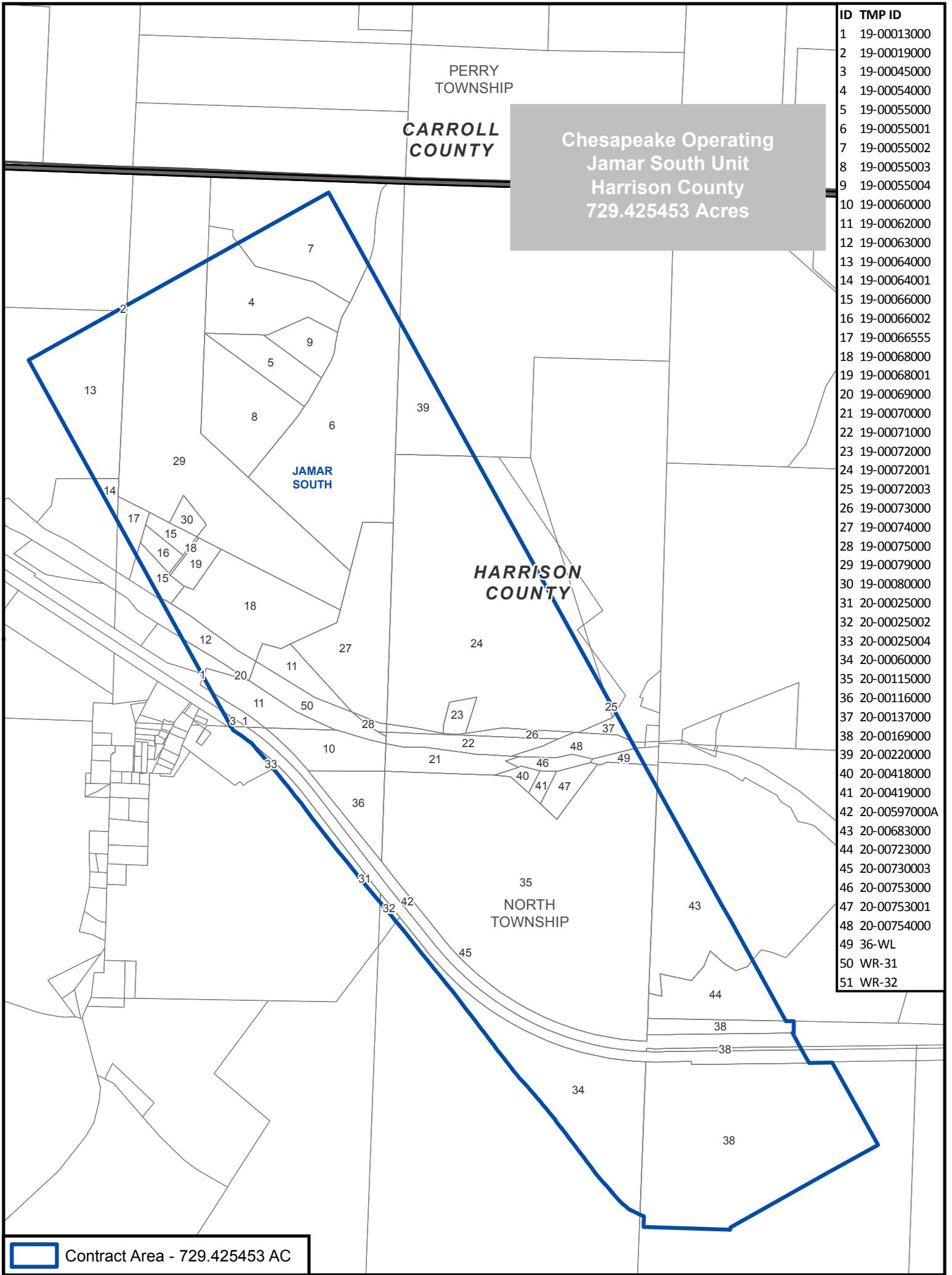


Exhibit "A-1"



ID	TMP ID
1	19-00013000
2	19-00019000
3	19-00045000
4	19-00054000
5	19-00055000
6	19-00055001
7	19-00055002
8	19-00055003
9	19-00055004
10	19-00060000
11	19-00062000
12	19-00063000
13	19-00064000
14	19-00064001
15	19-00066000
16	19-00066002
17	19-00066555
18	19-00068000
19	19-00068001
20	19-00069000
21	19-00070000
22	19-00071000
23	19-00072000
24	19-00072001
25	19-00072003
26	19-00073000
27	19-00074000
28	19-00075000
29	19-00079000
30	19-00080000
31	20-00025000
32	20-00025002
33	20-00025004
34	20-00060000
35	20-00115000
36	20-00116000
37	20-00137000
38	20-00169000
39	20-00220000
40	20-00418000
41	20-00419000
42	20-00597000A
43	20-00683000
44	20-00723000
45	20-00730003
46	20-00753000
47	20-00753001
48	20-00754000
49	36-WL
50	WR-31
51	WR-32

 Contract Area - 729.425453 AC

CONTRACT AREA

Jamar South
North Township
Harrison Co., OH

1 inch = 1,150 feet

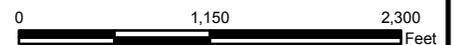


Exhibit "A-2"
Leases Within the Contract Area

Attached to and made a part of that certain Unit Operating Agreement dated April 25, 2014 as approved by the Ohio Department of Natural Resources for the Jamar South Unit.

TRACT NUMBER	CHESAPEAKE LEASE ID NUMBER	LESSOR	LEASED YES/NO	SURFACE ACRES IN UNIT	TRACT PARTICIPATION	TAX MAP PARCEL ID NUMBERS	TOWNSHIP	COUNTY	STATE	UNIT WORKING INTEREST	CHESAPEAKE WORKING INTEREST	CHESAPEAKE UNIT PARTICIPATION	ENERVEST WORKING INTEREST	ENERVEST UNIT PARTICIPATION	XTO WORKING INTEREST	XTO UNIT PARTICIPATION	AEU WORKING INTEREST	AEU UNIT PARTICIPATION	ADDRESS	CITY	STATE	ZIP CODE
1	1-383504-001	WHEELING AND LAKE ERIE RAILWAY COMPANY	YES	1.076293732	0.0014755	19-00013000	North	HARRISON	OH	0.14755%	100.00000%	0.14755%							100 E First St	Brewster	OH	44613
2	34-000369-000	BRUCE W & MARGARET A GANDEE	YES	0.067773652	0.0000929	19-00019000	North	HARRISON	OH	0.00929%	100.00000%	0.00929%							35000 Scio-Bowenston Rd	Bowenston	OH	44695
3	34-0001356-000	CONSOLIDATED RAIL CORPORATION	YES	0.267634881	0.003669	19-00045000	North	HARRISON	OH	0.03669%	100.00000%	0.03669%							1717 Arch St, Ste 1310	Philadelphia	PA	19103
4	34-029804-000	JERRY E & PEGGY L KNIGHT	YES	17.870858400	0.0244999	19-00054000	North	HARRISON	OH	2.44999%	100.00000%	2.44999%							91800 Timmerman Rd	Bowenston	OH	44695
5	34-000849-000	GEORGE H FARNSWORTH, II	YES	7.176876747	0.0098392	19-00055000	North	HARRISON	OH	0.98392%	100.00000%	0.98392%							2600 Ranch Rd	Carrollton	OH	44615
6	34-012516-000	JAMES R COSTIGAN	YES	50.892838720	0.0697711	19-00055001	North	HARRISON	OH	6.97711%	62.50000%	4.3670%	37.50%	2.616417%					3670 Forest Oaks Dr	Fairlawn	OH	44333
7	34-014466-000	JAMAR HOLDINGS LTD BY JACOB E YODER, JR	YES	16.188587270	0.0221936	19-00055002	North	HARRISON	OH	2.21936%	62.50000%	1.38710%	37.50%	0.832261%					13405 Harrison Rd	Applecreek	OH	44606
8	34-000849-000	GEORGE H FARNSWORTH, II	YES	17.644691520	0.0241898	19-00055003	North	HARRISON	OH	2.41898%	100.00000%	2.41898%							2600 Ranch Rd	Carrollton	OH	44615
9	34-000849-000	GEORGE H FARNSWORTH, II	YES	5.097083468	0.0069878	19-00055004	North	HARRISON	OH	0.69878%	100.00000%	0.69878%							2600 Ranch Rd	Carrollton	OH	44615
10	OH0000357-000	WOODLAND LEGACY, LLLP	YES	8.011035492	0.0109827	19-00060000	North	HARRISON	OH	1.09827%	100.00000%	1.09827%							3123 E Kimberly Rd	Davenport	IA	52807
11	OH0000357-000	WOODLAND LEGACY, LLLP	YES	11.039072410	0.0151339	19-00062000	North	HARRISON	OH	1.51339%	100.00000%	1.51339%							3123 E Kimberly Rd	Davenport	IA	52807
12	OPEN	OHIO DEPARTMENT OF TRANSPORTATION	NO	4.472620562	0.0061317	19-00063000	North	HARRISON	OH	0.61317%									Attn: John Maynard and Jim Viau ODOT Office of Real Estate 4TH Floor, 1980 W. Broad St. Mail Stop 4120	Columbus	OH	43223
13	34-003701-000	VERNON J WEBB	YES	21.277188360	0.0291698	19-00064000	North	HARRISON	OH	2.91698%	100.00000%	2.91698%							35200 Scio-Bowenston Rd	Bowenston	OH	44695
14	OPEN	LJ SMITH INC.	NO	1.125892043	0.0015435	19-00064001	North	HARRISON	OH	0.15435%									Attn: Craig Kurtz, President 35280 Scio-Bowenston Rd	Bowenston	OH	44695
15	34-001563-000	BERNARD L & KAREN J WEST	YES	4.347783776	0.0059606	19-00066000	North	HARRISON	OH	0.59606%	100.00000%	0.59606%							35500 SR 151 TR 204	Bowenston	OH	44695
16	34-000753-000	TY J WEST	YES	1.945348052	0.0026670	19-00066002	North	HARRISON	OH	0.26670%	100.00000%	0.26670%							91200 Timmerman Rd	Bowenston	OH	44695
17	34-0001415-000	BERNARD L & KAREN J WEST	YES	2.217810560	0.0030405	19-00066555	North	HARRISON	OH	0.30405%	100.00000%	0.30405%							35500 Scio-Bowenston Rd	Bowenston	OH	44695
18	34-000583-000	JOSEPH H & TERESA FINNICUM	YES	20.896866300	0.0286484	19-00068000	North	HARRISON	OH	2.86484%	100.00000%	2.86484%							9229 Deacon Rd	Bowenston	OH	44695
19	34-000753-000	TY J WEST	YES	2.790427666	0.0038255	19-00068001	North	HARRISON	OH	0.38255%	100.00000%	0.38255%							91200 Timmerman Rd	Bowenston	OH	44695
20	34-000582-000	JOSEPH H & TERESA FINNICUM	YES	1.426318084	0.0019581	19-00069000	North	HARRISON	OH	0.19581%	100.00000%	0.19581%							9229 Deacon Rd	Bowenston	OH	44695
21	34-000609-000	GREEN FIELDS FAMILY FARM LTD	YES	6.261692395	0.0085844	19-00070000	North	HARRISON	OH	0.85844%	100.00000%	0.85844%							132 Fair Ave NW	New Philadelphia	OH	44663
22	OPEN	OHIO DEPARTMENT OF TRANSPORTATION	NO	5.420134757	0.0074307	19-00071000	North	HARRISON	OH	0.74307%									Attn: John Maynard and Jim Viau ODOT Office of Real Estate 4TH Floor, 1980 W. Broad St. Mail Stop 4120	Columbus	OH	43223
23	34-0000812-001	DWIGHT & SANDRA L MCBRIDE	YES	0.617243154	0.0008462	19-00072000	North	HARRISON	OH	0.08462%	100.00000%	0.08462%							124 Piedmont Dr	Kannapolis	NC	28081
23	34-0000959-000	ROBERT MCBRIDE	YES	0.617243154	0.0008462	19-00072000	North	HARRISON	OH	0.08462%	100.00000%	0.08462%							1100 Liberty Ave	Pittsburgh	PA	15222
23	34-0000812-002	MILDRED M MCBRIDE	YES	0.617243154	0.0008462	19-00072000	North	HARRISON	OH	0.08462%	100.00000%	0.08462%							36000 Scio-Bowenston rd	Bowenston	OH	44695
24	34-000609-000	GREEN FIELDS FAMILY FARM LTD	YES	92.61499010	0.1269698	19-00072001	North	HARRISON	OH	12.69698%	100.00000%	12.69698%							132 Fair Ave NW	New Philadelphia	OH	44663
25	34-000609-000	GREEN FIELDS FAMILY FARM LTD	YES	0.132493808	0.0001816	19-00072003	North	HARRISON	OH	0.01816%	100.00000%	0.01816%							132 Fair Ave NW	New Philadelphia	OH	44663
26	OPEN	OHIO DEPARTMENT OF TRANSPORTATION	NO	2.243519920	0.0030757	19-00073000	North	HARRISON	OH	0.30757%									Attn: John Maynard and Jim Viau ODOT Office of Real Estate 4TH Floor, 1980 W. Broad St. Mail Stop 4120	Columbus	OH	43223
27	34-000609-000	GREEN FIELDS FAMILY FARM LTD	YES	23.141468600	0.0317256	19-00074000	North	HARRISON	OH	3.17256%	100.00000%	3.17256%							132 Fair Ave NW	New Philadelphia	OH	44663
28	OPEN	OHIO DEPARTMENT OF TRANSPORTATION	NO	0.468629306	0.0006425	19-00075000	North	HARRISON	OH	0.06425%									Attn: John Maynard and Jim Viau ODOT Office of Real Estate 4TH Floor, 1980 W. Broad St. Mail Stop 4120	Columbus	OH	43223
29	34-002232-000	THOMAS C & GAIL L DENNIS	YES	63.362215330	0.0868659	19-00079000	North	HARRISON	OH	8.68659%	100.00000%	8.68659%							91300 Timmerman Rd	Bowenston	OH	44695
30	34-002232-000	THOMAS C & GAIL L DENNIS	YES	1.628600792	0.0022327	19-00080000	North	HARRISON	OH	0.22327%	100.00000%	0.22327%							91300 Timmerman Rd	Bowenston	OH	44695
31	34-019492-000	CHRISTINE BLANC-OSBOURNE	YES	2.627417744	0.0036020	20-00025000	North	HARRISON	OH	0.36020%	100.00000%	0.36020%							9 Springfield Way	Arden	NC	28704

