events. In addition, there are several small farms ponds within and adjacent to the proposed shadow area. Refer to Map 2 – Identification of Interests for ownership information for ponds within and adjacent to the proposed shadow area. Refer to Map 4 – Hydro-Geological Map for drainage locations into and out of surface water bodies within the proposed shadow area and the adjacent areas.

2) Provide for surface water bodies listed under 2)(c)(1) above information on surface water quality and quantity sufficient to demonstrate seasonal variation and water usage.

a) Water quality description shall include at a minimum, baseline information as follows:

pH
total suspended solids
total dissolved solids
alkalinity
acidity
sulfates
total iron
total manganese
total chlorides

RESPONSE: ***Refer to Attachment III.2.C.2 – Surface Water Quality Data in this application for information on seasonal surface water quality and quantity in the Shoal Creek Reservoir Structure No. 5. This water body is a flood impoundment structure on an intermittent tributary of the Middle Fork of Shoal Creek. It is expected that the water quality of the water in the Shoal Creek Reservoir Structure No. 5 is representative of other water bodies located within the proposed shadow boundary area including Coffeen Lake.***

Water sampling and analysis to determine the seasonal surface water quality of the Coffeen Lake Reservoir began in April of 2014 and will continue for approximately one year. Seasonal baseline information for the following water quality parameters will be established: pH, total suspended solids, total dissolved solids, alkalinity, acidity, sulfates, total iron, total manganese, total chlorides.

Refer to Attachment III.2.C.2 in Permit No. 399 for baseline monitoring information of surface water streams within the Permit No. 399 surface permit area. Included in this attachment is typical seasonal water quality information on streams and tributaries representative of the mining area.

No known public water supplies in a surface water body exist within the proposed shadow boundary area. Water usage from surface water bodies within the proposed shadow boundary area is expected to be minimal and limited to domestic animal drinking water and recreational purposes.

b) Water quantity description shall include at a minimum base information on seasonal flow rates.

RESPONSE: ***Refer to Attachment III.2.C.2 – Surface Water Quality Data for information on flow rates during the monitoring periods. The data reflect periods of "low flow" or "no flow" conditions that are typical of ephemeral headwater streams in the area. Most of the streams only flow in direct response to precipitation. Thus, the flow rates vary depending on the size of the watershed, antecedent moisture conditions, and the amount of precipitation.***

D) Protection of Hydrologic Balance

1) The applicant shall provide a determination of the probable hydrologic consequences, (PHC) on the proposed permit area, proposed shadow area and adjacent areas with respect to the hydrologic regime and water quality and quantity in surface and ground water systems under all seasonal conditions. The determination of PHC shall include findings on the following:

a) Will the proposed operations have adverse impacts to the hydrologic balance;

RESPONSE: ***No surface disturbance is proposed by this application. The impacts to the hydrologic balance within the proposed shadow boundary area are similar to the impacts addressed in the previously approved shadow area in Permit No. 399.***

Underground Mining Operations Impacts to Surface Water

High extraction mining in the proposed shadow area can be expected to cause surface subsidence as detailed in the subsidence control plan contained in Part IV.3.B. of this application. Although changes in the surface elevations will occur, adverse impacts to the quantity and quality of surface water in the shadow area and adjacent area are not anticipated.

The shadow area topography is generally characterized by gently rolling terrain with several morainal hills throughout portions of the permit area. Surface elevations ranging from approximately 600 feet along the larger stream channels located in the western and eastern portions of the shadow area to over 600 feet at the crest of moraines between adjacent drainage courses in the western and eastern portions of the shadow area. The proposed mining area is

located beneath the headwater reaches of the named and unnamed streams that drain the permit area. These streams exhibit dendritic drainage patterns and have relatively steep gradients typical of upland headwater drainages in the area. The proposed longwall panels are laid out in an east-west direction while the majority of the streams in the shadow area generally flow towards the south and southwest. Thus, the subsidence troughs generally will be oriented perpendicular and at angles to the direction of stream flow. This can be evidenced by an evaluation of Map 4 – Hydro-Geological Map. Bearcat Creek and the tributaries to Bearcat Creek located at the headwaters of the watershed mostly flow to the southwest. There are a couple of tributaries to Bearcat Creek located in the southern portion of the proposed shadow area that flow generally to the west. For these locations, the subsidence trough will be oriented parallel to the direction of stream flow. A portion of McDavid Branch located in the northeastern portion of the proposed shadow boundary area flows south into Coffeen Lake. The tributaries into Coffeen Lake located in the eastern portion of the proposed shadow boundary area generally flow to the east. For these locations, the subsidence trough will be oriented parallel to the direction of stream flow. Refer to Map 8 – Post Subsidence Contour Map for the subsidence trough locations in relation to existing streams located within the shadow boundary area.

Subsidence related changes in the shadow area topography can produce surface depressions with localized ponding of surface water or interception of ground water where the water table is near the surface. The proposed subsidence mitigation plan calls for re-establishing pre-mining drainage patterns by grading and/or tiling to drain areas of trapped or standing water.

Longwall and other high-extraction mining methods cause collapse, fracturing, bed separation, and bedding plane slips in the roof strata above the mined seam. The height of the disturbed zone depends on the thickness of the mined coal, geometry of the mined panel, the rate of mining face advancement, and the geological characteristics of the overburden. The area of disturbance above a high-extraction mining area is generally divided into four zones, based on the extent and type of disturbance. The four zones are: the zone of primary caving where the immediate roof collapses irregularly to fill the mined void; the fractured zone where strata breakage and bed separation occur along existing bedding planes; the continuous bending or deformation zone where strata between the fractured zone and the surface bend downward without breaking; and the surface zone where tensile strain at the surface causes shallow fractures to develop.

Subsidence effects on the quantity of surface water can be created by two mechanisms resulting from the full-extraction mining operations. These two mechanisms are the progression of cracking and caving of the bedrock above the mining area and surface cracking resulting from horizontal strains created by deformation within the subsidence trough.

The combined height of the caved and fractured zones where changes in permeability due to subsidence occur has been described by various investigators to range from 30 to 60 times the thickness of the extracted seam. The lower end of this range is typical of areas where the overburden is composed of a high percentage of weak and more elastic strata similar to the geologic conditions at the Deer Run Mine. On the other hand, the upper end of this range was recorded only in mining with overburden composed entirely of brittle rock (limestone and sandstone). Therefore, considering the presence of mostly more elastic shales in the overburden, it is estimated that the impacts of subsidence on strata permeability would reach up to 40 times the mining height. Based on an average extraction height of 9 feet, this would indicate the zone of disturbance could reach 360 feet above the mine opening. Therefore, based on the thickness of the consolidated overburden in the permit area, the cracked and caved zone is not likely to reach the surface and cause loss of stream flow.

The other mechanism which could impact creek flow is surface cracking resulting from subsidence-induced strains due to deformation above the caved zone. Infiltration from the creek to the shallow ground water regime through the alluvial deposits along the streams already occurs. The occurrence of tensile cracks on the surface will not necessarily result in increased loss of flow from the streams. Several studies of the impacts of subsidence on surface water bodies have indicated that the subsidence cracks are limited in depth by the development of compressive stresses replacing the tensile stresses that cause surface cracking. Development of this type of crack would be limited due to the thickness of the unconsolidated alluvium material. Further, the presence of the fine-grained sediments in the stream beds will hasten the process of sealing the cracks. The presence of over 400 feet of overburden between the surficial deposits and mined coal, composed of approximately 60% elastic rock types (shales, siltstones and claystones), will also limit the potential flow of water from the creek.

The proposed subsidence mitigation plan assures the re-establishing of pre-mining drainage patterns by grading and/or tiling to drain areas of trapped or standing water. Subsidence can also affect wells and ponds, by increasing the permeability of the strata and temporarily lowering water levels. The water levels should recover to pre-mining levels within a few weeks after subsidence occurs. However, the decrease in water level in most wells is compensated for by an increased well yield. Therefore the slight decrease of water levels after mining in some wells does not materially affect the post-mining water availability. Studies have indicated that aquifers in unconsolidated materials are not typically impacted by subsidence. Therefore, wells completed in the surficial deposits are not expected to be impacted by the planned subsidence mining.

All proposed underground mining will be below drainage, so no water from the mine voids will gravity flow into surface waters. During mining, pumpage from

the mine to the surface may increase surface quantities but only marginally given the size of the receiving stream. Since the quantity will be only marginally increased during mining, any effect on quality will also be small. The net effect during mining, although marginal, will be similar to the effects caused by the surface activities (i.e. increased mineralization). After mining, no impacts to the surface water quality are anticipated.

Underground Mining Operations Impacts to Ground Water – No significant, detrimental impacts on drinking, domestic and residential water supplies are anticipated due to the proposed mining operations for several reasons. Although planned subsidence mining methods are proposed, the geologic conditions of the Deer Run Mine are favorable for limiting the impacts of any planned subsidence on both surface and ground water hydrology. The unconsolidated soil deposit which lies at the surface is composed of fine-grained materials consisting primarily of clay and silt with lesser amounts of sand. The soil thickness is generally from about 110 to 190 feet and the minimum thickness of the consolidated overburden between the mined coal and the bottom of the surficial deposits is approximately 310 feet. Based on the nature and thickness of the consolidated overburden in the permit area, subsidence is not likely to have significant, long-term impacts on ground water supplies.

Numerous studies have been conducted to determine the effects of surface subsidence due to underground mining on unconsolidated and bedrock aquifers. Booth and Spande described the impacts of longwall mining the No. 6 Coal Seam in south-central Illinois. At the subject mine location, the coal seam was about 10 feet thick and was being mined at a depth of about 725 feet. The major aquifers above the mined coal seam included the Mt. Carmel Sandstone and alluvial and glacial sediments. The results of the study indicated some increase in permeability of the sandstone strata after undermining, and a temporary decrease in water levels of up to 36 feet. The water levels recovered gradually after the longwall face passed, and within a month returned to the approximate pre-mining levels. Other studies were conducted of a longwall mining operation in Saline County, Illinois where the No. 6 Coal Seam was 5.6 feet thick and about 400 feet below the ground surface. The studies concluded that the subsidence slightly increased the permeability of the Trivoli Sandstone aquifer, located approximately 213 feet above the mined coal. No impacts on permeability or water levels in the glacial drift aquifer were noticed. A third study was conducted of the impacts of a longwall mining operation on glacial and sandstone aquifers at a mine in western Illinois mining the No. 6 Coal Seam. The coal seam at this mine was 6.5 feet thick and the coal is overlain by 140 to 240 feet of bedrock and 70 to 160 feet of unconsolidated glacial sediments. The Trivoli Sandstone, a major aquifer in the area, is located about 150 feet above the mined coal. This study concluded that the subsidence increased the hydraulic conductivity of the Trivoli Sandstone by about one order of magnitude, and by two to three orders of magnitude in the shales. The

study also found water levels in the glacial aquifers were increased due to the impacts of subsidence, and water levels in the sandstone decreased. It should be pointed out that the sandstone and shales for this latter case were within the caving and fracture zones described above.

Should subsidence affect a ground water supply, the impacts would be expected to be similar to the impacts described in the first two studies discussed above. Therefore, the potential impacts due to planned subsidence on water supply wells located above a mining panel in the bedrock aquifer could be a temporary lowering of water levels. The water levels should recover to pre-mining levels within a few weeks after subsidence occurs. The possibility of decreasing water levels after subsidence has occurred is typically caused by increasing permeability of the water bearing strata. However, the decrease in water level in most wells is compensated for by an increased well yield. Therefore, the slight decrease of water levels after mining in some wells does not materially affect the post-mining water availability. The studies have indicated that aquifers in unconsolidated materials are not typically impacted by subsidence, even if shallow bedrock aquifers are impacted. Therefore, wells completed in the surficial deposits are not expected to be impacted by the planned subsidence mining.

b) Are acid forming or toxic forming materials present that could result in contamination of surface and/or ground water supplies;

RESPONSE: ***N/A. There is no surface disturbance proposed by this application.***

c) Will the proposed operations result in contamination, diminution or interruption of an underground or surface source of water within the proposed permit or adjacent areas which is used for legitimate purposes; and

RESPONSE: ***The proposed operations are not expected to contaminate, reduce or interrupt any underground or surface sources of water within the shadow boundary revision area or adjacent areas used for legitimate purposes.***

d) What impact(s) will the proposed operations have on including, but not limited to the following parameters:

RESPONSE: ***Since no surface disturbance is proposed by this permit revision, this section does not apply.***

i) Sediment yield from the disturbed area;

ii) Acidity;

iii) Total suspended solids;

iv) Total dissolved solids;

v) Flooding or stream flow alterations;

vi) Availability of surface and ground water; and

2) The Department will review permit revision applications to determine whether a new or updated PHC determination will be needed. Prior to submission of a permit revision application, applicants must contact the Department for this determination. Sufficient information on the proposed revision must be submitted with the request for the PHC determination to allow the Department to make its determination.

RESPONSE: ***Refer to the response given in Part III.2.D.1.a for an update to the Probable Hydrologic Consequences taking into account the proposed shadow boundary area and adjacent areas.***

3) Surface Water Monitoring Program

a) Has an N.P.D.E.S. permit been applied for?
Yes ___X___ No _____

RESPONSE: ***An NPDES Permit has been applied for and issued.***

b) 1) Has an N.P.D.E.S. permit been obtained?
Yes __X__ No _____

If yes, give the permit number, the date issued, the expiration date, and the number of discharge points monitored. If additional discharge points are proposed by this application, list discharge numbers. Locate on the Water Monitoring Map and number all discharge points for the proposed permit area.

RESPONSE: ***NPDES Permit No. IL0078727 was originally issued on May 29, 2009. The permit expiration date is April 30, 2014. A renewal to the NPDES Permit has been applied for and is currently being processed by the Agency. The permit was issued for seven discharge points.***

No additional outlets are proposed by this permit application.

2) In accordance with 35 Ill. Adm. Code 406.101(b), is the applicant requesting that monitoring and reporting be on the basis of grab samples?
Yes ___X___ No _____

c) Are N.P.D.E.S. reports to be submitted to satisfy the reporting requirements?
Yes ___X___ No _____

If yes, provide the NPDES monitoring program including sampling method, sampling frequency and parameters to be analyzed. If not, submit a proposed monitoring and reporting program. Discharge information sheet is given in Schedule A and/or form 2C or 2D. Schedule A should be completed for all proposed discharge points. An estimate of the expected discharge concentration for each listed parameter must be indicated (or marked N/A) and a basis for that estimation provided.

RESPONSE: ***N/A. No additional surface disturbance or sediment control structures are proposed by this revision application.***

If ammonia is to be utilized in wastewater treatment, indicate the discharge(s) resulting from this treatment and provide an estimate of the expected concentration (mg/l) of ammonia nitrogen (as N) from the discharge(s).

RESPONSE: ***N/A. Ammonia will not be used for the treatment of wastewater.***

d) Give a brief description of the water sampling and flow measurement equipment which will be used to monitor the discharges.

RESPONSE: ***N/A. No additional surface disturbance or sediment control structures are proposed by this revision application.***

e) List the name and address of the laboratories which will perform the effluent and ground water sampling analyses.

RESPONSE: ***N/A. No additional surface disturbance or sediment control structures are proposed by this revision application.***

f) Discuss the expected impact this mining operation will have on surface water flows and quality and the effect this will have on downstream water uses.

RESPONSE: ***N/A. No additional surface disturbance or sediment control structures are proposed by this revision application.***

g) Is this proposed mining area covered by existing IEPA Subtitle D permits?

Yes _____ No ____***X***____

If yes,

1) List the permit number(s)

_____

_____

_____

2) Do the proposed mining boundaries exactly coincide with IEPA permitted boundaries?

Yes _____ No _____
(If no, delineate the IEPA Subtitle D permitted boundaries on the Water Monitoring Map).

h) Are the TDS related conditions requested under 35 Ill. Adm. Code 406.203 (from water quality requirements of Subtitle 3 for the discharge of total dissolved solids, chloride, sulfate, iron and manganese)?

Yes _____ No ___***X***____

If yes, provide the following:

1) Show that the discharge(s) will not cause an adverse effect on the environment in and around the receiving stream, by either:

RESPONSE: ***N/A. No additional surface disturbance or sediment control structures are proposed by this revision application.***

a) Demonstrating that the discharge will contain a concentration less than or equal to 3,500 mg/l sulfate and 1,000 mg/l chloride; or,

RESPONSE: ***N/A. No additional surface disturbance or sediment control structures are proposed by this revision application.***

b) through actual stream studies.

2) Show that the discharge(s) will not adversely affect any public water supply.

RESPONSE: ***N/A. No additional surface disturbance or sediment control structures are proposed by this revision application.***

3) Provide a detailed discussion of how you intend to comply with the good mining practices of 35 Ill. Adm. Code 406.204.

RESPONSE: ***N/A. No additional surface disturbance or sediment control structures are proposed by this revision application.***

4) Ground Water Monitoring Program

a) Describe in detail a proposed monitoring plan that will measure the amount and duration of any changes to the ground water system resulting from the mining operation. Parameters to be monitored are given in Schedule B. Monitoring should be on a quarterly basis with reports due within one month of the end of each quarter as follows:

Quarter	Report Due
January, February, March	May 1
April, May, June	August 1
July, August, September	November 1
October, November, December	February 1

RESPONSE: ***N/A. No additional surface disturbance is proposed by this revision application.***

b) Provide a drilling log and completion information and/or a diagram of each well proposed as a monitoring well.

RESPONSE: ***N/A. No new monitoring wells will be installed as part of this permit application.***

c) Locate wells and springs, on or within 1/2 mile of the permit area and shadow area on a hydrologic map. If any of these wells are to be employed for monitoring, designate on hydrologic map and complete Schedule B.

RESPONSE: ***Refer to Map 4 – Hydro-Geological Map for the location of wells located on and within ½ mile of the proposed shadow boundary area. Required monitoring of groundwater monitoring wells within the surface permit areas of the Deer Run Mine is covered in other permit applications.***

d) Discuss any reported problems of maintenance, or ground water quantity and quality which have occurred at the wells and springs listed above.

RESPONSE: ***There are no known or reported water quality problems that have occurred.***

e) Will this operation have any discharges to, or pump water from abandoned underground mines?

Yes _____ No ***X***

If yes, submit a detailed discussion.

5) Identify the general land uses of the watersheds upstream of the proposed permit area and any potential pollution sources which could significantly affect the stream quality at the mine area.

RESPONSE: ***The upstream land uses include pasture, forest, cropland and rural residential. There are no known sources of pollution that could significantly affect stream quality. Runoff from agricultural fields could contain herbicides and pesticides used during the farming operations.***

6) Provide names and addresses of all public water supplies within ten miles of the proposed permit boundaries.

Name	Location	Distance from Permit Boundary	Type (Surface or Well)
City of Hillsboro, IL	***912 St. Louis St., Hillsboro, IL 62049***	***2.5 miles***	***Surface***
Montgomery County Water Co.	***P.O. Box 343, Hillsboro, IL 62049***	***2.0 miles***	***Surface***
City of Litchfield	***120 E. Ryder Street, Litchfield, IL 62056***	***7.0 miles***	***Surface***
City of Witt	***P.O. Box 281, Witt, IL 62094***	***9.0 miles***	***Well***
City of Fillmore	***222 S. Logan, P.O. Box 106 Fillmore, IL 62032***	***9.0 miles***	***Well***

RESPONSE: ***The surface facilities of the Deer Run Mine are served with public utility water by the City of Hillsboro. The area within 10 miles of the permit area is served with public utility water provided by the sources listed above. The source of the***

water supply for the City of Hillsboro and for a portion of Montgomery County Water Company is Glenn Shoals Lake, in which the intake is located approximately 2.5 miles north of the permit area. Lake Hillsboro is a backup water supply for the City of Hillsboro and the intake is located 2.1 miles north of the permit area. The source of water for the City of Litchfield and a portion of Montgomery County Water Company is Lake Lou Yaeger, which is located approximately 7 miles northwest of the permit area. The source of water for the City of Witt and a portion of Montgomery County Water Company are groundwater wells drilled within the unconsolidated deposits and are located approximately 9 miles northeast of the permit area. The source of water for the City of Fillmore are groundwater wells drilled within the unconsolidated deposits and are located approximately 9 miles east of the permit area. There are no other known public water supply sources within ten miles of the permit boundary.

7) Discuss the possible effects that this mining operation will have on the above-listed public water supplies and explain what precautions will be taken to prevent an adverse impact from occurring.

RESPONSE: ***No impacts are expected because the surface and groundwater supplies identified above are not located within the direct watershed of the permit area. This permit application is for the expansion of the shadow boundary to permit planned subsidence induced by longwall mining. None of the surface water or groundwater resources identified are within the proposed shadow boundary expansion area or within ½ mile of the proposed shadow boundary expansion area.***

8) Locate on the hydrologic map or other designated map all private water supplies and private water wells within 1/2 mile of permit area and within the permit and shadow areas itself.

RESPONSE: ***Refer to Map 4 – Hydro-Geological Map for are all known private water supplies and private water wells within ½ mile of the proposed shadow area.***

9) Locate on the hydrologic map existing surface and ground water discharges into underground mines.

RESPONSE: ***There are no known existing surface or ground water discharges into underground mines.***

10) Provide the locations of water supply intakes for current users of surface water flowing into, out of, and within a hydrologic area defined by the Department.

RESPONSE: ***With the exception of Lake Hillsboro discussed previously, there are no known water supply intakes for current users of surface water flowing into, out of, and***

within a hydrologic area defined by the Department. Area domestic water use through the Public Service District is sourced from the Glenn Shoals Lake.

ATTACHMENT III.2.A.1
BORING LOGS

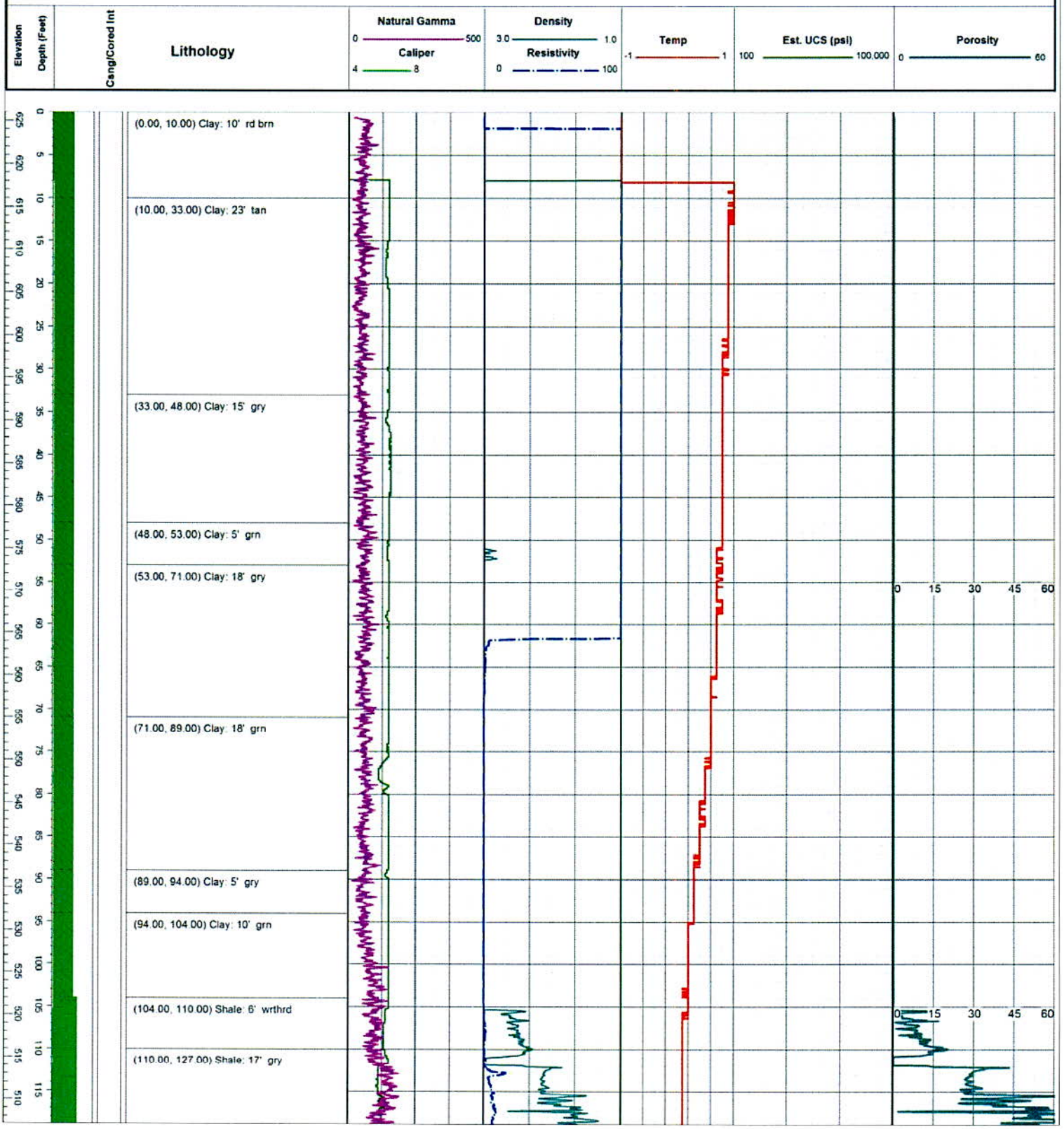
HILLSBORO ENERGY LLC

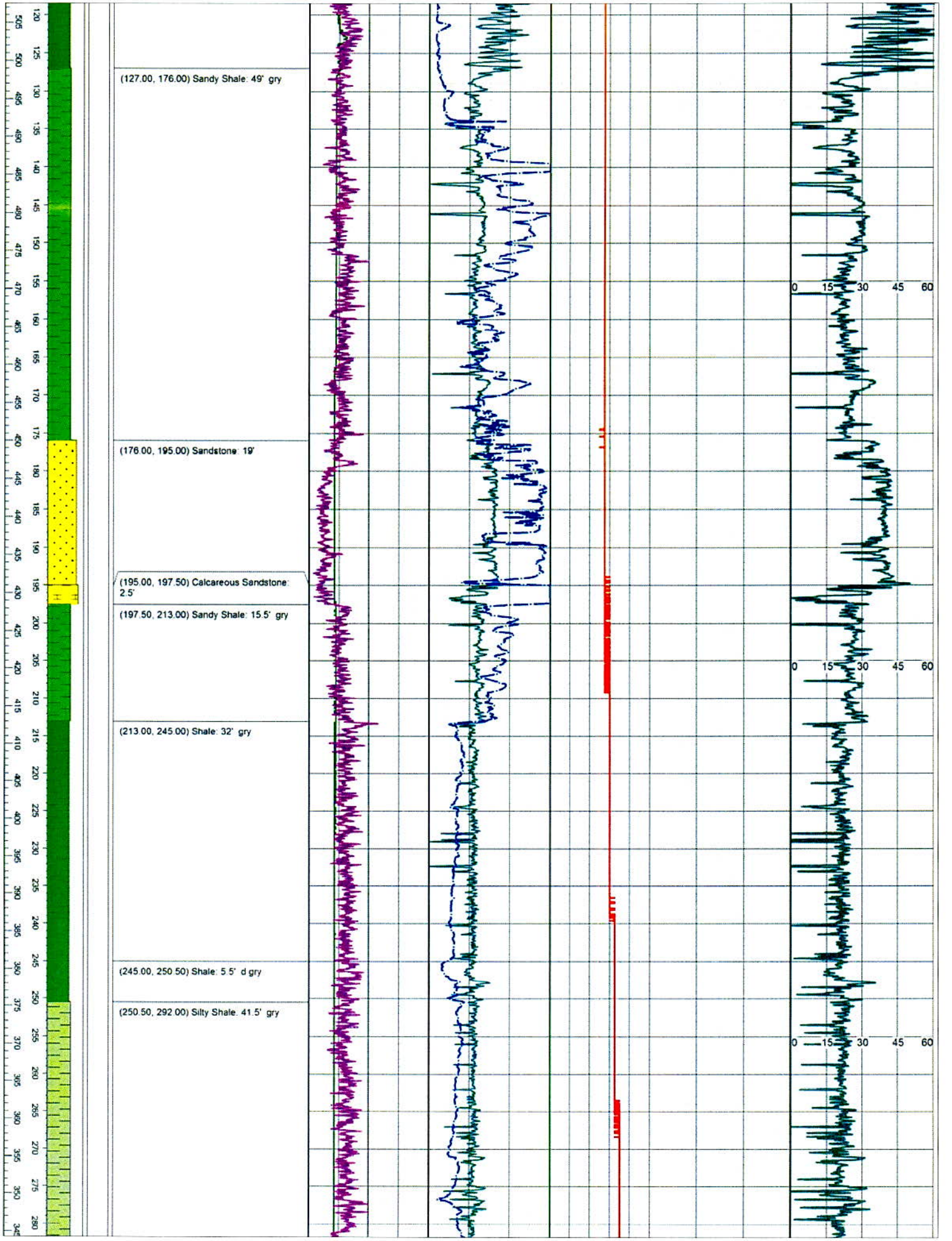
07-03-03-01

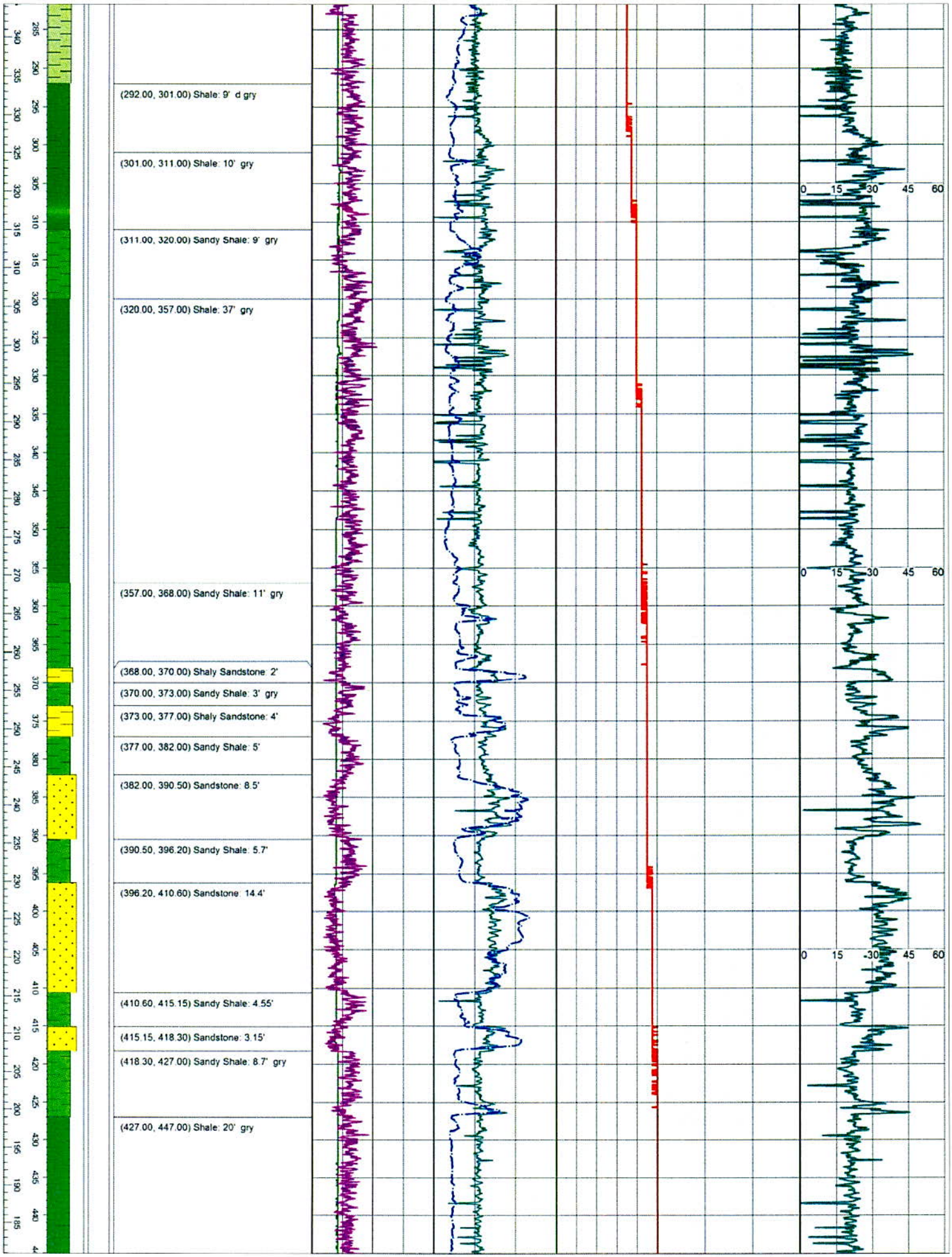
Lithology Log

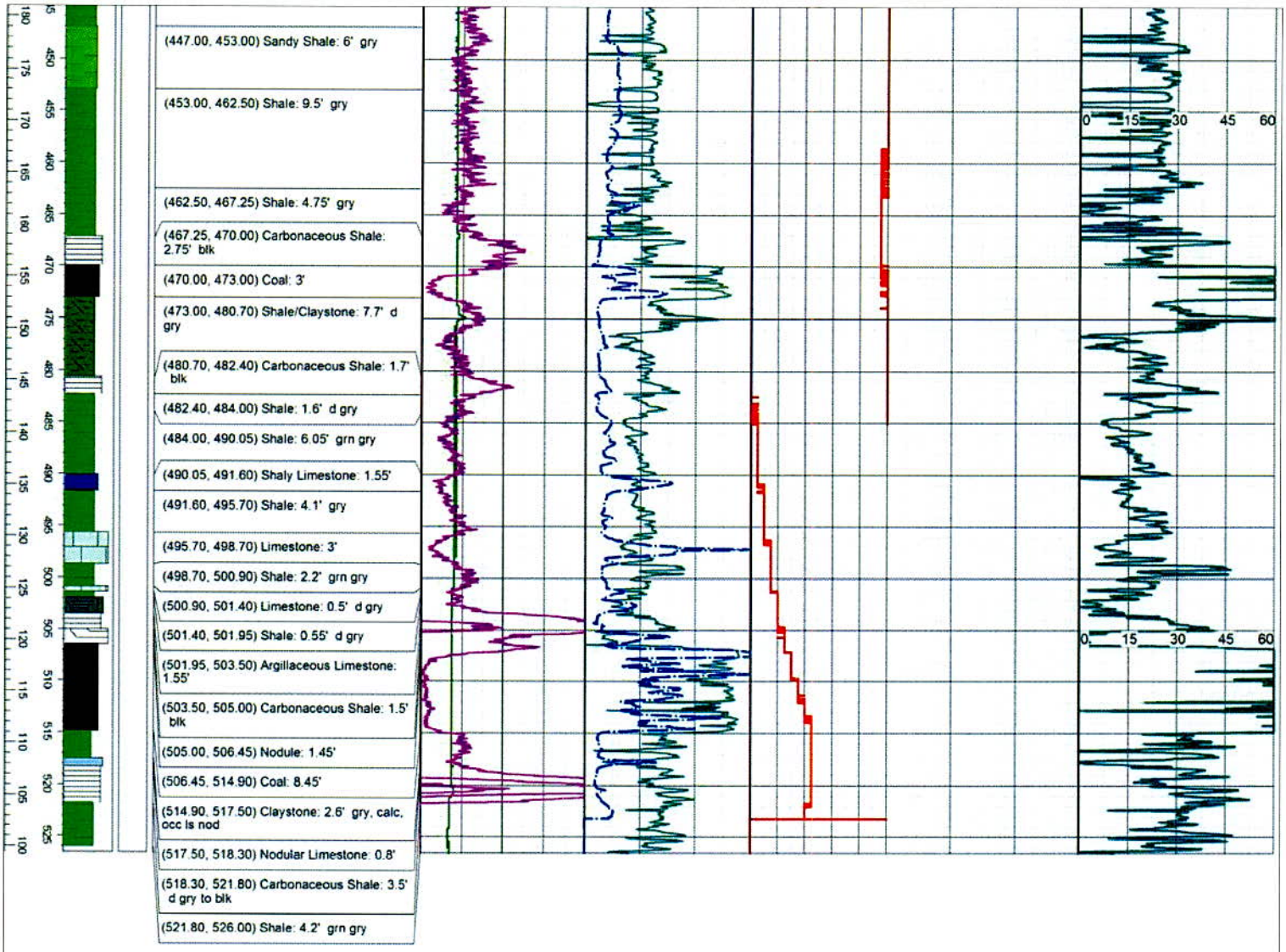
Easting:	2510447	Total Depth (Driller):	530	Drilled By:	Hawkey & Kline
Northing:	880238	Total Depth (Logger):	529.44	Cuttings Logged By:	Driller, JTP
Township:	7N	Elevation (GS):	626	Core Logged By:	JT Padgett
Range:	3W	Casing Depth:	112	Geophysical Log Operator:	Cardno
Section:	3	Core Interval:		Completion Date:	12/19/2013
County:	Montgomery				

Notes:




(127.00, 176.00) Sandy Shale: 49' gry
(176.00, 195.00) Sandstone: 19'
(195.00, 197.50) Calcareous Sandstone: 2.5'
(197.50, 213.00) Sandy Shale: 15.5' gry
(213.00, 245.00) Shale: 32' gry
(245.00, 250.50) Shale: 5.5' d gry
(250.50, 292.00) Silty Shale: 41.5' gry
0 15 30 45 60
0 15 30 45 60
0 15 30 45 60


(292.00, 301.00) Shale: 9' d gry
(301.00, 311.00) Shale: 10' gry
(311.00, 320.00) Sandy Shale: 9' gry
(320.00, 357.00) Shale: 37' gry
(357.00, 368.00) Sandy Shale: 11' gry
(368.00, 370.00) Shaly Sandstone: 2'
(370.00, 373.00) Sandy Shale: 3' gry
(373.00, 377.00) Shaly Sandstone: 4'
(377.00, 382.00) Sandy Shale: 5'
(382.00, 390.50) Sandstone: 8.5'
(390.50, 396.20) Sandy Shale: 5.7'
(396.20, 410.60) Sandstone: 14.4'
(410.60, 415.15) Sandy Shale: 4.55'
(415.15, 418.30) Sandstone: 3.15'
(418.30, 427.00) Sandy Shale: 8.7' gry
(427.00, 447.00) Shale: 20' gry
0 15 30 45 60
0 15 30 45 60
0 15 30 45 60


(447.00, 453.00) Sandy Shale: 6' gry
(453.00, 462.50) Shale: 9.5' gry
(462.50, 467.25) Shale: 4.75' gry
(467.25, 470.00) Carbonaceous Shale: 2.75' blk
(470.00, 473.00) Coal: 3'
(473.00, 480.70) Shale/Claystone: 7.7' d gry
(480.70, 482.40) Carbonaceous Shale: 1.7' blk
(482.40, 484.00) Shale: 1.6' d gry
(484.00, 490.05) Shale: 6.05' grn gry
(490.05, 491.60) Shaly Limestone: 1.55'
(491.60, 495.70) Shale: 4.1' gry
(495.70, 498.70) Limestone: 3'
(498.70, 500.90) Shale: 2.2' grn gry
(500.90, 501.40) Limestone: 0.5' d gry
(501.40, 501.95) Shale: 0.55' d gry
(501.95, 503.50) Argillaceous Limestone: 1.55'
(503.50, 505.00) Carbonaceous Shale: 1.5' blk
(505.00, 506.45) Nodule: 1.45'
(506.45, 514.90) Coal: 8.45'
(514.90, 517.50) Claystone: 2.6' gry, calc, occ ls nod
(517.50, 518.30) Nodular Limestone: 0.8'
(518.30, 521.80) Carbonaceous Shale: 3.5' d gry to blk
(521.80, 526.00) Shale: 4.2' grn gry
0 15 30 45 60
0 15 30 45 60

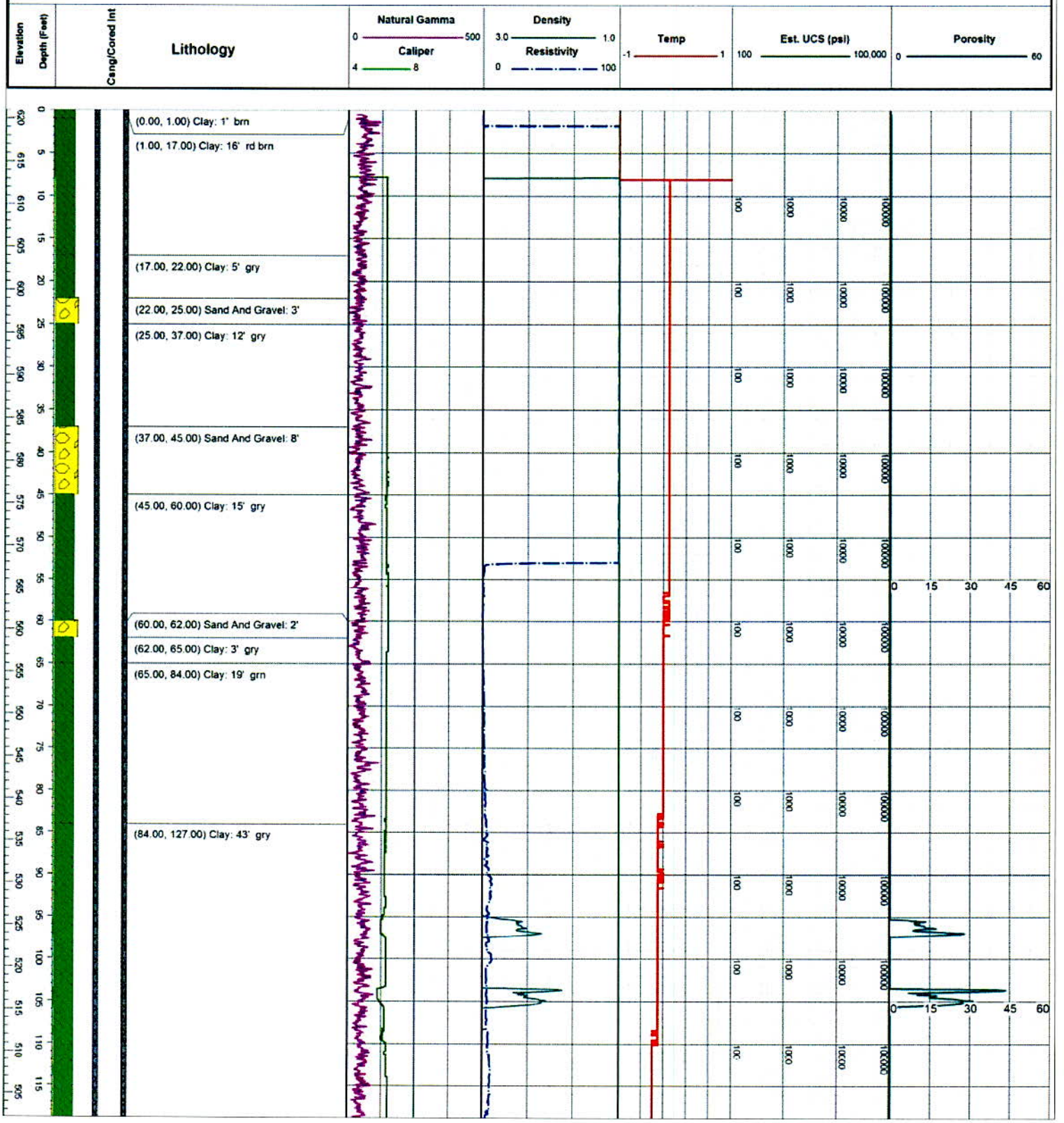
HILLSBORO ENERGY LLC

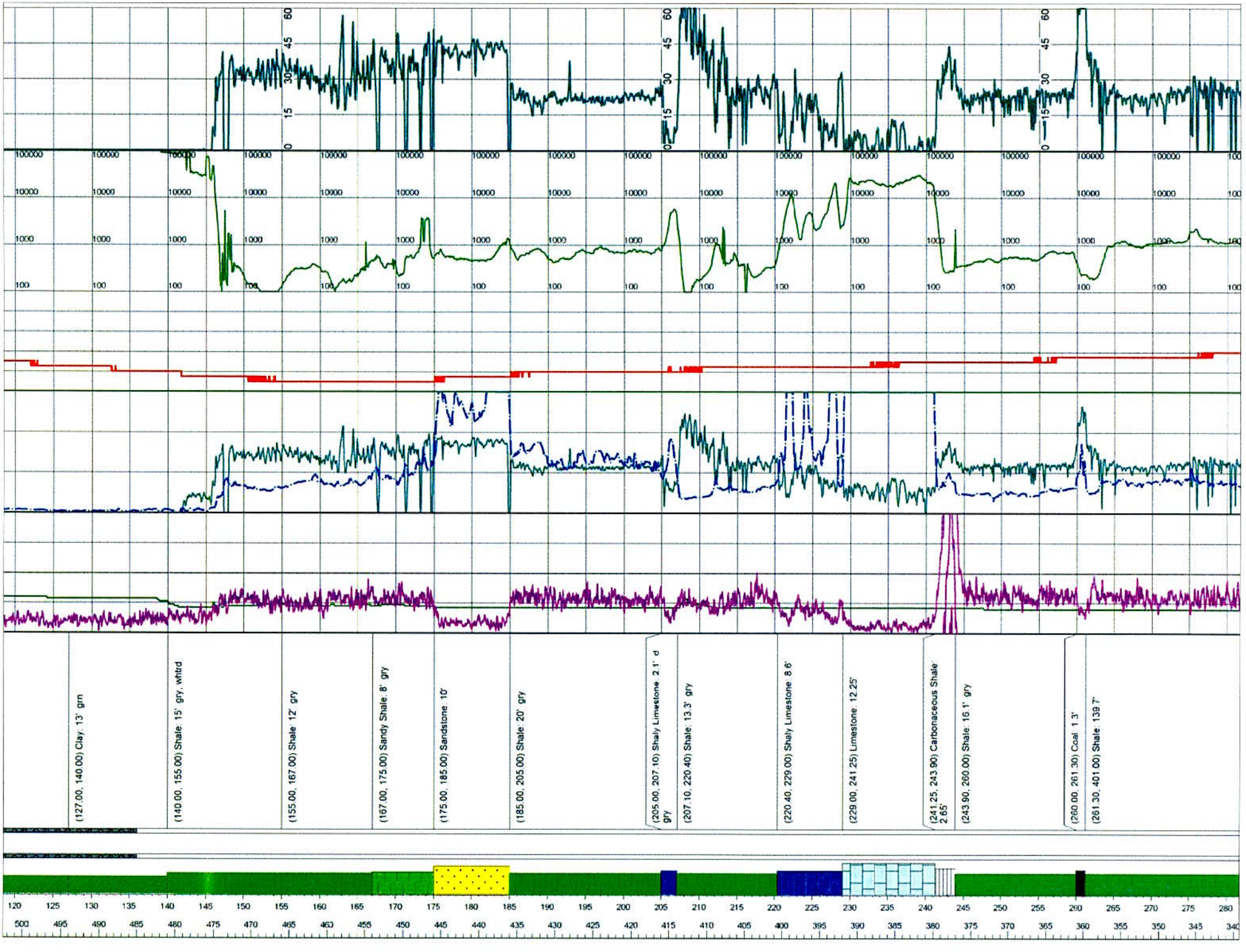
07-03-04-02

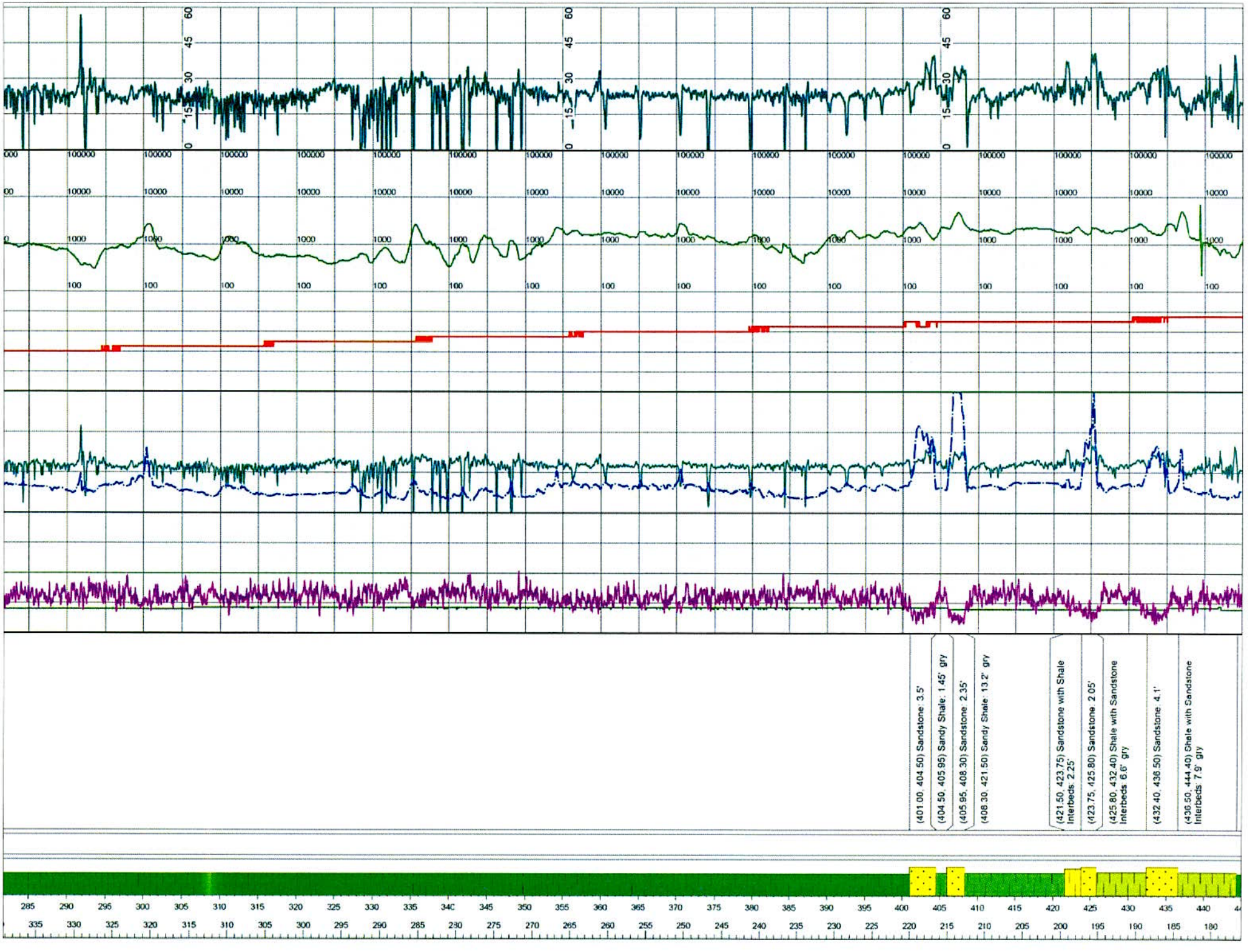
Lithology Log

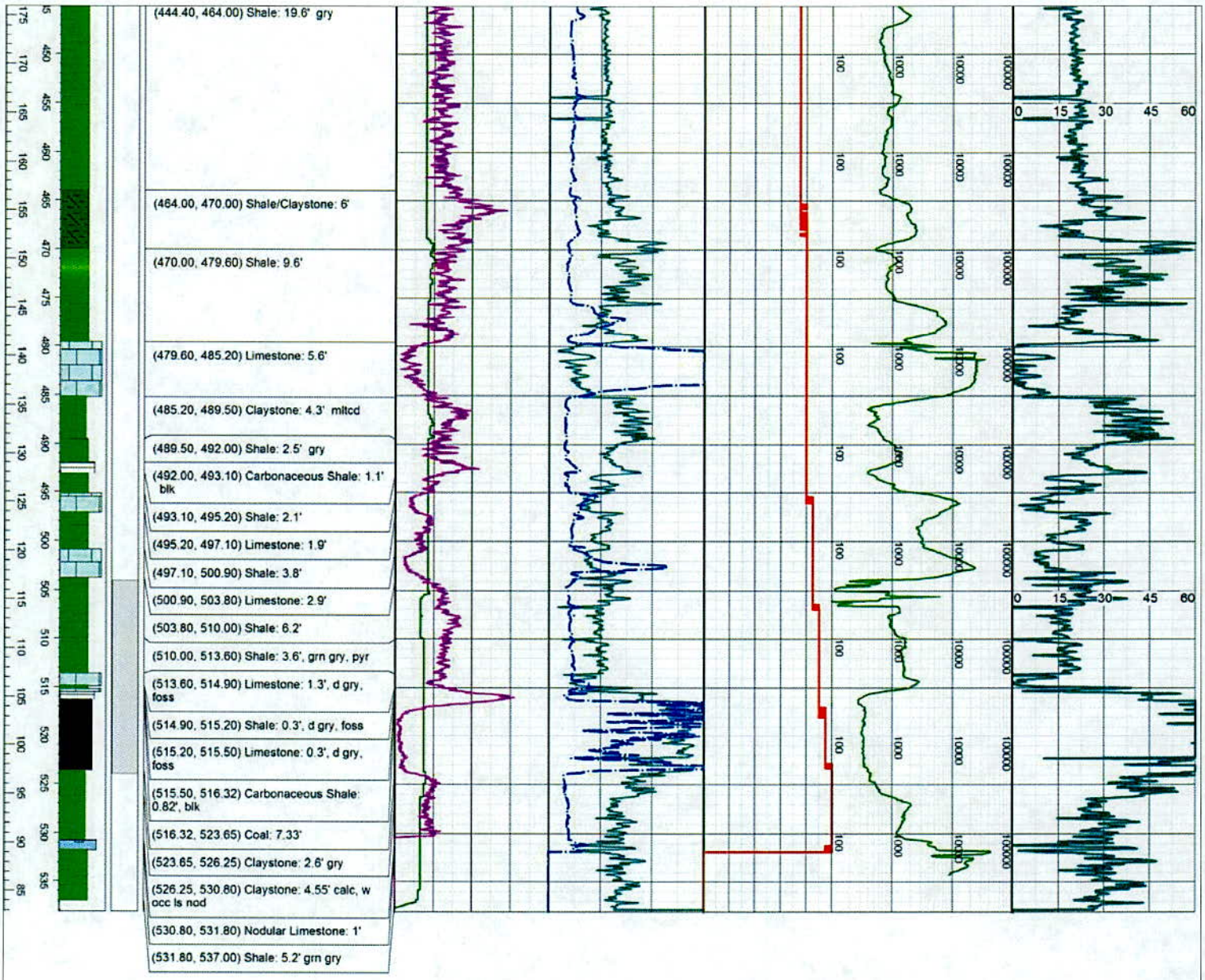
Easting:	2506563	Total Depth (Driller):	537	Drilled By:	Hawkey & Kline
Northing:	877447	Total Depth (Logger):	538.12	Cuttings Logged By:	Driller, JTP
Township:	7N	Elevation (GS):	621	Core Logged By:	JT Padgett
Range:	3W	Casing Depth:	146	Geophysical Log Operator:	Cardno
Section:	4	Core Interval:	504-524	Completion Date:	10/28/2013
County:	Montgomery				

Notes:




(127.00, 140.00) Clay, 13' grn
(140.00, 155.00) Shale: 15' gry, whtrd
(155.00, 167.00) Shale: 12' gry
(167.00, 175.00) Sandy Shale: 8' gry
(175.00, 185.00) Sandstone: 10'
(185.00, 205.00) Shale: 20' gry
(205.00, 207.10) Shaly Limestone: 2.1' d gry
(207.10, 220.40) Shale: 13.3' gry
(220.40, 229.00) Shaly Limestone: 8.6'
(229.00, 241.25) Limestone: 12.25'
(241.25, 243.90) Carbonaceous Shale: 2.65'
(243.90, 260.00) Shale: 16.1' gry
(260.00, 261.30) Coal: 1.3'
(261.30, 401.00) Shale: 139.7'


(401.00, 404.50) Sandstone 3.5'
(404.50, 405.95) Sandy Shale 1.45' gry
(405.95, 408.30) Sandstone 2.35'
(408.30, 421.50) Sandy Shale 13.2' gry
(421.50, 423.75) Sandstone with Shale Interbeds 2.25'
(423.75, 425.80) Sandstone 2.05'
(425.80, 432.40) Shale with Sandstone Interbeds 6.6' gry
(432.40, 436.50) Sandstone 4.1'
(436.50, 444.40) Shale with Sandstone Interbeds 7.9' gry


(444.40, 464.00) Shale: 19.6' gry
(464.00, 470.00) Shale/Claystone: 6'
(470.00, 479.60) Shale: 9.6'
(479.60, 485.20) Limestone: 5.6'
(485.20, 489.50) Claystone: 4.3' mltcd
(489.50, 492.00) Shale: 2.5' gry
(492.00, 493.10) Carbonaceous Shale: 1.1' blk
(493.10, 495.20) Shale: 2.1'
(495.20, 497.10) Limestone: 1.9'
(497.10, 500.90) Shale: 3.8'
(500.90, 503.80) Limestone: 2.9'
(503.80, 510.00) Shale: 6.2'
(510.00, 513.60) Shale: 3.6', grn gry, pyr
(513.60, 514.90) Limestone: 1.3', d gry, foss
(514.90, 515.20) Shale: 0.3', d gry, foss
(515.20, 515.50) Limestone: 0.3', d gry, foss
(515.50, 516.32) Carbonaceous Shale: 0.82', blk
(516.32, 523.65) Coal: 7.33'
(523.65, 526.25) Claystone: 2.6' gry
(526.25, 530.80) Claystone: 4.55' calc, w occ ls nod
(530.80, 531.80) Nodular Limestone: 1'
(531.80, 537.00) Shale: 5.2' grn gry
0 15 30 45 60
0 15 30 45 60

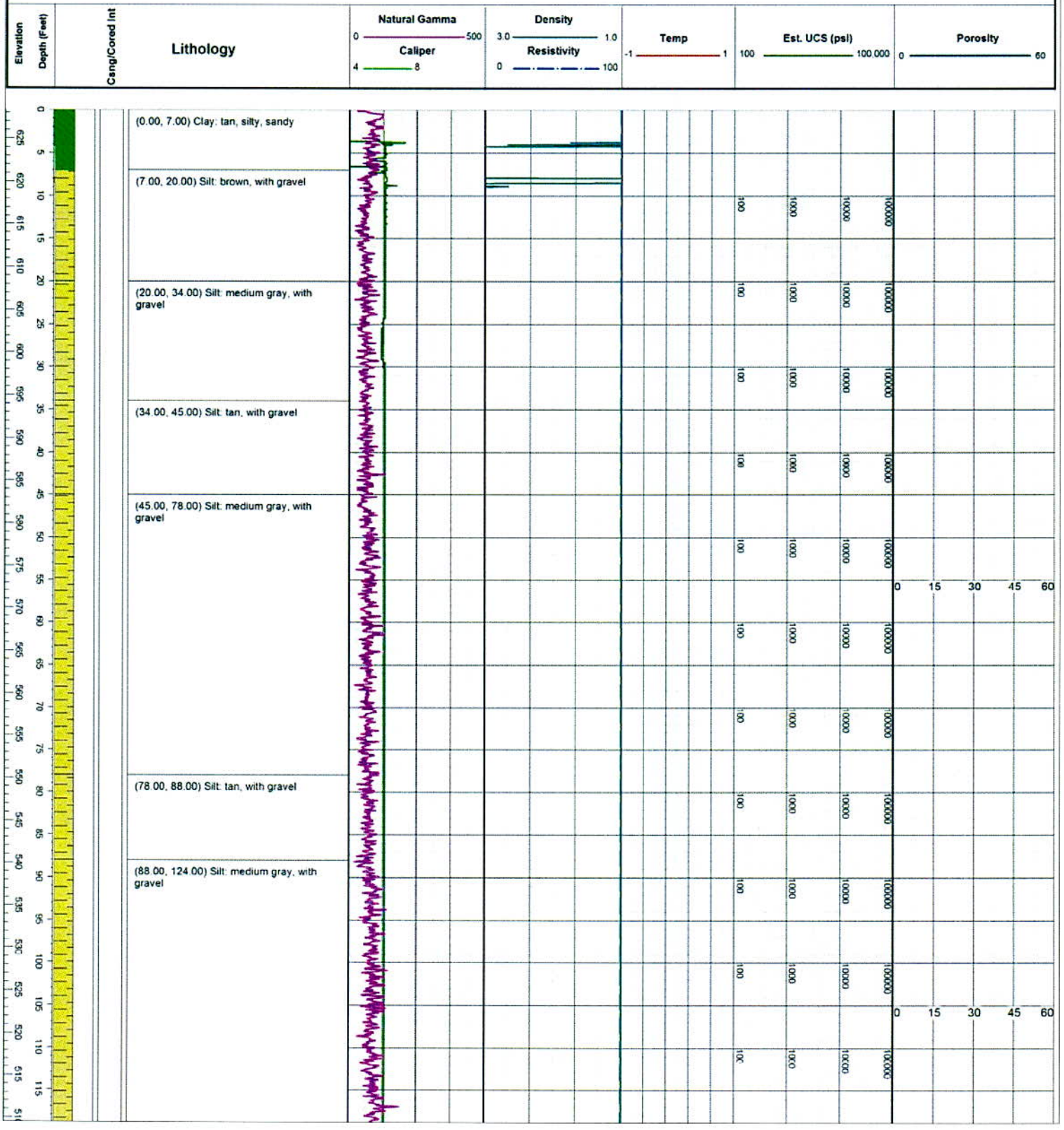
HILLSBORO ENERGY LLC

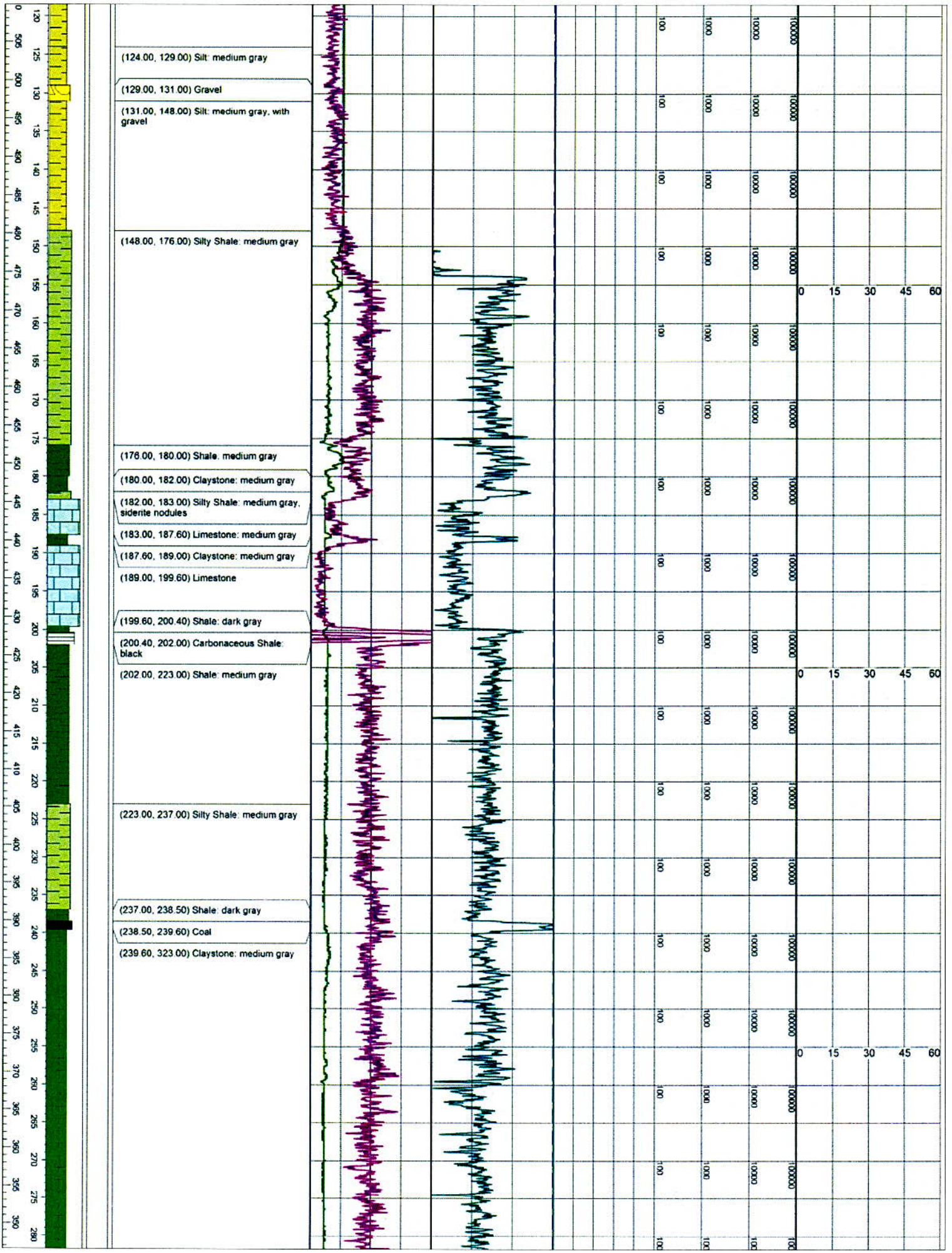
07-03-06-01

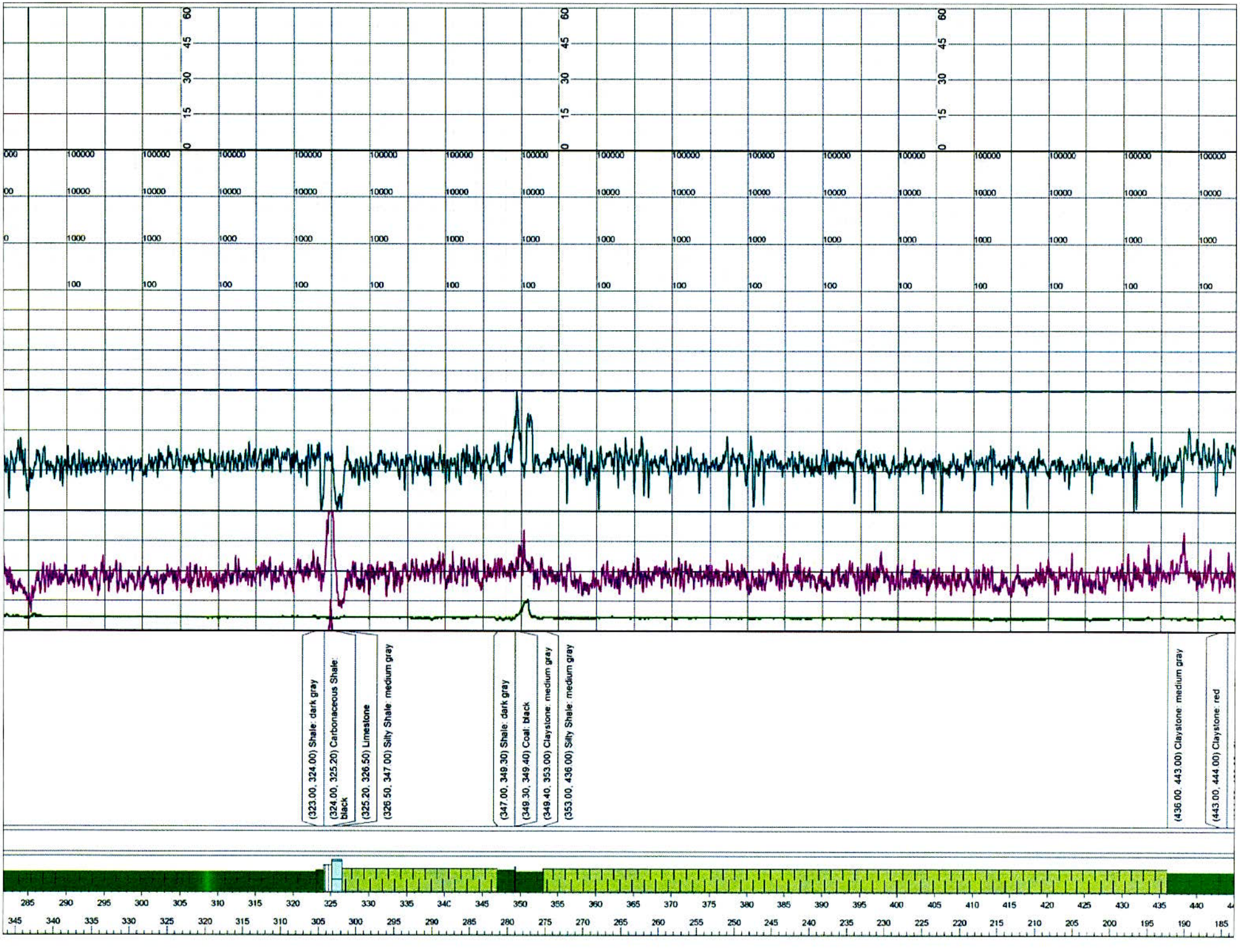
Lithology Log

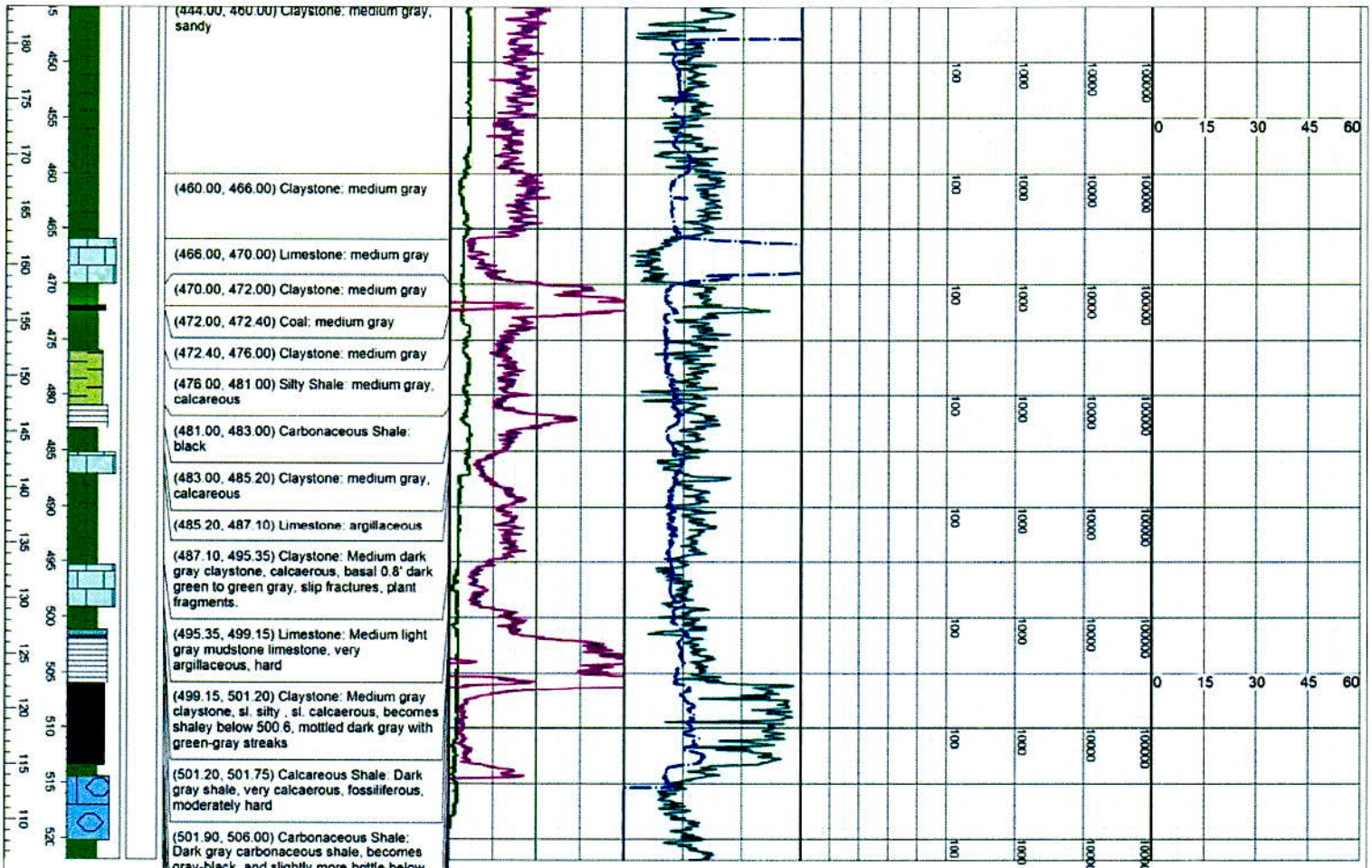
Easting:	2,497,229.810'	Total Depth (Driller):	520.1'	Drilled By:	Magnum Drilling
Northing:	881,068.507'	Total Depth (Logger):	522'	Cuttings Logged By:	Driller
Township:	3W	Elevation (GS):	628.350'	Core Logged By:	J. T. Padgett
Range:	7N	Casing Depth:	153'	Geophysical Log Operator:	GLS
Section:	6	Core Interval:	487' - 520.1	Completion Date:	1/24/2007
County:	Montgomery				

Notes: Core adjusted 1.95' @ coal to match e-log




(124.00, 129.00) Silt: medium gray
(129.00, 131.00) Gravel
(131.00, 148.00) Silt: medium gray, with gravel
(148.00, 176.00) Silty Shale: medium gray
(176.00, 180.00) Shale: medium gray
(180.00, 182.00) Claystone: medium gray
(182.00, 183.00) Silty Shale: medium gray, siderite nodules
(183.00, 187.60) Limestone: medium gray
(187.60, 189.00) Claystone: medium gray
(189.00, 199.60) Limestone
(199.60, 200.40) Shale: dark gray
(200.40, 202.00) Carbonaceous Shale: black
(202.00, 223.00) Shale: medium gray
(223.00, 237.00) Silty Shale: medium gray
(237.00, 238.50) Shale: dark gray
(238.50, 239.60) Coal
(239.60, 323.00) Claystone: medium gray
0 15 30 45 60
100 1000 10000 100000


(323.00, 324.00) Shale: dark gray
(324.00, 325.20) Carbonaceous Shale: black
(325.20, 326.50) Limestone
(326.50, 347.00) Silty Shale: medium gray
(347.00, 349.30) Shale: dark gray
(349.30, 349.40) Coal: black
(349.40, 353.00) Claystone: medium gray
(353.00, 436.00) Silty Shale: medium gray
(436.00, 443.00) Claystone: medium gray
(443.00, 444.00) Claystone: red



(444.00, 460.00) Claystone: medium gray, sandy

(460.00, 466.00) Claystone: medium gray

(466.00, 470.00) Limestone: medium gray

(470.00, 472.00) Claystone: medium gray

(472.00, 472.40) Coal: medium gray

(472.40, 476.00) Claystone: medium gray

(476.00, 481.00) Silty Shale: medium gray, calcareous

(481.00, 483.00) Carbonaceous Shale: black

(483.00, 485.20) Claystone: medium gray, calcareous

(485.20, 487.10) Limestone: argillaceous

(487.10, 495.35) Claystone: Medium dark gray claystone, calcaerous, basal 0.8' dark green to green gray, slip fractures, plant fragments.

(495.35, 499.15) Limestone: Medium light gray mudstone limestone, very argillaceous, hard

(499.15, 501.20) Claystone: Medium gray claystone, sl. silty , sl. calcaerous, becomes shaley below 500.6, mottled dark gray with green-gray streaks

(501.20, 501.75) Calcareous Shale: Dark gray shale, very calcaerous, fossiliferous, moderately hard

(501.90, 506.00) Carbonaceous Shale: Dark gray carbonaceous shale, becomes gray-black and slightly more brittle below 505.2, fissle, verticle fracture at 502.8 to 503.5.

(506.00, 513.40) Coal: Bright banded coal, < 0.5' pynte lenses at 507.35, 509.6, and 511.2. "Blueband" claystone and pynte parting at 511.8 to 511.9. Calcite on cleat.

(513.40, 514.45) Claystone: Medium gray claystone, soft, slip fractures, becomes calcareous below 514.2.

