

**DRAFT**  
**Environmental Assessment for the**  
**Rands Butte Gas Development Project**

**Volume 2**  
**Appendices**

**January 2010**



The BLM manages more land – 253 million acres – than any other Federal agency. This land, known as the National System of Public Lands, is primarily located in 12 Western States, including Alaska. The Bureau, with a budget of about \$1 billion, also administers 700 million acres of sub-surface mineral estate throughout the nation. The BLM's multiple-use mission is to sustain the health and productivity of the public lands for the use and enjoyment of present and future generations. The Bureau accomplishes this by managing such activities as outdoor recreation, livestock grazing, mineral development, and energy production, and by conserving natural, historical, cultural, and other resources on public lands.

**BLM/WY/PL-10/003+1310**

WY-100-EA09-43

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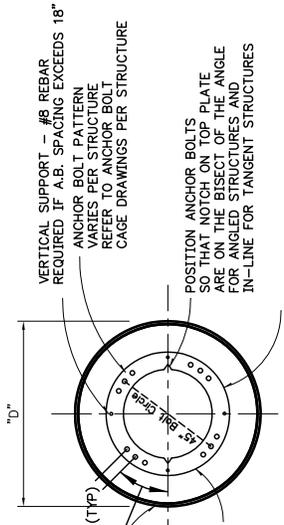
**Appendix A**  
**Project Design Schematics**

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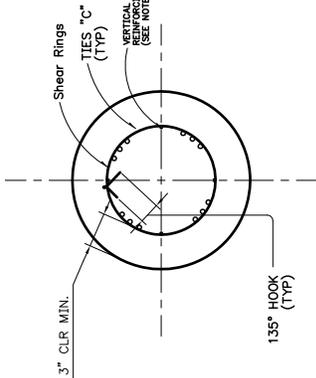
# CONCRETE CAISSON SCHEDULE

STR. NO.	STRUCTURE FRAMING TYPE	BAR. CAGE WEIGHT	UNIT NO.	TOTAL REBAR NO.	CONCRETE			REINFORCING BARS		
					LENGTH L	DIAL D	CY/PIER	SIZE	TIES (HORIZONTAL) BOLT GUAGE DIA.	TOTAL
4	TE252	5740 LBS.	1	1	4.5'	27	16	#4	45"	28

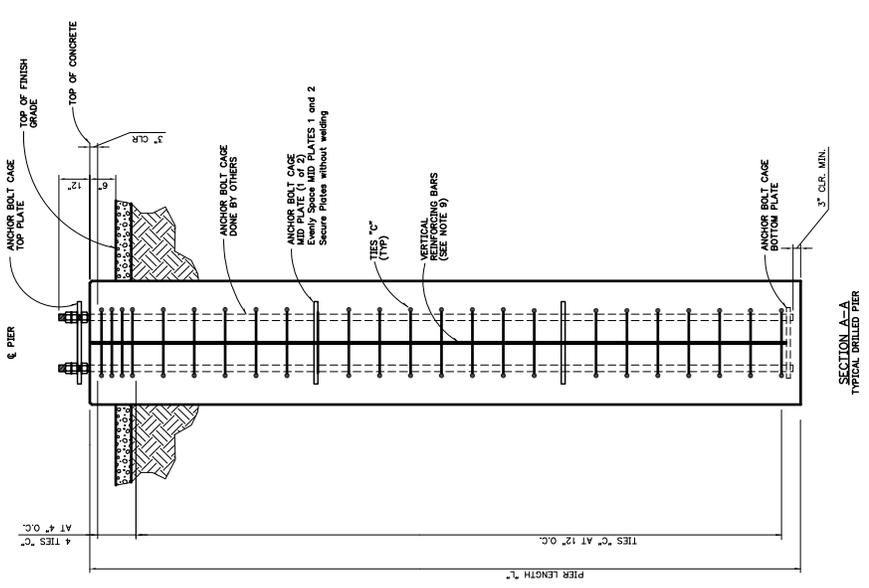
VERTICAL REINFORCING BARS	
REBAR LENGTH	TOTAL
#8	4
#4	4



DETAIL 1: Top Plate



Detail 2: Rebar Reinforcement



SECTION A-A  
TYPICAL DRILLED PIER

### NOTES

1. ALL CONCRETE SHALL HAVE A MINIMUM STRENGTH OF 3,500 PSI AT 28 DAYS WITH 6% ENTRAINED AIR.
2. ALL REINFORCING STEEL SHALL BE DEFORMED INTERMEDIATE GRADE NEW BILLET STEEL CONFORMING TO ASTM A615 GRADE 60.
3. TIE WIRE SHALL BE #8 GAUGE MINIMUM.
4. REVEAL ALL EXPOSED PROJECTING CORNERS OF CONCRETE WORK 1/4" UNLESS INDICATED OTHERWISE.
5. MINIMUM REINFORCING COVER SHALL BE AS FOLLOWS:  
UNREINFORCED CONCRETE AGAINST EARTH.....3"  
CONCRETE CAST AGAINST EARTH.....2"  
ALL OTHER SURFACES.....2"
6. HORIZONTAL TOLERANCE FOR ANCHOR BOLT LOCATION TO BE +/- 1/8".
7. SEE CONCRETE SPECIFICATIONS FOR DETAILED CONCRETE REQUIREMENTS.
8. ANCHOR BOLT CAGE AND STRUCTURES SUPPLIED BY WOODS CROSS-HOLLY OIL. CONTACT PERSON IS NEW YORK, P.O. BOX 466388/878  
PHONE: (817) 852-1848
9. NOTCH MIDDLE TEMPLATES TO ACCOMMODATE VERTICAL REINFORCING BARS.

**WOODS CROSS-HOLLY OIL**  
**46K TRANSMISSION LINE**  
**CONCRETE CAISSON SCHEDULE**

**PACIFICORP** TRANSMISSION

PROJECT NO.	02220003
DATE	2/15/2008
REV. NO.	01
REV. BY	BR
APPROVAL	

SCALE: N.T.S. SHEET 1 OF 1 REV. 0

NO.	DATE	REVISION	BY	CHK	APP	NO.	DATE	REVISION	BY	CHK	APP



230 kV Structure—Shielded, 3-Pole—Angle, 8° to 20°

May be used In raptor areas

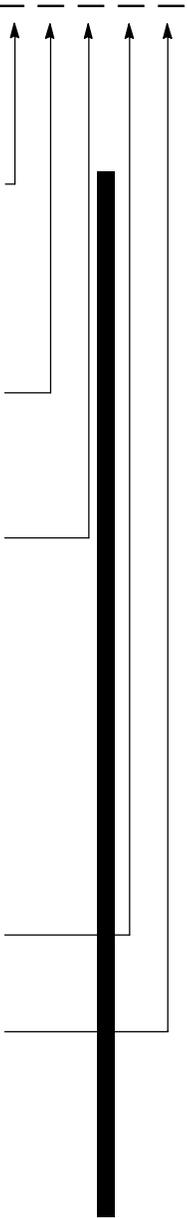
Scope

This structure is used for small to medium line angles when shielding is required. Line Angle: 5° to 30°

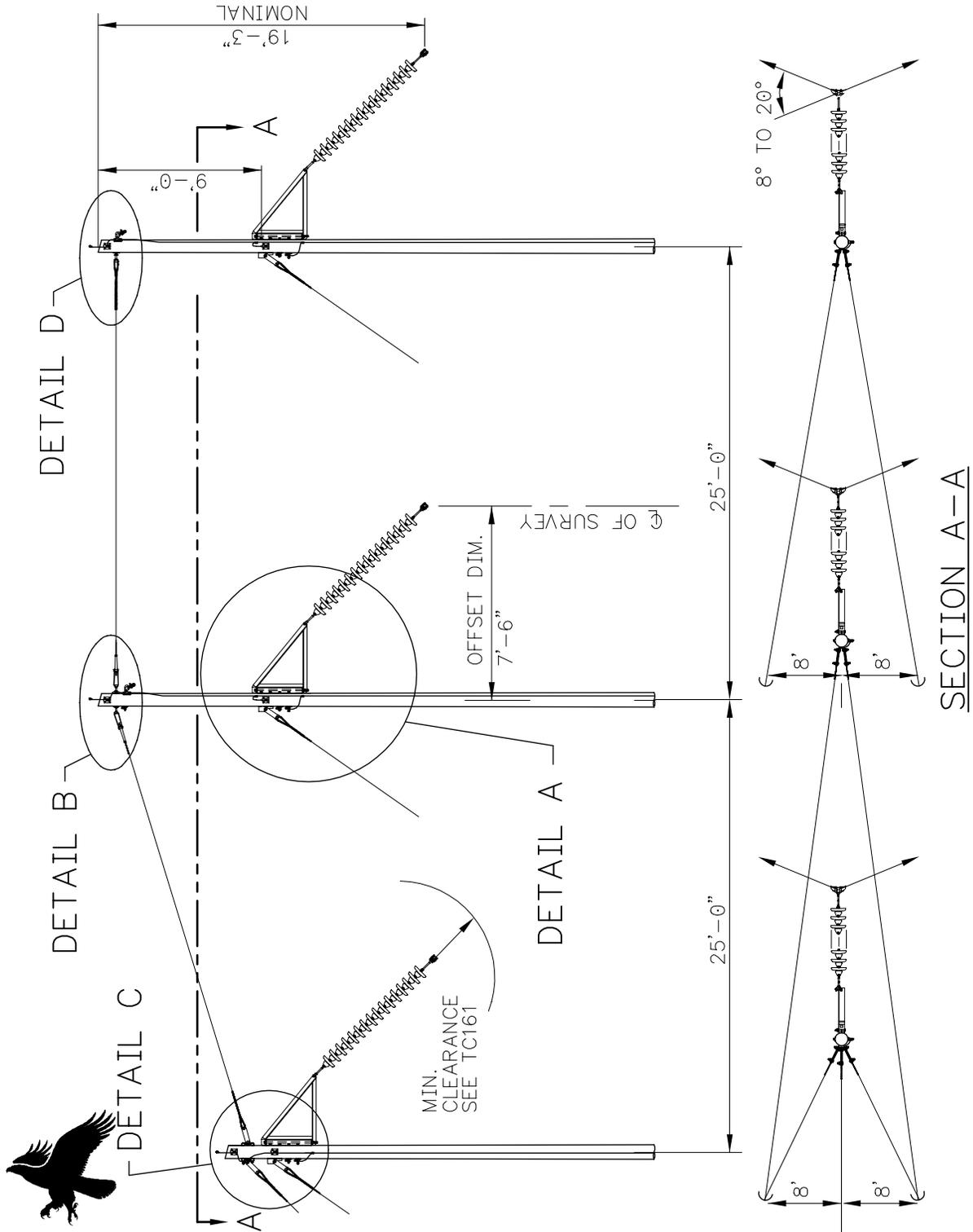
Standard References

- TA 181 General—Blowout and Right-of-Way Width Considerations
TC 161 Clearances—for Conductors on the Same Support
TD 001 Poles—General Information
TD 100 Conductor—General Information
TD 200 Shield and Guy Wire—General Information
TD 300 Grounding—General Information
TD 400 Suspension Hardware—General Information
TD 600 Guys and Anchors—General Information
TD 700 Crossarms and Braces—General Information
TD 800 Insulators—General Information
TD 900 Bolts, Nuts, and Washers—General Information

Table with columns for Conductor, Conductor Accessories, Shield Wire, Insulation, and Pole Class. Includes codes for various materials like ACSR, AAC, EHS, and species like Douglas fir and Western red cedar.



# TI 432



May be used  
in raptor areas



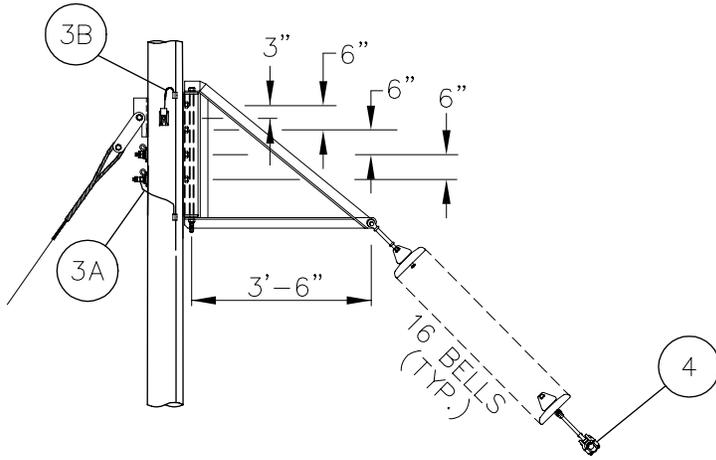
TI 432  
Page 2 of 4

6 Nov 00

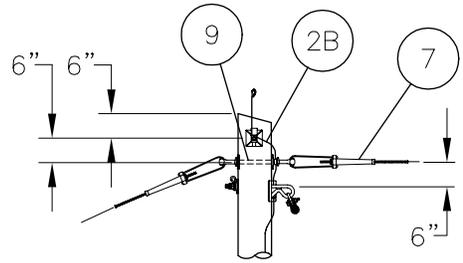
**230 kV  
Structure—Shielded,  
3-Pole—Angle, 8° to 20°**

**Transmission  
Construction Standard**

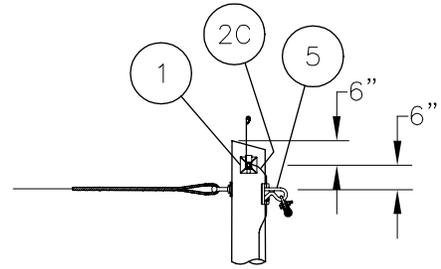
Asset Policy Engineer (C. L. Wright): *CLW*  
Asset Policy Manager (G. Shaw): *GShaw*



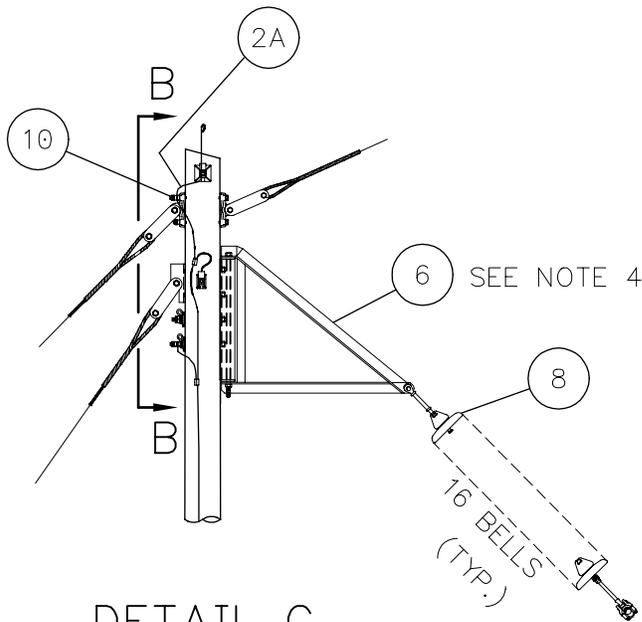
DETAIL A



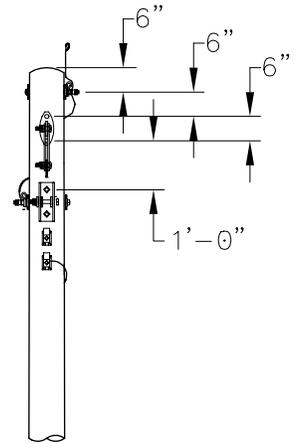
DETAIL B



DETAIL D



DETAIL C



SECTION B-B

**Transmission  
Construction Standard**

Asset Policy Engineer (C. L. Wright): *CLW*  
Asset Policy Manager (G. Shaw): *GShaw*

**230 kV  
Structure—Shielded,  
3-Pole—Angle, 8° to 20°**

**PACIFICORP**  
PACIFIC POWER UTAH POWER

6 Nov 00

**TI 432**  
Page 3 of 4

# TI 432

Table 1 – Components

Item	Qty.	Standard	Description
1	6	TD 022_	Pole Assembly, Split-Bolt, 3/4" Diameter
2A	1	TD 321C E	Grounding Assembly, Hardware-to-Hardware
2B	1	TD 321C C	Grounding Assembly, Hardware-to-Hardware
2C	1	TD 321C Z	Grounding Assembly, Hardware-to-Hardware
3A	3	TD 322D	Grounding Assembly, Hardware-to-Structure Ground
3B	3	TD 322C	Grounding Assembly, Hardware-to-Structure Ground
4	3	TD 420_ _ D	Suspension Assembly, Conductor
5	2	TD 425_ _ A	Suspension Assembly, Shield Wire
6	3	TD 430E _ _	Bracket Assembly
7	1	TD 540_ F B	Tie Wire Assembly
8	3	TD 828E _	Insulator Assembly, Suspension or Strain, Y-Clevis Ball, Hot-Line
9	1	TD 921_ B	Bolt Assembly, Double-Arming, 3/4-Inch
10	2	TD 928_ D	Bolt Assembly, Machine, 1-Inch

Table 2 – Additional Material To Be Specified To Complete This Structure

Item	Qty.	Standard	Description
A	3	TD 020_ _ A	Wood Pole Assembly
B	1	TD 622_ _ _ _	Guy Assembly, Dead-End Tee Pole Attachment
C	3	TD 624_ _ _ _	Guy Assembly, 2-Bolt Splayed Channel Pole Attachment
D	AS REQ	TD 630_ _ _	Anchor Assembly

## Notes

1. All hardware is to be bonded when it is separated by less than 8 inches. Bond wire shall loop around the bolt.
2. Install spring washers with loop end up where possible.
3. All pole attachment hardware shall be bonded to the pole grounding assembly.
4. See Notes section in TD 430 for installation details for attaching bracket assemblies to pole.
5. Clearance between the conductor and the structure shall be maintained under reverse wind conditions.
6. Class 1 or better pole is recommended.



TI 432

Page 4 of 4

6 Nov 00

**230 kV  
Structure—Shielded,  
3-Pole—Angle, 8° to 20°**

**Transmission  
Construction Standard**

Asset Policy Engineer (C. L. Wright):   
Asset Policy Manager (G. Shaw): 

# 230 kV Structure—Shielded, 3-Pole—Angle, 30° to 45°



**TI 435**

RCMS Code: CU

May be used  
In raptor areas

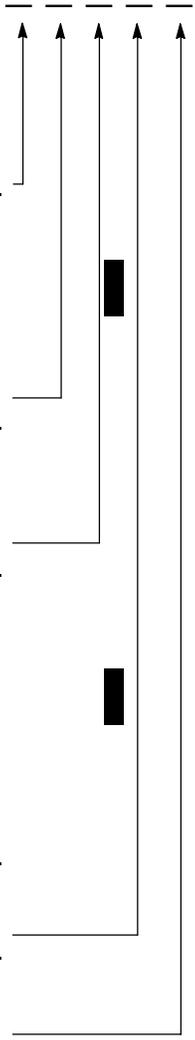
## Scope

This structure is used for medium line angles when shielding is required.  
Line Angle: 30° to 45°

## Standard References

- TA 181 General—Blow-out and Right-of-Way Width Considerations
- TC 161 Clearances—for Conductors on the Same Support
- TD 001 Poles — General Information
- TD 100 Conductor—General Information
- TD 200 Shield and Guy Wire—General Information
- TD 300 Grounding—General Information
- TD 400 Suspension Hardware—General Information
- TD 600 Guys and Anchors—General Information
- TD 800 Insulators—General Information
- TD 900 Bolts, Nuts, and Washers—General Information

<u>Conductor</u>	<u>Code</u>	
795 ACSR "Drake" .....	D	
954 ACSR "Cardinal" .....	E	
1272 ACSR "Bittern" and 1557.4 ACSR/TW "Potomac" ..	F	
795 AAC "Arbutus" .....	G	
1272 AAC "Narcissus" .....	H	
None .....	Z	
<u>Conductor Accessories</u>	<u>Code</u>	
<u>Suspension Hardware</u>		
Armor rod .....	A	
Line guard .....	B	
None .....	Z	
<u>Shield Wire</u>	<u>Code</u>	
3/8 EHS .....	A	
1/2 EHS .....	B	
7#8 AW .....	C	
7#6 AW .....	D	
3/8 EHS w/armor rod .....	I	
1/2 EHS w/armor rod .....	J	
7#8 AW w/armor rod .....	K	
7#6 AW w/armor rod .....	L	
None .....	Z	
<u>Insulation</u>	<u>Code</u>	
Porcelain .....	A	
Polymer .....	B	
<u>Pole Class</u>	<u>Species</u>	<u>Code</u>
1 .....	Douglas fir .....	C
H1 .....	Douglas fir .....	D
H2 .....	Douglas fir .....	E
1 .....	Western red cedar .	H
H1 .....	Western red cedar .	I
H2 .....	Western red cedar .	J



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Engineer (C. Wright): *CLW*  
Standards Manager (G. Lyons): *GS*