TRACT NUMBER	CHESAPEAKE LEASE ID NUMBER	LESSOR	LEASED YES/NO	SURFACE ACRES IN UNIT	TRACT PARTICIPATION	TAX MAP PARCEL ID NUMBERS	TOWNSHIP	COUNTY	STATE	UNIT WORKING INTEREST	CHESAPEAKE WORKING INTEREST	CHESAPEAKE UNIT PARTICIPATION	ENERVEST WORKING INTEREST	ENERVEST UNIT PARTICIPATION	XTO WORKING INTEREST	XTO UNIT PARTICIPATION	AEU WORKING INTEREST	AEU UNIT PARTICIPATION	ADDRESS	CITY	STATE	ZIP CODE
32	34-019492-000	CHRISTINE BLANC-OSBOURNE	YES	0.345483401	0.0004736	20-0025002	North	HARRISON	OH	0.04736%	100.00000%	0.04736%							9 Springfield Way	Arden	NC	28704
33	34-016700-000	KIM INBOURNE	YES	0.222695946	0.0003053	20-0025004	North	HARRISON	OH	0.03053%	100.00000%	0.03053%							91009 Conotton Rd.	Bowerston	OH	44695
34		WOODLAND LEGACY, LLLP	YES	33.05469689	0.0453161	20-0006000	North	HARRISON	OH	4.53161%	100.00000%	4.53161%							3123 E. Kimberly Rd.	Davenport	IA	52807
35	34-001565-000	WILLIAM R HARDING	YES	121.358067300	0.1663749	20-00115000	North	HARRISON	OH	16.63749%	100.00000%	16.63749%							283 Second St NW	Carrollton	OH	44615
36	34-001565-000	WILLIAM R HARDING	YES	7.513477542	0.0103005	20-00116000	North	HARRISON	OH	1.03005%	100.00000%	1.03005%							283 Second St NW	Carrollton	OH	44615
37	34-012310-000	THELMA M HORSTMAN	YES	1.145866311	0.0015709	20-00137000	North	HARRISON	OH	0.15709%	100.00000%	0.15709%							36230 Scio-Bowerston Rd	Bowerston	OH	44695
38	OH0000358-000	D STEVEN & LORRAINE REESE AND R CHRISTOPHER & CATHY REESE AND DOUGLAS S & CHRISTINA REESE	YES	72.601457910	0.0995324	20-00169000	North	HARRISON	OH	9.95324%	100.00000%	9.95324%							37900 Crimm Rd	Scio	OH	43988
39	34-012516-000	JAMES R COSTIGAN	YES	11.483286520	0.0157429	20-00220000	North	HARRISON	OH	1.57429%	62.50000%	0.98393%	37.50%	0.590359%					3670 Forest Oaks Dr	Fairlawn	OH	44333
40		HARRY C & DEANN HORSTMAN	YES	1.097242654	0.0015043	20-00419000	North	HARRISON	OH	0.15043%					100.00000%	0.150426%			90151 Kilgore Ridge Rd	Scio	OH	43988
41		HARRY C & DEANN HORSTMAN	YES	1.025846938	0.0014064	20-00419000	North	HARRISON	OH	0.14064%					100.00000%	0.140638%			90151 Kilgore Ridge Rd	Scio	OH	43988
42	34-0001356-000	CONSOLIDATED RAIL CORPORATION	YES	16.527542740	0.0226583	20-00597000A	North	HARRISON	OH	2.26583%	100.00000%	2.26583%							1717 Arch St, Ste 1310	Philadelphia	PA	19103
43	34-004953-000	PAUL A TRUSHELL	YES	21.977235430	0.0301295	20-00683000	North	HARRISON	OH	3.01295%	100.00000%	3.01295%							36695 Scio-Bowerston Rd	Scio	OH	43988
44		MARSH E AMOS	YES	12.952806260	0.0177575	20-00723000	North	HARRISON	OH	1.77575%					100.00000%	1.775755%			90700 Amos Rd	Scio	OH	43988
45	1-383504-001	WHEELING AND LAKE ERIE RAILWAY COMPANY	YES	15.807006280	0.0216705	20-00730003	North	HARRISON	OH	2.16705%	100.00000%	2.16705%							100 E First St	Brewster	OH	44613
46	34-012310-000	THELMA M HORSTMAN	YES	1.973372828	0.0027054	20-00753000	North	HARRISON	OH	0.27054%	100.00000%	0.27054%							36230 Scio-Bowerston Rd	Bowerston	OH	44695
47		RICHARD RICE	YES	3.141142578	0.0043063	20-00753001	North	HARRISON	OH	0.43063%							100.00000%	0.430632%	36230 Scio-Bowerston Rd	Bowerston	OH	44695
48	OPEN	OHIO DEPARTMENT OF TRANSPORTATION	NO	4.198011469	0.0057552	20-00754000	North	HARRISON	OH	0.57552%									Attn: John Maynard and Jim Viau ODOT Office of Real Estate 4TH Floor, 1980 W. Broad St. Mail Stop 4120	Columbus	OH	43223
49	OPEN	OHIO DEPARTMENT OF TRANSPORTATION	NO	1.047434920	0.0014360	WL-36	North	HARRISON	OH	0.14360%									Attn: John Maynard and Jim Viau ODOT Office of Real Estate 4TH Floor, 1980 W. Broad St. Mail Stop 4120	Columbus	OH	43223
50	OPEN	OHIO DEPARTMENT OF TRANSPORTATION	NO	6.325791843	0.0086723	WR-31	North	HARRISON	OH	0.86723%									Attn: John Maynard and Jim Viau ODOT Office of Real Estate 4TH Floor, 1980 W. Broad St. Mail Stop 4120	Columbus	OH	43223
51	OPEN	OHIO DEPARTMENT OF TRANSPORTATION	NO	0.038993680	0.0000535	WR-32	North	HARRISON	OH	0.00535%									Attn: John Maynard and Jim Viau ODOT Office of Real Estate 4TH Floor, 1980 W. Broad St. Mail Stop 4120	Columbus	OH	43223
TOTAL LEASED ACRES:				704.0844245	0.9652589					96.52589%	89.98940%	4.03904%			2.06682%	0.43063%						
TOTAL UNIT ACRES:				729.4254530																		

Exhibit "A-3"
Unitized Parties

Attached to and made a part of that certain Unit Operating Agreement dated April 25, 2014 as approved by the Ohio Department of Natural Resources for the Jamar South Unit.