(514.45, 520.25) Nodular Limestone: Medium gray nodular limestone with medium dark gray clay, clay becomes green gray below 518.5, slip fractures

(520.25, 522.00) Claystone: Dark green gray claystone, dark gray band from 521.1 to 521.25, soft, broken

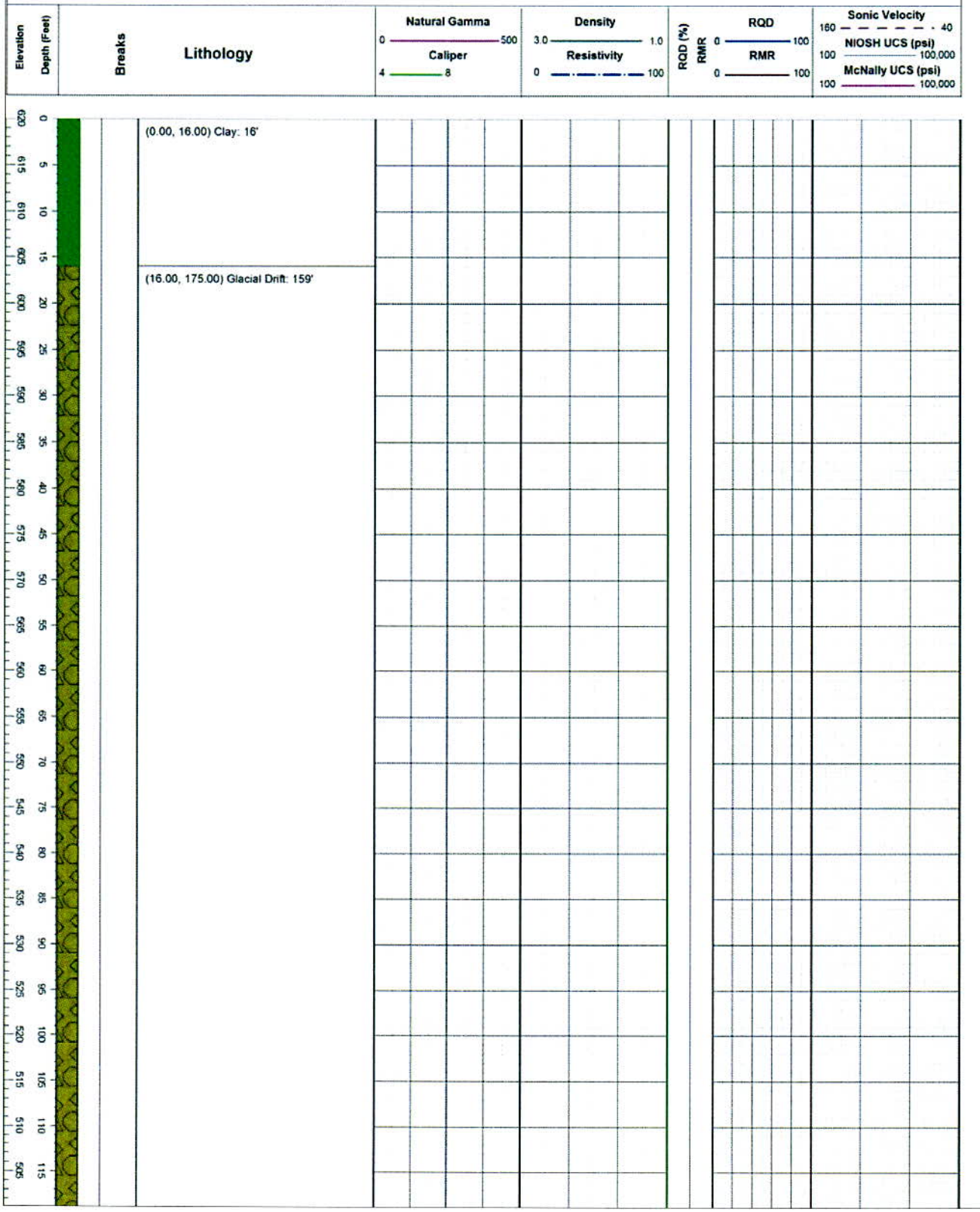
HILLSBORO ENERGY LLC

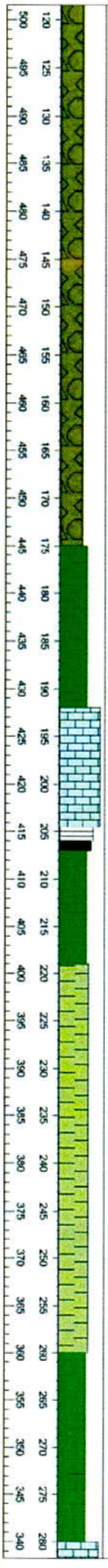
07-03-07-103

Detail Lithology Log with Estimated UCS

Easting:	2495314.57	Total Depth (Driller):	517	Drilled By:	
Northing:	873556.99	Total Depth (Logger):		Cuttings Logged By:	
Township:	7N	Elevation (GS):	620	Core Logged By:	
Range:	3W	Casing Depth:		Geophysical Log Operator:	
Section:	7	Core Interval:	481 - 517	Completion Date:	
County:	Montgomery				

Notes: Consol 103BB





(175.00, 192.00) Shale: 17' sft, w ls

(192.00, 204.50) Limestone: 12.5'

(204.50, 206.00) Carbonaceous Shale: 1.5' d

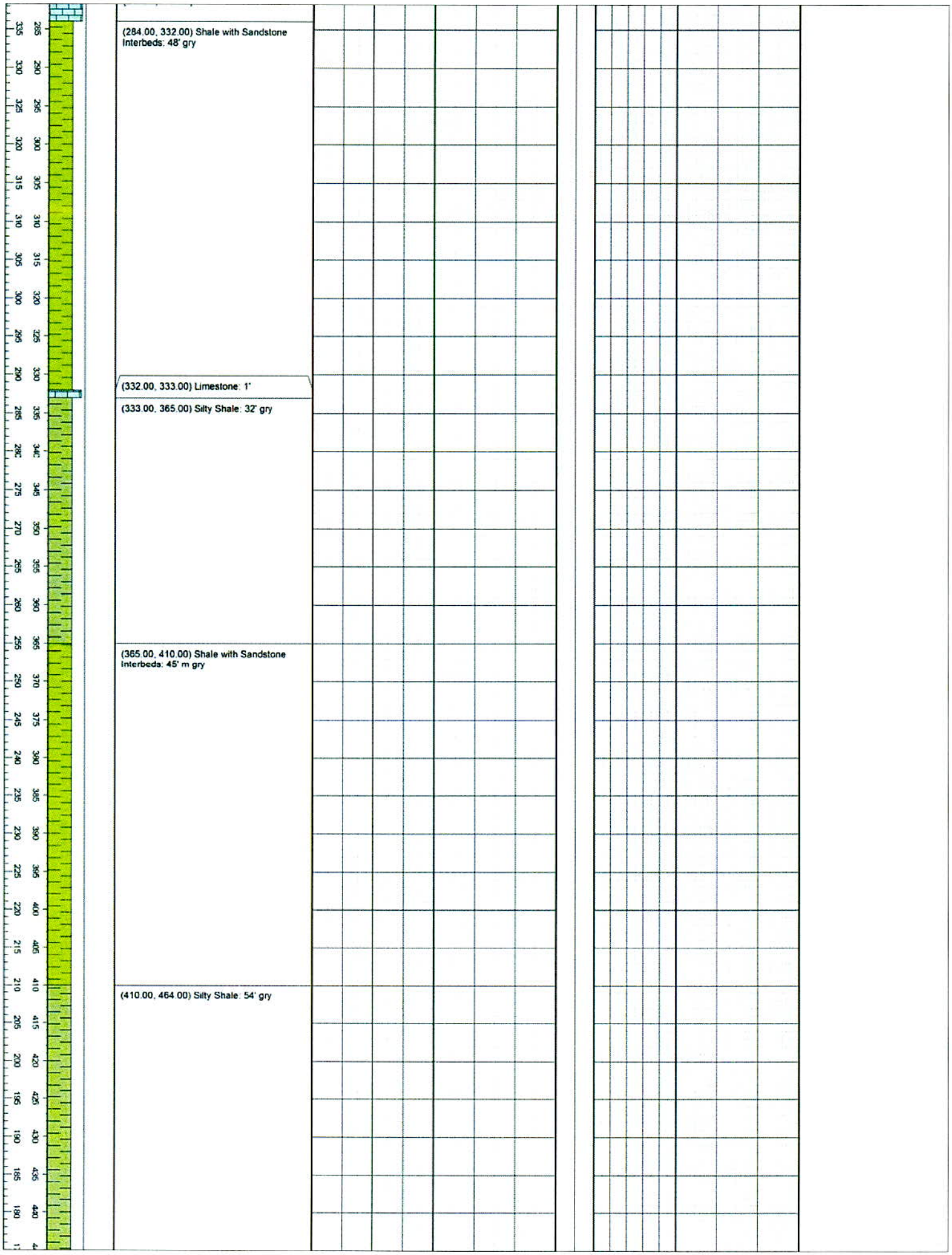
(206.00, 207.00) Coal: 1'

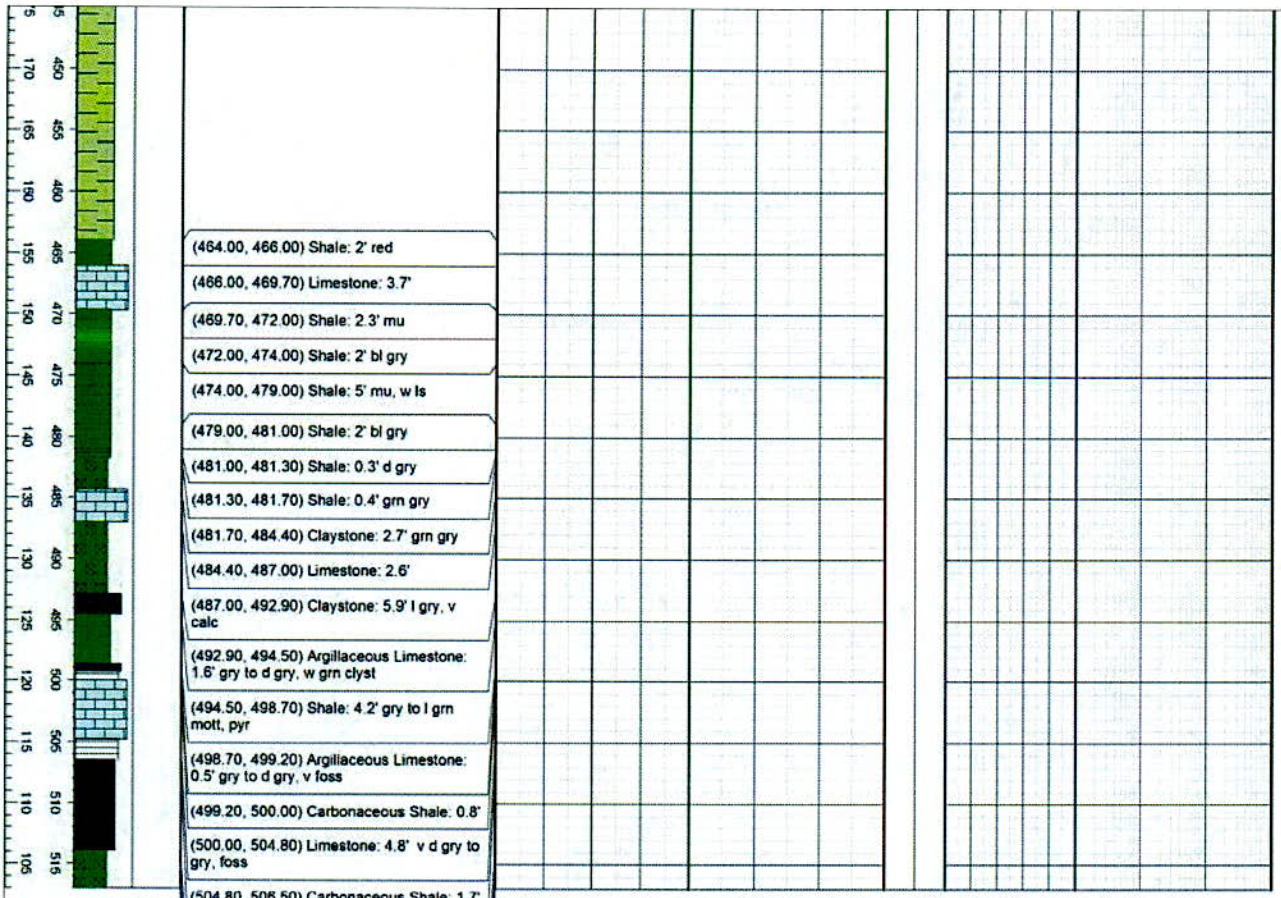
(207.00, 219.00) Shale: 12' m gry, w ls

(219.00, 260.00) Silty Shale: 41' m gry

(260.00, 280.00) Shale: 20' gry, w ls

(280.00, 284.00) Limestone: 4'


(284.00, 332.00) Shale with Sandstone Interbeds: 48' gry
(332.00, 333.00) Limestone: 1'
(333.00, 365.00) Silty Shale: 32' gry
(365.00, 410.00) Shale with Sandstone Interbeds: 45' m gry
(410.00, 464.00) Silty Shale: 54' gry



(464.00, 466.00) Shale: 2' red

(466.00, 469.70) Limestone: 3.7'

(469.70, 472.00) Shale: 2.3' mu

(472.00, 474.00) Shale: 2' bl gry

(474.00, 479.00) Shale: 5' mu, w ls

(479.00, 481.00) Shale: 2' bl gry

(481.00, 481.30) Shale: 0.3' d gry

(481.30, 481.70) Shale: 0.4' grn gry

(481.70, 484.40) Claystone: 2.7' grn gry

(484.40, 487.00) Limestone: 2.6'

(487.00, 492.90) Claystone: 5.9' l gry, v calc

(492.90, 494.50) Argillaceous Limestone: 1.6' gry to d gry, w grn clyst

(494.50, 498.70) Shale: 4.2' gry to l grn mott, pyr

(498.70, 499.20) Argillaceous Limestone: 0.5' gry to d gry, v foss

(499.20, 500.00) Carbonaceous Shale: 0.8'

(500.00, 504.80) Limestone: 4.8' v d gry to gry, foss

(504.80, 506.50) Carbonaceous Shale: 1.7' blk

(506.50, 513.90) Coal: 7.4'

(513.90, 515.50) Claystone: 1.6' non calc

(515.50, 517.00) Claystone: 1.5' w ls nod

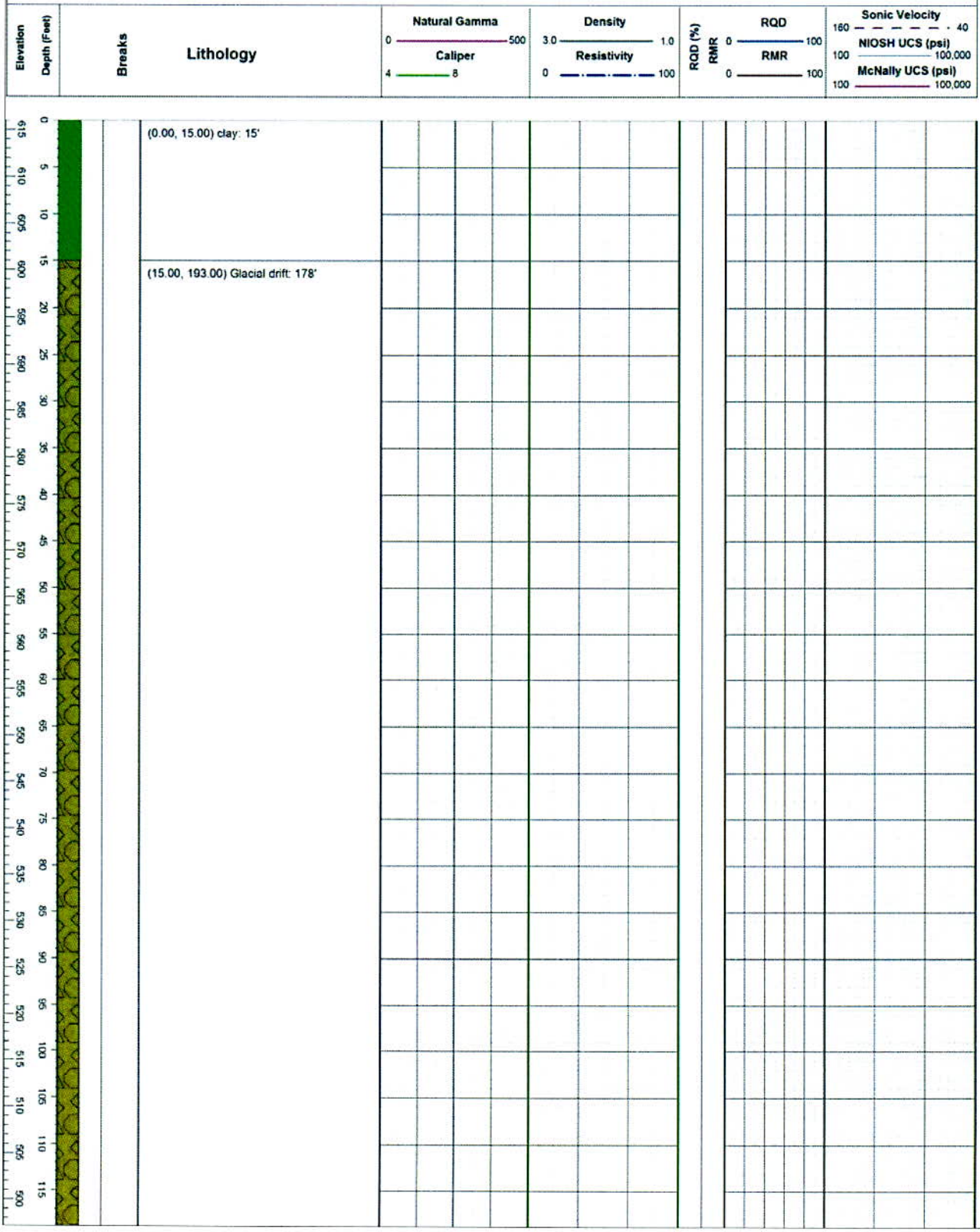
HILLSBORO ENERGY LLC

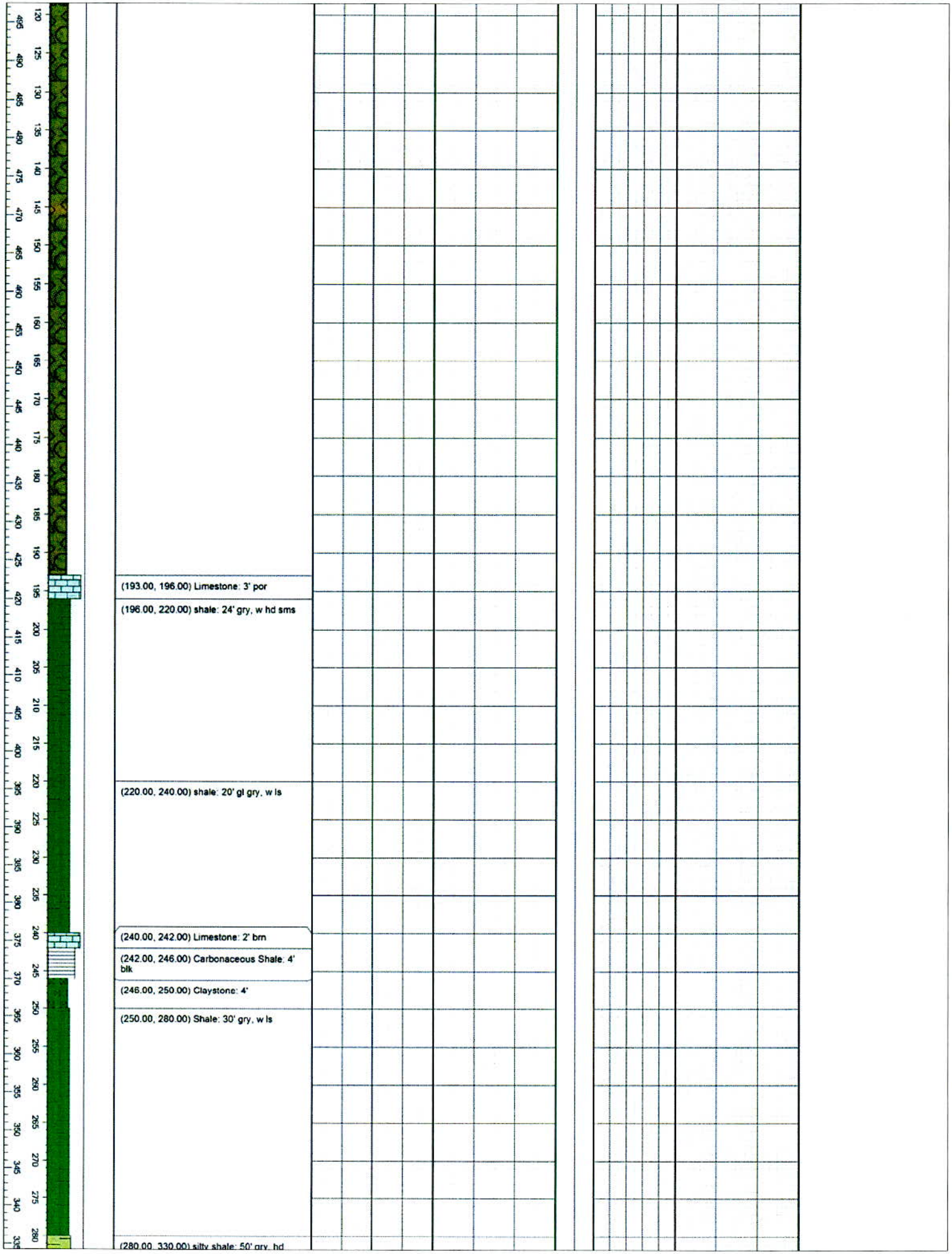
07-03-08-108

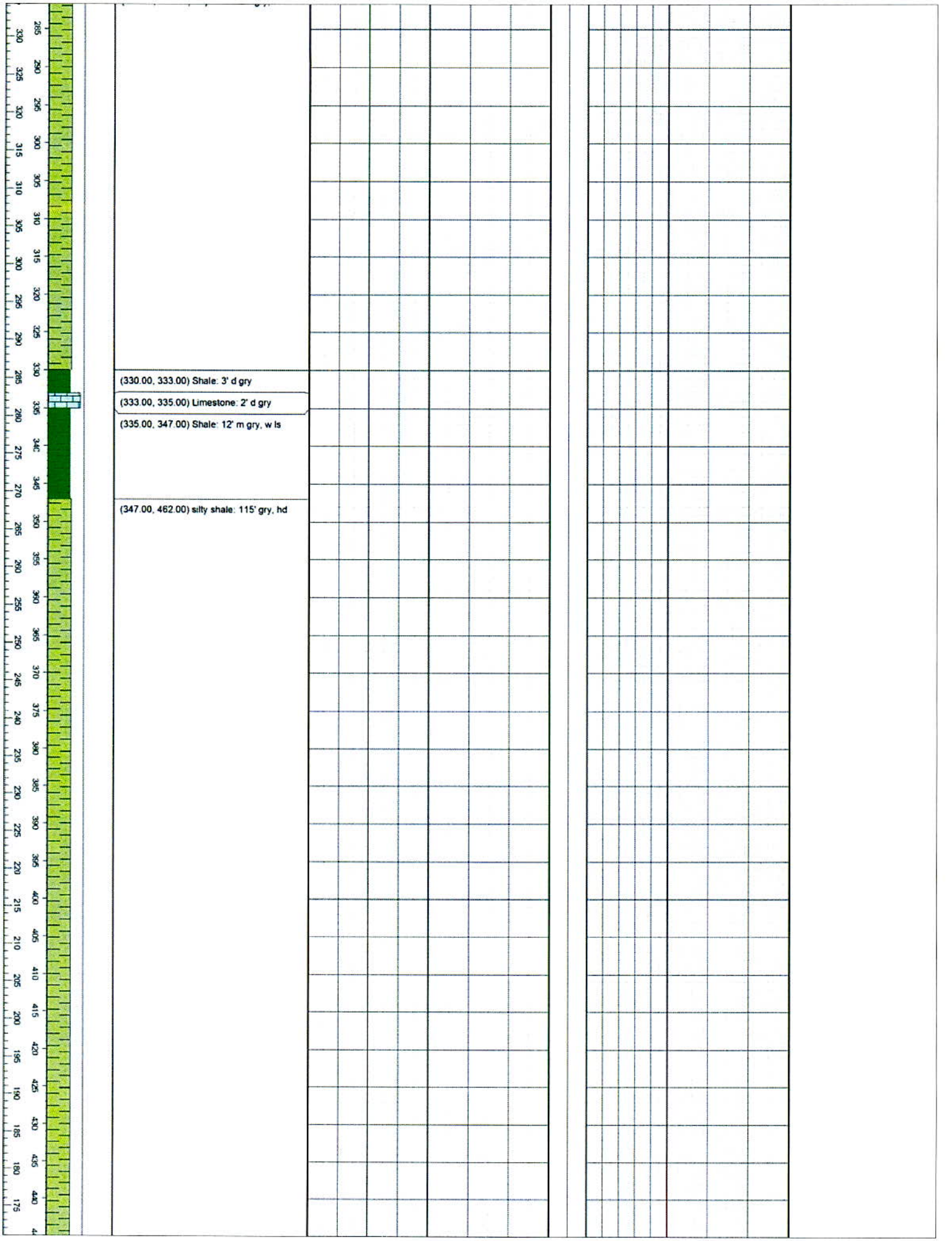
Detail Lithology Log with Estimated UCS

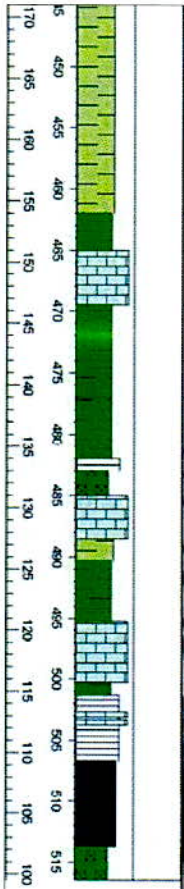
Easting:	2498934.2	Total Depth (Driller):	516.5	Drilled By:	Hoskins
Northing:	876191.19	Total Depth (Logger):		Cuttings Logged By:	
Township:	7N	Elevation (GS):	616	Core Logged By:	
Range:	3W	Casing Depth:	198	Geophysical Log Operator:	
Section:	8	Core Interval:	486 - 516.5	Completion Date:	5/30/1962
County:	Montgomery				

Notes: Consol 108BB




(193.00, 196.00) Limestone: 3' por
(196.00, 220.00) shale: 24' gry, w hd sms
(220.00, 240.00) shale: 20' gl gry, w ls
(240.00, 242.00) Limestone: 2' brn
(242.00, 246.00) Carbonaceous Shale: 4' blk
(246.00, 250.00) Claystone: 4'
(250.00, 280.00) Shale: 30' gry, w ls
(280.00, 330.00) silty shale: 50' gry, hd


(330.00, 333.00) Shale: 3' d gry
(333.00, 335.00) Limestone: 2' d gry
(335.00, 347.00) Shale: 12' m gry, w ls
(347.00, 462.00) silty shale: 115' gry, hd



(462.00, 465.00) shale: 3' grn gry

(465.00, 469.50) Limestone: 4.5'

(469.50, 474.00) Shale: 4.5' mu

(474.00, 477.00) Shale: 3' grn gry, w ls

(477.00, 482.00) Shale: 5' m d gry

(482.00, 483.00) Carbonaceous Shale: 1' w coal

(483.00, 485.00) Claystone: 2' grn gry

(485.00, 488.50) Limestone: 3.5' m gry, v arg, occ foss, mudst

(488.50, 490.30) Silty Shale: 1.8' gry, calc, carb

(490.30, 494.20) Shale: 3.9' gry, calc, carb

(494.20, 495.30) Shale: 1.1' grn gry, calc, w ls nods

(495.30, 500.30) Limestone: 5' l gry to bf, grn gry clyst, gry, foss @ base

(500.30, 501.30) Shale: 1' d gry to grn gry mott, non-calc

(501.30, 502.70) Carbonaceous Shale: 1.4' d gry to blk,

(502.70, 503.10) Limestone: 0.4' gry, v foss, arg

(503.10, 503.30) Carbonaceous Shale: 0.2' d gry to blk,

(503.30, 503.75) Limestone: 0.45' gry, v arg

(503.75, 506.67) Carbonaceous Shale: 2.92' blk, pyr, slpfracs

(506.67, 513.75) Coal: 7.08'

(513.75, 516.50) Claystone: 2.75'

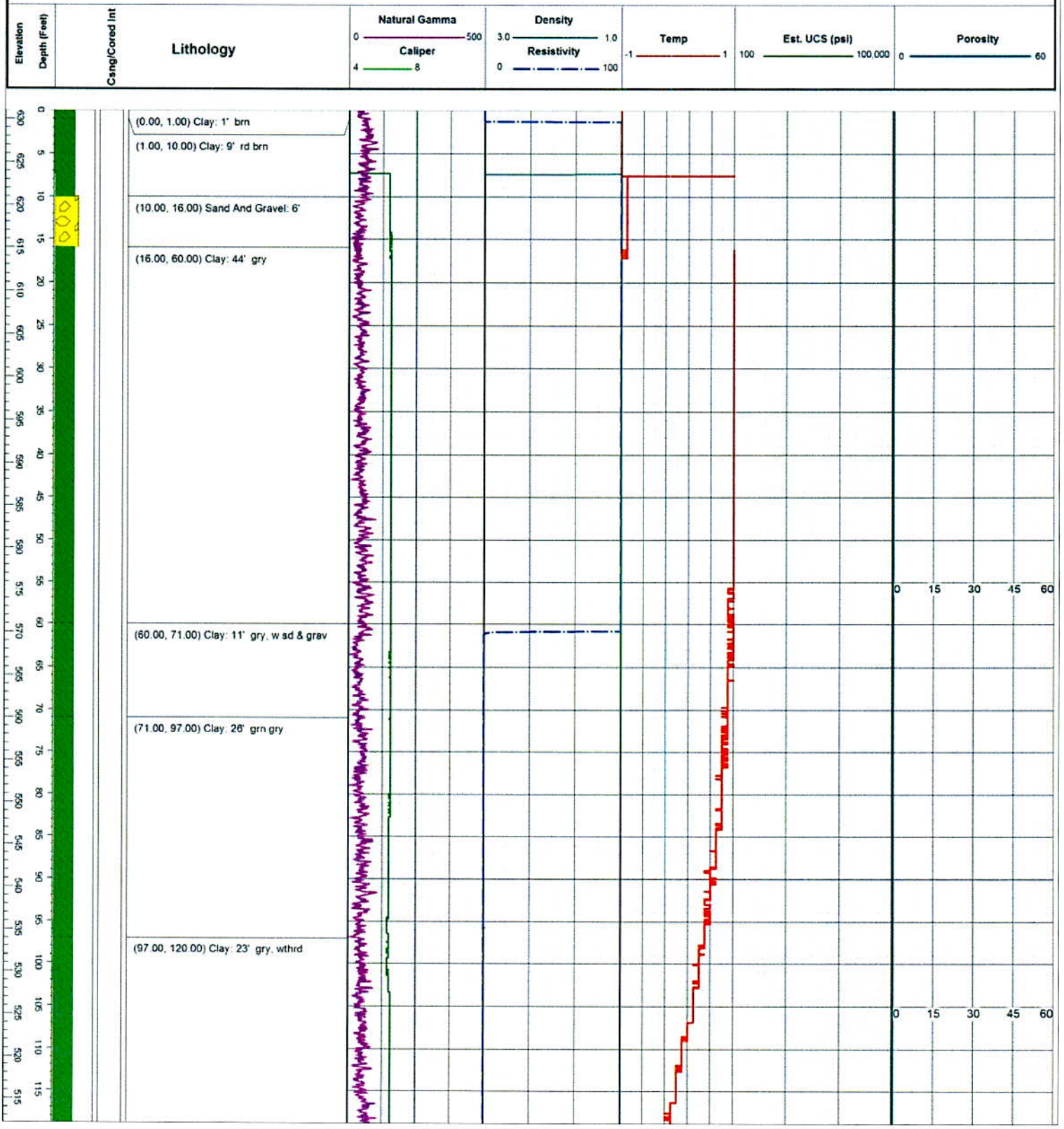
HILLSBORO ENERGY LLC

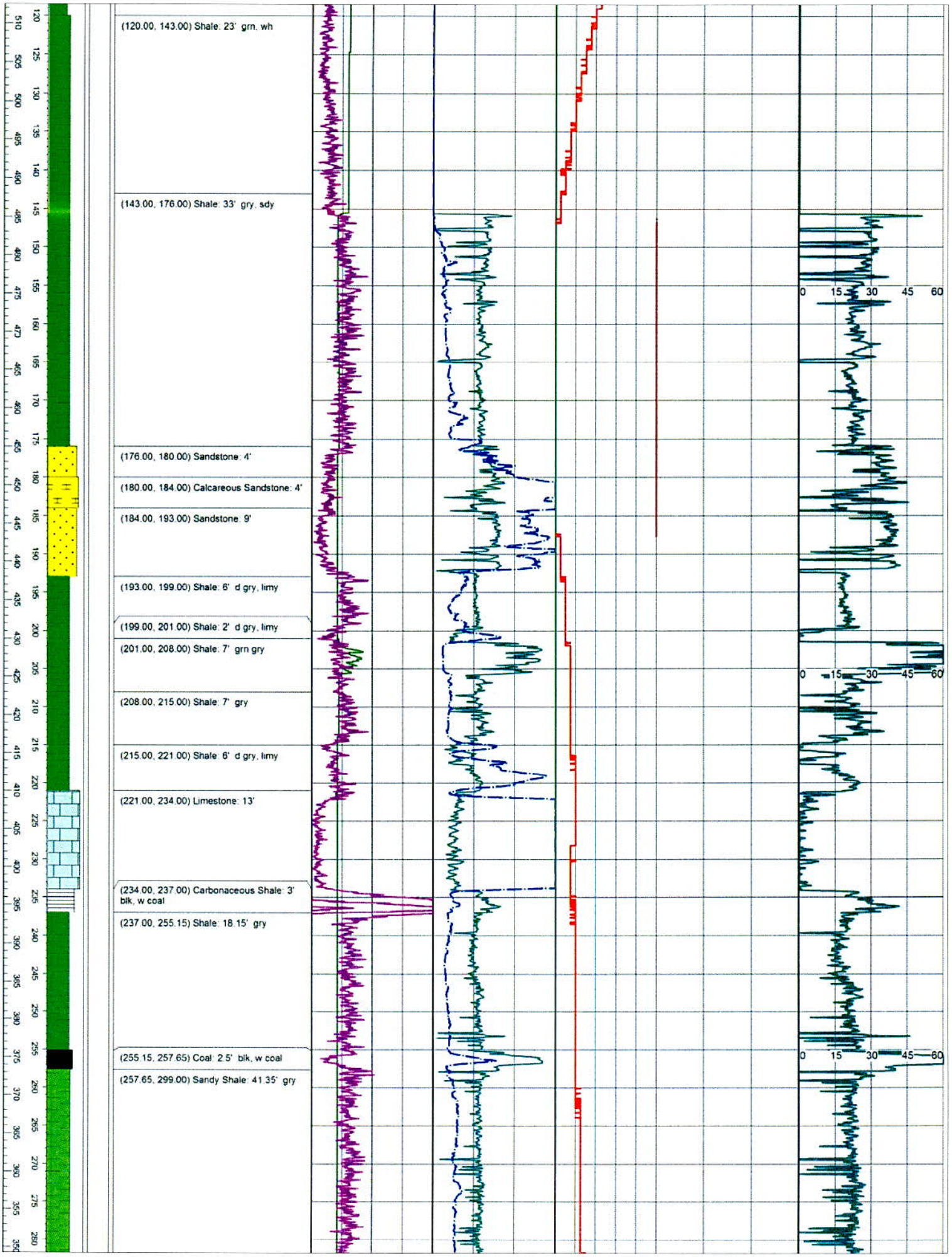
07-03-09-01

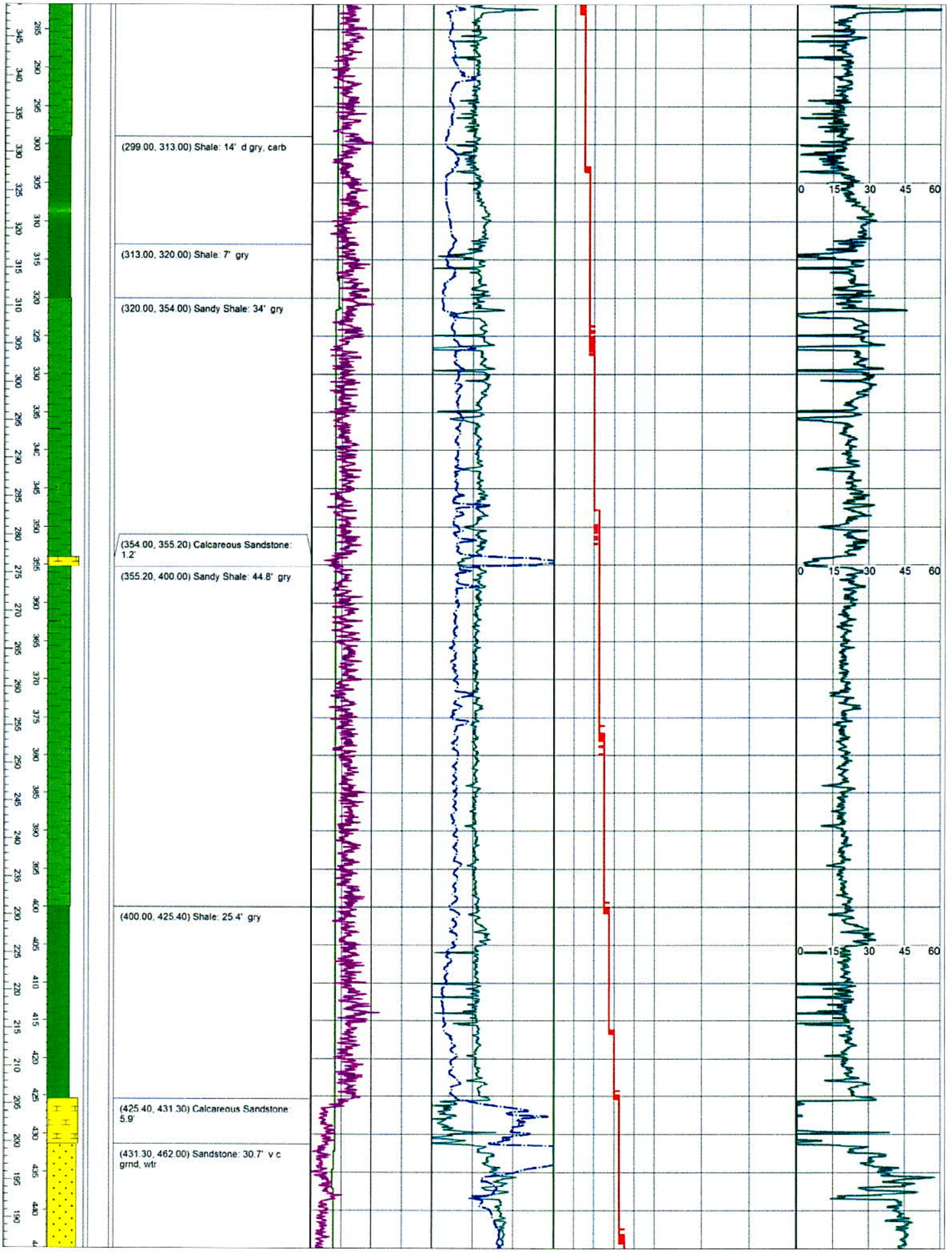
Lithology Log

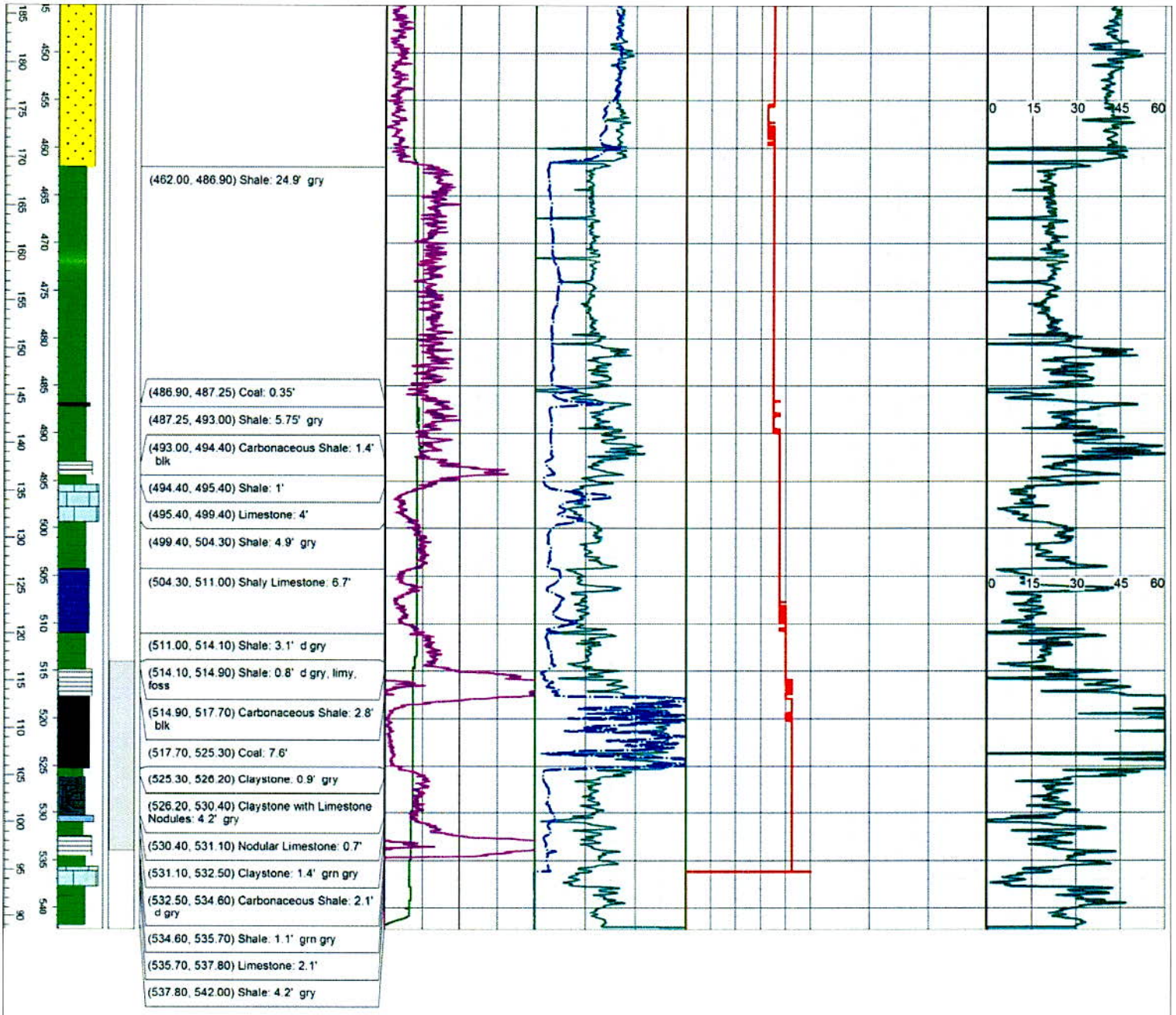
Easting:	2507564	Total Depth (Driller):	542	Drilled By:	Hawkey & Kline
Northing:	874631	Total Depth (Logger):	542.43	Cuttings Logged By:	Driller, JTP
Township:	7N	Elevation (GS):	631	Core Logged By:	JT Padgett
Range:	3W	Casing Depth:	145	Geophysical Log Operator:	Cardno
Section:	9	Core Interval:	514 - 534	Completion Date:	10/22/2013
County:	Montgomery				

Notes: No Sonic Log




(120.00, 143.00) Shale: 23' grn, wh
(143.00, 176.00) Shale: 33' gry, sdy
(176.00, 180.00) Sandstone: 4'
(180.00, 184.00) Calcareous Sandstone: 4'
(184.00, 193.00) Sandstone: 9'
(193.00, 199.00) Shale: 6' d gry, limy
(199.00, 201.00) Shale: 2' d gry, limy
(201.00, 208.00) Shale: 7' grn gry
(208.00, 215.00) Shale: 7' gry
(215.00, 221.00) Shale: 6' d gry, limy
(221.00, 234.00) Limestone: 13'
(234.00, 237.00) Carbonaceous Shale: 3' blk, w coal
(237.00, 255.15) Shale: 18.15' gry
(255.15, 257.65) Coal: 2.5' blk, w coal
(257.65, 299.00) Sandy Shale: 41.35' gry
0 15 30 45 60
0 15 30 45 60
0 15 30 45 60


(299.00, 313.00) Shale: 14' d gry, carb
(313.00, 320.00) Shale: 7' gry
(320.00, 354.00) Sandy Shale: 34' gry
(354.00, 355.20) Calcareous Sandstone: 1.2'
(355.20, 400.00) Sandy Shale: 44.8' gry
(400.00, 425.40) Shale: 25.4' gry
(425.40, 431.30) Calcareous Sandstone 5.9'
(431.30, 462.00) Sandstone: 30.7' v c grnd, wtr
0 15 30 45 60
0 15 30 45 60
0 15 30 45 60


(462.00, 486.90) Shale: 24.9' gry
(486.90, 487.25) Coal: 0.35'
(487.25, 493.00) Shale: 5.75' gry
(493.00, 494.40) Carbonaceous Shale: 1.4' blk
(494.40, 495.40) Shale: 1'
(495.40, 499.40) Limestone: 4'
(499.40, 504.30) Shale: 4.9' gry
(504.30, 511.00) Shaly Limestone: 6.7'
(511.00, 514.10) Shale: 3.1' d gry
(514.10, 514.90) Shale: 0.8' d gry, limy, foss
(514.90, 517.70) Carbonaceous Shale: 2.8' blk
(517.70, 525.30) Coal: 7.6'
(525.30, 526.20) Claystone: 0.9' gry
(526.20, 530.40) Claystone with Limestone Nodules: 4.2' gry
(530.40, 531.10) Nodular Limestone: 0.7'
(531.10, 532.50) Claystone: 1.4' grn gry
(532.50, 534.60) Carbonaceous Shale: 2.1' d gry
(534.60, 535.70) Shale: 1.1' grn gry
(535.70, 537.80) Limestone: 2.1'
(537.80, 542.00) Shale: 4.2' gry
0 15 30 45 60
0 15 30 45 60

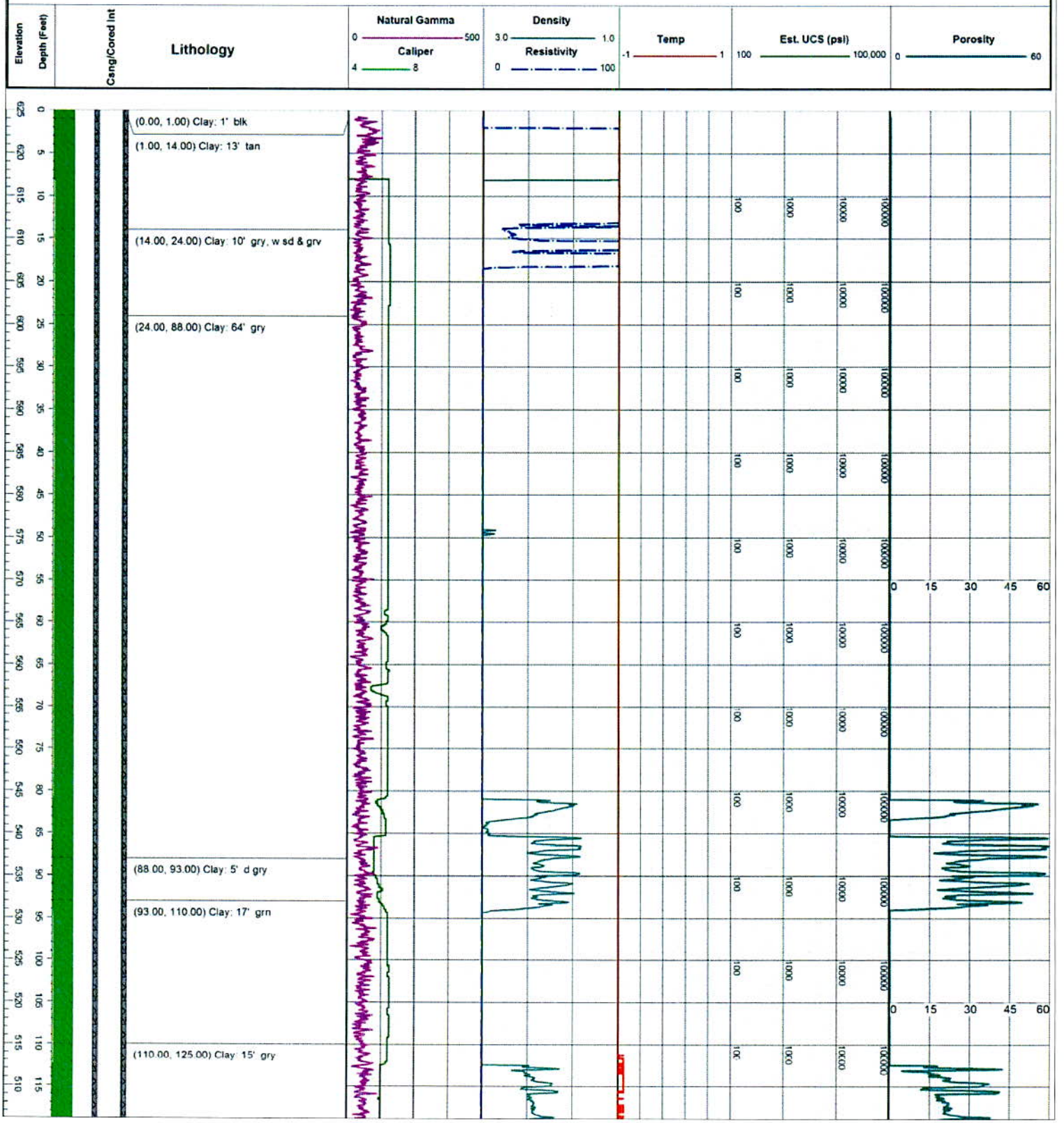
HILLSBORO ENERGY LLC

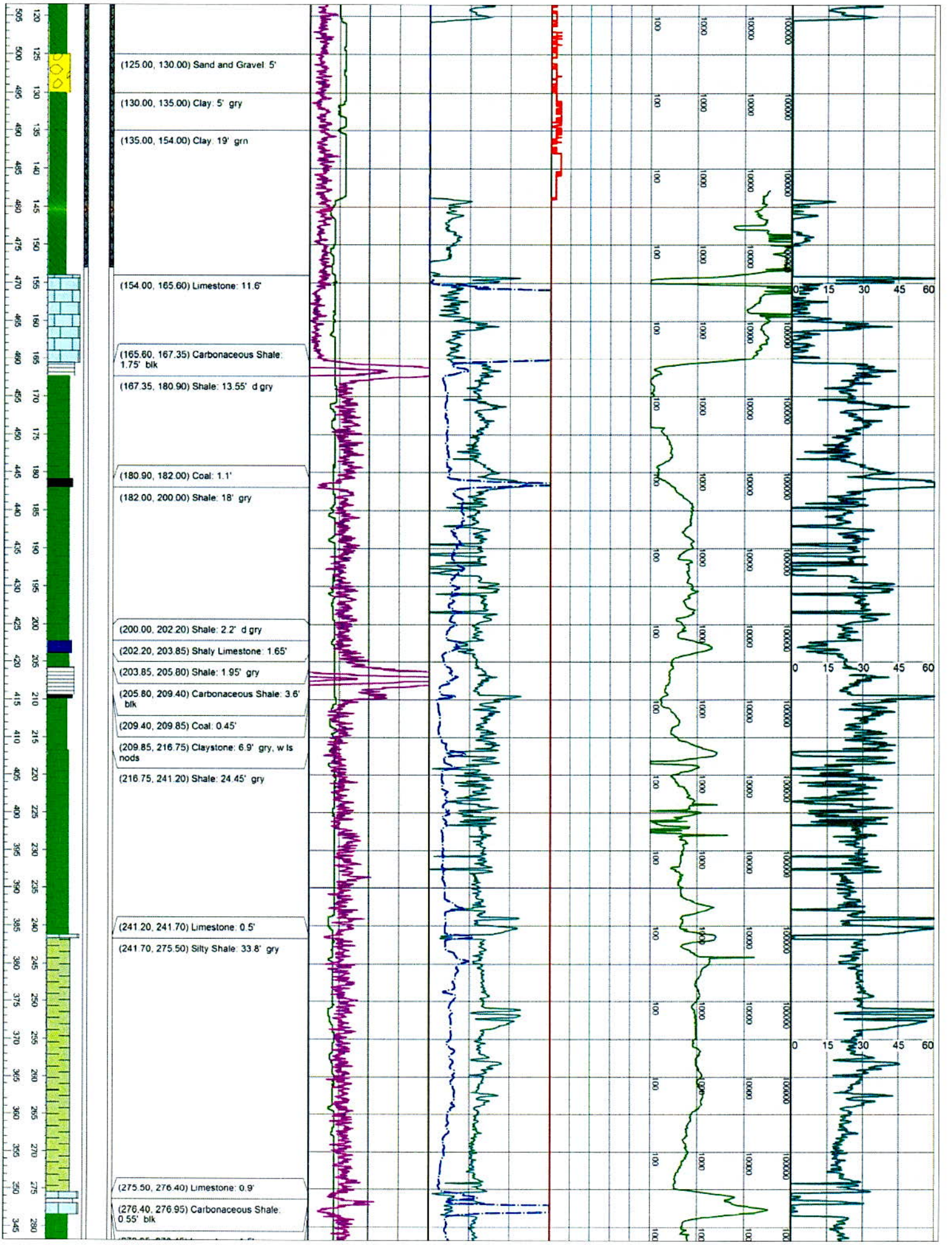
08-03-30-12

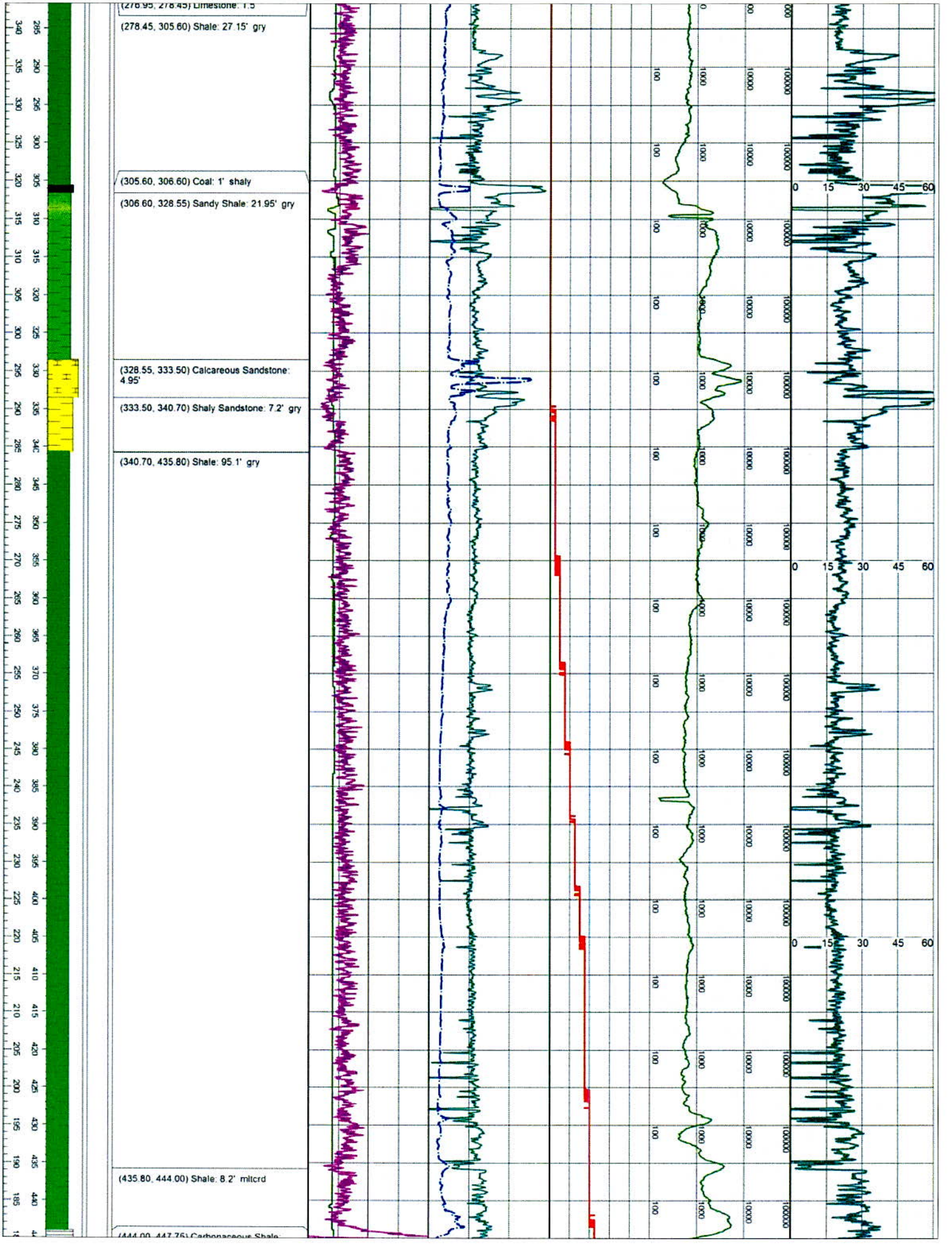
Lithology Log

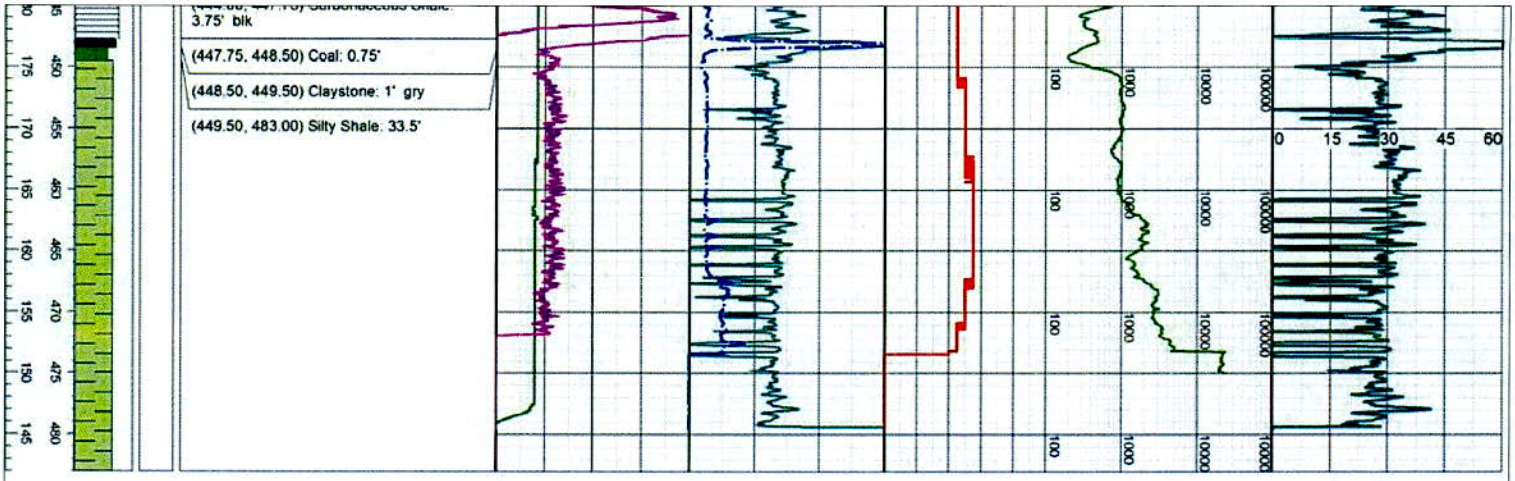
Easting:	2494063	Total Depth (Driller):	483	Drilled By:	Hawkey & Kline
Northing:	887059	Total Depth (Logger):	479.61	Cuttings Logged By:	Driller, JTP
Township:	8N	Elevation (GS):	625	Core Logged By:	
Range:	3	Casing Depth:	153	Geophysical Log Operator:	Cardno
Section:	30	Core Interval:	No core	Completion Date:	1/15/2014
County:	Montgomery				

Notes:




(125.00, 130.00) Sand and Gravel: 5'
(130.00, 135.00) Clay: 5' gry
(135.00, 154.00) Clay: 19' grn
(154.00, 165.60) Limestone: 11.6'
(165.60, 167.35) Carbonaceous Shale: 1.75' blk
(167.35, 180.90) Shale: 13.55' d gry
(180.90, 182.00) Coal: 1.1'
(182.00, 200.00) Shale: 18' gry
(200.00, 202.20) Shale: 2.2' d gry
(202.20, 203.85) Shaly Limestone: 1.65'
(203.85, 205.80) Shale: 1.95' gry
(205.80, 209.40) Carbonaceous Shale: 3.6' blk
(209.40, 209.85) Coal: 0.45'
(209.85, 216.75) Claystone: 6.9' gry, w ls nods
(216.75, 241.20) Shale: 24.45' gry
(241.20, 241.70) Limestone: 0.5'
(241.70, 275.50) Silty Shale: 33.8' gry
(275.50, 276.40) Limestone: 0.9'
(276.40, 276.95) Carbonaceous Shale: 0.55' blk
0 15 30 45 60


(276.95, 278.45) Limestone: 1.5
(278.45, 305.60) Shale: 27.15' gry
(305.60, 306.60) Coal: 1' shaly
(306.60, 328.55) Sandy Shale: 21.95' gry
(328.55, 333.50) Calcareous Sandstone: 4.95'
(333.50, 340.70) Shaly Sandstone: 7.2' gry
(340.70, 435.80) Shale: 95.1' gry
(435.80, 444.00) Shale: 8.2' mltcrd
(444.00, 447.76) Carbonaceous Shale
0 15 30 45 60
0 15 30 45 60
0 15 30 45 60


3.75' blk
(447.75, 448.50) Coal: 0.75'
(448.50, 449.50) Claystone: 1' gry
(449.50, 483.00) Silty Shale: 33.5'
0
15
30
45
60

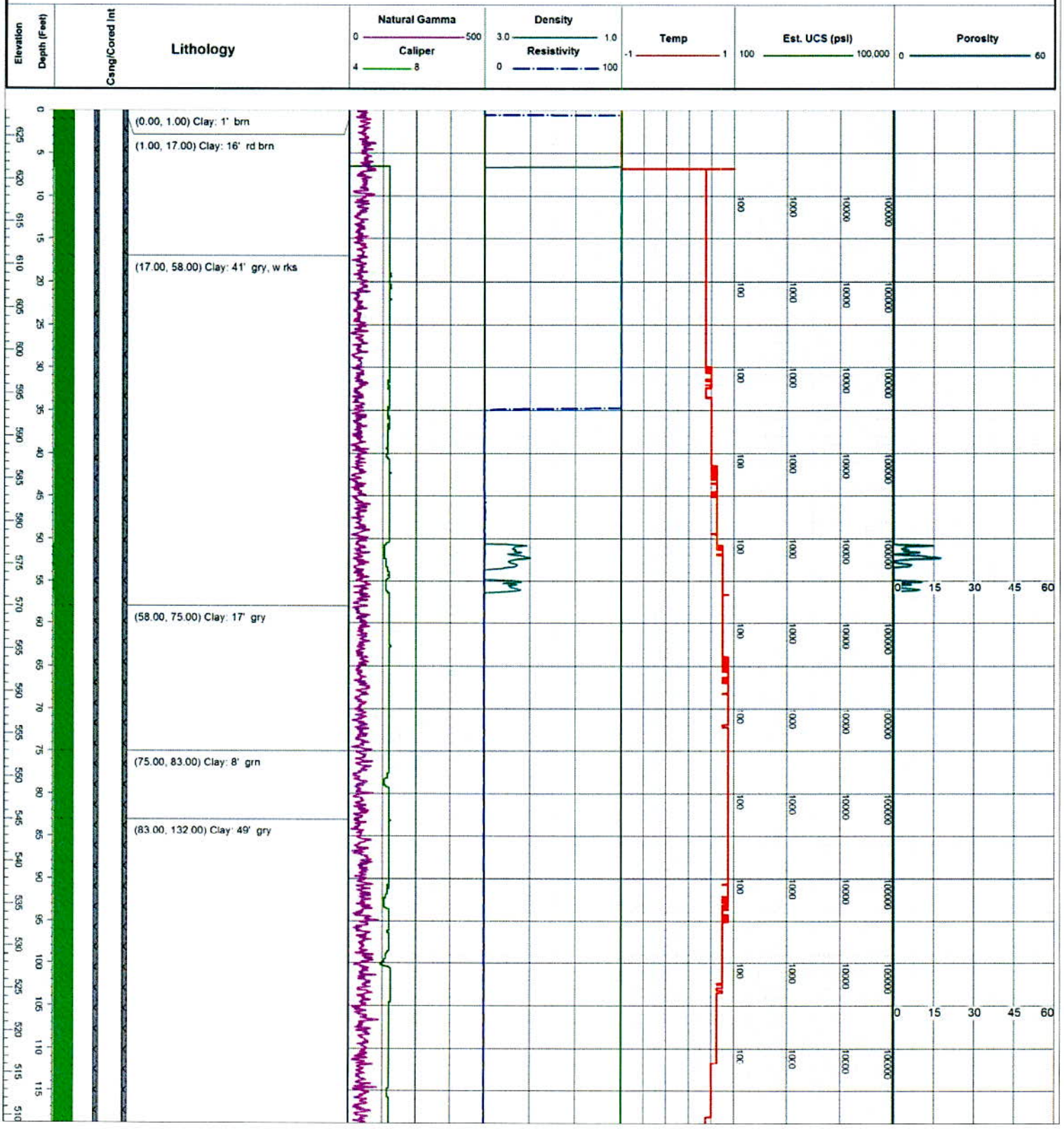
HILLSBORO ENERGY LLC

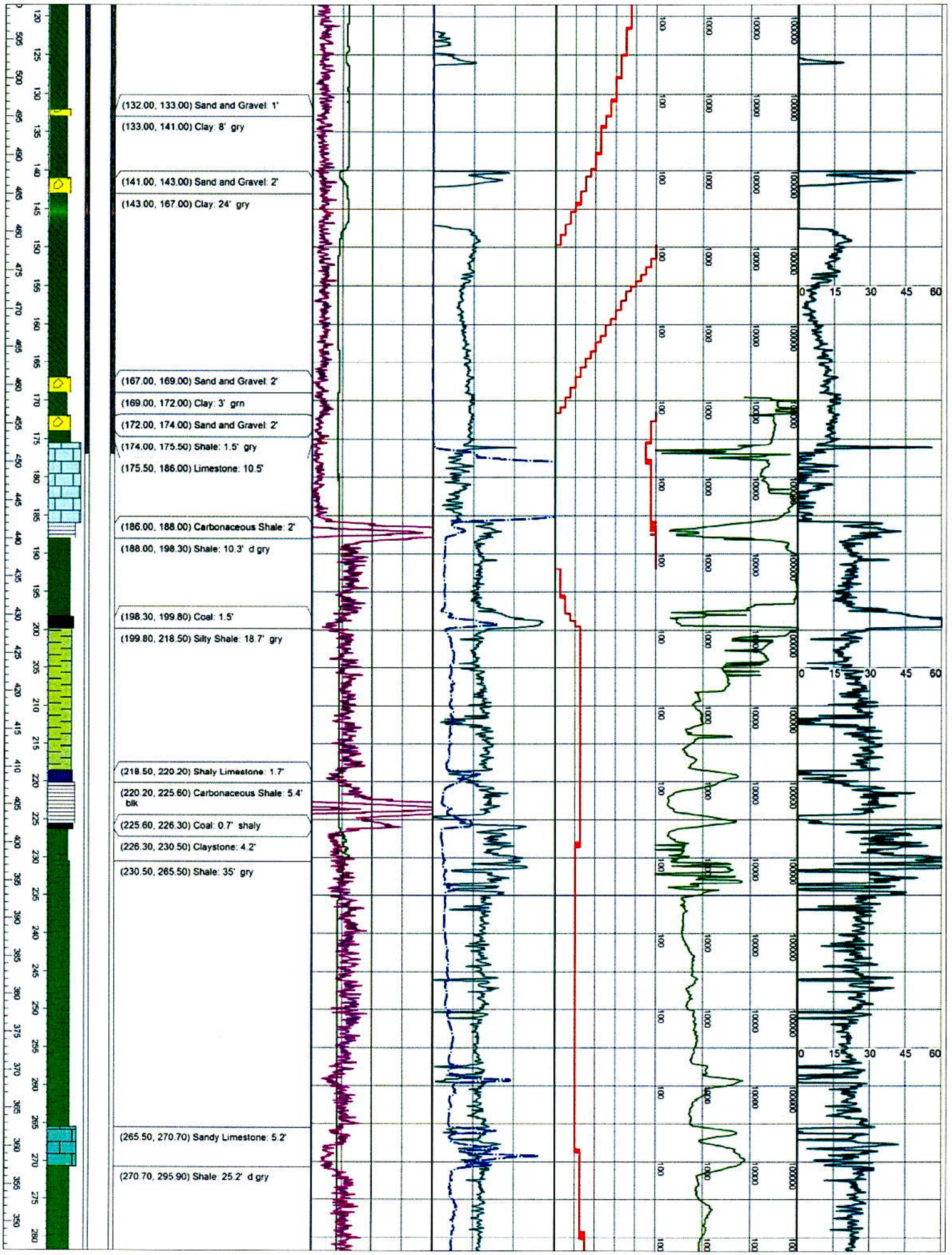
08-03-31-01

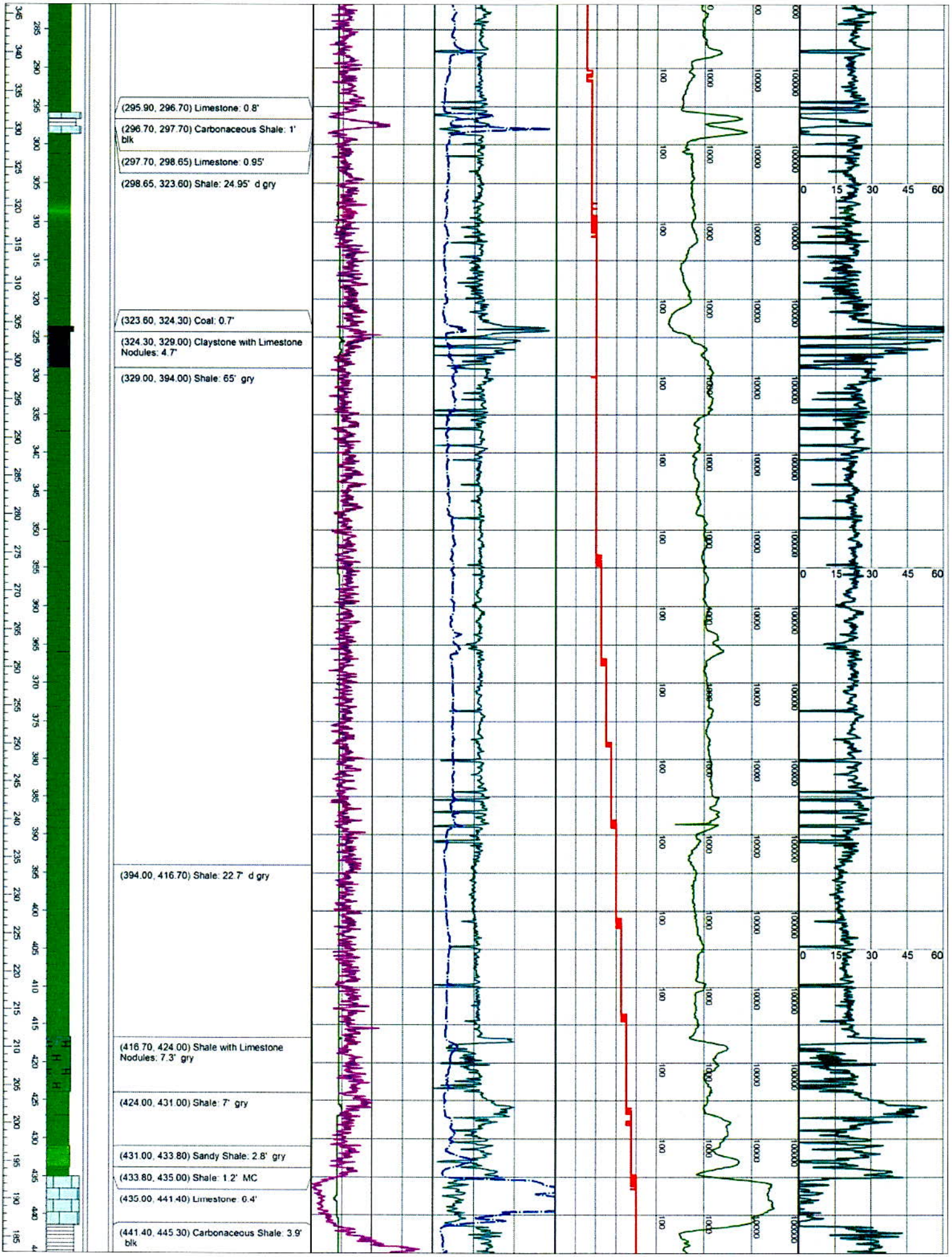
Lithology Log

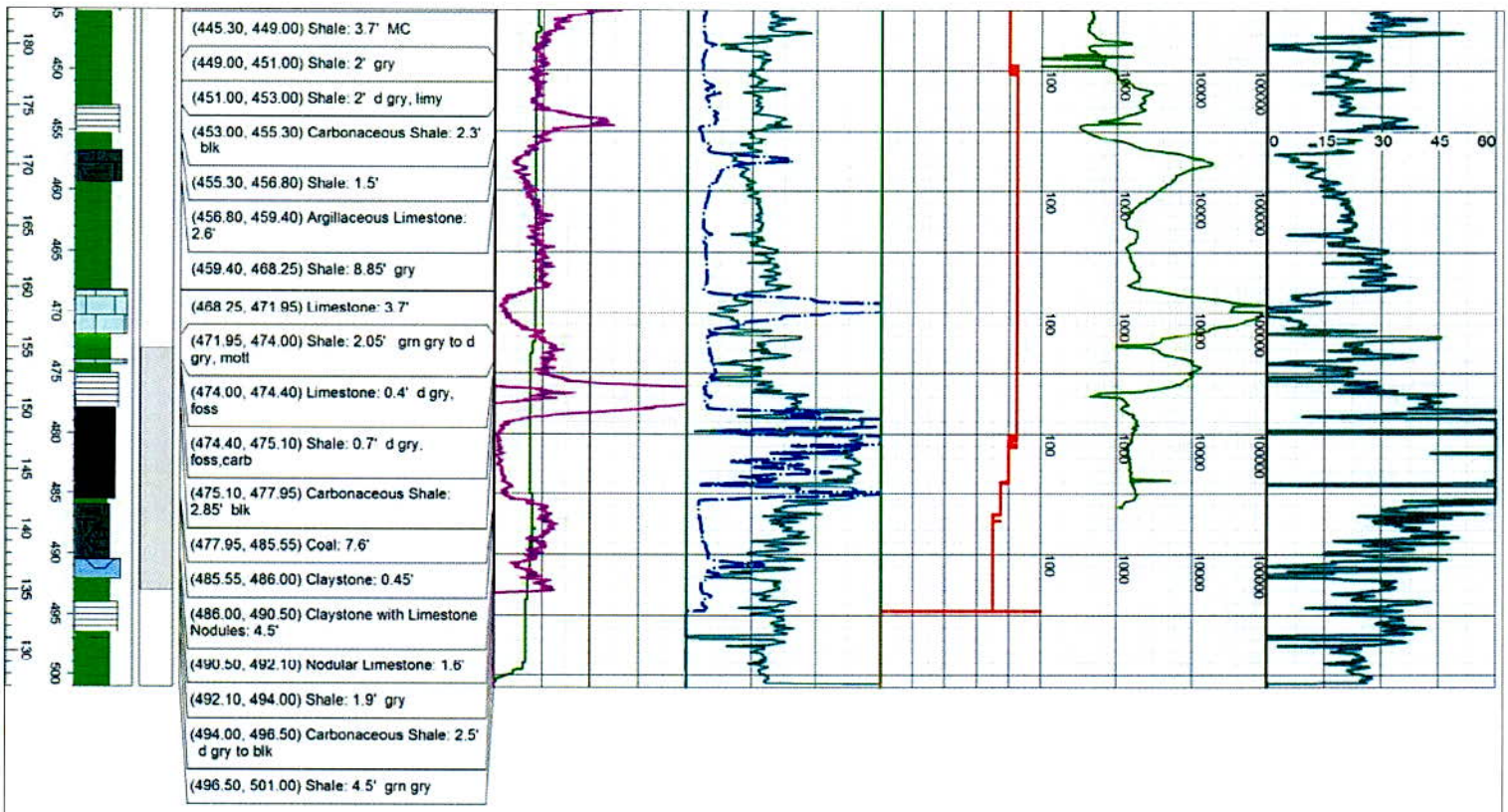
Easting:	24967515	Total Depth (Driller):	501	Drilled By:	Hawkey & Kline
Northing:	628	Total Depth (Logger):	500.89	Cuttings Logged By:	Driller, JTP
Township:	8N	Elevation (GS):	628	Core Logged By:	JT Padgett
Range:	3W	Casing Depth:	177	Geophysical Log Operator:	Cardno
Section:	31	Core Interval:	473-493	Completion Date:	9/24/2013
County:	Montgomery				