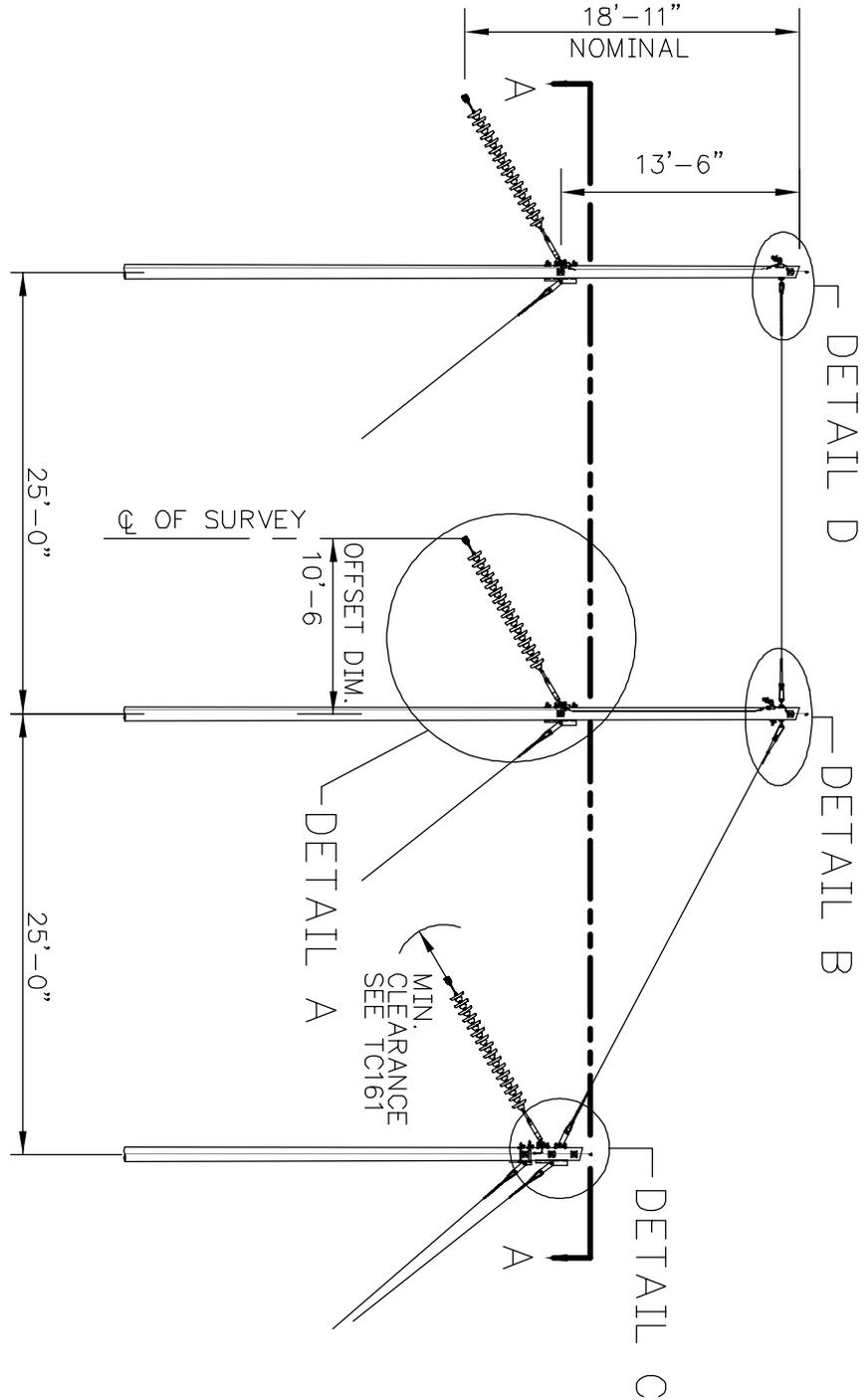
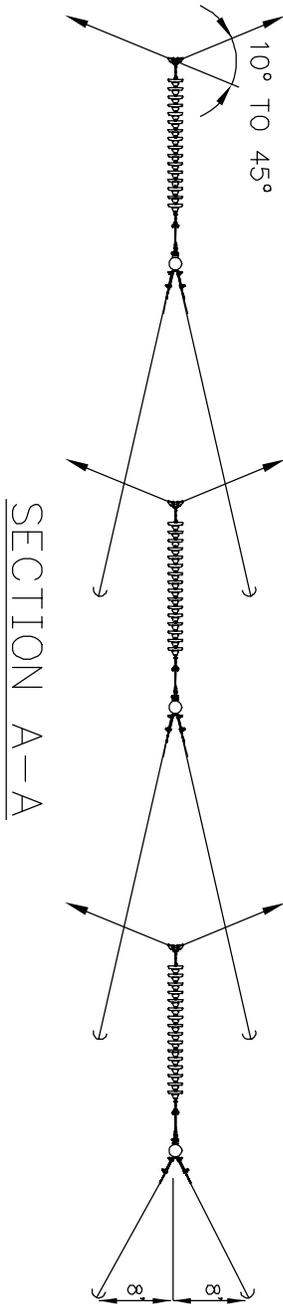
**230 kV Structure  
Shielded, 3-Pole Angle,  
30° to 45°**



24 Jul 07

**TI 435**  
Page 1 of 4

# TI 435



May be used  
In raptor areas



TI 435  
Page 2 of 4

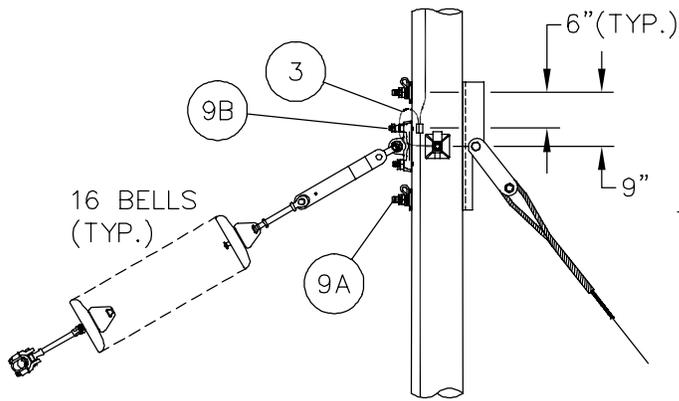
24 Jul 07

**230 kV Structure  
Shielded, 3-Pole Angle,  
30° to 45°**

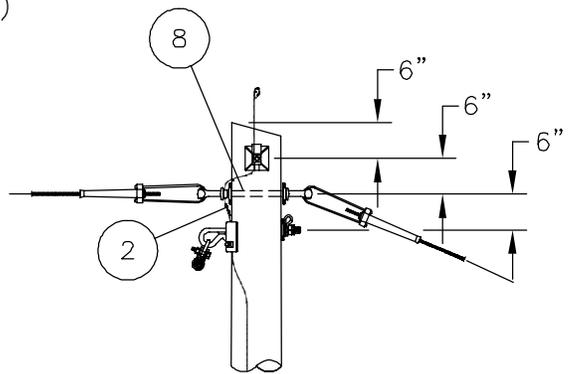
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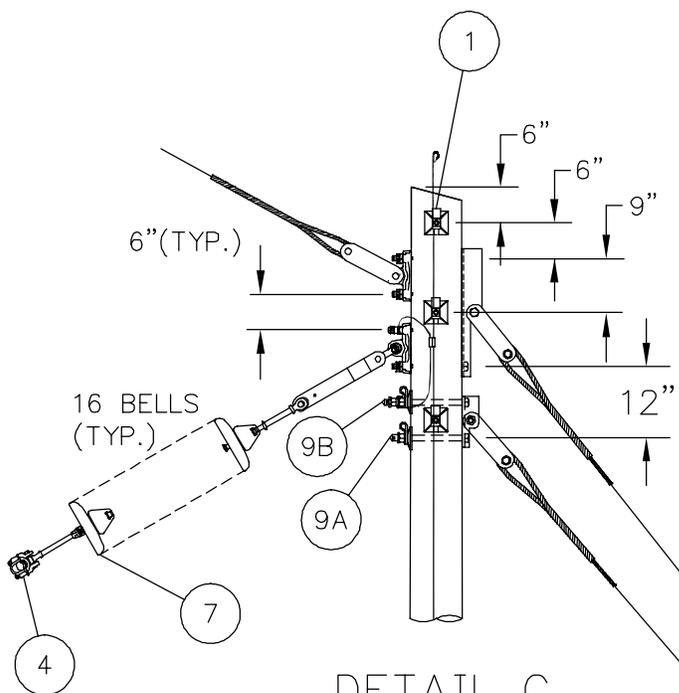
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Standards Manager (G. Lyons): *GS*



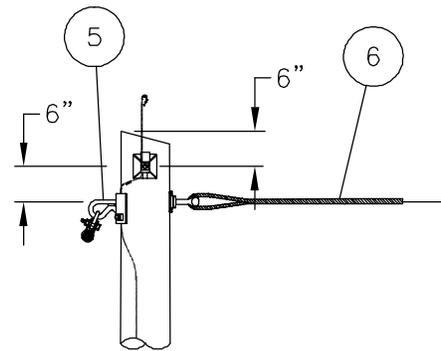
DETAIL A



DETAIL B



DETAIL C



DETAIL D

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 Standards Manager (G. Lyons): *GS*

**230 kV Structure  
 Shielded, 3-Pole Angle,  
 30° to 45°**



24 Jul 07

TI 435  
 Page 3 of 4

# TI 435

Table 1 - Components

Item	Qty.	Standard	Description
1	7	TD 022_	Pole Assembly, Split-Bolt, 3/4" Diameter
2	6	TD 321C E	Grounding Assembly, Hardware-to-Hardware
3	4	TD 322E	Grounding Assembly, Hardware-to-Structure Ground
4	3	TD 420_ _ E	Suspension Assembly, Conductor
5	2	TD 425_ _ B	Suspension Assembly, Shield Wire
6	1	TD 540_ F B	Tie Wire Assembly
7	3	TD 827E _ A	Insulator Assembly, Suspension, with Link and Y-Clevis-Eye
8	1	TD 921_ D	Bolt Assembly, Double-Arming, 3/4-Inch
9A	5	TD 928_ A	Bolt Assembly, Machine, 1-Inch
9B	9	TD 928_ D	Bolt Assembly, Machine, 1-Inch

Table 2 - Additional Material To Be Specified To Complete This Structure

Item	Qty.	Standard	Description
A	3	TD 020_ _ A	Wood Pole Assembly
B	3	TD 625_ _ _ _	Guy Assembly, 4-Bolt Splayed Channel Pole Attachment
C	1	TD 624_ _ _ _	Guy Assembly, 2-Bolt Splayed Channel Pole Attachment
D	AS REQ	TD 630_ _ _	Anchor Assembly

## Notes

1. All hardware is to be bonded when it is separated by less than 8 inches. Bond wire shall loop around the bolt.
2. Install spring washers with loop end up where possible.
3. All pole attachment hardware shall be bonded to the pole grounding assembly.
4. Clearance between the conductor and the structure shall be maintained under reverse wind conditions.
5. Class 1 or better poles are recommended.



TI 435

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24 Jul 07

**230 kV Structure  
Shielded, 3-Pole Angle,  
30° to 45°**

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Engineer (C. Wright):

*CLW*

Standards Manager (G. Lyons):

*GS*

# 230 kV Structure—Shielded, 3-Pole—Dead-End, 10° to 65°



**TI 451**

RCMS Code: CU

May be used  
In raptor areas

## Scope

This structure is used for deadends with line angles up to 65° when shielding is required.  
Line Angle: 10° to 65°

## Standard References

TD 001	<i>Poles—General Information</i>
TD 100	<i>Conductor—General Information</i>
TD 200	<i>Shield and Guy Wire—General Information</i>
TD 300	<i>Grounding—General Information</i>
TD 500	<i>Tension Hardware—General Information</i>
TD 600	<i>Guys and Anchors—General Information</i>
TD 700	<i>Crossarms and Braces—General Information</i>
TD 800	<i>Insulators—General Information</i>
TD 900	<i>Bolts, Nuts, and Washers—General Information</i>

<u>Conductor</u>	<u>Code</u>
795 ACSR "Drake" . . . . .	D
954 ACSR "Cardinal" . . . . .	E
1272 ACSR "Bittern" . . . . .	F
795 AAC "Arbutus" . . . . .	G
1272 AAC "Narcissus" . . . . .	H
None . . . . .	Z

<u>Conductor Accessories</u>	<u>Code</u>
Tension Hardware Compression Fittings	
Jumper w/armor rod . . . . .	C
Jumper w/o armor rod . . . . .	D
Tension Hardware Bolted Fittings	
Jumper w/armor rod . . . . .	E
Jumper w/o armor rod . . . . .	F
None . . . . .	Z

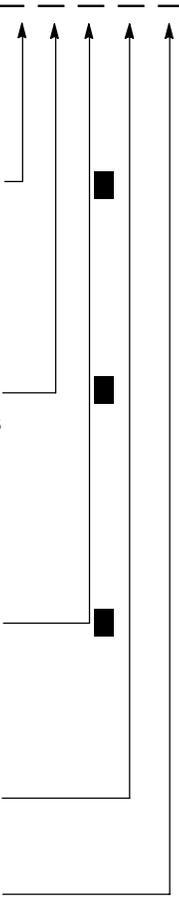
<u>Shield Wire</u>	<u>Code</u>
3/8 EHS . . . . .	A
1/2 EHS . . . . .	B
7#8 AW . . . . .	C
7#6 AW . . . . .	D
None . . . . .	Z

<u>Insulation</u>	<u>Code</u>
Porcelain . . . . .	A
Polymer . . . . .	B

<u>Pole Class</u>	<u>Species</u>	<u>Code</u>
3 . . . . .	Douglas fir . . . . .	A
2 . . . . .	Douglas fir . . . . .	B
1 . . . . .	Douglas fir . . . . .	C
H1 . . . . .	Douglas fir . . . . .	D
H2 . . . . .	Douglas fir . . . . .	E
3 . . . . .	Western red cedar . . . . .	F
2 . . . . .	Western red cedar . . . . .	G
1 . . . . .	Western red cedar . . . . .	H
H1 . . . . .	Western red cedar . . . . .	I
H2 . . . . .	Western red cedar . . . . .	J



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Standards Manager (G. Shaw): *GShaw*

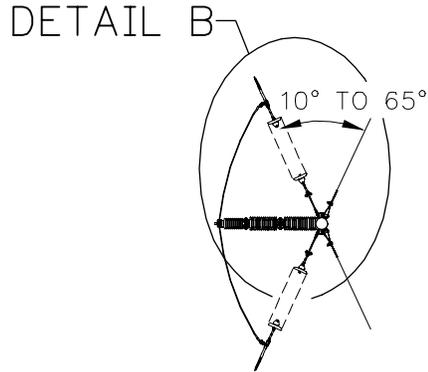
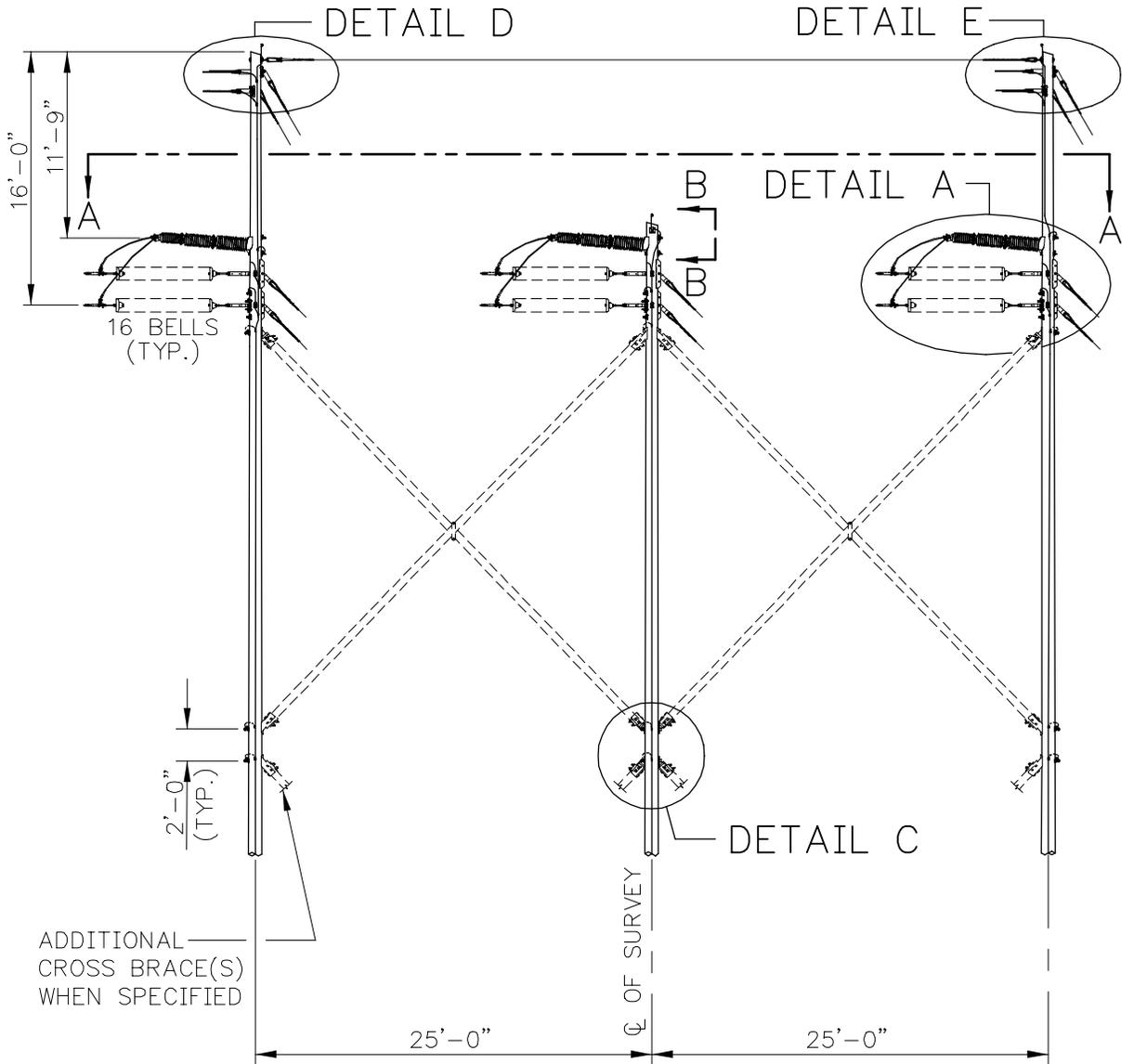
**230 kV Structure—Shielded,  
3-Pole—Dead-End, 10° to 65°**



28 Apr 04

**TI 451**  
Page 1 of 6

# TI 451



May be used  
In raptor areas

SECTION A-A



**230 kV Structure—Shielded,  
3-Pole—Dead-End, 10° to 65°**

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TI 451

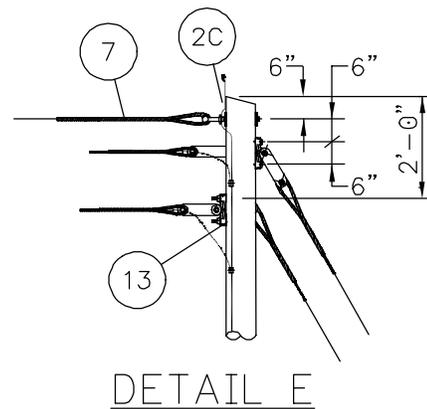
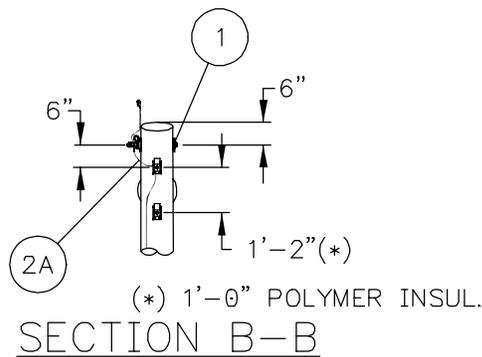
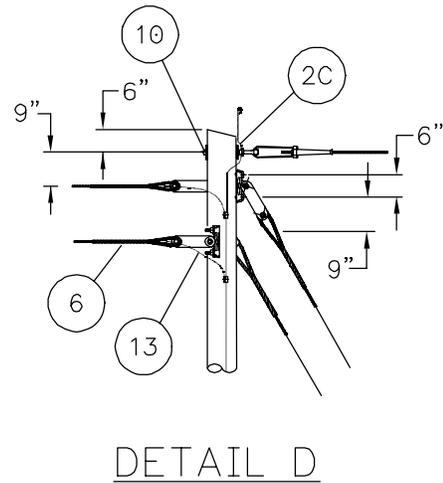
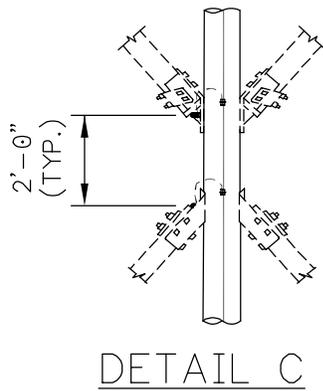
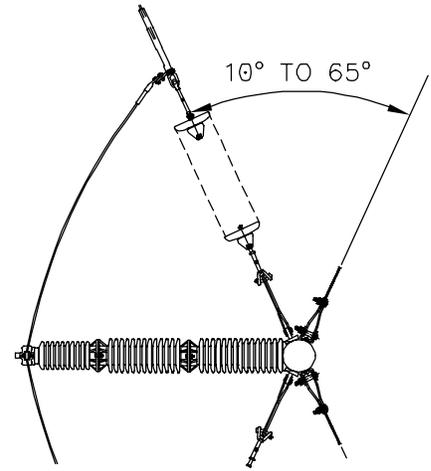
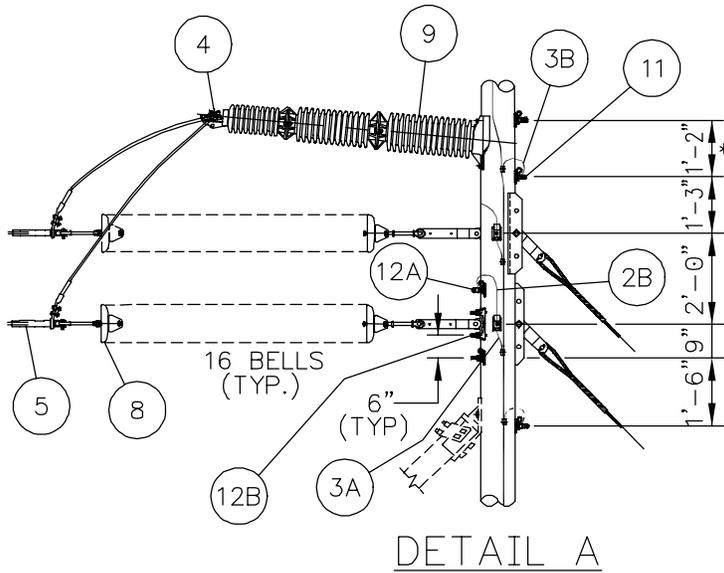
Page 2 of 6

28 Apr 04

Engineer (C. Wright): *CLW*

Standards Manager (G. Shaw): *GShaw*

(\* 1'-0" POLYMER INSUL.)