TRACT NUMBER	LESSOR	ADDRESS	LEASED YES/NO	SURFACE ACRES IN UNIT	TRACT PARTICIPATION	TAX MAP PARCEL ID NUMBERS	TOWNSHIP	COUNTY	STATE	LESSOR WORKING INTEREST	UNIT PARTICIPATION
12	OHIO DEPARTMENT OF TRANSPORTATION	OFFICE OF REAL ESTATE, ATTN: JIM VIAU AND LARRY HAMILTON, MAIL STOP 4120, 1980 W. BROAD STREET, COLUMBUS, OH 43223	NO	4.472620562	0.0061317	19-00063000	NORTH	HARRISON	OH	100.00%	0.006132
14	LJ SMITH INC.	ATTN: CRAIG KURTZ 35280 SCIO-BOWERSTON RD, BOWERSTON, OH 44695	NO	1.125892043	0.0015435	19-00064001	NORTH	HARRISON	OH	100.00%	0.001544
22	OHIO DEPARTMENT OF TRANSPORTATION	OFFICE OF REAL ESTATE, ATTN: JIM VIAU AND LARRY HAMILTON, MAIL STOP 4120, 1980 W. BROAD STREET, COLUMBUS, OH 43223	NO	5.420134757	0.0074307	19-00071000	NORTH	HARRISON	OH	100.00%	0.007431
26	OHIO DEPARTMENT OF TRANSPORTATION	OFFICE OF REAL ESTATE, ATTN: JIM VIAU AND LARRY HAMILTON, MAIL STOP 4120, 1980 W. BROAD STREET, COLUMBUS, OH 43223	NO	2.24351992	0.0030757	19-00073000	NORTH	HARRISON	OH	100.00%	0.003076
28	OHIO DEPARTMENT OF TRANSPORTATION	OFFICE OF REAL ESTATE, ATTN: JIM VIAU AND LARRY HAMILTON, MAIL STOP 4120, 1980 W. BROAD STREET, COLUMBUS, OH 43223	NO	0.468629306	0.0006425	19-00075000	NORTH	HARRISON	OH	100.00%	0.000643
48	OHIO DEPARTMENT OF TRANSPORTATION	OFFICE OF REAL ESTATE, ATTN: JIM VIAU AND LARRY HAMILTON, MAIL STOP 4120, 1980 W. BROAD STREET, COLUMBUS, OH 43223	NO	4.198011469	0.0057552	20-00754000	NORTH	HARRISON	OH	100.00%	0.005755
49	OHIO DEPARTMENT OF TRANSPORTATION	OFFICE OF REAL ESTATE, ATTN: JIM VIAU AND LARRY HAMILTON, MAIL STOP 4120, 1980 W. BROAD STREET, COLUMBUS, OH 43223	NO	1.04743492	0.0014360	WL-36	NORTH	HARRISON	OH	100.00%	0.001436
50	OHIO DEPARTMENT OF TRANSPORTATION	OFFICE OF REAL ESTATE, ATTN: JIM VIAU AND LARRY HAMILTON, MAIL STOP 4120, 1980 W. BROAD STREET, COLUMBUS, OH 43223	NO	6.325791843	0.0086723	WR-31	NORTH	HARRISON	OH	100.00%	0.008672
51	OHIO DEPARTMENT OF TRANSPORTATION	OFFICE OF REAL ESTATE, ATTN: JIM VIAU AND LARRY HAMILTON, MAIL STOP 4120, 1980 W. BROAD STREET, COLUMBUS, OH 43223	NO	0.03899368	0.0000535	WR-32	NORTH	HARRISON	OH	100.00%	0.000054
		TOTAL UNITIZED ACRES:		25.3410285	0.0347411						
		TOTAL UNIT ACRES:		729.4254530							

**STATE OF OHIO
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL AND GAS RESOURCES MANAGEMENT**

In re the Matter of the Application of :
Chesapeake Exploration, L.L.C., for :
Unit Operation : Application Date: April 25, 2014
: :
Jamar South Unit :

**PREPARED TESTIMONY OF DAVID F. YARD, PE
ON BEHALF OF CHESAPEAKE EXPLORATION, L.L.C.**

R. Neal Pierce (0028379)
Katerina E. Milenkovski (0063314)
STEPTOE & JOHNSON PLLC
Huntington Center
41 South High Street, Suite 2200
Columbus, OH 43215

Attorneys for Applicant,
Chesapeake Exploration, L.L.C.

Date: April 25, 2014

PREPARED DIRECT TESTIMONY OF DAVID F. YARD, PE

1 **Q1. Please introduce yourself.**

2 **A1.** My name is David Yard and my business address is 6100 N. Western Avenue, Oklahoma
3 City, Oklahoma 73154-0496. I am a Reservoir Engineering Advisor for Chesapeake
4 Energy Corporation.

5 **Q2. What is the purpose of your testimony today?**

6 **A2.** I am testifying in support of the Application of Chesapeake Exploration, L.L.C., for Unit
7 Operation filed with respect to the Jamar South Unit. My testimony addresses the
8 following: (1) that unit operations for the Jamar South Unit are reasonably necessary to
9 increase substantially the recovery of oil and gas, protect the correlative rights of the
10 mineral owners, and (2) that the estimated additional revenue, due to unit operations,
11 exceeds the estimated additional capital investment.

12 **Q3. Can you summarize your educational experience for me?**

13 **A3.** I hold a Bachelors of Science degree from Columbia University, NYC and I am licensed
14 as a Professional Petroleum Engineer in the State of Oklahoma, #14582.

15 **Q4. Are you a member of any professional associations?**

16 **A4.** I am a member, and former Section Chairman, of the Society of Petroleum Engineers; a
17 member of the Society of Petroleum Evaluation Engineers; and member of the Interstate
18 Oil and Gas Compact Commission.

19 **Q5. How long have you been a Reservoir Engineer for Chesapeake?**

20 **A5.** Three years.

21 **Q6. What other work experiences have you had?**

22 **A6.** I have experience of more than 30 years in the oil and gas industry; twenty of those years
23 as a domestic and international consultant specializing in regional studies for investment
24 purposes, secondary and tertiary flood design, optimization of mature oil and gas fields,
25 pressure transient analysis, Nodal analysis, and the economic evaluation of oil and gas
26 properties. I was one of the two founders of Columbia Production Co.; President and
27 CEO (4 yrs). Additionally, I was Technical Manager, Oklahoma Corporation
28 Commission, Oil and Gas Division in 2002.

29 **Q7. What do your job responsibilities entail?**

30 **A7.** I do exploratory property evaluations and strategic planning. I also train, coach, and
31 mentor other engineers in all matters associated with reservoir engineering and the public

1 disclosure of Chesapeake's assets. Finally I am responsible for the preparation of expert
2 engineering testimony for the Utica play in Ohio as well as all other areas of interest to
3 Chesapeake Energy Corporation.

4 **Q8. How do you do that?**

5 **A8.** I use public and proprietary information, coupled with sound engineering practices to
6 audit the value of Chesapeake assets. Practices include, but are not limited to,
7 volumetrics, material balance, Arps (decline curve) analysis, as well as other forms of
8 rate-time analysis and analytical models.

9 **Q9. Did you perform any analysis to support Chesapeake's application for unitization
10 for the proposed Jamar South Unit?**

11 **A9.** Yes.

12 **Q10. What sort of analysis did you perform?**

13 **A10.** First, I estimated the gas-in-place (GIP) without unitization, observing current regulatory
14 setbacks for individual tracts. Next, I calculated GIP pursuant to a unitization order.
15 Lastly, I calculated the future revenue, based on current pricing, and determined a
16 minimum recovery factor (RF) needed for revenues to exceed capital investment.

17 **Q11. Why is Chesapeake looking at drilling horizontal wells?**

18 **A11.** The permeability of unconventional resource plays is so low (in nano-darcy units (nd),
19 i.e. 1.0×10^{-9} darcies) that the hydrocarbons cannot be economically produced without
20 the use of horizontal drilling, coupled with massive stimulation treatments (i.e. hydraulic
21 fracturing). Horizontal drilling is the predominant method used to develop shale
22 formations such as the Utica/Point Pleasant.

23 **Q12. Turning specifically to the Jamar South Unit, have you made an estimate of the
24 production you anticipate from the proposed unit's operations?**

25 **A12.** Yes. I have estimated the GIP from the proposed Unit Area in the Jamar South Unit to be
26 72.0 BCFE.

27 **Q13. How did you make those estimates?**

28 **A13.** I used isopleth maps of petrophysical data, obtained from other wells in the area, to
29 estimate the anticipated GIP.

30 **Q14. Once you had that data from the other Utica/Point Pleasant wells, what did you do
31 with it?**

1 **A14.** I used the porosity, water saturations, net pay, formation pressures, etc. to do volumetric
2 calculations based on industry accepted methodologies.

3 **Q15. Why do you qualify your calculations as an estimate?**

4 **A15.** There is always the possibility that the petrophysical and geological data used from offset
5 wells may be slightly different than the characteristics of the productive horizon at this
6 location. However, the volumetric calculations of GIP should be a reasonably certain
7 estimate in this statistical unconventional play.

8 **Q16. In your professional opinion, would it be economic to develop the Jamar South Unit
9 using traditional vertical drilling?**

10 **A16.** Absolutely not.

11 **Q17. Are the estimates that you made based on good engineering practices and accepted
12 methods in the industry?**

13 **A17.** Yes.

14 **Q18. Do you have the calculations you performed?**

15 **A18.** The results of my calculations are attached to this prepared testimony as Exhibit DFY-1.

16 **Q19. Can you summarize what your calculations show?**

17 **A19.** The results of my prior stated methodology are (assuming 100% recovery in all cases);
18 1) Capital expenditure (CAPEX) to develop the unitized project is \$29.9 million. GIP
19 from the project is 69.8 BCFE (reduced from 72.0 BCFE due to regulatory setbacks from
20 unit boundaries) and future revenues (using current SEC pricing of \$3.989/Mcf (no btu
21 adjustments)) are \$278.2 million. A recovery factor (RF) of 10.7% is needed to achieve
22 revenues that exceed CAPEX.

23 2) CAPEX to develop the non-unitized project is \$11.1 million. GIP from the project is
24 26.3 BCFE and future revenues (using current SEC pricing of \$3.989/Mcf (no btu
25 adjustments)) are \$105.0 million. A recovery factor (RF) of 10.6% is needed to achieve
26 revenues that exceed CAPEX.

27 **Q20. Can you briefly explain why you are using current SEC pricing in this application?**

28 **A20.** Every company has its own ideas of economic indicators by which it decides to invest in
29 an opportunity or not. Current SEC pricing, un-escalated, eliminates all the issues
30 associated with corporate decision trees and reduces the evaluation of corporate assets,
31 and projects, to a single deterministic standard. We have no clear crystal ball into the

1 future of oil and gas prices. What we do know, and can verify, is the price we currently
2 and historically get for each barrel of oil and each MMBtu of gas.

3 **Q21. Can you briefly discuss why your analysis in this application considers natural gas**
4 **as the only product to be produced?**

5 **A21.** We know that the products ultimately purchased from these wells will be comprised of
6 natural gas, condensate, and natural gas liquids (NGLs). However, for the purpose of
7 conducting a volumetric analysis of the reservoir at initial conditions, there is only natural
8 gas in the reservoir. The condensates and NGLs are separated out at the surface and sold
9 separately, when economic to do so, in an attempt to maximize cash flow. Ultimately, as
10 the reservoir pressure drops below the dew point, condensate will drop out in the
11 reservoir. However, under initial conditions the reservoir is only natural gas. By using
12 only gas prices to evaluate the future cash flow from the project, I have assumed the most
13 conservative scenario, as no additional value for condensate sales, btu adjustments, or
14 NGL sales, all very real values, have been included. If the cash flow from the project
15 exceeds the investment, under the most conservative scenario, then unitization should be
16 granted to protect the correlative rights of the mineral owners.