Notes:




(132.00, 133.00) Sand and Gravel: 1'
(133.00, 141.00) Clay: 8' gry
(141.00, 143.00) Sand and Gravel: 2'
(143.00, 167.00) Clay: 24' gry
(167.00, 169.00) Sand and Gravel: 2'
(169.00, 172.00) Clay: 3' grn
(172.00, 174.00) Sand and Gravel: 2'
(174.00, 175.50) Shale: 1.5' gry
(175.50, 186.00) Limestone: 10.5'
(186.00, 188.00) Carbonaceous Shale: 2'
(188.00, 198.30) Shale: 10.3' d gry
(198.30, 199.80) Coal: 1.5'
(199.80, 218.50) Silty Shale: 18.7' gry
(218.50, 220.20) Shaly Limestone: 1.7'
(220.20, 225.60) Carbonaceous Shale: 5.4' blk
(225.60, 226.30) Coal: 0.7' shaly
(226.30, 230.50) Claystone: 4.2'
(230.50, 265.50) Shale: 35' gry
(265.50, 270.70) Sandy Limestone: 5.2'
(270.70, 295.90) Shale: 25.2' d gry
0
15
30
45
60
100
1000
10000
100000


(295.90, 296.70) Limestone: 0.8'
(296.70, 297.70) Carbonaceous Shale: 1' blk
(297.70, 298.65) Limestone: 0.95'
(298.65, 323.60) Shale: 24.95' d gry
(323.60, 324.30) Coal: 0.7'
(324.30, 329.00) Claystone with Limestone Nodules: 4.7'
(329.00, 394.00) Shale: 65' gry
(394.00, 416.70) Shale: 22.7' d gry
(416.70, 424.00) Shale with Limestone Nodules: 7.3' gry
(424.00, 431.00) Shale: 7' gry
(431.00, 433.80) Sandy Shale: 2.8' gry
(433.80, 435.00) Shale: 1.2' MC
(435.00, 441.40) Limestone: 6.4'
(441.40, 445.30) Carbonaceous Shale: 3.9' blk
0
15
30
45
60
100
1000
10000
100000


(445.30, 449.00) Shale: 3.7' MC
(449.00, 451.00) Shale: 2' gry
(451.00, 453.00) Shale: 2' d gry, limy
(453.00, 455.30) Carbonaceous Shale: 2.3' blk
(455.30, 456.80) Shale: 1.5'
(456.80, 459.40) Argillaceous Limestone: 2.6'
(459.40, 468.25) Shale: 8.85' gry
(468.25, 471.95) Limestone: 3.7'
(471.95, 474.00) Shale: 2.05' grn gry to d gry, mott
(474.00, 474.40) Limestone: 0.4' d gry, foss
(474.40, 475.10) Shale: 0.7' d gry, foss,carb
(475.10, 477.95) Carbonaceous Shale: 2.85' blk
(477.95, 485.55) Coal: 7.6'
(485.55, 486.00) Claystone: 0.45'
(486.00, 490.50) Claystone with Limestone Nodules: 4.5'
(490.50, 492.10) Nodular Limestone: 1.6'
(492.10, 494.00) Shale: 1.9' gry
(494.00, 496.50) Carbonaceous Shale: 2.5' d gry to blk
(496.50, 501.00) Shale: 4.5' grn gry
0
15
30
45
60

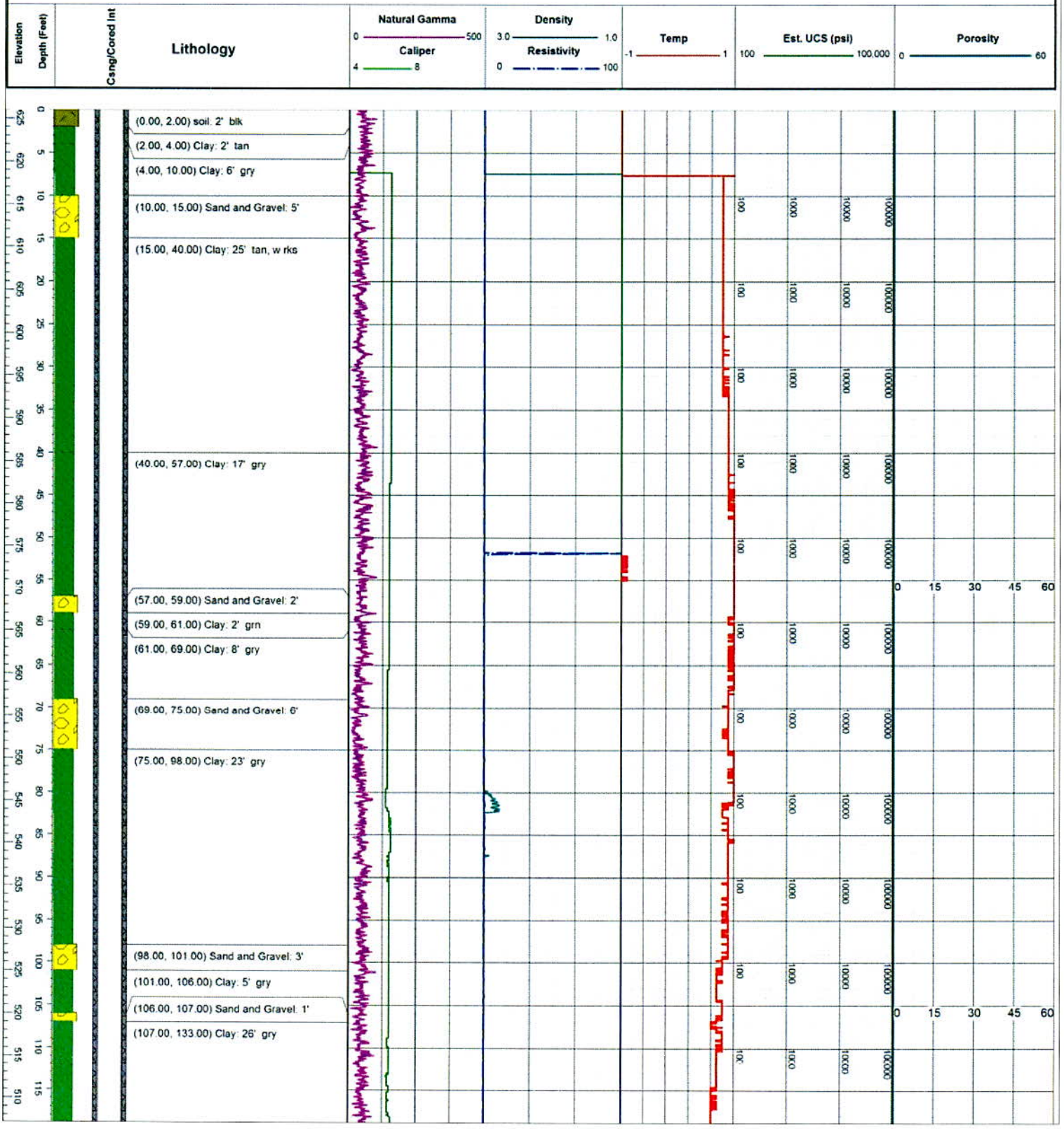
HILLSBORO ENERGY LLC

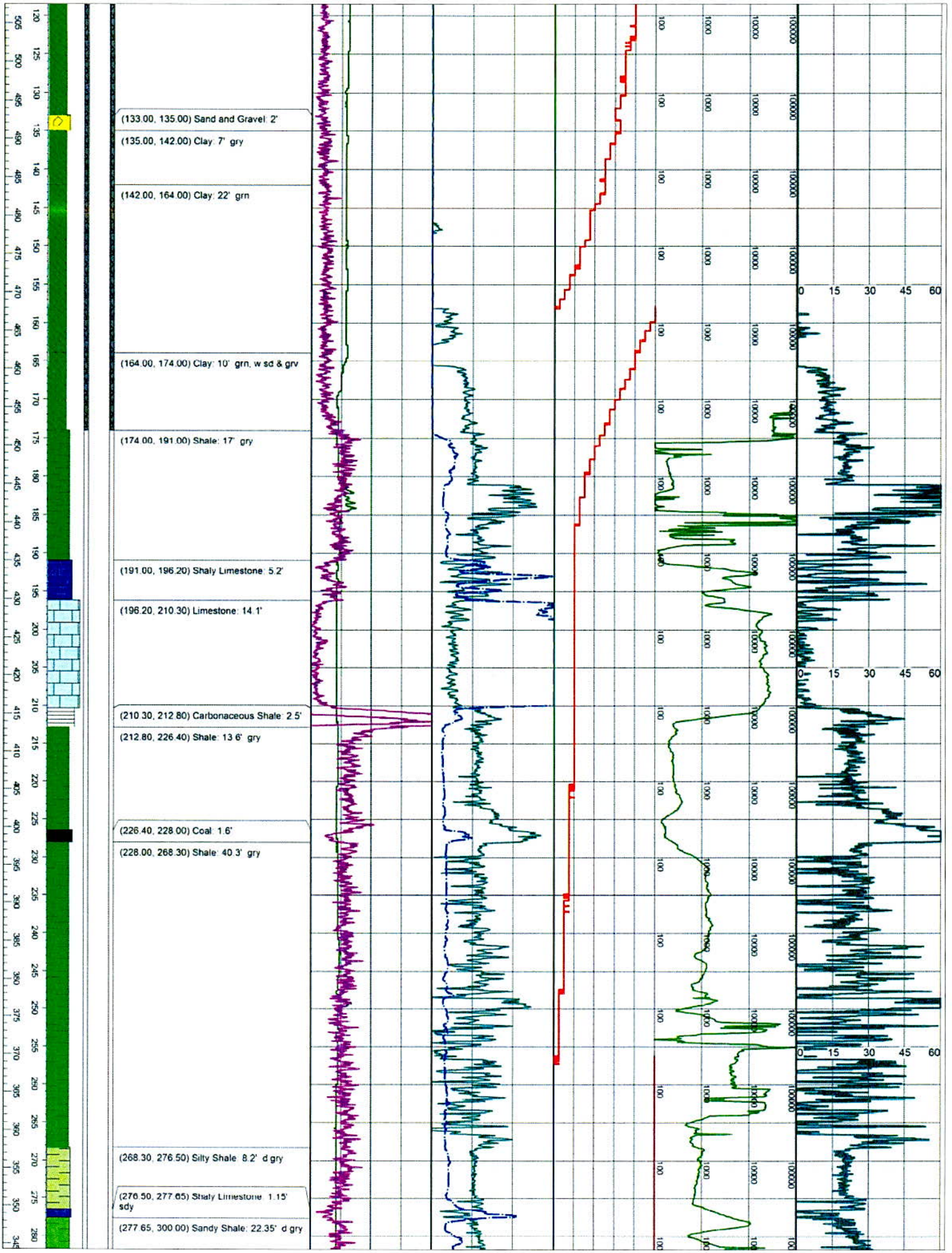
08-03-32-03

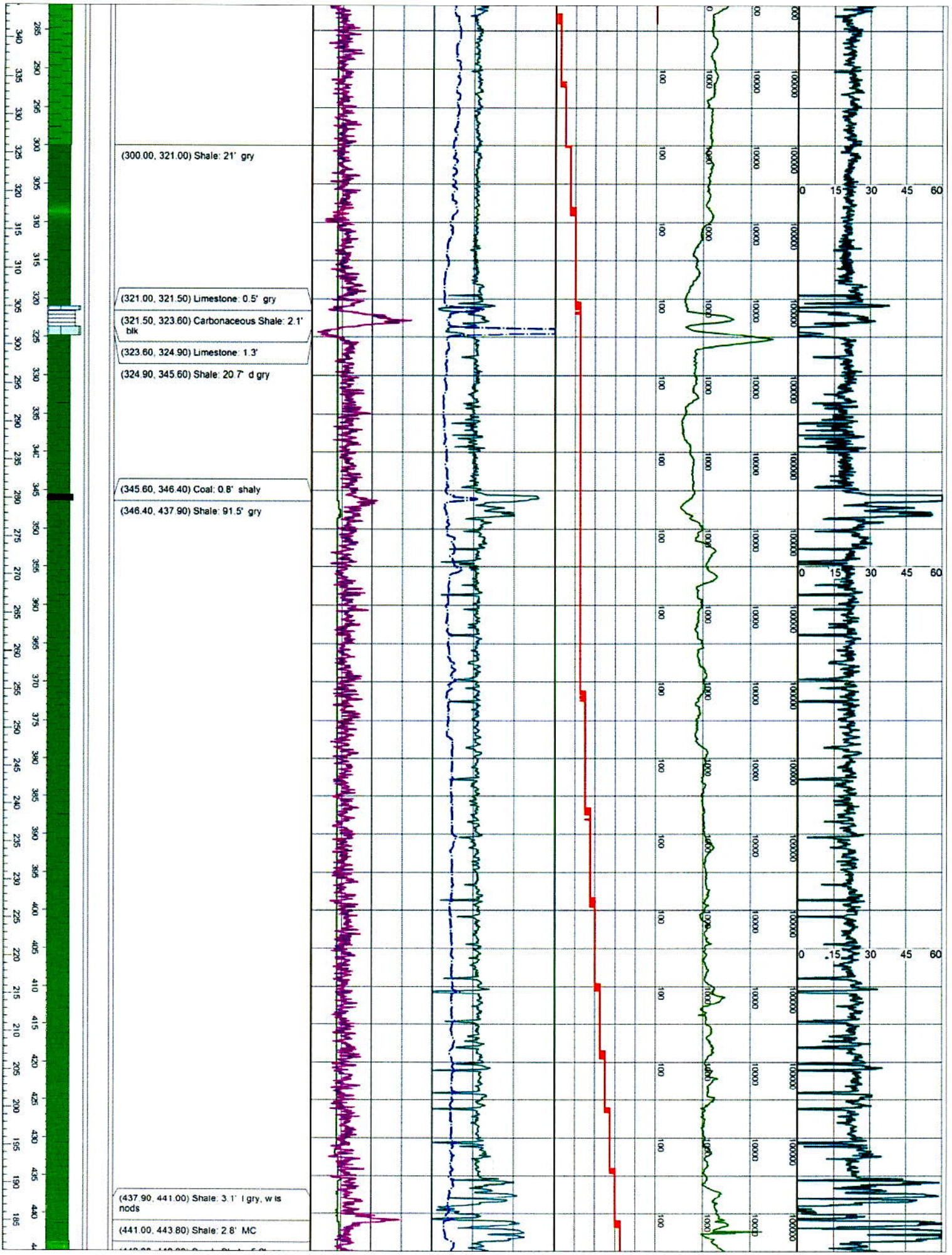
Lithology Log

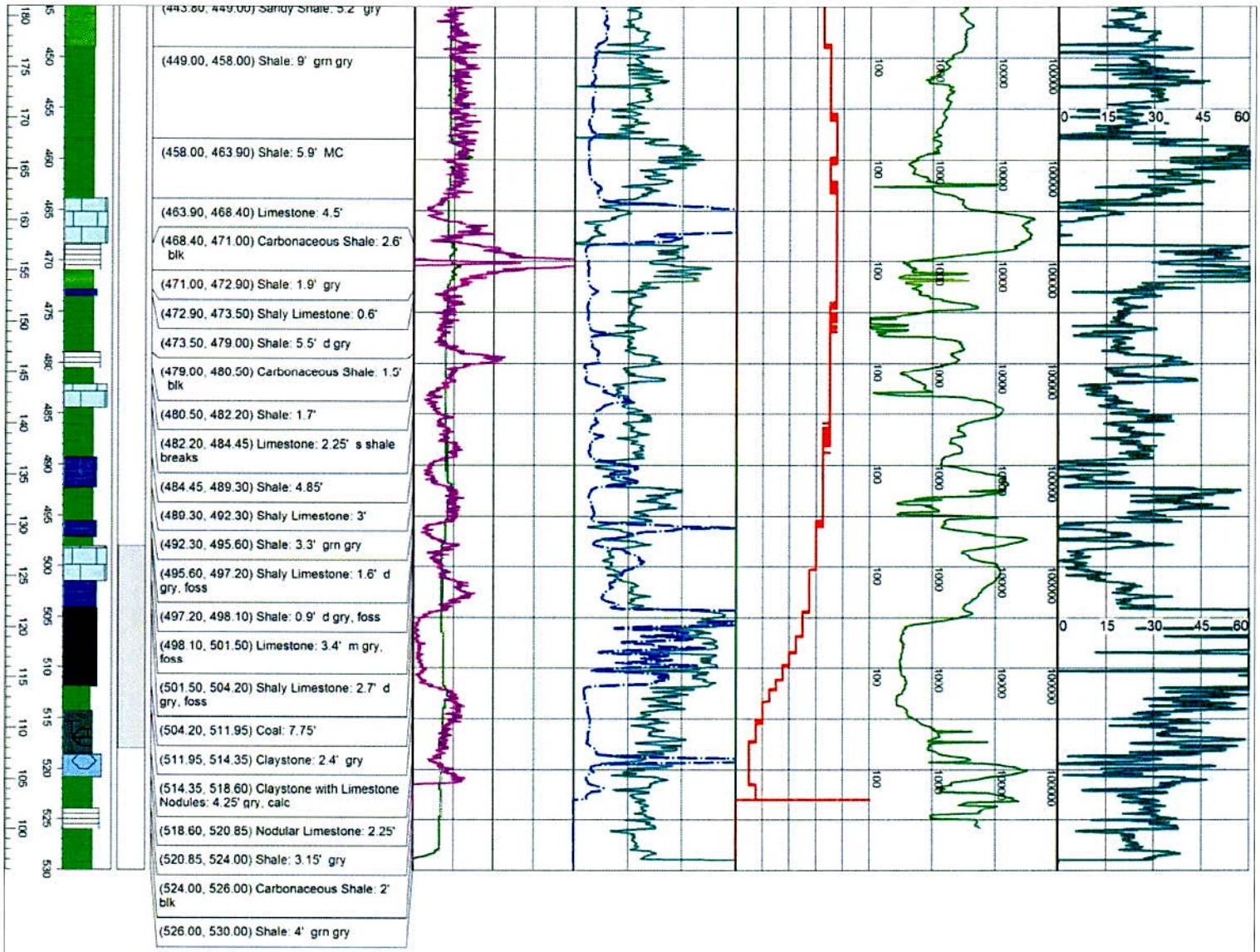
Easting:	2500880	Total Depth (Driller):	533	Drilled By:	Hawkey & Kline
Northing:	884295	Total Depth (Logger):	529.19	Cuttings Logged By:	Driller, JTP
Township:	8N	Elevation (GS):	626	Core Logged By:	JT Padgett
Range:	3W	Casing Depth:	174	Geophysical Log Operator:	Cardno
Section:	32	Core Interval:	498-518	Completion Date:	8/20/2013
County:	Montgomery				

Notes: Drill depths adjusted to E-log




(133.00, 135.00) Sand and Gravel: 2'
(135.00, 142.00) Clay: 7' gry
(142.00, 164.00) Clay: 22' grn
(164.00, 174.00) Clay: 10' grn, w sd & grv
(174.00, 191.00) Shale: 17' gry
(191.00, 196.20) Shaly Limestone: 5.2'
(196.20, 210.30) Limestone: 14.1'
(210.30, 212.80) Carbonaceous Shale: 2.5'
(212.80, 226.40) Shale: 13.6' gry
(226.40, 228.00) Coal: 1.6'
(228.00, 268.30) Shale: 40.3' gry
(268.30, 276.50) Silty Shale: 8.2' d gry
(276.50, 277.65) Shaly Limestone: 1.15' sdy
(277.65, 300.00) Sandy Shale: 22.35' d gry
0
15
30
45
60


(300.00, 321.00) Shale: 21' gry
(321.00, 321.50) Limestone: 0.5' gry
(321.50, 323.60) Carbonaceous Shale: 2.1' blk
(323.60, 324.90) Limestone: 1.3'
(324.90, 345.60) Shale: 20.7' d gry
(345.60, 346.40) Coal: 0.8' shaly
(346.40, 437.90) Shale: 91.5' gry
(437.90, 441.00) Shale: 3.1' l gry, w ls nods
(441.00, 443.80) Shale: 2.8' MC
0
15
30
45
60


(443.80, 449.00) Sandy Shale: 5.2' gry
(449.00, 458.00) Shale: 9' grn gry
(458.00, 463.90) Shale: 5.9' MC
(463.90, 468.40) Limestone: 4.5'
(468.40, 471.00) Carbonaceous Shale: 2.6' blk
(471.00, 472.90) Shale: 1.9' gry
(472.90, 473.50) Shaly Limestone: 0.6'
(473.50, 479.00) Shale: 5.5' d gry
(479.00, 480.50) Carbonaceous Shale: 1.5' blk
(480.50, 482.20) Shale: 1.7'
(482.20, 484.45) Limestone: 2.25' s shale breaks
(484.45, 489.30) Shale: 4.85'
(489.30, 492.30) Shaly Limestone: 3'
(492.30, 495.60) Shale: 3.3' grn gry
(495.60, 497.20) Shaly Limestone: 1.6' d gry, foss
(497.20, 498.10) Shale: 0.9' d gry, foss
(498.10, 501.50) Limestone: 3.4' m gry, foss
(501.50, 504.20) Shaly Limestone: 2.7' d gry, foss
(504.20, 511.95) Coal: 7.75'
(511.95, 514.35) Claystone: 2.4' gry
(514.35, 518.60) Claystone with Limestone Nodules: 4.25' gry, calc
(518.60, 520.85) Nodular Limestone: 2.25'
(520.85, 524.00) Shale: 3.15' gry
(524.00, 526.00) Carbonaceous Shale: 2' blk
(526.00, 530.00) Shale: 4' grn gry
0 15 30 45 60
0 15 30 45 60

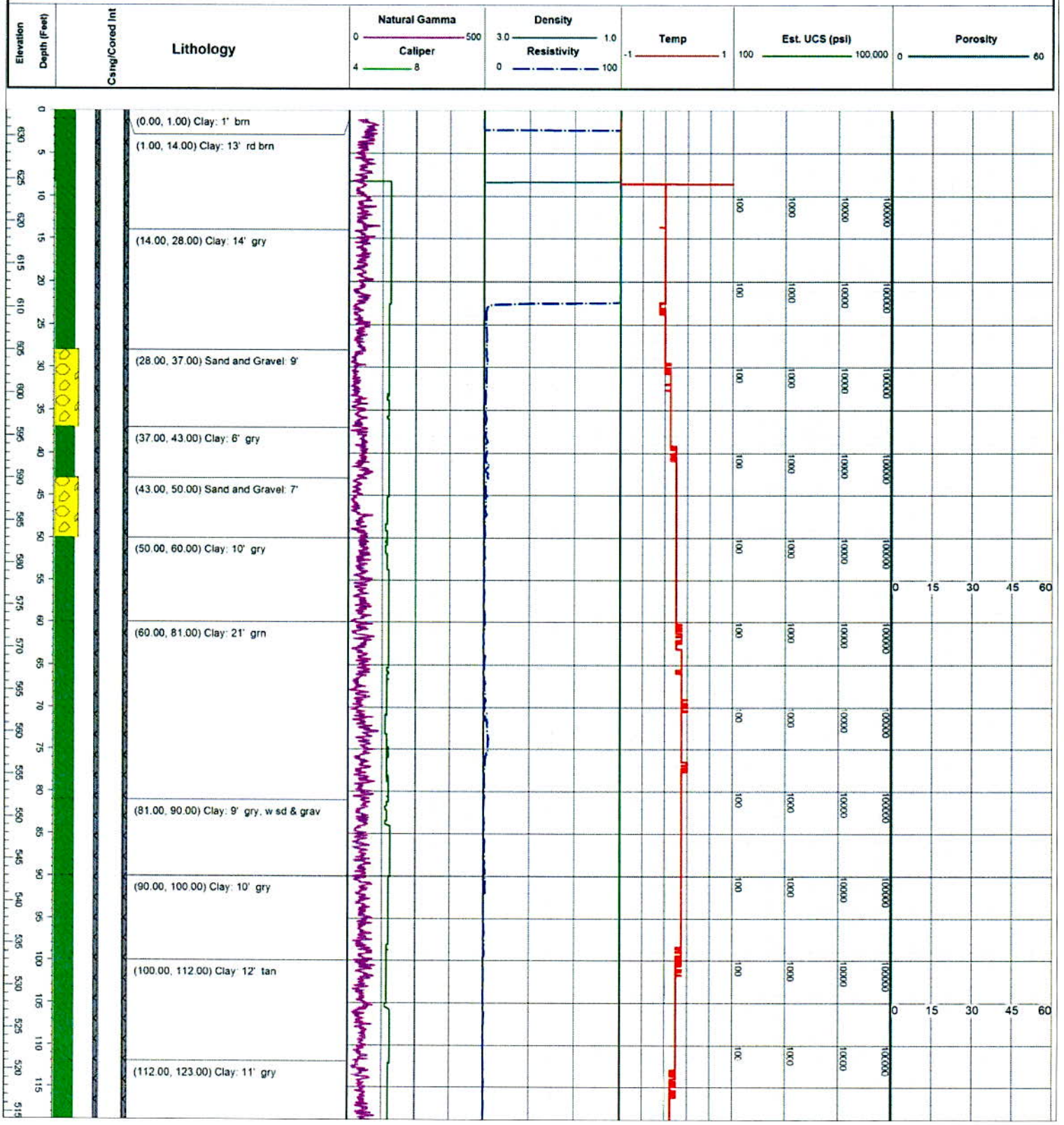
HILLSBORO ENERGY LLC

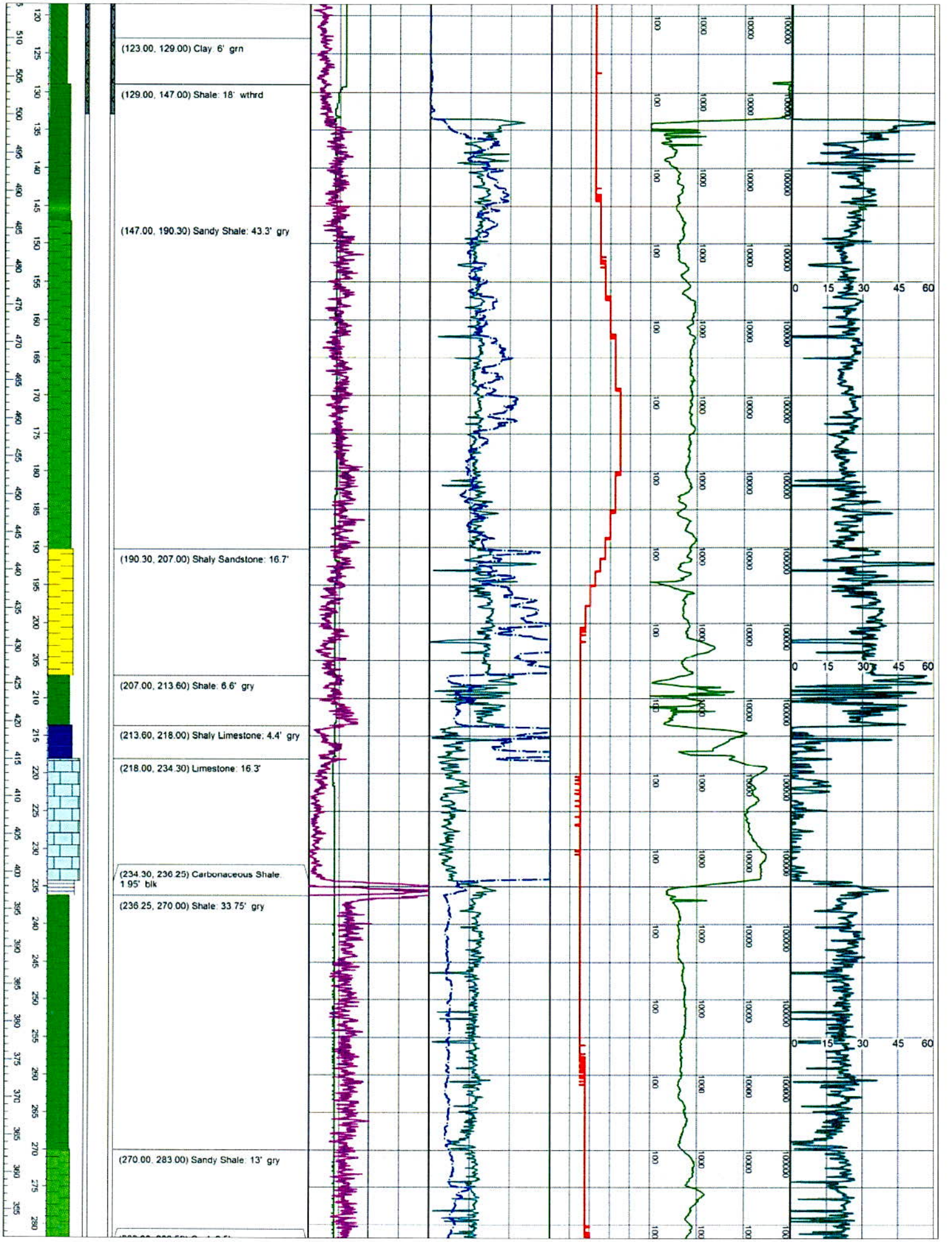
08-03-33-02

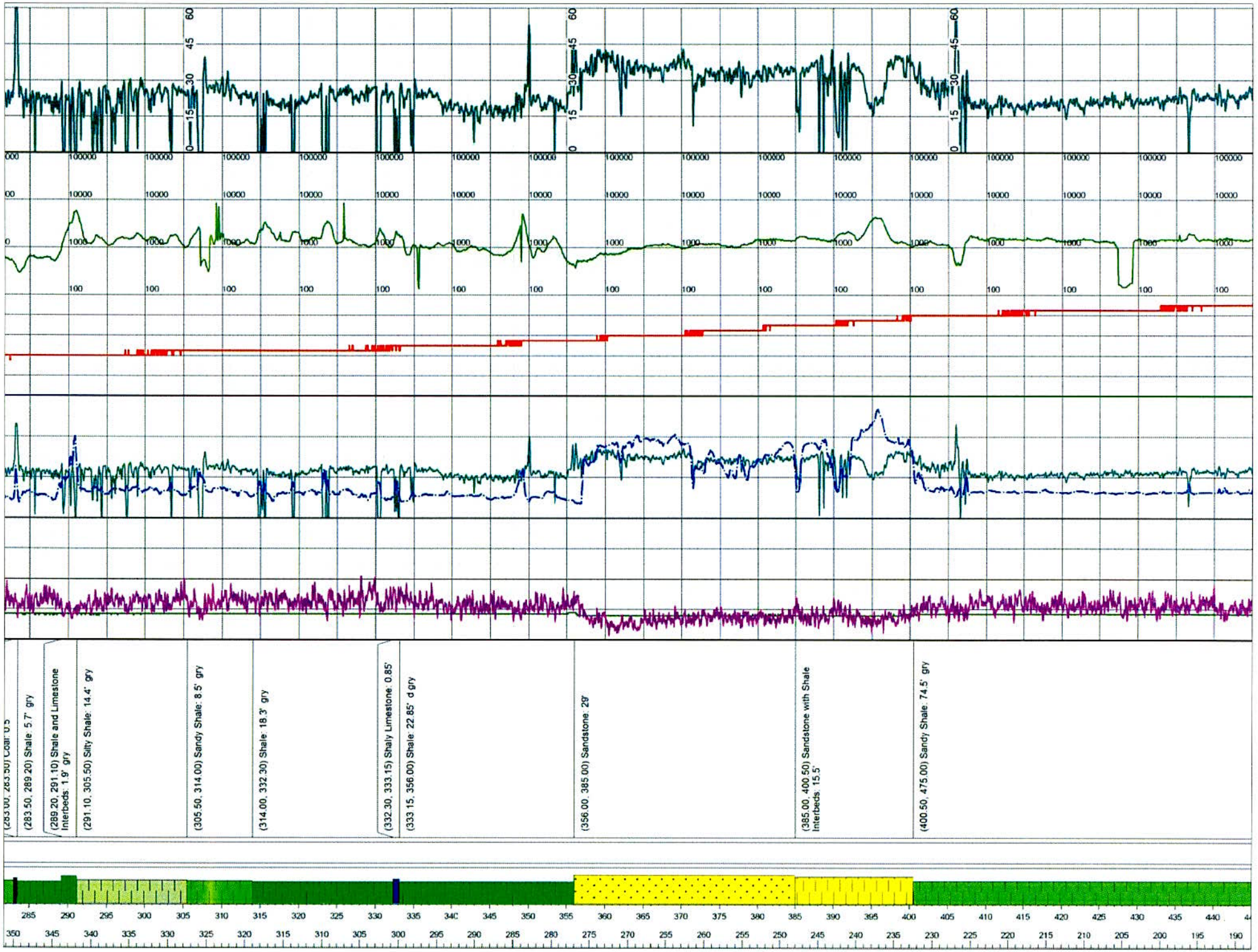
Lithology Log

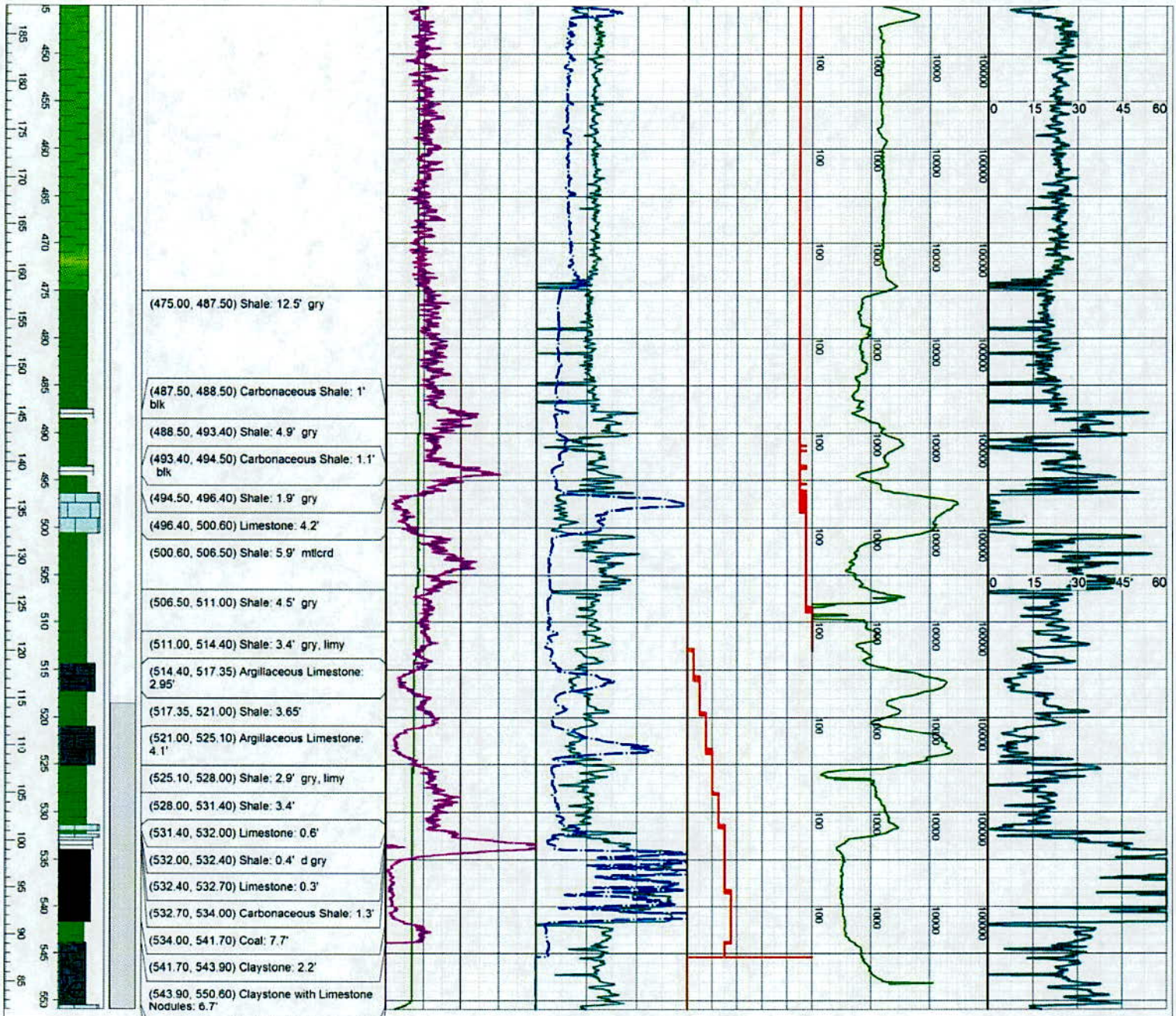
Easting:	2507404	Total Depth (Driller):	551	Drilled By:	Hawkey & Kline
Northing:	885488	Total Depth (Logger):	551.62	Cuttings Logged By:	Driller, JTP
Township:	8N	Elevation (GS):	633	Core Logged By:	JT Padgett
Range:	3W	Casing Depth:	133	Geophysical Log Operator:	Cardno
Section:	33	Core Interval:	518.5 - 551	Completion Date:	12/17/2013
County:	Montgomery				

Notes:




(123.00, 129.00) Clay: 6' grn
(129.00, 147.00) Shale: 18' wthrd
(147.00, 190.30) Sandy Shale: 43.3' gry
(190.30, 207.00) Shaly Sandstone: 16.7'
(207.00, 213.60) Shale: 6.6' gry
(213.60, 218.00) Shaly Limestone: 4.4' gry
(218.00, 234.30) Limestone: 16.3'
(234.30, 236.25) Carbonaceous Shale: 1.95' blk
(236.25, 270.00) Shale: 33.75' gry
(270.00, 283.00) Sandy Shale: 13' gry
0 15 30 45 60
100 1000 10000 100000


(283.50, 289.20) Shale: 5.7' gry
(289.20, 291.10) Shale and Limestone Interbeds: 1.9' gry
(291.10, 305.50) Silty Shale: 14.4' gry
(305.50, 314.00) Sandy Shale: 8.5' gry
(314.00, 332.30) Shale: 18.3' gry
(332.30, 333.15) Shaly Limestone: 0.85'
(333.15, 356.00) Shale: 22.85' d gry
(356.00, 385.00) Sandstone: 29'
(385.00, 400.50) Sandstone with Shale Interbeds: 15.5'
(400.50, 475.00) Sandy Shale: 74.5' gry


(475.00, 487.50) Shale: 12.5' gry
(487.50, 488.50) Carbonaceous Shale: 1' blk
(488.50, 493.40) Shale: 4.9' gry
(493.40, 494.50) Carbonaceous Shale: 1.1' blk
(494.50, 496.40) Shale: 1.9' gry
(496.40, 500.60) Limestone: 4.2'
(500.60, 506.50) Shale: 5.9' mtlcrd
(506.50, 511.00) Shale: 4.5' gry
(511.00, 514.40) Shale: 3.4' gry, limy
(514.40, 517.35) Argillaceous Limestone: 2.95'
(517.35, 521.00) Shale: 3.65'
(521.00, 525.10) Argillaceous Limestone: 4.1'
(525.10, 528.00) Shale: 2.9' gry, limy
(528.00, 531.40) Shale: 3.4'
(531.40, 532.00) Limestone: 0.6'
(532.00, 532.40) Shale: 0.4' d gry
(532.40, 532.70) Limestone: 0.3'
(532.70, 534.00) Carbonaceous Shale: 1.3'
(534.00, 541.70) Coal: 7.7'
(541.70, 543.90) Claystone: 2.2'
(543.90, 550.60) Claystone with Limestone Nodules: 6.7'
(550.60, 551.00) Limestone: 0.4'
0 15 30 45 60
0 15 30 45' 60

ATTACHMENT III.2.A.2
ACID BASE ACCOUNTABILITY

-A-
"Overburden Sampling and Analytical Techniques"

OVERBURDEN SAMPLING AND ANALYTICAL TECHNIQUES

Acid Base Accounting and Leaching Tests

Characterization of the acid or toxic potential of overburden material is generally accomplished by either a technique known as acid/base accounting (*Smith and others, 1982; Sobek and others, 1978*) or leaching tests (*Caruccio and others, 1977, 1981, 1982; Caruccio, 1984; Geidel, 1979*).

Acid/base accounting is utilized nationwide to assess acid or toxic potential and consists of the following three fundamental measurements:

1. Ph of a pulverized sample mixed with distilled water to the consistency of a thin paste.
2. Measurement of total disulfide content (mainly pyrite).
3. Measurement of total neutralization potential.

Paste Ph is a measure of the sample's immediate acidity or alkalinity and reflects current geochemical conditions. Samples with a paste Ph of 4.0 or less are classed as acid/toxic regardless of the pyrite and neutralizer balance (*Smith and Sencendiver, 1982; Sobek and others, 1978*).

Solubility and mobility of many trace elements and metals in water are strongly dependent on Ph. For example, at a Ph 4.0 or lower, elements such as aluminum, copper, manganese, zinc, lead, and chromium can be released into ground or surface waters.

Maximum potential acidity is calculated from the pyrite content of the sample and the four-step chemical reaction of pyrite to acid formation (*Sobek and others, 1978*). This calculated value represents the maximum or worst case condition of acid production. The actual acid production rate and completeness of reaction cannot be estimated using the acid/base technique.

Neutralization potential measures the sum total of carbonates, alkaline earths, and bases available to neutralize acidity and represents the most favorable condition. Calculations of maximum potential acidity and neutralization potential are structured to equate the two measurements to a common basis for comparison. The resulting values, expressed as calcium carbonate equivalent, are compared to compute a net acid-producing or neutralizing potential. Materials exhibiting a net acid production potential of 5 tons/1,000 tons of overburden material or more as calcium carbonate equivalent are classed as toxic or potentially toxic (Smith and Sencindiver, 1982; Sobek and others, 1978; Sturm and others, 1984).

The primary advantages of the acid/base accounting method are:

1. Short turn-around time for sample processing.
2. Low cost.
3. Relatively simple analytical procedures.
4. Relatively simple interpretation of results.

The principal disadvantages of acid/base accounting are:

1. The method predicts maximum potential acidity and maximum neutralization capability and implies a 1:1 acid to base reaction. Actual acid production and neutralization release rates cannot be predicted with this technique nor can the completeness of the reaction be assessed.
2. Acid/base accounting assumes all acid production is attributable to iron disulfide minerals (chiefly pyrite) and that no acid is produced by sulfate or organic sulfur forms. Sulfur fractionation studies of some Western overburden material have shown that about half of the total sulfur is present in organic forms and that acidity is being produced that cannot be accounted for by pyrite alone.
3. Measurement of neutralization potential utilizes a hot acid extract to measure carbonates and bases. Recent work in Texas suggests that this extraction procedure may overestimate neutralization potential and that a modified method may be needed.

Application of this acid/base accounting method to overburden handling and placement plans throughout the country has generally been moderately effective in eliminating or reducing adverse water quality impacts. Acid/base accounting is typically considered state-of-the-art for overburden analysis.

Leaching or simulated weathering tests have been advocated by *Caruccio and others (1977, 1981, 1982), Caruccio (1984), and Geidel (1979)* as an alternative overburden analysis method. The procedure is designed to mimic the conditions expected to occur in regraded spoil. Samples are subjected to alternating water leaching and exposure to moist air. Leachate is collected periodically and analyzed for pH, acidity, sulfate, and any other constituents of interest. Supplemental information may also be obtained by petrographic study of pyrite morphology. Caruccio has indicated that fine-grained pyrite with a large surface area is much more reactive and likely to produce acidity than coarse-grained pyritic material (*Caruccio, 1969, 1984; Caruccio and others, 1982*).

Results of leachate analyses are plotted as a function of time resulting in data on rate of reaction and the quantity of acidity or alkalinity produced. Leaching simulations have been applied to eastern and midwestern minesites and are reasonably good predictors of short-term (2 or 3 years) drainage quality.

Caruccio (1984) suggested that acid/base accounting be used as an initial screening test

for overburden samples. Materials containing a large net neutralization potential do not require further analyses. If total pyrite exceeds about 1 percent or if the neutralization potential is small, Caruccio recommends leaching tests to more accurately predict drainage quality.

The main advantages of leaching tests are summarized as follows:

1. Test methods are designed to simulate field conditions.
2. Reaction rates (kinetics) can be evaluated.
3. Leaching of overburden constituents other than acidity and alkalinity can be evaluated.

The primary disadvantages associated with leaching tests are:

1. Test time is lengthy; about two months are required to conduct one analysis.
2. Analysis is expensive.
3. Long-term predictive capability of leaching tests are uncertain.
4. Data interpretation requires more sophisticated review than the acid/base accounting method.

Tell us what you think.

Return to main Permitting Page
Last Updated by Doug Growitz: 02/06/2001 08:04:44

-B-
"Acid Base Accountability"

Appalachian Laboratories, Inc.

P.O. BOX 392
BECKLEY, WEST VIRGINIA 25802

PHONE 304-253-8677
FAX 304-253-4157
E-mail: applabs@charter.net

Client: Hillsboro Energy, LLC
P.O. Box 455
Hillsboro, Il 62049

Date Sampled: 2/1/2007
Date Received: 8/3/2007
Date Analyzed: 8/6/2007

Hole # 08-03-17-04
ACID BASE ACCOUNTABILITY
CAC03 Equiv. (Tons/1000 Tons of Material)

Lab No.	SAMPLE ID	Color	Fizz	% Sulfur	Max. From % Sulfur	Amount Present	Max. Needed pH 7	Excess	Paste pH
11282	Unit 3 Sample 1	5y/6/1	slight	0.0009	0.0281	23.5000	-0-	23.4719	8.71
11283	Unit 3 Sample 2	5y/6/1	none	0.0100	0.3125	4.5000	-0-	4.1875	8.80
11284	Unit 3 Sample 3	5y/6/1	none	0.0013	0.0406	3.7500	-0-	3.7095	8.59
11285	Unit 3 Sample 4	5y/6/1	slight	0.0130	0.4063	11.2500	-0-	10.8437	8.79
11286	Unit 4 Sample 1	5y/6/1	slight	0.0243	0.7594	7.2500	-0-	6.4906	8.79
11287	Unit 5 Sample 1	5y/5/2	moderate	0.0085	0.2656	15.0376	-0-	14.7720	8.36
11288	Unit 5 Sample 2	5y/5/2	moderate	0.0055	0.1719	17.5439	-0-	17.3720	8.74
11289	Unit 6 Sample 1	5y/5/2	moderate	0.0124	0.3875	22.5564	-0-	22.1689	8.40
11290	Unit 6 Sample 2	2.5y/5/1	moderate	0.0059	0.1844	18.7970	-0-	18.6126	8.77
11291	Unit 6 Sample 3	2.5y/5/1	slight	0.0033	0.1031	15.5000	-0-	15.3969	8.58
11292	Unit 7 Sample 1	5y/4/1	strong	0.1970	6.1563	140.7035	-0-	134.5472	8.04
11293	Unit 8 Sample 1	2.5y/2.5/1	slight	1.3090*	40.9063	21.2500	19.6563	-0-	7.08
11294	Unit 9 Sample 1	2.5y/2.5/1	slight	0.7300*	22.8125	18.2500	4.5625	-0-	6.21
11295	Unit 10 Sample 1	2.5y/7/1	strong	0.1090	3.4063	513.8191	-0-	510.4128	9.08
11296	Unit 11 Sample 1	5y/7/1	strong	0.0003	0.0094	65.3266	-0-	65.3172	9.37
11297	Unit 11 Sample 2	5y/7/1	none	0.0040	0.1250	10.2500	-0-	10.1250	9.02
11298	Unit 11 Sample 3	5y/6/1	none	0.0032	0.1000	6.7500	-0-	6.6500	9.19
11299	Unit 12 Sample 1	5y/6/1	none	0.0063	0.1969	6.7500	-0-	6.5531	9.09
11300	Unit 12 Sample 2	5y/5/2	moderate	0.0140	0.4375	28.8221	-0-	28.3846	8.12

*Calculated from the Pyritic Sulfur Content
See Attachment
hillsboro acid base,8-6-07.xls

Respectively Submitted: John A. Brumm

Appalachian Laboratories, Inc.

P.O. BOX 392
BECKLEY, WEST VIRGINIA 25802

PHONE 304-253-8677
FAX 304-253-4157
E-mail: applabs@charter.net

Client: Hillsboro Energy, LLC
P.O. Box 455
Hillsboro, Il 62049

Date Sampled: 2/1/2007
Date Received: 8/3/2007
Date Analyzed: 8/6/2007

Hole # 08-03-17-04
ACID BASE ACCOUNTABILITY
CAC03 Equiv. (Tons/1000 Tons of Material)

Lab No.	SAMPLE ID	Color	Fizz	% Sulfur	Max. From % Sulfur	Amount Present	Max. Needed pH 7	Excess	Paste pH
11301	Unit 12 Sample 3	5y/4/2	slight	0.0302	0.9438	14.0000	-0-	13.0562	8.03
11302	Unit 12 Sample 4	5y/4/2	moderate	0.0387	1.2094	18.7970	-0-	17.5876	8.02
11303	Unit 12 Sample 5	5y/5/2	slight	0.0655	2.0469	23.0000	-0-	20.9531	8.04
11304	Unit 12 Sample 6	5y/5/2	slight	0.0056	0.1750	14.2500	-0-	14.0750	8.60
11305	Unit 13 Sample 1	5y/5/2	slight	0.0027	0.0844	13.7500	-0-	13.6656	8.86
11306	Unit 14 Sample 1	5y/5/2	slight	0.0050	0.1563	16.5000	-0-	16.3437	9.17
11307	Unit 15 Sample 1	5y/5/2	slight	0.0006	0.0188	16.7500	-0-	16.7312	8.96
11308	Unit 16 Sample 1	2.5y/7/1	strong	0.0014	0.0438	683.4171	-0-	683.3733	8.89
11309	Unit 17 Sample 1	5y/5/1	slight	0.4670	14.5938	14.0000	0.5938	-0-	8.54
11310	Unit 18 Sample 1	5y/6/1	slight	0.1430	4.4688	16.7500	-0-	12.2812	8.48
11311	Unit 18 Sample 2	5y/6/1	slight	0.2180	6.8125	12.7500	-0-	5.9375	8.77
11312	Unit 18 Sample 3	2.5y/5/2	moderate	0.4240	13.2500	27.5689	-0-	14.3189	8.37
11313	Unit 18 Sample 4	2.5y/5/2	moderate	0.0959	2.9969	16.2907	-0-	13.2938	8.92
11314	Unit 19 Sample 1	2.5/	none	0.7320*	22.8700	12.7500	10.1250	-0-	5.79
11315	Unit 20 Sample 1	5y/6/1	none	0.1840	5.7500	2.2500	3.5000	-0-	6.92
11316	Unit 21 Sample 1	5y/7/1	none	0.0024	0.0750	8.2500	-0-	8.1750	8.64
11317	Unit 22 Sample1	5y/6/1	slight	0.0027	0.0844	16.5000	-0-	16.4156	9.02
11318	Unit 22 Sample 2	5y/6/1	slight	0.0019	0.0594	0.5000	-0-	0.4406	9.08
11319	Unit 23 Sample 1	5y/5/2	slight	0.4300	13.5313	14.0000	-0-	0.4687	8.11

*Calculated from the Pyritic Sulfur Content
See Attachment
hillsboro acid base,8-6-07.xls

Respectively Submitted: John A. Brumm

Appalachian Laboratories, Inc.

P.O. BOX 392
BECKLEY, WEST VIRGINIA 25802

PHONE 304-253-8677
FAX 304-253-4157
E-mail: applabs@charter.net

Client: Hillsboro Energy, LLC
P.O. Box 455
Hillsboro, Il 62049

Date Sampled: 2/1/2007
Date Received: 8/3/2007
Date Analyzed: 8/6/2007

Hole # 08-03-17-04
ACID BASE ACCOUNTABILITY
CAC03 Equiv. (Tons/1000 Tons of Material)

Lab No.	SAMPLE ID	Color	Fizz	% Sulfur	Max. From % Sulfur	Amount Present	Max. Needed pH 7	Excess	Paste pH
11320	Unit 23 Sample 2	5y/5/2	slight	0.0038	0.1188	15.0000	-0-	14.8812	8.90
11321	Unit 24 Sample 1	5y/5/2	slight	0.3910	12.2188	14.7500	-0-	2.5312	8.09
11322	Unit 24 Sample 2	5y/5/2	slight	0.2770	8.6563	13.7500	-0-	5.0937	8.64
11323	Unit 24 Sample 3	5y/5/2	moderate	0.0030	0.0938	21.3033	-0-	21.2095	8.99
11324	Unit 24 Sample 4	5y/5/2	moderate	0.0020	0.0625	27.5689	-0-	27.5064	9.03
11325	Unit 24 Sample 5	5y/5/2	moderate	0.0078	0.2438	35.0877	-0-	34.8439	9.08
11326	Unit 24 Sample 6	5y/5/2	slight	0.0014	0.0438	14.7500	-0-	14.7062	9.03
11327	Unit 24 Sample 7	5y/5/2	slight	0.0014	0.0438	17.0000	-0-	16.9562	8.97
11328	Unit 24 Sample 8	5y/5/2	slight	0.0071	0.2219	18.5000	-0-	18.2781	9.02
11329	Unit 24 Sample 9	5y/5/2	slight	0.0086	0.2688	16.0000	-0-	15.7312	9.05
11330	Unit 24 Sample 10	5y/5/2	slight	0.0006	0.0188	21.7500	-0-	21.7312	8.78
11331	Unit 24 Sample 11	5y/5/2	slight	0.0182	0.5688	17.0000	-0-	16.4312	9.03
11332	Unit 24 Sample 12	5y/5/2	moderate	0.0012	0.0375	28.8221	-0-	28.7846	9.02
11333	Unit 24 Sample 13	5y/5/2	slight	0.0027	0.0844	35.7500	-0-	35.6656	9.13
11334	Unit 25 Sample 1	5y/5/2	slight	0.0016	0.0500	18.5000	-0-	18.4500	9.10
11335	Unit 25 Sample 2	5y/5/2	slight	0.0029	0.0906	17.0000	-0-	16.9094	8.98
11336	Unit 25 Sample 3	5y/5/2	none	0.0067	0.2094	9.2500	-0-	9.0406	9.11
11337	Unit 26 Sample 1	5y/6/1	strong	0.0678	2.1188	149.4975	-0-	147.3787	8.94
11338	Unit 27 Sample 1	5y/7/1	slight	0.0268	0.8375	19.5000	-0-	18.6625	9.25

*Calculated from the Pyritic Sulfur Content
See Attachment
hillsboro acid base,8-6-07.xls

Respectively Submitted: John A. Brum

Appalachian Laboratories, Inc.

P.O. BOX 392
BECKLEY, WEST VIRGINIA 25802

PHONE 304-253-8677
FAX 304-253-4157
E-mail: applabs@charter.net

Client: Hillsboro Energy, LLC
P.O. Box 455
Hillsboro, Il 62049

Date Sampled: 2/1/2007
Date Received: 8/3/2007
Date Analyzed: 8/6/2007

Hole # 08-03-17-04
ACID BASE ACCOUNTABILITY
CAC03 Equiv. (Tons/1000 Tons of Material)

Lab No.	SAMPLE ID	Color	Fizz	% Sulfur	Max. From % Sulfur	Amount Present	Max. Needed pH 7	Excess	Paste pH
11339	Unit 28 Sample 1	5y/7/1	slight	0.0180	0.5625	25.7500	-0-	25.1875	9.41
11340	Unit 29 Sample 1	10yr/5/4	none	0.0012	0.0375	4.7500	-0-	4.7125	8.26
11341	Unit 29 Sample 2	2.5y/7/1	none	0.0023	0.0719	14.2500	-0-	14.1781	9.13
11342	Unit 30 Sample 1	2.5y/81	strong	0.0019	0.0594	866.8342	-0-	866.7748	9.28
11343	Unit 31 Sample 1	2.5y/5/4	none	0.0018	0.0563	11.2500	-0-	11.1937	9.30
11344	Unit 32 Sample 1	2.5y/3/1	none	0.2080	6.5000	1.7500	4.7500	-0-	7.43
11345	Unit 33 Sample 1	5y/6/1	strong	0.0410	1.2813	124.3719	-0-	123.0906	9.17
11346	Unit 34 Sample 1	2.5y/7/1	none	0.0012	0.0375	13.5000	-0-	13.4625	8.46
11347	Unit 35 Sample 1	10yr/2/1	moderate	2.2300*	69.6875	63.9098	5.7777	-0-	7.41
11348	Unit 36 Sample 1	2.5y/7/1	moderate	1.4750*	46.0938	22.5564	23.5374	-0-	8.85
11349	Unit 37 Sample 1	2.5y/8/1	strong	0.1340	4.1875	597.9899	-0-	593.8024	9.24
11350	Unit 38 Sample 1	5Gy7/1	slight	1.3500*	42.1875	58.0000	-0-	15.8125	9.06
11351	Unit 39 Sample 1	2.5y/8/1	strong	0.0086	0.2688	816.5829	-0-	816.3141	8.63
11352	Unit 40 Sample 1	2.5/5/1	strong	2.2670*	70.8438	236.1809	-0-	165.3371	7.81
11353	Unit 41 Sample 1	2.5y/7/1	strong	0.0114	0.3563	817.8392	-0-	817.4829	7.69
11354	Unit 42 Sample 1	2.5y/71	strong	0.0195	0.6094	741.2060	-0-	740.5966	7.97
11355	Unit 43 Sample 1	10yr/2/1	none	1.2720*	39.7500	10.0000	29.7500	-0-	6.47
11356	Unit 44 Sample 1	REMOVED							
11357	Unit 45 Sample 1	2.5/7/1	none	0.5343*	16.6969	-1.0000	17.6969	-0-	6.65

*Calculated from the Pyritic Sulfur Content
See Attachment
hillsboro acid base,8 6 07.xls

Respectively Submitted: John A. Brumm

-C-
"Sample for Chemical Analysis"

Sample for Chemical Analysis

Core Number: 08-03-17-04

Unit	Lithology	From	To	Thickness in Feet	Unit Sample Number and Depth Taken												
					1	2	3	4	5	6	7	8	9	10	11	12	13
1	Limestone	128.30	138.30	10.00	Drilled												
2	Claystone	138.30	139.50	1.20	Drilled												
3	Silty Shale	139.50	161.00	21.50	145.0	150.0	155.0	160.0									
4	Silty Shale	161.00	169.00	8.00	165.0												
5	Silty Shale and Sandstone Interbeds	169.00	179.00	10.00	170.0	175.0											
6	Silty Shale and Sandstone Interbeds	179.00	194.80	15.80	180.0	185.0	190.0										
7	Shale	194.80	198.40	3.60	196.5												
8	Carbonaceous Shale	198.40	201.95	3.55	200.0												
9	Coal	201.95	202.35	0.40	202.2												
10	Claystone	202.35	206.00	3.65	205.0												
11	Silty Shale	206.00	222.00	16.00	210.0	215.0	220.0										
12	Siltstone and Sandstone Interbeds	222.00	252.40	30.40	225.0	230.0	235.0	240.0	245.0	250.0							
13	Siltstone	252.40	256.70	4.30	255.0												
14	Silty Shale	256.70	260.30	3.60	258.5												
15	Shale	260.30	263.45	3.15	262.0												
16	Shale and Limestone Interbeds	263.45	265.50	2.05	265.0												
17	Silty Shale	265.50	273.00	7.50	270.0												
18	Shale	273.00	290.50	17.50	275.0	280.0	285.0	290.0									
19	Coal	290.50	291.60	1.10	291.0												
20	Claystone	291.60	293.60	2.00	292.5												
21	Siltstone and Sandstone Interbeds	293.60	299.00	5.40	297.0												
22	Sandstone	299.00	310.00	11.00	302.0	307.0											
23	Silty Shale	310.00	319.00	9.00	311.0	315.0											
24	Siltstone	319.00	380.00	61.00	320.0	325.0	330.0	335.0	340.0	345.0	350.0	355.0	360.0	365.0	370.0	375.0	379.0
25	Silty Shale	380.00	395.90	15.90	385.0	390.0	395.0										
26	Claystone	395.90	396.85	0.95	396.5												
27	Silty shale	396.85	401.10	4.25	399.0												
28	Shale and Siltstone Interbeds	401.10	403.05	1.95	402.0												
29	Claystone	403.05	413.05	10.00	405.0	410.0											
30	Limestone	413.05	418.50	5.45	415.0												
31	Claystone	418.50	420.75	2.25	420.0												
32	Carbonaceous Shale	420.75	423.05	2.30	422.0												
33	Claystone	423.05	425.70	2.65	424.5												
34	Silty Shale	425.70	428.80	3.10	427.5												
35	Carbonaceous Shale	428.80	430.00	1.20	429.5												
36	Claystone	430.00	431.80	1.80	431.0												
37	Limestone	431.80	434.50	2.70	433.0												
38	Shale	434.50	438.00	3.50	436.0												
39	Limestone	438.00	439.10	1.10	438.5												
40	Claystone	439.10	440.50	1.40	440.0												
41	Limestone	440.50	441.40	0.90	441.0												
42	Limestone	441.40	443.30	1.90	442.5												
43	Carbonaceous Shale	443.30	446.60	3.30	445.0												
44	Coal	446.60	454.10	7.50	Removed												
45	Siltstone	454.10	456.00	1.90	455.0												

-D-
"Acid Base Accountability Data"

Acid Base Accountability Data (Hole # 08-03-17-04)
Deer Run Mine
Montgomery County, IL

Unit	Sample	Feet	Weighted Feet (Feet / Total Feet)	$CACO_3$ Equivalent (T/1000 T CaCO3 Equiv)	Weighted $CACO_3$ Equivalent ($CACO_3$ Equiv * Wghtd Ft)
3	1	5.3750	0.0175	23.4719	0.4108
3	2	5.3750	0.0175	4.1875	0.0733
3	3	5.3750	0.0175	3.7095	0.0649
3	4	5.3750	0.0175	10.8437	0.1898
4	1	8.0000	0.0261	6.4906	0.1691
5	1	5.0000	0.0163	14.7720	0.2405
5	2	5.0000	0.0163	17.3720	0.2828
6	1	5.2700	0.0172	22.1689	0.3804
6	2	5.2700	0.0172	18.6126	0.3194
6	3	5.2700	0.0172	15.3969	0.2642
7	1	3.6000	0.0117	134.5472	1.5773
8	1	3.5500	0.0116	(19.6563)	(0.2272)
9	1	0.4000	0.0013	(4.5625)	(0.0059)
10	1	3.6500	0.0119	510.4128	6.0665
11	1	5.3300	0.0174	65.3172	1.1337
11	2	5.3300	0.0174	10.1250	0.1757
11	3	5.3300	0.0174	6.6500	0.1154
12	1	5.0667	0.0165	6.5531	0.1081
12	2	5.0667	0.0165	28.3846	0.4683
12	3	5.0667	0.0165	13.0562	0.2154
12	4	5.0667	0.0165	17.5876	0.2902
12	5	5.0667	0.0165	20.9531	0.3457
12	6	5.0667	0.0165	14.0750	0.2322
13	1	4.3000	0.0140	13.6656	0.1913
14	1	3.6000	0.0117	16.3437	0.1916
15	1	3.1500	0.0103	16.7312	0.1716
16	1	2.0500	0.0067	683.3733	4.5618
17	1	7.5000	0.0244	(0.5938)	(0.0145)
18	1	4.3750	0.0142	12.2812	0.1750
18	2	4.3750	0.0142	5.9375	0.0846
18	3	4.3750	0.0142	14.3189	0.2040
18	4	4.3750	0.0142	13.2938	0.1894
19	1	1.1000	0.0036	(10.1250)	(0.0363)
20	1	2.0000	0.0065	(3.5000)	(0.0228)
21	1	5.4000	0.0176	8.1750	0.1437
22	1	5.5000	0.0179	16.4156	0.2940

Unit	Sample	Feet	Weighted Feet (Feet / Total Feet)	$CACO_3$ Equivalent (T/1000 T CaCO3 Equiv)	Weighted $CACO_3$ Equivalent ($CACO_3$ Equiv * Wghtd Ft)
22	2	5.5000	0.0179	0.4406	0.0079
23	1	4.5000	0.0147	0.4687	0.0069
23	2	4.5000	0.0147	14.8812	0.2181
24	1	4.6920	0.0153	2.5312	0.0387
24	2	4.6920	0.0153	5.0937	0.0778
24	3	4.6920	0.0153	21.2095	0.3241
24	4	4.6920	0.0153	27.5064	0.4203
24	5	4.6920	0.0153	34.8439	0.5324
24	6	4.6920	0.0153	14.7062	0.2247
24	7	4.6920	0.0153	16.9562	0.2591
24	8	4.6920	0.0153	18.2781	0.2793
24	9	4.6920	0.0153	15.7312	0.2404
24	10	4.6920	0.0153	21.7312	0.3320
24	11	4.6920	0.0153	16.4312	0.2510
24	12	4.6920	0.0153	28.7846	0.4398
24	13	4.6920	0.0153	35.6656	0.5449
25	1	7.9500	0.0259	18.4500	0.4776
25	2	7.9500	0.0259	9.0406	0.2340
26	1	0.9500	0.0031	147.3787	0.4559
27	1	4.2500	0.0138	18.6625	0.2583
28	1	1.9500	0.0063	25.1875	0.1599
29	1	5.0000	0.0163	4.7125	0.0767
29	2	5.0000	0.0163	14.1781	0.2308
30	1	5.4500	0.0177	866.7748	15.3826
31	1	2.2500	0.0073	11.1937	0.0820
32	1	2.3000	0.0075	(4.7500)	(0.0356)
33	1	2.6500	0.0086	123.0906	1.0622
34	1	3.1000	0.0101	13.4625	0.1359
35	1	1.2000	0.0039	(5.7777)	(0.0226)
36	1	1.8000	0.0059	(23.5374)	(0.1380)
37	1	2.7000	0.0088	593.8024	5.2207
38	1	3.5000	0.0114	15.8125	0.1802
39	1	1.1000	0.0036	816.3141	2.9240
40	1	1.4000	0.0046	165.3371	0.7537
41	1	0.9000	0.0029	817.4829	2.3958
42	1	1.9000	0.0062	740.5966	4.5821
43	1	3.3000	0.0107	(29.7500)	(0.3197)
Total Feet =		**307.0962**		**Weighted Average =**	**57.3180**

ATTACHMENT III.2.A.3
SULFUR FORMS RESULT SHEET

ATTACHMENT III.2.B.1
SURFACE OWNERS WATER WELL SURVEYS

Parcel	Site Address	City	First Name	Last name	Mailing Address	Address 2	City	State	Zip Code	Inhabited Residence	Inhabited Mobile Home	Water Well Present	Primary Water Use	Well Dia (in)	Well Depth (ft)	Well Notes
16-25-100-005	7150 South Illinois Route 127	Hillsboro	Betty	McFarlin	7150 Illinois Route 127	P.O. Box 67	Hillsboro	Illinois	62049	X	X					
16-25-100-007	400 Rountree Street	Hillsboro	Roger	McFarlin	400 Rountree Street		Hillsboro	Illinois	62049							
16-25-200-001	7291 Buckeye Trail	Hillsboro	Joseph	Boas	11091 Brushy Trail		Irving	Illinois	62051							
16-25-300-005	7140 Illinois Route 127	Hillsboro	Bruce	Finley	7140 Illinois Route 127		Hillsboro	Illinois	62049	X	X					
16-25-300-009	11148 North 7th Avenue	Hillsboro	Edward & Susan	Boyd	422 West Fairground Avenue		Hillsboro	Illinois	62049							
16-25-300-010	7012 Illinois Route 127	Hillsboro	Arlen & Allen	Kasten	13314 Illinois Route 185		Hillsboro	Illinois	62049							
16-25-300-017	10110 Holloway Trail	Hillsboro	Scott	Strausgaugh	130 Randor Circle		Hillsboro	Illinois	62049							
16-25-400-001	123 North Broad	Hillsboro	New River Royalty, LLC	Wisdom Trust	208 Public Square	4th Floor	Benton	Illinois	62812			No				
16-25-400-004	7199 Buckeye Trail	Hillsboro	Larry	Schraut	7199 Buckeye Trail		Hillsboro	Illinois	62049	X		Well 203	-	36	34	
16-25-400-006	North 7th Avenue	Hillsboro	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019							
16-25-400-007	Coffeen Road	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812							
16-25-400-008	7th Avenue & Buckeye Trail	Hillsboro	Connie	Garrett	828 CR 3840		Bridgeport	Texas	76426							
16-36-100-002	11106 North 7th Avenue	Hillsboro	John & Patricia	Robinson	11106 North 7th Avenue		Hillsboro	Illinois	62049	X		Well VV	no	48	20	Used for garden
16-36-100-004	11148 North 7th Avenue	Hillsboro	Edward & Susan	Boyd	422 West Fairground Avenue		Hillsboro	Illinois	62049			Well 210	no	36	48	Well not used
16-36-100-008	6252 Illinois Route 127	Hillsboro	Mary	Rikli	6252 Illinois Route 127		Hillsboro	Illinois	62049	X		Well SS	no	8	-	Three wells present. Used for garden.
16-36-100-009	North 7th Avenue	Hillsboro	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019							
16-36-100-010	11180 North 7th Avenue	Hillsboro	Rhonda	Huber	11180 North 7th Avenue		Hillsboro	Illinois	62049	X						
16-36-200-001	11228 North 7th Avenue	Hillsboro	David & Carol	Schluckebier	11228 North 7th Avenue		Hillsboro	Illinois	62049	X						
16-36-200-002	Buckeye Trail	Hillsboro	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019							
16-36-200-003	Buckeye Trail	Hillsboro	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019							
16-36-200-004	Buckeye Trail	Hillsboro	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019							
16-36-300-002	6252 Illinois Route 127	Hillsboro	Daniel	Chappelear	5358 Waveland Road		Hillsboro	Illinois	62049							
16-36-300-006	11201 North 6th Avenue	Hillsboro	Kenneth & Betty	Weiss	312 West Third North Street		Mt. Olive	Illinois	62069							
16-36-400-001	6252 Illinois Route 127	Hillsboro	Daniel	Chappelear	5358 Waveland Road		Hillsboro	Illinois	62049							
16-36-400-002	Buckeye Trail	Hillsboro	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019							
16-36-400-005	North 6th Avenue	Hillsboro	Forrest	Delong	P.O. Box 334		Hillsboro	Illinois	62049	X						
16-36-400-006	North 6th Avenue	Hillsboro	Kenneth & Betty	Weiss	312 West Third North Street		Mt. Olive	Illinois	62069							
17-27-100-002	Coffeen Road	Hillsboro	Illinois Department of Natural Resources	c/o Raetta Realty	One Natural Resources Way		Springfield	Illinois	62702							
17-27-100-003	Illinois Route 185	Coffeen	Illinois Department of Natural Resources	c/o Raetta Realty	One Natural Resources Way		Springfield	Illinois	62702							
17-27-100-004	Illinois Route 185	Coffeen	Illinois Department of Natural Resources		One Natural Resources Way		Springfield	Illinois	62702							
17-27-100-502	Coffeen Road	Hillsboro	Illinois Department of Natural Resources	c/o Gary Laurent	822 Powder Avenue		Donnellson	Illinois	62019							
17-27-100-503	Illinois Route 185	Hillsboro	Illinois Department of Natural Resources	c/o Gary Laurent	822 Powder Avenue		Donnellson	Illinois	62019							
17-27-100-504	Illinois Route 185	Coffeen	Illinois Department of Natural Resources	c/o Gary Laurent	822 Powder Avenue		Donnellson	Illinois	62019							
17-27-200-005	Coffeen Road	Hillsboro	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017							
17-27-200-006	7225 Coffeen Road	Hillsboro	New River Royalty, LLC	F. Huber	208 Public Square	4th Floor	Benton	Illinois	62812	X		No				
17-27-200-007	Illinois Route 185	Coffeen	Illinois Department of Natural Resources	c/o Raetta Realty	One Natural Resources Way		Springfield	Illinois	62702							
17-27-200-008			Illinois Department of Natural Resources		One Natural Resources Way		Springfield	Illinois	62702							
17-27-200-009	Coffeen Road	Coffeen	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812							
17-27-200-010	Coffeen Road	Coffeen	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812							
17-27-200-507	Illinois Route 185	Coffeen	Illinois Department of Natural Resources	c/o Gary Laurent	822 Powder Avenue		Donnellson	Illinois	62019							
17-27-300-001	Illinois Route 185	Coffeen	Illinois Department of Natural Resources		One Natural Resources Way		Springfield	Illinois	62702							
17-27-300-005	15020 Illinois Route 185	Hillsboro	Elzie	Garrett	1715 Summit Street		Hillsboro	Illinois	62049	X						
17-27-300-006	Illinois Route 185	Hillsboro	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002							
17-27-300-011	15116 Illinois Route 185	Hillsboro	New River Royalty, LLC	C. Branch	208 Public Square	4th Floor	Benton	Illinois	62812	X		X	no	36	30	
17-27-300-012	15056 Illinois Route 185	Hillsboro	Celene	Harrelson	P.O. Box 293		Coffeen	Illinois	62017		X					
17-27-300-013	52 McDavid Cemetery Lane	Coffeen	Celene	Harrelson	P.O. Box 293		Coffeen	Illinois	62017							
17-27-300-014	15039 Illinois Route 185	Hillsboro	Kenneth & Karen	Blankenship	15039 Illinois Route 185		Hillsboro	Illinois	62049	X		Well MM	yes	-	20	Used for drinking & bathing
17-27-300-015	Illinois Route 185	Hillsboro	Randall & Rose	Huber	1201 University		Hillsboro	Illinois	62049							
17-27-300-016	Illinois Route 185	Hillsboro	Brian	Huber	6653 Majestic Way		Carpentersville	Illinois	60110							
17-27-300-501	Illinois Route 185	Coffeen	Illinois Department of Natural Resources	c/o Gary Laurent	822 Powder Avenue		Donnellson	Illinois	62019							
17-27-400-001	15039 Illinois Route 185	Hillsboro	Kenneth & Karen	Blankenship	15039 Illinois Route 185		Hillsboro	Illinois	62049							
17-27-400-003	Coffeen Road	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812							
17-27-400-005	Coffeen Road	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812							
17-27-400-006	Illinois Route 185	Hillsboro	Brian	Huber	6653 Majestic Way		Carpentersville	Illinois	60110	X						
17-27-400-007	Illinois Route 185	Hillsboro	Matthew	Elam	1465 Country Club Way		Smithboro	Illinois	62284							
17-28-100-004	East 14th Road	Hillsboro	Earl	Seltzer	904 Smith Lane	P.O. Box 502	Hillsboro	Illinois	62049							
17-28-100-005	14232 Illinois Route 185	Hillsboro	New River Royalty, LLC	J. Hamilton	208 Public Square	4th Floor	Benton	Illinois	62812	X		X	no	48	1.7	
17-28-100-006	14107 Illinois Route 185	Hillsboro	New River Royalty, LLC	George Elam	208 Public Square	4th Floor	Benton	Illinois	62812	X						
17-28-100-007	Illinois Route 185	Hillsboro	New River Royalty, LLC	H. Jurgena	208 Public Square	4th Floor	Benton	Illinois	62812			X	yes	6	30	6" (first 10') 36" (casing last 20')
17-28-200-001	East 14th Road	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812							