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Engineer (C. Wright): *CLW*  
Standards Manager (G. Shaw): *gshaw*

**230 kV Structure—Shielded,  
3-Pole—Dead-End, 10° to 65°**



28 Apr 04

**TI 451**  
Page 3 of 6

# TI 451

Table 1 - Components

Item	Qty.	Standard	Description
1	7	TD 022_	Pole Assembly, Split-Bolt, 3/4" Diameter
2A	1	TD 321C D	Grounding Assembly, Hardware-to-Hardware
2B	6	TD 321E Z	Grounding Assembly, Hardware-to-Hardware
2C	2	TD 321C Z	Grounding Assembly, Hardware-to-Hardware
3A	6	TD 322C	Grounding Assembly, Hardware-to-Structure Ground
3B	2	TD 322D	Grounding Assembly, Hardware-to-Structure Ground
4	3	TD 420_ _ A	Suspension Assembly, Conductor
5	6	TD 520_ _	Tension Assembly, Conductor
6	4	TD 525_ A	Tension Assembly, Shield Wire, Guy Grip
7	1	TD 540_ E A	Tie Wire Assembly
8	6	TD 826E _ A	Insulator Assembly, Dead-End, with 15" Link
9	3	TD 831G	Insulator, Post, Horizontal, Polymer
9	3	TD 835F	Insulator, Post, Horizontal, Porcelain
10	2	TD 926_ F	Bolt Assembly, Machine, 3/4-Inch
11	6	TD 927_ A	Bolt Assembly, Machine, 7/8-Inch
12A	12	TD 928_ A	Bolt Assembly, Machine, 1-Inch
12B	20	TD 928_ D	Bolt Assembly, Machine, 1-Inch
13	4	TD 325_	Grounding Assembly, Shield Wire-to-Pole Ground

Table 2 - Additional Material to Be Specified to Complete this Structure

Item	Qty.	Standard	Description
A	3	TD 020_ _ A	Wood Pole Assembly
B	4	TD 622B_ _ _	Guy Assembly, Dead-End Tee Pole Attachment
C	6	TD 623_ _ _ _	Guy Assembly, 4-Bolt Channel Pole Attachment
D	6	TD 627_ _ _ _	Guy Assembly, Bent Link Attachment
E	AS REQ	TD 630_ _ _	Anchor Assembly
F	1	TD 774F_ BA _	Brace, Cross, Wood Assembly with Double Bolt Connection



TI 451

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28 Apr 04

**230 kV Structure—Shielded,  
3-Pole—Dead-End, 10° to 65°**

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Construction Standard**

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Engineer (C. Wright): *CLW*

Standards Manager (G. Shaw): *GShaw*

**Notes**

1. All hardware is to be bonded when it is separated by less than 8 inches. Bond wire shall loop around the bolt. All pole attachment hardware shall be bonded to the pole grounding assembly.
2. Install spring washers with loop end up where possible.
3. In contaminated areas, use TD 840, code "F" for post insulators.
4. Class 1 or better poles are recommended.

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Engineer (C. Wright): *CLW*  
Standards Manager (G. Shaw): *GShaw*

**230 kV Structure—Shielded,  
3-Pole—Dead-End, 10° to 65°**



28 Apr 04

**TI 451**  
Page 5 of 6

# 230 kV Structure—Shielded, Single-Circuit—Dead-End, 15° to 65°



**TI 251**

RCMS Code: CU

May be used  
In raptor areas

## Scope

This structure is used for strain deadends with line angles up to 65° when shielding is required.

Line Angle: 15° to 65°

## Standard References

- TD 001 *Poles—General Information*
- TD 100 *Conductor—General Information*
- TD 200 *Shield and Guy Wire—General Information*
- TD 300 *Grounding—General Information*
- TD 500 *Tension Hardware—General Information*
- TD 600 *Guys and Anchors—General Information*
- TD 800 *Insulators—General Information*
- TD 900 *Bolts, Nuts, and Washers—General Information*

<u>Conductor</u>	<u>Code</u>
1/0 ACSR "Raven" . . . . .	A
4/0 ACSR "Penguin" . . . . .	B
397.5 ACSR "Ibis" . . . . .	C
795 ACSR "Drake" . . . . .	D
954 ACSR "Cardinal" . . . . .	E
1272 ACSR "Bittern" . . . . .	F
795 AAC "Arbutus" . . . . .	G
1272 AAC "Narcissus" . . . . .	H
None . . . . .	Z

<u>Conductor Accessories</u>	<u>Code</u>
<u>Suspension Hardware</u>	
Armor rod . . . . .	A
Line guard . . . . .	B
None . . . . .	Z
<u>Tension Hardware Compression Fittings</u>	
Jumper w/armor rod . . . . .	C
Jumper w/o armor rod . . . . .	D
<u>Tension Hardware Bolted Fittings</u>	
Jumper w/armor rod . . . . .	E
Jumper w/o armor rod . . . . .	F

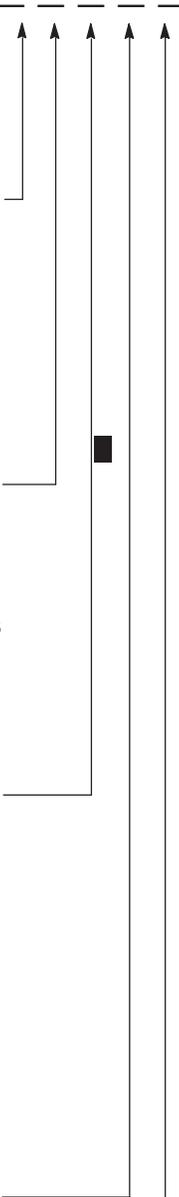
<u>Shield Wire</u>	<u>Code</u>
3/8 EHS . . . . .	A
1/2 EHS . . . . .	B
7#8 AW . . . . .	C
7#6 AW . . . . .	D
3/8 EHS w/AGS . . . . .	E
1/2 EHS w/AGS . . . . .	F
7#8 AW w/AGS . . . . .	G
7#6 AW w/AGS . . . . .	H
3/8 EHS w/armor rod . . . . .	I
1/2 EHS w/armor rod . . . . .	J
7#8 AW w/armor rod . . . . .	K
7#6 AW w/armor rod . . . . .	L
None . . . . .	Z

<u>Insulation</u>	<u>Code</u>
Porcelain . . . . .	A
Polymer . . . . .	B

<u>Pole Class</u>	<u>Species</u>	<u>Code</u>
3 . . . . .	Douglas fir . . . . .	A
2 . . . . .	Douglas fir . . . . .	B
1 . . . . .	Douglas fir . . . . .	C
H1 . . . . .	Douglas fir . . . . .	D
H2 . . . . .	Douglas fir . . . . .	E
3 . . . . .	Western red cedar . . . . .	F
2 . . . . .	Western red cedar . . . . .	G
1 . . . . .	Western red cedar . . . . .	H
H1 . . . . .	Western red cedar . . . . .	I
H2 . . . . .	Western red cedar . . . . .	J



**Transmission  
Construction Standard**

Stds Team Leader (C. L. Wright):   
Standards Services (M. Brimhall):

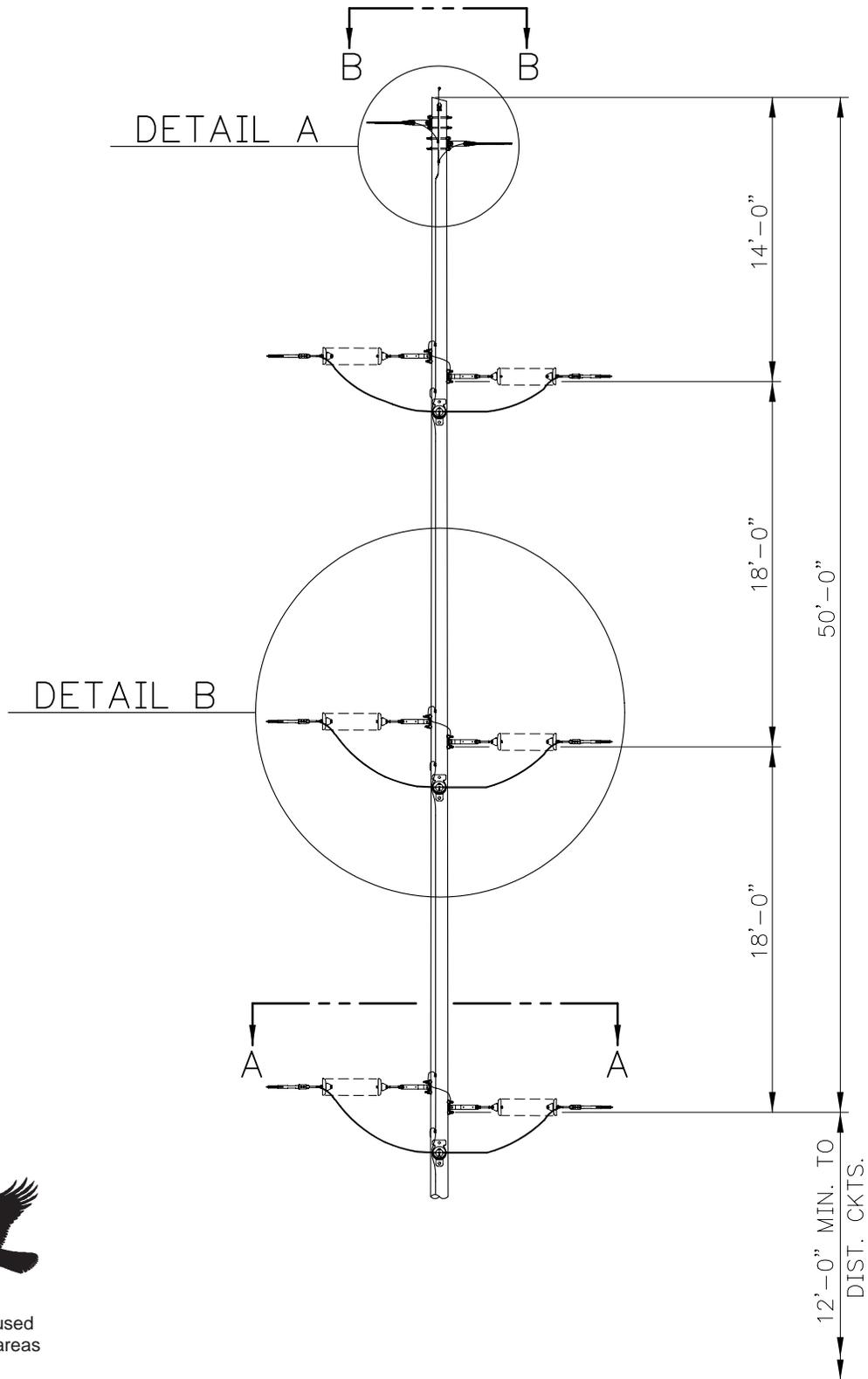
**230 kV Structure  
Shielded, Single-Circuit  
Dead-End, 15° to 65°**

**PACIFICORP**  
PACIFIC POWER UTAH POWER

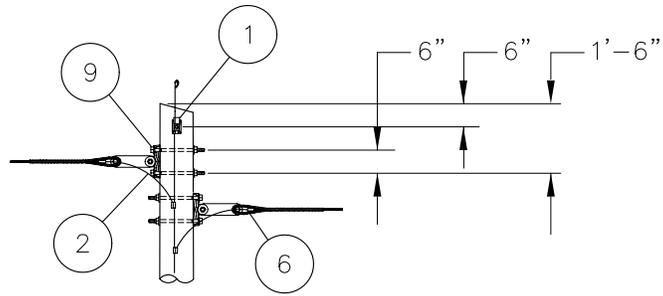
17 Mar 97

**TI 251**  
Page 1 of 4

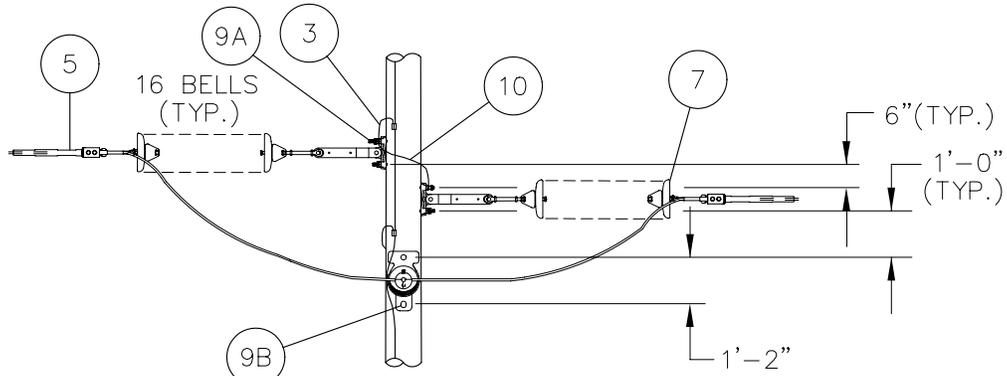
# TI 251



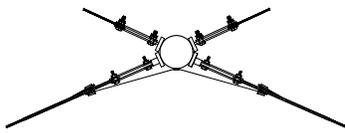
May be used  
In raptor areas



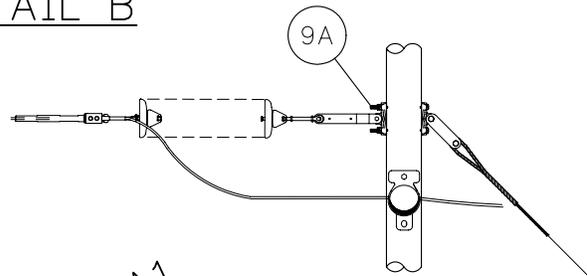
DETAIL A



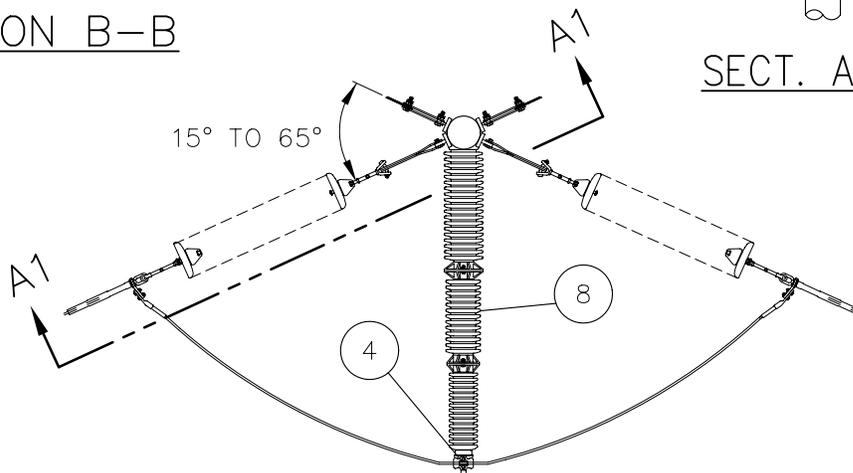
DETAIL B



SECTION B-B



SECT. A1-A1



SECTION A-A

**Transmission  
Construction Standard**

Stds Team Leader (C. L. Wright):   
Standards Services (M. Brimhall): 

**230 kV Structure  
Shielded, Single-Circuit  
Dead-End, 15° to 65°**



17 Mar 97

TI 251  
Page 3 of 4

# TI 251

Table 1 – Components

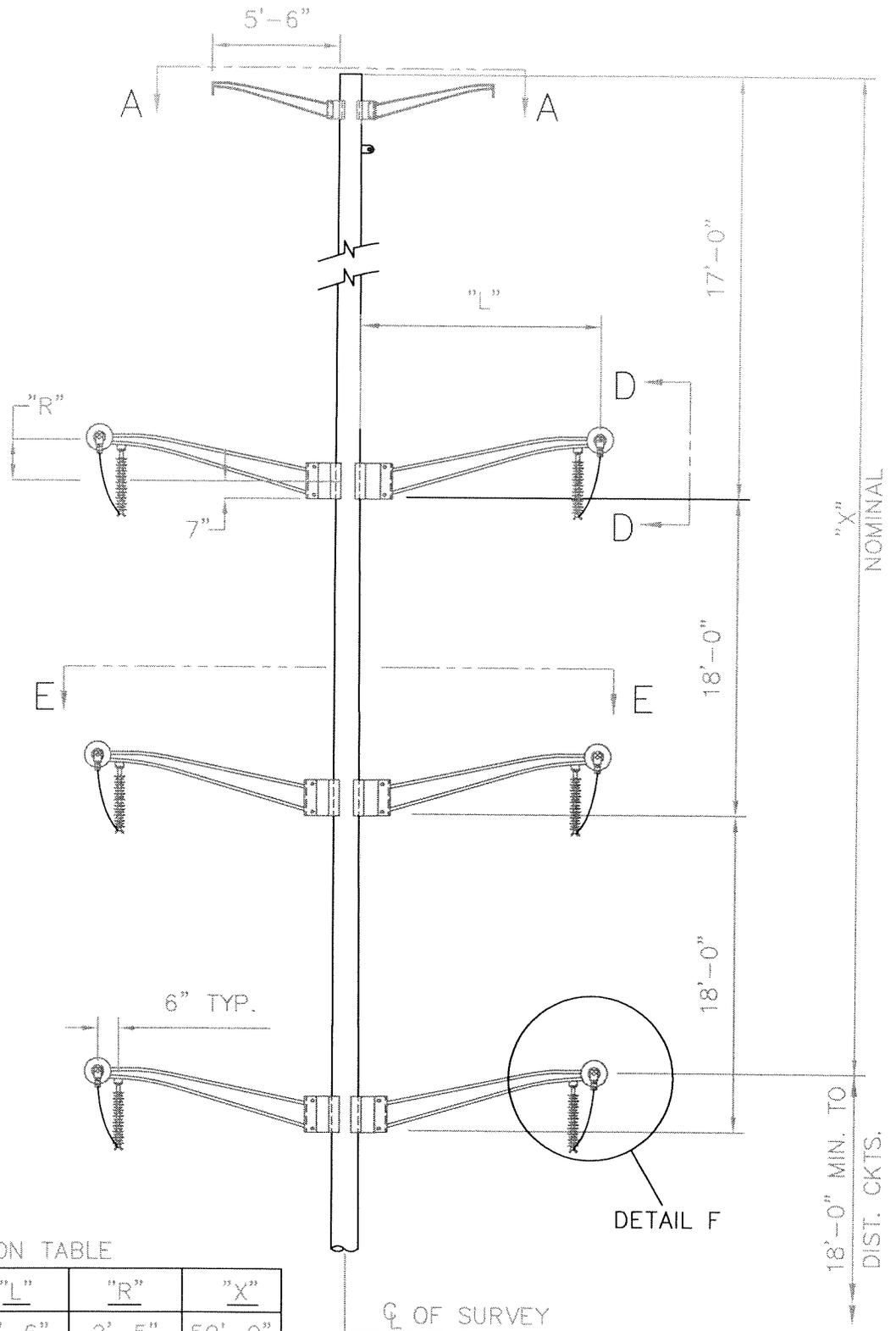
Item	Qty.	Standard	Description
1	1	TD 022_	Pole Assembly, Split-Bolt, 3/4" Diameter
2	2	TD 325_	Grounding Assembly, Shield Wire-to-Pole Ground
3	6	TD 322E	Grounding Assembly, Hardware-to-Structure Ground
4	3	TD 420_ _ A	Suspension Assembly, Conductor
5	6	TD 520_ _	Tension Assembly, Conductor
6	2	TD 525_ A	Tension Assembly, Shield Wire, Guy Grip
7	6	TD 826E _ A	Insulator Assembly, Dead-End, with Link
8	3	TD 831F	Insulator, Post, Horizontal, Polymer
8	3	TD 835F	Insulator, Post, Horizontal, Porcelain
9A	16	TD 928_ D	Bolt Assembly, Machine, 1-Inch
9B	6	TD 928_ E	Bolt Assembly, Machine, 1-Inch
10	4	TD 321E Z	Grounding Assembly, Hardware-to-Hardware

Table 2 – Additional Material To Be Specified To Complete This Structure

Item	Qty.	Standard	Description
A	1	TD 020_ _ A	Wood Pole Assembly
B	8	TD 620A _ _ _	Guy Assembly
C	AS REQ	TD 630_ _ _	Anchor Assembly

## Notes

1. All hardware is to be bonded when it is separated by less than 8 inches. Bond wire shall loop around the bolt.
2. Install spring washers with loop end up where possible.
3. All pole attachment hardware shall be bonded to the pole grounding assembly.
4. In contaminated areas, use TD 840, code "F" for post insulators.
5. Class 1 or better pole is recommended.