17 **Q22. Can you briefly comment on the anticipated range of recovery factors that**
18 **Chesapeake would expect to achieve for the Jamar South Unit?**

19 **A22.** Based upon the current statistical distribution of known data, a range of 30% to 70% is
20 anticipated. The statistical mean of the data is 49%.

21 **Q23. Based on this information and your professional judgment, do unit operations**
22 **increase substantially the ultimate recovery of oil and gas?**

23 **A23.** Yes. The GIP in the unitized project increases by approximately 164.9% from 26.3
24 BCFE to 69.8 BCFE.

25 **Q24. Based on this information and your professional judgment, does the value of the**
26 **estimated additional recovery of hydrocarbons from the unitized project exceed its**
27 **estimated costs?**

28 **A24.** Yes. CAPEX increases by \$18.8 million (169%) for the unitized project from the non-
29 unitized project. The maximum value of additional revenues from the proposed Jamar
30 South Unit is approximately \$173.2 million (165%) as compared to what could be
31 realized without approval of this application for unit operations.

1 **Q25. In your professional opinion, do you believe that the proposed unit operations for**
2 **the Jamar South Unit are reasonably necessary to increase substantially the**
3 **ultimate recovery of oil and gas from the unit area?**

4 **A25.** Yes. The unitization of the Jamar South Unit is definitely needed to maximize the
5 economic benefit to the interest owners, and protect the correlative rights of the mineral
6 owners. If the project is not unitized it will strand 62.2% of the recoverable gas, or 43.4
7 BCFE (100% RF) in the ground from which mineral owners would, most likely, never
8 see financial benefit, nor Chesapeake, nor the State of Ohio.

9 **Q26. Does this conclude your testimony?**

10 **A26.** Yes.

EXHIBIT "DFY-1"

Jamar South Unit

	Acreage	GIP (BCFE)
Nonconsenting Parcels (1)	25.3	2.5
Stranded CHK Leasehold (2)	395.0	39.0
Stranded Non-CHK Leasehold (3)	18.2	1.8
Abbreviated Development (4) = 5-(1+2+3)	290.9	28.7
Unit Total (5)	729.4	72.0

UNITIZED

Well Name	Lateral Length (ft)	GIP (BCFE)	Capital (MM\$)
Jamar 10H	10400	26.5	\$11.39
Jamar 8H	10400	26.5	\$11.39
Jamar 6H	6550	16.7	\$7.08
	27,350	69.8	\$29.9

NON-UNITIZED

Well Name	Lateral Length (ft)	GIP (BCFE)	Capital (MM\$)
Jamar 10H	4950	12.6	\$5.29
Jamar 8H	4275	10.9	\$4.53
Jamar 6H	1825	2.8	\$1.27
	11,050	26.3	\$11.1

* NPZ = No Perf Zone

* 725' NPZ

SEC Price =	\$3.989	Unitized	Non-Unitized	Increases due to Unitization
Total Capital (MM\$) *		\$29.87	\$11.10	\$18.78
GIP (BCFE)		69.75	26.33	43.42
Potential Revenues (MM\$) @ SEC (3.989)		\$278.23	\$105.04	\$173.20
RF needed for revenue to exceed CAPEX		10.7%	10.6%	

* CAPEX for compression and pipeline will be burden of midstream operator

% increase in Total Capital due to Unitization: 169%
 % increase in GIP due to Unitization: 165%
 % increase in Revenues due to Unitization: 165%

Est. Disc. Time to PO (Unitized), Yrs: 1.1
 P50 Fixed LOE per well, \$/month: \$3,302

Est. RF% due to Unitization: **32%**
 Est. Abbreviated RF%: **12%**

* Used Toe Setback of 150'

Total Toe & Heel Setbacks = 300'

** Used Heel Setback of 150'

Stranded GIP due to setbacks = 0.77 BCF

PREPARED DIRECT TESTIMONY OF ROBERT S. HIGSAW

1 **INTRODUCTION.**

2 **Q1. Please state your name and business address.**

3 A1. My name is Robert S. Highsaw and my business address is 6100 N. Western
4 Avenue, Oklahoma City, Oklahoma 73154-0496.

5 **Q2. Who is your employer?**

6 A2. Chesapeake Energy Corporation.

7 **Q3. What is your position with Chesapeake?**

8 A3. My official title at Chesapeake Energy Corporation is Landman II.

9 **Q4. Please describe your professional responsibilities at Chesapeake.**

10 A4. I am responsible for assisting with our oil and gas development program in eastern
11 Ohio in Chesapeake's Appalachia South business unit.

12 **Q5. Starting with college, please describe your educational background.**

13 A5. I hold a Bachelor of Arts from the University of Oklahoma and a Juris Doctor from
14 University of Oklahoma College of Law.

15 **Q6. Please briefly describe your professional experience.**

16 A6. After graduation from law school, I worked for a number of months as a contract
17 attorney with a downtown Oklahoma City law firm performing title work.
18 Following this brief period, I have worked for Chesapeake since January 2011.

19 **Q7. What do you do as a Landman II?**

20 A7. I essentially engage in what can be considered "prospect building." After our
21 geology department identifies a play, I help execute the company's leasing and
22 development efforts in a particular area. I help facilitate development of the Utica
23 play through lease acquisitions and negotiations, joint operation negotiations, title
24 review, unit formation, wellbore planning, various permitting activities, drilling
25 wells, and other related operational activities.

26 **Q8. Are you a member of any professional associations?**

27 A8. Yes. The American Association of Professional Landmen and the Oklahoma Bar
28 Association.

29 **Q9. Were you involved in the preparation of Chesapeake Exploration, L.L.C.'s**
30 **Application for unitization with respect to the Jamar South Unit?**

1 A9. Yes. I also am familiar with the efforts made by Chesapeake to put the Jamar
2 South Unit together and the Unit Plan that Chesapeake is proposing.

3 **Q10. Can you generally describe the Jamar South Unit?**

4 A10. Yes. The Jamar South Unit consists of fifty-one (51) separate tracts of land totaling
5 approximately 729.425453 acres in Harrison County, Ohio.

6 **EFFORTS MADE BY CHESAPEAKE TO LEASE UNIT TRACTS.**

7 **Q11. The Application submitted by Chesapeake indicates that it owns the oil and
8 gas rights to 656.4056188 acres of the proposed 729.425453-acre unit. Would
9 you describe how Chesapeake acquired its rights?**

10 A11. Chesapeake acquired its working interest in this unit through acquisitions and a
11 ground floor leasing effort. In the leasing effort, Chesapeake assigned field title
12 and leasing agents to research the county records for a specific area and then secure
13 oil and gas leases with the relevant mineral owners for those particular tracts. As
14 for the acquisitions, Chesapeake purchased some of its leasehold interest in the
15 Jamar South Unit from Atlas Noble, LLC and Atlas Resources, LLC.

16 **Q12. What percentage of the total acreage of the Jamar South Unit is represented
17 by the oil and gas rights held by Chesapeake and its working interest
18 partners?**

19 A12. Chesapeake and its working interest partners control over 96% of the acreage in the
20 unit, with Chesapeake holding 89.98940%, XTO holding 2.06882%, AEU holding
21 0.43063%, and EnerVest holding 4.03904% of the acreage in the Jamar South Unit.
22 Not including the non-operated acreage of XTO, AEU, and EnerVest, Chesapeake
23 alone accounts for over 89% of this Unit which still substantially exceeds the 65%
24 statutory minimum requirement for seeking unitization.

25 **Q13. Why was Chesapeake not able to acquire the oil and gas rights to all of the
26 acreage in the proposed unit?**

27 A13. There are nine (9) wholly unleased tracts owned by two (2) landowners (Unit
28 Tracts 12, 14, 22, 26, 28, 48, 49, 50 & 51) in the Jamar South Unit. The owner of
29 eight (8) of the nine (9) unleased tracts, the Ohio Department of Transportation, or
30 "ODOT," has decided not to lease or that it cannot lease to Chesapeake in the
31 Jamar South at this time. The owner of the only other unleased tract within the

1 Unit, L. J. Smith, Inc., has been approached about leasing, but Chesapeake has
2 been unable to obtain a lease to date. Chesapeake is still earnestly attempting to
3 negotiate a lease with L. J. Smith, Inc. at present.

4 **Q14. Have you prepared affidavits detailing Chesapeake's efforts to obtain a lease**
5 **from the unleased mineral owners in the proposed unit?**

6 A14. Yes. As just discussed, Exhibit RH-1 contains two (2) affidavits which identify
7 lease efforts which were made with the unleased mineral owners.

8 **Q15. If the unleased tract owners in the unit were to ask to lease with Chesapeake,**
9 **would Chesapeake be likely to agree?**

10 A15. Absolutely. As Chesapeake has demonstrated on a number of occasions with its
11 previous unitization applications, Chesapeake remains willing to lease on
12 reasonable, fair market value terms.

13 **Q16. Could you describe the location of the leased and unleased tracts within the**
14 **Jamar South Unit?**

15 A16. Yes. Exhibit RH-2, which is attached to my testimony, is a colored plat showing
16 each of the tracts in the Jamar South Unit, along with the wellbores in same. The
17 tracts in yellow indicate that Chesapeake has acquired the necessary mineral
18 interests for those particular tracts. The tracts in red indicate that those tracts are
19 still open and unleased for purposes of putting this unit together. The tracts in
20 green indicate the acreage owned by XTO and AEU in the Jamar South Unit.
21 Further, the green and olive portions of Exhibit RH-3 depict the approximate
22 413.178275-acre area of leasehold that is currently stranded from development due
23 to the aforementioned unleased tracts within the Jamar South Unit.

24 **UNIT PLAN PROVISIONS.**

25 **Q17. Would you describe generally the development plan for the Jamar South**
26 **Unit?**

27 A17. Chesapeake plans to develop the Jamar South Unit from a pad site located in the
28 northeast portion of the Unit, which would facilitate drilling three (3) planned
29 horizontal wells in the Unit. The Unit is configured to accommodate three
30 horizontal wellbores, with projected lateral lengths ranging from approximately
31 6,550 feet to 10,400 feet. These planned wellbores will be drilled to the southeast

1 from the aforementioned pad site. If an Order is granted for this application, and
2 depending upon rig availability and other logistical considerations, Chesapeake at
3 this point intends to drill the Jamar South wells beginning in late Q4 2015 or early
4 Q1 2016. Chesapeake has already drilled most of the Jamar North Unit which
5 consisted of six (6) horizontal wells and currently the rig is on location drilling the
6 last Jamar North lateral. If an order were to be granted, it would be imperative that
7 Chesapeake receive the order quickly to ensure a rig could be brought back on
8 before the Jamar North wells were completed and producing. If this were feasible,
9 Chesapeake could drill the Jamar South wells sooner depending, again, upon rig
10 availability and other logistical considerations.