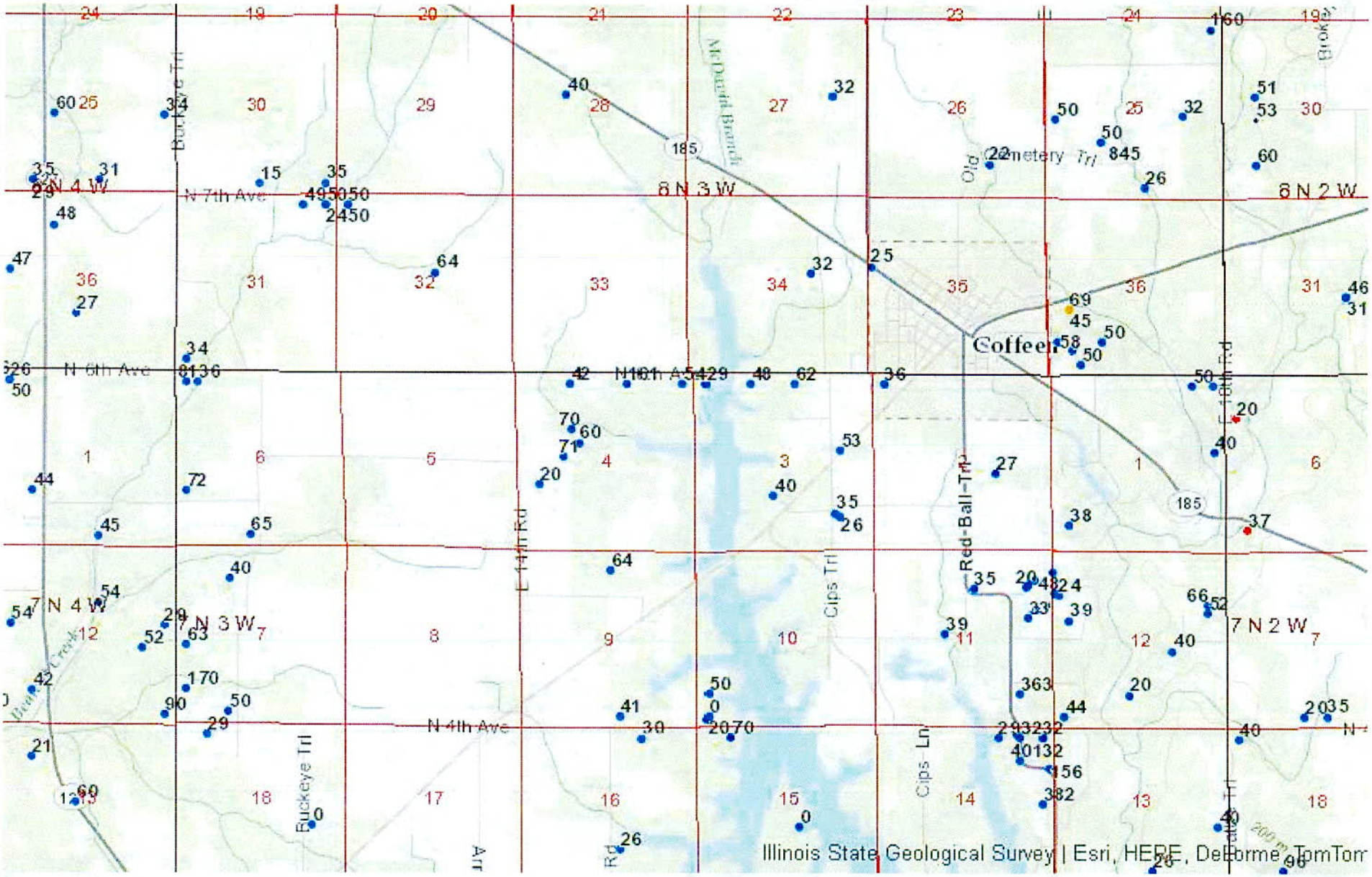
Parcel	Site Address	City	First Name	Last name	Mailing Address	Address 2	City	State	Zip Code	Inhabited Residence	Inhabited Mobile Home	Water Well Present	Primary Water Use	Well Dia (in)	Well Depth (ft)	Well Notes
17-28-200-002	East 14th Road	Hillsboro	David & Stephen	Spinner	715 East Union Avenue		Litchfield	Illinois	62056			Well NN	no	60	50	Used for garden
17-28-200-003	Illinois Route 185	Hillsboro	Earl	Seltzer	904 Smith Lane	P.O. Box 502	Hillsboro	Illinois	62049							
17-28-200-005	Illinois Route 185	Hillsboro	Earl	Seltzer	904 Smith Lane	P.O. Box 502	Hillsboro	Illinois	62049							
17-28-300-004	Illinois Route 185	Hillsboro	Earl	Seltzer	904 Smith Lane	P.O. Box 502	Hillsboro	Illinois	62049							
17-28-400-002	14401 Illinois Route 185	Hillsboro	New River Royalty, LLC	R. Hughes	208 Public Square	4th Floor	Benton	Illinois	62812	X		X	no	81	33.5	
17-28-400-003	14329 Illinois Route 185	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812	X						
17-29-100-001	North 7th Avenue	Hillsboro	Larry	Schraut	7199 Buckeye Trail		Hillsboro	Illinois	62049							
17-29-100-002	North 7th Avenue	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812							
17-29-200-001	13314 Illinois Route 185	Hillsboro	New River Royalty, LLC	L. Bowen	208 Public Square	4th Floor	Benton	Illinois	62812	X		X	yes	30	10	
17-29-200-003	Illinois Route 185	Hillsboro	Wright Trust	c/o First National Bank	P.O. Box 40		Vandalia	Illinois	62471							
17-29-200-004	Illinois Route 185	Hillsboro	Earl	Seltzer	904 Smith Lane	P.O. Box 502	Hillsboro	Illinois	62049							
17-29-300-001	13013 North 7th Avenue	Hillsboro	Larry	Schraut	7199 Buckeye Trail		Hillsboro	Illinois	62049							
17-29-300-002	13013 North 7th Avenue	Hillsboro	Larry	Schraut	7199 Buckeye Trail		Hillsboro	Illinois	62049	X		Well LL	yes	36	26	Three wells present. Used for drinking.
17-29-400-004	7170 East 14th Road	Hillsboro	Larry	Schraut	7199 Buckeye Trail		Hillsboro	Illinois	62049							
17-29-400-006	7179 East 14th Road	Hillsboro	Larry	Schraut	7199 Buckeye Trail		Hillsboro	Illinois	62049							
17-30-100-001	Buckeye Trail	Hillsboro	Joseph	Boas	11091 Brushy Trail		Irving	Illinois	62051							
17-30-200-001	North 7th Avenue	Hillsboro	Joseph	Boas	11091 Brushy Trail		Irving	Illinois	62051							
17-30-300-001	7108 Buckeye Trail	Hillsboro	Richard	Elam	7108 Buckeye Trail		Hillsboro	Illinois	62049	X		Well XX	yes	48	20	Used for drinking & bathing
17-30-400-001	Buckeye Trail	Hillsboro	Joseph	Boas	11091 Brushy Trail		Irving	Illinois	62051							
17-30-400-002	12188 North 7th Avenue	Hillsboro	Gerald	Young	12188 North 7th Avenue		Hillsboro	Illinois	62049							
17-30-400-003	12188 North 7th Avenue	Hillsboro	Gerald	Young	12188 North 7th Avenue		Hillsboro	Illinois	62049							
17-31-100-001	7199 Buckeye Trail	Hillsboro	Larry	Schraut	7199 Buckeye Trail		Hillsboro	Illinois	62049							
17-31-100-003	12188 North 7th Avenue	Hillsboro	Gerald	Young	12188 North 7th Avenue		Hillsboro	Illinois	62049	X						
17-31-100-004	12188 North 7th Avenue	Hillsboro	Gerald	Young	12188 North 7th Avenue		Hillsboro	Illinois	62049							
17-31-200-001	12248 North 7th Avenue	Hillsboro	Gerald	Young	12188 North 7th Avenue		Hillsboro	Illinois	62049							
17-31-200-002	12188 North 7th Avenue	Hillsboro	Gerald	Young	12188 North 7th Avenue		Hillsboro	Illinois	62049							
17-31-300-001	Buckeye Trail	Coffeen	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019							
17-31-300-002	Buckeye Trail	Coffeen	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019							
17-31-300-003	12057 North 6th Avenue	Hillsboro	Jerry & Wanda	Mercer	12057 North 6th Avenue		Hillsboro	Illinois	62049	X		Well 215	yes	36 & 30	34 & 60	Two wells present. Used for drinking.
17-31-300-004	6061 - 6063 Buckeye Trail	Hillsboro	Richard & Margaret	Harms	6063 Buckeye Trail		Hillsboro	Illinois	62049	X	X	Well OO	no	48	30	Used for garden
17-31-300-005	12179 North 6th Avenue	Hillsboro	Brian Weston	c/o Litchfield Community Savings	P.O. Box 445		Litchfield	Illinois	62056	X						
17-31-400-001	6063 Buckeye Trail	Coffeen	Richard & Margaret	Harms	6063 Buckeye Trail		Hillsboro	Illinois	62049							
17-31-400-007	6063 Buckeye Trail	Coffeen	Richard & Margaret	Harms	6063 Buckeye Trail		Hillsboro	Illinois	62049							
17-31-400-008	North 6th Avenue	Coffeen	Benjamin	Kenny	5250 East 18th Road		Coffeen	Illinois	62017							
17-31-400-010	North 6th Avenue	Coffeen	Nicholas	Kenny	1402 Kweit Lane		Greenville	Illinois	62246							
17-31-400-011	92 McQuern Lane	Hillsboro	Ben	Kenny	13001 North 6th Avenue		Hillsboro	Illinois	62049	X		Well JJ	yes	-	-	Used for drinking
17-32-100-002	6265 East 14th Road	Coffeen	Stella	Kasten	6265 East 14th Road		Hillsboro	Illinois	62049							
17-32-100-003	6265 East 14th Road	Coffeen	Stella	Kasten	6265 East 14th Road		Hillsboro	Illinois	62049							
17-32-100-004	13030 North 7th Avenue	Hillsboro	New River Royalty, LLC	John Clark	208 Public Square	4th Floor	Benton	Illinois	62812	X		X	yes	6	50	2 wells, both 6" diameter. 50' and 52' depth
17-32-100-006	13130 North 7th Avenue	Hillsboro	Brad & Dawn	Young	13130 North 7th Avenue		Hillsboro	Illinois	62049							
17-32-100-007	North 7th Avenue	Hillsboro	Brad & Dawn	Young	13130 North 7th Avenue		Hillsboro	Illinois	62049							
17-32-200-001	6265 East 14th Road	Coffeen	Stella	Kasten	6265 East 14th Road		Hillsboro	Illinois	62049							
17-32-200-002	6265 East 14th Road	Hillsboro	Stella	Kasten	6265 East 14th Road		Hillsboro	Illinois	62049	X						
17-32-300-004	13253 North 6th Avenue	Hillsboro	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049							
17-32-300-005	13253 North 6th Avenue	Hillsboro	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049							
17-32-400-001	13253 North 6th Avenue	Hillsboro	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049	X						
17-32-400-002	13253 North 6th Avenue	Hillsboro	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049							
17-32-400-003	13253 North 6th Avenue	Hillsboro	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049							
17-33-100-002	East 14th Road	Hillsboro	Earl Seltzer Enterprises		P.O. Box 502		Hillsboro	Illinois	62049							
17-33-200-001	Illinois Route 185	Hillsboro	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002							
17-33-300-001	North 6th Avenue	Coffeen	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049							
17-33-300-003	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017							
17-33-300-004	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017							
17-33-300-005	North 6th Avenue	Coffeen	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049							
17-33-300-006	14061 North 6th Avenue	Coffeen	Wade Edwards	c/o Corelogic	1 Corelogic Drive		Westlake	Texas	76262	X						
17-33-400-001	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017							
17-33-400-002	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017							
17-33-400-003	Rural Lake Area	Coffeen	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002							
17-33-400-004	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017							
17-33-400-005	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017							

Parcel	Site Address	City	First Name	Last name	Mailing Address	Address 2	City	State	Zip Code	Inhabited Residence	Inhabited Mobile Home	Water Well Present	Primary Water Use	Well Dia (in)	Well Depth (ft)	Well Notes
17-33-400-006	5263 East 14th Road	Coffeen	William, Cleola, & Cherlyn	Brackett	5204 East 14th Road		Coffeen	Illinois	62017							
17-34-100-004	72 McDavid Cemetery Lane	Coffeen	McDavid Point Cemetery		R.R. 1		Hillsboro	Illinois	62049							
17-34-100-005	95 McDavid Cemetery Lane	Coffeen	Kenneth & Linda	Null	95 McDavid Cemetery Lane		Hillsboro	Illinois	62049	X						
17-34-100-006	15212 Illinois Route 185	Hillsboro	Ralph	Ray	15212 Illinois Route 185		Hillsboro	Illinois	62049	X						
17-34-200-001	15172 Illinois Route 185	Hillsboro	Shawn & Hope	Titsworth	15172 Illinois Route 185		Hillsboro	Illinois	62049	X						
17-34-200-007	Coffeen Road	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812							
17-34-200-008	Coffeen Road	Hillsboro	New River Royalty, LLC	R. Huber	208 Public Square	4th Floor	Benton	Illinois	62812			No				
17-34-200-009	15448 Illinois Route 185	Hillsboro	Kenneth & Brenda	Timpe	15323 Irving Road		Irving	Illinois	62051			Well PP	no	-	-	Used for stock & garden
17-34-200-011	Illinois Route 185	Hillsboro	Arlen	Kasten	13314 Illinois Route 185		Hillsboro	Illinois	62049							
17-34-200-012	1322 CIPS Trail	Coffeen	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812							
17-34-200-015	1255 CIPS Trail	Coffeen	William	Kershaw	1255 CIPS Trail		Coffeen	Illinois	62017	X						
17-34-200-019	13314 Illinois Route 185	Hillsboro	Arlen	Kasten	13314 Illinois Route 185		Hillsboro	Illinois	62049							
17-34-200-020	1335 CIPS Trail	Coffeen	Danny	Lilley	1335 CIPS Trail		Coffeen	Illinois	62017	X		Well RR	no	80	35	Used for drinking, stock, & garden
17-34-200-021	Illinois Route 185	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812							
17-34-300-001	Border North Coffeen Lake	Coffeen	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002							
17-34-300-007	15112 North 6th Avenue	Coffeen	Brooks	Moreland	15112 North 6th Avenue		Coffeen	Illinois	62017							
17-34-300-008	15177 North 6th Avenue	Coffeen	Kathy	Turner	15177 North 6th Avenue		Coffeen	Illinois	62017	X		Well QQ	no	48	-	Well not used
17-34-300-009	CIPS Trail	Coffeen	Robert	Ray	6550 Oleatha		St. Louis	Missouri	63139			Well 212	no	-	-	
17-34-451-008	1057 CIPS Trail	Coffeen	Wade & Natalie	Fuller	1057 CIPS Trail		Coffeen	Illinois	62017							
17-34-451-009	15201 North 6th Avenue	Coffeen	Schylar & Amanda	Fuller	15201 North 6th Avenue		Coffeen	Illinois	62017	X						
20-01-100-008	5338 Illinois Route 127	Hillsboro	Gerald	Zumwalt	5338 Illinois Route 127		Hillsboro	Illinois	62049	X		Well C	yes	60	15	Used for drinking & bathing
20-01-100-009	13314 Illinois Route 185	Hillsboro	Arlen	Kasten	13314 Illinois Route 185		Hillsboro	Illinois	62049							
20-01-100-011	North 6th Avenue	Hillsboro	Karen Funk	c/o Farmers State Bank & Trust	200 West State		Jacksonville	Illinois	62650							
20-01-200-003	11202 North 6th Avenue	Hillsboro	Mary June	Koontz	11202 North 6th Avenue		Hillsboro	Illinois	62049	X						
20-01-200-005	11400 North 6th Avenue	Hillsboro	Douglas & Brenda	Johnson	11400 North 6th Avenue		Hillsboro	Illinois	62049	X						
20-01-200-006	12056 North 6th Avenue	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049							
20-01-200-008	North 6th Avenue	Hillsboro	Karen Funk	c/o Farmers State Bank & Trust	200 West State		Jacksonville	Illinois	62650							
20-01-200-009	11204 North 6th Avenue	Hillsboro	William & Ruth	Schroeder	11204 North 6th Avenue		Hillsboro	Illinois	62049	X		Well F	yes	36	42	Used for drinking & bathing
20-01-300-008	Illinois Route 127	Hillsboro	David & Luann	Chappelear	10110 Holloway Trail		Hillsboro	Illinois	62049							
20-01-300-009	Illinois Route 127	Hillsboro	Rodney	Bergmann	4 Deer Hollow		Litchfield	Illinois	62056			Well ZZ	yes	-	200	Used for drinking
20-01-300-011	169 Funk Lane	Hillsboro	Thomas & Mary	Murray	169 Funk Lane		Hillsboro	Illinois	62049	X		Well A	no	-	30	Used for garden
20-01-300-015	5126 Illinois Route 127	Hillsboro	Ronald	Hunshe	12610 Niggli Road		Highland	Illinois	62249			Well L	no	-	-	Well not used
20-01-400-010	253 Rock Lane	Hillsboro	Terri	Mackey	253 Rock Lane		Hillsboro	Illinois	62049							
20-01-400-012	Rock Lane	Hillsboro	Dolores	Yarbrough	1105 Devonshire Drive		Champaign	Illinois	61821							
20-01-400-013	Funk Lane	Hillsboro	Karen Funk	c/o Farmers State Bank & Trust	200 West State		Jacksonville	Illinois	62650							
20-01-400-014	12056 North 6th Avenue	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049							
20-01-400-015	Funk Lane	Hillsboro	Thomas	Boehler	379 South Starr Street		Waggoner	Illinois	62572			Well D	yes	8	65	235 ft deep well also present?
20-01-400-018	266 Rock Lane	Hillsboro	Jean	Snyder	266 Rock Lane		Hillsboro	Illinois	62049	X		Well B	yes	8	75	Used for drinking & bathing
20-01-400-019	259 Rock Lane	Hillsboro	Todd & Alicia	Kelly	8312 North State Route 159		Dorsey	Illinois	62021							
20-01-400-020	190 Page Lane	Hillsboro	Charles	Page	190 Page Lane		Hillsboro	Illinois	62049							
20-01-400-021	172 Page Lane	Hillsboro	Brian & Edina	Page	P.O. Box 341		Morrisonville	Illinois	62546							
20-01-400-022	204 Page Lane	Hillsboro	Charles & Daniel	Page	204 Page Lane		Hillsboro	Illinois	62049			Well 233	no	36	45	Used for garden
20-12-100-008	Illinois Route 127	Hillsboro	Dennie & Dee	Goedecke	338 Bens Drive		Chatham	Illinois	62629							
20-12-100-011	Illinois Route 127	Hillsboro	Roy & Cherlann	Rapien	4292 Illinois Route 127		Hillsboro	Illinois	62049							
20-12-100-013	4292 Illinois Route 127	Hillsboro	Roy & Cherlann	Rapien	4292 Illinois Route 127		Hillsboro	Illinois	62049	X						
20-12-200-002	181 Adams Lane	Hillsboro	Ronald	Cooper	181 Adams Lane		Hillsboro	Illinois	62049	X		Well 238	no	36	54	Used for garden
20-12-200-003	204 Funk Lane	Hillsboro	Charles & Daniel	Page	204 Funk Lane		Hillsboro	Illinois	62049							
20-12-200-006	253 Rock Lane	Hillsboro	Norman	Compton	253 Rock Lane		Hillsboro	Illinois	62049	X						
20-12-300-001	4121 Illinois Route 127	Hillsboro	P & B Trust		4121 Illinois Route 127		Hillsboro	Illinois	62049			Well EE	-	36	50	Used for drinking, stock, & garden
20-12-300-005	3538 Illinois Route 127	Hillsboro	Charles & Nancy	McDowell	3538 Illinois Route 127		Hillsboro	Illinois	62049							
20-12-300-011	3570 Illinois Route 127	Hillsboro	Corey	Beatty	502 Pine Street		Hillsboro	Illinois	62049							
20-12-300-012	Illinois Route 127	Hillsboro	Rande & Diane	Gibbs	10866 Lake Road		Highland	Illinois	62249							
20-12-300-013	4121 Illinois Route 127	Hillsboro	P & B Trust		4121 Illinois Route 127		Hillsboro	Illinois	62049							
20-12-400-001	181 Adams Lane	Hillsboro	Ronald	Cooper	181 Adams Lane		Hillsboro	Illinois	62049							
20-12-400-002	181 Adams Lane	Hillsboro	Ronald	Cooper	181 Adams Lane		Hillsboro	Illinois	62049							
20-12-400-003	3127 Illinois Route 127	Hillsboro	Wanda	Bee	3127 Illinois Route 127		Hillsboro	Illinois	62049							
20-12-400-005	4003 Buckeye Trail	Hillsboro	Earl	Law	4003 Buckeye Trail		Hillsboro	Illinois	62049			Well 244 & E	no	48	28	ISGS log (244) indicateds dry hole
20-12-400-006	140 Adams Lane	Hillsboro	Stacey Carroll	c/o Corelogic	1 Corelogic Drive		Westlake	Texas	76262	X						
20-12-400-007	142 Adams Lane	Hillsboro	Gary	Sneed	142 Adams Lane		Hillsboro	Illinois	62049	X		Well CC	yes	36	65	Used for drinking & bathing
20-13-100-007	3538 Illinois Route 127	Hillsboro	Charles & Nancy	McDowell	3538 Illinois Route 127		Hillsboro	Illinois	62049							

Parcel	Site Address	City	First Name	Last name	Mailing Address	Address 2	City	State	Zip Code	Inhabited Residence	Inhabited Mobile Home	Water Well Present	Primary Water Use	Well Dia (in)	Well Depth (ft)	Well Notes
20-13-100-009	3141 Illinois Route 127	Hillsboro	Samual Elizondo	c/o Corelogic	1 Corelogic Drive		Westlake	Texas	76262							
20-13-100-010	Illinois Route 127	Hillsboro	Barbara	Wright	P.O. Box 40		Vandalia	Illinois	62471							
20-13-200-002	Illinois Route 127	Hillsboro	Barbara	Wright	P.O. Box 40		Vandalia	Illinois	62471							
20-13-200-003	Bear Creek Lane	Hillsboro	Larry	Casarta	2618 Morganfair Lane		Katy	Texas	77450							
20-13-200-005	3127 Illinois Route 127	Hillsboro	Wanda	Bee	3127 Illinois Route 127		Hillsboro	Illinois	62049							
20-13-300-004	Bear Creek Lane	Donnellson	Barbara	Wright	P.O. Box 40		Vandalia	Illinois	62471							
20-13-400-001	Bear Creek Lane	Donnellson	Barbara	Wright	P.O. Box 40		Vandalia	Illinois	62471							
21-03-100-002	15034 North 6th Avenue	Coffeen	Robert & Clara	Dale	15034 Noth 6th Avenue		Coffeen	Illinois	62017			Well H	no	36	35	Not used
21-03-100-003	15034 North 6th Avenue	Coffeen	Robert & Clara	Dale	15034 Noth 6th Avenue		Coffeen	Illinois	62017							
21-03-100-004	15034 North 6th Avenue	Coffeen	Robert & Clara	Dale	15034 Noth 6th Avenue		Coffeen	Illinois	62017							
21-03-100-005	15010 North 6th Avenue	Coffeen	Mary	Shelbourne	15010 North 6th Avenue		Coffeen	Illinois	62017							
21-03-100-007	North 6th Avenue	Coffeen	Terry & Brenda	Young	73 Young Lane		Coffeen	Illinois	62017			Well I	yes	36	13	Used for drinking
21-03-100-008	15010 North 6th Avenue	Coffeen	Mary	Shelbourne	15010 North 6th Avenue		Coffeen	Illinois	62017	X						
21-03-100-009	15034 North 6th Avenue	Coffeen	Robert & Clara	Dale	15034 Noth 6th Avenue		Coffeen	Illinois	62017	X		Well G	no	36	35	Used for garden
21-03-100-012	15112 North 6th Avenue	Coffeen	Brooks	Moreland	15112 North 6th Avenue		Coffeen	Illinois	62017							
21-03-100-013	15112 North 6th Avenue	Coffeen	Brooks	Moreland	15112 North 6th Avenue		Coffeen	Illinois	62017	X						
21-03-100-014	15138 North 6th Avenue	Coffeen	Kevin & Gena	Lewey	15138 North 6th Avenue		Coffeen	Illinois	62017	X		Well YY	yes	36	70	Used for drinking & bathing
21-03-100-015	15152 North 6th Avenue	Coffeen	Doris	Graham	15152 North 6th Avenue		Coffeen	Illinois	62017							
21-03-100-016	15170 North 6th Avenue	Coffeen	Randy	White	3362 South Spring Street		Springfield	Illinois	62703	X		Well J	yes	-	-	May be same as Well K?
21-03-100-017	15194 North 6th Avenue	Coffeen	Randy	White	3362 South Spring Street		Springfield	Illinois	62703	X		Well K	yes	-	-	Used for drinking & bathing
21-03-300-001	CIPS Trail	Coffeen	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002							
21-03-300-002	151 Fox Lane	Coffeen	Drury	Emerson	151 Fox Lane		Coffeen	Illinois	62017	X						
21-04-100-001	North 6th Avenue	Coffeen	Illinois Power Company	c/o Ameren Services	P.O. Box 66149		St. Louis	Missouri	63166							
21-04-100-002	5264 East 14th Road	Coffeen	Dean	Huber	5264 East 14th Road		Coffeen	Illinois	62017							
21-04-100-007	14198 North 6th Avenue	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017							
21-04-100-008	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017			Wells M,N,O,P	yes	varies	20 ft to 174 ft	Used for drinking & bathing
21-04-100-009	14116 North 6th Avenye	Coffeen	Michael & Cheri	Huber	14116 North 6th Avenue		Coffeen	Illinois	62017	X		Well 218	no	36	42	Used for drinking & bathing
21-04-100-010	North 6th Avenue	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017							
21-04-200-001	13253 North 6th Avenue	Coffeen	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049							
21-04-200-004	Lake Boundary	Coffeen	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002							
21-04-200-005	14330 North 6th Avenue	Coffeen	New River Royalty, LLC	C. Mathenia	208 Public Square	4th Floor	Benton	Illinois	62812	X		X	yes	36	80	
21-04-200-007	14358 North 6th Avenue	Coffeen	Bob & Alice	Reynolds	14358 North 6th Avenue		Coffeen	Illinois	62017	X						
21-04-200-008	15010 North 6th Avenue	Coffeen	Mary	Shelbourne	15010 North 6th Avenue		Coffeen	Illinois	62017							
21-04-300-003	East 14th Road	Coffeen	Brian	Suhre	8233 Brickyard Hill Road		Worden	Illinois	62097							
21-04-300-004	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017							
21-04-300-005	6265 East 14th Road	Hillsboro	Stella	Kasten	6265 East 14th Road		Hillsboro	Illinois	62049							
21-04-300-006	East 14th Road	Coffeen	Brian	Suhre	8233 Brickyard Hill Road		Worden	Illinois	62097							
21-04-400-001	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017							
21-04-400-002	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017							
21-04-400-003	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017			Well Q	no	-	-	Well not used
21-04-400-004	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017							
21-05-100-003	13253 North 6th Avenue	Hillsboro	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049							
21-05-100-004	13253 North 6th Avenue	Hillsboro	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049							
21-05-100-005	13214 Flat Avenue	Hillsboro	Mark	Huber	9121 Briarfield Lane		Bunker Hill	Illinois	62014							
21-05-100-006	North 6th Avenue	Coffeen	Brian, Dacia, & Dean	Brown	12167 North Road		Hillsboro	Illinois	62049							
21-05-200-001	13253 North 6th Avenue	Hillsboro	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049							
21-05-200-002	East 14th Road	Coffeen	Dennis	Dressler	656 Lily Road		Lenzburg	Illinois	62255							
21-05-200-004	East 14th Road	Coffeen	Dennis	Dressler	656 Lily Road		Lenzburg	Illinois	62255							
21-05-200-005	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017	X		Well T	no	60	18	Two wells present. Used for garden
21-05-300-001	Flat Avenue	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049							
21-05-300-003	North 5th Lane	Hillsboro	Bank & Trust		P.O. Box 410		Litchfield	Illinois	62056							
21-05-300-007	Flat Avenue	Coffeen	Mark	Huber	9121 Briarfield Lane		Bunker Hill	Illinois	62014							
21-05-300-008	13214 Flat Avenue	Hillsboro	Phyllis	Simonton	13214 Flat Avenue		Coffeen	Illinois	62017	X		Well S	yes	-	-	Used for drinking & bathing
21-05-400-001	13214 Flat Avenue	Coffeen	Mark	Huber	9121 Briarfield Lane		Bunker Hill	Illinois	62014	X						
21-05-400-006	North 5th Lane	Hillsboro	Joyce Brothers	c/o Bank & Trust Company	401 North Madison	P.O. Box 410	Litchfield	Illinois	62056							
21-05-400-008	East 14th Road	Coffeen	Dean	Huber	5264 East 14th Road		Coffeen	Illinois	62017							
21-05-400-009	5073 East 14th Avenue	Coffeen	Bruce	Guckian	5073 East 14th Road		Coffeen	Illinois	62017	X						
21-05-400-011	North 5th Lane	Hillsboro	Jason Huston	c/o Countrywide Tax Service	P.O. Box 10211		Van Nuys	California	91410	X						
21-06-100-003	11400 North 6th Avenue	Hillsboro	Douglas & Brenda	Johnson	11400 North 6th Avenue		Hillsboro	Illinois	62049			Well V	no	36	20	Used for garden
21-06-100-004	12056 North 6th Avenue	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049	X		Well 216	yes	36	81	Used for drinking & bathing

Parcel	Site Address	City	First Name	Last name	Mailing Address	Address 2	City	State	Zip Code	Inhabited Residence	Inhabited Mobile Home	Water Well Present	Primary Water Use	Well Dia (in)	Well Depth (ft)	Well Notes
21-06-100-005	12198 North 6th Avenue	Hillsboro	Roberta	Meyer	12198 North 6th Avenue		Hillsboro	Illinois	62049	X		Well W	no	48	18	Two wells present. Used for garden
21-06-100-006	North 6th Avenue	Hillsboro	Roberta	Meyer	12198 North 6th Avenue		Hillsboro	Illinois	62049							
21-06-200-007	North 6th Avenue	Coffeen	New River Royalty, LLC	G. Edwards	208 Public Square	4th Floor	Benton	Illinois	62812			X	no	36	15	
21-06-200-008	North 6th Avenue	Hillsboro	Austin	Meyer	449 Bobwhite Road		Pocahontas	Illinois	62275							
21-06-200-009	North 6th Avenue	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049			Well DD	-	-	-	Presumed not used. Abandoned farmstead.
21-06-300-002	253 Rock Lane	Hillsboro	Norman	Compton	253 Rock Lane		Hillsboro	Illinois	62049							
21-06-300-007	Buckeye Trail	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049							
21-06-300-008	188 Rock Lane	Hillsboro	Patrick & Lora	Eck	188 Rock Lane		Hillsboro	Illinois	62049	X		Well 228	no	36	72	Used for stock & garden
21-06-300-009	Buckeye Trail	Hillsboro	Patrick	Jarnagin	4441 Buckeye Trail		Hillsboro	Illinois	62049							
21-06-300-010	4441 Buckeye Trail	Hillsboro	Carrie	Baron	4441 Buckeye Trail		Hillsboro	Illinois	62049	X		Well 234	yes	36	65	Two wells present. Used for drinking.
21-06-400-001	4441 Buckeye Trail	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049							
21-06-400-002	4441 Buckeye Trail	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049							
21-06-400-003	4441 Buckeye Trail	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049							
21-07-100-002	4255 Buckeye Trail	Hillsboro	Andrew Stritzel	c/o National Bank	P.O. Box 310		Hillsboro	Illinois	62049	X						
21-07-100-007	Buckeye Trail	Hillsboro	Travis & Aimee	Klump	17135 Illinois Route 185		Coffeen	Illinois	62017							
21-07-100-008	Buckeye Trail	Hillsboro	Justin & Brandi	Reynolds	1510 South Main Street		Hillsboro	Illinois	62049							
21-07-100-009	Buckeye Trail	Hillsboro	Tracy	Dressler	305 Washington Street		Donnellson	Illinois	62019							
21-07-100-010	Buckeye Trail	Hillsboro	Klump & Atterberry	c/o Phillip Klump	807 Keller Avenue		Hillsboro	Illinois	62049							
21-07-100-011	Buckeye Trail	Hillsboro	Terri	Mackey	253 Rock Lane		Hillsboro	Illinois	62049							
21-07-200-002	Buckeye Trail	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049							
21-07-300-003	4201 Buckeye Trail	Hillsboro	John & Edna	Balla	4201 Buckeye Trail		Hillsboro	Illinois	62049	X		Well Y	no	-	-	Used for stock & garden
21-07-300-007	4201 Buckeye Trail	Hillsboro	John & Edna	Balla	4201 Buckeye Trail		Hillsboro	Illinois	62049							
21-07-300-012	4121 Buckeye Trail	Hillsboro	Michelle Stritzel	c/o National Bank	P.O. Box 310		Hillsboro	Illinois	62049	X						
21-07-300-014	Buckeye Trail	Hillsboro	Larry	Casarta	2618 Morganfair Lane		Katy	Texas	77450							
21-07-300-015	Buckeye Trail	Hillsboro	Donna	Stritzel	13 Johnson Street		Hillsboro	Illinois	62049							
21-07-400-002	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017							
21-07-400-003	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017							
21-07-400-004	4441 Buckeye Trail	Hillsboro	David, Carol, & Nicholas	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019							
21-07-400-005	Buckeye Trail	Hillsboro	Kenneth & Lonna	Durbin	16130 East 7th Avenue		Butler	Illinois	62015							
21-08-100-001	4441 Buckeye Trail	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049							
21-08-100-002	North 5th Lane	Hillsboro	Joyce Brothers	c/o Bank & Trust Company	401 North Madison	P.O. Box 410	Litchfield	Illinois	62056							
21-08-100-003	North 5th Lane	Hillsboro	Eldon & Gerald Joyce	c/o Bank & Trust Company	401 North Madison	P.O. Box 410	Litchfield	Illinois	62056							
21-08-100-004	North 5th Lane	Hillsboro	Joyce Brothers	c/o Bank & Trust Company	401 North Madison	P.O. Box 410	Litchfield	Illinois	62056							
21-08-200-001	North 5th Lane	Hillsboro	Eldon & Gerald Joyce	c/o Bank & Trust Company	401 North Madison	P.O. Box 410	Litchfield	Illinois	62056							
21-08-200-002	East 14th Road	Coffeen	Nancy	Blackburn	899 County Road 800 East		Champaign	Illinois	61822							
21-08-200-003	East 14th Road	Coffeen	Nancy	Blackburn	899 County Road 800 East		Champaign	Illinois	61822							
21-08-200-004	East 14th Road	Coffeen	Nancy	Blackburn	899 County Road 800 East		Champaign	Illinois	61822							
21-08-300-001	North 4th Avenue	Donnellson	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017			Well U	no	60	18	Used for garden
21-08-300-002	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017							
21-08-300-003	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017							
21-08-300-004	North 4th Avenue	Donnellson	Robert	Elmore	10724 Burlington Lane		Marion	Illinois	62959							
21-08-400-001	13295 North 4th Avenue	Donnellson	Roger	Reeves	605 Hickory		Hillsboro	Illinois	62049			Well Z	no	48	50	Used for stock & garden
21-08-400-002	4177 East 14th Road	Hillsboro	Nancy	Blackburn	899 County Road 800 East		Champaign	Illinois	61822							
21-09-100-001	Mentors Lane	Coffeen	Brian	Suhre	8233 Brickyard Hill Road		Worden	Illinois	62097							
21-09-100-002	Mentors Lane	Coffeen	Nancy	Blackburn	899 County Road 800 East		Champaign	Illinois	61822							
21-09-100-003	14171 Mentors Lane	Coffeen	Stella	Kasten	6265 East 14th Road		Hillsboro	Illinois	62049							
21-09-200-005	14280 Mentors Lane	Coffeen	William & Cleola	Brackett	14280 Mentors Lane		Coffeen	Illinois	62017							
21-09-200-006	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017			Well R	no	-	-	Well not used
21-09-200-008	14243 Mentors Lane	Coffeen	Rose	Beard	14243 Mentors Lane		Coffeen	Illinois	62017	X						
21-09-200-010	Mentors Lane	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017							
21-09-200-011	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017							
21-09-200-012	Mentors Lane	Coffeen	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002							
21-09-300-001	4178 East 14th Road	Coffeen	Nancy	Blackburn	899 County Road 800 East		Champaign	Illinois	61822			Well AA	no	48	26	
21-09-300-003	North 4th Avenue	Coffeen	Michael & Paula	Shelton	14089 Ticky Point Trail		Donnellson	Illinois	62019							
21-09-300-004	14171 North 4th Avenue	Donnellson	Michael & Paula	Shelton	14089 Ticky Point Trail		Donnellson	Illinois	62019							
21-09-400-001	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017							
21-09-400-002	Border Coffeen Lake	Coffeen	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002							
21-09-400-004	14223 North 4th Avenue	Donnellson	Nathan & Christy	Hemken	14223 North 4th Avenue		Donnellson	Illinois	62019	X		Well 246	no	36	41	Used for stock & garden
21-09-400-005	14223 North 4th Avenue	Donnellson	Nathan & Christy	Hemken	14223 North 4th Avenue		Donnellson	Illinois	62019							
21-09-400-006	14261 North 4th Avenue	Coffeen	William Sarginson	c/o Jenni Parish	225A South Main Street		Hillsboro	Illinois	62049							

Parcel	Site Address	City	First Name	Last name	Mailing Address	Address 2	City	State	Zip Code	Inhabited Residence	Inhabited Mobile Home	Water Well Present	Primary Water Use	Well Dia (in)	Well Depth (ft)	Well Notes
21-09-400-009	14261 North 4th Avenue	Donnellson	Stephen	Castleman	P.O. Box 843		Belleville	Illinois	62220							
21-09-400-012	14305 North 4th Avenue	Coffeen	Joel	Thacker	14305 North 4th Avenue		Donnellson	Illinois	62019							
21-09-400-013	15001 North 4th Avenue	Coffeen	Michael & Candace	Ellington	15001 North 4th Avenue		Donnellson	Illinois	62019							
21-09-400-014	North 4th Avenue	Coffeen	Joel	Thacker	14305 North 4th Avenue		Donnellson	Illinois	62019	X		Well X	yes	48	35	Used for drinking & bathing
21-10-100-002	Border Coffeen Lake	Coffeen	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002							
21-10-300-003	North 4th Avenue	Coffeen	Traylor Cemetery	c/o Dorothy White	325 CIPS Trail		Coffeen	Illinois	62017							
21-10-300-004	15001 North 4th Avenue	Coffeen	Michael	Ellington	15001 North 4th Avenue		Donnellson	Illinois	62019	X		Well BB	yes	42	40	Used for drinking & bathing
21-10-300-005	15025 North 4th Avenue	Coffeen	William & Deborah	Withers	15025 North 4th Avenue		Coffeen	Illinois	62017	X		Wells 247 & 248	yes	-	-	Two wells present. Used for drinking
21-15-100-001	15020 North 4th Avenue	Coffeen	Joseph & Nancy	Blasko	14392 North 4th Avenue		Donnellson	Illinois	62019							
21-15-200-001	Border Coffeen Lake	Coffeen	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002							
21-16-100-001	14092 North 4th Avenue	Donnellson	Mary Beth Wolf	c/o Sue Lehr	P.O. Box 161		Ramsey	Illinois	62080							
21-16-200-003	Walnut Grove Road	Donnellson	Harriet	Gibson	3178 Buckeye Trail		Donnellson	Illinois	62019							
21-16-200-005	14392 North 4th Avenue	Coffeen	Joseph & Nancy	Blasko	14392 North 4th Avenue		Donnellson	Illinois	62019	X						
21-16-200-007	North 4th Avenue	Coffeen	Monroe	Reynolds	14304 North 4th Avenue		Donnellson	Illinois	62019	X						
21-16-200-008	North 4 Avenue	Coffeen	Robert	Coleman	1407 East Cloverviela		Greenville	Illinois	62246							
21-16-200-009	14300 North 4th Avenue	Coffeen	Linda	Mathena	14300 North 4th Avenue		Donnellson	Illinois	62019	X		Well 250	no	36	30	Used for garden
21-16-300-001	Arrow Trail	Donnellson	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019							
21-16-300-002	3095 Walnut Grove Road	Donnellson	Michael & Paula	Shelton	14089 Ticky Point Trail		Donnellson	Illinois	62019			Well HH	yes	-	60	Used for drinking
21-16-400-003	3176 Walnut Grove Road	Donnellson	Don & Alta	Betoche	3176 Walnut Grove Road		Donnellson	Illinois	62019							
21-16-400-005	Walnut Grove Road	Donnellson	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002							
21-16-400-007	Border Coffeen Lake	Donnellson	Dynegy, Inc.		601 Travis Street	Suite 1400	Houston	Texas	77002							
21-16-400-009	3176 Walnut Grove Road	Donnellson	Don & Alta	Betoche	3176 Walnut Grove Road		Donnellson	Illinois	62019	X		Well 256	no	30	26	Used for garden
21-17-100-001	North 4th Avenue	Donnellson	David, Carol, & Nicholas	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019							
21-17-100-003	3178 Buckeye Trail	Donnellson	Harriet	Gibson	3178 Buckeye Trail		Donnellson	Illinois	62019							
21-17-200-002	Arrow Trail	Donnellson	Mary Beth Wolf	c/o Sue Lehr	P.O. Box 161		Ramsey	Illinois	62080							
21-17-200-003	Arrow Trail	Donnellson	Michael & Paula	Shelton	14089 Ticky Point Trail		Donnellson	Illinois	62019							
21-17-200-004	3289 Arrow Trail	Donnellson	Micheal & Paula	Shelton	14089 Ticky Point Trail		Donnellson	Illinois	62019			Well GG	no	48	30	Used for stock
21-17-400-002	Arrow Trail	Donnellson	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019							
21-17-400-003	Arrow Trail	Donnellson	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019							
21-17-400-004	14383 East 14th Road	Irving	David	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019							
21-17-400-005	North 4th Avenue	Donnellson	Michael & Paula	Shelton	14089 Ticky Point Trail		Donnellson	Illinois	62019							
21-18-100-004			Tammy Huffman	c/o Corelogic	1 Corelogic Drive		Westlake	Texas	76262	X						
21-18-100-005	North 4th Avenue	Hillsboro	Larry	Casarta	2618 Morganfair Lane		Katy	Texas	77450							
21-18-200-006	3178 Buckeye Trail	Donnellson	Harriet	Gibson	3178 Buckeye Trail		Donnellson	Illinois	62019							
21-18-200-009	North 4th Avenue	Donnellson	David, Carol, & Nicholas	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019							
21-18-200-010	North 4th Avenue	Hillsboro	Ben	Kenny	13001 North 6th Avenue		Hillsboro	Illinois	62049							
21-18-200-011	Buckeye Trail	Donnellson	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019							
21-18-200-012	3358 Buckeye Trail	Donnellson	Craig	Foster	3358 Buckeye Trail		Donnellson	Illinois	62019	X		Well II	yes	36	18	Used for drinking & bathing
21-18-300-001	12316 North 3rd Avenue	Donnellson	Scott	Schluckebier	12316 North 3rd Avenue		Donnellson	Illinois	62019							
21-18-300-003	12227 North 3rd Avenue	Donnellson	Mildred	Balla	12227 North 3rd Avenue		Donnellson	Illinois	62019							
21-18-400-005	3177 Buckeye Trail	Donnellson	Harriet	Gibson	3178 Buckeye Trail		Donnellson	Illinois	62019	X		Well 254	no	10 & 30	30 & 25	Two wells present. Used for garden



ILLINOIS STATE GEOLOGICAL SURVEY
PRAIRIE RESEARCH INSTITUTE

Water Well Map

Printed:May 20, 2014

ILLINOIS STATE GEOLOGICAL SURVEY

201

Private Water Well	Top	Bottom
clay	0	15
gravel mixed clay	15	18
hardpan	18	40
Total Depth		40

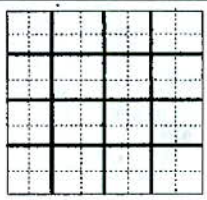
Casing: 6" PLASTIC from 0' to 10'
36" CONCRETE from 0' to 40'
Water from gravel at 15' to 18'.

Driller's Log filed

Owner Address: Coffeen, IL
Location source: Location from permit

Permit Date: April 5, 1977 **Permit #:** 58605

COMPANY Beasley, Eugene B.
FARM Young, Owen
DATE DRILLED April 11, 1977 **NO.**
ELEVATION 0 **COUNTY NO.** 22199
LOCATION SW SE NW
LATITUDE 39.10873 **LONGITUDE** -89.431654
COUNTY **Montgomery** **API** **121352219900** **28 - 8N - 3W**



ILLINOIS STATE GEOLOGICAL SURVEY

202

Private Water Well	Top	Bottom
clay	0	9
gravelly clay	9	13
sandy clay	13	16
gravelly clay	16	22
gray gravelly sand & layered gray gvl c	22	26
gray gravelly clay	26	32
Total Depth		**32**

Casing: 6" ASTM F480 SDR 21 from 0' to 10'
36" CONCRETE from 10' to 32'

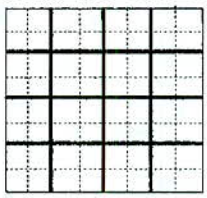
Grout: BENT HOLE PLUG from 9 to 10.

Water from gravelly clay at 10' to 13'.
Static level 12' below casing top which is 2' above GL

Owner Address: P.O. Box #218 Coffeen, IL
Address of well: 7225 Coffeen Rd.
Coffeen, IL
Location source: Location from permit

Permit Date: April 14, 1999 **Permit #:** 135-005

COMPANY Walters, Steven
FARM Hubert, Fred & Bernadine
DATE DRILLED April 20, 1999 **NO.** 3
ELEVATION 0 **COUNTY NO.** 23906
LOCATION SW SE NE
LATITUDE 39.108627 **LONGITUDE** -89.403662
COUNTY **Montgomery** **API** **121352390600** **27 - 8N - 3W**



ILLINOIS STATE GEOLOGICAL SURVEY

203

Private Water Well	Top	Bottom
clay	0	18
sand	18	20
gray hardpan	20	34
Total Depth		34

Casing: 6" PLASTIC from 0' to 10'
36" CONCRETE from 0' to 34'

Water from sand at 18' to 20'.

Driller's Log filed

Owner Address: Hillsboro, IL

Location source: Location from permit

Permit Date: November 4, 1975 **Permit #:** 42668

COMPANY Beasley, Eugene B.

FARM Schrant, Larry

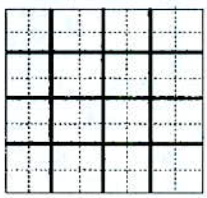
DATE DRILLED November 10, 1975 **NO.**

ELEVATION 0 **COUNTY NO.** 22017

LOCATION NE NE SE

LATITUDE 39.107064 **LONGITUDE** -89.474391

COUNTY Montgomery **API** 121352201700 **25 - 8N - 4W**



ILLINOIS STATE GEOLOGICAL SURVEY

204

Private Water Well	Top	Bottom
clay	0	12
gravely clay	12	15
clay	15	17
hardpan	17	31
Total Depth		**31**

Casing: 6" PLASTIC from 0' to 10'
36" CONCRETE from 0' to 31'

Water from gravely clay at 12' to 15'.

Driller's Log filed

Owner Address: Hillsboro, IL

Location source: Location from permit

Permit Date: April 29, 1975 **Permit #:** 37337

COMPANY Beasley, Eugene B.

FARM Lotham, H.C.

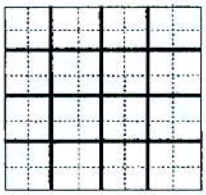
DATE DRILLED May 5, 1975 **NO.**

ELEVATION 0 **COUNTY NO.** 21927

LOCATION SW SW SE

LATITUDE 39.101641 **LONGITUDE** -89.48138

COUNTY **Montgomery** **API 121352192700** **25 - 8N - 4W**



ILLINOIS STATE GEOLOGICAL SURVEY

205

Private Water Well	Top	Bottom
gravel	0	15
Total Depth		**15**

Casing: 30" CONCRETE from 15' to 0'

Screen: 3' of 30" diameter slot

Grout: CLAY from 0 to 10.

Water from gravel at 10' to 20'.

Owner Address: R.R. #1 P.O. Box #178 Hillsboro, IL

Location source: Location from permit

Permit Date: July 14, 1994 **Permit #:**

COMPANY Noll, Gary E.

FARM Young, Gerald

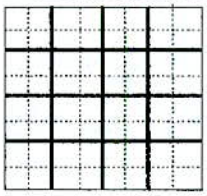
DATE DRILLED July 19, 1994 **NO.**

ELEVATION 0 **COUNTY NO.** 23603

LOCATION SW SW SE

LATITUDE 39.101413 **LONGITUDE** -89.464306

COUNTY **Montgomery** **API 121352360300** **30 - 8N - 3W**



ILLINOIS STATE GEOLOGICAL SURVEY

206

Private Water Well	Top	Bottom
clay	0	35
Total Depth		**35**

Casing: 30" CONCRETE from 0' to 36'

Screen: 3' of 30" diameter slot

Owner Address: R.R. #1 Hillsboro, IL

Location source: Location from permit

Permit Date: November 13, 1989 **Permit #:** 015851

COMPANY Noll, Gary E.

FARM Young, Brad

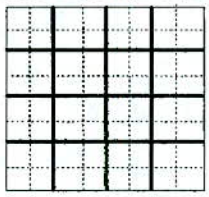
DATE DRILLED November 30, 1989 **NO.**

ELEVATION 0 **COUNTY NO.** 23258

LOCATION SE SE SE

LATITUDE 39.10149 **LONGITUDE** -89.457291

COUNTY **Montgomery** **API 121352325800** **30 - 8N - 3W**



ILLINOIS STATE GEOLOGICAL SURVEY

207

Private Water Well	Top	Bottom
clay	0	49
Total Depth		49

Casing: 30" CONCRETE from 0' to 50'

Size hole below casing: 0"

Water from clay at 0' to 0'.

Owner Address: Hillsboro, IL

Location source: Location from permit

Permit Date: October 9, 1979 **Permit #:** 90135

COMPANY Noll, Gary E.

FARM Young, Gerald

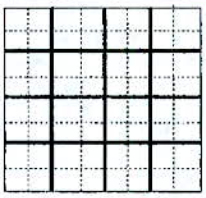
DATE DRILLED **NO.**

ELEVATION 0 **COUNTY NO.** 22887

LOCATION NW NE NE

LATITUDE 39.099639 **LONGITUDE** -89.459623

COUNTY **Montgomery** **API** **121352288700** **31 - 8N - 3W**



ILLINOIS STATE GEOLOGICAL SURVEY

208A

Private Water Well	Top	Bottom
clay	0	50
Total Depth		50

Casing: 30" CONCRETE from 0' to 51'

Size hole below casing: 0"

Water from clay at 0' to 0'.

Owner Address: Hillsboro, IL

Location source: Location from permit

Permit Date: December 27, 1979 **Permit #:** 92179

COMPANY Noll, Gary E.

FARM Young, Gerald

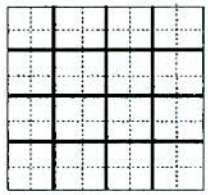
DATE DRILLED **NO.**

ELEVATION 0 **COUNTY NO.** 22889

LOCATION NE NE NE

LATITUDE 39.099663 **LONGITUDE** -89.457285

COUNTY **Montgomery** **API** **121352288900** **31 - 8N - 3W**



208 B

ILLINOIS STATE GEOLOGICAL SURVEY

Livestock Watering Well	Top	Bottom
clay	0	24
Total Depth		**24**

Casing: 30" CONCRETE from 0' to 25'

Size hole below casing: 0"

Water from clay at 0' to 0'.

Owner Address: Hillsboro, IL

Location source: Location from permit

Permit Date: December 27, 1979 **Permit #:** 92178

COMPANY Noll, Gary E.

FARM Young, Gerald

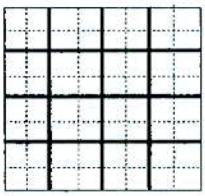
DATE DRILLED **NO.**

ELEVATION 0 **COUNTY NO.** 22888

LOCATION NE NE NE

LATITUDE 39.099663 **LONGITUDE** -89.457285

COUNTY **Montgomery** **API** **121352288800** **31 - 8N - 3W**



ILLINOIS STATE GEOLOGICAL SURVEY

209A

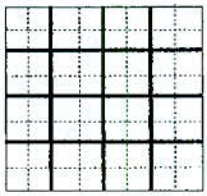
Private Water Well	Top	Bottom
clay	0	12
gravely clay	12	14
gray clay	14	37
gray gravel	37	39
gray clay	39	50
Total Depth		**50**

Casing: 6" PLASTIC from 0' to 1'
36" CONCRETE from 0' to 50'
Water from gravel at 12' to 39'.

Owner Address: R.R. #1 P.O. Box #180 Hillsboro, IL
Location source: Location from permit

Permit Date: March 18, 1988 **Permit #:** 000619

COMPANY Link, Harold F.
FARM Goottee, Tom
DATE DRILLED April 15, 1988 **NO.**
ELEVATION 0 **COUNTY NO.** 23147
LOCATION NW NW NW
LATITUDE 39.09967 **LONGITUDE** -89.454947
COUNTY **Montgomery** **API** **121352314700** **32 - 8N - 3W**



ILLINOIS STATE GEOLOGICAL SURVEY

209 B

Private Water Well	Top	Bottom
clay	0	9
gravely clay	9	11
hardpan yellow	11	21
gray hardpan	21	27
gray hardpan mixed w/ sand	27	36
gray hardpan	36	50
Total Depth		50

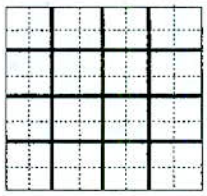
Casing: 6" PLASTIC from 0' to 10'
36" CONCRETE from 0' to 50'
Water from gravel at 27' to 36'.

Driller's Log filed

Owner Address: Hillsboro, IL
Location source: Location from permit

Permit Date: May 27, 1976 **Permit #:** 47817

COMPANY Beasley, Eugene B.
FARM Edwards, Robert
DATE DRILLED July 8, 1976 **NO.**
ELEVATION 0 **COUNTY NO.** 22075
LOCATION NW NW NW
LATITUDE 39.09967 **LONGITUDE** -89.454947
COUNTY Montgomery **API** 121352207500 32 - 8N - 3W



ILLINOIS STATE GEOLOGICAL SURVEY

210

Private Water Well	Top	Bottom
clay	0	4
mixed gravelly clay & gray sandy clay	4	9
gravelly clay	9	13
gray gravelly clay	13	19
layered gray gravel & gray gravelly clay	19	24
gray gravelly clay	24	41
gray gravel	41	43
gray gravelly clay	43	48
Total Depth		**48**

Casing: 6" PLASTIC from 0' to 10'
36" CONCRETE from 0' to 48'

Water from gravelly clay-gravel at 9' to 43'.

Owner Address: ,

Address of well: 11148 N. 7th Ave.
Hillsboro, IL

Location source: Location from the driller

Permit Date: June 10, 1997 **Permit #:**

COMPANY Walters, Steven

FARM Boyd, Edward

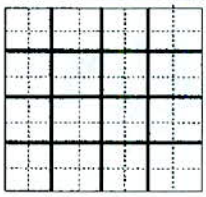
DATE DRILLED June 18, 1997 **NO.**

ELEVATION 0 **COUNTY NO.** 24013

LOCATION SW NE NW

LATITUDE 39.098016 **LONGITUDE** -89.486068

COUNTY **Montgomery** **API** **121352401300** **36 - 8N - 4W**



ILLINOIS STATE GEOLOGICAL SURVEY

21

Private Water Well	Top	Bottom
clay	0	24
sand & gravel	24	37
slate	37	46
blue clay	46	64
Total Depth		**64**

Casing: 6" PLASTIC from 0' to 10'
36" CONCRETE from 0' to 32'

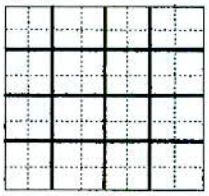
Size hole below casing: 0"

Water from gravel at 22' to 37'.

Owner Address: Coffeen, IL
Location source: Location from permit

Permit Date: June 6, 1977 **Permit #:** 61649

COMPANY Beasley, Eugene B.
FARM Kasten, Roy
DATE DRILLED June 26, 1977 **NO.**
ELEVATION 0 **COUNTY NO.** 22890
LOCATION SW SW NE
LATITUDE 39.094156 **LONGITUDE** -89.445555
COUNTY **Montgomery** **API** **121352289000** **32 - 8N - 3W**



ILLINOIS STATE GEOLOGICAL SURVEY

212

Private Water Well	Top	Bottom
clay	0	18
gravel	18	20
hardpan	20	32
Total Depth		32

Casing: 6" PLASTIC from 0' to 10'
36" CONCRETE from 0' to 32'

Size hole below casing: 0"

Water from gravel at 18' to 20'.

Owner Address: Coffeen, IL

Location source: Location from permit

Permit Date: October 7, 1980 **Permit #:** 96552

COMPANY Link, Harold F.

FARM Kershaw, William

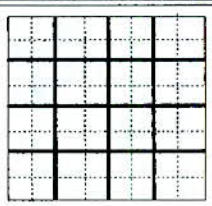
DATE DRILLED October 10, 1980 **NO.**

ELEVATION 0 **COUNTY NO.** 22891

LOCATION SE SW NE

LATITUDE 39.094089 **LONGITUDE** -89.405906

COUNTY Montgomery **API** 121352289100 **34 - 8N - 3W**



213

ILLINOIS STATE GEOLOGICAL SURVEY

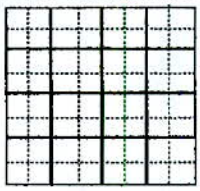
Private Water Well	Top	Bottom
topsoil	0	1
yellow clay	1	11
yellow sandy clay	11	18
gray sandy clay	18	25
Total Depth		**25**

Casing: 36" CONCRETE PIPE from -1' to 25'
Water from sandy clay at 15' to 16'.

Owner Address: Box 117 Coffeen, IL
Location source: Location from permit

Permit Date: September 1, 1978 **Permit #:** 78850

COMPANY Kohnen, Clarence
FARM Dowdy, John
DATE DRILLED October 4, 1978 **NO.**
ELEVATION 0 **COUNTY NO.** 22370
LOCATION 105'N line, 108'W line of SW SW NW
LATITUDE 39.094683 **LONGITUDE** -89.399649
COUNTY Montgomery **API** 121352237000 35 - 8N - 3W



ILLINOIS STATE GEOLOGICAL SURVEY

214

Private Water Well	Top	Bottom
clay	0	27
Total Depth		**27**

Casing: 48" CONCRETE from 0' to 28'

Water from clay at 0' to 0'.

Owner Address: Hillsboro, IL

Location source: Location from permit

Permit Date: **Permit #:**

COMPANY owner

FARM Rukle, Robert

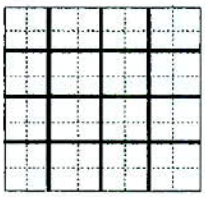
DATE DRILLED April 28, 1972 **NO.**

ELEVATION 0 **COUNTY NO.** 01772

LOCATION SE NE SW

LATITUDE 39.090742 **LONGITUDE** -89.48372

COUNTY **Montgomery** **API** **121350177200** **36 - 8N - 4W**



ILLINOIS STATE GEOLOGICAL SURVEY

215

Private Water Well	Top	Bottom
clay	0	34
Total Depth		**34**

Casing: 36" CONCRETE from 0' to 24'
6" PVC from 0' to 11'

Water from clay at 0' to 0'.

Owner Address: ,

Location source: Location from permit

Permit Date: **Permit #:** 47707

COMPANY Noll, Gary E.

FARM Merver, Jerry

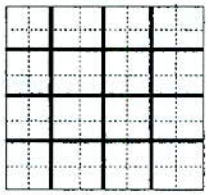
DATE DRILLED June 14, 1976 **NO.**

ELEVATION 0 **COUNTY NO.** 22061

LOCATION SW SW SW

LATITUDE 39.086999 **LONGITUDE** -89.472117

COUNTY **Montgomery** **API** **121352206100** **31 - 8N - 3W**



ILLINOIS STATE GEOLOGICAL SURVEY

216

Private Water Well	Top	Bottom
black top soil	0	1
yellow clay	1	8
brown clay-sand	8	23
gray clay-sand	23	72
brown clay-sand	72	78
gray clay-sand	78	81
Total Depth		**81**

Casing: 6" PVC SDR 21 from -1' to 10'
36" CONCRETE from 10' to 81'

Grout: NATURAL from 0 to 10.

Grout: GRAVEL from 10 to 81.

Water from clay-sand at 72' to 78'.

Owner Address: 134 N. Broad Hillsboro, IL

Address of well: Coffeen Rd.
Coffeen, IL

Location source: Location from permit

Permit Date: September 14, 1993 **Permit #:**

COMPANY Kohnen, Clarence

FARM Schneider, Randolph & Susan

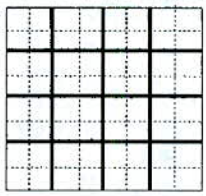
DATE DRILLED September 20, 1993 **NO.**

ELEVATION 0 **COUNTY NO.** 23347

LOCATION NW NW NW

LATITUDE 39.085204 **LONGITUDE** -89.472086

COUNTY **Montgomery** **API** **121352334700** **6 - 7N - 3W**



ILLINOIS STATE GEOLOGICAL SURVEY

217

Private Water Well	Top	Bottom
clay	0	36
Total Depth		36

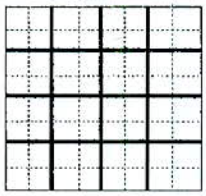
Casing: 30" CONCRETE from 1' to 36'
Water from clay at 0' to 0'.
Static level 10' below casing top which is 0' above GL

Driller's Log filed

Owner Address: Milleboro, IL
Location source: Location from permit

Permit Date: February 5, 1971 **Permit #:** 10119

COMPANY Bekemeyer, Gust
FARM Funk, Otto
DATE DRILLED November 4, 1971 **NO.**
ELEVATION 0 **COUNTY NO.** 01761
LOCATION NE NW NW
LATITUDE 39.085196 **LONGITUDE** -89.470786
COUNTY **Montgomery** **API** **121350176100** **6 - 7N - 3W**



ILLINOIS STATE GEOLOGICAL SURVEY

218

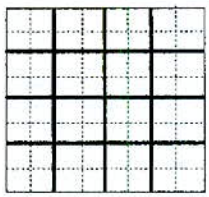
Private Water Well	Top	Bottom
clay	0	3
gravelly clay & gray clay mix	3	13
gravelly clay	13	17
sand	17	19
gray gravelly clay (hardpack)	19	42
Total Depth		**42**

Casing: 6" PLASTIC from 0' to 11'
36" CONCRETE from 0' to 42'
Water from gravelly clay at 13' to 17'.

Owner Address: R.R. #1 Box #101 Coffeen, IL
Location source: Location from permit

Permit Date: June 17, 1993 **Permit #:**

COMPANY Walters, Steven
FARM Huber, Michael
DATE DRILLED June 21, 1993 **NO.**
ELEVATION 0 **COUNTY NO.** 23346
LOCATION NW NE NW
LATITUDE 39.084991 **LONGITUDE** -89.431152
COUNTY **Montgomery** **API 121352334600** **4 - 7N - 3W**



ILLINOIS STATE GEOLOGICAL SURVEY

219

Private Water Well	Top	Bottom
s.s. #55572	0	0
yellow clay	0	14
yellow hardpan	14	22
blue clay	22	52
green sandy clay	52	66
brown sandy clay	66	74
blue sandy clay	74	93
green clay	93	107
blue clay	107	138
green shale	138	152
blue shale	152	161
Total Depth		**161**

Water from dry hole at 0' to 0'.

Driller's Log filed

Sample set # 55572 (0' - 155') Received: July 11, 1968

Owner Address: ,

Location source: Location from permit

Permit Date: June 10, 1968 **Permit #:** 5088

COMPANY owner

FARM Mathenia, Charles

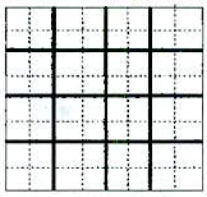
DATE DRILLED June 1, 1968 **NO.**

ELEVATION 0 **COUNTY NO.** 01611

LOCATION 300'N line, 2000'E line of NE

LATITUDE 39.085081 **LONGITUDE** -89.425194

COUNTY **Montgomery** **API 121350161100** **4 - 7N - 3W**



ILLINOIS STATE GEOLOGICAL SURVEY

320

Private Water Well	Top	Bottom
clay	0	5
gravelly clay	5	16
hardpack gravelly clay	16	22
gray gravelly clay	22	40
gray sandy gravel	40	51
gray gravelly clay	51	54
Total Depth		**54**

Casing: 6" PLASTIC from 0' to 10'
36" CONCRETE from 0' to 54'

Water from gravelly-sandy clay at 9' to 51'.

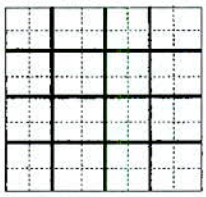
Owner Address: 7463 Greenhedge Rd. Edwardsville, IL

Address of well: Co. Rd. #600N
Coffeen, IL

Location source: Location from permit

Permit Date: January 29, 1996 **Permit #:**

COMPANY Walters, Steven
FARM Reynolds, Dairl
DATE DRILLED March 22, 1996 **NO.**
ELEVATION 0 **COUNTY NO.** 23761
LOCATION NE NE NE
LATITUDE 39.084997 **LONGITUDE** -89.419293
COUNTY **Montgomery** **API** **121352376100** **4 - 7N - 3W**



ILLINOIS STATE GEOLOGICAL SURVEY

321

Private Water Well	Top	Bottom
clay	0	29
Total Depth		29

Casing: 30" CONCRETE from 0' to 30'

Size hole below casing: 0"

Water from clay at 0' to 0'.

Owner Address: Coffeen, IL

Location source: Location from permit

Permit Date: June 3, 1980 **Permit #:** 94117

COMPANY Noll, Gary E.

FARM Hammer, Bernard

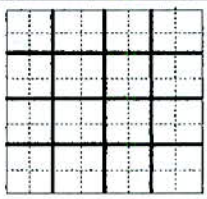
DATE DRILLED **NO.**

ELEVATION 0 **COUNTY NO.** 22827

LOCATION NW NW NW

LATITUDE 39.084998 **LONGITUDE** -89.416941

COUNTY **Montgomery** **API** **121352282700** **3 - 7N - 3W**



ILLINOIS STATE GEOLOGICAL SURVEY

222

Private Water Well	Top	Bottom
brown top soil	0	1
yellow clay	1	8
yellow clay sand	8	23
gray clay sand	23	48
Total Depth		**48**

Casing: 6" PLASTIC from 1' to 10'
36" CONCRETE from 10' to 47'

Grout: NATURAL from 0 to 10.

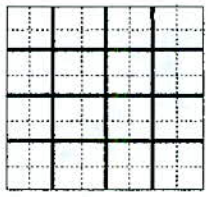
Grout: GRAVEL from 10 to 48.

Water from clay-sand at 11' to 28'.

Owner Address: R.R. #1 Box #116 Coffeen, IL
Location source: Location from permit

Permit Date: August 18, 1992 **Permit #:**

COMPANY Kohnen, Clarence
FARM Moreland, Brooks
DATE DRILLED August 31, 1992 **NO.**
ELEVATION 0 **COUNTY NO.** 23345
LOCATION NW NE NW
LATITUDE 39.085 **LONGITUDE** -89.412273
COUNTY **Montgomery** **API** **121352334500** **3 - 7N - 3W**



ILLINOIS STATE GEOLOGICAL SURVEY

223

Private Water Well	Top	Bottom
clay	0	18
gravel	18	19
gray clay	19	47
gray sand & gravel	47	53
gray clay	53	62
Total Depth		62

Casing: 6" PLASTIC from 0' to 10'
36" CONCRETE from 0' to 62'

Size hole below casing: 0"

Water from gravel at 18' to 53'.

Owner Address: 206 South Central Coffeen, IL
Location source: Location from permit

Permit Date: June 1, 1987 **Permit #:** 132259

COMPANY Link, Harold F.
FARM Young, Terri
DATE DRILLED June 2, 1987 **NO.**
ELEVATION 0 **COUNTY NO.** 23106
LOCATION NW NW NE
LATITUDE 39.084999 **LONGITUDE** -89.407608
COUNTY Montgomery **API** 121352310600 **3 - 7N - 3W**

224

ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
clay	0	70
Total Depth		70

Casing: 30" CONCRETE from 0' to 60'
6" PVC from 0' to 11'

Water from clay at 0' to 0'.

Owner Address: Hillboro, IL

Location source: Location from permit

Permit Date: **Permit #:** 51722

COMPANY Noll, Gary E.

FARM Brackett, William

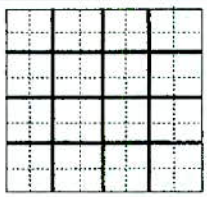
DATE DRILLED October 9, 1976 **NO.**

ELEVATION 0 **COUNTY NO.** 22104

LOCATION NW SE NW

LATITUDE 39.081344 **LONGITUDE** -89.431053

COUNTY **Montgomery** **API** **121352210400** **4 - 7N - 3W**



ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
top soil	0	1
yellow clay	1	10
yellow sandy clay	10	18
gray sandy clay	18	28
gray sand & gravel	28	30
gray sandy clay	30	60
Total Depth		**60**

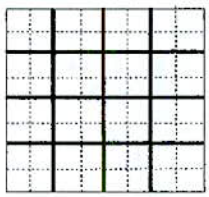
Casing: 36" CONCRETE PIPE from -1' to 60'
Water from sand & gravel at 29' to 30'.

Driller's Log filed

Owner Address: R.R. #1 Coffeen, IL
Location source: Location from permit

Permit Date: February 8, 1977 **Permit #:** 56703

COMPANY Kohnen, Clarence
FARM Brackett, Bill
DATE DRILLED May 23, 1977 **NO.**
ELEVATION 0 **COUNTY NO.** 22216
LOCATION 99'N line, 107'E line of SW SE NW
LATITUDE 39.080156 **LONGITUDE** -89.430218
COUNTY **Montgomery** **API** **121352221600** **4 - 7N - 3W**



ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		71

Remarks: See logbook for gas flow measurement.

Gas Flow Measurement filed

Owner Address: ,

Location source: Location from permit

Permit Date: **Permit #:**

COMPANY owner

FARM Brackett, Bill

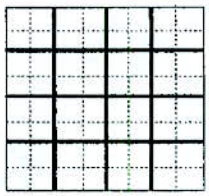
DATE DRILLED January 1, 1963 **NO.**

ELEVATION 630GL **COUNTY NO.** 01548

LOCATION 2500'N line, 1400'W line of NW

LATITUDE 39.079001 **LONGITUDE** -89.43192

COUNTY **Montgomery** **API** **121350154800** **4 - 7N - 3W**



227

ILLINOIS STATE GEOLOGICAL SURVEY

Semi-Private Water Well	Top	Bottom
coal mine mat coal, concrete, wood, slag	0	5
yellow & gray clay mix	5	7
yellow & gray sandy clay	7	10
gravelly clay	10	17
hardpacked gravelly clay	17	21
gray gravelly clay	21	30
layered gray sand & gray gravelly clay	30	38
gray gravelly clay	38	53
Total Depth		**53**

Casing: 6" ASTM F480 SDR 21 from 0' to 12'
36" CONCRETE from 0' to 53'

Grout: CONCRETE from 9 to 12.

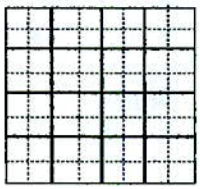
Grout: BENT HOLE PLUG from 11 to 12.

Water from gravelly clay at 13' to 17'.
Static level 16' below casing top which is 3' above GL

Owner Address: % Fairmont Minerals 796 CIPS Trail Coffeen, IL
Address of well: same as above
Location source: Location from permit

Permit Date: June 9, 1999 **Permit #:** 135-001

COMPANY Walters, Steven
FARM Stan Blast Abrasives
DATE DRILLED June 14, 1999 **NO.** 1
ELEVATION 0 **COUNTY NO.** 23908
LOCATION SW SE NE
LATITUDE 39.079557 **LONGITUDE** -89.402861
COUNTY Montgomery **API** 121352390800 3 - 7N - 3W



ILLINOIS STATE GEOLOGICAL SURVEY

228

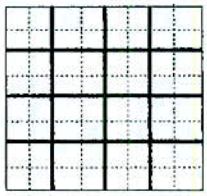
Private Water Well	Top	Bottom
clay	0	14
gravely clay mix	14	34
gray clay	34	58
gray sand	58	61
gray clay	61	72
Total Depth		**72**

Casing: 6" PLASTIC from 0' to 10'
36" CONCRETE from 0' to 72'

Owner Address: 901 Barry P.O. Box #55 Coffeen, IL
Location source: Location from permit

Permit Date: March 17, 1989 **Permit #:** 009917

COMPANY Link, Harold F.
FARM Eck, Joe
DATE DRILLED May 8, 1989 **NO.**
ELEVATION 0 **COUNTY NO.** 23240
LOCATION SW NW SW
LATITUDE 39.076221 **LONGITUDE** -89.472029
COUNTY **Montgomery** **API 121352324000** **6 - 7N - 3W**



ILLINOIS STATE GEOLOGICAL SURVEY

229

Water Well	Top	Bottom
top soil	0	1
brown silty clay some sand	1	10
brown silty clay some small gravel	10	14
very fine gry sand some silt & small gvl	14	20
Total Depth		**20**

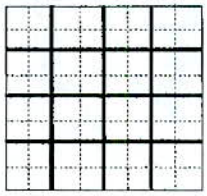
Static level 8' below casing top which is 0' above GL

Driller's Log filed

Owner Address: ,
Location source: Location from the driller

Permit Date: **Permit #:**

COMPANY owner
FARM Test Boring
DATE DRILLED December 1, 1961 **NO.** L-13-E
ELEVATION 0 **COUNTY NO.** 01607
LOCATION NW SW
LATITUDE 39.076805 **LONGITUDE** -89.434454
COUNTY **Montgomery** **API** **121350160700** **4 - 7N - 3W**



ILLINOIS STATE GEOLOGICAL SURVEY

230

Private Water Well	Top	Bottom
clay	0	15
gravely clay & hrdpan	15	25
gray hardpan	25	40
Total Depth		**40**

Casing: 6" PLASTIC from 0' to 10'
36" CONCRETE from 0' to 40'

Water from sand at 15' to 25'.

Driller's Log filed

Owner Address: Coffeen, IL

Location source: Location from permit

Permit Date: July 1, 1976 **Permit #:** 49211

COMPANY Beasley, Eugene B.