DIMENSION TABLE

LINE ANGLE	"L"	"R"	"X"
0°-30°	9'-6"	2'-5"	50'-0"
30°-60°	10'-6"	2'-9"	49'-8"
60°-90°	12'-6"	3'-5"	49'-0"

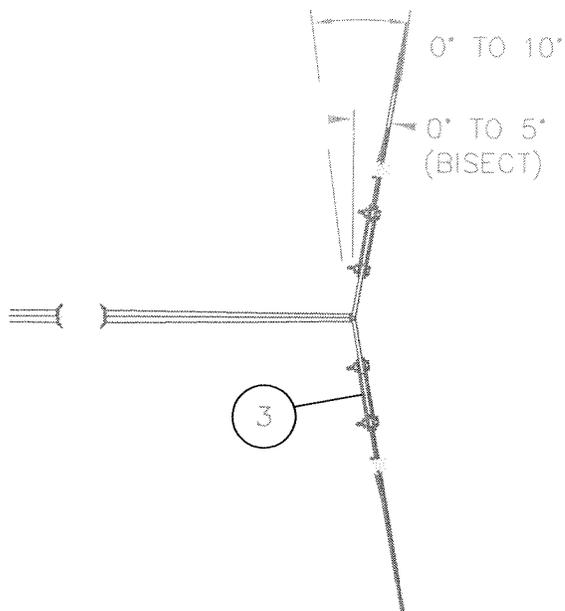
REV	DATE	DESC.	BY	CHK	APP
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ER/PR	
DATE	6 SEPT 06
ENG	/ DES
DR	CH
APP	

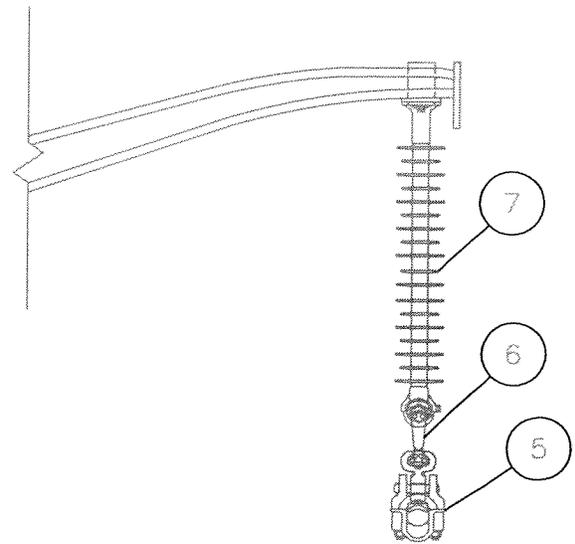
230KV STRUCTURE  
SHIELDED, D. C.  
DEADEND, 0° TO 90°, STEEL  
POLE W/ DAVIT ARMS

**PACIFIC CORP**  
PACIFIC

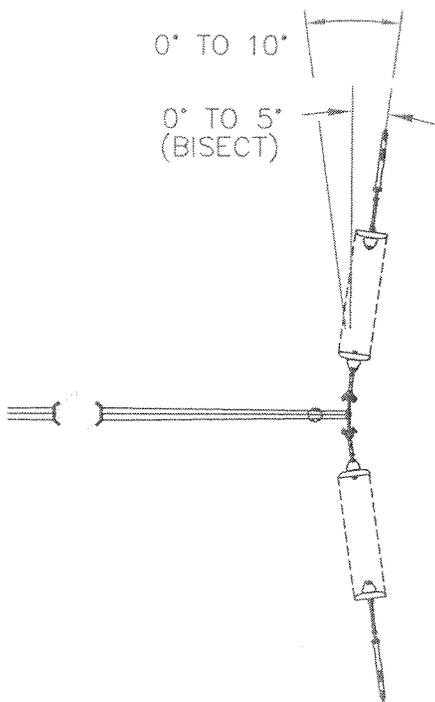
SHEET	1 of 2	SCALE	NONE
T1285		REV.	0



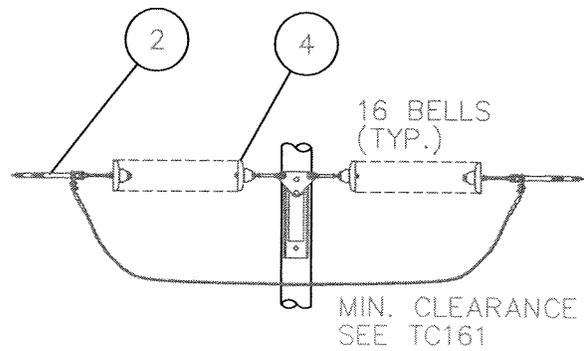
SECTION A-A



DETAIL F



SECTION E-E



SECTION D-D  
(TYPICAL)

REV	DATE	DESC.	BY	CHK	APP
ER/PR					
DATE	9/6/06				
ENG		DES			
DR		CH			
APP					

230KV STRUCTURE  
SHIELDED D. C.  
DEAD-END, 0° TO 90°, STEEL  
POLE W/ DAVIT ARMS



SHEET	2 of 2	SCALE	NONE
T1285F2		REV.	1

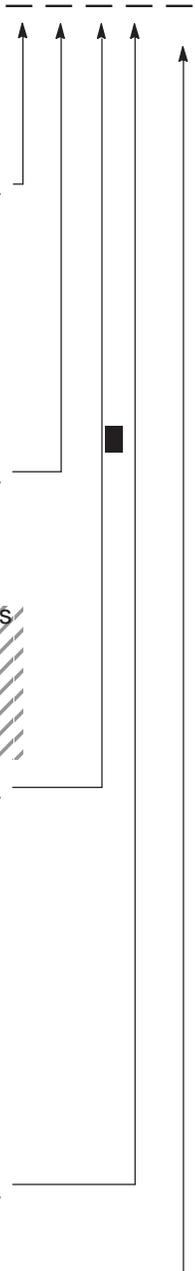
# 230 kV Structure—Shielded, H Frame—Tangent, with Steel Truss



**TI 403**

RCMS Code: CU

May be used  
In raptor areas



## Scope

This structure is used when shielding is required.

Line Angle: 0° to 1°

## Standard References

- TD 001 *Poles—General Information*
- TD 100 *Conductor—General Information*
- TD 200 *Shield and Guy Wire—General Information*
- TD 300 *Grounding—General Information*
- TD 400 *Suspension Hardware—General Information*
- TD 700 *Crossarms and Braces—General Information*
- TD 800 *Insulators—General Information*
- TD 900 *Bolts, Nuts, and Washers—General Information*

<u>Conductor</u>	<u>Code</u>
1/0 ACSR "Raven" . . . . .	A
4/0 ACSR "Penguin" . . . . .	B
397.5 ACSR "Ibis" . . . . .	C
795 ACSR "Drake" . . . . .	D
954 ACSR "Cardinal" . . . . .	E
1272 ACSR "Bittern" . . . . .	F
795 AAC "Arbutus" . . . . .	G
1272 AAC "Narcissus" . . . . .	H
None . . . . .	Z

<u>Conductor Accessories</u>	<u>Code</u>
<u>Suspension Hardware</u>	
Armor rod . . . . .	A
Line guard . . . . .	B
None . . . . .	Z
<u>Tension Hardware Compression Fittings</u>	
Jumper w/armor rod . . . . .	C
Jumper w/o armor rod . . . . .	D
<u>Tension Hardware Bolted Fittings</u>	
Jumper w/armor rod . . . . .	E
Jumper w/o armor rod . . . . .	F

<u>Shield Wire</u>	<u>Code</u>
3/8 EHS . . . . .	A
1/2 EHS . . . . .	B
7#8 AW . . . . .	C
7#6 AW . . . . .	D
3/8 EHS w/AGS . . . . .	E
1/2 EHS w/AGS . . . . .	F
7#8 AW w/AGS . . . . .	G
7#6 AW w/AGS . . . . .	H
3/8 EHS w/armor rod . . . . .	I
1/2 EHS w/armor rod . . . . .	J
7#8 AW w/armor rod . . . . .	K
7#6 AW w/armor rod . . . . .	L
None . . . . .	Z

<u>Insulation</u>	<u>Code</u>
Porcelain . . . . .	A
Polymer . . . . .	B

<u>Pole Class</u>	<u>Species</u>	<u>Code</u>
3 . . . . .	Douglas fir . . . . .	A
2 . . . . .	Douglas fir . . . . .	B
1 . . . . .	Douglas fir . . . . .	C
H1 . . . . .	Douglas fir . . . . .	D
H2 . . . . .	Douglas fir . . . . .	E
3 . . . . .	Western red cedar . . . . .	F
2 . . . . .	Western red cedar . . . . .	G
1 . . . . .	Western red cedar . . . . .	H
H1 . . . . .	Western red cedar . . . . .	I
H2 . . . . .	Western red cedar . . . . .	J

### Transmission Construction Standard

Stds Team Leader (C. L. Wright): *CLW*  
Standards Services (M. Brimhall): *MB*

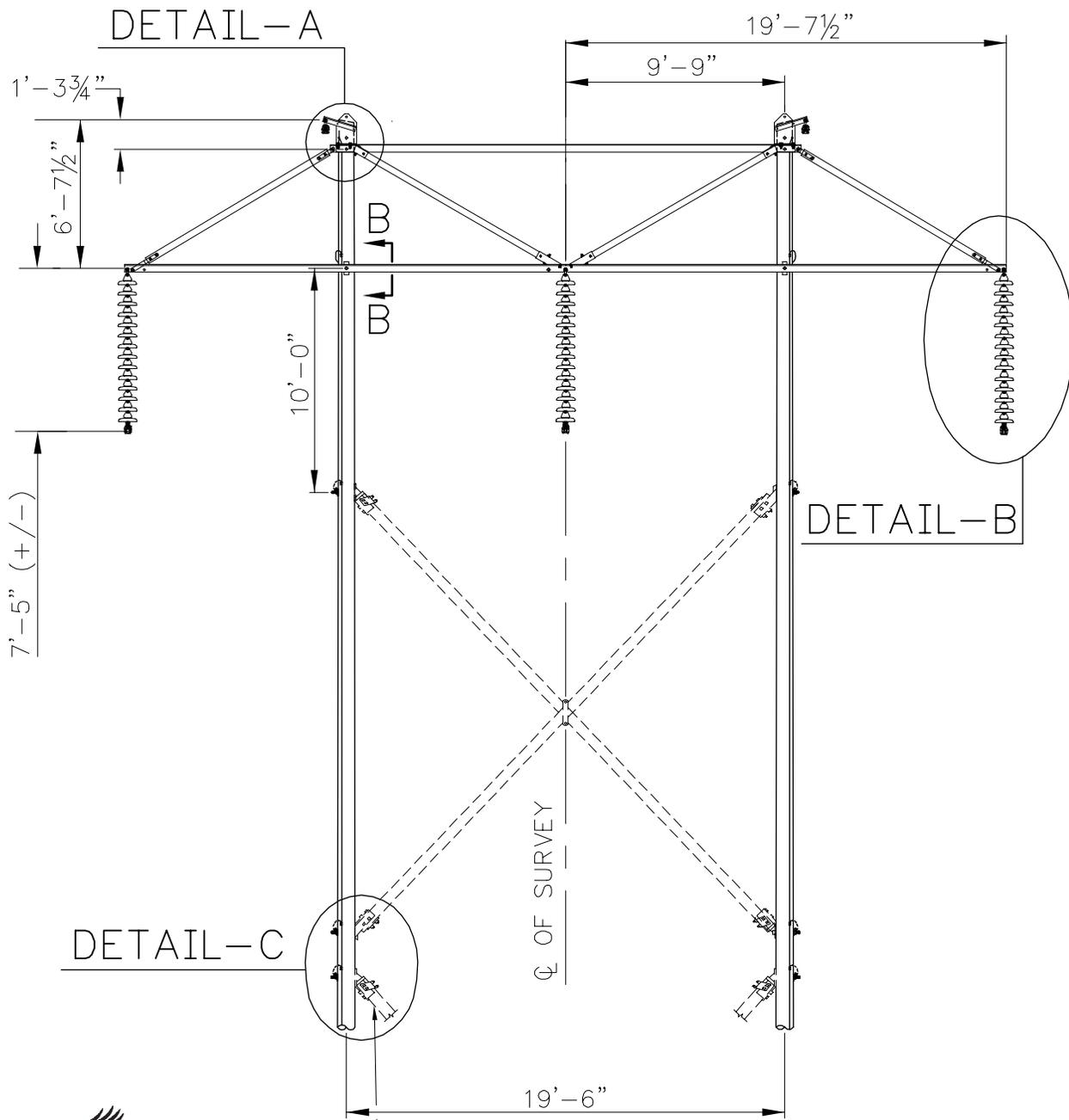
### 230 kV Structure Shielded, H Frame Tangent, with Steel Truss



27 May 97

**TI 403**  
Page 1 of 4

# TI 403



DETAIL-C

DETAIL-B

ADDITIONAL CROSS BRACE(S) WHEN SPECIFIED



May be used  
In raptor areas

**PACIFICORP**  
PACIFIC POWER UTAH POWER

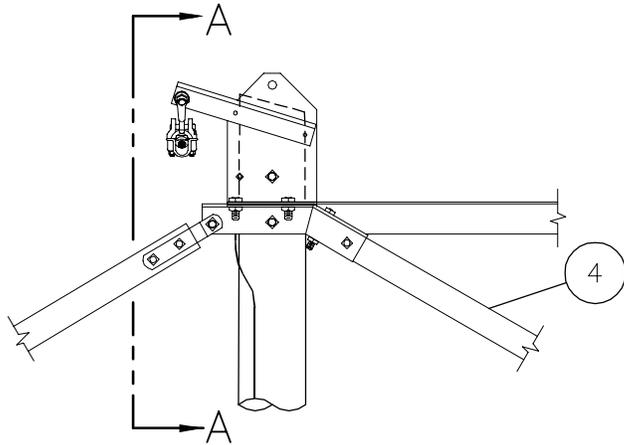
**230 kV Structure  
Shielded, H Frame  
Tangent, with Steel Truss**

**Transmission  
Construction Standard**

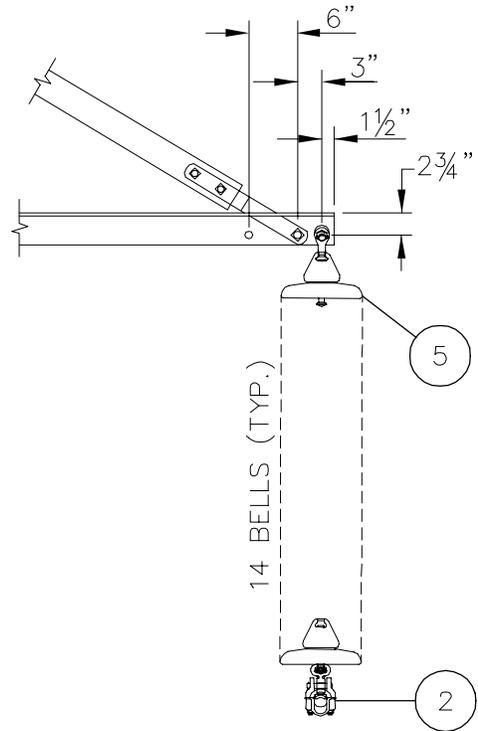
TI 403  
Page 2 of 4

27 May 97

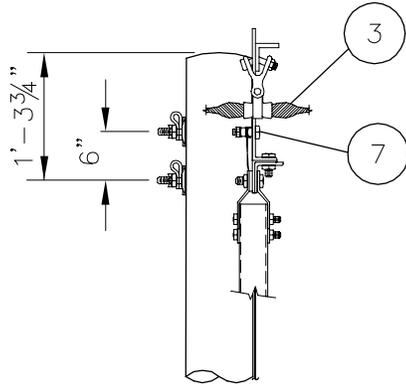
Std's Team Leader (C. L. Wright): *CLW*  
Standards Services (M. Brimhall): *MAB*



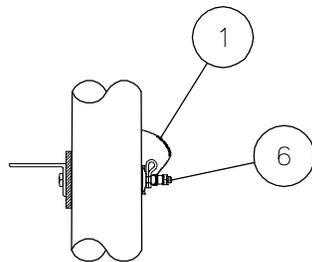
DETAIL A



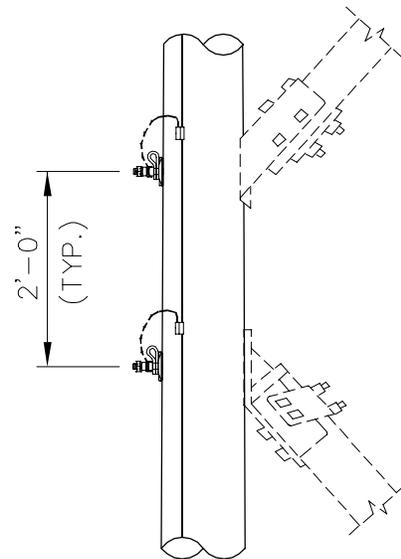
DETAIL B



SECTION A-A



SECTION B-B



DETAIL C

**Transmission  
Construction Standard**

Stds Team Leader (C. L. Wright): *CLW*  
Standards Services (M. Brimhall): *M.B.*

**230 kV Structure  
Shielded, H Frame  
Tangent, with Steel Truss**

**PACIFICORP**  
PACIFIC POWER UTAH POWER

27 May 97

**TI 403**  
Page 3 of 4

# TI 403

Table 1 – Components

Item	Qty.	Standard	Description
1	2	TD 322D	Grounding Assembly, Hardware-to-Structure Ground
2	3	TD 420_ _ C	Suspension Assembly, Conductor
3	2	TD 425_ _ C	Suspension Assembly, Shield Wire
4	1	TD 728C	Arm Assembly, Suspension, Steel Truss
5	3	TD 824E _	Insulator Assembly, Suspension, Tangent
6	6	TD 927_ A	Bolt Assembly, Machine, 7/8-Inch
7	2	TD 361Z	Grounding Clip

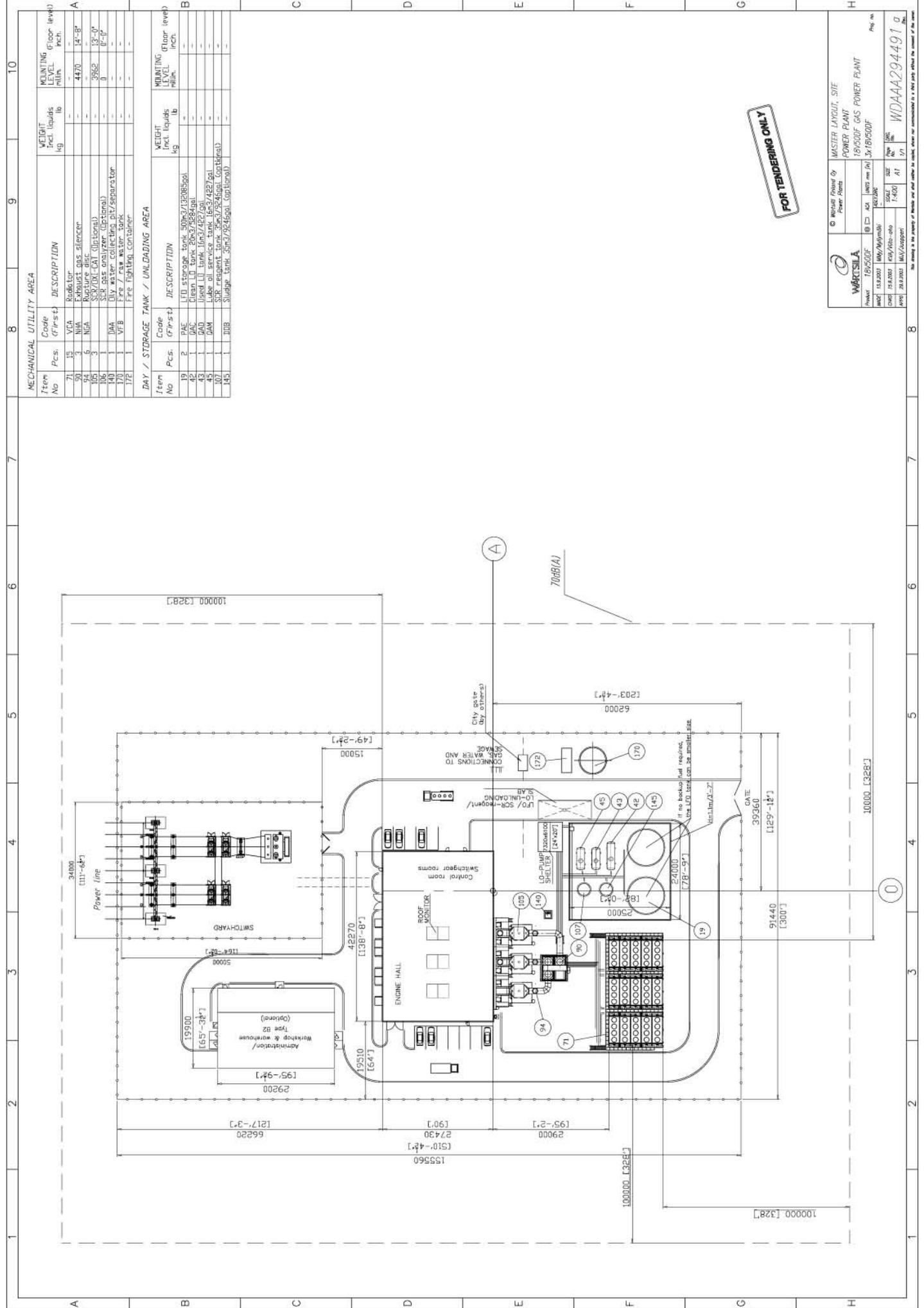
Table 2 – Additional Material To Be Specified To Complete This Structure

Item	Qty.	Standard	Description
A	2	TD 020_ _ A	Wood Pole Assembly
B	1 or More	TD 774A _ A A	Brace, Cross, Wood Assembly with Double Bolt Connection

## Notes

1. All hardware is to be bonded when it is separated by less than 8 inches. Bond wire shall loop around the bolt.
2. Install spring washers with loop end up where possible.
3. All pole attachment hardware shall be bonded to the pole grounding assembly.