11 **Q18. Can you describe the location of the proposed wellbore within the Jamar**
12 **South Unit?**

13 A18. Yes, the above-referenced Exhibit RH-2 depicts the configuration I just mentioned.
14 As you can see, it illustrates that we anticipate using a surface location in the
15 northeast portion of the Jamar South Unit, and then drilling three (3) wells in the
16 Unit Area to the southeast. The planned Jamar North Unit, which will not require
17 Chesapeake to submit a Unitization Application, will accommodate 6 horizontal
18 wells. Using one centrally located pad site to drill nine (9) wellbores minimizes
19 surface disturbance in the region by fully developing nine (9) horizontal laterals
20 from only one surface location. I have also attached to my testimony an aerial map
21 illustrating the pad location, identified as Exhibit RH-4.

22 **Q19. Do you know with certainty today where the drilling and completion equip-**
23 **ment will be located on the pad?**

24 A19. We have negotiated surface rights with a leased party for the area indicated on Ex-
25 hibit RH-4. A surface use agreement has been agreed upon and signed between the
26 surface owner and Chesapeake. All unleased parcels are located over 3,000 or
27 more feet from the proposed surface location.

28 **Q20. What are the benefits to this type of unit development?**

29 A20. Developing the Jamar South Unit in the manner previously described not only
30 protects the correlative rights of the unit participants, but has substantial economic
31 and environmental benefits as well. Drilling, completing and producing multiple

1 wells from a single surface location significantly reduces the impact on the surface.
2 Only one access road is constructed instead of several, the need for separate tank
3 batteries at multiple locations is eliminated, traffic to and from the area is
4 significantly reduced, and it allows development of acreage that might not
5 otherwise be developed with traditional drilling methods due to surface limitations,
6 such as local water features and residential and commercial activities. There is a
7 significant amount of acreage in eastern Ohio, where operators like Chesapeake
8 believe the Utica formation is prospective. Development through vertical wells
9 would not be practicable for two reasons: (1) because unconventional reservoirs
10 cannot be produced at economic flow rates or volumes with vertical drilling (as
11 described by David Yard); and (2) because vertical wells, even if they were
12 practical, require numerous surface locations spaced at consistent intervals, which
13 become impractical in areas where the surface is already occupied with other uses
14 (such as residential and commercial activities, existing surface waters, and,
15 occasionally, timber activities). In contrast, horizontal drilling is expected to be
16 both economically practical and physically viable, since it allows operators to
17 locate surface operations on strategically located properties, which can serve as
18 centralized access points used to develop mineral acreage underlying otherwise
19 inaccessible lands.

20 **Q21. So is it fair to say that the benefits of this type of development are substantial?**

21 A21. Yes, the type of development planned by Chesapeake for the Jamar South Unit, and
22 its adjacent units, offers significant benefits not only to the operator, but also to the
23 landowners in the unit and the surrounding area.

24 **Q22. Are you familiar with the Unit Plan proposed by Chesapeake for the Jamar
25 South Unit?**

26 A22. Yes. The Unit Plan proposed by Chesapeake is set out in two documents attached
27 to the Application – the Unit Agreement, which establishes the non-operating
28 relationship between the parties in the unit; and a Unit Operating Agreement and
29 related exhibits, which establish how the unit is going to be explored, developed,
30 and produced.

31 **Q23. Let's turn first to the Unit Agreement, marked as Exhibit 1 to the Application.**

1 **Would you describe briefly what it does?**

2 A23. Yes. The Unit Agreement in effect combines the oil and gas rights in the Jamar
3 South Unit so that they can be uniformly developed as if they were part of a single
4 oil and gas lease.

5 **Q24. Are mineral rights to all geological formations combined under the Unit
6 Agreement?**

7 A24. No. The Unit Agreement only unitizes the oil and gas rights located fifty feet
8 above the top of the Utica Shale to fifty feet below the base of the Point Pleasant
9 formation, defined in the Agreement as the “Unitized Formation,” to allow
10 development of the Utica Shale formation.

11 **Q25. How will production proceeds from the Jamar South Unit be allocated among
12 royalty interest owners and working interest owners in the Unit?**

13 A25. On a surface-acreage basis. Under Article 4 of the Unit Agreement, every tract is
14 assigned a tract participation percentage based on surface acreage and shown on
15 Exhibit A-2 to the Unit Operating Agreement. Article 5 of the Unit Agreement
16 allocates production based on that tract participation.

17 **Q26. Why use a surface-acreage basis as the method of allocation?**

18 A26. Based on the testimony of Larry Carter attached to the Application as Exhibit 3, a
19 surface-acreage basis is an appropriate method of allocation because the formation
20 thickness and reservoir quality of the Utica formation is expected to be consistent
21 across the unit.

22 **Q27. Would you go through an example from Exhibit A-2 to the Unit Operating
23 Agreement to illustrate how a surface-acreage basis would be applied to the
24 Jamar South Unit?**

25 A27. Yes. If you look at the fifth column on Exhibit A-2 to the Unit Operating
26 Agreement entitled “Surface Acres in Unit,” it shows the number of surface acres
27 in each tract of land within the Jamar South Unit. Column 6 on Exhibit A-2 shows
28 the related tract participation of each tract, which is calculated by taking the total
29 number of surface acres in the tract and dividing it by the total number of surface
30 acres in the unit. So, for example, if you look at Tract Number 11 on page 1 of
31 Exhibit A-2, it shows that this particular Woodland Legacy, LLLP tract comprises

1 11.03907241 surface acres in the 626.046000 acre Jamar South Unit, which equates
2 to a tract participation of approximately 1.7633% ($11.03907241 \div 626.046000$).

3 **Q28. What does that mean in terms of production allocated to that particular tract?**

4 A28. It would mean this particular Woodland Legacy, LLLP tract would have allocated
5 to it roughly 1.51339% of all production from the Jamar South Unit, which would
6 then be distributed based on the terms of the lease or other relevant document
7 affecting ownership to production proceeds from the tract.

8 **Q29. Does it work the same way for an unleased mineral interest, that is, for the**
9 **tract of a person or entity which did not lease its property in the unit?**

10 A29. Yes. If you take a look at Exhibit A-3 to the Unit Operating Agreement, you will
11 see that it lists, among other things, the surface acreage, tract participation and
12 related working interest and unit participations of each unleased parcel in the
13 proposed unit. In the fifty-one-tract Jamar South Unit, Tracts 12, 14, 22, 26, 28,
14 48, 49, 50, and 51 are the nine unleased parcels in the unit area. The minerals under
15 these tracts are currently owned by two (2) landowners. Specifically, 1.125892
16 acres are owned by L. J. Smith, Inc. and 24.215136 are owned by ODOT. If the
17 unleased acreage is divided by the full surface acreage comprising the unit
18 (729.425453 acres), the result gives a tract participation of approximately
19 0.0015435 for L. J. Smith, Inc. and 0.0331975 for ODOT. Under the Unit
20 Agreement, should the unleased landowners affirmatively select the non-consenting
21 working interest option if one is provided for in the Order, the landowners would
22 receive a 7/8 working interest and a 1/8 royalty interest on its respective tract
23 participation. The landowner's royalties would be calculated on the net proceeds
24 received by Chesapeake at the well in accordance with the royalty provision
25 contained in Exhibit B to the Unit Operating Agreement and rulings in the majority
26 of gas producing jurisdictions that royalty owners are responsible for their
27 proportionate share of post-production expenses. Allowing deduction of post-
28 production expenses for purposes of royalty calculation provides incentive to
29 producers to add value to their product by post-production treatment and
30 transportation. If producers are not allowed to deduct a proportionate share of
31 royalty owners' post-production expenses that enhance the value of the product, an

1 economic loss to all parties results and the incentive to generate additional value
2 disappears because producers are required to pay for *all* post-production expenses,
3 and also surrender one-eighth of the final proceeds received.

4 **Q30. In your experience, is surface acreage allocation a customary way to allocate**
5 **production in a unit?**

6 A30. In my experience, surface-acreage allocation is both fair and customary for
7 horizontal shale development.

8 **Q31. How are unit expenses allocated?**

9 A31. Like production in the unit, unit expenses are allocated generally on a surface-
10 acreage basis. Article 3 of the Unit Agreement provides that expenses, unless
11 otherwise allocated in the Unit Operating Agreement, will be allocated to each tract
12 of land within the unit in the proportion that the surface acres of each tract bears to
13 the surface acres of the entire unit.

14 **Q32. Who pays the unit expenses?**

15 A32. Working interest owners.

16 **Q33. Do the royalty owners pay any part of the unit expenses?**

17 A33. No. Royalty interest owners are responsible only for their proportionate share of
18 taxes and post-production costs, payable only from their share of the proceeds from
19 sales of production from the unit area.

20 **Q34. Let's turn to the Unit Operating Agreement, marked as Exhibit 2 to the**
21 **Application. It appears to be based upon a form document. Could you please**
22 **identify that form document?**

23 A34. Yes. The Unit Operating Agreement is based upon *A.A.P.L. Form 610 – Model*
24 *Form Operating Agreement – 1989*. We typically use a modified version of that
25 form agreement when we enter into joint operating agreements with other parties.

26 **Q35. Are you familiar with the custom and usage of the Form 610 and other similar**
27 **agreements in the industry?**

28 A35. Yes. The Form 610, together with its exhibits, is a commonly used form in the
29 industry and is frequently modified to fit the needs of the parties and
30 circumstances.

31 **Q36. Turning to the Unit Operating Agreement in particular, does it address how**

1 **unit expenses are determined and paid?**

2 A36. Yes. Article III of the Unit Operating Agreement provides that all costs and
3 liabilities incurred in operations shall be borne and paid proportionately by the
4 working interest owners, according to their Unit Participation percentages. Those
5 percentages can be found in Exhibits A-2 and A-3 to the Unit Operating
6 Agreement. Moreover, the Unit Operating Agreement has attached to it an
7 accounting procedure identified as Exhibit C.

8 **Q37. What is the purpose of the document marked Exhibit C in connection with the**
9 **Jamar South Unit?**

10 A37. The document provides greater details regarding how unit expenses are determined
11 and paid.

12 **Q38. At the top of each page of Exhibit C, there appears a label that reads:**
13 **“COPAS 1984 ONSHORE Recommended by the Council of Petroleum**
14 **Accountants Societies.” Are you familiar with this society?**

15 A38. Yes, COPAS stands for the Council of Petroleum Accountants Societies.

16 **Q39. Is this COPAS document used in oil and gas operations across the country?**

17 A39. Yes. This form is commonly used in the industry.

18 **Q40. In your opinion, is this COPAS document generally accepted in the industry?**

19 A40. Yes. Drafted by an organization that includes members from many different
20 companies in diverse sections of the industry, it was designed to be generally fair to
21 the parties. Chesapeake, in fact, is frequently subject to the COPAS in its
22 operations with other producers.