FARM Emerson, Danny

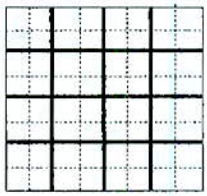
DATE DRILLED July 17, 1976 **NO.**

ELEVATION 0 **COUNTY NO.** 22092

LOCATION SE NE SW

LATITUDE 39.075863 **LONGITUDE** -89.409815

COUNTY **Montgomery** **API 121352209200** **3 - 7N - 3W**



ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
brown top soil	0	1
yellow clay	1	7
yellow clay & sand	7	12
yellow gravel & sand	12	14
gray clay & sand	14	35
Total Depth		**35**

Casing: 36" CONCRETE from -1' to 35'

Grout: CONCRETE from 0 to 10.

Grout: GRAVEL from 10 to 35.

Size hole below casing: 0"

Water from gravel & sand at 13' to 14'.

Owner Address: R.R. #1 Box #121 Coffeen, IL

Location source: Location from permit

Permit Date: September 22, 1983 **Permit #:** 109475

COMPANY Kohnen, Clarence

FARM Hull, Steve

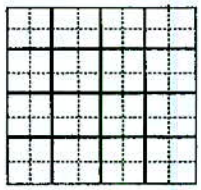
DATE DRILLED October 17, 1983 **NO.**

ELEVATION 0 **COUNTY NO.** 22828

LOCATION 210'N line, 190'W line of SE SE

LATITUDE 39.074433 **LONGITUDE** -89.403283

COUNTY Montgomery **API** 121352282800 3 - 7N - 3W



232 A

ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
clay	0	26
Total Depth		**26**

Casing: 30" CONCRETE from 1' to 26'

Water from clay at 0' to 0'.

Driller's Log filed

Owner Address: ,

Location source: Location from permit

Permit Date: **Permit #:**

COMPANY Bekemeyer, Gust

FARM Lafuria, Mick

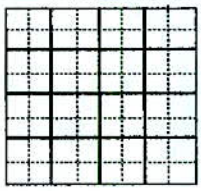
DATE DRILLED February 4, 1971 **NO.**

ELEVATION 0 **COUNTY NO.** 01725

LOCATION NW SE SE

LATITUDE 39.07411 **LONGITUDE** -89.402784

COUNTY Montgomery **API** 121350172500 3 - 7N - 3W



232 B

ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
brown top soil	0	1
yellow clay	1	7
yellow clay & sand	7	12
yellow gravel & sand	12	14
gray clay & sand	14	35
Total Depth		**35**

Casing: 36" CONCRETE from -1' to 35'

Grout: CONCRETE from 0 to 10.

Grout: GRAVEL from 10 to 35.

Size hole below casing: 0"

Water from gravel & sand at 13' to 14'.

Owner Address: R.R. #1 Box #121 Coffeen, IL

Location source: Location from permit

Permit Date: September 22, 1983 **Permit #:** 109475

COMPANY Kohnen, Clarence

FARM Hull, Steve

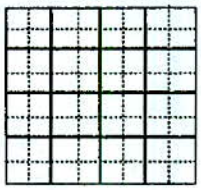
DATE DRILLED October 17, 1983 **NO.**

ELEVATION 0 **COUNTY NO.** 22828

LOCATION 210'N line, 190'W line of SE SE

LATITUDE 39.074433 **LONGITUDE** -89.403283

COUNTY Montgomery **API** 121352282800 3 - 7N - 3W



ILLINOIS STATE GEOLOGICAL SURVEY

233

Private Water Well	Top	Bottom
topsoil	0	6
dark brown clay	6	10
yellow clay	10	15
gray clay	15	31
gray sand	31	33
gray clay	33	45
Total Depth		**45**

Casing: 6" PVC SDR 21 from -4' to 11'
36" CONCRETE from 11' to 45'

Grout: NATURAL from 0 to 11.

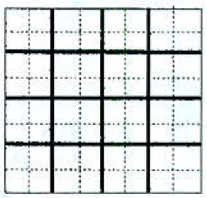
Grout: PEA GRAVEL from 11 to 45.

Water from gray sand at 31' to 33'.

Owner Address: 131 South East St. Hillsboro, IL
Location source: Location from permit

Permit Date: July 11, 1996 **Permit #:**

COMPANY Kohnen, Clarence
FARM Page, Charles
DATE DRILLED July 30, 1996 **NO.**
ELEVATION 0 **COUNTY NO.** 23804
LOCATION SW SW SE
LATITUDE 39.072502 **LONGITUDE** -89.481291
COUNTY **Montgomery** **API** **121352380400** **1 - 7N - 4W**



ILLINOIS STATE GEOLOGICAL SURVEY

234

Private Water Well	Top	Bottom
top soil	0	1
brown clay	1	19
brown & gray clay	19	27
gray clay	27	35
gravel, sand & gray clay	35	41
gray clay	41	65
Total Depth		65

Casing: 36" CONCRETE PIPE from -1' to 65'

Grout: CONCRETE from 0 to 10.

Grout: PEA GRAVEL from 10 to 65.

Water from gravel, sand, clay at 35' to 41'.

Owner Address: R.R. #1, Box #79 Hillsboro, IL

Location source: Location from permit

Permit Date: August 23, 1994 **Permit #:** 1350943

COMPANY Kohnen, Clarence

FARM Bonetto, James & Deanne

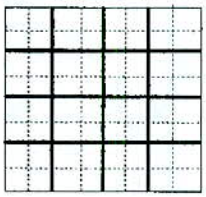
DATE DRILLED September 1, 1994 **NO.**

ELEVATION 0 **COUNTY NO.** 23659

LOCATION SE SE SW

LATITUDE 39.072628 **LONGITUDE** -89.465248

COUNTY **Montgomery** **API 121352365900** **6 - 7N - 3W**



ILLINOIS STATE GEOLOGICAL SURVEY

235

Private Water Well	Top	Bottom
black top soil	0	1
yellow clay	1	6
yellow clay & sand	6	18
gray clay & sand	18	64
Total Depth		**64**

Casing: 36" CONCRETE from -1' to 64'

Grout: CONCRETE from 0 to 10.

Grout: GRAVEL from 10 to 64.

Size hole below casing: 0"

Water from clay & sand at 58' to 59'.

Owner Address: R.R. #1 Box #104 Coffeen, IL

Location source: Location from permit

Permit Date: January 19, 1984 **Permit #:** 111034

COMPANY Kohnen, Clarence

FARM Brackett, William

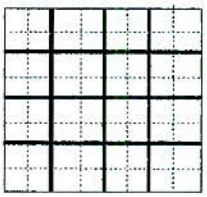
DATE DRILLED January 31, 1984 **NO.**

ELEVATION 0 **COUNTY NO.** 22830

LOCATION 100'S line, 100'W line of NW NW NE

LATITUDE 39.069747 **LONGITUDE** -89.426896

COUNTY Montgomery **API** 121352283000 **9 - 7N - 3W**



ILLINOIS STATE GEOLOGICAL SURVEY

234

Private Water Well	Top	Bottom
clay	0	14
gravel	14	16
gray clay	16	40
Total Depth		40

Casing: 6" PLASTIC from 0' to 10'
36" CONCRETE from 0' to 40'

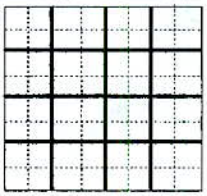
Size hole below casing: 0"

Water from gravel at 14' to 16'.
Permanent pump installed at 38'
on , with a capacity of 10 gpm

Owner Address: 712 D. Meadowlane Granite City, IL
Location source: Location from permit

Permit Date: May 30, 1986 **Permit #:** 124142

COMPANY Link, Harold F.
FARM Snead, Gary
DATE DRILLED June 3, 1986 **NO.**
ELEVATION 0 **COUNTY NO.** 22802
LOCATION SW NE NW
LATITUDE 39.068998 **LONGITUDE** -89.467463
COUNTY Montgomery **API** 121352280200 **7 - 7N - 3W**



ILLINOIS STATE GEOLOGICAL SURVEY

237

Private Water Well	Top	Bottom
clay	0	29
Total Depth		**29**

Casing: 30" CONCRETE from 0' to 30'

Size hole below casing: 0"

Water from clay at 0' to 0'.

Owner Address: Donellson, IL

Location source: Location from permit

Permit Date: September 24, 1980 **Permit #:** 96267

COMPANY Noll, Gary E.

FARM Compagni, Kathy

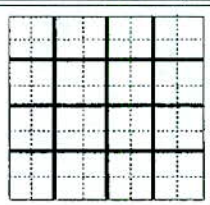
DATE DRILLED **NO.**

ELEVATION 0 **COUNTY NO.** 22843

LOCATION SE SE NE

LATITUDE 39.065154 **LONGITUDE** -89.474299

COUNTY **Montgomery** **API** **121352284300** **12 - 7N - 4W**



ILLINOIS STATE GEOLOGICAL SURVEY

238

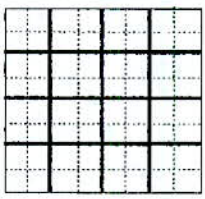
Private Water Well	Top	Bottom
clay	0	8
gravelly clay	8	20
hard packed gravelly clay	20	31
sandy gravel	31	32
gray gravelly clay	32	54
Total Depth		**54**

Casing: 6" PLASTIC from 0' to 10'
36" CONCRETE from 0' to 54'
Water from grvly clay/sandy gvl at 31' to 32'.

Owner Address: P.O. Box #275 Butler, IL
Location source: Location from permit

Permit Date: April 4, 1996 **Permit #:**

COMPANY Walters, Steven
FARM Laurent, Gary
DATE DRILLED July 6, 1996 **NO.**
ELEVATION 0 **COUNTY NO.** 23785
LOCATION NW SW NE
LATITUDE 39.067044 **LONGITUDE** -89.481289
COUNTY **Montgomery** **API 121352378500** **12 - 7N - 4W**



ILLINOIS STATE GEOLOGICAL SURVEY

239

Private Water Well	Top	Bottom
clay	0	12
sandy clay	12	16
hardpan	16	22
sand & hardpan mix	22	30
hardpan	30	52
Total Depth		**52**

Casing: 6" PLASTIC from 0' to 10'
36" CONCRETE from 0' to 52'

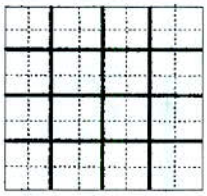
Size hole below casing: 0"

Water from sand at 22' to 30'.

Owner Address: R.R. #2 Hillsboro, IL
Location source: Location from permit

Permit Date: June 4, 1980 **Permit #:** 94214

COMPANY Link, Harold F.
FARM Braye, Mike
DATE DRILLED June 10, 1980 **NO.**
ELEVATION 0 **COUNTY NO.** 22842
LOCATION NW NE SE
LATITUDE 39.06336 **LONGITUDE** -89.47663
COUNTY **Montgomery** **API 121352284200** **12 - 7N - 4W**



ILLINOIS STATE GEOLOGICAL SURVEY

240

Private Water Well	Top	Bottom
clay	0	63
Total Depth		63

Casing: 30" CONCRETE from 0' to 64'

Size hole below casing: 0"

Water from clay at 0' to 0'.

Owner Address: Donnellson, IL

Location source: Location from permit

Permit Date: July 31, 1980 **Permit #:** 95231

COMPANY Noll, Gary E.

FARM Webb, Aubry

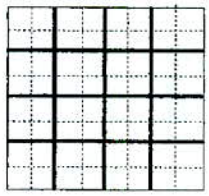
DATE DRILLED **NO.**

ELEVATION 0 **COUNTY NO.** 22829

LOCATION NW NW SW

LATITUDE 39.063558 **LONGITUDE** -89.472002

COUNTY **Montgomery** **API 121352282900** **7 - 7N - 3W**



ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
clay	0	15
y sd & gvl w/gry c	15	40
gray clay	40	42
Total Depth		**42**

Casing: 6" PLASTIC from 0' to 10'
36" CONCRETE from 0' to 42'

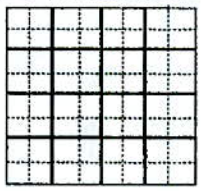
Size hole below casing: 0"

Water from gravel at 15' to 40'.

Owner Address: R.R.#1 P.O.Box #89 Hillsboro, IL
Location source: Location from permit

Permit Date: October 15, 1987 **Permit #:** 136292

COMPANY Link, Harold F.
FARM Boehler, Patrick
DATE DRILLED October 17, 1987 **NO.**
ELEVATION 0 **COUNTY NO.** 23124
LOCATION NE SW SW
LATITUDE 39.059839 **LONGITUDE** -89.488295
COUNTY Montgomery **API** 121352312400 **12 - 7N - 4W**



ILLINOIS STATE GEOLOGICAL SURVEY

242

Private Water Well	Top	Bottom
soil	0	1
clay	1	15
shale & gravel	15	165
gravel	165	170
Total Depth		**170**

Casing: 6" SDR 21 from 0' to 150'

Grout: CEMENT from 0 to 20.

Size hole below casing: 6"

Water from sandy shale at 165' to 170'.
Static level 18' below casing top which is 1' above GL

Owner Address: 304 S. Broad Hillsboro, IL
Location source: Location from permit

Permit Date: April 1, 1991 **Permit #:**

COMPANY Woodward, Larry A.
FARM Webb, Aubrey
DATE DRILLED April 30, 1991 **NO.** 1
ELEVATION 0 **COUNTY NO.** 23241
LOCATION NW SW SW
LATITUDE 39.059927 **LONGITUDE** -89.472003
COUNTY **Montgomery** **API** **121352324100** **7 - 7N - 3W**

ILLINOIS STATE GEOLOGICAL SURVEY

243

Private Water Well	Top	Bottom
clay	0	14
gravel & clay mix	14	16
yellow clay	16	31
gray clay	31	36
gry clay & gvl-mix	36	38
gray clay	38	50
Total Depth		50

Casing: 6" PLASTIC from 0' to 10'
36" CONCRETE from 0' to 50'

Size hole below casing: 0"

Water from gravel at 14' to 38'.

Owner Address: Coffeen, IL

Location source: Location from permit

Permit Date: May 15, 1984 **Permit #:** 112378

COMPANY Link, Harold F.

FARM Sidner, Joe

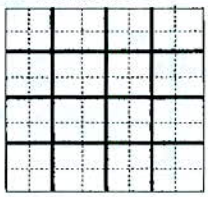
DATE DRILLED June 6, 1984 **NO.**

ELEVATION 0 **COUNTY NO.** 22831

LOCATION NW SW SW

LATITUDE 39.059539 **LONGITUDE** -89.416652

COUNTY **Montgomery** **API** **121352283100** **10 - 7N - 3W**



ILLINOIS STATE GEOLOGICAL SURVEY

244

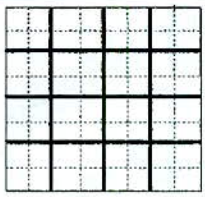
Private Water Well	Top	Bottom
black dirt	0	2
brown clay	2	27
sand	27	28
gray clay	28	56
sand	56	57
gray clay	57	90
Total Depth		**90**

Remarks: dry hole

Owner Address: P.O. Box #254 Hillsboro, IL
Location source: Location from permit

Permit Date: November 16, 1990 **Permit #:**

COMPANY Sims, Ronald M. Sr.
FARM Braye, Mike
DATE DRILLED **NO.**
ELEVATION 0 **COUNTY NO.** 23253
LOCATION SE SE SE
LATITUDE 39.05788 **LONGITUDE** -89.474302
COUNTY **Montgomery** **API 121352325300** **12 - 7N - 4W**



ILLINOIS STATE GEOLOGICAL SURVEY

245

Private Water Well	Top	Bottom
clay	0	16
gravel	16	18
gray clay	18	50
Total Depth		50

Casing: 6" PLASTIC from 0' to 10'
36" CONCRETE from 0' to 50'

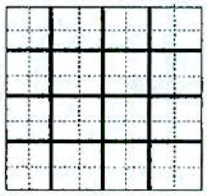
Size hole below casing: 0"

Water from gravel at 16' to 18'.

Owner Address: R.R.#1 P.O. Box#80 Hillsboro, IL
Location source: Location from permit

Permit Date: September 24, 1987 **Permit #:** 135392

COMPANY Link, Harold F.
FARM Webb, Paris
DATE DRILLED September 25, 1987 **NO.**
ELEVATION 0 **COUNTY NO.** 23121
LOCATION SW SE SW
LATITUDE 39.058068 **LONGITUDE** -89.467486
COUNTY Montgomery **API** 121352312100 **7 - 7N - 3W**



ILLINOIS STATE GEOLOGICAL SURVEY

246

Private Water Well	Top	Bottom
clay	0	6
sandy gravelly clay	6	10
gravelly clay	10	14
gravel	14	15
gray gravelly clay	15	31
layered gray gravelly clay & gray sand	31	36
gray gravelly clay	36	41
Total Depth		**41**

Casing: 6" PLASTIC from 0' to 10'
36" CONCRETE from 0' to 41'

Water from gravelly clay - sand at 10' to 36'.

Owner Address: 2151 Woodlawn Granite City, IL

Address of well: R.R. #2 Box #124
Donaldson, IL

Location source: Location from permit

Permit Date: September 3, 1996 **Permit #:**

COMPANY Walters, Steven

FARM Reynolds, Mark

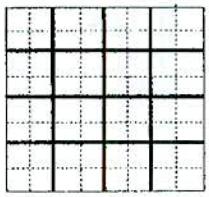
DATE DRILLED October 10, 1996 **NO.**

ELEVATION 0 **COUNTY NO.** 23801

LOCATION SW SW SE

LATITUDE 39.057726 **LONGITUDE** -89.425934

COUNTY **Montgomery** **API** **121352380100** **9 - 7N - 3W**



ILLINOIS STATE GEOLOGICAL SURVEY

Noncommunity - Public Water Well	Top	Bottom
no record	0	0
Total Depth		

Permit Date: **Permit #:**

COMPANY

FARM Indian Grove Campground

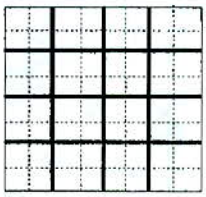
DATE DRILLED **NO.**

ELEVATION 0 **COUNTY NO.** 24007

LOCATION SW SW SW

LATITUDE 39.057742 **LONGITUDE** -89.416636

COUNTY **Montgomery** **API** **121352400700** **10 - 7N - 3W**



ILLINOIS STATE GEOLOGICAL SURVEY

248

Private Water Well	Top	Bottom
s.s. #56274	0	0
top soil	0	3
clay & sand	3	12
sand	12	15
sand clay & shale	15	20
Total Depth		**20**

Casing: 3" CONCRETE from 0' to 20'

Water from sand at 12' to 15'.

Driller's Log filed

Sample set # 56274 (0' - 20') Received: June 20, 1969

Owner Address: Coffeen, IL

Location source: Location from permit

Permit Date: January 1, 1969 **Permit #:** NF 6054

COMPANY owner

FARM Flori, Eugene

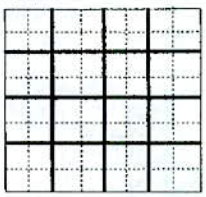
DATE DRILLED May 19, 1969 **NO.** 1

ELEVATION 0 **COUNTY NO.** 01644

LOCATION 210'S line, 300'W line of SW

LATITUDE 39.057424 **LONGITUDE** -89.416746

COUNTY **Montgomery** **API** **121350164400** **10 - 7N - 3W**



ILLINOIS STATE GEOLOGICAL SURVEY

249

Private Water Well	Top	Bottom
clay	0	15
sand	15	29
Total Depth		**29**

Casing: 30" CONCRETE from 0' to 30'

Size hole below casing: 0"

Water from sand at 0' to 0'.

Owner Address: Donnellson, IL

Location source: Location from permit

Permit Date: July 31, 1980 **Permit #:** 95232

COMPANY Noll, Gary E.

FARM Davis, Ken

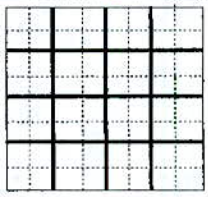
DATE DRILLED **NO.**

ELEVATION 0 **COUNTY NO.** 22835

LOCATION NE NW NW

LATITUDE 39.056258 **LONGITUDE** -89.469781

COUNTY **Montgomery** **API** **121352283500** **18 - 7N - 3W**



ILLINOIS STATE GEOLOGICAL SURVEY

250

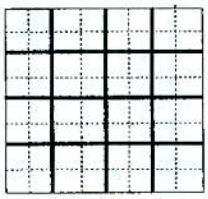
Private Water Well	Top	Bottom
clay	0	7
gravelly clay	7	12
sand	12	16
gravelly clay	16	28
gray gravelly clay	28	30
Total Depth		**30**

Casing: 6" PLASTIC from 0' to 11'
36" CONCRETE from 0' to 30'
Water from sand at 12' to 16'.

Owner Address: 3131 Rodger Ave. Granite City, IL
Address of well: 14300N 4th
Donnellson, IL
Location source: Location from permit

Permit Date: March 29, 1996 **Permit #:**

COMPANY Walters, Steven
FARM Valencia, Linda
DATE DRILLED May 20, 1996 **NO.**
ELEVATION 0 **COUNTY NO.** 23782
LOCATION NE NW NE
LATITUDE 39.055911 **LONGITUDE** -89.423596
COUNTY **Montgomery** **API** **121352378200** **16 - 7N - 3W**



ILLINOIS STATE GEOLOGICAL SURVEY

251

Noncommunity - Public Water Well	Top	Bottom
SS.#66054 (5'-70')	0	0
yellow clay	0	20
sandy wet clay	20	35
gray clay	35	50
gray peat mix	50	58
gray sandy clay	58	60
gray clay	60	68
gray wet sand	68	70
Total Depth		**70**

Casing: 6" PLASTIC from 0' to 12'
36" CONCRETE from 0' to 70'

Size hole below casing: 0"

Water from sandy clay at 22' to 70'.

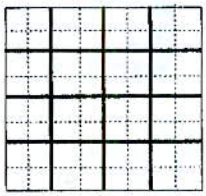
Remarks: drilled for Lost Creek Constr.

Sample set # 66054 (5' - 70') Received: July 2, 1987

Owner Address: 524 South Second St. Springfield, IL
Location source: Location from permit

Permit Date: June 16, 1987 **Permit #:** 132664

COMPANY Link, Harold F.
FARM Dept. of Conservation
DATE DRILLED June 23, 1987 **NO.**
ELEVATION 0 **COUNTY NO.** 23108
LOCATION NE NW NW
LATITUDE 39.055951 **LONGITUDE** -89.414273
COUNTY **Montgomery** **API** **121352310800** **15 - 7N - 3W**



252

ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
no record	0	16
sand, clay	16	21
Total Depth		**21**

Casing: 18" CONCRETE from 6' to 0'
30" CONCRETE from 21' to 0'

Screen: 3' of 30" diameter slot

Grout: CONCRETE from 0 to 10.

Water from sand at 16' to 21'.

Owner Address: R.R. #1 Box #87 Hillsboro, IL

Address of well: Rt. #127
Donnellson, IL

Location source: Location from permit

Permit Date: September 3, 1991 **Permit #:**

COMPANY Noll, Gary E.

FARM Elizondo, Sam

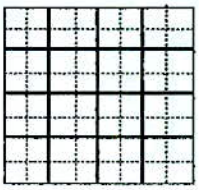
DATE DRILLED September 10, 1991 **NO.**

ELEVATION 0 **COUNTY NO.** 23355

LOCATION SE NW NW

LATITUDE 39.054373 **LONGITUDE** -89.48832

COUNTY Montgomery **API** 121352335500 13 - 7N - 4W



ILLINOIS STATE GEOLOGICAL SURVEY

253

Private Water Well	Top	Bottom
clay	0	14
gravely clay	14	16
clay	16	25
gray clay & gravel	25	28
gray clay	28	46
gravel	46	47
gray clay	47	60
Total Depth		**60**

Casing: 6" PLASTIC from 0' to 12'
36" CONCRETE from 0' to 60'

Water from gravel at 46' to 47'.

Owner Address: R.R. #1 P.O. Box #87 Hillsboro, IL

Location source: Location from permit

Permit Date: May 12, 1988 **Permit #:** 001899

COMPANY Link, Harold F.

FARM Elizondo, Sam

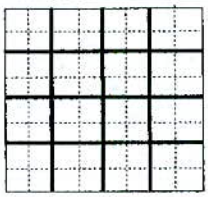
DATE DRILLED May 27, 1988 **NO.**

ELEVATION 0 **COUNTY NO.** 23154

LOCATION SE SE NW

LATITUDE 39.050679 **LONGITUDE** -89.483662

COUNTY **Montgomery** **API** **121352315400** **13 - 7N - 4W**



ILLINOIS STATE GEOLOGICAL SURVEY

254

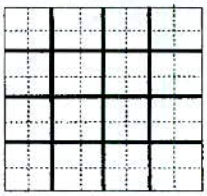
Private Water Well	Top	Bottom
clay	0	12
gravel	12	15
hardpan	15	39
gravel	39	40
hardpan	40	50

Total Depth
Casing: 6" PLASTIC from 0' to 10'
36" CONCRETE from 0' to 50'
Water from gravel at 12' to 40'.

Owner Address: Donnellson, IL
Location source: Location from permit

Permit Date: May 31, 1978 **Permit #:** 74906

COMPANY Beasley, Eugene B.
FARM Fredenburger, Everett
DATE DRILLED June 27, 1978 **NO.**
ELEVATION 0 **COUNTY NO.** 22354
LOCATION NW NE SE
LATITUDE 39.048812 **LONGITUDE** -89.458568
COUNTY Montgomery **API** 121352235400 **18 - 7N - 3W**

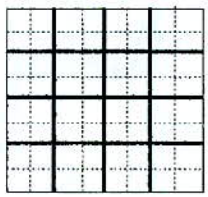


 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well for Business	Top	Bottom
no record	0	0
Total Depth		

Permit Date: **Permit #:**

COMPANY
FARM Coffeen Lake Fish & Wildlife
DATE DRILLED **NO.**
ELEVATION 0 **COUNTY NO.** 23969
LOCATION NW NW SE
LATITUDE 39.048688 **LONGITUDE** -89.407144
COUNTY **Montgomery** **API** **121352396900** **15 - 7N - 3W**



ILLINOIS STATE GEOLOGICAL SURVEY

254

Private Water Well	Top	Bottom
clay	0	26
Total Depth		**26**

Casing: 30" CONCRETE from 0' to 27'

Water from clay at 0' to 0'.

Owner Address: Donnellson, IL

Location source: Location from permit

Permit Date: **Permit #:** 30577

COMPANY Bekemeyer, Gust

FARM Betochie, Don

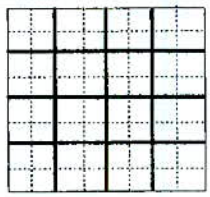
DATE DRILLED August 20, 1974 **NO.**

ELEVATION 0 **COUNTY NO.** 21842

LOCATION SW NW SE

LATITUDE 39.046749 **LONGITUDE** -89.425878

COUNTY **Montgomery** **API** **121352184200** **16 - 7N - 3W**



ILLINOIS STATE GEOLOGICAL SURVEY

257

Private Water Well	Top	Bottom
clay	0	7
gravelly clay	7	11
hardpacked gravelly clay layered gravel	11	18
hardpacked gravelly clay	18	20
gray gravelly clay layered sandy gravel	20	30
gray gravelly clay	30	40
gray gravelly clay layered sandy gravel	40	46
gray gravelly clay	46	53
layered sand gravel gray gravelly clay	53	55
gray gravelly clay	55	60
Total Depth		**60**

Casing: 6" PLASTIC from 0' to 0'
36" CONCRETE from 0' to 60'

Water from gravelly clay - sand at 10' to 46'.

Owner Address: 1112 S. Oak St. Hillsboro, IL

Address of well: R.R.

Location source: Location from permit

Permit Date: September 12, 1996 **Permit #:**

COMPANY Walters, Steven

FARM Finley, Bruce & Lisa

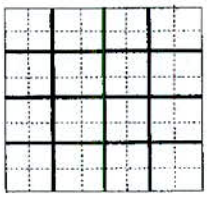
DATE DRILLED October 4, 1996 **NO.**

ELEVATION 0 **COUNTY NO.** 23807

LOCATION NW NE SW

LATITUDE 39.107107 **LONGITUDE** -89.486116

COUNTY **Montgomery** **API** **121352380700** **25 - 8N - 4W**



ATTACHMENT III.2.B.2
GROUNDWATER QUALITY SUMMARY

Attachment III.2.B.2

Groundwater wells have been sampled on a consistent basis from 2008 as a requirement of Permit 399 and sampling will continue in the future. As a result of these samples, the data has been compiled and averaged by the annual quarter in an attempt to determine seasonal variations in groundwater quality. The following groundwater wells were selected as a representation due to their location in the southern portion of Permit 399, and consequently, closest to the shadow boundary revision application.

Based on the following data, there does not appear to be a strong correlation between groundwater quality and the annual seasons. Monitoring of the permitted groundwater wells will continue.

In this attachment you will find the data (averaged per quarter) for Groundwater Wells 26-S, 27-S, 28-S, 30, and 31; associated graphs depicting the data; and a map showing the well locations.

WELL 26-S				
Quarter	**1**	**2**	**3**	**4**
Acidity, Total (as CaCO3)	-429.11	-418.78	-439.60	-506.44
Alkalinity, Total (as CaCO3)	404.40	411.78	437.00	475.00
Chloride, Total	35.86	40.00	35.33	40.00
Hardness, as (CaCO3)	421.00	573.33	497.00	643.00
Iron, Total	29.43	34.42	117.81	82.21
Lab pH	7.30	7.12	7.26	7.21
Manganese, Total	1.13	1.74	2.93	2.11
Sulfate, Total	112.90	131.22	126.60	184.50
Total Dissolved Solids, Total	615.00	647.78	620.00	796.60

WELL 27-S				
Quarter	**1**	**2**	**3**	**4**
Acidity, Total (as CaCO3)	-277.11	-315.38	-302.40	-289.11
Alkalinity, Total (as CaCO3)	276.44	315.00	313.00	290.89
Chloride, Total	36.14	32.80	32.33	38.83
Hardness, as (CaCO3)	346.67	375.00	359.40	402.89
Iron, Total	23.57	25.48	48.50	37.67
Lab pH	7.47	7.47	7.42	7.33
Manganese, Total	0.67	1.87	1.35	1.02
Sulfate, Total	99.11	67.13	68.20	118.11
Total Dissolved Solids, Total	470.89	420.75	426.00	502.00

WELL 28-S

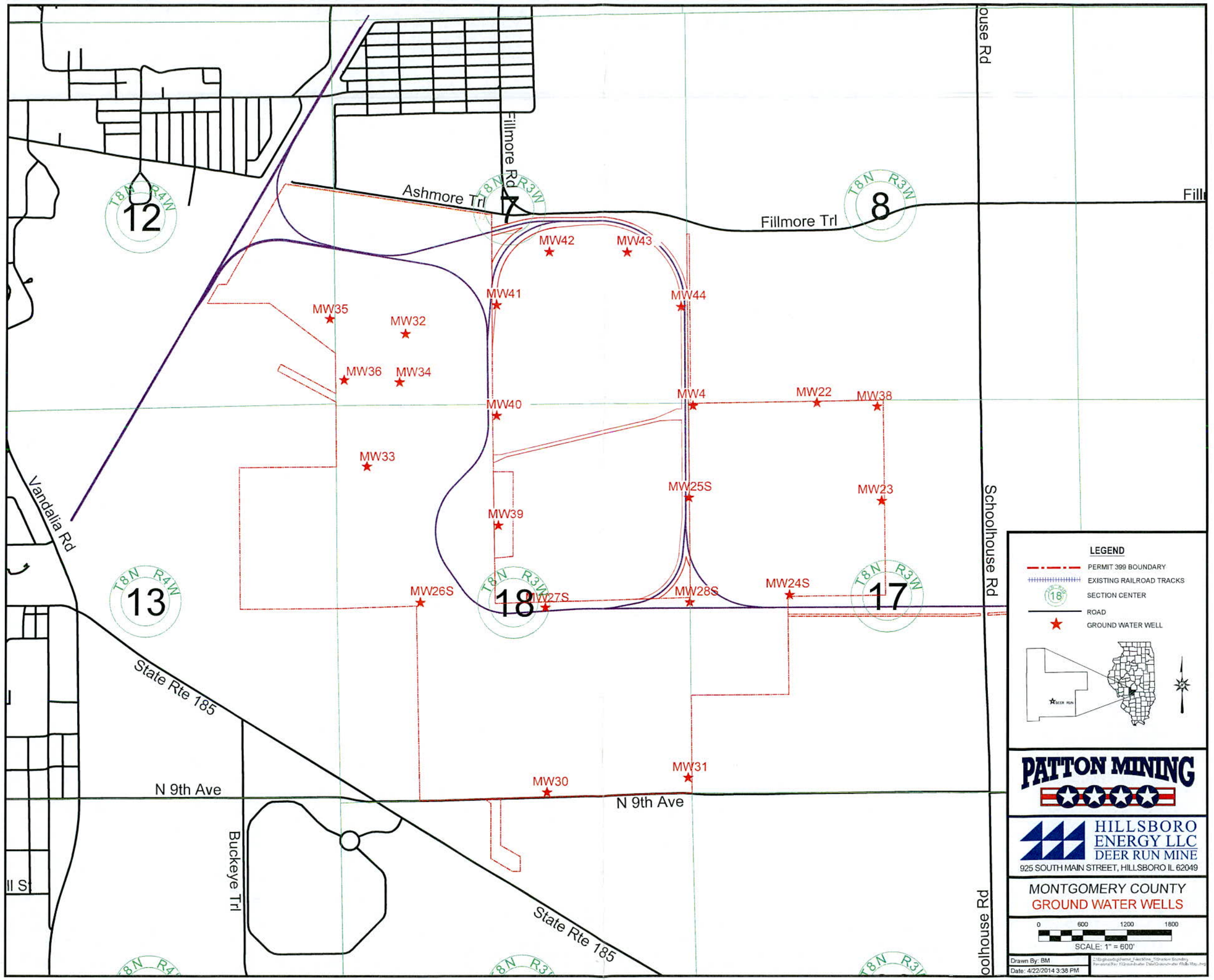
Quarter	1	2	3	4
Acidity, Total (as CaCO3)	-308.89	-370.22	-292.60	-332.89
Alkalinity, Total (as CaCO3)	301.40	361.89	298.60	316.40
Chloride, Total	46.67	51.00	51.25	43.50
Hardness, as (CaCO3)	391.00	572.22	370.30	398.00
Iron, Total	42.34	111.59	81.29	87.37
Lab pH	7.44	7.41	7.38	7.48
Manganese, Total	1.13	2.53	1.73	1.97
Sulfate, Total	110.30	125.33	87.90	65.70
Total Dissolved Solids, Total	559.40	550.89	479.00	429.60

WELL 30

Quarter	1	2	3	4
Acidity, Total (as CaCO3)	-372.44	-441.00	-416.40	-406.44
Alkalinity, Total (as CaCO3)	382.40	429.22	410.00	394.00
Chloride, Total	88.43	59.80	53.00	123.50
Hardness, as (CaCO3)	303.00	396.22	342.60	340.70
Iron, Total	29.69	45.04	115.53	101.10
Lab pH	7.34	7.26	7.18	7.26
Manganese, Total	0.38	0.72	1.10	0.91
Sulfate, Total	282.30	206.11	194.10	276.00
Total Dissolved Solids, Total	917.80	768.67	787.60	915.20

WELL 31

Quarter	1	2	3	4
Acidity, Total (as CaCO3)	-316.11	-354.89	-371.80	-342.89
Alkalinity, Total (as CaCO3)	325.60	352.00	368.00	333.60
Chloride, Total	15.86	20.80	21.17	15.67
Hardness, as (CaCO3)	319.00	403.89	411.60	361.70
Iron, Total	29.19	53.27	84.01	88.15
Lab pH	7.43	7.41	7.38	7.40
Manganese, Total	0.63	1.20	1.76	2.07
Sulfate, Total	153.70	160.22	159.50	158.40
Total Dissolved Solids, Total	601.80	589.78	657.40	582.70


Fillmore Rd
Ashmore Trl
Fillmore Trl
Schoolhouse Rd
Vandalia Rd
State Rte 185
N 9th Ave
Buckeye Trl
T8N R4W
12
T8N R3W
7
T8N R3W
8
T8N R4W
13
T8N R3W
18
T8N R3W
17
MW42
MW43
MW41
MW44
MW35
MW32
MW36
MW34
MW40
MW4
MW22
MW38
MW33
MW25S
MW23
MW39
MW26S
MW27S
MW28S
MW24S
MW30
MW31
LEGEND
PERMIT 399 BOUNDARY
EXISTING RAILROAD TRACKS
SECTION CENTER
ROAD
GROUND WATER WELL
PATTON MINING
HILLSBORO ENERGY LLC
DEER RUN MINE
925 SOUTH MAIN STREET, HILLSBORO IL 62049
MONTGOMERY COUNTY
GROUND WATER WELLS
0 600 1200 1800
SCALE: 1" = 600'
Drawn By: BM
Date: 4/22/2014 3:38 PM

ATTACHMENT III.2.B.3
COAL SEAM WELLS REPORT

HR
HURST - ROSCHE
ENGINEERS, INC.

June 11, 2012

SUBJECT: Coal Seam Wells
Deer Run Mine
Montgomery County, Illinois re: H-R 110-0787

Mr. Simon Stepp
Patton Mining, LLC
925 South Main Street
Hillsboro, Illinois 62049

Dear Mr. Stepp:

Three peizometer wells were installed in October/November 2008 within the Deer Run Mine shadow area, and the wells are screened within the Herrin No. 6 coal seam. Details of well installation have been presented in a report prepared by Hurst-Rosche Engineers, Inc. titled, 'Supplemental Hydrogeologic Investigation', dated December 10, 2008.

Groundwater level measurements were recorded on a routine basis following well installations. Enclosed is a table summarizing water level measurements. Reference to this table will indicate the water level within Well 1 stabilized relatively quickly after installation, the water level within Well 2 continued to slowly rise, and the water level within Well 3 apparently stabilized approximately 6 months following installation. Measuring of water levels within the wells was discontinued in August 2009. Current water levels in the wells were recently measured and have been noted on the summary table. It is noted the water level at the Well 1 location has apparently been influenced by recent coal mining activities adjacent to the well and it appears the water level at the Well 2 location has risen to a presumed stabilized level.

Based on the assimilated data, it appears flow gradient within the No. 6 coal seam is generally west to east, to southeast. Given the delayed response to well re-charge, this information suggests and/or confirms the No. 6 coal seam has very limited potential as a potable water source.

Enclosed are copies of well completion reports and a map identifying well locations.

If you have any questions or require additional information, please contact our office.

Sincerely,

HURST-ROSCHE ENGINEERS, INC.

David H. Kimmle, P.E.

DHK:ad

Enclosures

1400 East Tremont St.
P.O. Box 130
Hillsboro, IL 62049
Telephone 217-532-3959
Facsimile 217-532-3212
E-Mail Hillsboro@hurst-rosche.com
Web Page www.hurst-rosche.com

East St. Louis, Illinois
Marion, Illinois
Springfield, Illinois
Barnhart, Missouri
Neosho, Missouri

DEER RUN MINE
COAL SEAM GROUNDWATER MEASUREMENTS
110-0787

DATE	Well No.					
	1 (08-03-17-08)		2 (08-03-19-01)		3 (08-03-28-02)	
	Depth to Water (ft.)	Groundwater Elev. (ft.)	Depth to Water (ft.)	Groundwater Elev. (ft.)	Depth to Water (ft.)	Groundwater Elev. (ft.)
12/12/2008	53.95	580.75	342.28	295.22	240.55	391.15
12/18/2008	54.46	580.24	331.13	306.37	178.52	453.18
12/23/2008	54.55	580.15	320.28	317.22	154.64	477.06
1/2/2009	44.13	590.57	300.76	336.74	119.13	512.57
1/9/2009	47.00	587.70	289.15	348.35	100.55	531.15
1/16/2009	48.85	585.85	278.73	358.77	86.81	544.89
1/22/2009	49.92	584.78	269.70	367.80	77.30	554.40
1/28/2009	50.63	584.07	261.00	376.50	68.15	563.55
2/5/2009	51.32	583.38	251.82	385.68	62.30	569.40
2/24/2009	49.42	585.28	223.13	414.37	60.93	570.77
3/17/2009	26.55	608.15	201.95	435.55	42.71	588.99
5/14/2009	(1)	--	149.09	488.41	37.73	593.97
6/1/2009	27.00	607.70	140.06	497.44	37.69	594.01
7/1/2009	40.98	593.72	126.96	510.54	36.40	595.30
8/5/2009	45.45	589.25	114.93	522.57	37.11	594.59
8/24/2009	46.50	588.20	106.69	530.81	37.29	594.41
6/2/2012	215.85	418.85	51.96	585.54	35.42	596.28

(1) Reading not recorded due to well groundwater depth being impacted by surface water/heavy precipitation.

Well Completion Report

Site Name: Deer Run Mine
Drilling Contractor: Hawkey and Kline Coring and Drilling
Drilling Method: Mud Rotary
Coordinates: N 900431.3, E 2498009.9

Well No.: 08-03-17-08 (Coal Seam Well No. 1)
Date Completed: October 7, 2008
Drilling Fluids (type): Water/Bentonite Slurry

Annular Space Details

8-5/8" diameter steel casing installed in borehole between elevation 632.0 ft. and 496.0 ft. 5-1/2" diameter steel casing installed in borehole between elevation 632.0 ft. and 184.0 ft. Cement seal installed around outside of 8-5/8" diameter steel casing and in between 8-5/8" diameter and 5-1/2" diameter steel casing. Drilling fluid was removed from borehole prior to drilling into coal seam and then boring advanced to elevation 173.7 ft.

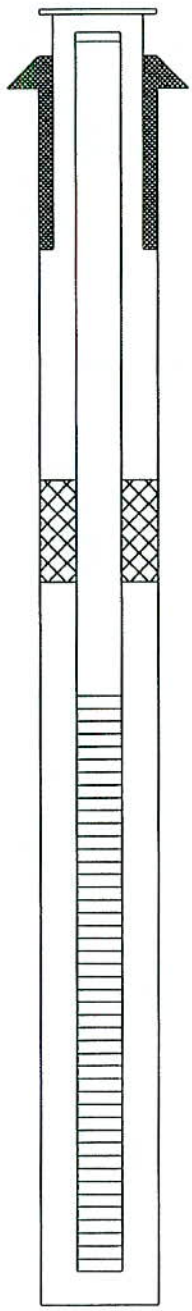
Well Construction Materials

	Stainless Steel Specify Type	3-inch PVC Specify Type	Carbon Steel
Riser coupling joint		Sch 40	
Riser pipe above w.t.		Sch 40	
Riser pipe below w.t.		Sch 40	
Screen		Sch 40	
Coupling joint screen to riser		Sch 40	
Protective casing			x

Measurements (ft.)

Riser pipe length	454.0
Screen length	7.0
Screen slot size in	0.01
Protective casing length	--
Depth to water (from riser)	387.0
Elevation of water	247.7
Gallons removed (develop)	64.0
Gallons removed (purge)	--
Other	--

Completed by: D. Jenkins



Elevations (ft.)

635.5 Top of Protective Casing
634.7 Top of Riser Pipe
632.0 Ground Surface
184.0 Bottom of Steel Casing
180.7 Top of Screen
7.0 Total Screen Interval
173.7 Bottom of Screen
173.7 Bottom of Borehole

Well Completion Report

Site Name: Deer Run Mine
Well No.: 08-03-28-02 (Coal Seam Well No. 2)
Drilling Contractor: Hawkey and Kline Coring and Drilling
Date Completed: October 24, 2008
Drilling Method: Mud Rotary
Drilling Fluids (type): Water/Bentonine Slurry
Coordinates: N 889565.0, E 2507291.3

Annular Space Details

8-5/8" diameter steel casing installed in borehole between elevation 634.8 ft. and 489.8 ft. 5-1/2" diameter steel casing installed in borehole between elevation 634.8 ft. and 121.3 ft. Cement seal installed around outside of 8-5/8" diameter steel casing and in between 8-5/8" diameter and 5-1/2" diameter steel casing. Drilling fluid was removed from borehole prior to drilling into coal seam and then boring advanced to elevation 118.3 ft. PVC well installation suggests bottom of borehole is at elevation 117.0 ft.

Well Construction Materials

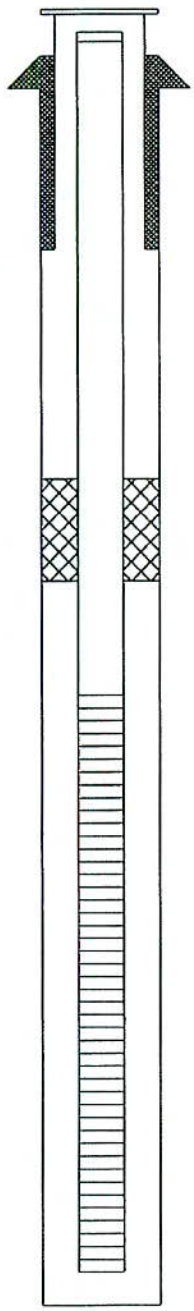
	Stainless Steel Specify Type	3-inch PVC Specify Type	Carbon Steel
Riser coupling joint		Sch 40	
Riser pipe above w.t.		Sch 40	
Riser pipe below w.t.		Sch 40	
Screen		Sch 40	
Coupling joint screen to riser		Sch 40	
Protective casing			x

Measurements (ft.)

Riser pipe length	510.6
Screen length	9.8
Screen slot size in	0.01
Protective casing length	--
Depth to water (from riser)	414.1
Elevation of water	223.4
Gallons removed (develop)	10.0
Gallons removed (purge)	--
Other	--

Completed by: D. Jenkins

Elevations (ft.)



638.1 Top of Protective Casing
637.5 Top of Riser Pipe
634.8 Ground Surface

126.8 Top of Screen

121.3 Bottom of Steel Casing

9.8 Total Screen Interval

117.0 Bottom of Screen
118.3 Bottom of Borehole

Well Completion Report

Site Name: Deer Run Mine
Well No.: 08-03-19-01 (Coal Well No. 3)
Drilling Contractor: Hawkey and Kline Coring and Drilling
Date Completed: November 12, 2008
Drilling Method: Mud Rotary
Drilling Fluids (type): Water/Bentonine Slurry
Coordinates: N 895712.3, E 2497058.9

Annular Space Details

8-5/8" diameter steel casing installed in borehole between elevation 630.8 ft. and 486.8 ft. 5-1/2" diameter steel casing installed in borehole between elevation 630.8 ft. and 179.3 ft. Cement seal installed around outside of 8-5/8" diameter steel casing and in between 8-5/8" diameter and 5-1/2" diameter steel casing. Drilling fluid was removed from borehole prior to drilling into coal seam and then boring advanced to elevation 176.3 ft.

Well Construction Materials

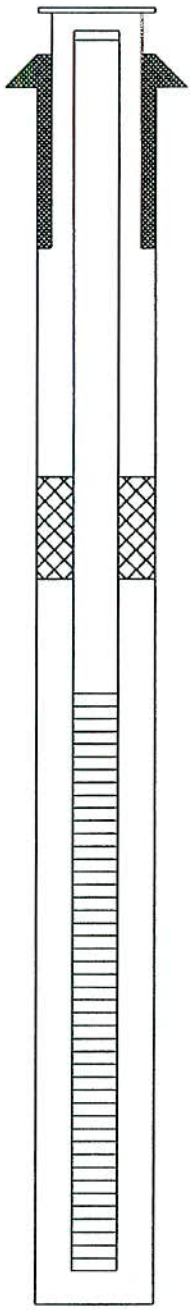
	Stainless Steel Specify Type	3-inch PVC Specify Type	Carbon Steel
Riser coupling joint		Sch 40	
Riser pipe above w.t.		Sch 40	
Riser pipe below w.t.		Sch 40	
Screen		Sch 40	
Coupling joint screen to riser		Sch 40	
Protective casing			x

Measurements (ft.)

Riser pipe length	444.2
Screen length	9.8
Screen slot size in	0.01
Protective casing length	--
Depth to water (from riser)	399.9
Elevation of water	231.8
Gallons removed (develop)	25.0
Gallons removed (purge)	--
Other	--

Completed by: D. Jenkins

Elevations (ft.)



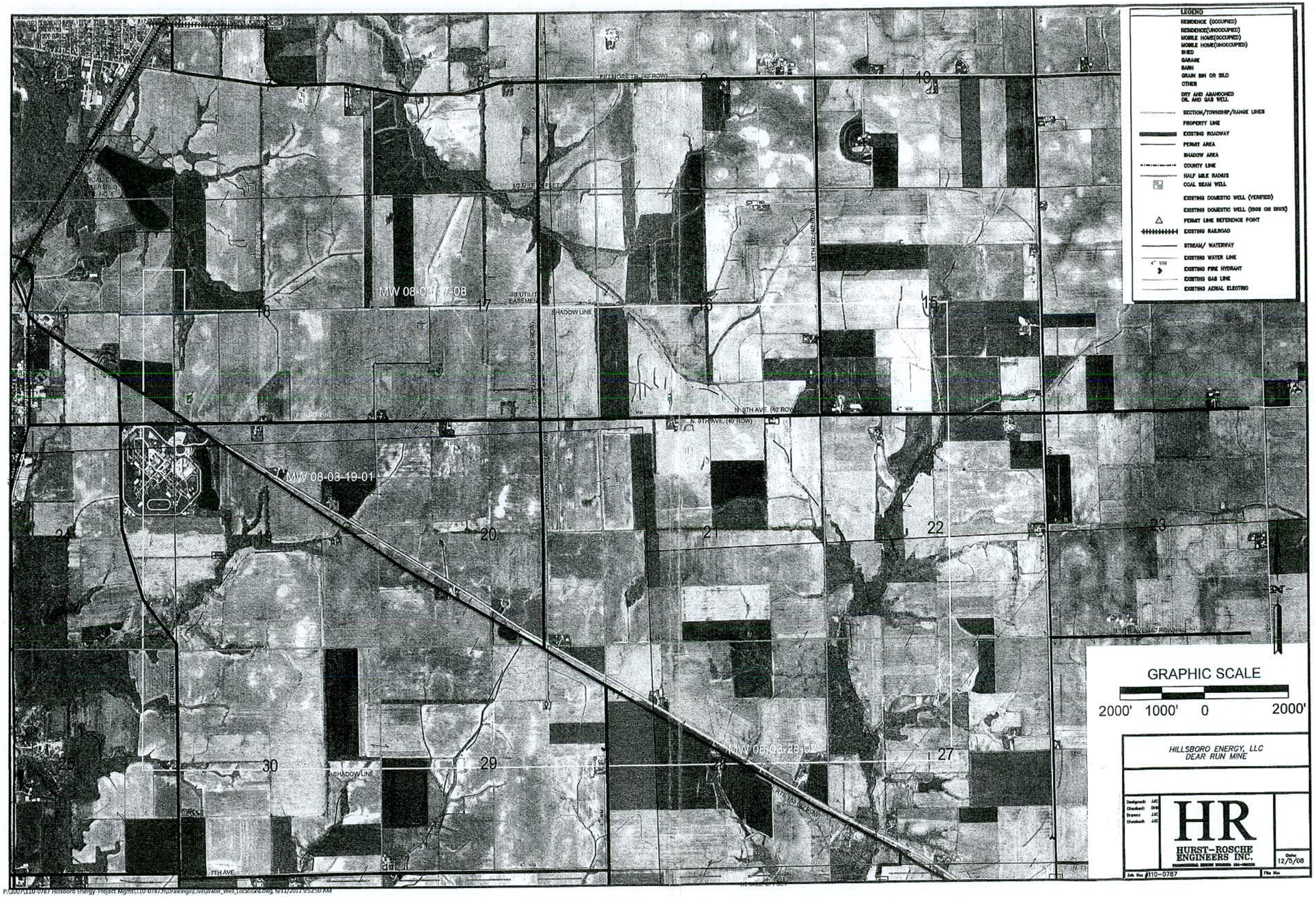
633.9 Top of Protective Casing
631.7 Top of Riser Pipe
630.8 Ground Surface

187.2 Top of Screen

179.3 Bottom of Steel Casing

9.8 Total Screen Interval

177.4 Bottom of Screen
176.3 Bottom of Borehole



P:\2007\110-0787 Hillsboro Energy-Project Mgmt\110-0787.31\Drawings\LIM\Water_Well_Location.dwg, 12/11/2008 9:52:50 AM

ATTACHMENT III.2.C.2
SURFACE WATER QUALITY DATA

Surface water sampling of Shoal Creek Reservoir Structure No. 5 has been sampled on a consistent basis from 2008 as a requirement of Permit 399 and sampling will continue in the future. As a result of these samples, the data has been compiled and averaged by the annual quarter in an attempt to determine seasonal variations in groundwater quality. This body of water is a flood impoundment structure on an intermittent tributary of the Middle Fork of Shoal Creek. It is expected that the water quality of the water in the Shoal Creek Reservoir Structure No. 5 is representative of other water bodies located within the proposed shadow boundary area.

QUARTER AVG	Settleable Solids	Hardness	Ph	Alkalinity, total (as CaCO3)	Acidity, total (as CaCO3)	Solids, total suspended
1	0.099	113.67	7.65	101.40	-75.60	24.00
2	0.099	132.71	8.30	102.29	-78.71	16.57
3	0.099	148.71	7.73	140.13	-115.13	28.00
4	0.099	183.75	8.03	104.33	-85.33	15.67

QUARTER AVG	Chloride (as Cl)	Sulfate, total (as SO4)	Iron, total (as Fe)	Manganese, total (as Mn)	Flow, in conduit or thru treatment plant (MgpD)	Mercury, total (as Hg)
1	75.54	75.80	2.06	0.14	0.46	4.28
2	53.00	59.13	2.35	0.29	0.21	6.28
3	110.19	59.63	2.28	0.36	0.13	3.56
4	209.50	147.50	1.13	0.20	0.38	2.30

Coffeen Lake Sample Results
Apr-14 thru Mar-15

Parameter	Units	Sample Date					
		4/28/2014	5/21/2014	6/16/2014	7/29/2014	8/12/2014	9/26/2014
Sulfate	mg/L	64	61	61	69	69	79
pH	--	8.45	8.99	8.30	8.35	8.30	8.51
Alkalinity	mg/L	103	104	98	105	104	102
Acidity	mg/L	-97	-93	-92	-98	-98	-95
Total Dissolved Solids	mg/L	228	294	248	248	240	264
Total Suspended Solids	mg/L	19	6	19	<6	<6	<6
Chloride	mg/L	26	22	21	29	25	28
Iron	mg/L	0.345	0.112	0.269	0.121	0.0955	0.087
Manganese	mg/L	0.0338	0.016	0.0453	0.0281	0.0199	0.0154

Parameter	Units	Sample Date					
		10/21/2014	11/20/2014	12/9/2014	1/13/2015	2/3/2015	3/19/2015
Sulfate	mg/L	66	69	75	74	76	84
pH	--	8.33	8.27	7.92	7.84	8.32	8.62
Alkalinity	mg/L	107	109	110	111	109	112
Acidity	mg/L	-101	-99	-101	-104	-99	-106
Total Dissolved Solids	mg/L	314	252	335	360	288	304
Total Suspended Solids	mg/L	<6	<6	<6	<6	<6	<6
Chloride	mg/L	29	28	32	28	32	32
Iron	mg/L	0.198	0.0764	0.163	0.0909	0.111	0.120
Manganese	mg/L	0.0313	0.0177	0.0178	0.0094	0.0154	0.0124

PART IV

Operations Plan

PART IV

OPERATIONS PLAN

1) Proposed Operational Procedures and Methods for the Mine Over Its Projected Life

Describe the type and method of mining procedures and proposed engineering techniques to be employed in the operation of the proposed mine. Describe the major equipment to be employed and how such equipment will be used in the different aspects of the mining operation. Provide an estimation of the anticipated annual coal production and anticipated coal production by tonnage once the mine is at full operational capacity.

RESPONSE: ***This significant revision is being submitted to extend the mining operations of the Deer Run Mine. Underground mining at the Deer Run Mine consists of continuous miner sections developing mains with a non-subsidence room and pillar mining system. Off of the mains, headgate and tailgate entries are developed by the continuous miner sections. A longwall set-up face is developed on the eastern end of the longwall panels to facilitate the installation of the longwall system. Adjacent to the longwall set-up face are the bleeder entries. The bleeder entries are designed for long term support and evaluation of the mine ventilation system. The mine ventilation system is engineered to adequately ventilate the active mining faces as well as worked out areas of the mine that require examinations. Longwall mining will result in planned, predictable surface subsidence. A total of eleven additional longwall panels are being proposed. Panels 7-17 will be located south of the approved Panel No. 6. Refer to Map 6 – Underground Operations Map for longwall panel layout. Currently, the Deer Run Mine is at its full planned operational capacity. Annual clean coal production capacity from the Deer Run Mine within the proposed shadow boundary area is estimated between 6 and 8 million tons.***

2) Mining Operations Plan for the Proposed Permit Area

Describe the proposed mining operations plan for the permit area in terms of the mining sequence, the employment of facilities, establishment and maintenance of erosion control facilities, air pollution control facilities, coal storage, cleaning and loading areas, location and placement of topsoil, spoil, coal waste, or other storage facilities.

A) 1) Describe how each type of overburden (soil horizons, glacial drift and consolidated material) will be handled with regards to shaft excavations.

RESPONSE: ***N/A. No additional shaft construction is proposed by this application.***

2) If toxic materials have been identified as occurring in the overburden, describe how these materials will be handled to insure proper disposal.

RESPONSE: ***N/A. No additional shaft construction is proposed by this application.***

B) 1) Locate on the operations map all soil horizon storage areas and/or root medium stockpiles. Identify each storage area as to its content.

RESPONSE: ***N/A. No additional soil storage areas are proposed by this application.***

2) Describe measures to be employed to prevent or minimize exposure of soil stockpiles to excessive water and wind erosion, unnecessary compaction and contamination by undesirable materials.

RESPONSE: ***N/A. No additional soil storage areas are proposed by this application.***

3) Describe methods and treatment measures to be used on exposed areas where topsoil has been removed to prevent excess air and water pollution.

RESPONSE: ***N/A. No topsoil is proposed to be removed by this application.***

C) The permit map and plans shall show the lands proposed to be affected within the proposed permit through the operation, according to the sequence of mining and reclamation and any change in a facility or feature to be caused by the proposed operations if the facility or feature was shown under 62 Ill. Adm. Code Sections 1783.24 through 1783.25.

RESPONSE: ***N/A.***

D) Show on the permit map or other designated map each area of land for which a performance bond will be posted under 62 Ill. Adm. Code 1800.

RESPONSE: ***N/A.***

E) Mining Operations Plan for the Proposed Shadow Area

1) Provide a map at a scale of 1 inch to 1,000 feet or other scales as approved by the Department identifying the limits of the proposed shadow area (area from which coal is proposed to be extracted by underground mining methods).

RESPONSE: ***Refer to Map 6 - Underground Operations Map for the approved and proposed shadow areas. It is important to note that there are some minor changes to the longwall panel layout from the layout shown in Insignificant Permit Revision No. 11 which was approved on July 30, 2012. Longwall Panel No. 3 has been shortened to approximately 12,700 feet in length. The width of Panel No. 3 has also been narrowed to from 1,400' to approximately 1,000 feet wide. The original Longwall Panel No. 4 as projected on the maps in IPR No. 11 is to be skipped. The skipped width is approximately 1,300'. Panel 4 will be mined immediately south of the skipped panel and a new longwall bleeder district will be started. The applicable maps within this permit revision reflect this change.***

2) Within the limits of the proposed shadow area identify all areas projected to be mined, at a minimum, during the term of the permit showing the proposed size, sequence and yearly projections for the development of underground workings.

RESPONSE: ***Refer to Map 7 – Underground Timing Map for the approximate yearly development of underground workings.***

3) Subsidence Control Plan

A) General Requirements

1) Within the permit, shadow and adjacent areas are there structures or renewable resource lands?

Yes ___***X***___ No _____

If yes, on the shadow area map described in 2,E, above, or other designated map, provide survey information which identifies all structures and renewable resource lands. Include all topographic features at a maximum contour interval of 10 feet. Identify all surface and subsurface man made features within, passing through, or passing over the area in which underground mining operations are located or will be projected to be located. Such features shall include but are not limited to all buildings, facilities, roads, bridges, major electric transmission lines, pipelines, agricultural drainage tile fields, gas and oil wells and water wells.

If no, provide evidence and support documentation that no structures or renewable resource lands exist as a result of a survey conducted within these areas.

RESPONSE: ***Refer to Map 2 – Identification of Interests for the location of all structures within the proposed shadow boundary area. Refer to Attachment II.10.A – Identification of Structures for a listing and aerial photographs of all structures currently within the proposed shadow boundary area.***

Refer to Map 3 – Pre-Mining Land Use Map for pre-mining contours on 2-foot intervals as well as topographic features passing over the area in which underground mining operations are located. These features include all buildings, facilities, roads, bridges, major electric transmission lines, pipelines, oil wells, and water wells. Existing field drainage tiles are not shown on the map. Refer to the response to Part II.12.A for a discussion detailing how field drainage tiles will be dealt with in the mining area.

2) Within the proposed permit, shadow or adjacent areas does the applicant intend to adopt mining technologies which provide for planned subsidence in a predictable and controlled manner?

Yes ***X*** No _____

If yes, provide information requested under "Planned Subsidence", Subsection B.

If no, provide information requested under "Subsidence Unplanned", Subsection C.

If the applicant intends to conduct both planned and unplanned subsidence mining operations, both subsections B and C must be addressed.

3) Provide geologic descriptions characterizing the thickness and lithology of the coal and overburden geological units throughout the shadow area. Provide stratigraphy test boring and core sampling log descriptions from the shadow area. Include the elevation and locations of the boring logs.

RESPONSE: ***Refer to Map 4 – Hydrogeologic Map for the location of core borings and Attachment III.2.A.1 Boring Logs for the stratigraphic geological logs characterizing the thickness and lithology of the coal and overburden geological units throughout the shadow area. Also included in this attachment are the log description, the coordinates, and the elevation at each boring location.***

B) Planned Subsidence

1) Provide a detailed description of the mining technology used to produce planned and predictable subsidence?

RESPONSE: ***Planned subsidence will occur using the longwall mining method. Longwall mining creates an almost complete excavation of the coal seam, which allows the overburden to subside in a controlled and predictable manner. The longwall shields support the mine roof and provide protection for the mining equipment and the miners. As the mining shearer removes the coal, each shield will advance behind the shearer and will allow the overburden to fall in the void left by the removal of the coal. This advancement of the mining equipment and the subsidence of the overburden results in the movement of the surface, which is predictable and uniform and allows for the protection of surface structures.***

2) Provide a description of factors (i.e. drift thickness variations, expected variations in extraction height, or presence of faults and their direction (strike & dip) in relation to mine panels, etc.) with supporting documentation which may influence the magnitude, extent and predictability of planned subsidence. Include data on predicted subsidence

profiles and post- subsidence contours, including calculations on the predicted angle of draw. Provide a description of measures taken in the field to confirm the accuracy and reliability of predicted subsidence profiles.

RESPONSE: ***The total depth from the coal seam to be mined below the surface as well as surface topography is a factor to be considered when predicting subsidence. Coal depth from the surface in the proposed shadow boundary area ranges from 460 feet to 540 feet. This is shown on Map 9 – Overburden thickness. The surface elevations over the proposed shadow boundary area range from a low of 600' to a high of 660' mean sea level. The topography on the surface is relatively flat with gently rolling areas. Refer to Map 3 – Pre-Mining Land Use Map for pre-mining contours on 2-foot intervals. The subsidence prediction model does take into account the total depth of overburden as well as the surface topography. This is accomplished by creating a surface topography grid as well as a 3D polyline of the longwall panel boundary that is correlated to a coal seam elevation grid and inputting them into the model.***

Overburden materials are another factor that can affect the magnitude of planned subsidence created by longwall mining. The overburden in this area consists of glacial deposits of up to 200 feet in thickness, with shales, sandstones, claystones, and limestones comprising the rest of the overburden material thickness. The angle of draw can vary slightly depending on the Glacial Drift and bedrock thicknesses for each location. The glacial drift, shales, claystones, and sandstones in this area are considered weak for the purposes of subsidence prediction modeling. The limestones are considered the hard rock within the overburden strata. The total percent of limestone within the total overburden is taken into account in the subsidence model. Due to the low total thickness of the limestones in the overburden in relation to the total overburden thickness, the magnitude of the subsidence is relatively high compared to the extraction height.

Planned subsidence may also be impacted by minor differences in the extraction height at the longwall face. The longwall mining system employed at the Deer Run Mine typically operates within the confines of the coal seam being mined. The Herrin No. 6 Coal seam thickness in the proposed shadow boundary area ranges from approximately seven feet to over nine feet. Due to equipment height restrictions, the minimum mining height is approximately eight feet. Since the longwall has been in operation at the Deer Run Mine, the mining height is typically between eight and ten feet. Depending on the geologic conditions in the immediate area of the face, the mining height can reach heights of twelve feet in certain areas. Minor variations in the geologic conditions within certain portions of the longwall face at any given time that could lead to a higher extraction height are impossible to precisely predict. Therefore, the subsidence prediction model assumes an average cutting height of nine feet four inches. The average extraction height was developed by correlating the actual subsidence monitoring data gathered from the mine subsidence in Panel No. 1 with the subsidence prediction model.

The modeling software used to model the subsidence of the Deer Run Mine is the SDPS (Surface Deformation Prediction System) version 6.0. This software was developed by the Department of Mining and Minerals Engineering, and the Virginia Center for Coal and Energy Research, Virginia Polytechnic Institute and State University. This software provides an integrated approach to subsidence prediction. It is very useful to mine planning engineers for calculating and predicting ground deformations above mined areas. The software has proven to be extremely accurate and an invaluable tool for predicting surface deformations over the Deer Run Mine. The accuracy of the models has been verified by extensive in-field survey monitoring over two longwall panels at the mine. The information is used to develop drainage enhancements to the valuable farm ground that overlies the longwall areas. Due to the number of parameters that contribute to the ultimate subsidence model calculated by the SDPS software, the angle of draw is variable. This software develops a higher degree of accuracy when predicting the minor fluctuations of the zero-subsidence line versus using a constant angle of draw. The surface movement along this outer edge is negligible and can only be measured by using surveying equipment.

A subsidence monitoring program was established at the Deer Run Mine upon the initial start-up of the longwall mining system in 2012. Subsidence monitoring was conducted over certain areas of the first two longwall panels. The monitoring was performed by using surface surveying methods to compare pre-subsidence conditions with post subsidence movements. Survey stations were established along several lines running parallel to, perpendicular with, and diagonally across the longwall panel(s). Monitoring occurred at different times depending on the location of the retreating longwall face as required by the subsidence control plan in Permit 399. The information that was collected from the subsidence monitoring program indicated the amount of surface movement as well as the duration that the movement occurred.

Refer to <u>Attachment IV.3.B.2 – Subsidence Monitoring and Prediction Analysis</u> for details of the comparisons between the subsidence prediction model as developed from the SDPS software and the actual monitoring data gathered from the first two longwall panels at the Deer Run Mine. Also included in this attachment is an angle of draw calculation to verify the accuracy of the model. Post subsidence contours over the proposed shadow boundary area are shown on <u>Map 8 – Post Subsidence Contour Map</u>.

3) On a plan base map(s), at a map scale of 1 inch to 400 feet provide a map of underground workings which locates all areas where planned subsidence mining operations are to be conducted. Include detailed information in regard to the location, length, width and height of projected panel development and extraction areas. Give typical percentage of coal removed in planned subsidence extraction areas.

RESPONSE: ***Refer Map 6 – Underground Operations Map for the locations of the longwall panels in which planned subsidence mining operations are to be conducted. Total percentage of coal to be removed in the longwall extraction area is 90%. The panels will typically be 1,400 feet wide and approximately 15,000 feet in length. The longwall typically has an average extraction height of approximately ± 9.0 feet.***

4) On the 1-inch to 400 feet plan base map(s) the information regarding the location of features required in Parts a-d below is to be provided in relation to areas of planned subsidence.

a) Identify all topographic features at a maximum contour interval of 10 feet.

RESPONSE: ***Contours and topographic features are shown on Map 6 – Underground Operations Map. These contours have been mapped at 2-feet intervals.***

b) Identify and label all impoundments with a storage capacity of 20 acre-feet or more, or bodies of water with a volume of 20 acre feet or more. In a written narrative, provide information which assures compliance with the requirement of Title 62 Ill. Adm. Code 1817.121(d) to permit such proposed mining operations. If no such features exist, provide a specific statement indicating such.

RESPONSE: ***The physical ground survey of the shadow area as well as the review of aerial photographs of the area indicates that one impoundment of more than 20-acre feet is located over the area planned for subsidence. The water reservoir, known as Coffeen Lake, is located over the Eastern edge of the projected mine panels. Refer to Map 6 – Underground Operations Map and Map 3 Pre-Mining Land Use Map. In accordance with 62 Illinois Administrative Code 1817.121(d), subsidence will not cause material damage to, or reduce the reasonably foreseeable use of the water body. The functionality of the lake will be maintained by reasonably keeping the lake within the confines of its current pre-mining boundaries. Refer to Map 8 – Post Subsidence Contour Map for the post-mining extents of the lake.***

The depth of the Glacial Drift in this location acts as a physical barrier between the lake and bedrock layers beneath. The Glacial Drift, or till, consists of unconsolidated materials deposited by glaciation during the last Ice Age that are virtually impermeable. Permeability testing was conducted on the unconsolidated till by Hurst-Rosche Engineers, Inc. to calculate hydraulic conductivity through the Glacial Drift. Laboratory testing on an undisturbed Shelby tube sample from approximately 7 ft. in depth in a boring located near the surface facilities of the mine site resulted in a permeability of $2x10^{-8}$ cm/sec. Refer to Attachment IV.3.B.4.b. – Hydrogeologic Investigation Report for the lab

data permeability data being referenced. An analysis of the drilling logs reveals that the unconsolidated materials are approximately 130 feet in thickness in the location of Coffeen Lake. Refer to Map 10 – Top of Bedrock Contour Map for the depths of the unconsolidated materials measured at the drilling locations.

It is anticipated that no stability issues would occur as a result of the settlement and deformation of the ground surface caused by mine subsidence. The Coffeen Lake Reservoir is completely incised with the exception of the earthen embankment located on the downstream (South) end of the lake. This embankment is not being proposed to be undermined in this permit application. Surface cracks in the upper soils caused by tensile strains induced by mine subsidence are common. However, the depth of the surface cracking resulting from the maximum surface tensile strains induced by the mine subsidence will be mitigated by the depth of the glacial till. The plasticity of the clay in the glacial till allows the material to bend instead of crack.

The lake is utilized as a cooling reservoir for the nearby Coffeen Power Station. This body of water does not serve as a significant water source for any public water supply system.

The presence of additional impoundments of 20 acre-feet capacity is unlikely over the area planned for subsidence. If, however, during the mining of the area impoundments of this capacity are identified, the subsidence control plan will be modified to assure the planned subsidence will not cause material damage to, or reduce the reasonably foreseeable use of such structures or facilities.

c) Identify and label all public road right-of-ways and cemeteries located within 100 feet measured horizontally of surface areas of predicted planned subsidence. In a written narrative, provide information which assures compliance with the requirements of Title 62 Ill. Adm. Code 1761.11 and 12 as may be necessary to permit planned subsidence mining operations within the prohibited area. If no such features exist, provide a specific statement indicating such.

RESPONSE: *Refer to Map 3 – Pre-Mining Land Use Map for the location of public roadways within 100 feet horizontally of surface areas of planned subsidence. Prior to such planned mining, the requirements of the referenced Code 1761.11 will be complied with, including the measures to minimize inconvenience to the users of such public roadways, and necessary waivers from the authority governing the use of these roads.*

Also refer to Map 3 – Pre-Mining Land Use Map for known cemeteries. In the event that cemeteries are to be affected by subsidence, where subsidence rights are not obtained, an agreement will be reached with the respective cemetery trustees or responsible party or parties, prior to subsidence occurring. Where subsidence rights have been obtained, an agreement will be reached with the

respective cemetery trustees or responsible party or parties, prior to subsidence occurring or a detailed damage minimization plan, approved by the Department, will be obtained prior to subsiding a cemetery. In order to minimize possible damage to monuments, a professional monument company will be contracted to prepare the cemetery for subsidence. After mining, all damages to the cemeteries and monuments will be repaired.

Other places denoted by 1761.11 have not been identified within the shadow area of the permit.

d) Identify and label all occupied dwellings, public buildings and facilities, schools, churches, hospitals, community or institutional buildings, or public parks located within 300 feet measured horizontally of surface areas of predicted planned subsidence. If no such features exist, provide a specific statement indicating such. If such features do exist, include the following information as may be necessary:

RESPONSE: ***Refer to Map 8a/b – Post Subsidence Contour Map for the location and types of all structures located within 300 feet measured horizontally of the surface areas of predicted planned subsidence. Also refer to Attachment II.10.A – Identification of Structures for a listing and identification of all structures currently within the proposed shadow boundary area.***

i) Provide a written narrative with support documentation which assures compliance with the requirements of Title 62 Ill. Adm. Code 1761.11 and 12 as may be necessary to permit planned subsidence mining operations within the prohibited area.

RESPONSE: ***Planned subsidence in areas designated by Title 62 Illinois Administrative Code 1761.11 (Areas Where Mining is Prohibited or Limited) will occur within 100 feet measured horizontally of the outside right of way line of public roads. The necessary waivers from the public authority governing these roads will be obtained or a detailed damage minimization plan approved by the Department prior to subsiding a public road.***

Planned subsidence is also anticipated within 300 feet of occupied dwellings. Where the right to subside does not exist, the necessary rights will be obtained prior to subsidence occurring.

Refer to Map 3 – Pre-Mining Land Use Map for known cemeteries. In the event that cemeteries are to be affected by subsidence, where subsidence rights are not obtained, an agreement will be reached with the respective cemetery trustees or responsible party or parties, prior to subsidence occurring. Where subsidence

rights have been obtained, an agreement will be reached with the respective cemetery trustees or responsible party or parties, prior to subsidence occurring or a detailed damage minimization plan, approved by the Department, will be obtained prior to subsiding a cemetery. In order to minimize possible damage to monuments, a professional monument company will be contracted to prepare the cemetery for subsidence. After mining, all damages to the cemeteries and monuments will be repaired.

Other places denoted by 1761.11 have not been identified within the area of planned subsidence of the permit.

There are no public buildings and facilities, schools, churches, hospitals, community or institutional buildings located within 300 feet measured horizontally of surface areas of predicted planned subsidence.

The Illinois Department of Natural Resources controls and manages property around the Coffeen Lake reservoir. This property can be identified on Map 3 – Pre-Mining Land Use Map as well as Map 2 – Identification of Interests, which includes the applicable parcel numbers and acreage.

ii) Provide a written narrative which assures compliance with the requirements of Title 62 Ill. Adm. Code 1817.121(d) as may be necessary to permit such proposed mining operations in relation to public buildings and facilities, schools, churches and hospitals.

RESPONSE: ***There are no public buildings and facilities, schools, churches, hospitals, community or institutional buildings located within 300 feet measured horizontally of surface areas of predicted subsidence.***

5) Describe the anticipated effects of planned subsidence.

a) Using the predicted magnitude, extent of planned subsidence profiles, post-subsidence contours and angle of draw provided in response to 4.B, above, provide a list of all structures and facilities located within the projected area of influence of the planned subsidence. The list provided must correspond to each panel or extraction area to be mined by planned subsidence mining methods and must cross-reference with surface structures and feature map(s).

RESPONSE: ***Structures identified within the Revision No. 2 shadow area are identified on Map 2 – Identification of Interests. Refer to Attachment I.2.A – Surface and Coal Ownership Within and Adjacent to Shadow Area of this revision application for the land owners of structures within the Revision No. 2 area.***

b) Using the predicted magnitude, extent of planned subsidence profiles and post-subsidence contours provided in response to B, 2, above, locate and identify all areas of where surface subsidence impacts are projected to cause disruptions of surface drainage or drainage problems on a map(s) at a 1" to 400' scale.