MECHANICAL UTILITY AREA

Item No	Pcs	Code (F1=st)	DESCRIPTION	WEIGHT Incl. liquids lb	MOUNTING LEVEL ft/inch
71	15	VEA	Refractor	-	14'-8"
90	3	NIA	Explosion gas detector	-	-
94	5	NIA	Explosion disc	-	-
105	3	NIA	SCR/OXI-CAT (Optional)	-	-
106	1	DAM	SCR gas analyzer (Optional)	-	-
170	1	DAM	Dry water collecting PIT/separators	-	-
171	1	VFB	Water tank	-	-
172	1	VFB	Fire fighting container	-	-

DAY / STORAGE TANK / UNLOADING AREA

Item No	Pcs	Code (F1=st)	DESCRIPTION	WEIGHT Incl. liquids lb	MOUNTING LEVEL ft/inch
19	2	PAE	LEO storage tank_50m3/13200kgal	-	-
40	1	DAM	Fire tank_50m3/13200kgal	-	-
43	1	DAM	Used oil tank_16m3/422gal	-	-
45	1	DAM	Lube oil service tank_16m3/422gal	-	-
107	1	DAM	SCR reagent tank_35m3/924kgal (Optional)	-	-
145	1	DAM	Sludge tank_35m3/924kgal (Optional)	-	-

FOR TENDERING ONLY

**WAPSIILA**

© Waptsiila Power Co  
 MASTER LAYOUT, SITE  
 POWER PLANT  
 20'000F GAS POWER PLANT  
 3X18'000F

Product: 19'000F  
 Unit: 18'000F  
 Unit: 18'000F  
 Unit: 18'000F

Drawn: 15.8.2007  
 Checked: 15.8.2007  
 Approved: 15.8.2007

Scale: 1:1000  
 Date: 15.8.2007  
 No: 1/1

Project No: WDA44294491.g

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**Appendix B**  
**Wyoming State Lands Special Use Lease and**  
**Wyoming Game and Fish Department**  
**Memorandum of Agreement**

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**ACTION:** APPROVAL OF SPECIAL USE LEASE APPLICATION

**AUTHORITY:** W.S. 36-5-114; Rules Chapter 5, Section 3

Type of Use: Methane and Helium Recovery Facility

Lease No.: SU-599

Applicant: Cimarex Energy, Inc.

County: Sublette

Acres: 33.83

Description: Tract in E2  
Section 16, Township 29 North, Range 114 West, 6<sup>th</sup> P.M.

Improvements: Proposed Improvements: Seven Buildings with Equipment in each building described as: Control Room/Office/Shop, Motor Control Center 1 and 2, Compressor Building, Processing Building, Sour Gas Building, Carbon Dioxide/Hydrogen Sulfide Injection Pump Building, Warehouse, Switchgear/Control Building with the Electrical Substation plus Plat Inlet facility, Propane Refrigeration System, Flare Stack, Atmospheric Storage Tanks, Cryogenic Separation Equipment, Communications Infrastructure, Various Plant Pipe Racks and Appurtenances, a Warehouse Building, Plant Security Fencing, Electrical Pole Structures, Well Flow Pipelines, etc., Water Well, Waste Facilities with an applicant estimated value of \$40,000,000.00

Recommended Rental: \$19,000.00, per year adjusted annually by 2.7% to offset inflationary pressure and subject to five year rental review

Recommended Term: September 1, 2008 to September 1, 2058  
(50 Years)

Discussion:

The Rands Butte Project entails the building and installation of a Methane & Helium Recovery Facility (MHRF) which will produce methane and helium from the Madison formation in the Riley Ridge Federal Unit (RRU) and will re-inject all byproduct gasses such as carbon dioxide and hydrogen sulfide back into their source producing formation. No liquid petroleum products will be produced. No sulfur products will be produced.

This application was submitted to the Board for consideration during the June 5, 2008 Board meeting. Following testimony from the Wyoming Game and Fish Department (Game and Fish), the grazing lessee and Cimarex, the matter was deferred pending further investigation by the Office and scheduling of a field inspection by the Board.

Since the June meeting, the Board of Land Commissioners has conducted an onsite field inspection (June 16, 2008) to gather specific facts related to the proposed project. Additionally, a meeting involving Cimarex, Game and Fish and affected landowners was held on June 24, 2008 to identify and discuss specific concerns and possible solutions related to the proposed MHRF plant. Finally, a meeting was held on July 11, 2008 between Game and Fish and Cimarex to discuss the mitigation measures and possible stipulations that would be placed on the Special Use Lease should it be approved.

Recently, a Mitigation Agreement between the Game and Fish and Cimarex has been agreed upon that would provide funding for elk monitoring and research, habitat enhancement and elk damage prevention. Correspondence detailing the Agreement is attached as Exhibit A. The projects would be funded by Cimarex with funds held by a mutually agreed upon third party and administered by the Game and Fish. Additionally, lease stipulations have been agreed to that would serve to reduce /mitigate impacts associated with the facility (Exhibit B).

An analysis of the proposal including discussions regarding background, siting considerations, construction and operational impacts, potential impacts to elk winter range and income to trust beneficiaries is attached as Exhibit C.

#### Public / Agency Comment

Comment from the Game and Fish and the public regarding the proposed project has been received by the Office. General concerns related to the proposed MHRF can be summarized as follows:

- 1) Negative impacts to the Riley Ridge elk herd and potential increased threat of brucellosis transmission.
- 2) Air quality impacts related to ozone and Hydrogen sulfide
- 3) Potential water quality impacts
- 4) Reduction or cancellation of BLM or State grazing lease(s)

As stated earlier, the Game and Fish has approved the Mitigation Agreement and lease stipulations that would serve to reduce/mitigate impacts to the elk herd and adjacent landowners that may be affected by change in elk distribution patterns. As the plant will be essentially a zero emissions facility, negative impacts to air quality are expected to be minimal. Hydrogen sulfide gas is easily dispersed by air movement. Due to wind intensity and flow at the preferred location, dispersion of any Hydrogen sulfide, that may be accidentally released, would be maximized. Cimarex is currently working with the Department of Environmental Quality to conduct an extensive analysis of air quality in the Riley Ridge area. As the gasses will be re-injected into source formation, no water quality impacts would be expected. In addition, this potential will be evaluated by the Wyoming Oil and Gas Commission prior to approval of required permits. Finally, there are no anticipated effects related to the cancellation or a reduction in AUMs of either a State or federal grazing lease resulting from the proposed plant, Mitigation Agreement or the lease stipulations.

Comments received by the Office are attached as Exhibit D.

Other permitting requirements associated with construction of the MHRP are detailed under Section E of the Detailed Analysis (attached). These permitting and regulatory compliance measures will provide the public additional opportunities for comment on the project.

It has been determined that this special use lease application site is not in a sage grouse habitat core area.

#### **DIRECTOR'S RECOMMENDATION:**

The Director provides this Board Matter for the above described Special Use Lease application for consideration with a recommendation to approve conditioned upon Cimarex compliance with provisions of the Mitigation Agreement with the Wyoming Game and Fish Department, lease stipulations designed to minimize disturbance to the Riley Ridge Elk herd and compliance with all other applicable local, state and federal regulations. Should the Board approve the application, the lease would be for a fifty year term at a rental of \$19,000.00 per year adjusted annually by 2.7% to offset inflationary pressure and subject to a rental review every five years. A bond required by Cimarex Energy, Inc. equal to an Engineer's estimate for reclamation of the site until such time as it is no longer being used would be required. Approval of the application is not to be considered as an approval of the applicant's estimated value of improvements.

**BOARD ACTION:** \_\_\_\_\_



## WYOMING GAME AND FISH DEPARTMENT

5400 Bishop Blvd. Cheyenne, WY 82006

Phone: (307) 777-4600 Fax: (307) 777-4610

Web site: <http://gf.state.wy.us>

### EXHIBIT A

GOVERNOR  
DAVE FREUDENTHAL  
DIRECTOR  
STEVE FERRELL  
COMMISSIONERS  
JERRY GALLES - President  
CLIFFORD KIRK - Vice President  
CLARK ALLAN  
FRED LINDZEY  
RON LOVERCHECK  
ED MIGNERY  
BILL WILLIAMS, DVM

July 23, 2008

Lynn Boomgaarden, Director  
Office of State Lands and Investments  
122 West 35<sup>th</sup> Street, Herschler Bldg 3<sup>rd</sup> Floor West  
Cheyenne, WY 82001

RE: Memorandum of Agreement for ("MOA") Wildlife Mitigation of the Riley Ridge  
Methane & Helium Recovery Facility

Dear Director Boomgaarden:

This letter shall summarize the understanding between Cimarex Energy Co. (Cimarex) and Wyoming Game and Fish Commission (WGFC) regarding Wildlife Mitigation measures for the construction, operation and maintenance of a natural gas sequestration plant known as the Riley Ridge Methane & Helium Recovery Facility located in T29N, R114W, Sec.16, Sublette County, Wyoming ("Facility").

WGF and Cimarex have agreed to enter into an MOA that will contain, among others, the following terms and conditions.

1. A mitigation fund in the amount of up to \$1,550,000.00 will be funded by Cimarex and held by a third party as mutually agreed upon by WGFC and Cimarex.
2. The mitigation fund is intended to provide financial resources for three specific mitigation objectives to be undertaken as they relate to Cimarex's Facility which are: (i) elk damage prevention; (ii) elk monitoring/research; and, (iii) elk habitat enhancement.
3. Cimarex agrees to provide the following mitigation funds as described:
  - a. Elk Monitoring/Research - not to exceed \$450,000.00
  - b. Habitat Enhancement - not to exceed \$350,000.00
  - c. Elk Damage Prevention - not to exceed \$750,000.00

Lynne Boomgaarden  
July 23, 2008  
Page 2

The total portion of the fund applicable to Elk Monitoring/Research is expected to be available in the first year of the project and maintained up to five years as needed. The portion of the fund applicable to Habitat Enhancement is expected to be maintained for up to 10 years as needed with the goal of maintaining an annual account balance up to \$100,000, but in no event will the total habitat enhancement amount paid by Cimarex exceed \$350,000. The portion of the fund applicable to Elk Damage Prevention is expected to be maintained for the life of the project as needed with the goal of maintaining an annual account balance of up to \$50,000, but in no event will the total amount paid by Cimarex exceed \$750,000 for elk damage prevention. Funds not previously disbursed within the prescribed time lines will be returned to Cimarex.

4. The geographic area covered by the Memorandum of Agreement is expected to fall into three (3) categories:
  - a. Elk Monitoring and Research: The geographic area for capturing elk for monitoring and research will be the general geographic area from Middle Piney Creek (immediately north of Finnegan Feed ground) south to LaBarge Creek within the Hunt Area 94, South Piney. Elk monitoring would include the geographic areas used by radio-collared elk.
  - b. Elk Habitat Enhancement: The geographic area for elk habitat enhancement will be expected to cover all occupied elk transitional and winter range in the Riley Ridge/Rand's Butte areas Hunt Area 94, South Piney. Documented movements of radio-collared elk may more closely define the area.
  - c. Elk Damage: The geographic mitigation area for elk damage prevention will encompass lands that have direct surface impacts from elk displaced by the construction and operation of the Riley Ridge Facility. Such areas are expected to be South Piney and Middle Piney drainages within the geographic scope of Hunt Area 94, South Piney. However, elk damage prevention would occur wherever radio-collared elk are displaced.

Lynne Boomgaarden  
July 23, 2008  
Page 3

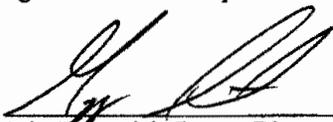
Cimarex and WGF agree to finalize the MOA prior to the August 7, 2008 State Land Board Meeting and look forward to presenting the final Wildlife Mitigation plan to the Board.

Thank you in advance for your cooperation and support.

Cimarex Energy Co.

By:   
Michael M. Wolfe, Regional Land Manager

Wyoming Game and Fish Department

By:   
for John Emmerich, Deputy Director

JE/cmc

## EXHIBIT B

### Example/Proposed Wildlife Stipulations

#### **Pre-Construction Phase**

1. Prohibit site preparation activities in designated parturition areas from May 1 to June 20.
2. Prohibit site preparation activity in designated elk crucial winter range from November 15 to April 30.
3. Maintain locked gates at private land crossings to prevent unauthorized access.
4. No possession of firearms by employees or contractors on, to, or from the site.

#### **Construction Phase**

1. Prohibit project related human activity in designated parturition areas from May 1 to June 20.
2. Prohibit project related human activity in designated elk crucial winter range from November 15 to April 30.
3. Maintain locked gates at private land crossings to prevent unauthorized access.
4. No possession of firearms by employees or contractors on, to, or from the construction site.
5. When accessing the 17-34 well site, limit motorized access to established roads.
6. Dogs (excluding guide dogs) shall be prohibited at construction site.
7. Mandatory reprimand or dismissal for employees convicted of unlawful take (hunt, pursue, catch, capture, shoot, fish, seine, trap, kill or possess, or attempt to hunt, pursue, catch, capture, shoot, fish seine, trap, kill or possess) of wildlife while employed or contracted by the company or on company property. This applies to unlawful activities that occur within the Riley Ridge Unit and main access routes to the Unit
8. Project proponent shall comply with all applicable Federal wildlife laws and regulations to eliminate/minimize potential impacts to endangered, threatened, proposed or protected species, and their habitat (i.e. Migratory Bird Treaty Act, Golden Eagle/Bald Eagle Act) determined to be present through on-site inventories conducted by the proponents during pre-construction phase.

#### **Post-Construction/Operations Phase**

1. Limit routine maintenance flaring operations from November 15 to April 30 to reduce disturbance to wintering elk
2. Limit snow plowing operations to only main road to plant/well site (17-34).

3. When accessing the 17-34 well site, limit motorized access to established road.
4. No possession of firearms by employees or contractors on, to, or from the plant site.
5. Winter road maintenance must include blading turnouts on both uphill and downhill sides of the road at one-half to one-mile intervals and at known game crossings to allow wildlife escape routes.
6. Dogs (excluding guide dogs) shall be prohibited at the plant site.
7. Mandatory reprimand or dismissal for employees convicted of unlawful take (hunt, pursue, catch, capture, shoot, fish, seine, trap, kill or possess, or attempt to hunt, pursue, catch, capture, shoot, fish seine, trap, kill or possess) of wildlife while employed or contracted by the company or on company property. This applies to unlawful activities that occur within the Riley Ridge Unit and main access route to the Unit.
8. Use best efforts to carpool or bus work crews during shift changes to reduce vehicle disturbance to wildlife.
9. Use best efforts to minimize vehicle travel between dawn (6-8 a.m.) and dusk (4-6 p.m.) during critical winter months.
10. Off-road travel shall be minimized to prevent habitat damage.
11. Use best efforts to limit routine visits to well sites on crucial winter range to times when big game are typically bedded (i.e., mid-day), to reduce disturbance and stress on wildlife.
12. Use best efforts to employ remote sensing technology to reduce daily/weekly truck trips to well sites.
13. All compressor engines/exhaust stacks shall be adequately muffled, to reduce noise levels to 49dBA; Use best and practical efforts to ensure compressor engines/exhaust stacks meet a noise level of 10 dBA (with a standard deviation of + or - 3dBA) above ambient background noise at the lease line fenced perimeter.
14. Powerlines and conductors shall be constructed in accordance with raptor-safe design criteria.
15. Project proponent is to provide information to their employees and contractors about wildlife laws and regulations, and about the sensitivity of wildlife to disturbance.
16. Garbage disposal must be strictly monitored. Open pits or landfills are prohibited and garbage collection and/or disposal must minimize bear-human conflicts. Garbage containers shall be bear-proof.
17. Project proponents shall comply with all applicable Federal wildlife laws and regulations to eliminate/minimize potential impacts to endangered, threatened, proposed, or protected species, and their habitat (i.e. Migratory Bird Treaty Act, Golden Eagle/Bald Eagle Act) determined to be present through on site inventories conducted by the proponents during pre-construction phase.

EXHIBIT C

**CIMAREX ENERGY, INC.**  
**SPECIAL USE LEASE APPLICATION**  
**SU-599**  
**DETAILED ANALYSIS**

**August 7, 2008**

**Prepared by the**

**Office of State Lands and Investments**

**Herschler Building, 3W**

**122 West 25<sup>th</sup> Street**

**Cheyenne, WY 82002**

**PROPOSAL:**

Cimarex Energy has submitted a Special Use Lease application on State trust lands located in Sublette County. Termed the Rands Butte Project, the proposal entails the building and installation of a 200 MMSCFD capacity Methane & Helium Recovery Facility (MHRF) that will recover methane and helium from the Madison formation in the Riley Ridge Federal Unit (RRU) and will re-inject all byproduct gasses such as carbon dioxide and hydrogen sulfide back into their source producing formation. No liquid petroleum products or sulfur products will be produced. The plant would be owned, and operated by Cimarex Energy and would be staffed with approximately 15-20 employees for year-round operations.

**AUTHORITY:**

W.S. 36-5-114, Leasing for industrial, commercial and recreational purposes.

Rules: Chapter 5, Section 3.

**LEGAL / LAND DESCRIPTION:**

Section 16 (E2), Township 29 North, Range 114 West, 6th P.M., Sublette, County, Wyoming (see Attachment A). The preferred MHRF would occupy approximately 10 acres within a total area of 33.83 acres and would be enclosed with 10 ft. chain link fence.

The site is at an elevation of approximately 8,500 feet along Riley Ridge, an west-east trending sedimentary formation east of the Wyoming Range, in Sublette County, Wyoming approximately 17 miles west of Big Piney. It is marked by steep slopes and patches of aspen woodlands within extensive stands of Wyoming big sagebrush vegetation.

Based on ecoregion mapping compiled by the Environmental Protection Agency (EPA), the preferred plant site is generally located within the Level III Middle Rockies ecoregion, which is characterized by glaciated mountains with moderately steep to steep slopes. Deep, V-shaped drainages with moderate to high gradient perennial streams and boulder, cobble, and bedrock substrates are common. Common soil series that may be found in this area are Sapphire, Redfeather, Tongue River, Starley, Farlow, Nathrop, Starman, and Turnerville. These shallow to moderately deep, well-drained soils are indicative of the rolling to steep topography in the area. Geologic conditions, combined with the parent materials, have produced variable soil textures and very complex soil/landform relationships.

Vegetation communities in the preferred plant site are dominated by sagebrush. The Wyoming big sagebrush vegetation community is characterized by a mosaic distribution of sagebrush stands ranging from moderate density to high density. Other shrub species that occur within the sagebrush community include rabbitbrush (*Chrysothamnus* spp.), winterfat (*Krascheninnikovia lanata*), Gardner's saltbush (*Artiplex gardneri*), and occasionally black greasewood (*Sarcobatus vermiculatus*). Mountain big sagebrush (*A. t. ssp. vaseyana*) and silver sagebrush (*A. cana*) also occur in or near the preferred plant site and are interspersed with the mixed conifer, aspen, and lodgepole pine forests. Mixed conifer forest, which consists mainly of Engelmann spruce (*Picea engelmannii*) and subalpine fir (*Abies lasiocarpa*), and lodgepole pine (*Pinus contorta*) can also occur in the area.