23 **Q41. Will there be in-kind contributions made by owners in the unit area for unit**
24 **operations, such as contributions of equipment?**

25 A41. No, Chesapeake Energy does not anticipate in-kind contributions for the Unit Op-
26 erations.

27 **Q42. Are there times when a working interest owner in the unit chooses not to – or**
28 **cannot – pay their allocated share of the unit expenses?**

29 A42. Yes, such a situation is not uncommon in the industry. Joint operating agreements
30 contemplate that there will be times when less than all of the working interest
31 owners choose to participate in operations on the Contract Area. The agreements

1 are drafted to allow the parties flexibility. That includes flexibility for one or more
2 working interest owners to decline to participate in an operation that they may not
3 believe will be a profitable venture or one that they cannot afford, as well as
4 flexibility for the remaining parties to proceed with such operation at their own risk
5 and expense if they wish to do so.

6 **Q43. Generally, how is the working interest accounted for when an owner chooses**
7 **not to participate in an operation?**

8 A43. A working interest owner who cannot or chooses not to participate is considered a
9 non-consenting party. If the remaining working interest owners decide to proceed
10 with an operation, then the consenting parties bear the full costs and expenses of
11 that operation. A non-consenting party is deemed to have relinquished its interest
12 in that operation until such time as the well pays out the costs that would have been
13 payable by that party, plus some sort of risk factor, sometimes called a risk penalty
14 or non-consent penalty.

15 **Q44. What is a risk penalty or non-consent penalty, and why are they included in**
16 **the agreement?**

17 A44. A risk penalty or non-consent penalty is a mechanism which recognizes that in
18 instances when a working interest owner chooses not to agree in advance to pay its
19 share of the costs of drilling a well, the other working interest owners should be
20 compensated for the financial risks they undertake in paying the costs of drilling a
21 well considering that the well may be a non-producer. Additionally, a non-consent
22 penalty can serve as a means to allow a working interest owner to finance
23 participation in a well when unable to advance its share of drilling costs.

24 **Q45. Can a working interest owner choose to go non-consent in the initial well in**
25 **the Jamar South Unit?**

26 A45. Yes. If a working interest owner fails to participate in the unit's initial well, Article
27 VI.A of the Unit Operating Agreement provides that the working interest owner
28 shall be deemed to have relinquished to the other parties its working interest in the
29 unit with a back-in provision that includes a risk factor of 200%.

30 **Q46. Does the Unit Operating Agreement treat the initial well and subsequent**
31 **operations differently in terms of going non-consent, and if so, why?**

1 A46. Yes, subsequent operations have a smaller risk factor of 150%. It's typically much
2 riskier to participate in the initial well in a unit because, as here, you frequently
3 don't have enough information to determine whether the well will be productive
4 and economic. As a consequence, to prevent parties from gaming the system and
5 avoiding the substantial risks associated with the drilling of the initial well, while
6 still being able to participate in subsequent operations when the risks are
7 substantially reduced, it is common for joint operating agreements to distinguish
8 between these types of operations.

9 **Q47. But if the working interest owner still has a royalty interest in the unit, that**
10 **royalty interest would remain in place and be paid?**

11 A47. Yes. The royalty interest would still be paid even if the working interest is being
12 used to pay off a risk factor.

13 **Q48. Are the risk penalty/non-consent penalty percentages included in the Unit**
14 **Operating Agreement unusual?**

15 A48. Actually, yes, these risk penalties are quite a bit lower than what Chesapeake
16 typically utilizes in its joint operating agreements used in horizontal drilling
17 programs. While Chesapeake and its peers in the industry are optimistic about
18 development of the Utica and other shale formations, the projects proposed are
19 significant capital investments (often exceeding \$7,000,000 per well to plan, drill
20 and complete). In addition, unconventional plays like the Utica are not simple,
21 homogeneous plays. Within the boundaries of the play (here, the Utica Shale
22 generally), there are likely to be areas of uneven geological performance.
23 Therefore, given the inherent risks and significant capital outlays, it is common for
24 companies to incorporate a higher risk factor in their joint operating agreements.

25 **Q49. Have you seen risk factor levels of 150% to 200% in other parts of the country**
26 **that you've worked in and are familiar with?**

27 A49. Typically, we will see see risk factor levels at significantly higher rates than these
28 due to the uncertainties and costs involved in horizontal development.
29 Additionally, courts in other jurisdictions have determined that higher non-consent
30 penalties than these were reasonable.

31 **Q50. How are decisions made regarding unit operations?**

1 A50. Article V of the Unit Operating Agreement designates Chesapeake Exploration,
2 L.L.C., as the Unit Operator, with full operational authority for the supervision and
3 conduct of operations in the unit. Additionally, except where otherwise provided,
4 Article XVI of the Unit Operating Agreement states that any decision,
5 determination or action to be taken by the unit participants shall be based on a
6 voting procedure in which each unit participant has a vote that corresponds in value
7 to that participant's allocated responsibility for the payment of unit expenses.

8 **Q51. I believe you've already described generally the documents in Exhibits A and**
9 **C to the Unit Operating Agreement. Let's turn therefore to Exhibit B of the**
10 **Unit Operating Agreement. What is it?**

11 A51. Exhibit B is a standard oil and gas lease form that is attached to the joint operating
12 agreement to govern any unleased interests owned by the parties. Article III.A of
13 the Unit Operating Agreement provides that if any party owns or acquires an oil
14 and gas interest in the Contract Area, then that interest shall be treated for all
15 purposes of the Unit Operating Agreement as if it were covered by the form of
16 lease attached as Exhibit B.

17 **Q52. Does this oil and gas lease contain standard provisions that Chesapeake uses in**
18 **connection with its drilling operations in Ohio and elsewhere?**

19 A52. Yes.

20 **Q53. Moving on to Exhibit D of the Unit Operating Agreement, would you describe**
21 **what it is?**

22 A53. Yes, Exhibit D is the insurance exhibit to the joint operating agreement. It sets
23 forth coverage amounts and limitations, and the insurance terms for operations
24 conducted under the Unit Operating Agreement. It requires the operator, to obtain
25 General Liability coverage, including bodily injury and property damage liability,
26 in an amount of five million dollars, which is substantially similar to those
27 employed in connection with Chesapeake's other unitized projects in the State of
28 Ohio.

29 **Q54. Would you next describe Exhibit E of the Unit Operating Agreement?**

30 A54. Yes. Exhibit E is the Gas Balancing Agreement, which further details the rights
31 and obligations of working interest parties with respect to marketing and selling

1 any production from the Contract Area. It would normally not come in to play with
2 an unleased landowner, but only with a working interest owner who desired to
3 market their share of production separately from the Operator.

4 **Q55. Has Chesapeake documented which of the working interest owners included**
5 **within the Jamar South Unit have given their consent to the proposed**
6 **unitization?**

7 A55. Yes. Exhibit 6 to the Application documents the approvals for the Unit Plan
8 received from working interest owners included within the Jamar South Unit, up to
9 the time that the Application was filed. Exhibit 6 gives the approval of working
10 interest owners approving the Unit Plan; currently, that being Chesapeake
11 Exploration as owner of 656.4056188 acres (roughly 89%), EnerVest as owner of
12 29.4617672 (roughly 4%) XTO Energy as owner of 15.075896 (roughly 2%), and
13 American Energy – Utica as owner of 3.141143 (roughly 0.4%). The tracts in
14 which Chesapeake has a working interest are depicted in Exhibit 6-1.

15 **Q56. Does the Application contain a list of the fee interest owner and mineral**
16 **reservation holders who have not previously agreed to enter into any oil and**
17 **gas lease with respect to the tracts they own, or possibly own, within the**
18 **Jamar South Unit?**

19 A56. Yes. Exhibit A-3 to the Unit Operating Agreement lists the “unitized parties,” that
20 is, the fee interest owner and mineral reservation holders who have not leased their
21 mineral interests to any party. For notice purposes, the proper addresses for these
22 unleased parties are listed on Exhibit A-3 as well.

23 **Q57. In your professional opinion, given your education and experience, are unit**
24 **operations for the proposed Jamar South Unit reasonably necessary to**
25 **increase substantially the ultimate recovery of oil and gas?**

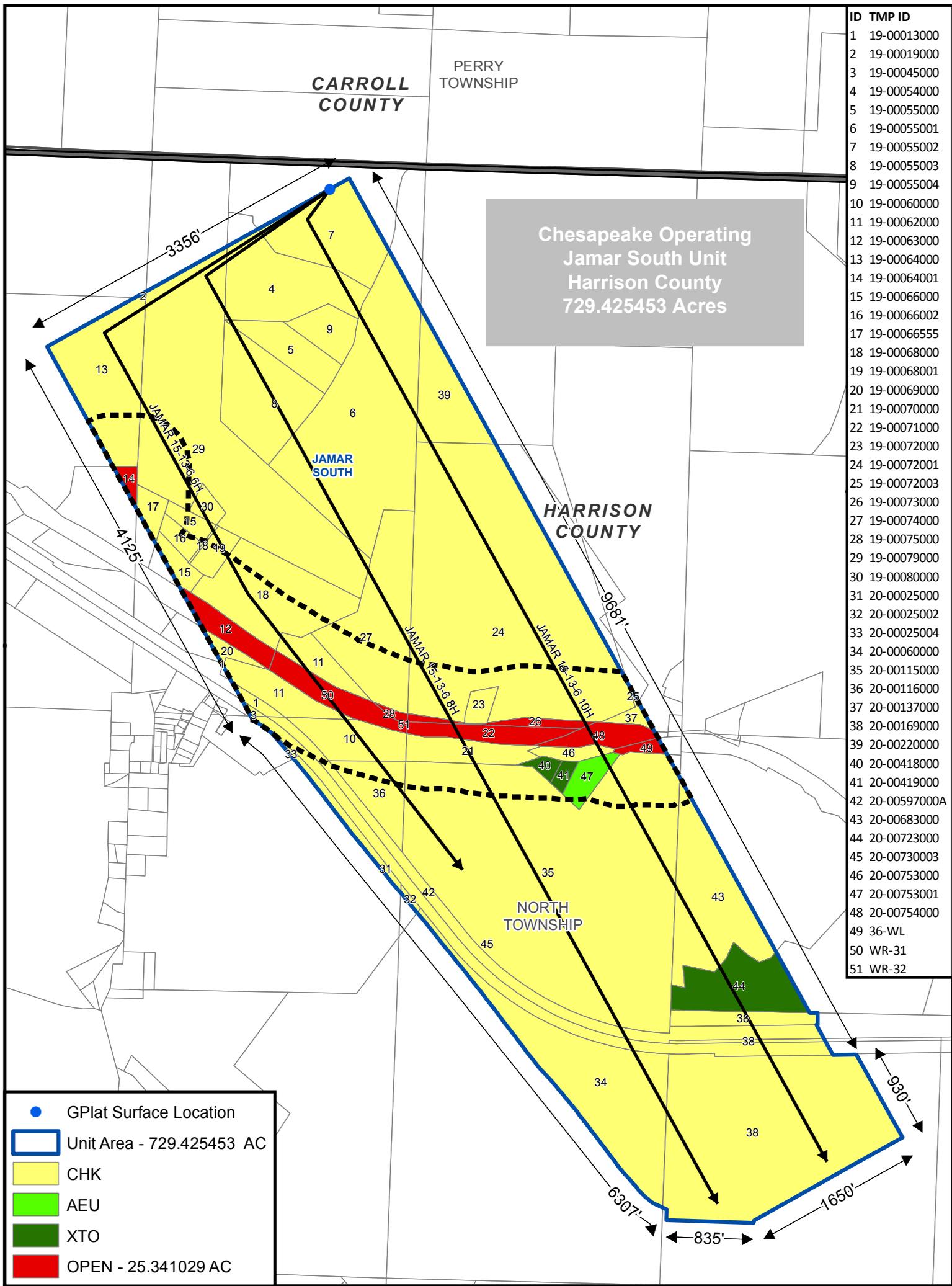
26 A57. Yes. Unit operations for the proposed Jamar South Unit are reasonably necessary to
27 increase substantially the ultimate recovery of oil and gas. As testified by my
28 colleagues Mr. Yard and Mr. Carter, unit operations will promote a rational and
29 efficient development of the Utica formation underlying the Jamar South Unit. In
30 addition, as a land professional I am supportive of any efforts to reduce waste by
31 minimizing the number of wells and surface locations utilized for drilling