RESPONSE: ***Refer to Map 8 - Post Subsidence Contour Map. Shown on this map are areas where there are expected impacts caused by surface subsidence that could result in temporary surface drainage disruptions. The post mining contours were developed by the subsidence prediction modeling software (SDPS) and imported into a computer aided design (CAD) software package. Certain precipitation events developed by regional precipitation histories can then be simulated over the re-contoured area. This indicates where probable pooling will occur during the subsidence process. A generalized plan can then be developed to correct drainage disruptions. Upon subsidence occurring, common surveying methods, such as global positioning system (GPS), traverses, and/or the use of construction grade laser levels can be used to develop a site specific drainage correction plan. The plan can then be implemented to correct any drainage disruptions caused by surface subsidence.***

c) Describe any other anticipated effects of planned subsidence.

RESPONSE: ***As previously discussed in this application, planned subsidence will cause the surface areas located within the angle of draw and above the proposed longwall panels to change elevation. The amount of vertical and horizontal movement, as well as the degree of compressive and tensile strains induced by the subsidence can be accurately predicted. This prediction model has been correlated to actual surface subsidence monitoring that was conducted on the first two mined longwall panels at the Deer Run Mine. The monitoring was performed by using surface surveying methods to compare pre-subsidence conditions with post subsidence movements. Survey stations were established along several lines running parallel to, perpendicular with, and diagonally across the longwall panel(s). Monitoring occurred at different times depending on the location of the retreating longwall face as required by the subsidence control plan in Permit 399. The information that was collected from the subsidence monitoring program indicated the amount of surface movement as well as the duration that the movement occurred.***

Planned subsidence can also be expected to have an effect on water bearing sandstones or limestones within the subsidence zone. Typically, the subsidence can have a positive effect on the sandstones by increasing the porosity of the rock units. This Fracture Porosity will increase well yields if wells were drilled into these zones. With the generous amount of shales surrounding these zones, groundwater can be expected to migrate horizontally but not vertically. Potential impacts to the water bearing sandstones located within the area of planned subsidence are covered in the response to Part III.2.D of this application.

The uniform subsidence that occurs with longwall mining will give a predictable pattern. Structures within the subsidence area will experience movement. This movement will occur uniformly and predictably.

6) Describe, if any, measures to be taken on the surface to prevent or minimize the effects of planned subsidence.

RESPONSE: ***Measures to be taken on the surface to prevent or minimize the effects of planned subsidence may include the following:***

- ***Recontouring and drainage correction in agricultural areas. See response to Part IV.3.B.5.b above. Upon subsidence occurring, common surveying methods, such as global positioning system (GPS), traverses, and/or the use of construction grade laser levels can be used to develop a site specific drainage correction plan. The plan can then be implemented to correct drainage disruptions caused by surface subsidence.***
- ***Temporary support for surface structures, flexible utility connections***
- ***Exposure of pipelines***
- ***Regrading and re-ditching for roadways***

Specific actions will be determined for each structure prior to subsidence occurring.

As required by 1817.121(a)(3), Hillsboro Energy, LLC will implement damage minimization to all surface structures unless a pre-mining agreement with the structure owner is reached that precludes the need to minimize drainage.

7) Describe measures to be taken to mitigate or remedy any subsidence-related material damages.

a) Provide a description of mitigation measures to be taken to repair or compensate the owners of structures or facilities which sustain material damage caused by subsidence, including but not limited to the following:

i) Compensate the owner of structures or facilities in the full amount of the diminution in value resulting from the subsidence.

ii) Repair, restore, rehabilitate or replace damaged structures or facilities.

iii) Compensation may be accomplished by the purchase prior to mining of a noncancelable premium prepaid insurance policy payable to the surface owner in the full amount of the

possible material damage. Documentation of the purchase of such qualifying insurance must be provided.

RESPONSE: ***Hillsboro Energy, LLC will pursue premining agreements with owners of all structures potentially impact by planned subsidence. The agreements will detail measures designed to prevent or minimize subsidence damages and/or to outline an orderly procedure for the repair or replacement of damaged structures following subsidence. Hillsboro Energy, LLC may also pursue a written waiver from the structure Owner to not perform minimization procedures per 62 Illinois Administrative Code 1817.121(a)(3).***

Regardless of the existence of premining agreements with structure Owners, Hillsboro Energy, LLC will propose a presubsidence condition survey on all structures to determine the current condition. The condition surveys will be performed a minimum of 120 days in advance of projected subsidence impacts unless a shorter time frame is justified and approved by IDNR. A certified condition survey will be repeated to document all material damage caused by planned subsidence. A contractor will then be employed to provide estimates of the total cost of repair to presubsidence conditions. Hillsboro Energy, LLC will then propose a plan to repair or replace the structure to presubsidence condition or compensate the Owner for the amount of repair up to the presubsidence appraised value. All costs associated with condition surveys, appraisals and repair estimates will be the responsibility of Hillsboro Energy, LLC.

Refer to Addendum No. 1 to the UCM-1 Application covered in Part VI of this permit applciation, for additional information concerning damage minimization, repair, replacement or compensation of structures impacted by subsidence.

b) Provide a description of measures adopted to control and correct material damage resulting from subsidence caused to surface lands, to the extent technologically and economically feasible, by restoring the land to a condition capable of maintaining the value and reasonable foreseeable uses which it was capable of supporting before subsidence. Also provide descriptions of specific repair measures recommended to remedy anticipated material damages detailed in 7.a above.

RESPONSE: ***Longwall mining provides predictable and uniform subsidence patterns. Pre-mining contours have been developed by aerial mapping. This mapping provides a basis to determine the extent of subsidence to the lands. The post mining contours were developed by the subsidence prediction modeling software (SDPS) and imported into a computer aided design (CAD) software package. Certain precipitation events developed by regional precipitation histories can then be simulated over the re-contoured area. This indicates where probable pooling will occur during the subsidence process. A generalized plan can then be developed to correct drainage disruptions. Upon subsidence occurring, common surveying***

methods, such as global positioning system (GPS), traverses, and/or the use of construction grade laser levels can be used to develop a site specific drainage correction plan. The plan can then be implemented to correct any drainage disruptions caused by surface subsidence. Any impacts that may impair the value or use of the lands will be mitigated to insure the land reaches a condition capable of maintaining the value and reasonable foreseeable uses which it was capable of supporting prior to subsidence.

Hillsboro Energy, LLC, or an agent thereof, will promptly inspect the lands affected by subsidence in order to determine the extent of the subsidence impacts. Hillsboro Energy, LLC will take the necessary measures to restore proper field drainage including, but not limited to, the installation of new field drainage tile around and through subsided areas to eliminate pooling, repairing and/or resizing and replacing existing field drainage tiles, deepening and repairing existing drainage ways, and installing new drainage ways where necessary. In many cases, the current drainage of the existing farm fields can be improved upon after the subsidence occurs. This is due to the fact that within the Shadow Area, a regional drainage system does not exist. This results in many areas that currently pool water in wet periods because the landowners do not have downstream locations to drain water without getting approval from several other landowners affected by the drainage correction. The subsidence allows a comprehensive drainage plan to be developed by requiring drainage corrections. Current drainage issues not caused by surface subsidence can be corrected by Hillsboro Energy, LLC and the agents thereof, by involving all landowners in whom subsidence rights are obtained. This can result in crop yield increases in certain areas that were not previously possible prior to subsidence occurring.

Hillsboro Energy, LLC will develop appropriate mitigation plans for all necessary drainage repairs on a site specific basis. This will be accomplished by utilizing the subsidence prediction modeling software prior to subsidence occurring and by using surveying techniques and field evaluations after the subsidence has occurred. Drainage restoration plans will typically be made in consultation with the landowners and/or the respective tenant farmers. This allows the landowners and/or tenant farmers input on the drainage corrections and improvements to be made on their respective properties. For farm production lands where subsidence impacts crop production, Hillsboro Energy, LLC will compensate the landowner for acreage temporarily taken out of production or any crop loss resulting from subsidence, until such time that the land's drainage is restored and the land returned to its pre-mining use. Crop losses will be compensated for based on the average yields the property has provided historically, the land area disturbed, and the price of the crop that was lost.

Lands taken out of production due to creation of newly designed drainage ways will be minimized where ever practical by working with existing drainage ways. Where this is not practical, for any area taken out of production to facilitate

placement of permanent drainage ways, compensation will be made to the landowner at an agreed upon value.

Similar to crop land, any wooded areas impacted by subsidence will be properly drained to preserve the pre-mining land use and prevent tree damage.

c) In conjunction with subsidence control plans to mitigate subsidence-related material damage to land and structures, provide a description of measures to be taken to determine the degree of material damage or diminution of value or reasonable foreseeable use of the surface.

RESPONSE: *FOR LAND: The land will be restored to the extent that the land was capable of supporting prior to subsidence. The restoration plan may include drainage correction to restore drainage patterns.*

FOR STRUCTURES: A pre-subsidence survey will be performed on structures prior to subsidence occurring. This survey will include photographic and sketched documentation of the condition of the structures in a pre-subsidence condition. The survey will be performed by a person trained and experienced in performing such surveys.

A report will be generated including a description of the structure including photographs and documentation of the physical condition of the structure. A copy will be provided to the structure owner and any comments to the survey will be addressed.

After subsidence has occurred, a post subsidence survey will be performed in the same manner and procedures as the pre-subsidence survey. Any changes to the structure due to subsidence will be noted and will provide a basis to determine the extent of material damage to the structure.

If a dispute between the landowner and permittee occurs over the existence, amount, level or degree of material damage, then the following procedures will be sought:

i. Permittee will obtain the services of a licensed appraiser.

ii. The Land Owner will obtain the services of a licensed appraiser.

iii. Each appraiser shall perform an independent review of the property to determine the existence, amount, level or degree of material damage;

iv. If an agreement can not be reached, then both appraisers shall agree on a third licensed appraiser. If an agreement can not be made on a third

appraiser; then a referee, who need not be a licensed appraiser would be sought through the local Judicial Authority.

v. *Each appraiser shall provide his/her appraisal to the third appraiser/referee and upon receipt of the appraisals, the third appraiser and/or referee shall promptly select one or the other of the appraisals, without modification, as the final determination of the existence, amount, level or degree of material damage.*

***FOR STREAM SUBSIDENCE:** Specific actions will be determined for each stream channel prior to subsidence occurring.*

Drainage corrective measures will be coordinated with the land owners as necessary.

A post subsidence inspection will be performed on affected stream channels and, if necessary, a plan will be prepared and communicated to the USACOE to determine if the corrective measures are located within jurisdictional waters. If they are jurisdictional, a USACOE Permit will be obtained. Upon approval of any necessary USACOE permit, the drainage corrective activities will be performed.

As stated in the affidavit contained herein in Attachment I.10.A – Mining Affidavits in this application, the applicant has or will possess, prior to subsidence, all necessary rights to correct drainage problems associated with subsidence.

***FOR ROADWAYS, PIPELINES, TRANSMISSION LINES, UTILITIES:** The Permittee will pursue agreements with governmental bodies and utility companies responsible for all public roadways, utility lines, and buried pipelines expected to be affected by subsidence. Such agreements, to be negotiated well in advance of subsidence, will allow the implementation of measures designed to prevent or minimize subsidence damage and/or outline a timely procedure for the repair or replacement of damaged facilities following subsidence. These agreements will vary in scope and content, and will be site specific for each such facility.*

In accordance with 62 ILL. Adm. Code 1784.20 b) 8), the convenience and safety of the public will be a high priority in the development and implementation of such cooperative agreements.

Refer to Attachment IV.3.B.7.c – Utilities Agreements Status for additional information concerning the owners of Roadways, Pipelines, Transmission Lines and Utilities and the current status of the agreements for Permit 399.

C) Subsidence Unplanned (Maximize Mine Stability)

1) Describe the method of coal removal which is designed consistent with known technology to maximize mine stability to prevent or minimize subsidence and subsidence related damage so that if subsidence does occur it cannot be considered planned subsidence.

RESPONSE: ***The majority of the mining employed at the Deer Run Mine is planned subsidence mining using the longwall mining method. There is a small portion of the mine, however, that is room and pillar mining. The room and pillar mining method is used at the Deer Run Mine to develop Mains, Gate, and Bleeder Entries for the longwall mine that extracts coal from the Herrin No. 6 Coal Seam. The Mains Entries are typically developed with six entries on 100-foot centers. The maximum entry and crosscut width is 20 feet. The Gate Entries are typically developed three entries wide and are mined the length of the longwall panel. The crosscut centers are typically 120 feet and the entry width is 18 to 20 feet wide. The Bleeder Entries are utilized for long term ventilation and examination airways at the back end of the longwall panels. The Bleeder Entries typically consist of five entries and are heavily supported with standing roof support for long term protection. A coal barrier pillar is left between the end of the longwall panel and the Mains Entries. The average extraction height in the continuous miner development units typically ranges between 9 and 12 feet depending on the immediate geology of the area being mined.***

The room and pillar mining method, as described, is intended to provide protection against unplanned surface subsidence. Mine stability is assessed using site-specific strength values of the coal seam. Accurate surveying of the mine workings, as required by law, assures that the plans implemented are carried out in the operation. Pillar centers are selected to provide adequate safety factors to maintain roof stability. In addition, adequate sizing of pillars prevent the pillar from failing under load, or undue settlement into the underlying strata; all of which could lead to surface damage. Analysis of Retreat Mining Pillar Stability (ARMPS) Software was used to determine the safety factor of the room and pillar mining. Factors of Safety were calculated on the smallest pillar size, and the largest crosscut and entry widths. Refer to Attachment IV.3.C.1 – Geotechnical Information for pillar stability calculations.

2) On the shadow area map(s) describe in 2,E, above, or other designated map show all areas where coal extraction as described above in 3,C,1 is to occur. Include the following detailed information:

   a) Provide the location of mains, submains and extraction panels giving geometric sizes, dimensions and orientation including lengths, widths, and extraction heights of each.

RESPONSE: ***Refer to Map 6 – Underground Operations Map for the locations of proposed mains, submains, and extraction panels giving sizes, dimensions, and orientations. Refer to the response located in Part IV.3.C.1 above and the***

response located in Part IV.3.B.2 for explanations on the typical widths and extraction heights utilized in the mining process.

b) Identify and label all impoundments with a storage capacity of 20 acre-feet or more, or bodies of water with a volume of 20 acre feet or more, public buildings and facilities, churches, schools and hospitals. In a written narrative, provide information which assures compliance with the requirements of Title 62 Ill. Adm. Code 1817.121(d) as may be necessary to permit such proposed mining operations. If no such features exist, provide a specific statement indicating such.

RESPONSE: ***Refer to Map 2 - Identification of Interests and Map 3 – Pre-Mining Land Use Map. Coffeen Lake is the only impoundment having a storage capacity of 20 acre-feet or more located above the areas of unplanned subsidence mining. A portion of Coffeen Lake is also located above the area of planned subsidence. In accordance with 62 Illinois Administrative Code 1817.121(d), unplanned subsidence will not cause material damage to, or reduce the reasonably foreseeable use of the water body. The functionality of the lake will be maintained by reasonably keeping the lake within the confines of its current pre-mining boundaries. Refer to Map 8 – Post Subsidence Contour Map for the post-mining extents of the lake. The lake is utilized as a cooling reservoir for the nearby Coffeen Power Station. Unplanned subsidence would only deepen the water reservoir in that specific location increasing the functionality of the lake as a cooling pond. The more total water volume in the lake, the more cooling ability it will have.***

The depth of the Glacial Drift in this location acts as a physical barrier between the lake and bedrock layers beneath. The Glacial Drift or till consists of unconsolidated materials deposited by glaciation during the last Ice Age that are virtually impermeable. Permeability testing was conducted on the unconsolidated till by Hurst-Rosche Engineers, Inc. to calculate hydraulic conductivity through the Glacial Drift. Laboratory testing on an undisturbed Shelby tube sample from approximately 7 ft. in depth in a boring located near the surface facilities of the mine site resulted in a permeability of $2x10^{-8}$ cm/sec. Refer to Attachment IV.3.B.4.b. – Hydrogeologic Investigation Report for the lab data permeability data being referenced. An analysis of the drilling logs reveals that the unconsolidated materials are approximately 130 feet in thickness in the location of Coffeen Lake. Refer to Map 10 – Top of Bedrock Contour Map for the depths of the unconsolidated materials measured at the drilling locations.

It is anticipated that no stability issues would occur as a result of the settlement and deformation of the ground surface caused by mine subsidence. The Coffeen Lake Reservoir is completely incised with the exception of the earthen embankment located on the downstream (South) end of the lake. This embankment is not being proposed to be undermined in this permit application.

Surface cracks in the upper soils caused by tensile strains induced by mine subsidence are common. However, the surface cracking resulting from the maximum surface tensile strains induced by the mine subsidence will be mitigated by the depth of the glacial till. The plasticity of the clay in the glacial till allows the material to bend instead of crack.

Coffeen Lake also does not serve as a significant water source for any public water supply system.

c) Provide calculations for the estimated potential angle of draw.

RESPONSE: ***Refer to <u>Attachment IV.3.B.2 – Subsidence Monitoring and Prediction Analysis</u> for details of the comparisons between the subsidence prediction model as developed from the SDPS software and the actual monitoring data gathered from the first two longwall panels at the Deer Run Mine. Also included in this attachment are angle of draw calculations to verify the accuracy of the model. Post subsidence contours over the proposed shadow boundary area are shown on <u>Map 8 – Post Subsidence Contour Map</u>.***

3) Provide information regarding proposed mining extraction geometries, including information on the dimensions of pillars, extraction widths of rooms, entries, and crosscuts, etc., for all mains, submains, panel entries and all development areas. Provide information regarding the highest extraction percentage for each of the mining geometries proposed by the operator, if variations are proposed. Information is to include specific details of the effects of any proposed second mining operations on final mining geometries and extraction percentages. Map(s) at a scale of 1 inch to 400 feet (other scales as approved by the Department) are to be provided representing all proposed extraction geometries, including any proposed second mining.

Provide information regarding the design engineering of the various mining geometries proposed in 3,C,3 above in maximizing mine stability to prevent subsidence. Include the following:

i) Detailed information regarding the specific methodology used to calculate mine stability with support documentation and design calculations.

ii) Data concerning actual coal strengths typical of the coal to be mined and as this information relates to pillar design and stability.

iii) Data regarding the strength and geotechnical characteristics of the actual mine floor and subfloor as it relates to mine

design and stability. Information is to be included describing the thickness and lithology of the floor and subfloor units.

RESPONSE: ***Refer to Attachment IV.3.C.1 – Geotechnical Information for pillar stability calculations and for additional information regarding the mining extraction geometries.***

4) Provide detailed descriptions of subsidence control measures that will be taken to prevent or minimize subsidence and subsidence-related damage which includes, but is not limited to the following:

a) Backstowing or backfilling, include map locations;

RESPONSE: ***Backstowing or backfilling is not proposed at this operation.***

b) Leaving areas in which no coal is removed within the shadow area, including a description of the overlying area to be protected by solid coal blocks left in place. Identify any such areas by map locations;

RESPONSE: ***Besides barrier pillars and mains development, all other areas are planned subsidence.***

c) Surface measures taken to prevent material damage or lessening of the value of reasonably foreseeable uses of the surface;

RESPONSE: ***Refer to the response in Part IV.3.C.5.a below.***

d) Monitoring, if any, to determine the commencement and degree of subsidence so that other appropriate measures can be taken to prevent or reduce material damage. Include map locations of any proposed monitoring sites.

RESPONSE: ***No monitoring is proposed on areas of unplanned subsidence.***

5) Describe measures to be taken to mitigate or remedy any subsidence-related material damages.

a) Provide a description of mitigation measures taken to repair or compensate the owners of structures or facilities which may be materially damaged by subsidence, including but not limited to the following:

i) Compensate the owner of structures or facilities in the full amount of diminution in value resulting from the subsidence.

ii) Repair, restore, rehabilitate or replace damaged structures or facilities.

iii) Compensation may be accomplished by the purchase prior to mining of a noncancelable premium prepaid insurance policy payable to the surface owner in the full amount of the possible material damage. Documentation of the purchase of such qualifying insurance must be provided.

RESPONSE: ***Subsidence related material damage is not anticipated in the South Mains area shown in Map 6 – Underground Operations Map. Adequate pillar blocks will be designed for long term stability which will prohibit overburden movement from occurring.***

However, if subsidence related material damage is identified, the Permittee will repair or reimburse the owner for identified damages, if any, which occur to the surface and to any improvements located on the surface owned by others which are caused by subsidence resulting from its mining activities. Pre-subsidence surveys will be the basis of damage assessment. Coordination with applicable owners, utilities and governmental agencies will be established to ensure restoration, repair or reinstallation of infrastructure features to the capability and condition of such features prior to subsidence. Restoration, repair or reinstallation of such features will be initiated in a timely matter after subsidence occurs. Structure and facility owners will be reimbursed for actual out-of-pocket expenses after subsidence is complete. A post-subsidence survey and/or appraisal will be performed to determine the extent of subsidence damage. Mitigation measures with respect to surface structures and facilities will be undertaken at Hillsboro Energy, LLC's expense where material damage has incurred as a result of subsidence. Mitigation of material damages due to subsidence could include one of the following: restoration to its pre-subsidence capability and condition; replacement with a structure having the same capability and in the full amount of any diminution in value of the original structure; purchase of the structure at its pre-subsidence appraised value; or compensation to the owner of the structure for any loss or damage incurred.

b) Provide a description of measures adopted to control and correct material damage resulting from subsidence caused to surface lands, to the extent technologically and economically feasible, by restoring the land to a condition capable of maintaining the value and reasonably foreseeable uses which it was capable of supporting before subsidence.

RESPONSE: ***Where structures are not involved, a method capable of supporting the foreseeable use of the surface land affected by subsidence will be utilized. Such methods may drain a subsided area by re-contouring the surface, filling the***

subsided area to permit drainage, and/or develop an underground agricultural drainage system to drain the area.

c) In conjunction with the requirements to mitigate subsidence-related material damage to land, and structures provide a description of measures to be taken to determine the degree of material damage or diminution of value or reasonable foreseeable uses of the surface.

RESPONSE: ***Pre-mining contours have been documented by 2 foot incremental aerial mapping. This mapping is shown on Map 3 – Pre-Mining Land Use Map and Map 6 - Underground Operations Map. This will provide a baseline to determine the extent of any subsidence impacts to surface lands.***

When Hillsboro Energy, LLC (Permittee) is contacted regarding potential surface subsidence damage, a representative will arrange a personal meeting to respond to the inquiry and make a visual inspection documenting the details of the claimed damage. In areas of alleged damages not clearly defined, a structural engineer or other qualified person will be retained to inspect and evaluate the property and provide a written report, stating conditions of the alleged damages as well as probable causes. Once the details of the damage have been identified and documented, representatives of the Permittee will appraise the alleged claim and propose a resolution or compensation.

If the property owner is dissatisfied with the proposed resolution, differences will be resolved through arbitration or litigation.

4) Existing Structures

A) Provide a description of each existing structure proposed to be used in connection with or to facilitate the surface coal mining and reclamation operations. The description shall include the following:

1) Locate the structure on the operations map or other designated map,

2) Provide plans of the structure detailing its current, pre-mining condition,

3) Provide approximate dates, beginning and completion for construction of the structure, and

4) Provide a showing that the structure meets the performance standards of either 62 Ill. Adm. Code Sections 1810 through 1828 or 62 Ill. Adm. Code Sections 280-300 (Interim Regulation Program). The showing shall monitor data or other substantiating evidence.

RESPONSE: ***No Existing Structures are proposed to be used in connection with or to facilitate the surface coal mining and reclamation operations.***

B) For each structure proposed to be modified or reconstructed for use in connection with or to facilitate the surface coal mining and reclamation operations a compliance plan is required which shall include the following:

1) Design specifications for reconstruction or modification of the structure to meet the design and performance standards of 62 Ill. Adm. Code Sections 1810 through 1828.

2) A schedule for reconstruction or modification of the structure showing dates for beginning and completing interim steps as well as final reconstruction,

3) Provisions for monitoring the structure during and after modification to ensure that the performance standards of 62 Ill. Adm. Code Sections 1810 through 1828 are met, and

4) A showing that the risk of harm of the environment or to public health or safety is not significant during the period of modification or reconstruction.

RESPONSE: ***No Existing Structures are proposed to be used in connection with or to facilitate the surface coal mining and reclamation operations.***

5) Support Facilities

A) Locate on a mining operations map each of the areas to be permitted for surface disturbance to facilitate the mining operation. Map shall include all support facilities including buildings, structures, conveyors, parking areas, coal preparation plants, yards, railroad spurs, on-site rail yards, each air pollution collection and control facility, each facility to be used to protect and enhance fish and wildlife and related environmental values, and each explosive storage and handling facility.

RESPONSE: ***N/A. No additional surface facilities are being proposed by this revision.***

B) Indicate acreage of each type of facility within permit area such as: buildings, roads, railroads, parking areas, pavements, loading and unloading facilities, sanitary facilities, and undeveloped areas. (Summation of above areas should equal total support facility area.)

RESPONSE: ***N/A. No additional surface facilities are being proposed by this revision.***

SUPPORT AREA		ACRES
Mine Buildings		
Mine Office Parking		
Mine Yard		
Preparation Plant Buildings		

Prep Plant Parking		
Prep Plant Yard		
Refuse Area		
Railroad		
Access Roads (Roads and Shoulders)		
Topsoil Storage		
Dirt Stockpile		
Drainage Facilities		
Coal Storage		
Mine Support Areas		
Plant Support Areas		
Other		
Undeveloped Areas		
TOTAL		

C) Transportation Facilities

1) Provide a detailed description on mining operations map or other map and show location of the following:

a) Proposed road(s), conveyor system(s), or rail system.

b) Related sediment control facilities.

c) Earth borrow locations and/or locations for deposition of excess excavation.

RESPONSE: ***N/A. No additional transportation facilities are proposed by this revision.***

2) Provide specifications and plan-profiles of existing gradeline, proposed road centerline, ditch flow lines, road cut, fill embankment, culvert, bridge and drainage structures. Provide typical cross sections where appropriate.

RESPONSE: ***N/A. No additional transportation facilities are proposed by this revision.***

3) For all transportation facilities to be constructed, provide construction details for all sediment control facilities to be constructed to prevent additional contributions of suspended solids to streamflow or to runoff outside the permit area.

RESPONSE: ***N/A. No additional transportation facilities are proposed by this revision.***

4) Discuss the revegetation of ditch and borrow areas involved in construction.

RESPONSE: ***N/A. No ditches or borrow areas are proposed by this revision.***

5) Discuss the estimated life of each facility and how materials will be removed when the facility becomes inactive.

RESPONSE: ***N/A. No additional transportation facilities are proposed by this revision.***

6) Provide a report of appropriate geo-technical analysis where approval from the Department is required for alternative specifications or steep cut slopes under 62 Ill. Adm. Code 1817.150.

RESPONSE: ***N/A. No additional transportation facilities are proposed by this revision.***

7) Provide a description of measures to be taken to protect the inlet end of a ditch relief culvert, other than use of a rock headwall, and for alteration or relocation of a natural drainageway for approval by the Department under 62 Ill. Adm. Code 1817.150.

RESPONSE: ***N/A.***

6) Waste Material

A) Identify the nature of all waste material including shaft excavation material and non-coal waste to be disposed of within the permit area. Give the net neutralization potential.

RESPONSE: ***N/A. This application is to address expansion of the approved shadow area.***

B) Coal processing waste bank dams shall be designed to comply with requirements of 62 Ill. Adm. Code 1817.81 through 1817.84. For coal processing waste dams and embankments each plan shall comply with the requirements of MSHA, 30 CFR 77.216-1 and 77.216-2, and shall contain the results of a geo-technical investigation as prescribed under 62 Ill. Adm. Code 1784.16(e).

RESPONSE: ***N/A. This application is to address expansion of the approved shadow area.***

C) Indicate location of all areas in which such materials including shaft excavation material and non-coal waste (including those under Subtitle C of RCRA) are to be disposed of on the mining operations map. Indicate all streams, creeks, and surface water impoundments within such areas or which receive runoff from such areas. Provide acreage of disposal area and borrow areas. Indicate location of borrow area on mining operations map.

RESPONSE: ***N/A. This application is to address expansion of the approved shadow area.***

D) Provide construction details for all impoundments and structures to contain such waste material. Provide typical cross-sections of all proposed levees, dams and excavations.

RESPONSE: ***N/A. This application is to address expansion of the approved shadow area.***

E) Indicate location and provide details for diversions as necessary to divert surface water around such areas on the mining operations map.

RESPONSE: ***N/A. This application is to address expansion of the approved shadow area.***

F) Provide details of diversions or other devices designed to collect surface runoff from waste disposal sites and transport same to appropriate treatment facility.

RESPONSE: ***N/A. This application is to address expansion of the approved shadow area.***

G) Provide details of such treatment facilities and identify points of discharge.

RESPONSE: ***N/A. This application is to address expansion of the approved shadow area.***

H) For disposal areas explain measures to be taken to avoid pollution of surface or groundwater due to leaching through levees or dams and through underlying soil.

RESPONSE: ***N/A. This application is to address expansion of the approved shadow area.***

I) Describe estimated life of each area.

RESPONSE: ***N/A. This application is to address expansion of the approved shadow area.***

J) Coal preparation:

1) Give a general description of the coal processing operation at this facility.

RESPONSE: ***N/A. This application is to address expansion of the approved shadow area.***

2) Describe the fresh water (makeup) and slurry circuits for this operation and indicate if a discharge occurs. If a discharge does occur, it should be included on Schedule A. If a discharge does not occur, a detailed description of how this will be accomplished must be submitted.

RESPONSE: ***N/A. This application is to address expansion of the approved shadow area.***

3) What safeguards are provided to prevent the discharge of slurry fines and untreated slurry water during emergency situations (e.g. power outages, mechanical equipment breakdown, plant shutdowns, etc.)? Also indicate

where the slurry would go by gravity flow in the event of an emergency discharge, and the environmental impact this would have.

RESPONSE: ***N/A. This application is to address expansion of the approved shadow area.***

7) Surface Drainage Control

A) 1) Locate on the mining operations map or on a separate drainage map all proposed drainage control systems. Show drainage patterns of all affected mining areas.

RESPONSE: ***N/A. This application is to address expansion of the approved shadow area.***

2) Will all surface drainage from the affected mining area be collected and treated prior to leaving the permit area?

Yes _____ No _____

If yes, delineate how and where surface drainage will be collected and treated, and list permit numbers and type of permit that the drainage control systems are operated under. If above answer is no, explain how regulatory compliance will be achieved without treatment, i.e., address the requirements of Section 1817.46(e).

RESPONSE: ***N/A. This application is to address expansion of the approved shadow area.***

B) Will all surface drainage from unaffected areas be intercepted and diverted around the affected mining area?

Yes _____ No _____

If no, please discuss.

RESPONSE: ***N/A. This application is to address expansion of the approved shadow area.***

C) Describe the timing in which all construction of the sediment ponds and surface drainage control structures will be complete. Include a discussion of the vegetation stabilization of these structures.

RESPONSE: ***N/A. This application is to address expansion of the approved shadow area.***

D) Overland Flow Diversions

For all diversions of overland flow, shallow groundwater flow, and ephemeral streams which divert surface water around the mining area, and all collection drains that transport affected area runoff into water-treatment facilities, provide the following:

1) Typical cross sections bottom width, side slopes and depth.

2) Proposed flow line slopes.

3) Runoff and diversion capacity calculations.

4) Details of proposed erosion and sediment control measures to be employed.

RESPONSE: ***N/A. This application is to address expansion of the approved shadow area.***

For permanent diversion also include:

5) Watershed limits upstream from the diversions.

RESPONSE: ***N/A. This application is to address expansion of the approved shadow area.***

6) Plan profile drawings of the proposed diversion showing existing gradeline, proposed diversion bottom gradeline and water surface at design storm.

RESPONSE: ***N/A. This application is to address expansion of the approved shadow area.***

E) Sediment pond Design:

NPDES
MSHA#
Total Drainage Area (Acres)
Total Disturbed Drainage Area (Acres)
Total Calculated Inflow From Design Storm (AC-FT)
Sediment Storage Volume (AC- FT)
Total Volume Below Primary Spillway Elevation (AC-FT)
Total Volume Below Emerg. Spillway Elevation (AC-FT)

RESPONSE: ***N/A. This application is to address expansion of the approved shadow area.***

NPDES	MSHA #	Total Drainage Area (ac.)	Total Disturbed Area (ac.)	Total Calculated Inflow from Design Storm (ac-ft)	Sediment Storage Volume (ac-ft)	Total Volume Below Primary Spillway (ac-ft)	Total Volume Below Emergency Spillway (ac-ft)	Embankment Height from Upstream Toe to Emergency Spillway (ft)

F) 1) Discuss the design basis for the sediment pond(s) calculations.

Submit calculations used in spillway designs and determination of inflow volume and pond volume.

RESPONSE: ***N/A. This application is to address expansion of the approved shadow area.***

2) Submit a typical section of the embankment(s), details of the principal and emergency spillways and a plan view of each pond at a scale of 1 inch = 200 ft. or larger showing pond bottom contours and points of inflow.

RESPONSE: ***N/A. This application is to address expansion of the approved shadow area.***

3) For all sedimentation ponds provide design information showing compliance with the requirements of 62 Ill. Adm. Code 1817.46. Each plan shall, at minimum, comply with the requirements of MSHA, 30 CFR 77.216-1 and 77.216-2.

RESPONSE: ***N/A. This application is to address expansion of the approved shadow area.***

G) If sediment removal becomes necessary, explain how the sediment will be removed, where it will be disposed of, and what disposal methods will be used.

RESPONSE: ***N/A. This application is to address expansion of the approved shadow area.***

H) Will pH adjustment be necessary on any of the discharges in order to meet the applicable State and Federal Standards?

Yes _____ No _____

If yes, a discussion of the situation is necessary, along with a detailed basis of design. The basis should include a detailed description of the proposed treatment facilities, process flow diagrams, and design calculations.

RESPONSE: ***N/A. This application is to address expansion of the approved shadow area.***

I) Does a perennial or intermittent stream occur within the proposed permit area?

Yes _____ No _____

If yes, is an exception to the 100-foot buffer zone being requested or is a stream diversion being proposed. For exception to the 100-foot buffer zone, indicate how compliance with Section 1817.57 will be assured. For a stream diversion, complete Part V 6) of the application form.

RESPONSE: ***N/A. This application is to address expansion of the approved shadow area.***

J) Permanent and Temporary Impoundments, Ponds, Banks, Dams and Embankments

1) All temporary and permanent impoundments must meet the requirements of 62 Ill. Adm. Code 1817.49. Will the mining operation involve the construction of any impoundments other than those waste retention?

Yes _____ No _____

If yes, include the following information:

a) Locate on mining operations map all impoundments, dam locations, and watershed limits, indicate which impoundments are proposed to be permanent and complete Part V 3)D) of the application.

RESPONSE: ***N/A. This application is to address expansion of the approved shadow area.***

b) Provide construction and maintenance details of dams, spillways, seepage control measures, and erosion control measures for inlets and outlets. Employ maps and cross sections where necessary. Where design plans for proposed structures are not provided, submit a certification statement providing a schedule for submission of detailed design plans for each structure.

RESPONSE: ***N/A. This application is to address expansion of the approved shadow area.***

2) Describe proposed reclamation plans for each structure, including a time table and plans for removal and disposal of material. Each plan shall:

a) Be prepared by or under the direction of, and sealed by a qualified registered professional engineer licensed under the Illinois Professional Engineering Act,

b) contain a description, map, and cross-section of the structure and its location,

c) contain preliminary hydrologic and geologic information required to assess the hydrologic impact of the structure,

d) if underground mining has occurred, the plan shall contain a survey describing the potential effect on the structure from subsidence of the subsurface strata resulting from the post underground mining operations,

e) for structures where the detailed design plans are not submitted to the Department with the general plan, the plan shall contain a certification statement which includes a schedule setting forth the dates that detailed design plans are to be submitted. For these structures, the detailed design plans must be submitted to the Department and approved in writing prior to the beginning of construction.

RESPONSE: ***N/A. This application is to address expansion of the approved shadow area.***

3) For each structure that meets or exceeds the size or other criteria of MSHA, 30 CFR 77.216(a), the detailed design plan shall:

a) Be prepared by or under the direction of and sealed by a qualified registered professional engineer licensed under the Illinois Professional Engineering Act,

b) include any design and construction requirements for the structure, including any required geo-technical information,

d) describe the operation and maintenance requirements for each structure, and

e) describe the timetable and plans for removal of each structure if appropriate.

RESPONSE: ***N/A. This application is to address expansion of the approved shadow area.***

4) For each structure that does not meet the size or other criteria of MSHA, 30 CFR 77.216(a), the detailed plan shall:

a) Be prepared by or under the direction of and sealed by a qualified registered professional engineer licensed under the Illinois Professional Engineering Act,

b) include any design and construction requirements for the structure, including any required geo-technical information,

b) describe the operation and maintenance requirements for each structure, and

c) describe the timetable and plans for removal of each structure if appropriate.

RESPONSE: ***N/A. This application is to address expansion of the approved shadow area.***

K) If any of the following questions are answered yes, a permit may be needed from Illinois Department of Natural Resources, Office of Water Resource Management.

RESPONSE: ***N/A. This application is to address expansion of the approved shadow area.***

1) Will the mining operation involve the construction of any levees, dikes, haul roads or other similar structures or the placement of any fill along or in the flood plain of any stream serving a drainage area of ten (10) square miles or greater at the point of construction?

Yes _____ No _____

2) Will the mining operation involve any relocation or diversion of or any construction activity in, over, under or along the banks of any stream serving a drainage area of ten (10) square miles or greater at the point of construction?

Yes _____ No _____

3) Is there any urban development (residential, commercial or industrial uses) in the areas immediately surrounding the mining operation?

Yes _____ No _____

(If yes, please re-answer questions 1 and 2 above applying a one (1) square mile drainage area limit.)

4) Will the mining operation involve the construction, major modification, or removal of any dam which in the event of failure would have probability for loss of life or additional economic loss in excess of that which would occur downstream of the dam in the absence of the dam?

Yes _____ No _____

5) Will the mining operation involve the construction, major modification, or removal of any dam 25 feet or more in height?

Yes _____ No _____

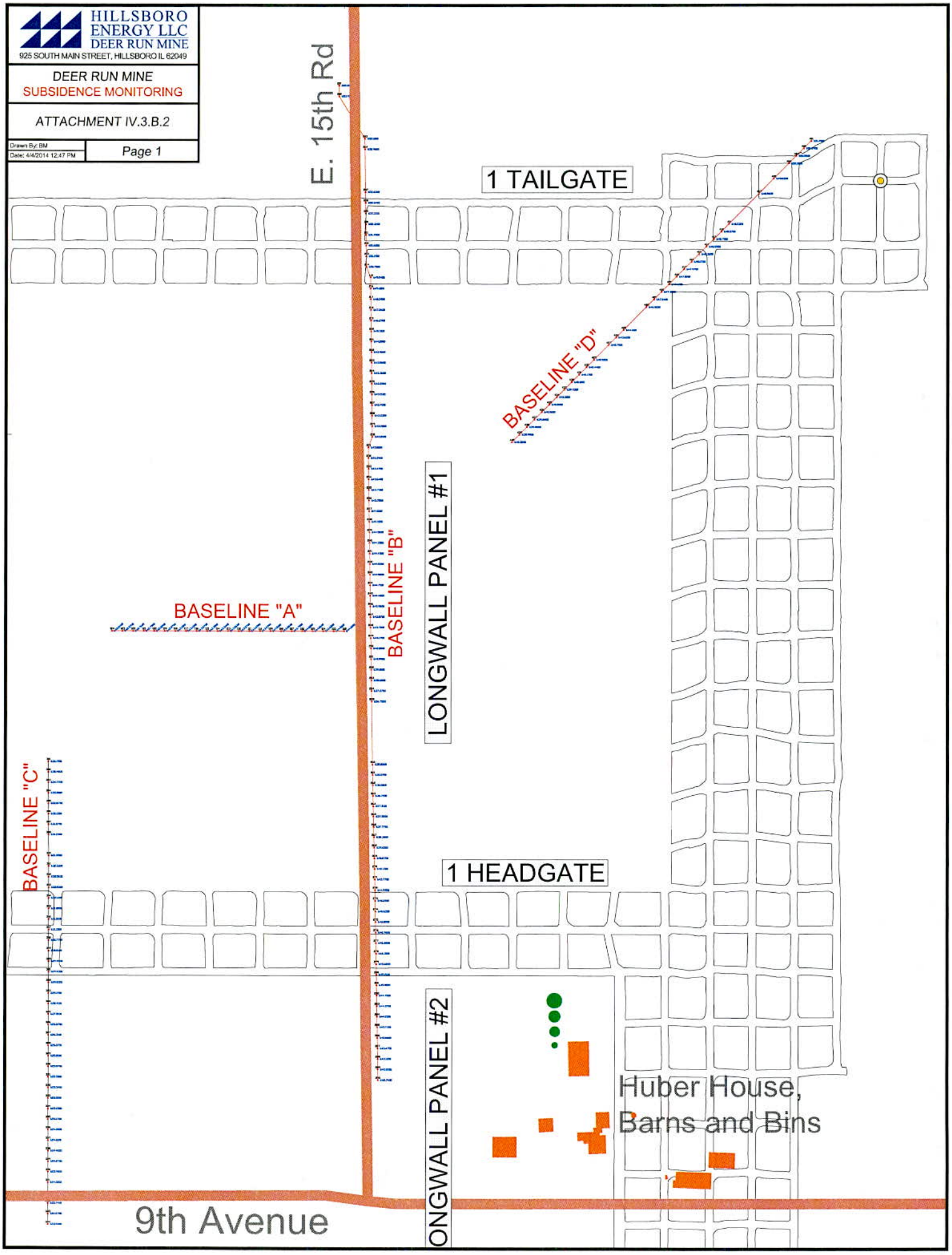
6) Will the mining operation involve construction, major modification, or removal of any dam which would have an impounding capacity of 50 acre feet or more?

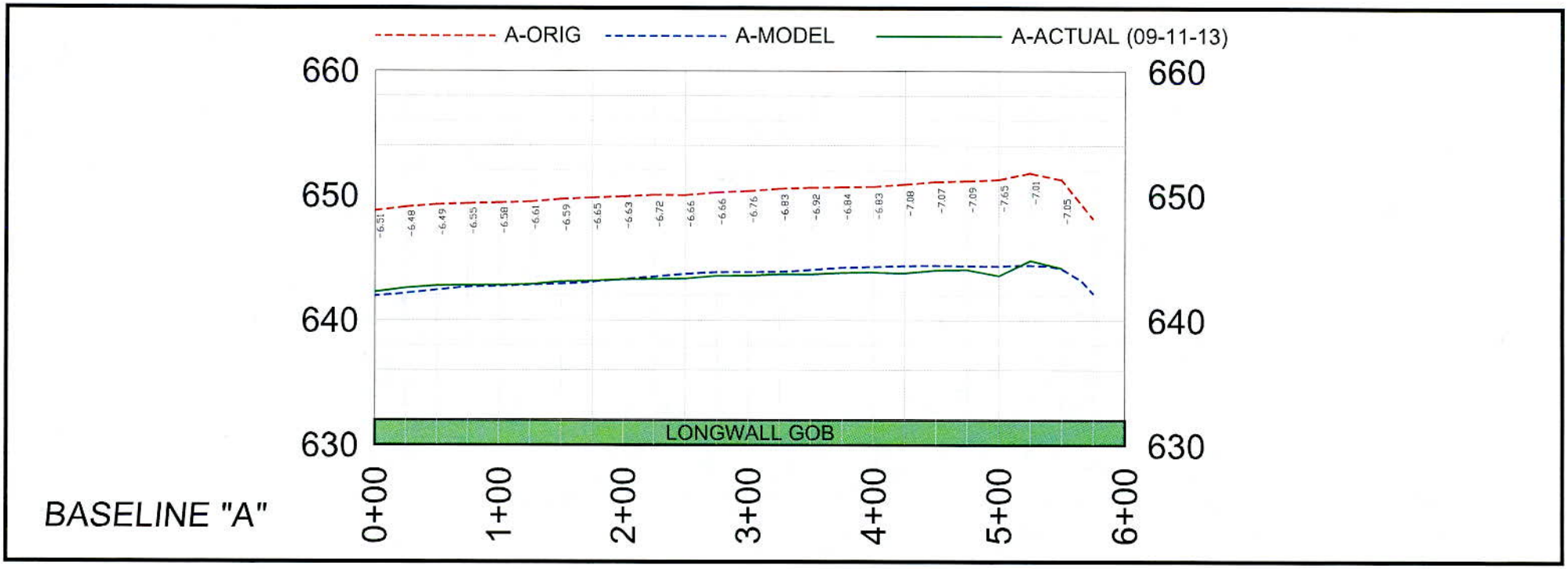
Yes _____ No _____

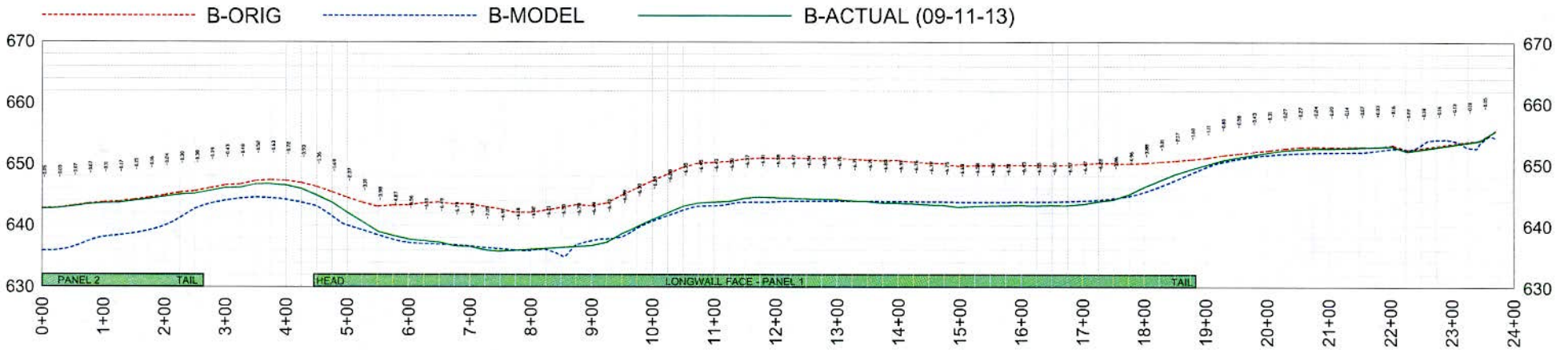
8) Provide a plan detailing fugitive dust control practices to be employed during proposed surface coal mining and reclamation operations as required under 62 Ill. Adm. Code 1817.95.

RESPONSE: ***N/A. This application is to address expansion of the approved shadow area.***

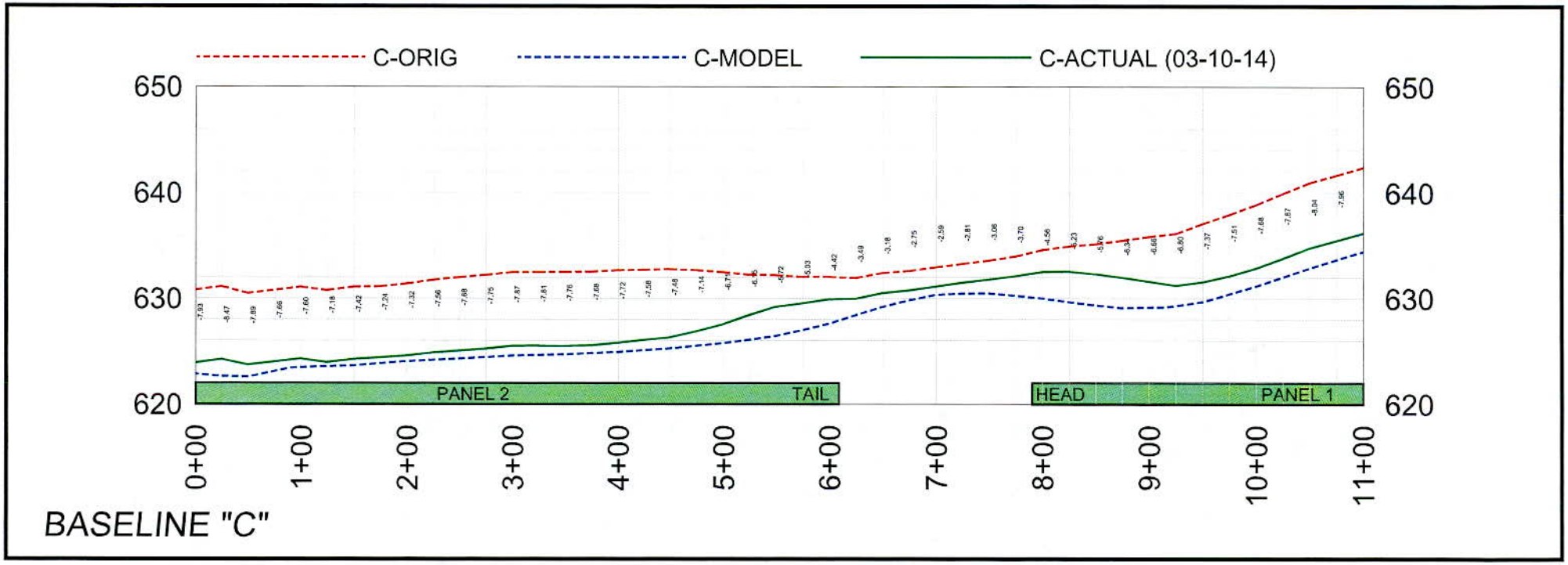
ATTACHMENT IV.3.B.2
SUBSIDENCE MONITORING AND PREDICTION ANALYSIS


HILLSBORO ENERGY LLC
DEER RUN MINE
925 SOUTH MAIN STREET, HILLSBORO IL 62049
DEER RUN MINE
SUBSIDENCE MONITORING
ATTACHMENT IV.3.B.2
Drawn By: BM
Date: 4/4/2014 12:47 PM
Page 1
E. 15th Rd
1 TAILGATE
BASELINE "D"
BASELINE "B"
LONGWALL PANEL #1
BASELINE "A"
BASELINE "C"
1 HEADGATE
LONGWALL PANEL #2
Huber House,
Barns and Bins
9th Avenue

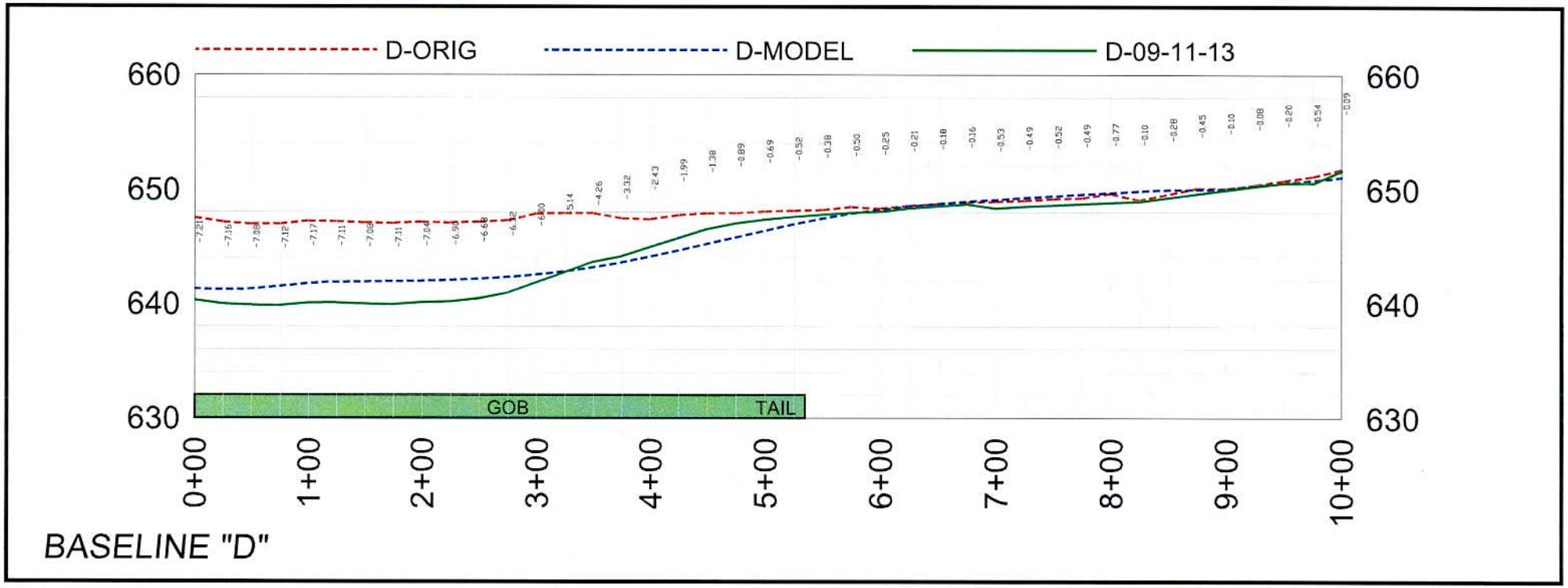

A-ORIG
A-MODEL
A-ACTUAL (09-11-13)
660
650
640
630
-6.51
-6.48
-6.49
-6.55
-6.58
-6.61
-6.59
-6.65
-6.63
-6.72
-6.66
-6.66
-6.76
-6.83
-6.92
-6.84
-6.83
-7.08
-7.07
-7.09
-7.65
-7.01
-7.05
LONGWALL GOB
0+00
1+00
2+00
3+00
4+00
5+00
6+00
BASELINE "A"


B-ORIG
B-MODEL
B-ACTUAL (09-11-13)
670
660
650
640
630
PANEL 2
TAIL
HEAD
LONGWALL FACE - PANEL 1
TAIL
0+00
1+00
2+00
3+00
4+00
5+00
6+00
7+00
8+00
9+00
10+00
11+00
12+00
13+00
14+00
15+00
16+00
17+00
18+00
19+00
20+00
21+00
22+00
23+00
24+00

BASELINE "B"


C-ORIG
C-MODEL
C-ACTUAL (03-10-14)
650
640
630
620
PANEL 2
TAIL
HEAD
PANEL 1
0+00
1+00
2+00
3+00
4+00
5+00
6+00
7+00
8+00
9+00
10+00
11+00

BASELINE "C"


D-ORIG
D-MODEL
D-09-11-13
660
650
640
630
GOB
TAIL
0+00
1+00
2+00
3+00
4+00
5+00
6+00
7+00
8+00
9+00
10+00

BASELINE "D"

ATTACHMENT IV.3.B.4.b
HYDROGEOLOGIC INVESTIGATION REPORT

Hydrogeologic Investigation
Portions of Sections 7 and 18
East Fork Township (North Half)
Montgomery County, Illinois

Prepared for

Hillsboro Energy, LLC
Hillsboro, Illinois

February 4, 2009

TABLE OF CONTENTS

I. INTRODUCTION

Hurst-Rosche Engineers, Inc. has completed a hydrogeologic investigation for an approximate 290 acre parcel of property to be added to the permit area for Deer Run Mine (Permit No. 399). The investigation included the completion of four subsurface borings, and installation of two piezometer/monitoring wells. In addition, soil samples have been collected at selected locations and these samples have been analyzed for classification and remolded permeability characteristics. A process of monthly groundwater sampling and analysis has also been implemented. These activities have been completed with the purpose of identifying subsurface conditions and characterizing hydrogeologic conditions within the added permit area.

The added permit area is to be used for mine waste disposal. A map identifying the specific project area has been presented in Appendix A. The 290 acre parcel is located in Sections 7 and 18, T8N, R9W (North Half of East Fork Township), Montgomery County, Illinois. This parcel is intended to be added to the original 803.5 acre mine permit area.

Hydrogeologic investigations have been completed in conjunction with the original mine permitting process. These investigations also included the completion of subsurface borings, installation of shallow and deep piezometer/monitoring wells, laboratory testing, and analytical analyses. The results of these investigations have been presented in the following reports:

- Hydrogeologic Investigation, Portions of Sections 7, 8, 17, and 18, East Fork Township, Montgomery County, Illinois, Prepared by Hurst-Rosche Engineers, Inc., September 14, 2007, Revised November 15, 2007.

- Supplemental Hydrogeologic Investigation, Portions of Sections 7, 8, 17, and 18, East Fork Township, Montgomery County, Illinois, Prepared by Hurst-Rosche Engineers, Inc., December 10, 2008.

These reports have been referenced throughout this report. Information gathered from the previous investigations, in conjunction with more recent information, has been used collectively to characterize hydrogeologic conditions in the added permit area and adjacent areas.

II. FIELD INVESTIGATION

Four borings (Nos. 35 through 38) were completed at selected locations within the added permit area. These borings were completed using hollow stem augering techniques, and split-spoon samples were collected at 2.5 ft. intervals at each boring location. Each boring was extended to a 30 ft. depth. Boring locations have been identified on a site map presented in Appendix A, and logs of the borings have been presented in Appendix B. The locations of borings completed in the mine permit area in conjunction with previous investigations have also been identified on the map in Appendix A.

Two piezometer/monitoring wells were installed in conjunction with the recent investigation. One well was installed adjacent to the Boring 35 location, and the second well was installed adjacent to a previous boring location (Boring 4). Each well was screened within the uppermost aquifer. Well installations were completed in accordance with industry recognized procedures. Two inch diameter pre-manufactured PVC well screens and risers were utilized. A sand pack was placed around each well screen, and the well screen was

sealed with a bentonite plug. The well anulus above the bentonite plug was filled with a cement/bentonite slurry. Following well installation, each well was developed by removing a minimum of five gallons of water from the well. Water was removed using a stainless steel bailer. The well locations have been identified on the map in Appendix A. Well completion reports have been presented in Appendix B.

In addition to completion of borings and well installations, Shelby tube samples were collected at selected depths at selected boring locations. Collected samples were used to complete classification and permeability testing. Testing procedures and results have been discussed in Section III below. Bail tests were completed at the two well locations for the purpose of identifying in-situ permeability of the shallow aquifer. Results of this testing have been presented in Appendix D, and the results have been discussed in Section VI below.

Two geologic cross sections have been developed from the boring information. These cross sections present anticipated subsurface conditions within the added permit area. Stratigraphic horizons have been delineated on the cross sections based on the geologic history of Montgomery County, site topographic features, and subsurface conditions encountered at the boring locations. The cross sections (Sections D-D and E-E) have been presented in Appendix A.

III. LABORATORY TESTING

Samples recovered from the Boring 36 (2 ft.-5 ft. depth) and Boring 38 (6 ft.-10 ft. depth) locations have been used to complete classification and permeability testing. Specifically, mechanical analysis (ASTM D422) has been completed and index properties (ASTM D4318) have been determined to classify the samples; and permeability testing (ASTM D5084) has been completed to determine conductivity characteristics of in situ and remolded samples. The samples were remolded to approximately 90% and 95% standard Proctor density at a moisture content near optimum prior to conductivity testing. Also, permeability testing has been completed on a Shelby tube sample collected from the 7 ft. depth at the Boring 38 location. Laboratory test results have been summarized and presented in Appendix C, and test results have been discussed in Sections V and IX below.

As indicated in Section II above, groundwater samples were collected from the installed wells. These samples were delivered to Teklab, Inc. in Collinsville, Illinois for analysis of total metals and other selected parameters. Analytical results have been presented in Appendix F. Monthly sampling and analysis of groundwater is to continue.

IV. PHYSIOGRAPHIC LOCATION AND SITE TOPOGRAPHY

The project site is located in the Springfield Plain of the Till Plains Section, Central Lowland Province. The Springfield Plain generally consists of flat to gently rolling plains which were formed during glacial advancements into Illinois. The glacial advancements left behind large amounts of glacial remnants and have produced extensive till plains. Subsequent or later glacial activity produced morainic ridges and outwash plains. Most of the steep and long ridges as originally deposited have been reduced by erosion to rounded hills. The moronic topography is characteristic of the immediate Hillsboro area, and other areas throughout the county.

The site topography is generally described as flat, with overall relief in the added permit area less than 10 ft. Surface water runoff from the site is generally westward via surface flow and drainage ditches toward a pond identified as Shoal Creek Watershed Structure No. 5. This

water body is located approximately ¼ mile west of the added permit area. Surface water runoff in the northeastern corner of the site is northeastward toward a tributary to the Big Four Reservoir. This reservoir, or lake, is approximately 1/2 mile north of the project site. A majority of the site is tillable, with timber and brushy areas immediately adjacent to local drainageways.

V. GEOLOGIC CHARACTERISTICS

Geologic maps suggest that unconsolidated deposits in the project area are expected to be in excess of 100 ft. thick. The primary subsurface soils are identified as Vandalia Till. These soils are characteristically compact, hard, silty till with intercolated sand and gravel. Due to depositional history, the till may contain intermittent and discontinuous sand seams. Loessial soils up to approximately 5 ft. thick may be present at ground surface.

Reference to the boring logs and geologic cross sections suggest that subsurface conditions are generally characterized as a medium stiff to stiff, clay to silty clay (ablation till) being present down to approximately 15 ft. below ground surface. The compact, very stiff to hard Vandalia till (basal till) was present beneath the ablation till soils. The Vandalia till extends down to bedrock. Depth to bedrock in the project area varies from approximately 100 ft. to 150 ft. below ground surface.

A saturated sand seam(s) was encountered at the base of the ablation till at the north end of the added permit area. Sand thickness varied from approximately 2.5 ft. to 5.5 ft. thick. The sand was absent at the boring locations at the south end of the added permit area. An intermittent sand seam was also encountered within the Vandalia till at the Boring 36 location. The thickness of the isolated sand seam was approximately 2.5 ft.

Classification testing of collected soil samples suggests the fine grained ablation till soils within the added permit area classify as a lean clay (CL), and generally contained approximately 25% clay, 60% silt, and 15% sand, with a liquid limit of 35 and a plasticity index of 15. Laboratory testing on an undisturbed sample from the approximate 7 ft. depth at the Boring 38 location resulted in a permeability of $2x10^{-8}$ cm/sec. Soil samples remolded to approximately 95% standard Proctor density at a moisture content near optimum resulted in permeabilities of $2x10^{-7}$ cm/sec (Boring 36) and $3x10^{-7}$ cm/sec (Boring 38). Soil samples remolded to a lesser compactive effort resulted in significantly greater permeabilities. Further discussion of soil suitability for recompacted soil liner construction has been presented in Section IX below.

The geologic characteristics described above for the added permit area are consistent with geologic characteristics throughout the mine permit area.

VI. HYDROGEOLOGIC CHARACTERISTICS

As indicated in Section V above, a saturated sand seam was encountered within 15 ft. to 20 ft. of ground surface at the north end of the added permit area, and groundwater was evidenced as being present within 15 ft. at the southern end of the site. Accordingly, the uppermost aquifer at the site appears to be associated with the sand seam and/or the upper ablation till soils. Shallow piezometer/monitoring wells installed in conjunction with this investigation (Wells 4 and 35) and wells installed within the original permit area, have been screened within the sand seam, and screened to intercept the surface of the apparent water table.

As indicated in Section V above, an intermittent and discontinuous granular outwash deposit was encountered within the Vandalia till at the Boring 36 location. Intermittent and discontinuous outwash deposits have been encountered throughout the mine permit area. The depth and thickness of the outwash units does not suggest the sand was uniformly deposited throughout the area in a manner to form a consistent aquifer.

Although detailed and supporting information has not been presented within this report, any bedrock aquifers which may exist within or adjacent to the mine permit area are not consistently used as a domestic water source. There are no water wells within the mine permit area, including the added permit area, and a majority of the domestic water wells within or near the mine shadow area are shallow wells screened within unconsolidated deposits.

A. Uppermost Aquifer

As indicated above, the uppermost aquifer is identified as being associated with saturated sand seams located within 15 ft. to 20 ft. of ground surface, and/or the upper ablation till soils where sand seams are not present.

1. Flow Direction, Gradient, and Discharge Rate

Water level measurements taken in January 2009 in piezometer wells suggest the direction of groundwater flow across the added permit area is generally east to west. Based primarily on site topography, flow in northeastern areas of the site is anticipated to flow northeasterly. The flow gradient across the site is estimated to be less than 0.005 ft/ft. A summary of recorded water level measurements and a piezometric surface map have been presented in Appendix E.

Reference to the summary table in Appendix E will indicate water level measurements have been recorded for piezometer wells associated with the mine permit area since September 2007. Reference to the table will also indicate the groundwater level throughout the mine permit area has generally been approximately 10 ft. below ground surface, with fluctuations from well to well. Further, seasonal fluctuations have been experienced, with higher water levels being recorded in late winter. These trends are expected to be representative of groundwater level fluctuations anticipated within the added permit area.

Groundwater discharge is briefly defined as the removal of water from the saturated area. Discharge can be accomplished through exfiltration; direct discharge to surface via springs, rivers, or lakes; or induced removal of groundwater through means of production wells, field tiles, underground water works, etc. In a balanced system, the rate of discharge is essentially equivalent to the rate of recharge. In reality, transient flow is likely, especially for shallow aquifers. Considering these conditions, the rate of discharge for the shallow aquifer in the added permit area cannot be identified with certainty, however can be discussed generally. Given the ephemeral nature of the drainageways/ditches within the added permit area, discharge to these areas is expected only during seasonal high groundwater periods. Similarly, discharge to water bodies, such as Structure No. 5 to the west, is also expected to be seasonal with longer duration. As indicated

above, there are no domestic water wells within the permit area, therefore induced removal of groundwater is not expected.

In-situ conductivity testing resulted in permeabilities of $7x10^{-5}$ cm/sec and $6x10^{-4}$ cm/sec. at the Well 4 and Well 35 locations, respectively. Test results have been presented in Appendix D.

2. Water Quality

Groundwater monitoring wells installed within or adjacent to the permit area have been sampled on a monthly basis since September 2007. Collected groundwater samples have been analyzed for specific parameters, including pH, TDS, hardness, alkalinity, acidity, sodium, sulfate, iron, manganese, nitrate and chloride. Two additional wells have been installed within or immediately adjacent to the added permit area. These wells were sampled in January 2009, and the collected groundwater samples have been analyzed for the noted parameters. The recent test results have been presented in Appendix F.

Based on the initial analytical results, parameter concentrations at the Well 4 and Well 35 locations are generally consistent with parameter concentrations at other wells within the mine permit area, however specific concentrations (sodium, sulfate, nitrate, and chloride) were noted to be somewhat elevated at the Well 35 location. Monthly sampling and analysis is to continue at these well locations. Additional data can be used to assess seasonal trends in groundwater quality.

Reference to the water quality data presented in Appendix F will indicate that parameter concentrations for iron, manganese, and nitrate are above Class I groundwater standards established in 35 IAC 620.410.

B. Herrin Coal (No. 6 Seam)

To assess the presence of water associated with the coal seam to be mined, at Deer Run Mine three piezometer wells have been installed within the mine shadow area, and the wells were screened within the coal seam. Well installations were completed using rotary drilling methods, whereby an 8-5/8 inch diameter steel casing was set to bedrock. The borehole was then drilled to a depth just above the coal seam, and a 5-1/2 inch diameter steel casing was set inside the larger diameter casing. Both casings were grouted with cement, including the interstitial space between the casings. Drilling fluid was then removed from the well, and the borehole was advanced into the coal seam using potable water as the drilling fluid. This water was also removed from the borehole, with exception of a few feet of water at the base of the borehole. A 3-inch diameter PVC well screen and riser pipe were then set within the steel casing. The riser pipe was extended to ground surface, thereby allowing continuous access to the screened area.

Following well installations as described above, each coal seam well was developed by bailing a specified quantity of water from the well. This was done to insure potable water previously introduced to the well was removed, and to propogate flow to the well. The coal seam wells were installed in Sections 17, 19, and 28 of East Fork

Township (North Half). Well construction logs have been presented in the December 2008 supplemental hydrogeologic report.

1. Flow Direction, Gradient, and Discharge Rate

   Following well development, water level measurements were recorded for the coal seam wells, and bailing operations were continued. This process was repeated to insure water entering the well was indeed seepage from the coal seam, and to assess well recovery and/or stabilization. Also, slug or bail tests were completed to assess infiltration and/or permeability of the coal seam. Results of in-situ conductivity testing suggest the permeability of the coal seam varies from 1×10^{-6} cm/sec to 2×10^{-8} cm/sec.

   Water was present within the coal seam, and based on static water levels within the wells, the water appears to be present under confined conditions. Well installations were completed in October and November 2008. Water levels within the wells have been measured on a routine basis, and water levels within Wells 2 and 3 apparently have not yet stabilized. Accordingly, flow direction and gradient within the coal seam cannot yet be determined with confidence. Water level measurements will continue to be recorded at all three well locations until stabilized conditions are achieved. A summary of water level measurements to date has been presented in Appendix G.

   Due to the impermeable nature of the coal seam, the rate of groundwater discharge from the coal seam is expected to be minimal.

2. Water Quality

   Water samples were collected from each coal seam well following well development activities. Collected samples were analyzed for selected parameters. Results of these analyses have been presented in the December 2008 supplemental hydrogeologic report.

   Reference to the water quality data will indicate that parameter concentrations were generally consistent from well to well, with slightly higher concentrations noted at the Well 1 location for selected parameters (e.g. lead, chromium, etc.). Salinity concentrations suggest the water is highly saline.

3. Potential as Potable Water Source

   Information generated from the coal seam investigation suggests the Herrin No. 6 seam has very limited potential as a potable water source. This conclusion is based on the apparent low permeability of the coal seam and associated ability to produce reliable quantities of water for consumption or production use. Further, results of sampling and analyses suggest the water quality is not suitable for consumption. Specifically, parameter concentrations for barium, chloride, chromium, iron, lead, manganese, and TDS are above water quality standards established in 35 IAC 620.410 for Class I (potable resource) groundwater. Also, the water is highly saline.

VII. CUMULATIVE IMPACT AREAS

The cumulative impact area (CIA) is defined as the area, including the added and original permit areas, within which impacts resulting from the proposed mining operation may interact with the impacts of all anticipated mining on surface and groundwater systems. The cumulative impact areas as described below, have been identified on a topographic map presented in Appendix H.

A. Surface Water

As described in Section IV above, drainage from the added permit area is primarily directed westward to a water body known as Shoal Creek Watershed No. 5 Structure. This water body discharges to an unnamed tributary to the Middle Fork of Shoal Creek, known locally as Central Park Creek. Discharge to the Middle Fork of Shoal Creek is approximately 2 miles downstream of Structure No. 5. Central Park Creek migrates through the City of Hillsboro, and a majority of surface water drainage within the city is directed to this creek. The drainage basin for Central Park Creek is estimated to be approximately 2,400 acres. The watershed of the Middle Fork of Shoal Creek, including the Central Park Creek basin, encompasses approximately 88 square miles (56,320 acres). Considering a total mine permit area of 1,094 acres, the combined permit area represents approximately 45% of the Central Park Creek drainage basin, and less than 2% of the Middle Fork of Shoal Creek basin upstream of the confluence with Central Park Creek. The drainage basins for Structure No. 5 and Central Park Creek have been identified on the topographic map in Appendix H.

Following site development, it is understood all surface water having contact with coal refuse is to be directed to the Structure No. 5 drainage basin. Considering this, it is recommended the surface water CIA for the total mine permit area be established as the drainage area associated with the unnamed tributary to the Middle Fork of Shoal Creek (Central Park Creek). This area has been identified on the topographic map in Appendix H. Areas 1 and 2 combined represent the limits of the proposed surface water CIA.

No active mining operations are known to exist within the surface water CIA, and no future mining operations within the surface water CIA are known to be proposed, with exception of possibly expanding the Deer Run Mine permit area to contiguous property(ies). Past mining did occur within the surface water CIA. Specifically, Hillsboro Coal Company Mine No. 1 operated an underground mine from 1888 to 1941, and mined the Herrin No. 5 seam. The former hoisting shaft location is shown on the topographic map presented in Appendix H. The shaft has been sealed, and no refuse piles associated with the mine are reported to be present within the surface water CIA (reference 1).

B. Groundwater

Groundwater recharge for the shallow aquifer within the added and original permit areas is primarily through surface water percolation. Piezometric mapping suggests groundwater flow within the upper aquifer generally conforms with topographic conditions, and as such shallow groundwater flow in the added and original permit areas and adjacent areas is expected to generally conform with surface drainage conditions. Accordingly, it is recommended the groundwater CIA for the total mine permit area be established to coincide with the drainage area associated with Shoal Creek Watershed

No. 5 Structure (Area 1), along with small areas to the east. These additional areas (identified as Areas 3 and 4 on the topographic map in Appendix H) encompass approximately 151 acres, and represent areas whereby shallow groundwater beneath the added permit area could flow northeastward and impact these areas. Following site development, the extent of the groundwater CIA will encompass approximately 1,462 acres. Considering a permit area of 1,094 acres, the permit area will represent approximately 75% of the groundwater CIA.

No other active mining operations are known to exist within the groundwater CIA, and no future mining operations within the groundwater CIA are known to be proposed, with exception of possibly expanding the Deer Run Mine permit area to contiguous property(ies). Underground mining associated with the former Hillsboro Coal Company Mine No. 1 progressed into northwestern areas of the groundwater CIA, however no surface facilities associated with this former mine are located within the groundwater CIA.

The combined (groundwater and surface water) cumulative impact areas have been identified on the topographic map presented in Appendix H. Areas 1, 3, and 4 on the map, when combined, represent the limits of the proposed groundwater CIA; and Areas 1 and 2 combined represent the limits of the proposed surface water CIA.

VIII. GROUNDWATER MONITORING PROGRAM

Given the hydrogeologic conditions described herein, it is recommended the groundwater monitoring program for site development activities be focused on monitoring the uppermost aquifer. Accordingly, it is recommended site monitoring wells be screened within the upper ablation till soils, and specifically the upper sand units. The well screens should be positioned at least 10 ft. below ground surface. A minimum of one monitoring well should be located hydraulically upgradient of impoundment and disposal areas. Remaining wells should be located downgradient and/or sidegradient of impoundment and disposal areas to assess facility impacts. An interwell monitoring program is recommended, however, it is also suggested adequate background data be assimilated at monitoring well locations to assess future intrawell trends if necessary. Well locations and spacing should be based on final facility configurations and associated hydrogeologic conditions.

IX. RECOMPACTED SOIL LINER

As indicated in Sections III and V above, fine-grained soil expected to be excavated from the added permit area in conjunction with development of coal refuse disposal cells is generally classified as a lean clay (CL) with a liquid limit of approximately 35, and a plasticity index of 15. Permeability testing has been completed on soil samples remolded to approximately 90% and 95% standard Proctor density at a moisture content near optimum. The samples remolded to approximately 95% compaction resulted in permeabilities of $2x10^{-7}$ cm/sec (Boring 36) and $3x10^{-7}$ cm/sec (Boring 38), while the samples remolded to approximately 90% compaction resulted in significantly greater permeabilities. Recompacted soil liners used to line coal refuse disposal cells are to maintain a permeability of $1x10^{-7}$ cm/sec or less.

Considering the noted test results, it is recommended that additional testing be completed to verify the suitability of site soils for construction of recompacted soil liners. It is further recommended that a proto-type test liner be constructed using anticipated construction

equipment and construction procedures. Samples from the test liner can then be collected and tested to identify permeabilities resulting from actual liner construction.

X. LIMITATIONS OF REPORT

This assessment and report have been completed with the intent of determining hydrogeologic characteristics at the project site, and presenting analyses and recommendations based on those characteristics. The information presented in this report is based on data obtained from site reconnaissance, borings completed at the site, laboratory test results, well and water level data, published information, and other pertinent information presented in this report. Information presented is not intended to be a guarantee that all geologic and hydrogeologic conditions described herein will be consistent. There may be, and often is, a considerable variation in subsurface conditions within the same general area.