The Wyoming big sagebrush community provides forage for livestock and big game, and nesting cover and forage for sage-grouse and some big game species, depending on elevation and density. The site is not located within a defined sage grouse core area. There are no known threatened or endangered plant species at this elevation or on Riley Ridge in general.

#### **BACKGROUND:**

The Special Use Lease application for the MHRF facility was received by the Office in January of 2008. The Project was presented to the Board of Land Commissioners for consideration at the June 5, 2008 Board meeting. Testifying on the matter were representatives of Cimarex Energy, the Wyoming Game and Fish Department (WGFD) and the current grazing lessee.

The primary issues of concern raised during the meeting were 1) the current preferred plant location, 2) potential negative impacts to the Piney Elk herd and 3) potential economic loss to trust beneficiaries.

No action was taken by the Board pending further review of the proposal.

#### **EXISTING LEASES / RIGHTS OF WAY:**

The current grazing lessee is Dan H. Budd and Sons (#3-6884). The lease expires on March 1, 2017. True Oil, LLC currently has two gas wells in the section. Both wells are located south of the preferred MHRF and outside of the subject area. To date, there are no current rights of way (ROW) of record on the parcel.

#### **PROPOSED IMPROVEMENTS:**

The proposed MHRF will consist of the following buildings and equipment; control room/office/shop, motor control center 1 and 2, compressor building, processing building, sour gas building, Carbon Dioxide/Hydrogen Sulfide injection pump building, warehouse, switchgear/control building with the electrical substation plus plat inlet facility, propane refrigeration system, flare stack, atmospheric storage tanks, cryogenic separation equipment, communications infrastructure, various plant pipe racks and appurtenances, a warehouse building, plant security fencing, electrical pole structures, well flow pipelines, water well, and waste facilities. The applicant estimates the value of improvements to be approximately \$40,000,000.00

#### **DISCUSSION POINTS:**

##### **A) Siting Considerations**

During early Project development, several options for Project location were reviewed. The primary and most critical consideration for all location reviews was employee and public health and safety and using the natural wind normally present. Preservation of the view shed of the Piney Creek drainages and their historic western character along with preservation of the view shed of the Lander Cutoff of the Oregon Trail were also highly important. Reduction of human

activities and surface disturbance along with minimizing impact on wildlife were important considerations as well.

The Project will not require construction of new roads. Reduction of human and truck traffic and the use of multi-well pad drilling were key principals in location selection and review.

The following detail discusses salient points regarding the locations reviewed by Cimarex Energy:

1. Location of MHRF at a lower elevation in the general Riley Ridge area on private fee or state lands outside the Riley Ridge Federal Unit (Attachment B, sites A, B and C).

These locations were rejected for the following reasons:

- a. Wind velocity and turbulent mixing were judged to be somewhat less effective in the lower elevation, more open environment.
- b. Public surface occupancy is considerably closer to this location than the Cimarex preferred alternative raising the potential for safety concerns.
- c. The location would be near open, flowing springs and well established traditional agricultural uses on the private fee property.

2. Location of the MHRF on State land (Attachment B, sites D,E,F and preferred site location).

Cimarex considered a total of four possible alternative locations for the MHRF on State lands in Section 16, T29N, R114W. In addition to the current preferred site, the following locations were considered:

- i. Site D: Located in Section 16, T29N, R114W generally north of current preferred site.
- ii. Site E: Located in Section 16, T29N, R114W generally northeast of current preferred site and west of Well RRU 10-14.
- iii. Site F: Located in Section 16, T29N, R114W generally south of current preferred site.

After considering all options and potential issues, the current site was selected as the Cimarex preferred location for the MHRF.

The other three locations (D, E and F) were rejected for location of the MHRF for the following reasons:

- a. Wind velocity and turbulent mixing were judged to be slightly less effective in the more open environment.
- b. Public surface occupancies are slightly closer to these locations as opposed to the Cimarex preferred alternative (16-D).
- c. In consultation with the state grazing lessee, the plant site was located in an area to account for minimal impact to AUM's and cattle distribution.

- d. This location would require development of a new and/or upgraded road system to improve access. This would result in increased disturbance and potential public demand for access.
- e. The location would be near open, flowing springs and well established traditional agricultural uses on the private Fee property in 2 of the 3 rejected locations.

3. Location of the MHRF to serve the RRU and operated as a third party processing facility (Attachment B, sites G, H and I).

Cimarex considered building the Facility outside the RRU as a third party processing facility. Any third party processing facility would have been problematic due to issues related to transfer metering, ownership and liability associated with moving fluids across unit and lease boundaries. Three primary options for a third-party MHRF co-located on non-federal land northeast of the RRU were considered.

- i. Location H on private Fee lands
- ii. Location I on private Fee lands
- iii. Location G on State of Wyoming lands

These locations are at lower elevation in the Piney Creek drainage and on existing developed road infrastructure.

The above three locations (G, H, and I) were rejected for location of the MHRF for the following reasons:

- a. The producing wells on the RRU would be some 5 to 8 miles away and across flowing streams. This exposes the public to more miles of sour gas gathering flow lines installed at lower elevations close to public use and occupancy with potentially increased risk to public health and safety compared to the Cimarex preferred alternative in the unlikely event of an accidental leak or release.
- b. This location could potentially result in increased environmental disturbance to wildlife habitats and existing agricultural land uses.
- c. All facilities, as well as the production flow lines and their reclaimed ROW would be more visible from the Lander Cutoff of the Oregon Trail than in other locations.
- d. Wind velocity and turbulent mixing were judged to be slightly less effective in the more open environment.
- e. Public surface occupancies are closer to these locations as opposed to the Cimarex preferred alternative.
- f. The sour gas gathering flow lines from the producing wells to the MHRF would cross several public roads thence exposing the travelling public to increased risk in the event of a flow line leak

4. Location of the MHRF on BLM land outside the boundaries of the RRU to serve the RRU (Attachment B, site J).

Cimarex considered an option presented at a meeting with WGFD that would have located the MHRF on BLM land approximately 2 to 3 miles south and/or southeast on lower Reed Ridge or lower Trail Ridge.

This location was rejected for the following reasons:

- a. The producing wells on the RRU would be several miles away from the MHRF. This location would require the construction and continued operation of longer production flow lines through a difficult pipeline construction topography, high gradient environment from the wells on the RRU to the MHRF. This exposes the public to more flow line miles of sour gas gathering flow lines installed at lower elevations and crossing natural air channels (deep valleys) close to public use and occupancy with potentially increased risk to public health and safety compared to the Cimarex preferred alternative in the unlikely event of an accidental leak or release.
- b. Construction of the production flow lines will disturb more surface in this option and could increase the potential for ongoing surface damage due to erosion of the ROW's due to the steep gradients involved along the route(s).
- c. The need for winter access to the entire Project area including flow line ROW's is not decreased. Periodic human intrusion on wildlife winter range may be increased due to the length of such ROW with possible increased impact to wildlife on winter range.
- d. Increased human disturbance in big game crucial winter range due to the need for periodic monitoring access along the increased length of flow line ROW; monitoring of the Multi-Well pad envisioned for the RRU 17-34 site and for access to the RRU 10-14. Winter access to the RRU 17-34 site in the absence of an opened road to the MHRF located per the Cimarex preferred alternative will likely involve use of heavy equipment on at least a periodic basis to ensure access.
- e. This option increases the overall human disturbance and project footprint. Human presence on Riley Ridge is lowered but is still required. Increased surface disturbance occurs and human presence is dispersed over a larger area than other options.
- f. If used, a successful deployment of remote monitoring technology for the producing wells will still require periodic human presence for verification, calibration and maintenance.
- g. Human presence on Reed Ridge and Trail Ridge is potentially increased thus dispersing activity across the landscape within new areas considered to be within big game crucial winter range.
- h. Relocation of the MHRF to this location appears to have potential affect on BLM sensitive fish species due to MHRF location on the upper Beaver Creek drainage.
- i. There are complex BLM administrative policies for the use and management of non-unitized lands used in servicing the RRU gas. There is no assurance that such policies can be successfully modified to ensure Cimarex comparable access to their RRU resources.
- j. If the MHRF is located outside the unit boundaries, additional facilities and surface footprint is required for transfer metering and associated preprocessing.
- k. The MHRF could possibly be visible from the historic Lander Cutoff of the Oregon Trail due to construction of the facility on north-eastern and eastern facing slopes.
- l. To protect the RRU from drainage; preserve the BLM mineral interest and royalty from RRU production and preserve the State's royalty interest intact, the project wells will need to remain located as currently planned in the Rand's Butte Project.
- m. Disposal of produced water would be difficult if the plant site is not located within the unit boundaries and absent a good Nugget formation test.

- n. State of Wyoming and other RRU owners would sustain a dilution in their ownership interests in the RRU if the facility was moved to another location off RRU with subsequent loss of royalty revenue to the State and the School Trust Fund.
- o. The State of Wyoming and the Common School Permanent Land Income Fund would lose rental payments if the MHRF or other parts of the project were moved off the preferred location on State lands.

The WGFD has also indicated that alternative sites would require an evaluation of feasibility and possible impacts to other wildlife values in the area including:

- Colorado River Cutthroat (CRC) Trout habitat associated with Beaver Creek and Trail Ridge Creek.
- Given the sensitive nature of habitat for CRC trout along Beaver Creek, the Bureau of Land Management (BLM) designated this area as an Area of Critical Environmental Concern (ACEC).
- Potential Canadian Lynx habitat is mapped for many of the Conifer/Aspen stands along the ridge tops to the west and southwest of the proposed plant site.

#### B) CONSTRUCTION AND OPERATIONAL IMPACTS:

The Plant site as previously indicated will cover/disturb 33.83 acres and is the only new disturbance within the RRU which covers 9,780 acres. The Unit is designated by the red crosshatched area and extends to the North of the map perimeter (see attachment C). Two existing well sites will be utilized as indicated by the green boxes (10-14 well site and 17-34 well site). Regardless of the plant site location both these well sites will exist and be accessed over the life of the project. Access to these well sites and the preferred plant site is by way of an existing road shown "roughly" by the dark green line, and again, will be utilized over the life of the project.

The facility is designed to have a capacity of 200 MMSCFD. Processing capacity at start up would only be 100 MMSCFD. The limiting factor will likely be the production capacity of the two producing wells. The drilling of two additional wells and the installation of additional electrically compressors will allow the full capacity to be utilized.

Construction of substantial portions of the MHRF will be performed off-site in fabrication shops in Midland, Texas and Pocatello, Idaho. The modular components would be transported to the plant site and assembled. The plant site will be tiered to follow the natural contour of the site and minimize the amount of surface disturbance.

All aboveground MHRF components would be painted a BLM-accepted environmental color that blends with the surrounding landscape, except for structures that require hot or cold insulation and subsequent metal cover and structures that require safety coloration to comply with Occupational Safety and Health Administration (OSHA) regulations.

Specific design features have been selected to minimize the visibility of the MHRF and to lower the visual profile of the facility. The facility as currently proposed should not be visible from the Lander Cutoff of the Oregon Trail. Some of the taller equipment may be visible from certain areas distant to the facility but designs have been selected to lower visual impact. Aircraft warning lights should not be required on the facility permanent structures

A new electrical substation will be constructed at the site along with major processing equipment and related piping. Construction would involve normal oil and gas construction equipment including cranes, welding machines, forklifts, graders and other equipment required by the contractor.

Summary of anticipated surface activity for the proposed MHRF:

Pre-construction Phase:

Activity on the State lands prior to construction would entail individual site visits by Cimarex employees and contractors to do tasks such as surveys, soil samples, water samples air monitoring etc. and meeting with applicable regulatory agencies. No disturbance of the surface would take place and no heavy equipment would be traveling on to the "State site" (other than the existing road access for the drilling of unit wells to the west of the State section).

Construction Phase:

Construction of the MHRF would take place following approval of the State Lease as well as all other agency approvals (BLM, Wyoming DEQ etc.) The total time required to complete all components of the project is estimated to be approximately 28 months. The majority of the outside construction will likely be completed during a single construction season (May-November). A work crew of 50 to 150 may be present on the construction site during certain periods and will require 200-400 heavy truck loads depending of the phase of the construction. Construction period will take into account and will be limited by seasonal stipulations.

Post- Construction Phase:

The MHRF will be operated 24 hours per day, 365 days per year and maintained by a total staff of approximately 15-20. This total staff would not likely all be on site at any one time. Typical staffing may be as low as two during the night shift and 8-10 during the day. The personnel would travel from local communities to the plant site daily. Snow control structures and snow removal programs will be required for winter access

Cimarex will make efforts to "car pool" personnel when applicable.

Due to design of the project, with CRA flowlines eliminating chemical injection and where metering and flow control of the wells is handled at the plant site, access to the multi-well pad (the 17-34 site) will be much less than is typical. This will further decrease human presence on the ridge, particularly in the more sensitive areas to the west.

#### C) POTENTIAL IMPACTS TO CRUCIAL ELK WINTER RANGE

The Cimarex MHRF in the Riley Ridge area (Section 16, T29N, R114W) is located along the Wyoming Range Front, and includes crucial winter range for a free-ranging elk herd segment in Sublette County. The Riley Ridge area is one of two native elk winter ranges remaining in the entire Piney Elk Herd unit. Mid-winter surveys conducted by the WGFD for the past 3 years indicate on average, 198 elk have used this winter range complex (approximately 50% of the elk in Hunt Area 94 that winter on native range). Attachment C depicts results of a study conducted

as a University of Wyoming Cooperative Wildlife Unit master's project (2000-2002). The study monitored elk distribution for three consecutive winters and shows elk use on Section 16 and the surrounding area. Winter use is significant around the proposed plant location (Section 16, T29N, R114W).

If development activity displaced these elk from native winter range and elk sought forage from nearby private lands, the WGFD would be forced to either haze the animals from the conflict areas or establish emergency feeding operations. Personnel costs to haze animals from conflict areas would be highly variable and difficult to project. However, emergency feeding costs could be estimated based on data from the WGFD elk feedground program. Operational costs for the closest elk feedground to the Riley Ridge area averaged \$132 per elk over the last 5 years. Projecting displacement of 50 to 100% of the Riley Ridge elk to an emergency feeding operation, annual cost could range from \$13,200 to \$26,400. The WGFD estimates the economic return per elk harvested is \$1,527. Annually, sportsmen in elk Hunt Area 94 record a 30% success rate during the hunting season. Based on the past 3 year average of ~ 200 elk wintering in the Riley Ridge complex, and a harvest of 50 to 60 elk, the economic return to the state totals between \$80,000 and \$90,000, annually.

#### D) INCOME TO TRUST BENEFICIARIES

Should the plant be constructed, the following revenues could be anticipated by the state;

##### 1) Special Use Lease

Pursuant to Chapter 5, section 7 of the Rules and Regulations of the Board of Land Commissioners, the annual rental for a special Use Lease shall be the amount bid by the applicant, if accepted by the Board, or as set by the Board as part of its decision in a case of conflicting applications. The minimum annual rental shall be based on fair market value for the same or similar use of the land and any improvements owned by the State after an economic analysis is made. In cases where annual rental cannot be established based on fair market value for the same or similar use of the land, the minimum rental shall not be less than \$250.00 or 5 1/2% of the appraised land value and any improvements owned by the State.

A staff appraiser completed an evaluation of the lease application in February of 2008. Based upon comparables of similar land use in the area, the appraiser recommended that the rental rate be established at \$19,000 annually. This rate would be adjusted annually by 2.7% to offset inflationary pressure and subject to five year rental review. The recommended term of the lease is 50 years.

##### 2) Royalty Income

Within the Riley Ridge Unit, there are 640 acres of State land, 40 acres of fee land and 9,100 acres of federal lands. The location of the plant within the unit on either state, federal or fee lands would have no affect on the gas royalties received by the State. The State's share of the unit production is 6.54341% on Methane and Helium sales following production and processing. The State would also receive 50% of the royalties generated from methane production on the federal lands. The State would not realize revenue from Helium produced from federal lands.

Based upon projected plant production of 620 bcf and current Methane pricing, the State could expect approximately \$32.1MM over the life of the plant should it be installed. Additionally, Helium production is estimated to be 17 bcf and would generate estimated revenues of \$8.5MM over the expected plant life.

#### E) REGULATORY PERMITTING SUMMARY

Below is a summary and status of permits required for the proposed MHRF plant:

1. BLM Permit for Power Line and Pipeline corridor and associated actions
  - a. Scoping document for preparation of a Environmental Assessment has been prepared and submitted
    - i. Scoping document includes reference to MHRF as well as the proposed wells and associated actions (including a third party operated Helium recovery facility located at Calpet Road and HWY 189)
2. APD for the drilling of the 20-14 well in the Riley Ridge Unit
  - a. Application submitted in April, anticipate approval in July 2008
  - b. Application has already been made with the Wyoming OGCC for this well
3. DEQ Air Emissions permit
  - a. This is associated with the any emissions from the MHRF
  - b. Application has been made and approval anticipated this summer via a public hearing
4. DEQ Construction permit, timing unknown
5. Wyoming OGCC permit for CO2 and H2S injection well
  - a. Permit will be applied for once the 20-14 well is drilled and applicable well information is obtained; approval anticipated in late '08 or early '09
6. Wyoming OGCC permit for the drilling of a Unit Water Injection well to be located on State Section 16 T114N-R29W
  - a. Two permits are required, 1 for drilling and a UIC permit; application to be made in summer of '09
7. Local Construction Permit from Sublette County/Big Piney for the construction of the MHRF; subject to approval of BLM EA application, application could be as early as late '08
8. Water well permit from the State of Wyoming, Office of the State Engineer; anticipated application to be made in summer of '09
9. Eventually 3 more well permits will be applied for with the Wyoming OGCC and the BLM (APD's) all of which are to be dilled from the same existing pad.; will submit APD's in June of '08, approval subject to BLM EA (note wells have already received approval from Resource Management group of BLM under an existing Plan of Development)

#### F) PUBLIC COMMENT

Comment regarding the proposed project was invited in either written or electronic format from adjacent landowners and other who expressed interest. Comments can generally be summarized as follows:

- 1) Negative impacts to the Riley Ridge elk herd and potential increased threat of brucellosis transmission.

The Game and Fish and Cimarex have settled on language for a Mitigation Agreement

and lease stipulations that would serve to reduce/mitigate impacts to the elk herd and adjacent landowners that may be affected by change in elk patterns.

2) Air quality impacts related to ozone and Hydrogen sulfide

As the plant will be essentially a zero emissions facility, negative impacts to air quality are expected to be minimal. Hydrogen sulfide gas is easily dispersed by air movement. The preferred location would maximize dispersion of any Hydrogen sulfide that may be accidentally released due to wind intensity and flow. Cimarex is currently working with the Department of Environmental Quality to conduct an extensive analysis of air quality in the Riley Ridge area.

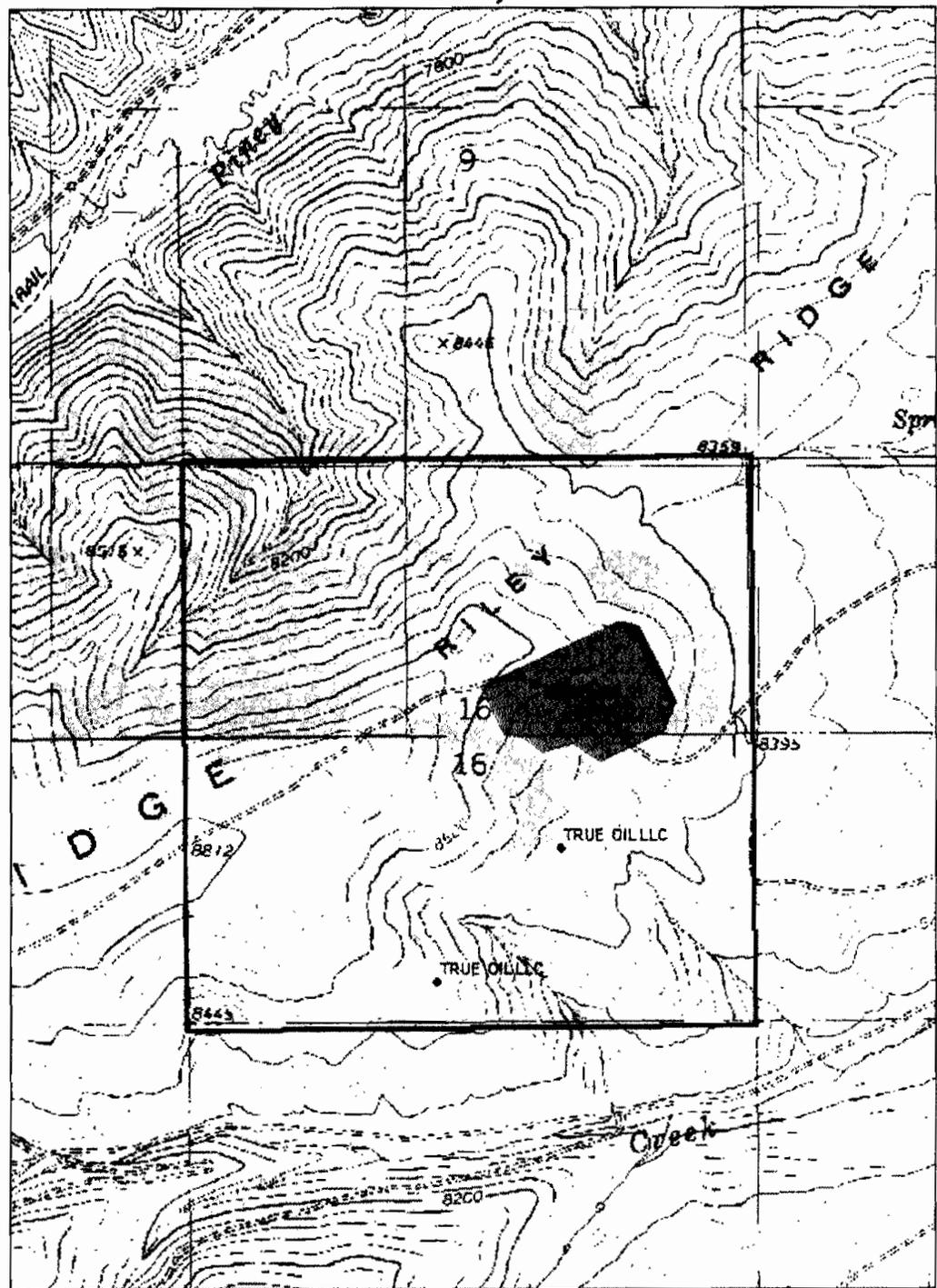
3) Potential water quality impacts

As the waste gasses will be re-injected into source formation, no water quality impacts would be expected. In addition, this potential will be evaluated by the Wyoming Oil and Gas Commission prior to approval of required permits.