1 operations. I understand that land is a valuable commodity and that horizontal
2 drilling is an excellent way to accommodate both the rights of the mineral owner
3 and the rights of the surface owner to accomplish reasonable development.

4 **Q58. Does this conclude your testimony?**

5 A58. Yes.

Exhibit "RH-2"



ID	TMP ID
1	19-00013000
2	19-00019000
3	19-00045000
4	19-00054000
5	19-00055000
6	19-00055001
7	19-00055002
8	19-00055003
9	19-00055004
10	19-00060000
11	19-00062000
12	19-00063000
13	19-00064000
14	19-00064001
15	19-00066000
16	19-00066002
17	19-00066555
18	19-00068000
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20	19-00069000
21	19-00070000
22	19-00071000
23	19-00072000
24	19-00072001
25	19-00072003
26	19-00073000
27	19-00074000
28	19-00075000
29	19-00079000
30	19-00080000
31	20-00025000
32	20-00025002
33	20-00025004
34	20-00060000
35	20-00115000
36	20-00116000
37	20-00137000
38	20-00169000
39	20-00220000
40	20-00418000
41	20-00419000
42	20-00597000A
43	20-00683000
44	20-00723000
45	20-00730003
46	20-00753000
47	20-00753001
48	20-00754000
49	36-WL
50	WR-31
51	WR-32

- GPlat Surface Location
- Unit Area - 729.425453 AC
- CHK
- AEU
- XTO
- OPEN - 25.341029 AC

UNIT PLAT

Jamar South Unit
North Township
Harrison Co., OH

1 inch = 1,150 feet

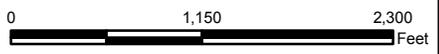
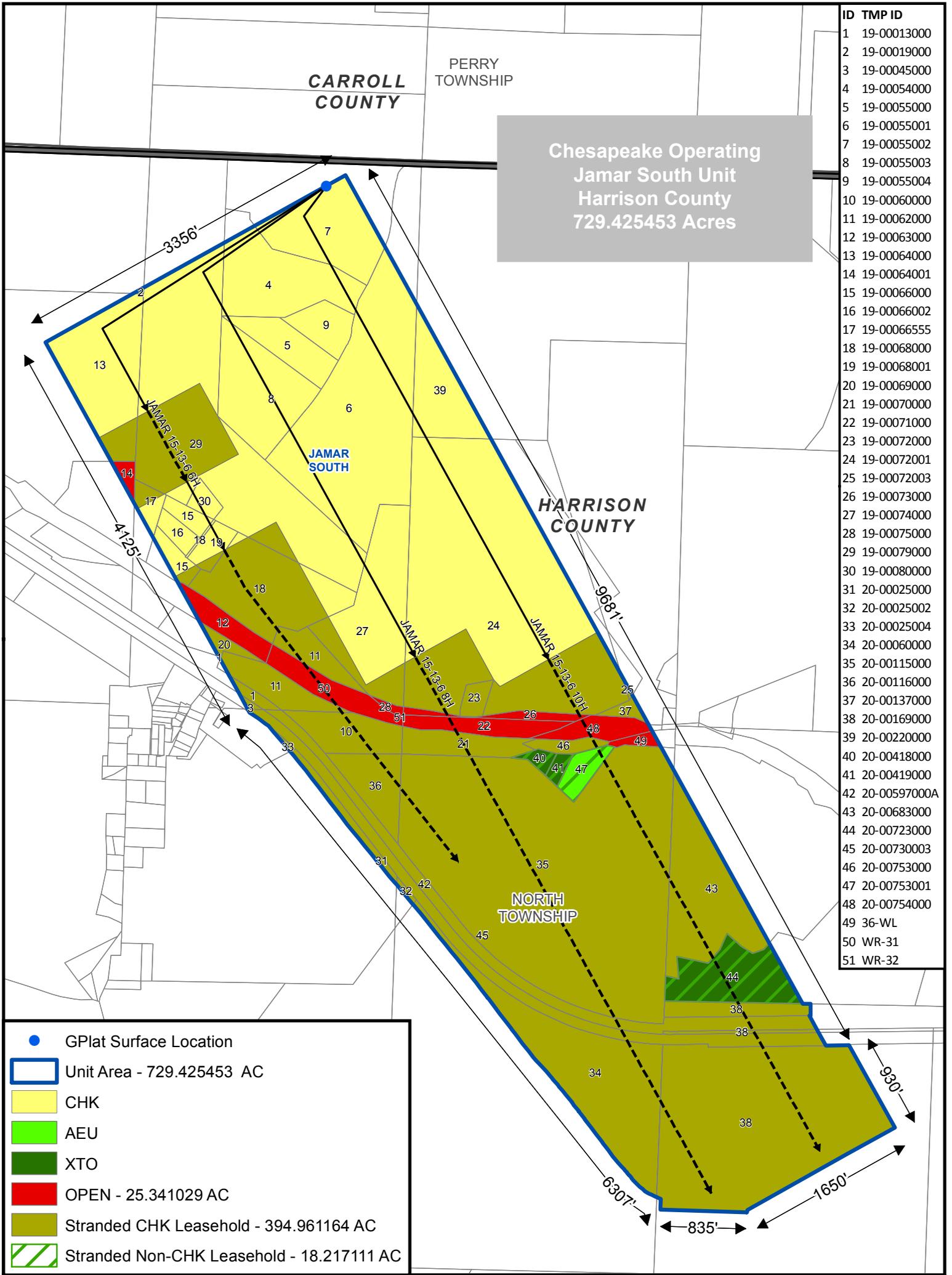


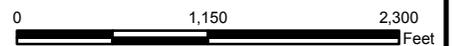
Exhibit "RH-3"

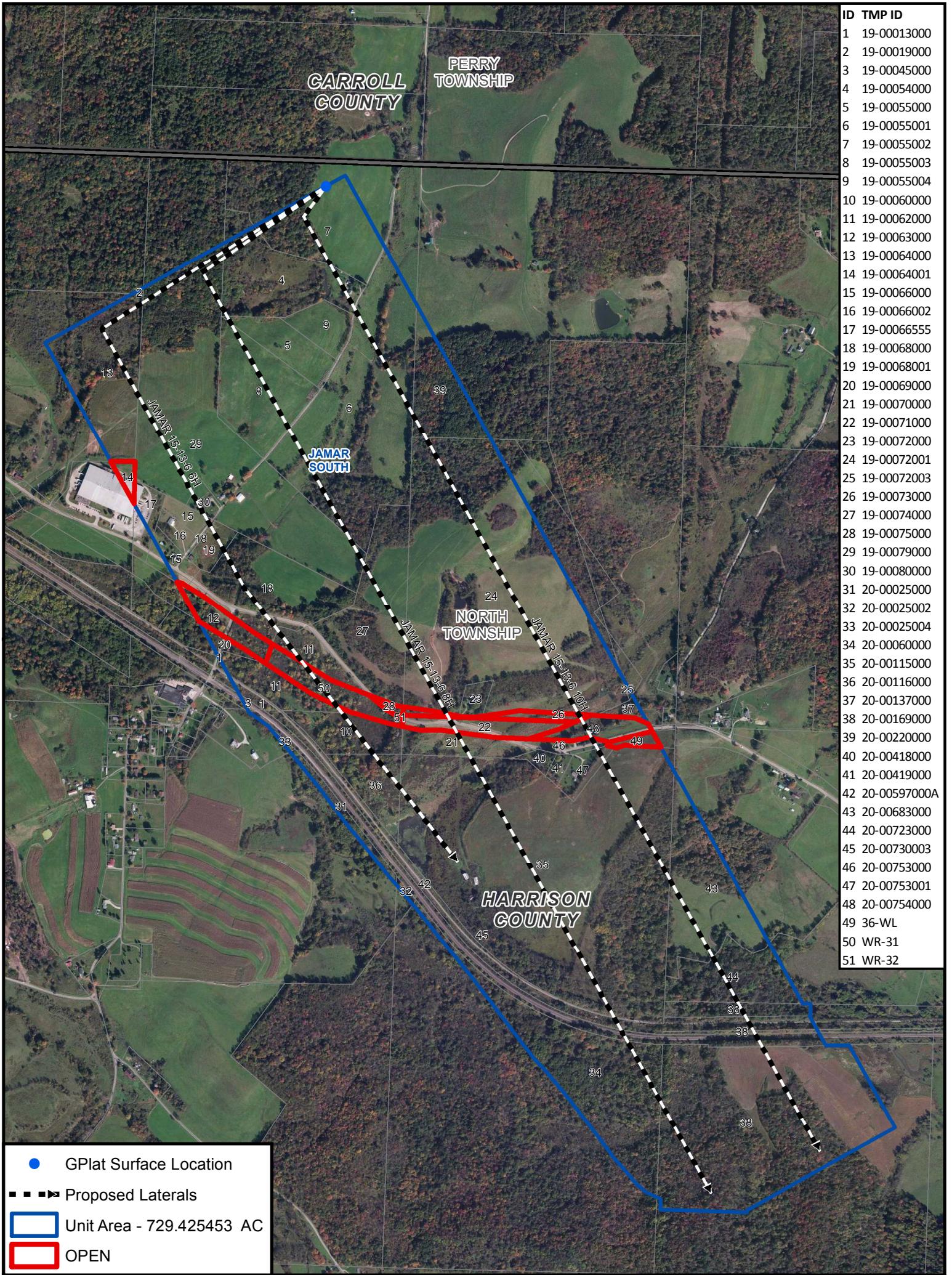


UNIT PLAT

**Jamar South Unit
North Township
Harrison Co., OH**

1 inch = 1,150 feet





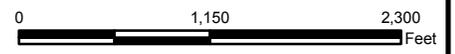
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2	19-00019000
3	19-00045000
4	19-00054000
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8	19-00055003
9	19-00055004
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13	19-00064000
14	19-00064001
15	19-00066000
16	19-00066002
17	19-00066555
18	19-00068000
19	19-00068001
20	19-00069000
21	19-00070000
22	19-00071000
23	19-00072000
24	19-00072001
25	19-00072003
26	19-00073000
27	19-00074000
28	19-00075000
29	19-00079000
30	19-00080000
31	20-00025000
32	20-00025002
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34	20-00060000
35	20-00115000
36	20-00116000
37	20-00137000
38	20-00169000
39	20-00220000
40	20-00418000
41	20-00419000
42	20-00597000A
43	20-00683000
44	20-00723000
45	20-00730003
46	20-00753000
47	20-00753001
48	20-00754000
49	36-WL
50	WR-31
51	WR-32