XI. REFERENCES

References: 1. Information from Mr. Joseph Pelc, IDNR Abandoned Mines Land Reclamation Division, Springfield, Illinois.

APPENDIX A

Boring Location Map and Cross Sections

- Mine Floor Safety Factor
- Summary of Geotechnical Data of Floor Core
- Detailed Lithology Log of Floor Core

ATTACHMENT IV.3.C.1
GEOTECHNICAL INFORMATION

HR
HURST–ROSCHE ENGINEERS INC.
PROFESSIONAL DESIGN NUMBER: 184-000250
1400 EAST TREMONT ST.
HILLSBORO, IL 62049
PH: 217.532.3959
F: 217.532.3212
MARION, IL
EAST ST. LOUIS, IL
SPRINGFIELD, IL

N

GRAPHIC SCALE
600' 300' 0 600'

DEER RUN MINE
HILLSBORO ENERGY, LLC
MONTGOMERY COUNTY, ILLINOIS

MARK	DATE	DESCRIPTION
	FEB. 2009	

PROJECT NO: 183-4298

DESIGN:	DRAWN:	CHECK:
D.H.K.	M.L.K.	D.H.K.

BORING LOCATION MAP

1

APPENDIX B

Boring Logs and Well Completion Reports

Hillsboro Energy Borings
Section 17, East Fork Township
Northwest Corner White Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: January 2-3, 2007
BORING TECH.: D. Jenkins / C. Greenwood
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 4 (08-03-17-02)
COORDINATES: N903013.3
E2498019.6
SURFACE ELEV.: 633.5 ft.

GROUNDWATER ELEV.
COMP.: - -
AFTER 48 HRS.: 0.0 ft.;
Bridge at -8.6 ft.

		N Value	Qu (tsf)	W (%)	REC (%)
0	SILTY CLAY LOAM (CL-ML), Brown, Moist				
	Brown, Gray, Mottled, Stiff		P		
5		20	2.0	--	70
			P		
10	CLAY (CL), Brown, Gray, Mottled, Stiff, Little Sand & Gravel	41	2.3	--	100
	With Saturated Sand Seams		P		
15		11	0.5	--	100
			P		
20	SILTY LOAM TILL (ML), Gray, Dry To Moist, Hard, Trace Gravel	100/4.5"	1.5	--	75
20	CLAY TILL (CL), Gray, Moist, Hard, Little Sand		P		
25	Coarse Sand Seam At 25 Ft.	100/2"	>4.5	--	90
			P		
30	Gray, Dry, Hard, Trace Sand & Gravel	100/2"	>4.5	--	90
			P		
35		80	>4.5	--	85
			P		
40		55	>4.5	--	100

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 17, East Fork Township
Northwest Corner White Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: January 2-3, 2007
BORING TECH.: D. Jenkins / C. Greenwood
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 4 (08-03-17-02)
COORDINATES: N903013.3
E2498019.6
SURFACE ELEV.: 633.5 ft.

GROUNDWATER ELEV.
COMP.: --
AFTER 48 HRS.: 0.0 ft.;
Bridge at -8.6 ft.

		N Value	Qu (tsf)	W (%)	REC (%)			N Value	Qu (tsf)	W (%)	REC (%)
CLAY TILL (CL), Gray, Dry, Hard, Trace Sand & Gravel	40		P				60				
	45	43	>4.5	--	100		65	19	--	--	35
			P						P		
	50	37	>4.5	--	100		70	17	3.0	--	100
			P			Hard			P		
Very Stiff	55	29	>4.5	--	95		75	35	>4.5	--	100
			P						P		
	60	29	3.8	--	100		80	56	>4.5	--	100

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 17, East Fork Township
Northwest Corner White Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: January 2-3, 2007
BORING TECH.: D. Jenkins / C. Greenwood
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 4 (08-03-17-02)
COORDINATES: N903013.3 E2498019.6
SURFACE ELEV.: 633.5 ft.

GROUNDWATER ELEV.
COMP.: --
AFTER 48 HRS.: 0.0 ft.;
Bridge at -8.6 ft.

		N Value	Qu (tsf)	W (%)	REC (%)
80	CLAY TILL (CL), Brown, Dry, Hard, Trace Sand & Gravel		P		
85		45	>4.5	--	100
			P		
90	Gray, Little Sand	52	>4.5	--	100
	Fine Sand Seam At 94 Ft.		P		
95		46	>4.5	--	80
			P		
100		47	>4.5	--	100
105		32	>4.5	--	100
			P		
110	Very stiff	19	2.5	--	90
	Hard		P		
115	Thin Gravel Seam At 115 Ft.	33	2.0	--	100
		100/1"	--	--	--
120	Auger Refusal at 117.0'				

Notes:
1) Borehole backfilled with soil cuttings intermixed with bentonite chips after completion of final water table measurement.
2) Precipitation and/or surface water may have impacted final groundwater reading.

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Well Completion Report

Site Name: Deer Run Mine
Drilling Contractor: Atlas Soils, Inc.
Driller: Mike Hough
Drilling Method: Hollow Stem Auger

Well No.: 4
Date Started January 2, 2009
Date Completed: January 2, 2009
Boring Tech: Andrew Kimmle
Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Cement
Type of Annular Sealant: Cement/Bentonite
Type of Bentonite Seal (Granular, Pellet): Pellet

Type of Sand Pack: Industrial Quartz #1

Well Construction Materials

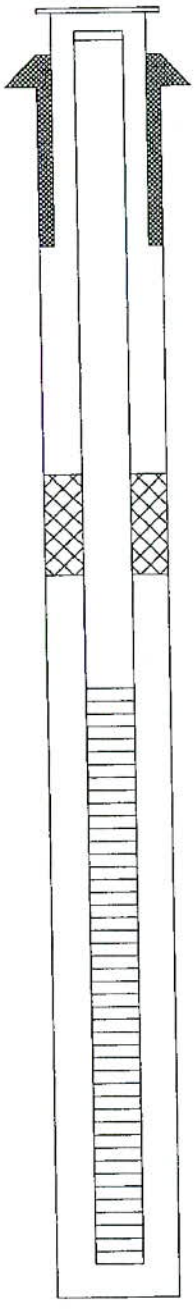
	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		Sch 40	
Riser pipe above w.t.		Sch 40	
Riser pipe below w.t.		Sch 40	
Screen		Sch 40	
Coupling joint screen to riser		Sch 40	
Protective casing			None

Measurements (ft.)

Riser pipe length	10.0
Screen length	10.0
Screen slot size	0.01
Protective casing length	N/A
Depth to water (from riser)	6.89
Elevation of water	628.7
Gallons removed (develop)	6.4
Gallons removed (purge)	--
Other	--

Completed by: D. Jenkins

Elevations (ft.)



635.58 Top of Riser Pipe
633.5 Ground Surface
633.2 Top of Annular Sealant

626.6 Top of Seal

2.0 Total Seal Interval
624.6 Top of Sand

625.6 Top of Screen

10.0 Total Screen Interval

615.6 Bottom of Screen
615.5 Bottom of Borehole

Deer Run Mine
Kunz Property
Hillsboro, Montgomery County, Illinois
Project # 180-4298

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: December 3, 2008
BORING TECH.: J. Weiser
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 35 COORDINATES: N905167.0 E2496320.9 SURFACE ELEV.: 632.6	N Value	P (tsf)	W (%)	REC (%)
0 SILTY CLAY(CL), Brown, Gray, Mottled, Moist, Stiff				
	8	1.3	--	100
SILTY CLAY LOAM (CL), Brown, Moist, Stiff 5	9	1.8	--	100
	14	2.5	--	100
CLAY (CL), Brown, Moist, Stiff 10	8	1.8	--	100
SAND (SP), Brown, Saturated, Fine to Medium Coarse, Little Gravel and Clay, Very Loose	2	NP	--	100
Fine, Little Clay, Trace of Gravel 15	2	NP	--	100
SILT (ML), Gray, Wet, Medium Stiff	5	--	--	100
SILTY CLAY LOAM TILL (CL), Gray, Dry, Very Stiff, Trace of Sand and Gravel 20	26	>4.5	--	100

GROUNDWATER ELEV. COMP.: Dry AFTER 24 HRS.: --	N Value	P (tsf)	W (%)	REC (%)
20 Hard				
	30	>4.5	--	100
25	36	>4.5	--	100
Very Stiff				
	28	>4.5	--	89
Hard				
30	30	>4.5	--	100
End of Exploration at 30.0 ft. Note: 1) Borehole backfilled with soil cuttings upon completion. 2) Groundwater monitoring well installed into adjacent borehole. 35 40				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Well Completion Report

Site Name: Deer Run Mine
Drilling Contractor: Atlas Soils, Inc.
Driller: Mike Hough
Drilling Method: Hollow Stem Auger

Well No.: 35
Date Started: December 3, 2008
Date Completed: December 3, 2008
Boring Tech: Jim Weiser
Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Cement
Type of Annular Sealant: Cement/Bentonite
Type of Bentonite Seal (Granular, Pellet): Pellet

Type of Sand Pack: Industrial Quartz #1

Well Construction Materials

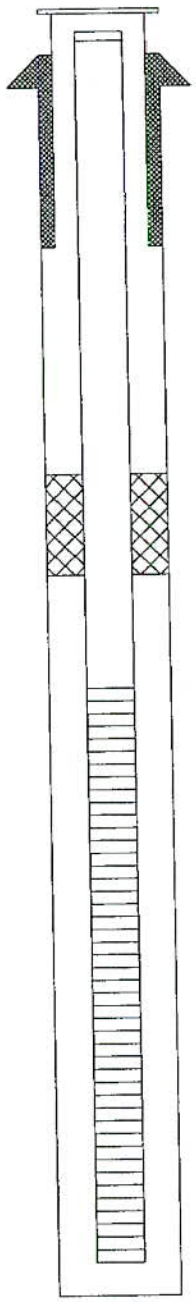
	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		Sch 40	
Riser pipe above w.t.		Sch 40	
Riser pipe below w.t.		Sch 40	
Screen		Sch 40	
Coupling joint screen to riser		Sch 40	
Protective casing			None

Measurements (ft.)

Riser pipe length	10.0
Screen length	10.0
Screen slot size	0.01
Protective casing length	N/A
Depth to water (from riser)	12.16
Elevation of water	624.1
Gallons removed (develop)	3.8
Gallons removed (purge)	--
Other	--

Completed by: D. Jenkins

Elevations (ft.)



636.27 Top of Riser Pipe
632.6 Ground Surface
632.6 Top of Annular Sealant

629.3 Top of Seal

2.0 Total Seal Interval
627.3 Top of Sand

626.3 Top of Screen

10.0 Total Screen Interval

616.3 Bottom of Screen
616.2 Bottom of Borehole

Deer Run Mine
Kunz Property
Hillsboro, Montgomery County, Illinois
Project # 180-4298

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: December 8, 2008
BORING TECH.: J. Weiser
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 36
COORDINATES: N903901.3
E2496409.1
SURFACE ELEV.: 628.8
GROUNDWATER ELEV.
COMP.: Dry
Bridge at -9.3 ft.
AFTER 24 HRS.: --

	N Value	P (tsf)	W (%)	REC (%)
CLAY (CL), Brown, Moist, Medium Stiff	5	2.0	--	78
Brown, Gray, Mottled, Moist, Stiff, Trace of Sand	8	1.8	--	83
SILTY CLAY (CL), Gray, Moist, Soft, Trace of Sand	3	0.5	--	100
CLAY TILL (CL), Brown, Gray, Mottled, Moist, Soft, Little Gravel, Trace of Sand	3	0.5	--	94
SANDY LOAM (SP), Brown, Saturated, Loose, Little Sand and Gravel	3	NP	--	100
SILTY LOAM TILL (ML), Gray, Dry, Hard, Trace of Sand and Gravel	77	>4.5	--	94
SAND (SP), Gray, Fine, Saturated, Very Dense	70	4.3	--	100
SILTY LOAM TILL (ML), Gray, Dry, Hard, Trace of Sand, Little Gravel	100/7.5"	>4.5	--	100
1" Sand Layer	100/10"	>4.5	--	100
5" Sand Layer	100/8"	>4.5	--	100
	87	>4.5	--	100
	40	>4.5	--	100
End of Exploration at 30.0 ft.				

Note:
1) Borehole backfilled with soil cuttings upon completion.

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Deer Run Mine
Kunz Property
Hillsboro, Montgomery County, Illinois
Project # 180-4298

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: December 8, 2008
BORING TECH.: J. Weiser
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 37
COORDINATES: N902497.3
E2496398.1
SURFACE ELEV.: 628.9

GROUNDWATER ELEV.
COMP.: Dry
Bridge at -5.5 ft.
AFTER 24 HRS.: --

Depth	Description	N Value	P (tsf)	W (%)	REC (%)
0	CLAY (CL), Gray, Moist, Medium Stiff				
		6	2.3	--	61
	Stiff				
5		8	0.8	--	78
	Medium Stiff				
		5	1.3	--	83
	SILTY CLAY TILL (CL), Gray, Moist, Soft, Trace of Sand and Gravel				
10		3	0.3	--	94
	CLAY (CL), Gray, Moist to Wet, Soft, Trace of Sand				
		3	0.1	--	56
	SILTY CLAY LOAM TILL (CL), Gray, Moist to Wet, Soft, Little Gravel				
15		3	0.3	--	61
	Moist, Medium Stiff				
		6	3.0	--	100
	Dry to Moist, Very Stiff, Little Sand and Gravel				
20		18	3.3	--	72
	Dry, Hard				
		63	>4.5	--	94
25		39	>4.5	--	100
		37	>4.5	--	100
30		31	>4.5	--	94
	End of Exploration at 30.0 ft.				
	Note: 1) Borehole backfilled with soil cuttings upon completion.				
35					
40					

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Deer Run Mine
Kunz Property
Hillsboro, Montgomery County, Illinois
Project # 180-4298

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: December 4, 2008
BORING TECH.: J. Weiser
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 38
COORDINATES: N901239.5
E2496526.4
SURFACE ELEV.: 626.5

GROUNDWATER ELEV.
COMP.: 11.6 ft.
AFTER 24 HRS.: --

Depth	Description	N Value	P (tsf)	W (%)	REC (%)
0	CLAY (CL), Gray, Moist, Stiff				
		8	1.0	--	72
	Soft				
5		4	0.5	--	22
	SILTY CLAY TILL (CL), Gray, Moist, Medium Stiff, Trace of Sand	6	1.0	--	94
	Brown, Gray, Mottled				
10		7	1.0	--	100
	SILTY LOAM TILL (ML), Gray, Dry to Moist, Stiff, Little Gravel	14	>4.5	--	100
	Dry, Hard				
15		33	>4.5	--	89
	Little Sand and Gravel				
		134	>4.5	--	100
20		157/10"	>4.5	--	100
20		100/5"	>4.5	--	100
25		100/9"	>4.5	--	93
		100/10"	>4.5	--	100
30		46	>4.5	--	94
	End of Exploration at 30.0 ft.				
	Note: 1) Borehole backfilled with soil cuttings upon completion.				
35					
40					

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

APPENDIX C

Laboratory Test Results (Soil)

ATLAS SOILS, INC.
SOIL TEST DATA

Project: Deer Run Mine

Project No.: 180-4298

Date: January 2009

Lab. Number	1	2				
Boring No.	36	38				
Depth (ft.)	2 - 5	6 - 10				
Textural Classification (USDA)	Silty Clay Loam	Silt Loam				
Unified Soil Group Name	Lean Clay	Lean Clay w/ Sand				
Unified Soil Group Symbol	CL	CL				
Total Sample Passing 2 1/2" (%)	100.0	100.0				
Total Sample Passing 1" (%)	100.0	100.0				
Total Sample Passing 3/4" (%)	100.0	100.0				
Total Sample Passing 1/2" (%)	100.0	100.0				
Total Sample Passing 3/8" (%)	100.0	100.0				
Total Sample Passing No. 4 (%)	99.9	99.9				
Total Sample Passing No. 8 (%)	99.8	99.4				
Total Sample Passing No. 10 (%)	99.7	99.3				
Total Sample Passing No. 16 (%)	99.6	98.6				
Total Sample Passing No. 40 (%)	99.0	95.7				
Total Sample Passing No. 100 (%)	97.8	85.6				
Total Sample Passing No. 200 (%)	97.2	81.1				
Gravel (> No. 4) (%)	0	0				
Sand (< No. 4 > No. 200) (%)	3	19				
Silt (< No. 200 > 0.005 mm) (%)	67	56				
Clay (< 0.005 mm) (%)	30	25				
Liquid Limit (%)	40	31				
Plasticity Index (%)	18	13				
Optimum Moisture (%)	17.7	14.2				
Maximum Dry Density (pcf)	106.4	109.6				
Remarks:						

REPORT OF
MOISTURE - DENSITY RELATIONSHIP OF SOIL

For: Hillsboro Energy, LLC

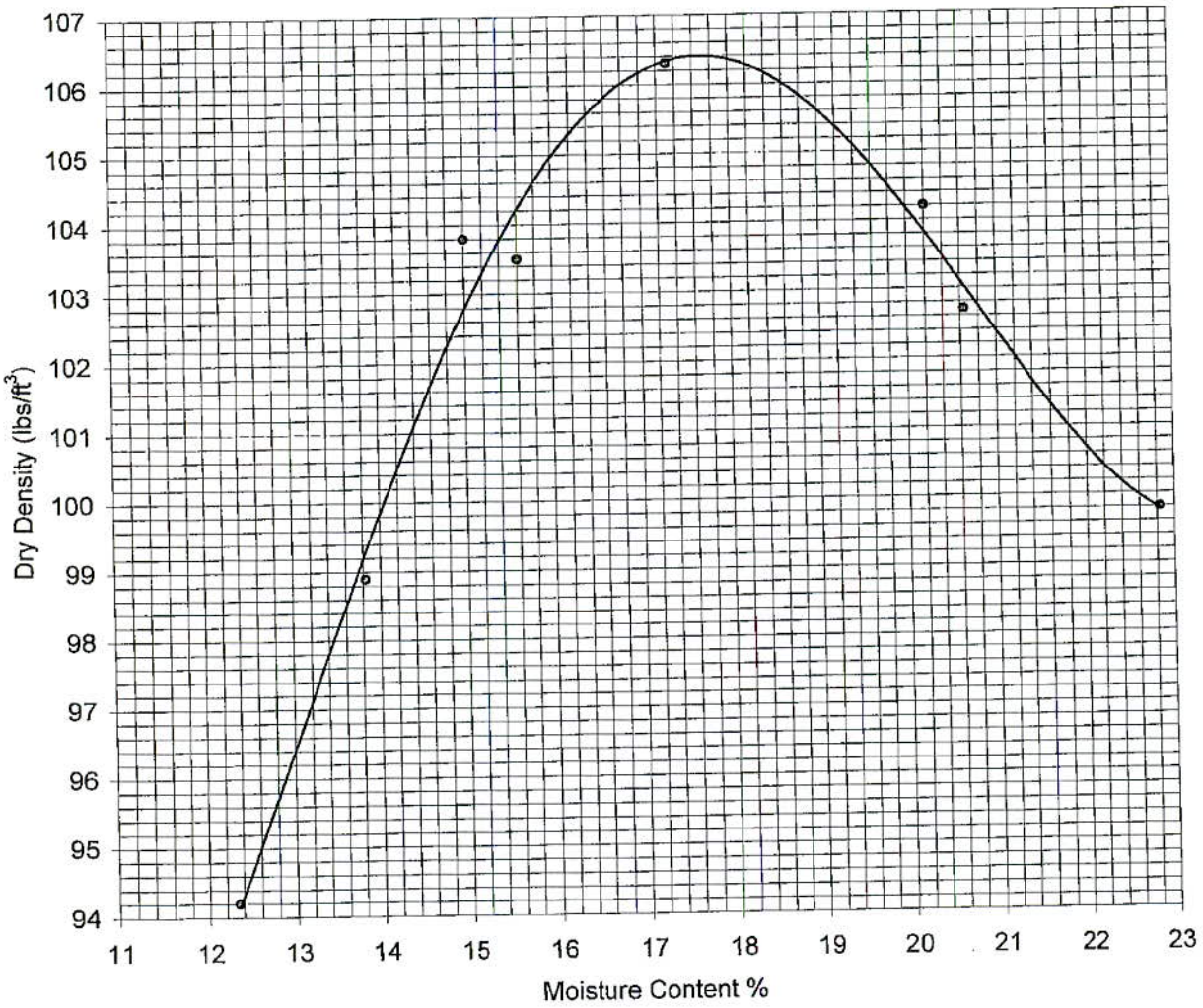
Project: Deer Run Mine (181-4298)

Location: Hillsboro, Illinois

Sample: Boring No. 36; 2 ft. to 5 ft. depth; Silty Clay Loam, Brown

Method of Test: ASTM D698, Method A

MOISTURE - DENSITY RELATIONSHIP CURVE



Optimum Moisture	17.7	%	Max. Dry Density	106.4	lbs./cu.ft.
Corrected Optimum Moisture	--	%	Corrected Max. Dry Density	--	lbs./cu.ft.
Natural Moisture	--	%			

REPORT OF
MOISTURE - DENSITY RELATIONSHIP OF SOIL

For: Hillsboro Energy, LLC

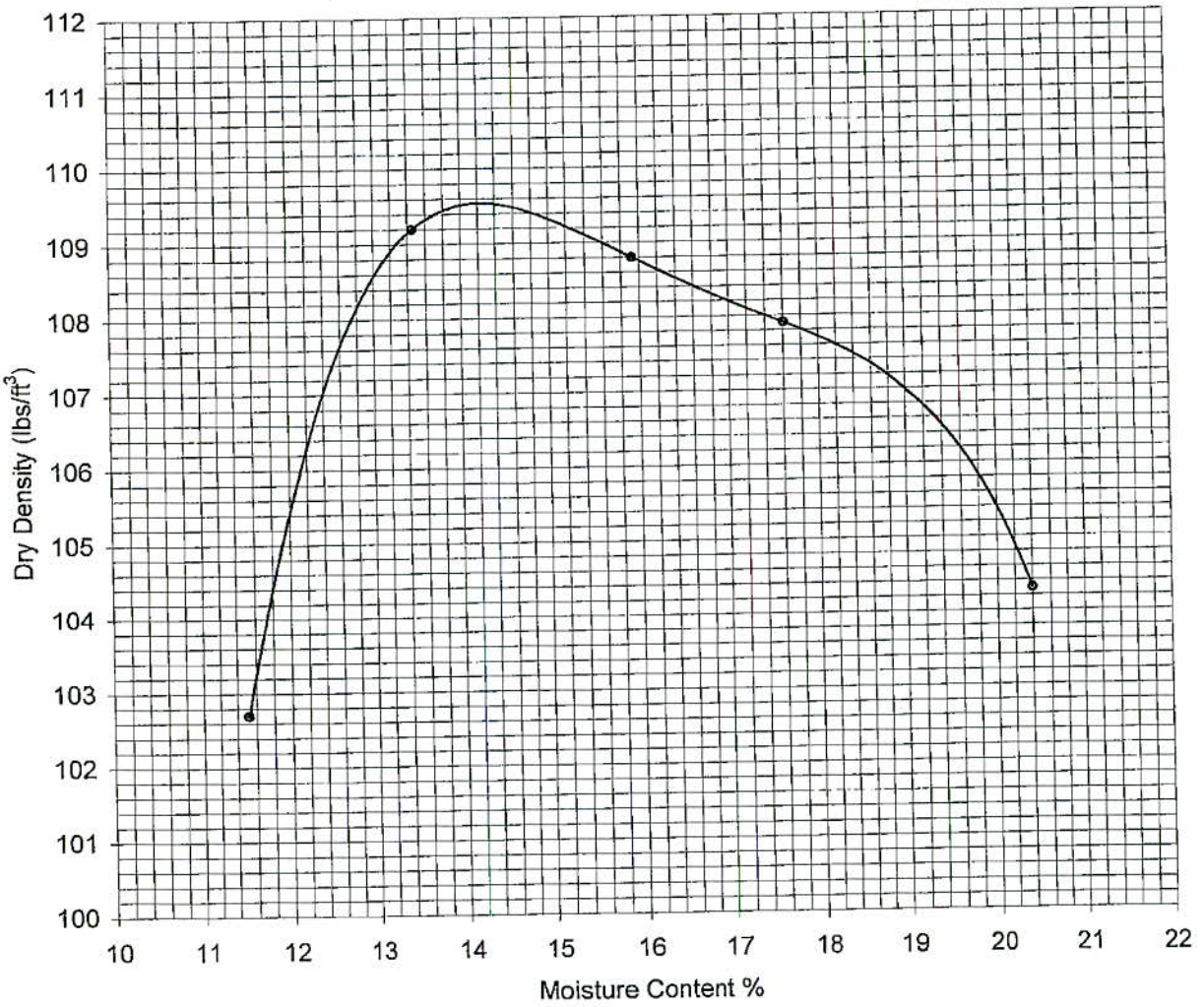
Project: Deer Run Mine (181-4298)

Location: Hillsboro, Illinois

Sample: Boring No. 38; 6 ft. to 10 ft. depth; Silt Loam, Gray, Few Sand

Method of Test: ASTM D698, Method A

MOISTURE - DENSITY RELATIONSHIP CURVE



Optimum Moisture	14.2	%	Max. Dry Density	109.6	lbs./cu.ft.
Corrected Optimum Moisture	--	%	Corrected Max. Dry Density	--	lbs./cu.ft.
Natural Moisture	--	%			

HYDRAULIC CONDUCTIVITY TEST RESULTS

PROJECT DESCRIPTION

Project: Deer Run Mine
Client: Hillsboro Energy
Project No.: 180-4298
Date: January 27, 2009

SAMPLE IDENTIFICATION

Location: Boring No. 36
Laboratory No.: 1
Re-compacted at 89.2% Compaction; +1.0% OMC
Depth/Elevation: 2 ft. - 5 ft.
Classification/Description: Silty Clay Loam, Brown,
Natural Moisture: ---
Liquid Limit: ---
Plastic Limit: ---
Natural Dry Density: ---
Optimum Moisture: 17.7%
Max. Dry Density: 106.4 lb/ft^3
% Compaction: 89.2%

HYDRAULIC CONDUCTIVITY TEST DETAILS

Test No.: 1
Specimen Data:
Diameter: 7.09 cm
Length: 7.65 cm
Area: 39.48 cm^2
Volume: 302.02 cm^3
Void Ratio: --

Date of Test: January 27, 2009
Tested by: R. Comer
Initial Weight: 542.43 g
Dry Unit Weight: 95.0 lb/ft^3
Initial Moisture: 18.7%
Final Moisture: 27.4%

Test Data:
Test Apparatus: Flex. wall permeater
Flow Orientation: Vertical
Permeant Liquid: $CaSO_4$
Confining Pressure: 6 psi
Back Pressure: 4 psi
Avg. Driving Pressure: 285.7 cm
Time for Saturation: 6 minutes
Time for Conductivity Measurements: 9 minutes
Total Flow In: 20.0 mL
Total Flow Out: 20.5 mL
Hydraulic Conductivity at 20° C: 1.3 x 10^{-5} cm/sec (time-weighted average)
Average Headwater: 73.4 cm
Average Tailwater: 69.2 cm
Hydraulic Gradient: 37.3

Hydraulic Conductivity Calculations

Project:	Deer Run Mine
Project No.:	180-4298
Sample No.:	Re-compacted at 89.2% compaction, at 18.7% (+1.0% optimum moisture)
Location:	Boring 36; 2 ft. - 5 ft. depth
Permeameter No.:	2

Diameter (cm):	7.09
End Area (cm^2):	39.48
Length (cm):	7.65
Back Pressure (psi):	4
Lateral Pressure (psi):	6

Date & Time	Time Increment (min)	Reading (in)	Reading (out)	Inflow (ml)	Outflow (ml)	Outflow/ Inflow Ratio	Avg. Flow (ml)	H1(in) (cm)	H2(out) (cm)	Driving Pressure	K (cm/sec)	Temp. (deg C)	Temp Factor	Cum. Time (min)	Cum. Volume (ml)	K 20 deg C (cm/sec)
1/27/09 8:05:00 AM		13.1	23.8					91.3	44.5			24	0.910			
1/27/09 8:07:00 AM	2	16.3	20.6	3.2	3.2	1.00	3.2	87.7	49.3	323.9	1.60E-05	24	0.910	2	3.20	1.45E-05
1/27/09 8:09:00 AM	2	19.2	17.6	2.9	3.0	1.03	3.0	84.5	53.8	315.8	1.51E-05	24	0.910	4	6.15	1.37E-05
1/27/09 8:11:00 AM	2	22.1	14.6	2.9	3.0	1.03	3.0	81.3	58.3	308.1	1.55E-05	24	0.910	6	9.10	1.41E-05
1/27/09 8:13:00 AM	2	24.8	11.9	2.7	2.7	1.00	2.7	78.3	62.4	300.7	1.45E-05	24	0.910	8	11.80	1.32E-05
1/27/09 8:15:00 AM	2	27.2	9.3	2.4	2.6	1.08	2.5	75.6	66.3	293.9	1.37E-05	24	0.910	10	14.30	1.25E-05
1/27/09 8:17:00 AM	2	29.6	6.8	2.4	2.5	1.04	2.5	72.9	70.0	287.4	1.38E-05	24	0.910	12	16.75	1.25E-05
1/27/09 8:20:00 AM	3	33.1	3.3	3.5	3.5	1.00	3.5	69.1	75.3	279.6	1.35E-05	24	0.910	15	20.25	1.23E-05

Time weighted average (last four readings): 1.26E-05

HYDRAULIC CONDUCTIVITY TEST RESULTS

PROJECT DESCRIPTION

Project: Deer Run Mine
Client: Hillsboro Energy
Project No.: 180-4298
Date: January 27, 2009

SAMPLE IDENTIFICATION

Location: Boring No. 36
Laboratory No.: 1
Re-compacted at 95.5% Compaction; +1.0% OMC
Depth/Elevation: 2 ft. - 5 ft.
Classification/Description: Silty Clay Loam, Brown,
Natural Moisture: ---
Liquid Limit: ---
Plastic Limit: ---
Natural Dry Density: ---
Optimum Moisture: 17.7%
Max. Dry Density: 106.4 lb/ft^3
% Compaction: 95.5%

HYDRAULIC CONDUCTIVITY TEST DETAILS

Test No.: 1
Specimen Data:
Diameter: 7.04 cm
Length: 9.14 cm
Area: 38.93 cm^2
Volume: 355.82 cm^3
Void Ratio: --

Date of Test: January 26, 2009
Tested by: R. Comer
Initial Weight: 686.72 g
Dry Unit Weight: 101.6 lb/ft^3
Initial Moisture: 18.7%
Final Moisture: 24.9%

Test Data:
Test Apparatus: Flex. wall permeater
Flow Orientation: Vertical
Permeant Liquid: $CaSO_4$
Confining Pressure: 4 psi
Back Pressure: 6 psi
Avg. Driving Pressure: 453.7 cm
Time for Saturation: 642 minutes
Time for Conductivity Measurements: 389 minutes
Total Flow In: 20.0 mL
Total Flow Out: 22.1 mL
Hydraulic Conductivity at 20° C: 1.9×10^{-7} cm/sec (time-weighted average)
Average Headwater: 87.5 cm
Average Tailwater: 56.0 cm
Hydraulic Gradient: 49.6

Hydraulic Conductivity Calculations

Project:	Deer Run Mine
Project No.:	180-4298
Sample No.:	Re-compacted at 95.5% compaction, at 18.7% (+1.0% optimum moisture)
Location:	Boring 36; 2 ft. - 5 ft. depth
Permeameter No.:	5

Diameter (cm):	7.04
End Area (cm^2):	38.93
Length (cm):	9.14
Back Pressure (psi):	4
Lateral Pressure (psi):	6

Date & Time	Time Increment (min)	Reading (in)	Reading (out)	Inflow (ml)	Outflow (ml)	Outflow/ Inflow Ratio	Avg. Flow (ml)	H1(in) (cm)	H2(out) (cm)	Driving Pressure	K (cm/sec)	Temp. (deg C)	Temp Factor	Cum. Time (min)	Cum. Volume (ml)	K 20 deg C (cm/sec)
								92.9	44.7			23	0.931			
1/26/09 7:49:00 AM		11.5	24.5													
1/26/09 9:32:00 AM	103	14.5	21.8	3.0	2.7	0.90	2.9	89.6	48.7	325.8	3.32E-07	24	0.910	103	2.85	3.06E-07
1/26/09 10:48:00 AM	76	16.3	19.9	1.8	1.9	1.06	1.9	87.7	51.5	319.8	2.98E-07	24	0.910	179	4.70	2.71E-07
1/26/09 12:50:00 PM	122	18.9	17.0	2.6	2.9	1.12	2.8	84.9	55.8	313.9	2.81E-07	24	0.910	301	7.45	2.56E-07
1/26/09 2:42:00 PM	112	21.0	14.6	2.1	2.4	1.14	2.3	82.6	59.4	307.4	2.56E-07	24	0.910	413	9.70	2.33E-07
1/26/09 4:25:00 PM	103	22.9	12.5	1.9	2.1	1.11	2.0	80.6	62.5	301.9	2.52E-07	24	0.910	516	11.70	2.29E-07
								94.4	44.6			24	0.910			
1/27/09 7:30:00 AM		10.1	24.6													
1/27/09 9:36:00 AM	126	12.7	21.2	2.6	3.4	1.31	3.0	91.6	49.6	327.1	2.85E-07	24	0.910	642	14.70	2.59E-07
1/27/09 11:02:00 AM	86	14.2	19.5	1.5	1.7	1.13	1.6	90.0	52.1	321.2	2.27E-07	24	0.910	728	16.30	2.06E-07
1/27/09 12:43:00 PM	101	15.7	17.7	1.5	1.8	1.20	1.7	88.3	54.8	317.0	2.02E-07	24	0.910	829	17.95	1.84E-07
1/27/09 2:35:00 PM	112	17.3	16.0	1.6	1.7	1.06	1.7	86.6	57.3	312.7	1.84E-07	24	0.910	941	19.60	1.68E-07
1/27/09 4:05:00 PM	90	18.7	14.5	1.4	1.5	1.07	1.5	85.1	59.5	308.7	2.04E-07	24	0.910	1031	21.05	1.86E-07

Time weighted average (last four readings): 1.85E-07

HYDRAULIC CONDUCTIVITY TEST RESULTS

PROJECT DESCRIPTION

Project: Deer Run Mine
Client: Hillsboro Energy
Project No.: 180-4298
Date: January 26, 2009

SAMPLE IDENTIFICATION

Location: Boing No. 38
Laboratory No.: 1
Re-compacted at 90.9% Compaction; +0.2% OMC
Depth/Elevation: 6 ft. - 10 ft.
Classification/Description: Silt Loam, Gray, Few Sand
Natural Moisture: ---
Liquid Limit: ---
Plastic Limit: ---
Natural Dry Density: ---
Optimum Moisture: 14.2%
Max. Dry Density: 109.6 lb/ft^3
% Compaction: 90.9%

HYDRAULIC CONDUCTIVITY TEST DETAILS

Test No.: 1
Specimen Data:
Diameter: 7.04 cm
Length: 8.51 cm
Area: 38.93 cm^2
Volume: 331.29 cm^3
Void Ratio: --
Date of Test: January 22, 2009
Tested by: R. Comer
Initial Weight: 603.87 g
Dry Unit Weight: 99.6 lb/ft^3
Initial Moisture: 14.4%
Final Moisture: 24.4%

Test Data:
Test Apparatus: Flex. wall permeater
Flow Orientation: Vertical
Permeant Liquid: $CaSO_4$
Confining Pressure: 4 psi
Average Headwater: 78.1 cm
Back Pressure: 6 psi
Average Tailwater: 67.3 cm
Avg. Driving Pressure: 433.1 cm
Hydraulic Gradient: 50.9
Time for Saturation: 442 minutes
Time for Conductivity Measurements: 80 minutes
Total Flow In: 115.4 mL
Total Flow Out: 117.3 mL
Hydraulic Conductivity at 20° C: 3.1×10^{-6} cm/sec (time-weighted average)

Hydraulic Conductivity Calculations

Project:	Deer Run Mine
Project No.:	180-4298
Sample No.:	Re-compacted at 90.9% compaction, at 14.4% (+0.2% optimum moisture)
Location:	Boring No. 38; 6 ft. - 10 ft. depth
Permeameter No.:	5

Diameter (cm):	7.04
End Area (cm^2):	38.93
Length (cm):	8.51
Back Pressure (psi):	4
Lateral Pressure (psi):	6

Date & Time	Time Increment (min)	Reading (in)	Reading (out)	Inflow (ml)	Outflow (ml)	Outflow/ Inflow Ratio	Avg. Flow (ml)	H1(in) (cm)	H2(out) (cm)	Driving Pressure	K (cm/sec)	Temp. (deg C)	Temp Factor	Cum. Time (min)	Cum. Volume (ml)	K 20 deg C (cm/sec)
								90.5	45.5			23	0.931			
1/22/09 7:57:00 AM		13.7	24.0													
1/22/09 8:40:00 AM	43	21.9	15.9	8.2	8.1	0.99	8.2	81.6	57.5	315.9	2.19E-06	23	0.931	43	8.15	2.04E-06
								92.9	44.4			23	0.931			
1/22/09 10:42:00 AM		11.5	24.7													
1/22/09 11:28:00 AM	46	21.0	15.4	9.5	9.3	0.98	9.4	82.6	58.2	317.7	2.34E-06	23	0.931	89	17.55	2.18E-06
1/22/09 12:36:00 PM	68	32.8	3.1	11.8	12.3	1.04	12.1	69.9	76.4	290.2	2.22E-06	23	0.931	157	29.60	2.07E-06
1/22/09 12:56:00 PM	20	36.0	0.0	3.2	3.1	0.97	3.2	66.4	81.0	270.7	2.12E-06	23	0.931	177	32.75	1.97E-06
								93.1	44.9			23	0.931			
1/22/09 1:24:00 PM		11.3	24.4													
1/22/09 2:19:00 PM	55	23.0	12.5	11.7	11.9	1.02	11.8	80.5	62.5	314.4	2.49E-06	23	0.931	232	44.55	2.31E-06
1/22/09 2:52:00 PM	33	29.2	6.2	6.2	6.3	1.02	6.3	73.8	71.8	291.2	2.37E-06	23	0.931	265	50.80	2.21E-06
1/22/09 3:22:00 PM	30	34.0	1.3	4.8	4.9	1.02	4.9	68.6	79.1	277.0	2.13E-06	23	0.931	295	55.65	1.98E-06
								94.1	46.4			23	0.931			
1/23/09 9:51:00 AM		10.4	23.4													
1/23/09 10:25:00 AM	34	20.8	13.6	10.4	9.8	0.94	10.1	82.8	60.9	316.1	3.42E-06	23	0.931	329	65.75	3.19E-06
1/23/09 10:55:00 AM	30	27.4	6.0	6.6	7.6	1.15	7.1	75.7	72.1	294.0	2.93E-06	23	0.931	359	72.85	2.73E-06
1/23/09 11:24:00 AM	29	33.2	0.2	5.8	5.8	1.00	5.8	69.4	80.7	277.4	2.63E-06	23	0.931	388	78.65	2.45E-06
								101.5	46.7			23	0.931			
1/23/09 11:32:00 AM		3.5	23.2													
1/23/09 12:26:00 PM	54	19.3	7.2	15.8	16.0	1.01	15.9	84.5	70.3	315.8	3.40E-06	23	0.931	442	94.55	3.16E-06
								94.0	44.9			23	0.931			
1/23/09 12:28:00 PM		10.5	24.4													
1/23/09 12:45:00 PM	17	15.6	19.3	5.1	5.1	1.00	5.1	88.5	52.4	323.8	3.38E-06	23	0.931	459	99.65	3.14E-06
1/23/09 12:57:00 PM	12	19.0	15.7	3.4	3.6	1.06	3.5	84.8	57.8	312.8	3.40E-06	23	0.931	471	103.15	3.16E-06
1/23/09 1:18:00 PM	21	26.9	7.5	7.9	8.2	1.04	8.1	76.2	69.9	298.0	4.69E-06	23	0.931	492	111.20	4.36E-06
1/23/09 1:48:00 PM	30	31.9	2.2	5.0	5.3	1.06	5.2	70.8	77.7	281.0	2.23E-06	23	0.931	522	116.35	2.07E-06

Time weighted average (last four readings): 3.06E-06

HYDRAULIC CONDUCTIVITY TEST RESULTS

PROJECT DESCRIPTION

Project: Deer Run Mine
Client: Hillsboro Energy
Project No.: 180-4298
Date: January 26, 2009

SAMPLE IDENTIFICATION

Location: Boing No. 38
Laboratory No.: 1
Re-compacted at 94.8% Compaction; +0.2% OMC
Depth/Elevation: 6 ft. - 10 ft.
Classification/Description: Silt Loam, Gray, Few Sand
Natural Moisture: ---
Natural Dry Density: ---
Liquid Limit: ---
Optimum Moisture: 14.2%
Plastic Limit: ---
Max. Dry Density: 109.6 lb/ft^3
% Compaction: 94.8%

HYDRAULIC CONDUCTIVITY TEST DETAILS

Test No.: 1
Date of Test: January 22, 2009
Specimen Data:
Tested by: R. Comer
Diameter: 7.09 cm
Initial Weight: 770.66 g
Length: 10.26 cm
Dry Unit Weight: 103.9 lb/ft^3
Area: 39.48 cm^2
Initial Moisture: 14.4%
Volume: 405.06 cm^3
Final Moisture: 24.4%
Void Ratio: --

Test Data:

Test Apparatus: Flex. wall permeater
Flow Orientation: Vertical
Permeant Liquid: $CaSO_4$
Confining Pressure: 4 psi
Average Headwater: 81.9 cm
Back Pressure: 6 psi
Average Tailwater: 59.8 cm
Avg. Driving Pressure: 444.4 cm
Hydraulic Gradient: 43.3
Time for Saturation: 661 minutes
Time for Conductivity Measurements: 414 minutes
Total Flow In: 31.4 mL
Total Flow Out: 31.3 mL
Hydraulic Conductivity at 20° C: 3.2×10^{-7} cm/sec (time-weighted average)

Hydraulic Conductivity Calculations

Project: Deer Run Mine
Project No.: 180-4298
Sample No.: Re-compacted at 94.8% compaction, at 14.4% (+0.2% optimum moisture)
Location: Boring No. 38; 6 ft. - 10 ft. depth
Permeameter No.: 2

Diameter (cm): 7.09
End Area (cm^2): 39.48
Length (cm): 10.26
Back Pressure (psi): 4
Lateral Pressure (psi): 6

Date & Time	Time Increment (min)	Reading (in)	Reading (out)	Inflow (ml)	Outflow (ml)	Outflow/ Inflow Ratio	Avg. Flow (ml)	H1(in) (cm)	H2(out) (cm)	Driving Pressure	K (cm/sec)	Temp. (deg C)	Temp Factor	Cum. Time (min)	Cum. Volume (ml)	K 20 deg C (cm/sec)
								96.6	42.9			23	0.931			
1/22/09 7:45:00 AM		8.3	24.9					94.1	45.3	332.6	4.50E-07	23	0.931	55	1.90	4.19E-07
1/22/09 8:40:00 AM	55	10.5	23.3	2.2	1.6	0.73	1.9	89.3	51.3	324.7	4.55E-07	23	0.931	178	6.10	4.24E-07
1/22/09 10:43:00 AM	123	14.9	19.3	4.4	4.0	0.91	4.2	87.5	53.5	317.3	4.70E-07	23	0.931	223	7.65	4.38E-07
1/22/09 11:28:00 AM	45	16.5	17.8	1.6	1.5	0.94	1.6	84.9	56.8	312.3	4.59E-07	23	0.931	291	9.90	4.27E-07
1/22/09 12:36:00 PM	68	18.8	15.6	2.3	2.2	0.96	2.3	81.3	61.6	305.2	4.39E-07	23	0.931	396	13.15	4.09E-07
1/22/09 2:21:00 PM	105	22.1	12.4	3.3	3.2	0.97	3.3	76.3	68.2	295.1	4.21E-07	23	0.931	551	17.60	3.92E-07
1/22/09 4:56:00 PM	155	26.6	8.0	4.5	4.4	0.98	4.5									
								92.9	43.3			23	0.931			
1/23/09 7:42:00 AM		11.6	24.6					89.5	49.3	326.2	4.29E-07	23	0.931	661	21.15	3.99E-07
1/23/09 9:32:00 AM	110	14.7	20.6	3.1	4.0	1.29	3.6	84.3	56.5	315.2	3.69E-07	23	0.931	838	25.90	3.43E-07
1/23/09 12:29:00 PM	177	19.4	15.8	4.7	4.8	1.02	4.8	81.9	59.8	306.2	3.54E-07	24	0.910	924	28.05	3.26E-07
1/23/09 1:55:00 PM	86	21.5	13.6	2.1	2.2	1.05	2.2	79.9	62.5	301.1	3.16E-07	24	0.910	1006	29.85	2.87E-07
1/23/09 3:17:00 PM	82	23.3	11.8	1.8	1.8	1.00	1.8	78.4	64.9	296.7	3.17E-07	24	0.910	1075	31.35	2.89E-07
1/23/09 4:26:00 PM	69	24.7	10.2	1.4	1.6	1.14	1.5									

Time weighted average (last four readings): 3.19E-07

HYDRAULIC CONDUCTIVITY TEST RESULTS

PROJECT DESCRIPTION

Project: Deer Run Mine
Client: Hillsboro Energy
Project No.: 180-4298
Date: January 27, 2009

SAMPLE IDENTIFICATION

Location: Boring No. 38
Laboratory No.: 1
Depth/Elevation: 7'2" - 7'5"
Classification/Description: Silty Loam, Gray, Few Sand
Natural Moisture: ---
Liquid Limit: ---
Plastic Limit: ---
Natural Dry Density: ---
Optimum Moisture: --
Max. Dry Density: -- lb/ft^3
% Compaction: --

HYDRAULIC CONDUCTIVITY TEST DETAILS

Test No.: 1
Specimen Data:
Diameter: 7.26 cm
Length: 7.65 cm
Area: 41.40 cm^2
Volume: 316.71 cm^3
Void Ratio: --

Date of Test: January 29, 2009
Tested by: R. Comer
Initial Weight: 623.04 g
Dry Unit Weight: 98.3 lb/ft^3
Initial Moisture: 24.9%
Final Moisture: 26.6%

Test Data:
Test Apparatus: Flex. wall permeater
Flow Orientation: Vertical
Permeant Liquid: $CaSO_4$
Confining Pressure: 6 psi
Average Headwater: 77.1 cm
Back Pressure: 4 psi
Average Tailwater: 68.0 cm
Avg. Driving Pressure: 290.6 cm
Hydraulic Gradient: 38.0
Time for Saturation: 6,256 minutes
Time for Conductivity Measurements: 3,635 minutes
Total Flow In: 30.3 mL
Total Flow Out: 30.5 mL
Hydraulic Conductivity at 20° C: 2.0 x 10^{-6} cm/sec (time-weighted average)

Hydraulic Conductivity Calculations

Project: Deer Run Mine
Project No.: 180-4298
Sample No.: Shelby Tube from 7'2" - 7'5" depth
Location: Boring No. 38
Permeameter No.: 1

Diameter (cm): 7.26
End Area (cm^2): 41.40
Length (cm): 7.65
Back Pressure (psi): 4
Lateral Pressure (psi): 6

Date & Time	Time Increment (min)	Reading (in)	Reading (out)	Inflow (ml)	Outflow (ml)	Outflow/ Inflow Ratio	Avg. Flow (ml)	H1(in) (cm)	H2(out) (cm)	Driving Pressure	K (cm/sec)	Temp. (deg C)	Temp Factor	Cum. Time (min)	Cum. Volume (ml)	K 20 deg C (cm/sec)
								92.1	51.3			20	1.000			
1/20/09 10:34:00 AM		12.5	21.0					91.9	51.6	321.8	2.35E-08	21	0.976	61	0.15	2.33E-08
1/20/09 11:35:00 AM	61	12.6	20.8	0.1	0.2	2.00	0.1	91.5	52.4	321.0	3.96E-08	22	0.953	170	0.60	3.82E-08
1/20/09 1:24:00 PM	109	13.0	20.3	0.4	0.5	1.25	0.5	90.6	53.8	319.2	4.93E-08	23	0.931	346	1.50	4.65E-08
1/20/09 4:20:00 PM	176	13.8	19.3	0.8	1.0	1.25	0.9	86.0	59.7	312.8	4.44E-08	23	0.931	1255	5.60	4.13E-08
1/21/09 7:29:00 AM	909	18.0	15.3	4.2	4.0	0.95	4.1	79.2	68.9	299.6	4.43E-08	23	0.931	2706	11.85	4.12E-08
1/22/09 7:40:00 AM	1451	24.2	9.0	6.2	6.3	1.02	6.3	78.5	69.7	290.8	2.61E-08	23	0.931	2949	12.45	2.43E-08
1/22/09 11:43:00 AM	243	24.8	8.4	0.6	0.6	1.00	0.6	77.8	70.8	289.2	4.72E-08	23	0.931	3107	13.15	4.39E-08
1/22/09 2:21:00 PM	158	25.5	7.7	0.7	0.7	1.00	0.7	77.3	71.5	287.7	3.11E-08	23	0.931	3262	13.60	2.89E-08
1/22/09 4:56:00 PM	155	25.9	7.2	0.4	0.5	1.25	0.4									
								93.5	46.4			24	0.910			
1/22/09 4:59:00 PM		11.2	24.4					90.0	50.9	324.3	3.43E-08	24	0.910	4135	16.75	3.12E-08
1/23/09 7:32:00 AM	873	14.4	21.3	3.2	3.1	0.97	3.2	88.9	52.4	319.0	3.24E-08	24	0.910	4433	17.75	2.95E-08
1/23/09 12:30:00 PM	298	15.4	20.3	1.0	1.0	1.00	1.0	83.6	59.8	311.4	2.69E-08	24	0.910	6256	22.70	2.44E-08
1/24/09 6:53:00 PM	1823	20.2	15.2	4.8	5.1	1.06	5.0	78.0	66.8	298.7	2.32E-08	23	0.931	8458	27.65	2.13E-08
1/26/09 7:35:00 AM	2202	25.3	10.4	5.1	4.8	0.94	5.0	77.2	68.0	291.5	2.18E-08	24	0.910	8821	28.40	2.01E-08
1/26/09 1:38:00 PM	363	26.0	9.6	0.7	0.8	1.14	0.8	76.9	68.4	290.1	1.82E-08	24	0.910	8996	28.70	1.66E-08
1/26/09 4:33:00 PM	175	26.3	9.3	0.3	0.3	1.00	0.3	74.9	70.8	287.6	2.03E-08	24	0.910	9891	30.40	1.85E-08
1/27/09 7:28:00 AM	895	28.1	7.7	1.8	1.6	0.89	1.7									

Time weighted average (last four readings): 2.03E-08

APPENDIX D

In-Situ Permeability Test Results

HILLSBORO ENERGY
HYDROGEOLOGIC INVESTIGATION
HILLSBORO, ILLINOIS

WELL NO.: 4 DATE: 1/16/2009

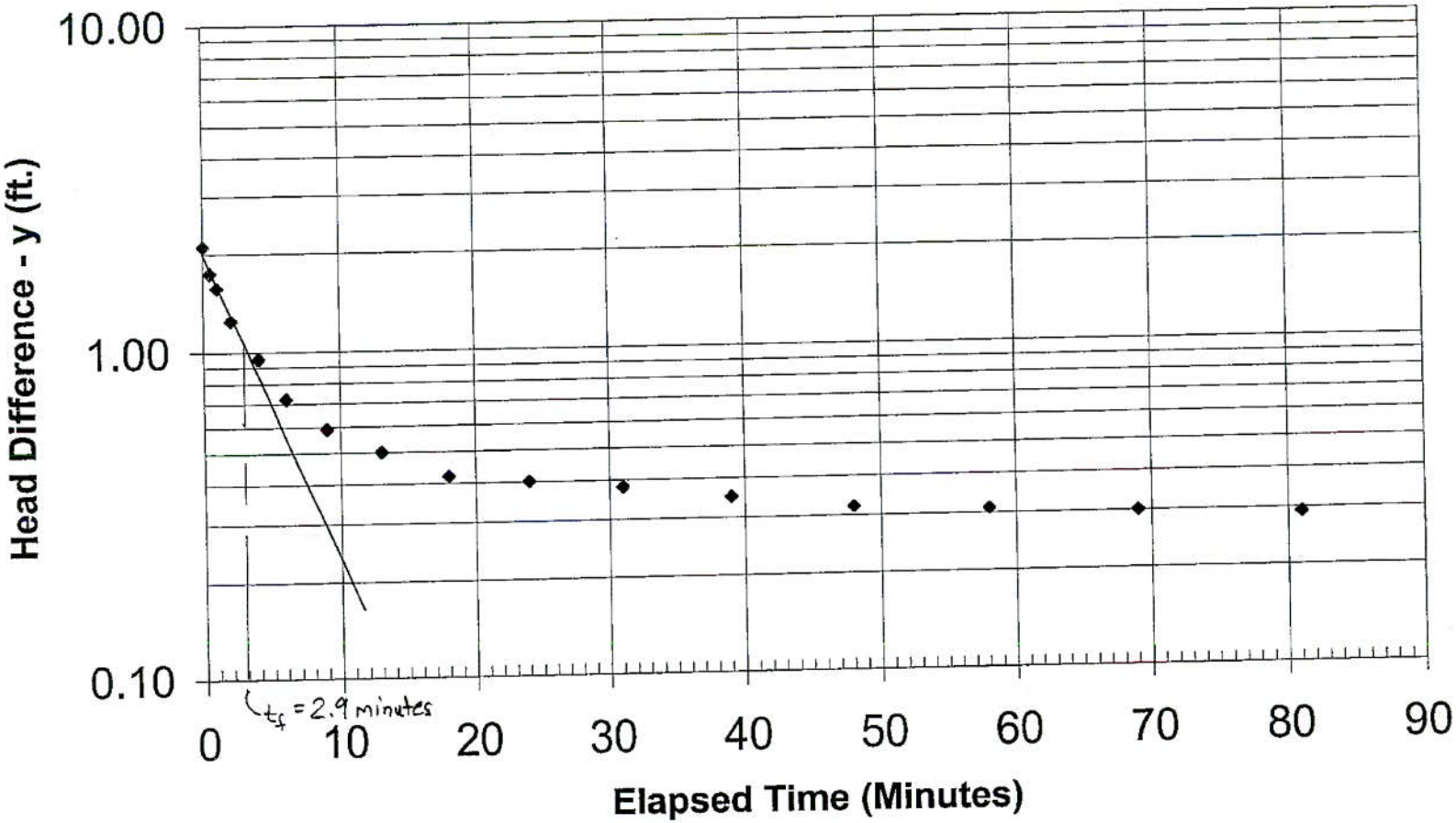
H_i = Initial depth to water before water was removed (ft.)* = 7.80

$y = H_t - H_i$ = Difference between original static water level (time = t_o) and water level during test at time t.

Date and Clock Time	Elapsed Time (Minutes)	Depth to Water (Feet)*	y (Feet)
1/16/09 12:38 PM	0.0	9.90	2.10
	0.5	9.55	1.75
	1	9.38	1.58
	2	9.05	1.25
	4	8.75	0.95
	6	8.52	0.72
	9	8.39	0.59
	13	8.30	0.50
	18	8.22	0.42
	24	8.20	0.40
	31	8.18	0.38
	39	8.15	0.35
	48	8.12	0.32
	58	8.11	0.31
	69	8.10	0.30
	81	8.09	0.29

* Water level measured from top of riser.

Deer Run Mine
Groundwater Monitoring Well No. 4



Deer Run Mine
Hillsboro, Illinois

To determine the in-situr hyrdualic conductivity of the soil at the project site, a slug test or bail test was completed and the test data used in the following calculations.

Reference to documentation presented by Bouwer and Rice, Water Resources Research, 1976, and ASTM D5912 provides the following equations and procedures.

Monitoring Well No. 4

R_e = effecitve radius, detrmined empirically based on well geometry over which y is dissipated.

r_w = radial distance from well center to original undisturbed aquifer (borehole radius): $r_w := 0.58$ ft.

H = distance between static water level and base of well open interval (screen): $H := 12.20$ ft.

A = coefficient determined graphically as function of L/r_w.

B = coefficient determined graphically as function of L/r_w.

D = aquifer thickness (distance between static water level and impermeable surface): $D := 13.6$ ft.

L= length of well open to aquifer (screen length exposed to groundwater): $L := 10.0$ ft.

$$\frac{L}{r_w} = 17.24$$

From Fig. No. 2 in ASTM D5912:

$A := 2.1$

$B := 0.3$

$C := 1.5$

Let x be equivalent to ln (R_e/r_w) for equation 2 in ASTM D5912 and below.

$$x := \begin{cases} \left(\dfrac{1.1}{\ln\left(\dfrac{H}{r_w}\right)} + \dfrac{A + B \cdot \ln\left(\dfrac{D-H}{r_w}\right)}{\dfrac{L}{r_w}} \right)^{-1} & \text{if } D > H \\ \left(\dfrac{1.1}{\ln\left(\dfrac{H}{r_w}\right)} + \dfrac{C}{\dfrac{L}{r_w}} \right)^{-1} & \text{otherwise} \end{cases}$$

$x = 2.01$

r_c = inside radius of well casing in which water level changes: $r_c := 0.083$ ft.

If some of filter pack around well is dewatered during test than a corrected r_c value should be used.

t_f = time at end point of straight line portion of graph: $t_f := 2.9$ minutes

t_o = time at beginning point of straight line portion of graph: $t_o := 0.0$ minutes

y_o = head difference at beginning of straight line portion of graph: $y_o := 2.0$ ft.

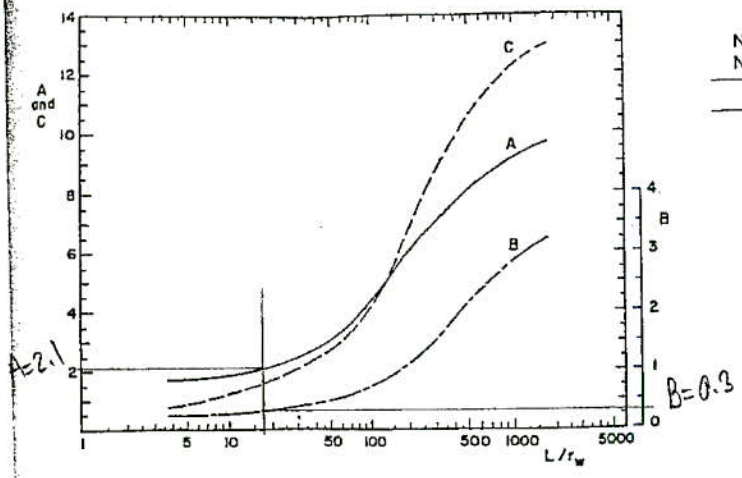
y_f = head difference at end point of straight line portion of graph: $y_f := 1.1$ ft.

$$K := \frac{r_c^2 \cdot x}{2 \cdot L} \cdot \frac{1}{t_f - t_o} \cdot \ln\left(\frac{y_o}{y_f}\right)$$

$K = 1.43 \times 10^{-4}$ ft./min

$K := K \cdot 12 \cdot 2.54 \cdot \frac{1}{60}$ (conversion of units to cm/sec)

$K = 7.2 \times 10^{-5}$ cm/sec



NOTE—See Fig. 3 of Footnote 2.

FIG. 2 Curves Relating Coefficients *A*, *B*, and *C* to L/r_w

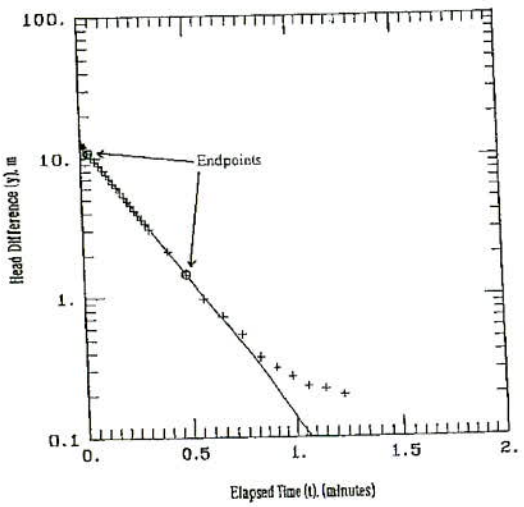


FIG. 3 Sample Plot of Slug Test Data

NOTE 7—An example of the plot of this test method is given in Fig. 3. The data used to prepare the plot is presented in Table 1. Table 1 also presents the well configuration data and the corresponding values of *A*, *B*, and *C*.

TABLE 1 Sample Slug Test Data[A,B]

NOTE 1—*A* and *B* are not used since $D = H$.
NOTE 2—Endpoint values are highlighted.

Elapsed Time, min	Head Difference, m
0.0034	12.86
0.0067	12.71
0.0100	12.40
0.0134	12.13
0.0167	11.96
0.0334	10.94
0.0500	10.15
0.0667	9.45
0.0834	8.80
0.1000	8.16
0.1167	7.05
0.1334	6.54
0.1500	6.10
0.1667	5.64
0.1834	5.21
0.2000	4.85
0.2167	4.51
0.2334	4.14
0.2500	3.88
0.2667	3.59
0.2834	3.35
0.3000	3.06
0.3167	2.12
0.4001	1.45
0.4834	0.97
0.5667	0.72
0.6501	0.54
0.7334	0.37
0.8167	0.31
0.9001	0.27
1.0667	0.23
1.1501	0.22
1.2334	0.20

[A] Well configuration data, m: $Rc = 0.0833$, $Rw = 0.1615$, $D = 41.5$, $L = 8$, and $H = 41.5$.
[B] Coefficients (dimensionless): A = n/a, B = n/a, and $C = 2.624$.

8. Report

8.1 Prepare a report including the information described in this section. The final report of the analytical procedure will include information from the report on the test method selection (see Guide D 4043) and the field testing procedure (see Test Method D 4044).

8.1.1 *Introduction*—The introductory section is intended to present the scope and purpose of the slug test method for determining hydraulic conductivity. Summarize the field hydrogeologic conditions and field equipment and instrumentation including the construction of the control well, and the method of measurement and of effecting a change in head. Discuss the rationale for selecting the method used (see Guide D 4043).

8.1.2 *Hydrogeologic Setting*—Review information available on the hydrogeology of the site; interpret and describe the hydrogeology of the site as it pertains to the method selected for selected for conducting and analyzing an aquifer test. Compare hydrogeologic characteristics of the site as it conforms and differs from the assumptions made in the solution to the aquifer test method.

8.1.3 *Equipment*—Report the field installation and equipment for the aquifer test. Include in the report, well construction information, diameter, depth, and open interval to the aquifer, and location of control well. Include a list of measuring devices used during the test; the manufacturer's name, model number, and basic specifications for each major item; and the name and date of the last calibration, if applicable.

8.1.4 *Test Procedures*—Report the steps taken in conducting the pretest and test phases. Include the frequency of head measurements made in the control well and other environmental data recorded before and during the test procedure.

8.1.5 *Presentation and Interpretation of Test Results:*

8.1.5.1 *Data*—Present tables of data collected during the test.

8.1.5.2 *Data Plots*—Present data plots used in analysis of the data.

8.1.5.3 Show calculation of hydraulic conductivity.

8.1.5.4 Evaluate the overall quality of the test on the basis of the adequacy of instrumentation and observations of

HURST-ROSCHE ENGINEERS, INC.

PROJECT: Deer Run Mine SHEET NO.: 1 OF: 1

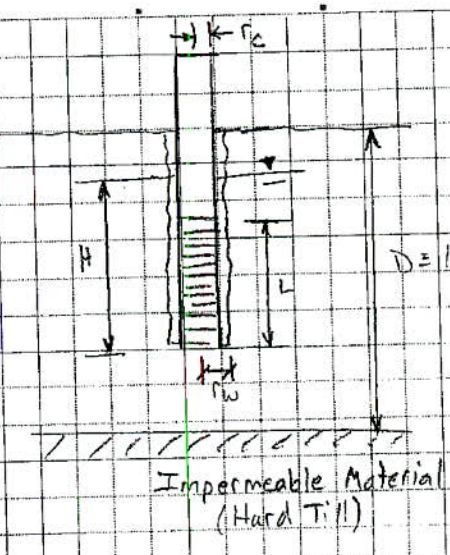
COMPUTATIONS FOR: In-situ Hydraulic Cond.-MW4 DESIGNED: MEE DATE: 1/19/09

JOB CODE: 180-4298 CHECKED: DATE:

MW No. 4

$$K = \frac{r_c^2 \ln\left(\frac{Re}{r_w}\right)}{2L} \cdot \frac{1}{t_f - t_o} \cdot n \frac{y_o}{y_f}$$

$$\ln\left(\frac{Re}{r_w}\right) = \left[\frac{1.1}{\ln\left(\frac{H}{r_w}\right)} + \frac{A + B \ln\left[\frac{D-H}{r_w}\right]}{\frac{L}{r_w}}\right]^{-1}$$



r_c = well casing radius = 1 inch = 0.083 ft.

r_w = borehole diameter = 7" = 0.58 ft

H = distance from static water to well bottom = 12.20 ft

D = aquifer thickness = 19 − 5.4 = 13.6 ft

L = length of well open to aquifer

$$\ln\left(\frac{Re}{r_w}\right) = \left[\frac{1.1}{\ln\left(\frac{12.20}{0.58}\right)} + \frac{2.1 + 0.3 \ln\left(\frac{13.6 - 12.2}{0.58}\right)}{\frac{10\,ft.}{0.58}}\right]^{-1}$$

$$\frac{L}{r_w} = \frac{10.0\,ft}{0.58} = 17.24$$

$$= \left[\frac{1.1}{3.05} + \frac{2.1 + 0.26}{17.24}\right]^{-1} = (0.36 + 0.137)^{-1}$$

$$\ln \frac{Re}{r_w} = (0.497)^{-1} = 2.01$$

$$K = \frac{0.083^2 (2.01)}{2(10.0\,ft)} \cdot \frac{1}{2.9 - 0} \cdot \ln \frac{3.0}{1.1} = 6.92 \times 10^{-4} (0.345)(0.598)$$

$$= 1.43 \times 10^{-4}\ ft/min \cdot \frac{12\,inch}{ft} \cdot \frac{2.54\,cm}{inch} \cdot \frac{1\,min}{60\,sec} = 7.3 \times 10^{-5}\ cm/sec$$

HILLSBORO ENERGY
HYDROGEOLOGIC INVESTIGATION
HILLSBORO, ILLINOIS

WELL NO.: 35 DATE: 1/16/2009

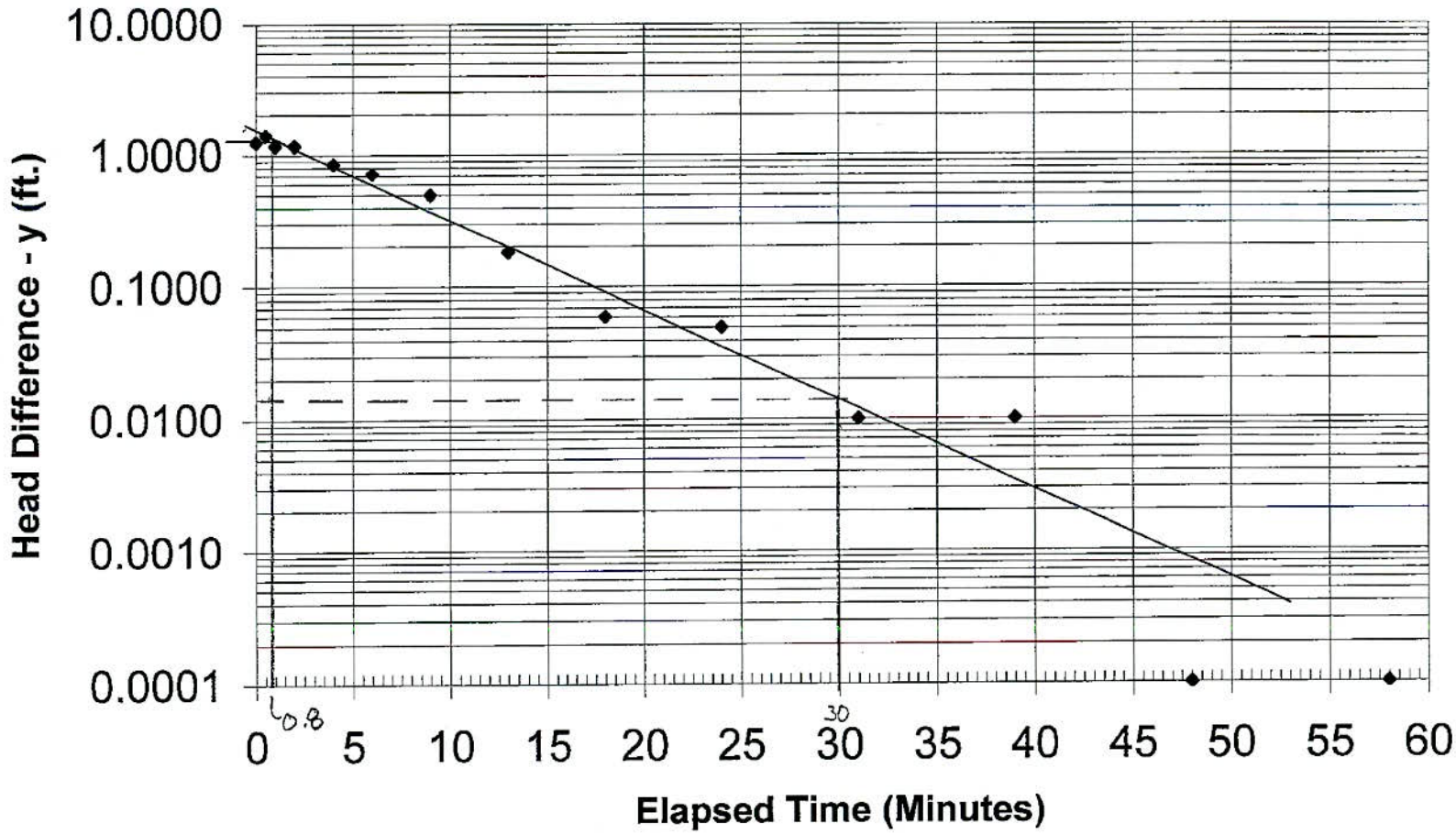
H_i = Initial depth to water before water was removed (ft.)* = 9.80

$y = H_t - H_i$ = Difference between original static water level (time = t_o) and water level during test at time t.

Date and Clock Time	Elapsed Time (Minutes)	Depth to Water (Feet)*	y (Feet)
1/16/09 10:34 AM	0.0	11.04	1.24
	0.5	11.19	1.39
	1	10.96	1.16
	2	10.96	1.16
	4	10.65	0.85
	6	10.52	0.72
	9	10.30	0.50
	13	9.98	0.18
	18	9.86	0.06
	24	9.85	0.05
	31	9.81	0.01
	39	9.81	0.01
	48	9.80	0.00
	58	9.80	0.00

* Water level measured from top of riser.

Deer Run Mine
Groundwater Monitoring Well No. 35



Deer Run Mine
Hillsboro, Illinois

To determine the in-situr hyrdualic conductivity of the soil at the project site, a slug test or bail test was completed and the test data used in the following calculations.

Reference to documentation presented by Bouwer and Rice, Water Resources Research, 1976, and ASTM D5912 provides the following equations and procedures.

Monitoring Well No. 35

R_e = effecitve radius, detrmined empirically based on well geometry over which y is dissipated.

r_w = radial distance from well center to original undisturbed aquifer (borehole radius): $r_w := 0.58$ ft.

H = distance between static water level and base of well open interval (screen): $H := 10.2$ ft.

A = coefficient determined graphically as function of L/r_w.

B = coefficient determined graphically as function of L/r_w.

D = aquifer thickness (distance between static water level and impermeable surface): $D := 12.9$ ft.

L= length of well open to aquifer (screen length exposed to groundwater): $L := 10.0$ ft.

$$\frac{L}{r_w} = 17.24$$

From Fig. No. 2 in ASTM D5912:

$A := 2.1$

$B := 0.3$

$C := 1.6$

Let x be equivalent to ln (R_e/r_w) for equation 2 in ASTM D5912 and below.

$$x := \begin{cases} \left(\frac{1.1}{\ln\left(\frac{H}{r_w}\right)} + \frac{A + B \cdot \ln\left(\frac{D-H}{r_w}\right)}{\frac{L}{r_w}} \right)^{-1} & \text{if } D > H \\ \left(\frac{1.1}{\ln\left(\frac{H}{r_w}\right)} + \frac{C}{\frac{L}{r_w}} \right)^{-1} & \text{otherwise} \end{cases}$$

$x = 1.88$

If some of filter pack around well is dewatered during test than a corrected r_c value should be used.

r_c = inside radius of well casing in which water level changes: $r_c := .276$ ft. (corrected)

t_f = time at end point of straight line portion of graph: $t_f := 30$ minutes

t_o = time at beginning point of straight line portion of graph: $t_o := 0.8$ minutes

y_o = head difference at beginning of straight line portion of graph: $y_o := 1.3$ ft.

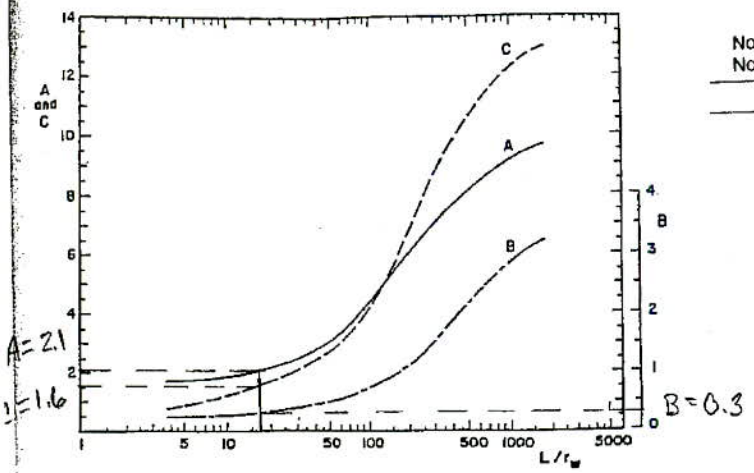
y_f = head difference at end point of straight line portion of graph: $y_f := 0.014$ ft.

$$K := \frac{r_c^2 \cdot x}{2 \cdot L} \cdot \frac{1}{t_f - t_o} \cdot \ln\left(\frac{y_o}{y_f}\right)$$

$K = 1.11 \times 10^{-3}$ ft./min

$K := K \cdot 12 \cdot 2.54 \cdot \frac{1}{60}$ (conversion of units to cm/sec)

$K = 5.6 \times 10^{-4}$ cm/sec



NOTE—See Fig. 3 of Footnote 2.

FIG. 2 Curves Relating Coefficients *A*, *B*, and C to L/r_w

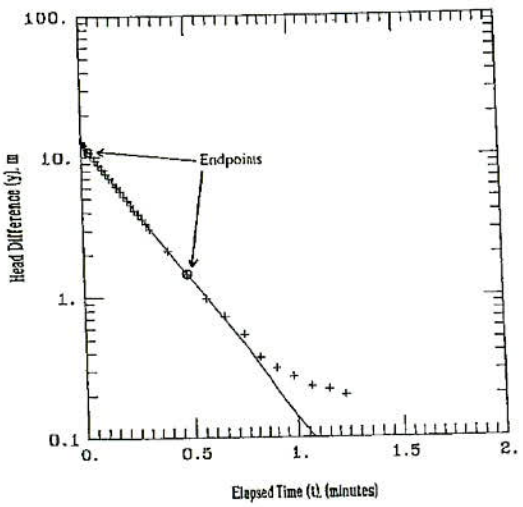


FIG. 3 Sample Plot of Slug Test Data

NOTE 7—An example of the plot of this test method is given in Fig. 3. The data used to prepare the plot is presented in Table 1. Table 1 also presents the well configuration data and the corresponding values of *A*, *B*, and *C*.