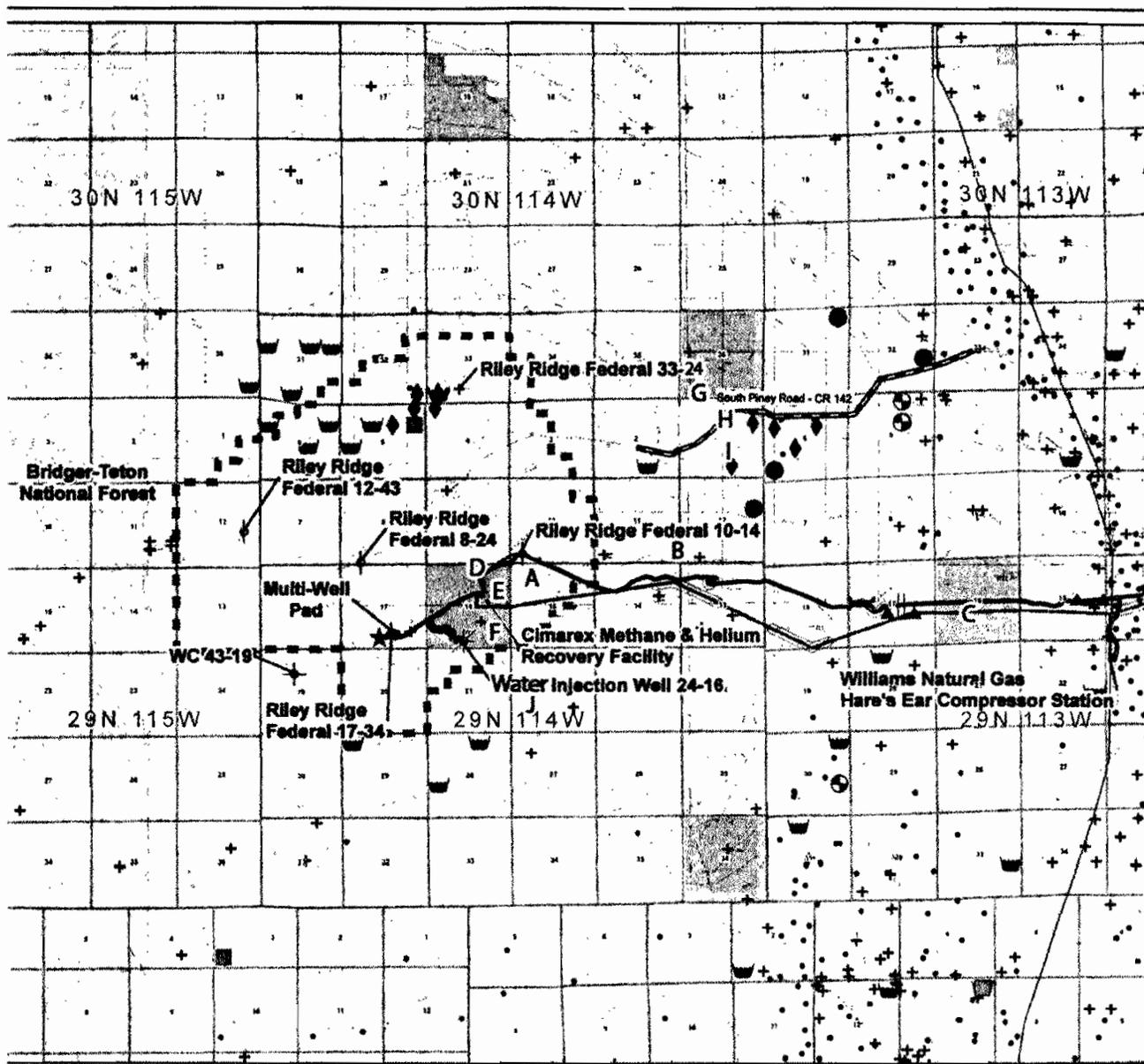
4) Reduction or cancellation of BLM or State grazing lease(s)

There are no anticipated reductions in either AUMs or cancellation of lease agreements, whether Federal or State, associated with the proposed MHRF plant.

# Cimarex Riley Ridge Site Sec 16 T29N, R114W

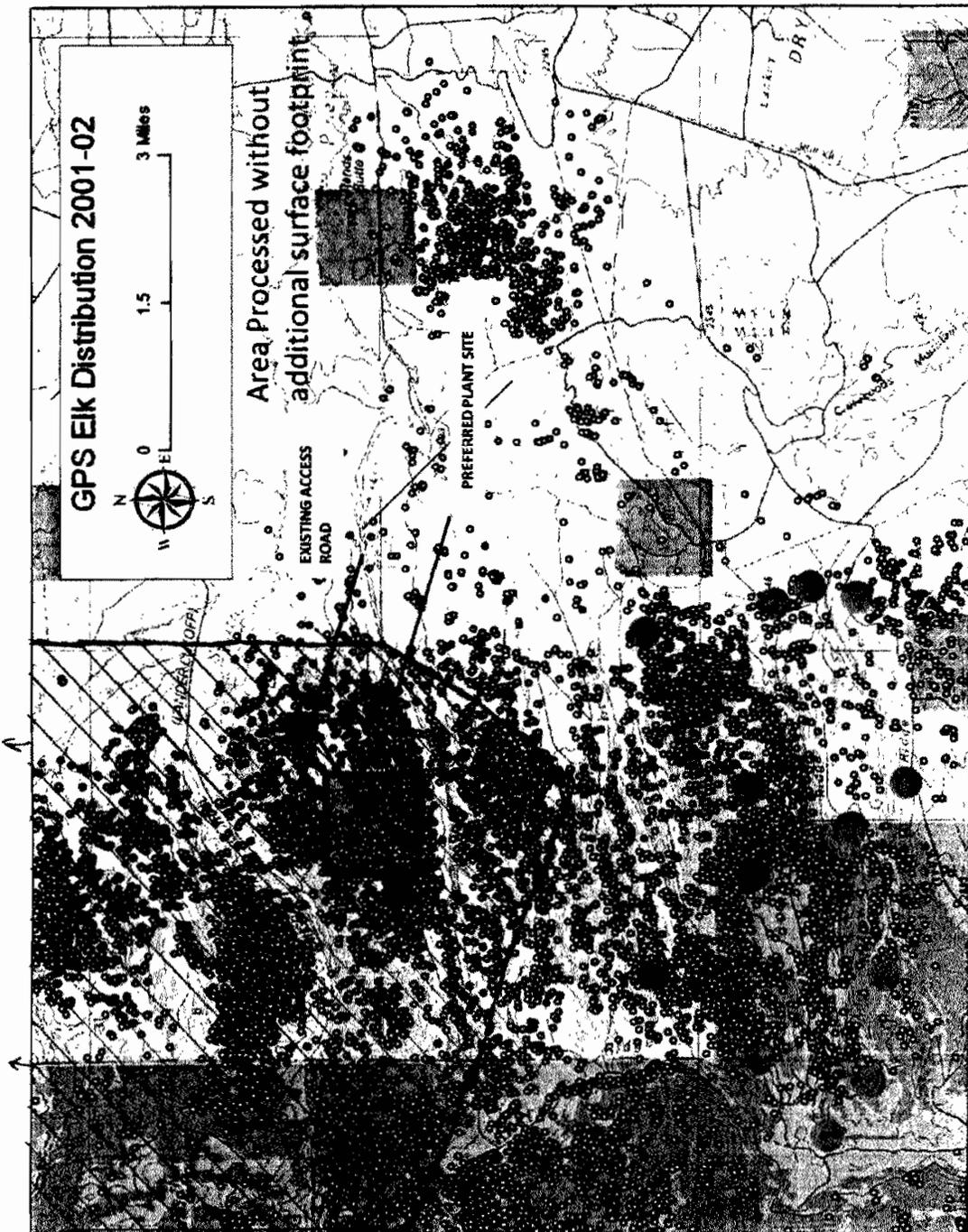


# Rands Butte Siting Considerations ATTACHMENT B



## Legend

⊗ Helium Plant	■ MS Water Well	— Proposed Gas & Fiber Optic Line	□ Well Pad
⋮ PA Gas Well	• Active Well	— Proposed Gas, Electric & Fiber Optic Line	□ Substation
↑ Shutin Gas	+ Plugged & Abandoned Well	— Proposed Helium & Fiber Optic Line	Ownership
★ Meteorological Tower	≡ Existing Culvert	— Proposed Electric, Helium & Fiber Optic Line	⋯ BLM
⊕ Water Injection Well	▲ Existing Cattle Guard	— Proposed Electric, Gas, Helium & Fiber Optic Line	⋯ Forest Serv
⊕ CBM Water Well	▲ Existing Cattle Guard & Gate	⋯ Proposed Electric & Fiber Optic Line	□ State
⊕ Domestic Water Well	— Proposed Electric	— Existing Williams' Pipeline	□ Private
⊕ Stock/Domestic Water Well	— Proposed Electric, Water & Fiber Optic Line	— Existing Improved Road	⊕ Riley Ridge
⊕ Stock Water Well	— Proposed Gas, Electric, Water & Fiber Optic Line	▨ Pending Final Design and Alignment	





## WYOMING GAME AND FISH DEPARTMENT

5400 Bishop Blvd. Cheyenne, WY 82006

Phone: (307) 777-4600 Fax: (307) 777-4610

Web site: <http://gf.state.wy.us>

**GOVERNOR**  
DAVE FREUDENTHAL  
**DIRECTOR**  
TERRY CLEVELAND  
**COMMISSIONERS**  
RON LOVERCHECK - President  
BILL WILLIAMS, DVM - Vice President  
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CLARK ALLAN  
JERRY GALLES  
CLIFFORD KIRK  
KERRY POWERS

March 17, 2008

WER 11757  
Office of State Lands and Investments  
Cimarex Riley Ridge Project  
(AKA Rand's Butte Project)  
Sublette County

Mr. Jim Arnold  
Real Estate Management - Assistant Director  
Office of State Lands and Investments  
Herschler Building, 3rd West  
122 West 25th Street  
Cheyenne, Wyoming 82002-0600

Dear Mr. Arnold:

Cimarex Energy Company proposes to construct a 200 MMSCFD capacity Gas Processing and Carbon Sequestration Plant on a State Land parcel (Section 16, T29N, R114W) in Sublette County. Wyoming Game and Fish Department (WGFD) have identified this location as important winter wildlife habitat for elk and moose. This area, known as Riley Ridge, includes crucial winter range for the largest wintering elk herd in Sublette County.

Cimarex expects the plant construction to take 12 months. Once complete, the plant will operate year-round, including during winter when access to and activity at the proposed plant location would be expected to result in considerable disturbance to the elk.

WGFD data indicate elk concentrate on this State section during winter months. Typically, free-ranging elk will avoid winter habitats where human disturbance occurs. The Riley Ridge area provides native elk winter range for approximately 150-200 elk, or about 40% of all elk in the Piney Elk Herd that winter on native ranges along the Wyoming Range Front. There are no other native elk winter ranges remaining outside of the Riley Ridge area that provide the vital requirements of security, freedom from human disturbance, and natural forage to support this number of elk each winter. Thus, we expect significant impacts to the elk if they cannot access this area.

WGFD has been working with Cimarex to identify an alternate location for the plant. To avoid the expected impacts to elk, WGFD recommends the plant location be moved approximately two miles southeast of the currently proposed location. We have also visited with the BLM to discuss other resource issues for the alternate location, and plan to continue working with Cimarex and the BLM to identify an appropriate alternate location.

Mr. Jim Arnold  
March 17, 2008  
WER 11756 – Page 2

WGFD appreciates the benefit of carbon sequestration, but we would certainly like to avoid impacting crucial elk habitat function on this particular location. We ask that you consider these impacts and the decreased habitat value for the elk when assessing this proposal. We would be happy to take part in any discussions with you and Cimarex regarding possible alternate locations for this project.

Thank you for the opportunity to provide comments.

Sincerely,

  
By JOHN EMMERICH  
DEPUTY DIRECTOR

JE:VS

cc: Ryan Lance – Governor's Planning Office



## WYOMING GAME AND FISH DEPARTMENT

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RON LOVERCHECK  
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BILL WILLIAMS, DVM

May 21, 2008

WER 11757  
Office of State Lands and Investments  
Cimarex Riley Ridge Project  
Gas Plant proposal  
Sublette County

Jim Arnold  
Real Estate Management - Assistant Director  
Office of State Lands and Investments  
Herschler Building, 3rd West  
122 West 25th Street  
Cheyenne, Wyoming 82002-0600

Dear Mr. Arnold:

We understand that Cimarex Energy Company has submitted an application to construct a 200 MMSCFD capacity Gas Processing and Carbon Sequestration Plant on a State Land parcel (Section 16, T29N, R114W) in Sublette County.

This is located along the Wyoming Range Front, in the Riley Ridge area, and includes crucial winter range for the largest wintering elk herd in Sublette County (200+, or about 40% of the Piney Elk Herd Unit that winter on native range). Attached are maps from a University of Wyoming Cooperative Wildlife Unit master's project (2000-2002) that shows elk use on Section 16 and the surrounding area. Winter use is highest, and there is also spring use and likely some calving there as well.

Cimarex expects the plant construction to take 12 months. Once complete, the plant will operate year-round, including during winter when access to and activity at the proposed plant location would be expected to result in considerable disturbance and significant impact to the elk. Mitigation opportunities for the elk impacts are extremely limited and not considered a viable option.

We previously asked, in a letter dated March 17, 2008, that you consider these impacts and the decreased habitat value for the elk when assessing this proposal, and indicated that we were working with Cimarex to find a possible solution.

We have had additional discussions with Cimarex and have been unable to find a solution for the elk issue on the State section. We must continue to recommend that options for siting the plant in a less crucial habitat area be considered.

Jim Arnold  
May 21, 2008  
WER 11757 – Page 2

Toward that end, it is our understanding that Cimarex has an option to place the plant on the adjoining Section 10, which is private land. While this would still be on crucial winter range, it would be farther onto the periphery of the winter range. Our field biologists have indicated that the plant site for this location has less elk use and the elk impact there would be much less significant.

Given that option, it would certainly be our strong recommendation that the plant be located on the optional site and off State land.

Thank you for your consideration of this issue. We continue to be available for discussion.

Sincerely,

  
for TERRY CLEVELAND  
DIRECTOR

TC:VS

Attachments

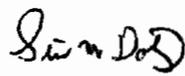
June 16, 2008

To Governor Dave Freudenthal and the Wyoming State Land Board,

I have lived within a few miles of the proposed Cimarex Energy Company's Madison Gas Development Project site for 25 years and I have some very pressing concerns about their proposal. The venting of poisonous gas during a mechanical malfunction and the release of hydrogen sulfide<sup>1</sup> into the air on a calm night would be totally devastating to everything in its path, as was demonstrated when the well at this location blew out during its original drilling (necessitating the evacuation of the local residents). Even if the escaping gas is burned, thus changing it to sulfur dioxide, the ramifications to my greenhouse operation, which earns over \$300,000 per year, could be a loss of approximately \$200,000. Sulfur dioxide, although not as poisonous to people, is highly toxic to tomato plants. In the event of a mandatory evacuation heating systems for my greenhouses would shut down resulting in an immediate freeze (during much of the year) of our entire 28,000 sq ft facility. This would result in not only the loss of plants, but also the freeze and rupture of the boiler and water system resulting in an additional \$100,000 worth of damage. Other agricultural losses in the area would be in the millions, and each agricultural operator would have to estimate their own values. I am sure the loss of wildlife can be estimated by Wyoming Game and Fish. Although a cash bond to cover possible damages resulting from the planned system might be acceptable for business losses, it would of course never be able to cover the loss of human life. All sour-gas processing facilities that I am aware of are always located in totally unpopulated areas, which would be a better option. Given the fact that there are approximately 35 winter residents, not including daytime employees, within approximately 6 miles and an unknown increase of this number in the summertime due to recreational activities, I feel this needs to be addressed in a satisfactory manner. Notification by telephone would be difficult and cell phone signal is pretty much nonexistent in much of the area. A sheriff's deputy dispatched from Big Piney would have a hard time locating a rancher who's working out on their property. The wind speed and direction in this area are consistently inconsistent. Water quality is also an extreme concern. Loss of quality water would of course be devastating to the agricultural community here.

This operation is not your average natural gas processing plant. It brings up highly toxic gas and attempts to re-inject it at extreme pressures through a system that has yet to be tested on such a scale. Residents who I have talked with in Big Piney range in opinion from "it shouldn't be built in the forest" to flatly saying that "we don't want it and we don't need it". Of the people with whom I've discussed this, the general opinion is that Sublette County has no more room for construction workers' housing or the desire to bring more jobs to an economy that is overwhelmed by workers at this point.

While it is true that the Cimarex plant is not being built in a major city, I feel people who have invested their lives in this valley should have the right not to be cast aside in the name of progress. Many of these people have lived here for generations. We have chosen to live here, and have survived the winters, the wind, and the droughts. Please don't think of us as disposable. We are an important part of Wyoming, its history, and its future.

  
Stewart M. Doty  
WYOMATOES  
PO Box 375  
Big Piney, WY 83113  
(307) 276-3057  
Wyomatoes@wyoming.com

<sup>1</sup> The toxicity levels of hydrogen sulfide can be found online at a site such as Wikipedia.



## Wyoming Outdoor Council

wyomingoutdoorcouncil.org

444 East 800 North  
Logan, UT 84321

t: 435 752.2111  
f: 435 753.7447

July 10, 2008

Mr. Jim Arnold  
Real Estate Management—Assistant Director  
Office of State Lands and Investments  
Herschler Building, 3<sup>rd</sup> West  
122 West 25<sup>th</sup> Street  
Cheyenne, WY 82002-0600

**Re: Cimarex Energy, Inc. Rands Butte Project Methane and Helium  
Recovery Facility**

Dear Mr. Arnold:

Please accept these comments from the Wyoming Outdoor Council regarding the above project, which is proposed in Sublette County (hereinafter we will refer to it as the “Cimarex Project”). This large industrial facility in the foothills of the Riley Ridge would recover methane and helium, at least partially from the approximately four new wells that would be drilled, and reinject gasses, apparently primarily carbon dioxide and toxic hydrogen sulfide, back into the ground. The project would be located in the Riley Ridge Federal Unit. The preferred location for this project from Cimarex’s standpoint is Site 16-D, which is located in T29N R114W Section 16.

This proposed site is problematic and should be rejected by the Office of State Lands and Investments because construction of the Cimarex Project on this location will be harmful to elk that winter in the area. In correspondence from the Wyoming Game and Fish Department (WGFD) to the land board, the WGFD stated that this area is critically important for wintering elk and moose, that access to the proposed plant site would “result in considerable disturbance to the elk,” and that about 40% of the elk in the Piney Elk Herd that winter on native ranges (a relatively rare situation in northwestern Wyoming) rely on this area. The WGFD stated, “There are no other native elk winter ranges remaining outside of the Riley Ridge area that provide the vital requirements of security, freedom from human disturbance, and natural forage to support this number of elk each winter. Thus, we expect significant impacts to the elk if they cannot access this area.” In addition to providing winter range for the elk herd, some calving also may occur there, and as the WGFD also stated, “Mitigation opportunities for the elk impacts are extremely limited and not considered a viable option.” Given these severe problems, we urge

the Office of State Lands and Investments to reject construction of the Cimarex Project on the proposed site.

We would also note that at least on federal lands in the Riley Ridge Unit, the BLM has not been permitting oil and gas development activities since a March 2005 Documentation of Land Use Plan Conformance and NEPA [National Environmental Policy Act] Adequacy, or DNA, found that the 1983 Riley Ridge Environmental Impact Statement was deficient in several regards. We have enclosed that DNA for your consideration. We especially note the concerns raised over the air quality analysis in this DNA. We feel this is a significant issue that must be addressed before the Cimarex Project is approved.