- GPlat Surface Location
- Proposed Laterals
- Unit Area - 729.425453 AC
- OPEN

UNIT PLAT

Jamar South Unit
 North Township
 Harrison Co., OH

1 inch = 1,150 feet



WORKING INTEREST OWNER

APPROVAL OF

UNIT PLAN FOR THE

JAMAR SOUTH UNIT

North Township

Harrison County, Ohio

KNOW ALL MEN BY THESE PRESENTS:

WHEREAS, a Unit Plan has been prepared for the testing, development, and operation of certain Tracts identified therein, which Plan consists of an agreement entitled, "Unit Agreement, The Jamar South Unit, North Township, Harrison County, Ohio," dated April 18, 2014 (the "Unit Agreement"); and an agreement entitled, "A.A.P.L. Form 610-1989 Model Form Operating Agreement," also regarding the Jamar South Unit and of like date (the "Unit Operating Agreement"); and,

WHEREAS, the undersigned is the owner of a Working Interest in and to one or more of the Tracts identified in said Unit Plan, namely, the Tracts identified below (hereinafter, the "Owner").

NOW, THEREFORE, the Owner hereby approves the Unit Plan and acknowledges receipt of full and true copies of both the Unit Agreement and the Unit Operating Agreement.

IN WITNESS WHEREOF, the undersigned has executed this instrument on the date set forth opposite the signature of its representative.

WORKING INTEREST OWNER

TRACT NO. (see attached)

TRACT ACREAGE 656.4056188

RELATED WORKING INTEREST PERCENTAGE 89.98940%

CHESAPEAKE EXPLORATION, L.L.C.

Date 11/24/2014

By:

Robert Highsaw

Robert Highsaw, Landman II – Appalachia South

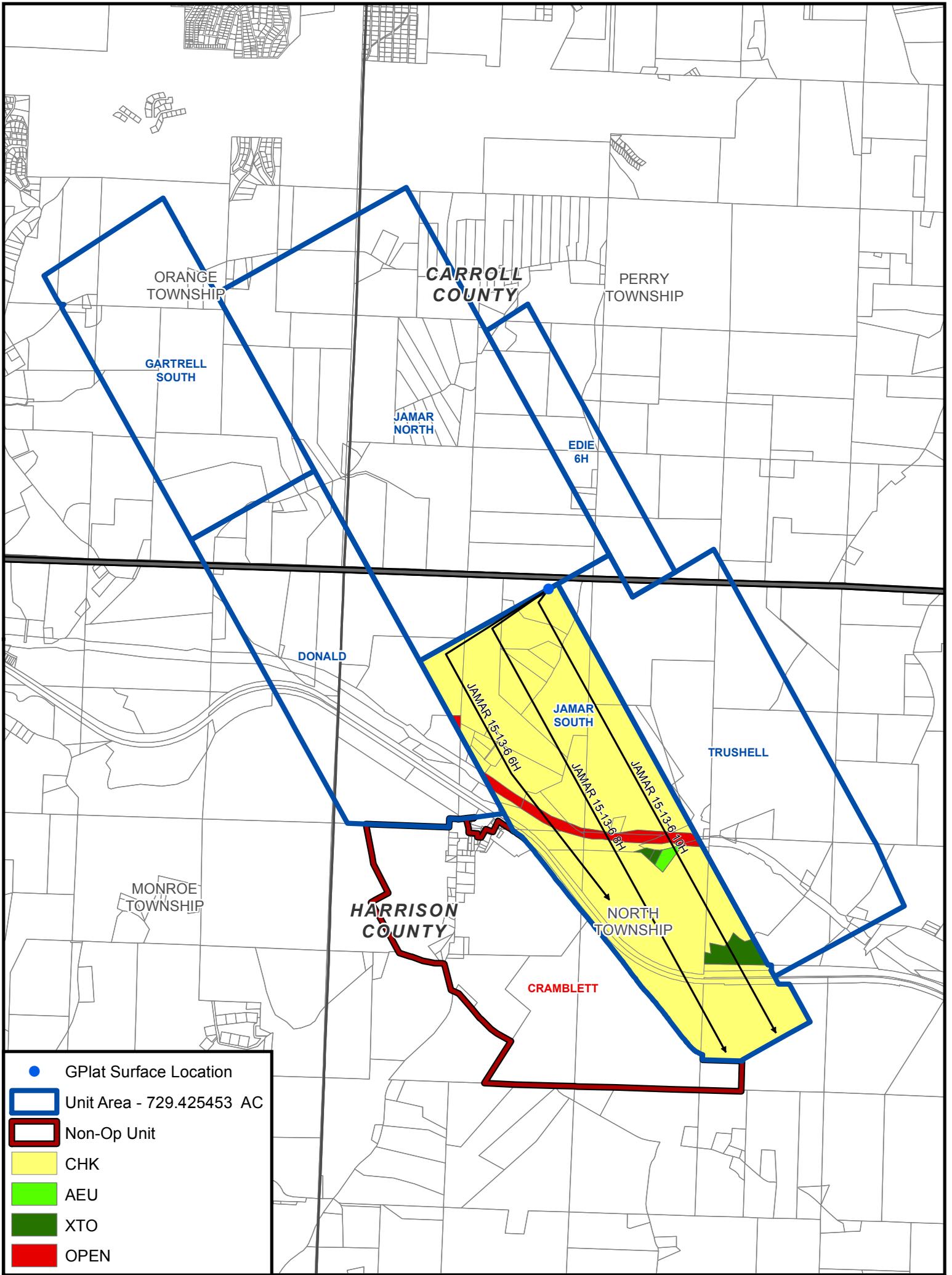
Exhibit 1
Working Interest Owners

Attached to and made a part of that certain Unit Operating Agreement dated April 25, 2014 as approved by the Ohio Department of Natural Resources for the Jamar South Unit.

TRACT NUMBER	LESSOR	SURFACE ACRES IN UNIT	TAX MAP PARCEL ID NUMBERS
1	WHEELING AND LAKE ERIE RAILWAY COMPANY	1.076294	19-00013000
2	BRUCE W & MARGARET A GANDEE	0.067774	19-00019000
3	CONSOLIDATED RAIL CORPORATION	0.267635	19-00045000
4	JERRY E & PEGGY L KNIGHT	17.870858	19-00054000
5	GEORGE H FARNSWORTH, II	7.176977	19-00055000
6	JAMES R COSTIGAN	31.808024	19-00055001
7	JAMAR HOLDINGS LTD BY JACOB E YODER, JR	10.117867	19-00055002
8	GEORGE H FARNSWORTH, II	17.644692	19-00055003
9	GEORGE H FARNSWORTH, II	5.097083	19-00055004
10	WOODLAND LEGACY, LLLP	8.011035	19-00060000
11	WOODLAND LEGACY, LLLP	11.039072	19-00062000
13	VERNON J WEBB	21.277188	19-00064000
15	BERNARD L & KAREN J WEST	4.347784	19-00066000
16	TY J WEST	1.945348	19-00066002
17	BERNARD L & KAREN J WEST	2.217811	19-00066555
18	JOSEPH H & TERESA FINNICUM	20.896866	19-00068000
19	TY J WEST	2.790428	19-00068001
20	JOSEPH H & TERESA FINNICUM	1.428318	19-00069000
21	GREEN FIELDS FAMILY FARM LTD	6.261692	19-00070000
23	DWIGHT & SANDRA L MCBRIDE	0.617243	19-00072000
23	ROBERT MCBRIDE	0.617243	19-00072000
23	MILDRED M MCBRIDE	0.617243	19-00072000
24	GREEN FIELDS FAMILY FARM LTD	92.614990	19-00072001
25	GREEN FIELDS FAMILY FARM LTD	0.132494	19-00072003
27	GREEN FIELDS FAMILY FARM LTD	23.141469	19-00074000
29	THOMAS C & GAIL L DENNIS	63.362215	19-00079000
30	THOMAS C & GAIL L DENNIS	1.628601	19-00080000
31	CHRISTINE BLANC-OSBOURNE	2.627418	20-00025000
32	CHRISTINE BLANC-OSBOURNE	0.345483	20-00025002
33	KIM INBODEN	0.222696	20-00025004
34	WOODLAND LEGACY, LLLP	33.054697	20-00060000
35	WILLIAM R HARDING	121.358067	20-00115000

TRACT NUMBER	LESSOR	SURFACE ACRES IN UNIT	TAX MAP PARCEL ID NUMBERS
36	WILLIAM R HARDING	7.513478	20-00116000
37	THELMA M HORSTMAN	1.145866	20-00137000
38	D STEVEN & LORRAINE REESE AND R CHRISTOPHER & CATHY REESE AND DOUGLAS S	72.601458	20-00169000
39	JAMES R COSTIGAN	7.177054	20-00220000
42	CONSOLIDATED RAIL CORPORATION	16.527543	20-00597000A
43	PAUL A TRUSHELL	21.977235	20-00683000
45	WHEELING AND LAKE ERIE RAILWAY COMPANY	15.807006	20-00730003
46	THELMA M HORSTMAN	1.973373	20-00753000
656.4056188			

Exhibit 7 to
 Jamar South
 Unitization Application



- GPlat Surface Location
- Unit Area - 729.425453 AC
- Non-Op Unit
- CHK
- AEU
- XTO
- OPEN

UNIT PLAT

Jamar South Unit
 North Township
 Harrison Co., OH

1 inch = 2,500 feet