TABLE 1 Sample Slug Test Data[A,B]

NOTE 1—*A* and *B* are not used since $D = H$.
NOTE 2—Endpoint values are highlighted.

Elapsed Time, min	Head Difference, m
0.0034	12.86
0.0067	12.71
0.0100	12.40
0.0134	12.13
0.0167	11.96
0.0334	10.94
0.0500	10.15
0.0667	9.45
0.0834	8.80
0.1000	8.16
0.1167	7.05
0.1334	6.54
0.1500	6.10
0.1667	5.64
0.1834	5.21
0.2000	4.85
0.2167	4.51
0.2334	4.14
0.2500	3.88
0.2667	3.59
0.2834	3.35
0.3000	3.06
0.3167	2.12
0.4001	1.45
0.4834	0.97
0.5667	0.72
0.6501	0.54
0.7334	0.37
0.8167	0.31
0.9001	0.27
1.0667	0.23
1.1501	0.22
1.2334	0.20

[A] Well configuration data, m: $Rc = 0.0833$, $Rw = 0.1615$, $D = 41.5$, $L = 8$, and $H = 41.5$.
[B] Coefficients (dimensionless): A = n/a, B = n/a, and $C = 2.624$.

8. Report

8.1 Prepare a report including the information described in this section. The final report of the analytical procedure will include information from the report on the test method selection (see Guide D 4043) and the field testing procedure (see Test Method D 4044).

8.1.1 *Introduction*—The introductory section is intended to present the scope and purpose of the slug test method for determining hydraulic conductivity. Summarize the field hydrogeologic conditions and field equipment and instrumentation including the construction of the control well, and the method of measurement and of effecting a change in head. Discuss the rationale for selecting the method used (see Guide D 4043).

8.1.2 *Hydrogeologic Setting*—Review information available on the hydrogeology of the site; interpret and describe the hydrogeology of the site as it pertains to the method selected for selected for conducting and analyzing an aquifer test. Compare hydrogeologic characteristics of the site as it conforms and differs from the assumptions made in the solution to the aquifer test method.

8.1.3 *Equipment*—Report the field installation and equipment for the aquifer test. Include in the report, well construction information, diameter, depth, and open interval to the aquifer, and location of control well. Include a list of measuring devices used during the test; the manufacturer's name, model number, and basic specifications for each major item; and the name and date of the last calibration, if applicable.

8.1.4 *Test Procedures*—Report the steps taken in conducting the pretest and test phases. Include the frequency of head measurements made in the control well and other environmental data recorded before and during the test procedure.

8.1.5 *Presentation and Interpretation of Test Results:*

8.1.5.1 *Data*—Present tables of data collected during the test.

8.1.5.2 *Data Plots*—Present data plots used in analysis of the data.

8.1.5.3 Show calculation of hydraulic conductivity.

8.1.5.4 Evaluate the overall quality of the test on the basis of the adequacy of instrumentation and observations of

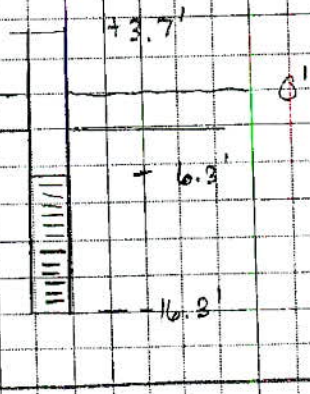
HURST-ROSCHE ENGINEERS, INC.

PROJECT: Deer Run Mine | SHEET NO.: 1 | OF: 1

COMPUTATIONS FOR: In-situ Hyd. Cond. | DESIGNED: MEE | DATE: 1/28/09

JOB CODE: 180 - 4298 | CHECKED: | DATE:

MW 35



$.8 \times 10^{-5}$ ft²
2.7×10^{-3} ft/sec
7.5×10^{-4} ft²/sec

$r_e(\text{corrected}) = \left[(1-n) r_s^2 + n r_w^2\right]^{0.5}$

$n = 0.21$ (from typical value fine sand)

$r_s = 0.083$ ft

$r_w = 0.58$ ft

$r_e(\text{corrected}) = \left[(1-0.21)0.083^2 + 0.21(0.58)^2\right]^{0.5}$

$= (0.0054 + 0.0706)^{0.5} = 0.276$ ft

ATTACHMENT IV.3.B.7.c
UTILITIES AGREEMENTS STATUS

ATTACHMENT IV.3.B.7.c

Hillsboro Energy, LLC currently has or is working to obtain agreements with several utilities companies within the original shadow boundary area. It shall continue to do so in the future for the proposed shadow boundary revision.

The following is a list of utility contacts for the shadow area. Included are contacts for township, county, and state roads and highways.

City of Coffeen	Dale Nowlan	217-534-2216
Frontier Communications	R. Mark Burks	217-854-2222
Charter Communications	Larry Harmon	888-871-4485
Consolidated Utility Service	Bill Daniel	402-334-8150
City of Hillsboro	Hurst-Rosche Engineers	217-532-3959
Illinois Consolidated Telephone	Barb Williams	217-235-3326
Ameren IP	Steve Ralston	618-236-6207
Montgomery County Water	Bill Brown	618-252-8111
M.J.M. Electric Cooperative	Charlie Baker	217-854-3137
East Fork Twp. Road Commissioner	Steve Voyles	217-534-6315
Hillsboro Twp. Road Commissioner	Lenny Kurfiss	217-532-6832
Montgomery Co. Highway Dept.	Ruben Boehler	217-532-6109
Illinois Dept. of Transportation	Roger Driskell	217-782-7331

Deer Run Mine Floor Safety Factor

ESTIMATION OF FLOOR SAFETY FACTOR developed by Chugh and Hao (1990)

Log Hole Number	MC (pct)	LL	UBCm (psi)	B (in)	L	UBCplt (psi)	S1 (psi) (Speck)	(CHC)	S2 (psi)	K (Speck)	K (CHC)	Wp (ft)	Lp (ft)	We (ft)	H (ft)	D (ft)	BETA	NUME1 (Speck)	NUME2 (Speck)	DINO1 (Speck)	DINO2 (Speck)	Nm (Speck)	Er (pct)	RF	UBC (psi) (Speck)	q (psi)	SF (Speck)
08-03-18-15	6.71	38.95	0	8	8	753	142	122	700	5	6	60	60	20	2.16	500	6.944	367.21	447.69	16512.9	259.92	10.11	43.8	0.712	1441	978	1.5

* See Summary Geotechnical Data for Floor Cores Sheet for Test Results

Note:

MC	Moisture content (pct)
LL	Liquid limit (pct)
UBCm	Measured ultimate bearing capacity from plate load tests (psi)
S1	Cohesive strenth of the weak layer (psi)
S2	Cohesive strenth of competent stratum beneath the weak layer (psi)
K	S2/S1
Lp	Length of pillar (ft)
Wp	Width of pillar (ft)
We	Entry width (ft)
H	Thickness of the weak layer (ft)
D	Thickness of overburden
BETA	BL/[2(B+L)H]
NUME1	6.17K(6.17+BETA-1)
NUME2	6.17^2(K+1)+6.17(1+K*BETA)+BETA-1
DINO1	[6.17K(K+1)+K+BETA-1][6.17(6.17+BETA)+BETA-1]
DINO2	(6.17K+BETA-1)(6.17+1)
Nm	NUME1*NUME2/(DINO1-DINO2)
B	Plate width (in)
L	Plate length (in)
RF	Reduction factor
UBC	S1*Nm (psi)
p	Vertical pressure on a pillar (psi)
SF	Safety facotr of weak floor

Summary Geotechnical Data for Floor Cores

Hole number: 08-03-18-15 | **Date logged: 10/23/2007**

Total core depth: 480.4.0 to 484.4

Sample depth below coal seam (inches)	Moisture content %	Point Load Index		Indirect Tensile Strength (psi)	Atterberg Limits (%)			Water sensitivity index	Geotechnical description and length of pieces (inches) recovered from core sample
		Axial Is50	Diametral Is50		Plastic Limit	Liquid Limit	Plasticity Index		
0	6.75	15.16	3.63		18.5	33.7	15.2		
4.625	8.35								
10.125	6.7	16.25	5.08		18.3	40.9	22.6	-15	
13.25				51.17					
16.5				107.66					2.375, 3.5, 1.125, 1.75 (large gap on one side), 1.375,
17.875	6.6	15.96	10.16		18.1	41.9	23.8		3.125, 3.25, 1.375 (angled gap between segments), 3.0,
20.875	6.5								
22.875	5.9	8.345	1.16		16.9	39.3	22.4		
25.875	6.2							-15	
31.625	5.85	9	6.53						2.0, 3.0, 2.125, 2.125, 1.5 (broken , slickensides), 1.375 (broken, slickensides). 1.5, 1.75, 2.375, 1.25, 1.0, 1.5,
36.25	6.4								0.75, 1.25, 0.625 The last 5 segments were broken into
40.875	6.4	6.96	2.9						several pieces.

Note: Water sensitivity index value of -15 implies the material is extremely sensitive to moisture.

Hillsboro Energy

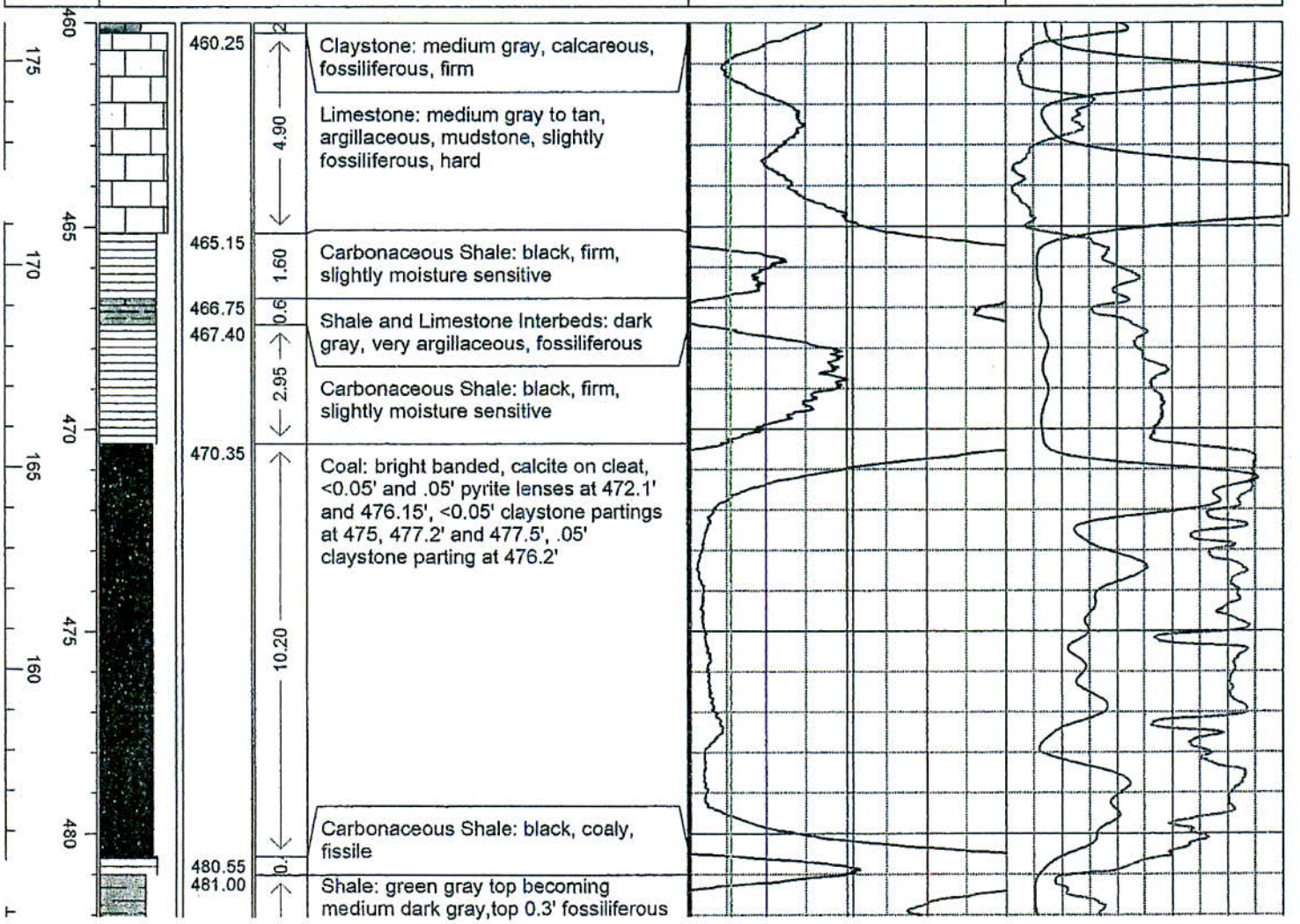
Detail Lithology Log

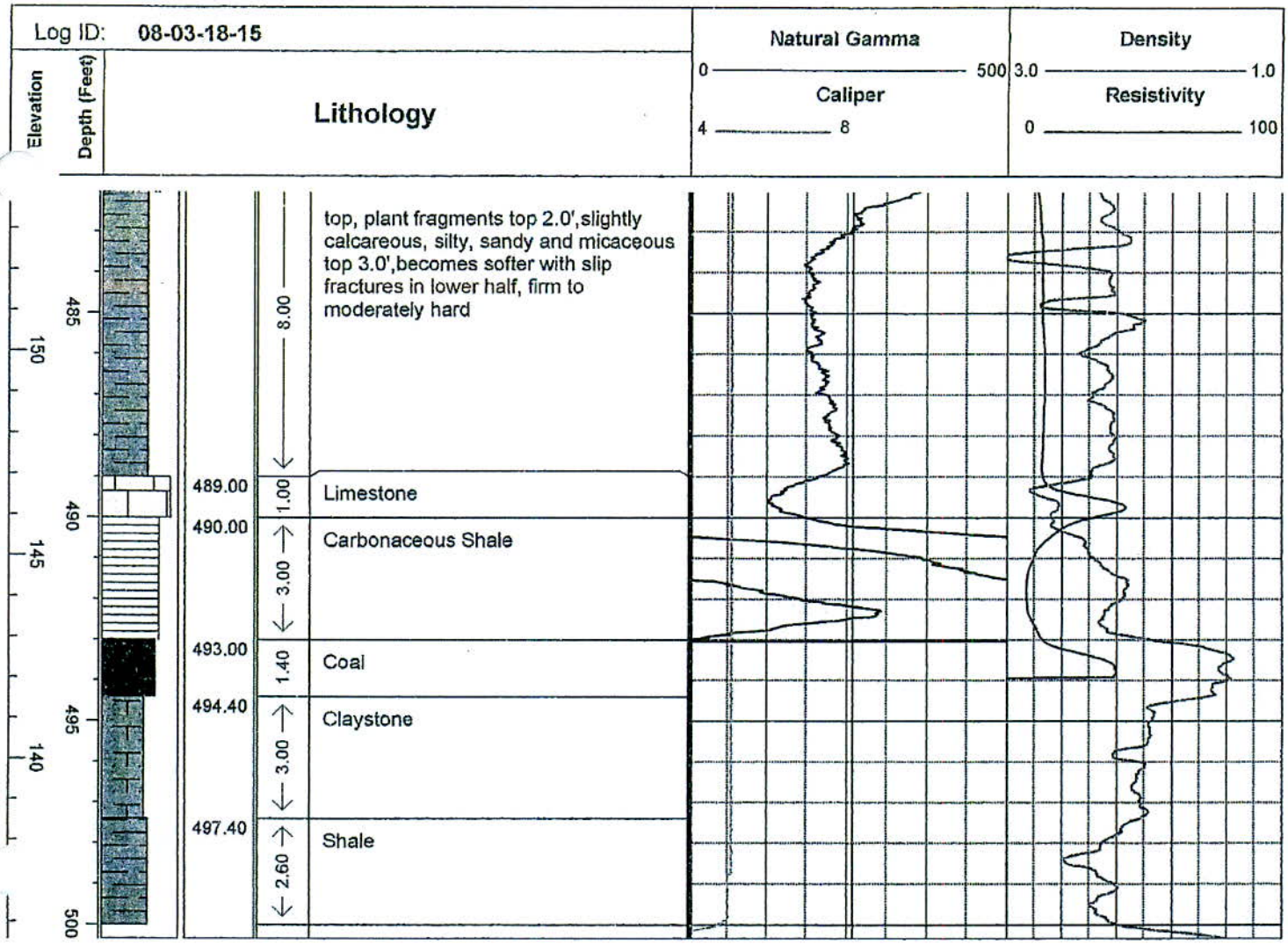
Log ID: **08-03-18-15**

Project/Area:

Easting:	**2,497,941.90'**	Total Depth (Driller):	Casing Depth: **145'**
Northing:	**897,914.27'**	Total Depth (Logger): **500.34'**	Core Interval: **439' - 500' adj.**
Location:		Elevation (GS): **635.92'**	Drilling Date: **8/23/2007**
Township:	**8N**	Drilled By:	**Goff & Pruitt**
Range:	**3W**	Core Logged By:	**J. T. Padgett**
Section:	**18**	Cuttings Logged By:	**Driller, J. T. Padgett**
County:	**Montgomery**	Geophysical Log Operator:	**GLS**

Notes: Drill depths adjusted 0.65' at coal seam to match E-log




Log ID: 08-03-18-15
Elevation
Depth (Feet)
Lithology
Natural Gamma
0
500
Caliper
4
8
Density
3.0
1.0
Resistivity
0
100
485
490
495
500
150
145
140
top, plant fragments top 2.0',slightly calcareous, silty, sandy and micaceous top 3.0',becomes softer with slip fractures in lower half, firm to moderately hard
8.00
489.00
1.00
Limestone
490.00
3.00
Carbonaceous Shale
493.00
1.40
Coal
494.40
3.00
Claystone
497.40
2.60
Shale

Coal Pillar Strength Calculation

Comparison of Area Seam Coal Values to ARMPS Recommended In Situ Coal Pillar Strength

Based on (Hustrulid, 1976), the scaling of coal properties from laboratory-measured data to field values may be estimated by the following equation:

$\sigma_{cube}=k/36^{1/2}$

$k=\sigma_c\,(D)^{1/2}$

Where: σ_c=uniaxial compressive strength of coal specimens tested in the lab (psi)

D=diameter or cube side dimension, in.

k=constant characteristic of coal seam (Gaddy 1956)

Where: σ_c=3,372 psi (average of 32 samples)

D=2.5 in. (sample size)

Therefore: $\sigma_{cube}=((3{,}372)(2.5)^{1/2})/36^{1/5}$

888.5 psi

The strength value of 888.5 psi is very close to the recommended value of 900 psi used in the ARMPS program.

NIOSH, ARMPS Simulation

[PROJECT TITLE]
Hillsboro Energy LLC, Deer Run Mine

[PROJECT DESCRIPTION]
Pillar Stability Factors for the Main Entries on 80ft. by 80ft. Centers

[DEVELOPMENT GEOMETRY PARAMETERS]
Entry Height.....10 (ft)
Depth of Cover.....500 (ft)
Crosscut Angle.....90 (deg)
Entry Width.....20 (ft)
Number of Entries.....6
Crosscut Spacing.....80 (ft)
Center to Center Distance #1.....80 (ft)
Center to Center Distance #2.....80 (ft)
Center to Center Distance #3.....80 (ft)
Center to Center Distance #4.....80 (ft)
Center to Center Distance #5.....80 (ft)

[DEFAULT PARAMETERS]
In Situ Coal Strength.....900 (psi)
Unit Weight of Overburden.....162 (pcf)
Breadth of AMZ.....111 (ft)
AMZ set automatically

[RETREAT MINING PARAMETERS]
Loading Condition.....DEVELOPMENT

[ARMPS STABILITY FACTORS]

DEVELOPMENT.....2.52

[DATA ABOUT THE ACTIVE MINING ZONE (AMZ)]

AMZ Width.....400.0 (ft)
AMZ Breadth.....111.0 (ft)
AMZ Area.....44400.0 (ft)*(ft)
Extraction Ratio Within AMZ.....0.44
Development Load on AMZ.....1.80E+06 (tons)

TOTAL LOADINGS ON AMZ, INCLUDING TRANSFER FROM BARRIERS

LOAD CONDITION	ABUTMENT LOAD (tons)	LTRANSBAR (tons)	LTRANSREM (tons)	TOTAL (tons)
DEVELOPMENT	0.00E+00	0.00E+00	0.00E+00	1.80E+06

R-Factor for front abutment is the percent of the total front abutment load that is applied to the AMZ.

R-Factor for side abutment is the percent of the total side abutment load that is applied to the barrier pillar (the remainder is applied to the AMZ).

LTRANSBAR is the load transferred to the AMZ from the barrier pillar between the side and active gob if the barrier's SF is less than 1.5.

LTRANSREM is the load transferred to the AMZ from the remnant barrier between the side and active gob if the remnant's SF is less than 1.5.

[PILLAR PARAMETERS]

PILLAR	ENTRY	MINIMUM	MAXIMUM

	CENTER (ft)	DIMENSION (ft)	DIMENSION (ft)
1	80.00	60.00	60.00
2	80.00	60.00	60.00
3	80.00	60.00	60.00
4	80.00	60.00	60.00
5	80.00	60.00	60.00

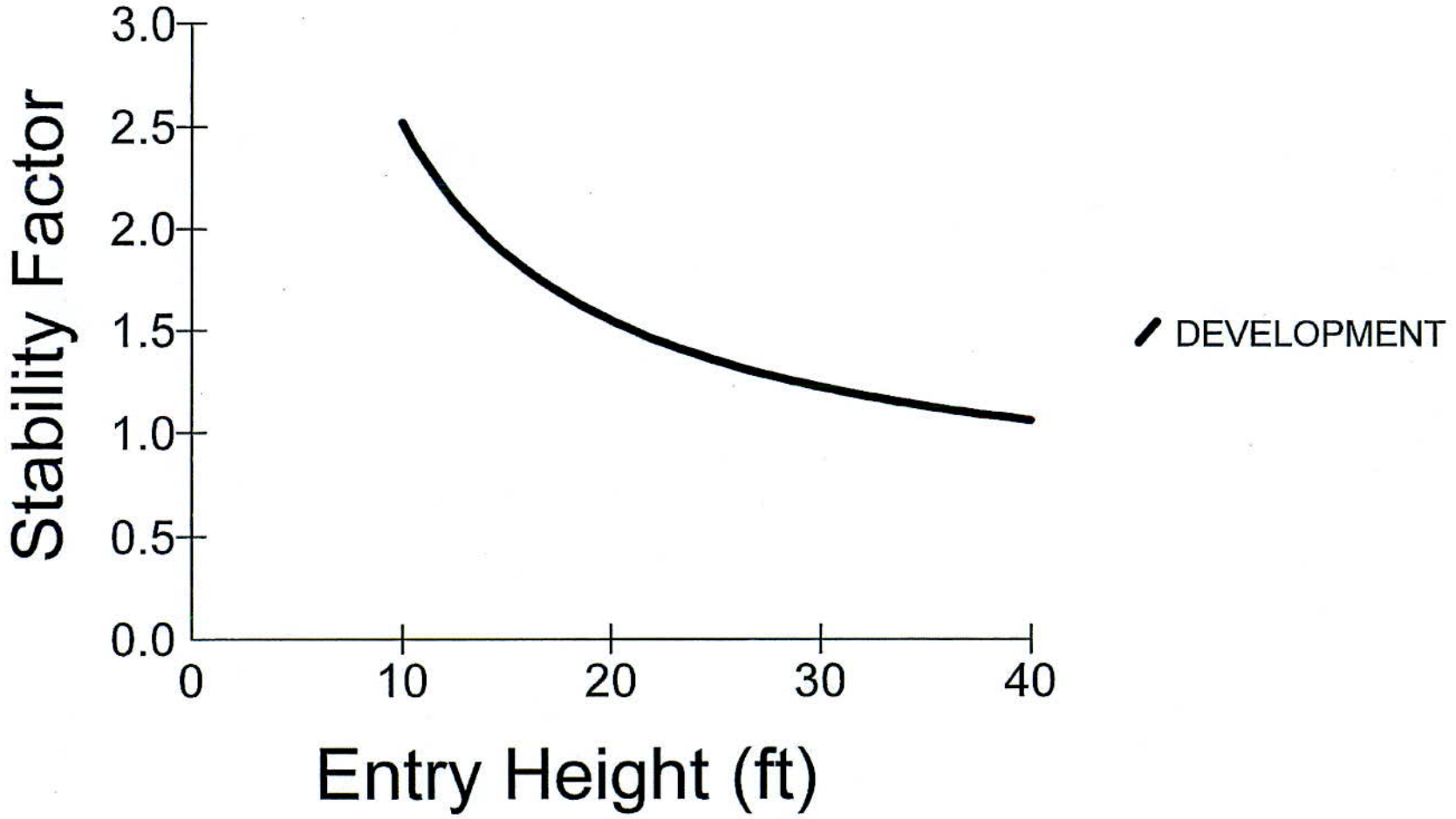
PILLAR	AREA (ft)*(ft)	STRENGTH (psi)	LOAD-BEARING CAPACITY (tons)
1	3.60E+03	2.52E+03	6.53E+05
2	3.60E+03	2.52E+03	6.53E+05
3	3.60E+03	2.52E+03	6.53E+05
4	3.60E+03	2.52E+03	6.53E+05
5	3.60E+03	2.52E+03	6.53E+05

TOTAL LOAD-BEARING CAPACITY OF PILLARS WITHIN AMZ: 4.53E+06 (tons)

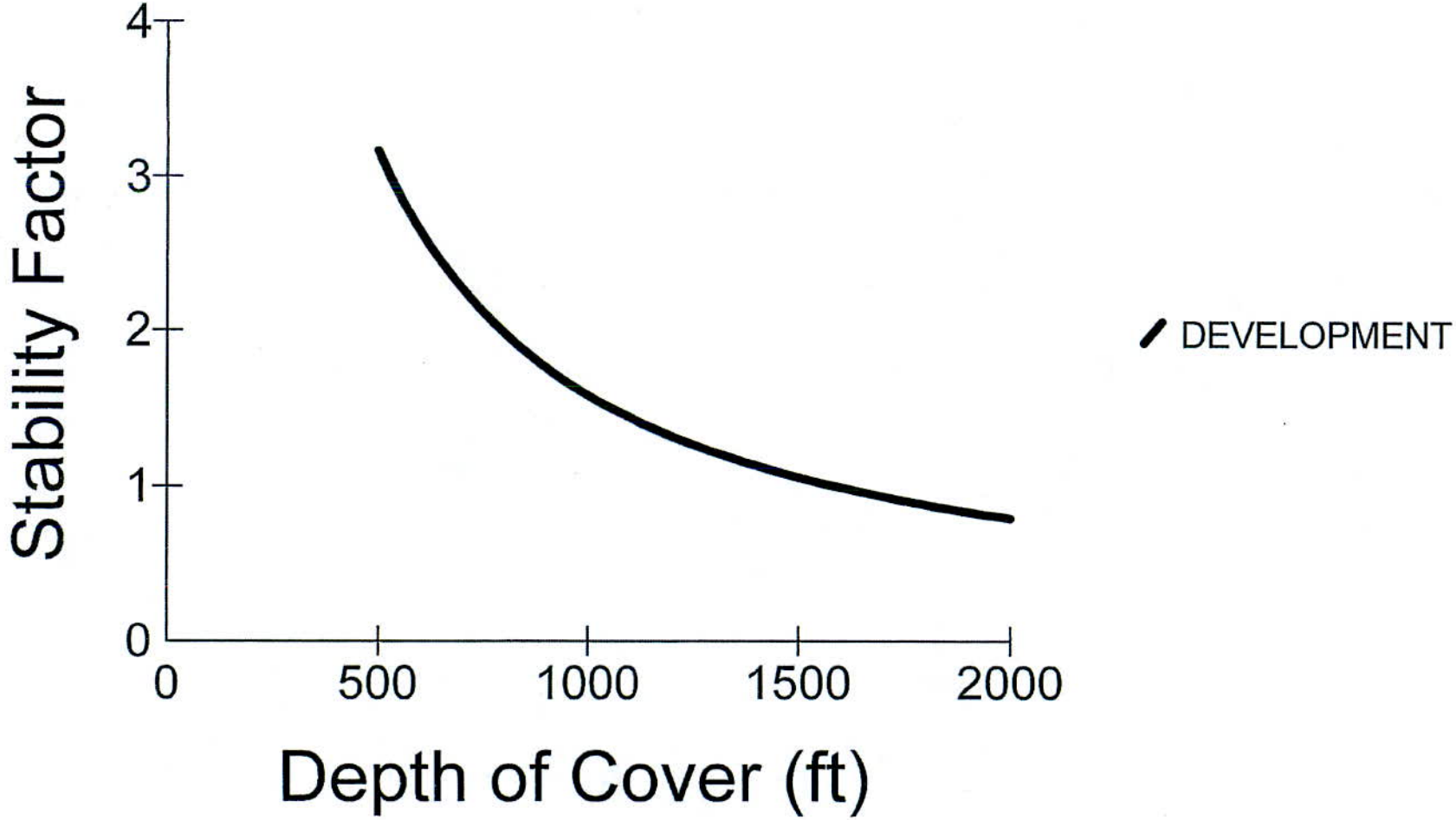
To view the distribution of Pillar Load Bearing Capacity
select 'View Plots->Settings->Pillar Load Bearing Capacity'

[BARRIER PILLAR PARAMETERS]
none

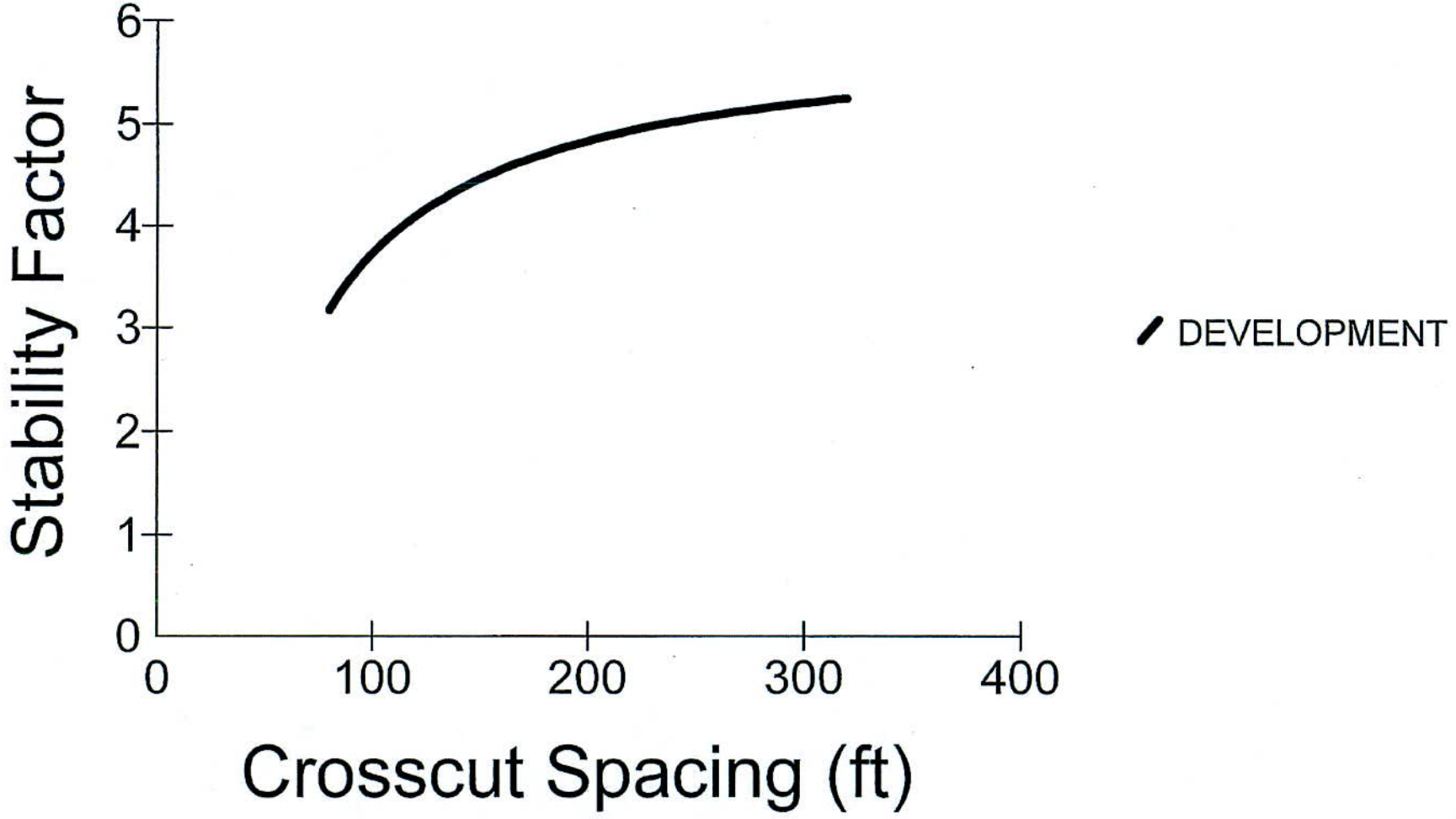
Analysis of Retreat Mining Pillar Stability

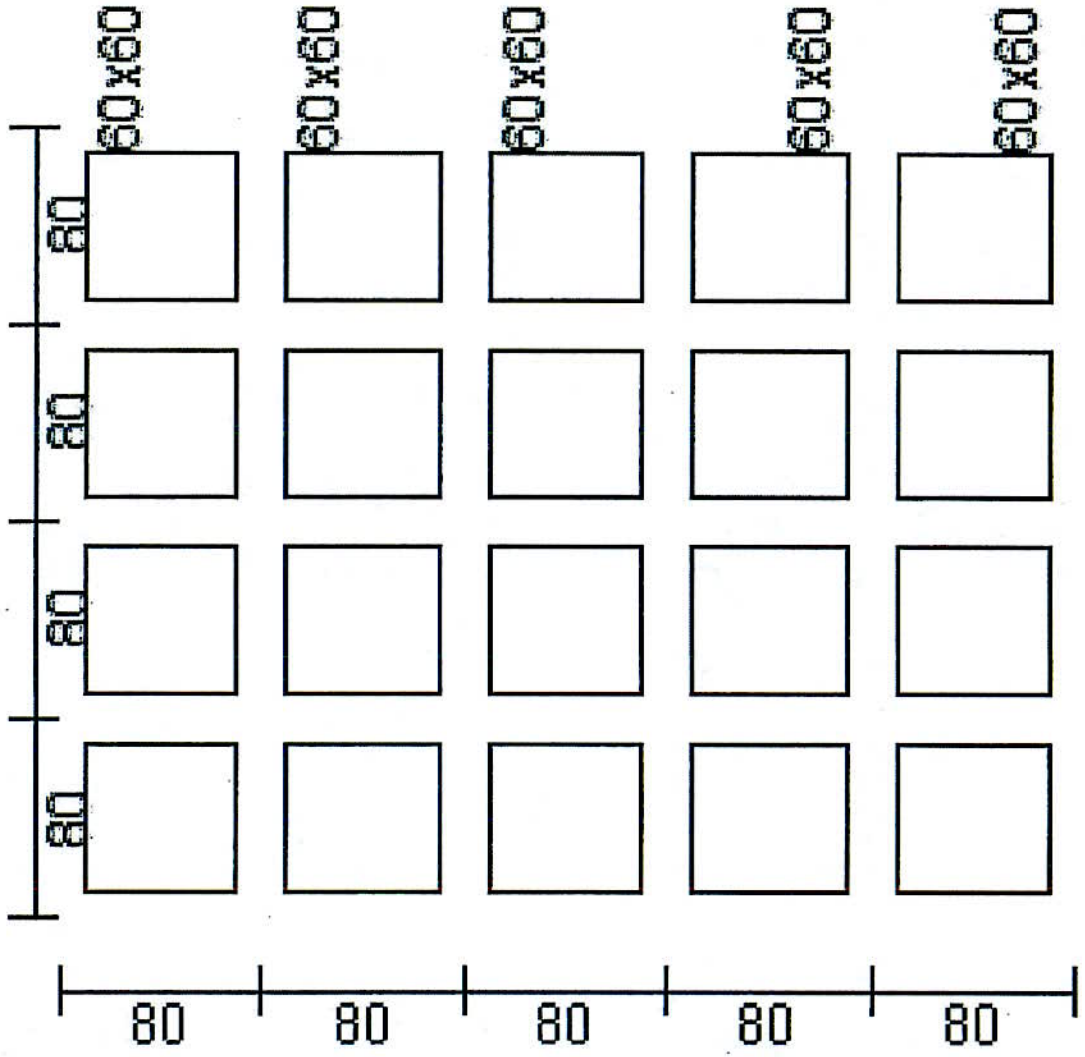


Analysis of Retreat Mining Pillar Stability

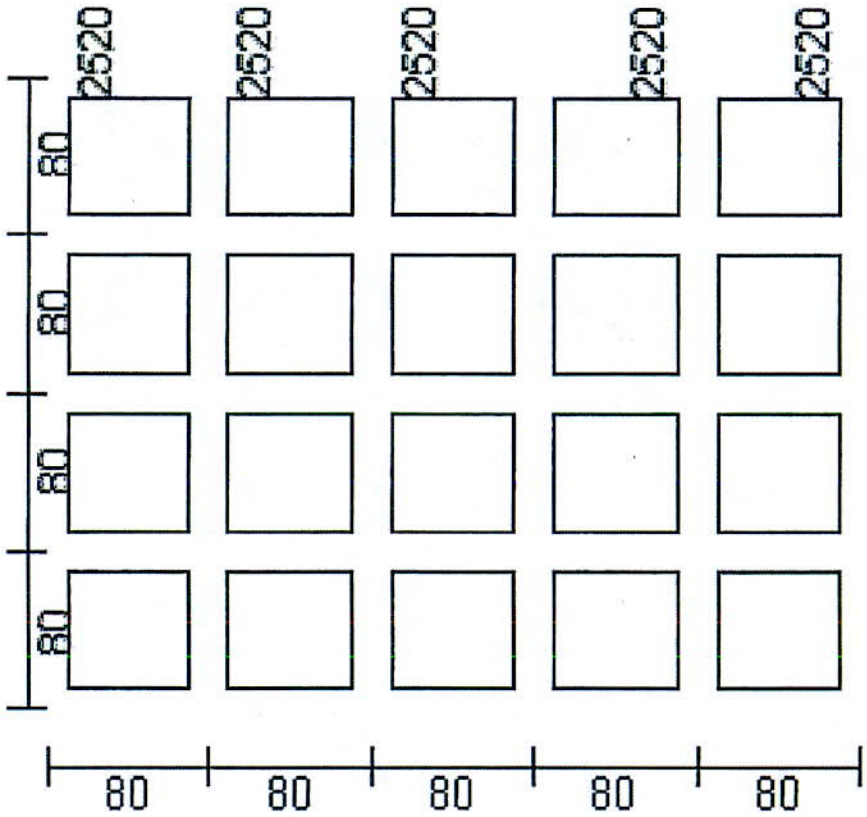


Analysis of Retreat Mining Pillar Stability

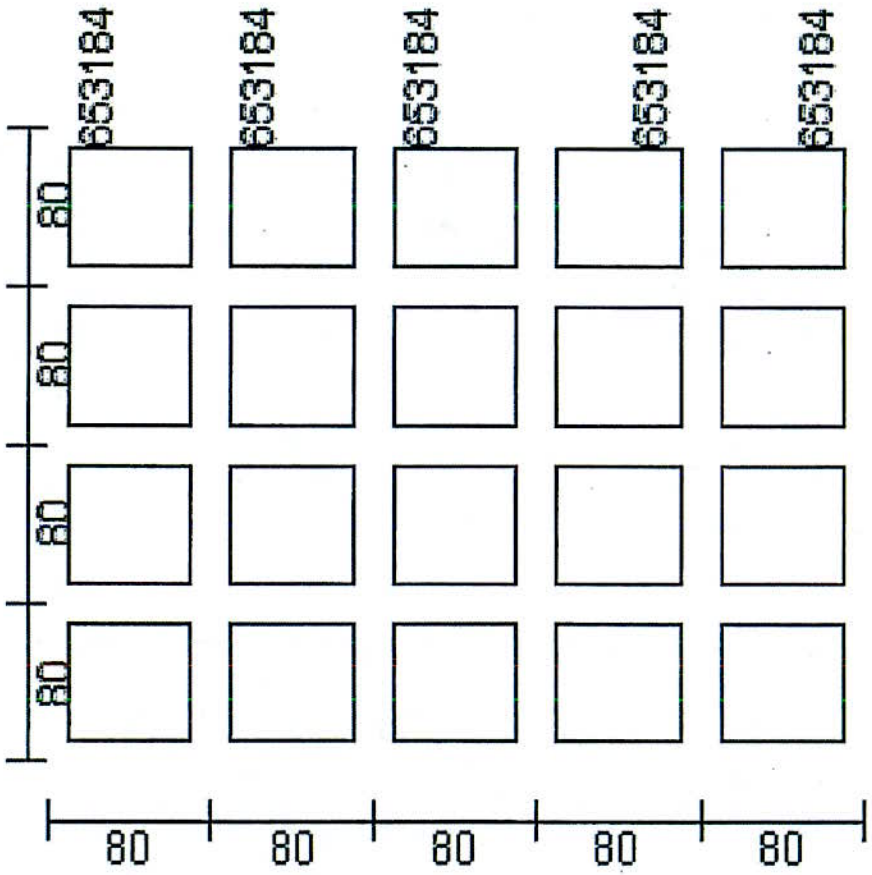



60x60
60x60
60x60
60x60
60x60
80
80
80
80
80
80
80
80
80

ARMPS: Unit Pillar Strength (ps. Entries shown from left to right.



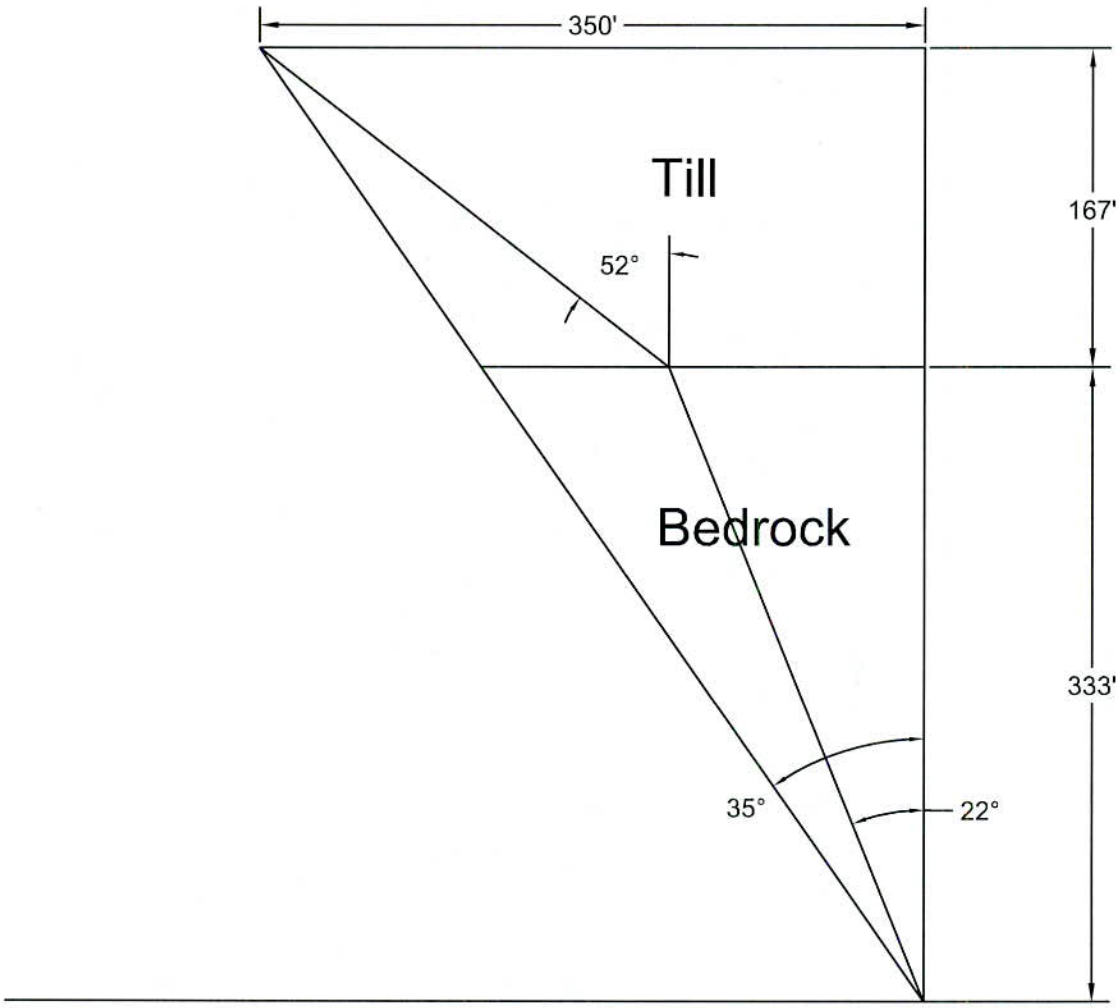
\RMPS: Pillar Load Bearing Capacity ıns)/ (ft). Entries shown from left to rig



Angle of Draw Example

Deer Run Mine Typical

Example Angle of Draw Calculation



The overall angle of draw is 35 degrees.
The bedrock is 22 degrees and the till is 53 degrees.

PART V

Reclamation Plan

PART V

RECLAMATION PLAN

RESPONSE: ***N/A. Refer to Part V of the approved Permit 399, Book 2 of 3 for the requested information.***

PART VI

UCM 1 Application Addendum
Pursuant to rules enacted March 21, 2000

PART VI

UCM 1 Application Addendum
Pursuant to rules enacted March 21, 2000

I. DRINKING DOMESTIC AND RESIDENTUAL WATER SUPPLIES

A. For all underground operations: Shadow area water supply background information.

1. Compliance with 62 Ill. Adm. Code 1784.14(b)(1): The operator shall provide the location and ownership of all existing drinking, domestic and residential water supplies, including private wells, municipal wells and springs. This information shall be provided for all areas within the proposed shadow area and within 1/2 mile of the boundaries of the proposed shadow area.

RESPONSE: ***Refer to Attachment III.2.B.1 – Surface Owners Water Well Survey and Map 4 - Hydro-Geological Map for information regarding the location and ownership of existing water supplies within the proposed shadow area and within ½ mile of the shadow area boundary. It should be pointed out that the majority of the residents in the vicinity of the shadow area obtain their water supply from rural and municipal water systems that serve the area.***

2. Compliance with 62 Ill. Adm. Code 1784.14(b)(1)(A)(ii): Provide adequate ground water quality descriptions for the shadow area and its adjacent area (1/2 mile). The information shall include at a minimum pH, total dissolved solids, total iron and total manganese. The Department may require additional parameters based on site specific conditions.

RESPONSE: ***Monitoring of water quality within the adjacent, currently approved, shadow area of the Deer Run Mine was initiated for three surface sampling points. Data on pH collected from the surface sampling points indicates the surface water in the vicinity of the shadow area ranges from 7.40 to 8.80. Total dissolved solids results for samples from the on-site wells ranged from 100 to 405 mg/liter total manganese ranged from 0.0 to 2.6 mg/liter, and total iron ranged from 0.21 to 5.05 mg/liter.***

In addition, twelve (12) monitoring wells were installed around the perimeter of the surface effects area to gather baseline information about the shallow ground water resources in the permit area. Data on pH collected from the monitoring wells in the surface effects area indicates the ground water in the vicinity of the shadow area ranges from 7.02 to 7.34. Total dissolved solids results for samples from the on-site wells ranged from 392 to 740 mg/liter, total manganese ranged from 1.44 to 62.2 mg/liter, and total iron ranged from 54.8 to 2,550 mg/liter.

Refer to attachments III.2.C.2 – Baseline Surface Sample Site Data and III.2.B.2 – Schedule B Groundwater Monitoring Well Data in the approved Permit 399 for the detailed data on all water sampling.

Also refer to <u>Attachment III.2.B.2 – Groundwater Quality Summary</u> in this permit application for a summary of groundwater results that were collected and analyzed at the nearby surface facilities site of the Deer Run Mine. This is a collection of groundwater quality data that has been required to be monitored as per the requirements of Permit No. 399.

3. Compliance with 62 Ill. Adm. Code 1784.14(b)(1)(B): Respond to UCM-1 Application Part III(2)(B)(3).

<u>RESPONSE:</u> See Part III.2.B.3 of the permit application text.

B. For all underground operations: Qualification for exemption for performing individual water quantity and quality data collection.

1. Compliance with 62 Ill. Adm. Code 1784.20(b)(7) and (b)(8)(B): Provide sufficient documentation concerning site specific geologic, geotechnical and historical performance to demonstrate that existing wells and springs will not be impacted by the operation. Stratigraphic locations of drinking, domestic and residential water supplies relative to the seam to be mined shall also be discussed in relation to potential impacts from mine level instabilities such as roof falls.

<u>RESPONSE:</u> Drinking, domestic, and/or residential water supplies have been identified within the Revision No. 2 shadow area.

As indicated by previously approved submittals, based on the results of the water use survey conducted of residents within the approved permit shadow area and adjacent area (1/2 mile), the vast majority of the residents obtain their drinking water from rural and municipal water systems that serve the area. Refer to <u>Map 4 – Hydro-Geological Map</u> and <u>Attachment III.2.B.1 – Surface Owners Water Well Survey</u> submitted in this revision for the known locations of private wells within and adjacent to the proposed Shadow Area. The absence of wide spread reliance on ground water for domestic use in such rural areas is indicative of the limited availability and poor quality of the ground water resources in the vicinity of the mining operation.

According to Illinois State Geological Survey (ISGS) Circular 225, the best potential sources of groundwater are sand and gravel deposits in the major valley systems. However, many of the surficial sand and gravel deposits throughout the county are narrow and discontinuous. The bottomlands of the East Fork Shoal Creek drainage system has been found to contain thicker deposits and has produced sufficient yields for communities such as Witt to the

North and Fillmore to the East. It is important to note that the public water supply wells for both of these communities are located approximately nine miles away from the surface facilities of the Deer Run Mine and are not located within the proposed shadow boundary or within ½ mile of the proposed shadow boundary. Drift aquifers are generally thin with low yields throughout the permit area. The Pennsylvanian age sandstone bedrock aquifers can usually provide only enough water for individual domestic farm supplies. Yields from wells completed in these formations are usually less than 10 gallons per minute with yields less than 5 gallons per minute common. The mantle of unconsolidated materials at the ground surface (which generally ranges from 110 to 190 feet thick within the proposed shadow boundary area) does not contain substantial sand and gravel deposits capable of yielding sufficient quantities of water for a dependable domestic supply. The shallow drilled wells and cisterns generally have depths of 30 to 40 feet. These wells may tap discontinuous sand lenses contained in the upper part of the unconsolidated strata that are recharged directly by percolation of precipitation within the immediate area. These wells may be supplemented by directing runoff from nearby structures into the well bore.

The other source of ground water is the consolidated rock materials in the Pennsylvanian bedrock. The bedrock surface in the permit area consists of rocks in the Modesto Formation, which overlies the Carbondale Formation, the unit containing the coal seam being mined. In general, rocks of these formations consist of alternating sandstone, limestone, shales and coal. Among these deposits, the best aquifer candidates are the relatively thin sandstones and the fractured or partially dissolved limestone beds. ISGS Circular 225 states that the low permeabilities of the Pennsylvanian System rocks cause the water in the deeper formations to be highly mineralized. Therefore, some deeper bedrock aquifers may contain water whose quality is unsatisfactory without expensive treatment and, generally, are not developed. Recharge to these bedrock aquifers is primarily from precipitation which percolates into and through the overlying unconsolidated materials.

Longwall and other high extraction mining methods cause collapse, fracturing, bed separation, and bedding plane slip in the roof strata above the mined seam. All of these impacts on the overlying strata can result in changes to ground water availability if a major water resource is within reach of the mining disturbance. The height of the disturbed zone depends on the thickness of the mined coal, geometry of the mined panel, the rate of mining face advancement, and the geological characteristics of the overburden. The area of disturbance above a high extraction mining area is generally divided into four zones, based on the extent and type of disturbance. The four zones are: the zone of primary caving where the immediate roof collapses irregularly to fill the mined void; the fractured zone where strata breakage and bed separation occur along existing bedding planes; the continuous bending or deformation zone where strata between the fractured zone and the surface bend downward without breaking;

and the surface zone where tensile strain at the surface causes shallow fractures to develop.

The combined height of the caved and fractured zone where changes in permeability due to subsidence occur has been described by various investigators to range from 30 to 60 times the thickness of the extracted seam. The lower end of this range is typical of areas where the overburden is composed of a high percentage of weak and more elastic strata. On the other hand, the upper end of this range was recorded only in mining with overburden composed entirely of brittle rock (limestone and sandstone). The presence of approximately 310 feet of overburden between the surficial deposits and mined coal, composed of approximately 60% elastic rock types (shales, siltstones and claystones), will limit the height of the caved and fractured zone. Therefore, considering the presence of mostly more elastic shales in the overburden for the Deer Run Mine, it is estimated that the impacts of subsidence on strata permeability could reach up to 40 times the mining height. Based on an average extraction height of approximately 9 feet, this would indicate the zone of disturbance could reach an average of 360 feet above the mine opening.

Numerous studies have been conducted to determine the effects of surface subsidence due to underground mining on unconsolidated and bedrock aquifers. Booth and Spande described the impacts of longwall mining the No. 6 Coal Seam in south-central Illinois. At the subject mine location, the coal seam was about 10 feet thick and was being mined at a depth of about 725 feet. The major aquifers above the mined coal seam included the Mt. Carmel Sandstone and alluvial and glacial sediments. The results of the study indicated some increase in permeability of the sandstone strata after undermining, and a temporary decrease in water levels of up to 36 feet. The water levels recovered gradually after the longwall face passed, and within a month returned to the approximate pre-mining levels. Other studies were conducted of a longwall mining operation in Saline County, Illinois where the No. 6 Coal Seam was 5.6 feet thick and about 400 feet below the ground surface. The studies concluded that the subsidence slightly increased the permeability of the Trivoli Sandstone aquifer, located approximately 213 feet above the mined coal. No impacts on permeability or water levels in the glacial drift aquifer were noticed. A third study was conducted of the impacts of a longwall mining operation on glacial and sandstone aquifers at a mine in western Illinois mining the No. 6 Coal Seam. The coal seam at this mine was 6.5 feet thick and the coal is overlain by 140 to 240 feet of bedrock and 70 to 160 feet of unconsolidated glacial sediments. The Trivoli Sandstone, a major aquifer in the area, is located about 150 feet above the mined coal. This study concluded that the subsidence increased the hydraulic conductivity of the Trivoli Sandstone by about one order of magnitude, and by two to three orders of magnitude in the shales. The study also found water levels in the glacial aquifers were increased due to the impacts of subsidence, and water levels in the sandstone decreased. It should be pointed out that the sandstone and shales for this latter case were within the

caving and fracture zones described above.

No significant, detrimental impacts on drinking, domestic and residential water supplies are anticipated due to the proposed mining operations for several reasons. Although planned subsidence mining methods are proposed, the geologic conditions of Deer Run Mine are favorable for limiting the impacts of any planned subsidence on both surface and ground water hydrology. The unconsolidated soil deposit which lies at the surface is composed of fine-grained materials consisting primarily of clay and silt with lesser amounts of sand. The soil thickness is generally from about 110 to 155 feet and the minimum thickness of the consolidated overburden between the mined coal and the bottom of the surficial deposits is approximately 310 feet. Based on the nature and thickness of the consolidated overburden in the permit area, subsidence is not likely to have significant, long-term impacts on ground water supplies.

Should subsidence affect a ground water supply, the impacts would be expected to be similar to the impacts described in the first two studies discussed above. Therefore, the potential impacts due to planned subsidence on water supply wells located above a mining panel in the bedrock aquifer could be a temporary lowering of water levels. The water levels should recover to pre-mining levels within a few weeks after subsidence occurs. The possibility of decreasing water levels after subsidence has occurred is typically caused by increasing permeability of the water bearing strata. However, the decrease in water level in most wells is compensated for by an increased well yield. Therefore, the slight decrease of water levels after mining in some wells does not materially affect the post-mining water availability. The studies have indicated that aquifers in unconsolidated materials are not typically impacted by subsidence, even if shallow bedrock aquifers are impacted. Therefore, wells completed in the surficial deposits are not expected to be impacted by the planned subsidence mining.

Based on the significant overburden depth and its high percentage of elastic rocks, the distance from the mined coal to the surface deposits and the fine texture of the unconsolidated materials, no significant, long-term impacts to any drinking, domestic or residential water supplies are anticipated due to the planned subsidence resulting from the proposed mining.

2. Provide the locations of any water supplies that will be specifically monitored for water quality and quantity based on the potential for adverse impacts from the underground mining operations. Based on the analysis provided under B above, the Department will determine if any water supplies beyond those proposed to be monitored warrant pre-mining collection of quality and quantity data. In the event the Department determines additional monitoring is required beyond that proposed under B.2. above, the operator will be notified of such determination and will be required to modify the monitoring plan provided under C, below.

RESPONSE: ***Due to the minimal potential for adverse impacts to any water supply from the proposed underground mining operations, Deer Run Mine is not proposing to monitor any specific water supplies for water quality and quantity. The necessity of monitoring individual water supply wells will be evaluated on a case-by-case basis. Monitoring of specific wells will be conducted in accordance with any agreements reached with individual residents and landowners.***

The presence of groundwater wells within the subsidence control plan zone have been identified. The groundwater surveys that were returned indicated some structures that used a well as a primary water source. As the mining plan progresses, subsidence agreements will be sought with structure owners and additional information on additional groundwater sources that may exist.

C. For all operations where water supplies have not been exempt from monitoring requirements under B, above: Water quality and quantity monitoring plan.

1. Provide a plan for obtaining adequate pre-mining water quality and quantity data from wells and springs potentially impacted by subsidence. Specific parameters to be monitored and method(s) for defining approximate water supply quantities shall be detailed.

RESPONSE: ***At least 6 months prior to longwall mining subsidence occurring at a property, the Illinois Department of Natural Resources, Office of Mines and Minerals, Reclamation Division will be notified of any groundwater sources that should be monitored. Quarterly progress reports shall be submitted to IDNR that will describe the location of the longwall face during the previous quarter and the predicted longwall face progress for the following 6 months. Surface property tracts will be identified that have been subsided during the past quarter as well as those tracts anticipated to be subsided in the next 6 months. Within the quarterly report will be information on groundwater wells that have been identified within the shadow area and the plans to monitor prior to and after subsidence.***

Notification of residents will occur at least 6 months prior to subsidence occurring and will be made by certified mail in accordance to 62 Ill. Adm. 1817.122. The notification will contain all items required by the regulation and will also request information on any groundwater sources that the owners and occupants may be aware of on the surface property.

The vast majority of the residents utilize a public water source for their water supply. However, when sources of groundwater such as water wells, springs and/or cisterns have been identified, pre-subsidence monitoring for quality and quantity will be made, with the permission of the land owners. Data will be collected on the location, the use, the construction, the depth, the elevation, the

capacity, the water quality, the water quantity and the general geology of the water supply.

A pre-subsidence agreement may be entered into to describe what compensation may be provided if a water source is damaged.

Once subsidence has occurred, the water source will be monitored to determine the effect of subsidence. If the water source has been damaged by subsidence, the water source will be repaired or a new water source will be provided or the land owner will be compensated.

As part of the Subsidence Program, a spreadsheet has been developed to track the documentation of structures prior to subsidence occurring. This spreadsheet will be submitted to the local inspector on a quarterly basis to provide the agency with updated progress on the Subsidence Program at this mine.

The tracking template for monitoring of domestic drinking and residential supplies is included in Attachment VI.1.C.1 – Quarterly Subsidence Report Template.

2. Provide a time table for collection of data sufficiently in advance of underground mine development to document pre-mining quality and quantity. Data collection should reflect seasonal fluctuations.

RESPONSE: ***At least 6 months prior to longwall mining subsidence occurring at a property, the Illinois Department of Natural Resources, Office of Mines and Minerals, Reclamation Division will be notified of any groundwater sources that should be monitored. Quarterly progress reports shall be submitted to IDNR that will describe the location of the longwall face during the previous quarter and the predicted longwall face progress for the following 6 months. Surface property tracts will be identified that have been subsided during the past quarter as well as those tracts anticipated to be subsided in the next 6 months. Within the quarterly report will be information on groundwater wells that have been identified within the shadow area and the plans to monitor prior to and after subsidence.***

Notification of residents will occur at least 6 months prior to subsidence occurring and will be made by certified mail in accordance to 62 Ill. Adm. 1817.122. The notification will contain all items required by the regulation and will also request information on any groundwater sources that the owners and occupants may be aware of on the surface property.

The tracking template for monitoring of domestic drinking and residential supplies is included in Attachment VI.1.C.1 – Quarterly Subsidence Report Template.

D. For all underground operations: Replacement of impacted water supplies.

1. Compliance with 62 Ill. Adm. Code 1784.20(b)(9): Provide a general plan for replacing any contaminated, diminuted, or interrupted drinking, domestic or residential water supply. The plan should include possible contingencies for emergency, temporary and permanent replacement of affected water supplies. Replacement of water supplies must comply with the definition found under 62 Ill. Adm. Code 1701. Appendix A Definitions: "Replacement of Water Supply".

RESPONSE: ***If any drinking, domestic or residential water supplies are adversely affected due to the planned subsidence caused by the mining activities, Hillsboro Energy, LLC will provide a suitable alternative water supply of equivalent quantity and quality as the original supply. Emergency or temporary water replacement will be provided within 24 hours and could be established by hauling water in until a permanent supply is established. Owners of adversely affected water supplies will be reimbursed for actual out-of-pocket expenses caused by the temporary disruption of their water supply. Alternative permanent water supplies in the area include extension and connection to a public water supply system, drilled wells in the bedrock aquifer, and surface water impoundments. Permanent replacement includes providing an equivalent water delivery system and reimbursement for operation and maintenance costs in excess of the customary and reasonable delivery costs for the pre-mining water supplies.***

2. Compliance with 62 Ill. Adm. Code 1784.20(b)(9)(A): Provide a procedural plan for determining the existence and degree of material damage, loss or diminution of water quality and quantity. Address resolution of disputes over the existence, amount or level of water quality and quantity such as third party arbitration.

RESPONSE: ***If Deer Run Mine personnel are contacted by a resident or owner alleging that a drinking, domestic or residential water supply has been adversely affected by subsidence, mine personnel will meet with the person as soon as practicable to investigate the claim and collect information documenting the details of the claimed damage. Based on the results of the initial investigation and in areas of alleged damages not clearly defined, Deer Run Mine will retain appropriate experts or other qualified persons, such as hydrologists, geologists, well drilling contractors, and plumbers, to inspect and evaluate the property and provide a written report, stating the conditions of the alleged damages. Procedures to determine the existence and degree of material damage, loss or diminution of water quality and quantity will be selected based on the findings of the experts' evaluation. The procedures may include comparing information from unaffected, nearby residents who use the same water source, such as analyzing samples for water quality or conducting pump tests to determine aquifer yield characteristics. Once the details of the damage have been identified and documented, Deer Run Mine will appraise the alleged claim and propose a***

resolution or compensation. If the property owner is dissatisfied with the proposed resolution, differences will be resolved through third party arbitration or litigation.

3. Compliance with 62 Ill. Adm. Code 1784.20(b)(9)(B): Provide a plan for determining the present worth of the cost to replace a water supply if the operator wishes to pursue a one time lump sum payment for costs associated with provisions for an equivalent water delivery system and payment of operation and maintenance costs in excess of customary and reasonable delivery costs for pre-mining water supplies. Any lump sum payments for future costs must be agreed to by the water supply owner.

RESPONSE: ***In the event Hillsboro Energy, LLC wishes to pursue a one-time lump sum payment for costs associated with providing an equivalent water delivery system and payment of operation and maintenance costs in excess of customary and reasonable delivery costs for the pre-mining water supply, accepted economic analysis procedures will be used to determine the amount of the lump sum payment. A discounted cash flow analysis using accepted compound interest formulas will be performed to determine the net differences in the present value of the installation, operating and maintenance costs between the pre-mining water supply system and an equivalent water delivery system. Installation costs will be determined based on estimates or bids prepared by qualified contractors experienced in the installation of the selected water supply system. All equipment, components and construction necessary for installation and hookup of the replacement system will be included. Operating and maintenance costs over the expected life of the pre-mining system for both the pre-mining and replacement systems will be computed based on actual costs incurred by the owner, if available, or by estimates provided by a qualified contractor. Operating costs will include the reasonable and customary expenses for power, treatment chemicals, filters, and other consumable items related to the ongoing provision of the water supply. If the replacement system involves connection to a municipal water supply, the operating costs will include the periodic charges imposed by the utility for the expected water usage. Maintenance costs will include expenses required for the repair and replacement of system components such as pumps, pressure tanks, and treatment systems. As indicated in Item I.D.1. in this addendum, the lump sum payment may also include reimbursement for actual out-of-pocket expenses caused by the temporary disruption of the water supply. Any proposal for lump sum payments for future costs will be presented to the water supply owner and their approval obtained.***

II. STRUCTURES, FACILITIES, AND OCCUPIED DWELLINGS

A. For all operations proposing planned subsidence. Compliance with 62 Ill. Adm. Code 1784.20(b)(8)(A) and 1817.121(a)(3): Provide a general plan for the following:

a. A description of the methods that will be employed to minimize damage from planned subsidence to structures and facilities.

Please note that if minimization methods are not proposed for a given structure or facility, the written consent of the owner must be obtained and provided to the Department in advance of any planned subsidence impacts.

RESPONSE: ***At a minimum, the Company will pursue a premining agreement with the structure owner prior to subsidence occurring. The agreement will allow the implementation of measures designed to prevent or minimize subsidence damages and/or outline an orderly procedure for the repair or replacement of damaged structures following subsidence. These agreements will vary in content in accordance with each structures' site-specific conditions. A site-by-site determination will be made prior to subsidence occurring.***

Pre-subsidence activities could include the following:

- ***Reinforcement of sensitive structures or features;***
- ***Installation of footers or other techniques designed to reduce damages caused by movement;***
- ***Change of location of pipelines, utility lines or other features;***
- ***Exposure of buried structures such as water lines or gas lines prior to subsidence;***
- ***Relocation of moveable improvements to sites outside the angle of draw;***
- ***Monitoring, to determine the commencement and degree of subsidence so that appropriate measures can be taken to prevent or reduce damage;***

b. A description of the procedure that will be used to demonstrate that the costs of minimizing damages exceeds the anticipated cost of repair. This option is not possible if subsidence material damage would constitute a threat to health or safety.

RESPONSE: ***A waiver of the requirements of minimization of subsidence damages may be obtained from the owner of the structure; or,***

The structure will be appraised of its value by a qualified appraiser. An estimate of the cost of minimization of subsidence will be made by a person qualified and experienced in subsidence related construction estimates. If the cost of minimization exceeds the value of the property or the cost of the repair, the Company may opt to not minimize the subsidence damage but may reimburse the owner of the structure.

c. A time table for submitting to the Department the specific minimization method for each structure or facility sufficiently in advance of underground mine development to comply with 62 Ill. Adm. Code 1784.20(b)(8)(A).

RESPONSE: ***Pre-subsidence agreements are being pursued in advance of mining. The pre-subsidence agreement provides the owners of structures or facilities a means of understanding the effects of subsidence upon their structures or facilities well in advance of the subsidence occurring. The Permittee is provided assurance that mining will continue without interruption.***

The Pre-subsidence Agreement is provided as a means to communicate with the Owner of the structure or facility what events will occur during the subsidence event, what techniques will be utilized to minimize subsidence damage and how the health and safety of the residents of the structure will be assured during the subsidence event.

The negotiation prior to the pre-subsidence agreement between the owner of the structure and facility and the permittee will provide the decision of whether to 1) Minimize the damage to the structure or facility; 2) Provide the owner the opportunity to not have minimization measures taken; or 3) Provide a method to discover if the minimization costs would exceed the anticipated costs of repair.

If a Pre-subsidence Agreement cannot be agreed upon between the structure owner and applicant prior to 120 days before subsidence is to occur, then the Permittee shall submit to the Illinois Department of Natural Resources, Division of Mines and Minerals a site specific written plan of minimization of damage to surface structures.

B. For operations proposing planned subsidence: Qualification for exemption from performing individual structural condition surveys.

1. Compliance with 62 Ill. Adm. Code 1784.20(b)(7) and (b)(8)(B): Provide sufficient documentation concerning site specific geologic, geotechnical and historical performance to demonstrate that a given structure or facility will not be impacted by the operation.

2. Provide the locations of any structures and facilities for which an exemption to conduct condition surveys is requested in B.1. above.

Based on the analysis provided under B above, the Department will determine if any structures qualify for an exemption. In the event the Department determines structures can be exempted, the operator will be specifically notified of such determination.

RESPONSE: ***An exemption from performing individual structural surveys condition surveys is not requested.***

C. Compliance with 62 Ill. Adm. Code 1784.20(b)(8)(B): Conducting pre-subsidence condition surveys. Provide a description of procedures to determine the condition of structures and facilities in accordance with 62 Ill. Adm. Code 1817.121(a)(2).

RESPONSE: ***The pre-subsidence survey will be conducted by a person qualified in evaluating structures and the effects of subsidence on structures. The survey must be performed with the consent of the Property Owner. The survey will be performed at least 120 days prior to subsidence occurring unless approved by the Department after justification by the Permittee in writing. The survey will include a detailed documentation of the condition of the structure supported by either photographs and/or drawings. The Permittee shall provide the Department verification that copies of the survey and technical assessment or engineering evaluation have been provided to the Owner.***

Much of the shadow area above the Deer Run Mine is supplied by a public water supply system. If a property owner utilizes other water sources, the condition of the drinking, domestic and residential water supply will be conducted and submitted at least 120 days prior to the water delivery system being undermined. A lesser time may be approved by the Department if justified by the Permittee in writing. A copy of the water survey will be provided to the property owner and to the Department.

D. For all underground operations, compliance with 62 Ill. Adm. Code 1817.121(c)(3): Adjustment of bond due to material damage from subsidence. When material damage resulting from subsidence occurs to land, structures and facilities, the operator must comply with 1817.121(c)(3). Describe how the operator will adjust the bond or alternatively assure financial responsibility with appropriate liability insurance if repair, replacement or compensation is not accomplished within the allocated time frames.

RESPONSE: ***Where practicable, repair, replacement, or compensation for damage to land, structures, and facilities will be completed within 90 days of the damage. However, if repair, replacement, or compensation of material damage resulting from subsidence cannot be accomplished within 90 days of the occurrence of such damage, Hillsboro Energy, LLC will rely on the property damage provisions of its liability insurance to demonstrate the required assurance of financial responsibility. Hillsboro Energy, LLC will maintain its general liability insurance required by 62 IAC 1800.60 in full force and affect for the duration of its mining operations and until all subsidence related damage is repaired, replaced, or compensated. When a claim is paid, the insurance company is obligated to pay the damaged party the full amount of the agreed settlement up to the policy limits. The $5,000 deductible will be paid by the insured (Hillsboro Energy, LLC) to the insurance company, and whether or not it is paid, it will have no effect on the claiment's settlement. Refer to Attachment I.10.C – Insurance Certificate.***

III. MINING OPERATIONS BLASTING

A. Will the applicant be conducting any surface blasting activities incident to underground mining, including, but not limited to, initial rounds of slopes or shafts that are within 50 vertical feet of the original ground surface? [ ] Yes [*X*] No

RESPONSE: ***No blasting activities within 50 feet of the ground surface are being proposed in this application revision.***

B. If the answer to the above is yes, please describe how the applicant will comply with 62 Ill. Adm. Code 1817.61 through 68.

RESPONSE: ***No blasting activities within 50 feet of the ground surface are being proposed in this application revision.***

1) A copy of the proposed blasting schedule(s) and a list of persons to whom the schedule will be distributed for each blasting area described.

RESPONSE: *N/A*

2) A copy of the format used to notify persons within one-half (1/2) mile of the permit area as to how to obtain a pre-blast or condition survey.

RESPONSE: *N/A*

3) A brief description of procedures to be used to perform pre-blast or condition surveys and for distributing copies of the survey reports to owner's residents and the Department.

RESPONSE: *N/A*

4) A copy of the blasting report form.

RESPONSE: *N/A*

5) The distance to, and the names and addresses of the owners of, all dwellings or other structures within one half (1/2) mile of the proposed permit area.

RESPONSE: *N/A*

6) a.) Will blasting be conducted within one thousand (1,000) feet of any building used as a dwelling, public building, school, church community building or institutional building outside the permit area?

Yes ___ No X

b.) Will blasting be conducted within five hundred (500) feet of an active or

abandoned underground mine?

Yes ____ No _X_

If the answer to a) and b) is NO, then continue to Item c) below; if the answer to either a) or b) is YES, an anticipated blast design shall be submitted as described below:

RESPONSE: *N/A*

The blast design shall contain sketches of the drill patterns, delay periods, and decking and shall indicate the type and amount of explosives to be used, critical dimensions and the location and general description of the structures to be protected, as well as a discussion of the design factors to be used, which protect the public man meet the application air blast, flyrock, and ground vibration standards in Section 1819.67.

The blast design shall be prepared and signed by a certified blaster.

RESPONSE: *N/A*

If the blast design is not included with this application please state when you plan to submit the blast design:

_____

_____

c.) Include information setting forth the limitations the operator will meet with regard to ground vibration and airblast, the basis for those limitations, and the methods to be applied in controlling the adverse effects of blasting operations.

RESPONSE: *N/A*

d.) Include a description of any system to be used to monitor compliance with the standards of 62 Ill. Adm. Code 1816.67, including the type, capability, and sensitivity of any blast monitoring equipment and proposed procedures and locations of monitoring.

RESPONSE: *N/A*

e.) Blasting operations within five hundred (500) feet of active underground mines require approval of the Department and Federal Mine Safety and Health Administrations (MSHA). If blasting operations are expected to occur within five hundred (500) feet of an active underground mine, please include the written approvals of the Department and MSHA, or state when the written approvals will be submitted prior to conducting blasting operations.

RESPONSE: *N/A*

ATTACHMENT VI.1.C.1
QUARTERLY SUBSIDENCE REPORT TEMPLATE

Hillsboro Energy LLC's Deer Run Mine

Permit No. 399

Longwall Subsidence Quarterly Progress Report

Nth Quarter YYYY

PROGRESS: Summary of current status of longwall. Footage mined in the current panel of longwall operation, along with the footage mined in the previous 2 quarters shown in the table below.

Quarter	Date Ending	Plus Station Position	Feet of Advance

PROJECTIONS: Summary of projections for the next quarter. This item may also include any pertinent details such as longwall panel pullout projections and future panel.

MONITORING: Subsidence monitoring has been established, but is observed on a regular basis in order to mitigate drainage issues and to ensure subsidence modeling is producing an accurate representation.

MITIGATION: Summary of actual mitigation from the previous quarter. This item may include an attached map to illustrate approximate locations and methods of mitigation if deemed beneficial.

STATUS SHEET: An attachment reporting information regarding surface property, structures, and groundwater wells within the subsidence zone of the current longwall panel as well as the next 6 months.

Hillsboro Energy, LLC
925 South Main Street
Hillsboro, Illinois 62049
Office: 217-532-3983 Fax: 217-532-6005

Hillsboro Energy, LLC
Deer Run Mine
Permit #399 Shadow Area

Nth Quarter Report - YYYY
Panel #

ATTACHMENT I
Report Date:

	Parcel Number	S-T-R	Landowner	Subsidence Rights	Structure & Facility Mitigation Measures								Minimization Waiver		Drinking, Domestic and Residential Water				National Register/Historical Places		
					Survey 1	LO Refusal 2	Copy to LO 3	Verification to IDNR 4	Compensate 5	Purchase 6	Preventative/ Repair 7	Demolition 8	Structures	Acquired	Required 1	Date 2	Copy to LO 3	Copy to IDNR 4	Date Performed	Copy to IDNR	Follow Up
PANEL #																					