As the State knows, last winter the Wyoming Department of Environmental Quality (DEQ) was forced to issue five health advisories due to elevated ozone levels in the Pinedale area. Clearly air quality is a major concern in this area. If the Cimarex Project Plant will emit precursors to ozone formation such as volatile organic compounds and nitrogen oxides, the State must have assurance that this will not lead to or contribute to violation of air quality standards *before* this plant is approved by the land board, not after. At the June 5, 2008 Air Quality Advisory Board meeting in Casper, Air Division Administrator Dave Finley stated to the Board, "We are anticipating we are going to have a non-attainment area" in Sublette County. Because this area is nearing noncompliance with the National Ambient Air Quality Standard for ozone, the implications of that change in status are numerous and highly significant. Thus, the State Lands Board should ensure this issue is fully considered prior to permitting the Cimarex Project. Given the numerous other large industrial projects undergoing environmental analysis in this area—including the Pinedale Anticline infill on BLM land and the Plains Exploration and Development (PXP) project on the Bridger-Teton National Forest—there is likely little room for increased emissions of ozone precursors. In addition, Class I areas in this area (principally the Bridger Wilderness Area) must receive full protection of visibility under the provisions of the Clean Air Act, and both ozone and nitrogen oxide emissions are significant contributors to visibility problems.

Another significant concern with this project is that it will apparently be processing and/or producing large quantities of hydrogen sulfide, a very toxic gas. This seems to be driving many of the siting and other planning considerations for this project. For example, in the document before the board entitled "Board Matter D-14," Cimarex stated that "The primary and most critical consideration for all location reviews was employee and public health and safety and using the natural wind normally present." It seems apparent that this industrial site will be a dangerous place that the public must be protected from. If this is true, this raises grave questions in our view as to whether this project should be approved at all. Creating a public health hazard does not seem like good public policy to us. We know that much of the natural gas from the Riley Ridge area is "sour" (i.e., it contains hydrogen sulfide), but there is much "sweet" natural gas available in Wyoming, so there seems to be little need to pursue development of sour gas if doing so presents public health threats, or potentially does. We ask the Office of State Lands and Investments to fully consider this issue before approving this project.

Thank you for considering these comments, and please keep us apprised of the status of this project.

Sincerely,



Bruce Pendery

cc: Governor Dave Freudenthal  
Secretary of State Max Maxfield  
State Auditor Rita Meyer  
State Treasurer Joseph B. Meyer  
Superintendent of Public Instruction Dr. Jim McBride

## Documentation of Land Use Plan Conformance and NEPA Adequacy (DNA)

U.S. Department of the Interior Bureau of Land Management  
WY100-DNA05-107

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**Note:** This Worksheet is to be completed consistent with the policies stated in the Instruction Memorandum entitled, "Documentation of Land Use Plan Conformance and National Environmental Policy Act (NEPA) Adequacy" transmitting this Worksheet and the "Guidelines for using the DNA Worksheet," located at the end of the Worksheet.

### A. Describe the Proposed Action

### B. Land Use Plan (LUP) Conformance

LUP Name:\* Pinedale RMP Date Approved: 12/12/88  
Other document: Bridger-Teton NF Land and RMP Date Approved: 3/2/90  
Other document \_\_\_\_\_ Date Approved \_\_\_\_\_

\* List applicable LUPs (e.g., Resource Management Plans and activity, project, management, or program plans, or applicable amendments thereto)

The proposed action is in conformance with the applicable LUPs because it is specifically provided for in the following LUP decisions:

According to provisions held within the Pinedale RMP, the planning area will be open to consideration for exploration, leasing, and development for all leasable minerals, which include oil, gas, coal, shale, and geothermal steam.

The proposed action is in conformance with the LUP, even though it is not specifically provided for, because it is clearly consistent with the following LUP decisions (objectives, terms, and conditions):

### C. Identify applicable NEPA documents and other related documents that cover the proposed action.

List by name and date all applicable NEPA documents that cover the proposed action.

Riley Ridge Natural Gas Project Environmental Impact Statement, November 1983

Riley Ridge NGP Supplemental Environmental Assessment, Exxon LaBarge Project Well Field Changes, February 1985

Riley Ridge NGP Supplemental Environmental Assessment Exxon LaBarge Project Phase II, May 1985

Riley Ridge NGP Supplemental Environmental Assessment, Exxon LaBarge Project Waste Water Disposal, June 1985

List by name and date other documentation relevant to the proposed action (e.g., biological assessment, biological opinion, watershed assessment, allotment evaluation, and monitoring report).

Big Piney/La Barge Coordinated Activity Plan Environmental Assessment, August 1991  
Mobil Tip Top/Hogsback Unit Natural Gas Project, Big Piney/LaBarge Coordinated Activity Plan Area Environmental Assessment, March 1994  
Supplemental Information Report (SIR) Riley Ridge Natural Gas Project, August 2004  
Biological Evaluation to supplement SIR, July 2004  
Biological Assessment to supplement SIR, May 2004

#### D. NEPA Adequacy Criteria

1. Is the current proposed action substantially the same action (or is a part of that action) as previously analyzed? Is the current proposed action located at a site specifically analyzed in an existing document?

Documentation of answer and explanation:

Both the current proposal and the proposed action for the 1984 Riley Ridge EIS have a natural gas well development component. Beyond the fact that both would develop wells, the proposed actions vary substantially.

Within the Riley Ridge DEIS, major project actions and components included the following: (1) exploration, development and abandonment of a 159,928-acre, low-Btu gas well field projected to develop 238 Hydrogen Sulfide (H<sub>2</sub>S) sour gas wells; (2) construction, operation, maintenance, and abandonment of four sour gas treatment plants with a total processing capacity of 2.8 billion cubic feet per day (cf<sub>d</sub>) and a production threshold of 576 cf<sub>d</sub> of methane; (3) construction, operation, maintenance, and abandonment of associated rights-of-way for gathering lines, trunk lines, railroads, access roads, transmission lines, and other ancillary facilities; and (4) processing and transportation of products and by-products.

The proposed action as it relates to the Riley Ridge EIA, addresses sweet gas development as opposed to sour gas development of which have entirely different health, safety, and production requirements. The proposed action is consistent with the number of wells analyzed within the Riley Ridge EIS, but the spacing analyzed was approximately 1 well per 640 acres. The proposed action would significantly increase the density of well spacing previously analyzed. Development of a sweet gas natural gas field would also require the authorization of a new sweet gas pipeline corridor, requiring additional compression, which was not analyzed within the original Riley Ridge EIS.

In 1994, an Environmental Assessment was completed for Mobil Tip Top/Hogsback Unit Natural Gas Project which overlapped a portion of the Riley Ridge project area. While the analysis area for both of these documents overlap a portion of the Riley Ridge EIS area, neither document states or infers that they supplement, augment or otherwise modify or apply to the Riley Ridge EIS area.

2. Is the range of alternatives analyzed in the existing NEPA document(s) appropriate with

respect to the current proposed action, given current environmental concerns, interests, and resource values?

Documentation of answer and explanation:

NO—The range of alternatives analyzed within the 1984 Riley Ridge EIS focused on the placement/siting of four processing plants that would be needed to make the sour gas saleable. Other components of these alternatives included two methodologies addressing sulfur transport; three possible routes for power supply; the placement of man-camps which would provide employee housing; as well as the well field development of 238 H<sub>2</sub>S wells. A No Action alternative was also analyzed in the 1984 Riley Ridge EIS document. Several alternatives were considered but dropped from detailed analysis. These include: additional treatment plan siting scenarios and the use of multi-well directional drilling.

The current proposed action, given current environmental concerns, interests, and resource values was not addressed by any of the above referenced alternatives as written within the Riley Ridge document. On page 1-53 of the DEIS, an allowance for approximately 21 sweet gas wells per year was made and the impacts of said sweet gas wells was to have been included as part of the baseline conditions from which impacts could be measured. It was not carried forward in any of the subsequent decision documents. Some aspects of the proposed action, such as the processing of rights-of-ways actions, overall well pad design, road and pipeline placement would not change. However, alternatives which would have addressed tighter well spacing beyond the 1 well per 640 acres or the location of a new sweet gas pipeline corridor, were not included as part of the 1984 document. The current project would require no new employee housing, and power sources are already in existence. Because sweet gas is made saleable at the well site location, no new processing facilities would be required beyond in-situ production activities.

**3. Is the existing analysis valid in light of any new information or circumstances?**

Documentation of answer and explanation:

NO- Within the Pinedale Field Office, there are currently two areas, the Pinedale Anticline and the Jonah field, which have undergone rapid development. The Pinedale Anticline is currently piloting 20 acre-spaced wells and the Jonah Infill may be going to 5-10 acre-spaced wells. Because of the rapid rate of development, it is hypothesized that emissions of Nitrous Oxide (NO<sub>x</sub>) are beyond what has been analyzed in any existing documents for these areas, and may require new, additional monitoring to determine impacts on the adjacent Class I Bridger National Forest airshed and high-quality area lakes. Because of NO<sub>x</sub> concerns, additional air quality monitoring is in the foreseeable future. In particular, previous analysis of air quality within the Pinedale Field Office as a whole has classified drilling rigs as non-point sources but because of the sheer number of rigs operating at one time, they may need to be addressed as a point source. Existing air quality analysis within the Riley Ridge document concentrated on emissions of SO<sub>2</sub> and H<sub>2</sub>S, not NO<sub>x</sub>.

Additionally, several species became eligible for listing under the Endangered Species Act following the implementation of the Riley Ridge decision document. The Riley Ridge document

has not been updated with new analyses addressing impacts to the Threatened and/or Endangered Species. The T&E species of concern include: the Grizzly Bear (*Ursus arctos horribilis*), Gray Wolf (*Canis lupus*), and Canada lynx (*Lynx Canadensis*). Also not included in the original evaluation were probable water depletions in the Colorado River System and impacts to threatened and/or endangered aquatic species. These include: the Bonytail chub (*Gila elegans*), Colorado pikeminnow (*Ptychocheilus lucius*), Humpback chub (*Gila cypha*, and Razorback sucker (*Xyrauchen texanus*). Water depletions could also affect the native, pure strain Cutthroat trout for which an upper watershed area was designated as an Area of Critical Environmental Concern after the Riley Ridge document.

Impacts to a BLM sensitive species, the greater sage-grouse, have not been addressed within the Riley Ridge documents.

Because the CAP EA addressed concerns under an 80-acre spacing scenario, analyses are valid but the cumulative impacts have not been addressed to the full extent required under a 40-acre spacing scenario. In addition, the above-listed Threatened and/or Endangered Species, and the sensitive greater sage-grouse, were accounted for in the CAP analyses, but possible impacts to Canada lynx or their habitat, was not.

**4. Do the methodology and analytical approach used in the existing NEPA document(s) continue to be appropriate for the current proposed action?**

Documentation of answer and explanation:

NO- The EIS for the Riley Ridge Natural Gas Project was completed 21 years ago (January 84) and several significant issues have arisen since. The methodology and analytical approach employed are still valid and applicable to some but not all elements of the current proposed action. Some significant issues identified during public scoping of the original project as well as new issues that have surfaced/re-surfaced. In recent discussions between Forest Service and BLM personnel, it has become apparent that new circumstances as well as current conditions and potential impacts warrant additional analysis. These issues include but are not limited to 1) air quality, 2) Threatened and Endangered Species, 3) Cumulative Impacts due to proposed tighter spacing of well sites as well as proposed pipelines that were not analyzed, 4) sour gas wells vs. conventional gas wells

The air quality methodology used in the 1984 analysis is considered archaic to air quality modeling procedures and techniques used today. Industry analysis completed in 1999 adjusted qualitatively to a current 2004 figure shows actual impacts are in excess of those analyzed and approved in the original Pinedale Anticline EIS. NOx levels adjusted from the 1999 analysis indicate we are above the threshold or additional cumulative Air Quality impact analysis in the original Pinedale Anticline EIS. This is without taking into account emissions from the Jonah field and the Riley Ridge Natural Gas Project and how they will affect current conditions related to NOx emission levels in the upper Green River Basin at this time.

Since 1984 new Threatened and/or Endangered Species have been listed that were not analyzed nor were they included in a biological assessment to determine if the proposed project will affect the species. Some of these species include the Grizzly Bear (*Ursus arctos horribilis*), Gray Wolf (*Canis lupus*), Canada lynx (*Lynx Canadensis*). Also not included in the original evaluation was

the possibility of water depletions in the Colorado River System and the impacts to threatened and endangered species (Bonetail chub (Gila elegans), Colorado pikeminnow (Ptychocheilus lucius), Humpback chub (Gila cypha, and Razorback sucker (Xyrauchen texanus)) inhabiting the downstream reaches.

Current and planned spacing density vs. the 1 well per section that was analyzed, as well as sour gas wells vs. conventional wells with pipelines that were not analyzed, raises concerns regarding surface placement and the quantity of new surface disturbance, dust and habitat fragmentation. This tighter spacing as well as the proposing of conventional wells and pipelines requires that the Effected Environment be further analyzed to determine the effect on Wildlife and Fisheries, Water Resources, Air Quality, Soils and Vegetation, Visual Resources, Cultural Resources, Recreation Resources, Grazing, Timber and Transportation Networks.

**5. Are the direct and indirect impacts of the current proposed action substantially unchanged from those identified in the existing NEPA document(s)? Does the existing NEPA document analyze site-specific impacts related to the current proposed action?**

Documentation of answer and explanation:

NO- While many of the direct and indirect impacts identified in the existing Riley Ridge EIS would remain substantially unchanged with the current proposed action there will be some elements of the current proposed action that would substantially change direct and indirect impacts that were identified in the existing NEPA document. The proposed planned and current spacing density and addition of pipelines would result in additional surface disturbance. This tighter spacing and new surface disturbance would increase human activity levels, erosion and sedimentation, air quality impacts, habitat fragmentation, as well as possibly affecting newly listed T&E Species and impacting visual resources, among other elements identified in the existing NEPA. The existing NEPA document does not analyze site specific impacts related to the current proposed action as spacing density was analyzed at 1 well per section and the new proposed pipeline was not analyzed. Current and proposed spacing density is greater than 1 well per section. Multiwell Directional Drilling was an alternative considered in the original Riley Ridge EIS but eliminated from further analysis.

**6. Are the cumulative impacts that would result from implementation of the current proposed action substantially unchanged from those analyzed in the existing NEPA document(s)?**

Documentation of answer and explanation:

NO-Two additional natural gas projects are proposed in this area, one is the Jonah Infill project which proposes up to 3100 additional well on 5 to 10 acre spacing within the Jonah Field. The other is the South Piney Coalbed Methane project which is proposing up to 210 wells. The cumulative impacts from these proposed projects in conjunction with the current proposed activities in the Riley Ridge area would not be the same as those described in the initial EIS for the Riley Ridge Natural Gas Project.

The air quality methodology used in the 1984 analysis is considered archaic to air quality modeling procedures and techniques used today. Industry analysis completed in 1999 adjusted

qualitatively to a current 2004 figure shows actual impacts are in excess of those analyzed and approved in the original Pinedale Anticline EIS. NOx levels adjusted from the 1999 analysis indicate we are above the threshold for additional cumulative Air Quality impact analysis in the original Pinedale Anticline EIS. This is without taking into account emissions from the Jonah field and the Riley Ridge Natural Gas Project and how they will affect current conditions related to NOx emission levels in the upper Green River Basin at this time.

**7. Are the public involvement and interagency review associated with existing NEPA document(s) adequate for the current proposed action?**

Documentation of answer and explanation:

Public involvement including interagency review for Riley Ridge Natural Gas Project EIS occurred during the preparation of the November 1983 EIS and January 1984 Record of Decision and then again for the Supplemental EA for the Riley Ridge Project in February 1985. New circumstances (outlined above #4) as well as current conditions and potential impacts require new public involvement and interagency review to some but not all elements of the current proposed action.

**E. Interdisciplinary Analysis:** Identify those team members conducting or participating in the NEPA analysis and preparation of this worksheet. (See attached specialist input sheets)

David Geer  
Merry Gamper  
Bill Lanning  
Lisa Solberg  
Steve Laster  
Carol Kruse

Natural Resource Specialist  
Natural Resource Specialist  
Supervisory Natural Resource Specialist  
Wildlife Biologist  
Rangeland Management Specialist  
Planning & Environmental Coordinator

### **Conclusion**

- Based on the review documented above, I conclude that this proposal conforms to the applicable land use plan and that the NEPA documentation fully covers the proposed action and constitutes BLM's compliance with the requirements of NEPA

Note: If you found that one or more of these criteria is not met, you will not be able to check this box.

Based on the preceding evaluation, we found the 1984 Riley Ridge EIS to be deficient in several categories. Therefore to implement additional actions under the umbrella of this EIS supplemental NEPA analysis is needed.

NEPA options available include: 1) Individual EA's for individual APD's, 2) Programmatic EA to supplement the EIS, 3) Supplemental EIS, 4) New stand alone EIS.

Individual EA/APD: This would not be practical because it would not be expedient or realistic to prepare comprehensive air quality/emissions cumulative impact analysis for each and every

APD and to do less than a comprehensive analysis would result in piecemeal effects.

Programmatic EA: Air quality impacts would likely be significant, consequently a FONSI could not be achieved. Additionally USFS EA process is essentially the same as the EIS process in terms of public comment periods and overall processing time.

Supplemental EIS: This would be the recommended option. It will allow the specific deficiencies to be corrected without re-creating those EIS sections that are still viable and applicable to the current proposed actions.

New EIS: This is not recommended because it would duplicate/re-create portions of the existing EIS that are still viable and applicable to current proposed actions.

/s/ Priscilla E. Meham

Signature of the Responsible Official

March 3, 2005

Date

Note: The signed Conclusion on this Worksheet is part of an interim step in the BLM's internal decision process and does not constitute an appealable decision.

**From:** Jim Arnold  
**To:** Fresquez, Lorraine  
**Date:** 8/1/2008 9:11 AM  
**Subject:** Fwd: Cimarex Plant

>>> "Tim Thompson" <[crosslazytwo@wildblue.net](mailto:crosslazytwo@wildblue.net)> 7/20/2008 7:58 PM >>>  
To: State Land and Investments, Director Lynn Boomgaarden, Assistant Director Jim Arnold, State Loan and Investment Board, Chairman, Governor Dave Freudenthal, Secretary of State Max Maxfeld, State Auditor Rita Meyer, State Treasure Joseph Meyer, Superintendent of Public Instruction Dr. Jim McBride.

I would like to voice my concerns and comments pertaining to the Cimarex Energy Co. Application for a helium processing plant and the infrastructure associated with this plant located in a state school section in the Riley ridge area on the Southern end of the Wyoming range. The approval of this application will have numerous effects to large tracts of land outside the permit area which is home to many types of wildlife along with permitted livestock allotments both state and federal along with, private lands. Inevitable complications to a herd of elk, local livestock producers their lifestyle and the risk of losing grazing allotments and permits.

A brief history begins with a small group of elk staying in this area from late fall through winter and into spring seasons in the early 1980's with numbers around 15-25 head growing to over 300 head to date. The past 25 plus years this herd has remained in this same area through fall, winter, spring and summer, thriving and prospering with minimal oil and gas impacts, the siege of the wolf reintroduction, state regulated hunting seasons, and forage competition from agriculture users such as myself throughout their entire natural range and existence. In this area and time frame this particular herd has caused minimal cost to local agriculture producers our ranch in particular in lost forage and fence damage, again minimal, and to the people and the State of Wyoming 0 \$ cost for what is and should be looked at as an indigenous herd, a hidden gem competing against nature, some unnatural nature, industry, agriculture, and government making this herd prime for study and documentation.

Concerns for impacts caused from the dispersal of this elk herd has a serious brucellosis alert and a much higher contact opportunity than already exists with our operation that borders this project area and lies with in the improved roads, pipe- lines, and power line easements to be constructed, along with the traffic and man power to operate such a project. Historically our cow calf operation has of late professionally brucellosis tested our herd each fall for the voluntary State of Wyoming test results and personal knowledge. The managers of this particular elk herd have no documentation relating to there health status, or the extent of their entire range. Through several phone conversations mitigation was never directly addressed towards local livestock producers with the concerns of elk/ cattle contact, exposure, and competition seemed a non issue or concern of the Wyoming Game and Fish or Cimarex Energy personal. This is a real issue and concern to our operation and adjacent allotment and permit users as well as private land owners.

Meetings have taken place between Wyoming Game and Fish and Cimarex Energy Co. to discuss various mitigation plans along with dollar amounts for potential problems, conflicts, and managements plans for winter feeding, habitat improvement, studies of migratory patterns and health documentation. Our ranches private ground, state grazing leases, BLM allotments of summer range lies within and next to this herd natural range. This exposes our

family owned and operated of 106 years federal and state permits for grazing first in line for reduction or cancellation as steps to these mitigation plans are implemented with no input from agriculture / livestock producers in the immediate area.

The boards decision towards this permit should be put on hold to allow state agencies, and the energy company along with interested land owners, and permit holders the proper time and professional opportunity to document the full extent of this particular herds range, patterns, routes, tendencies, along with a complete health status report for the better understanding of how and why this area has allowed this particular herd to survived and produce the healthy numbers that have remained obscure to so many for so long, posing such controversies and alarms to the numbers of different entities involved directly or indirectly. A moratorium of this permit will not only allow the full understanding of this herd it will allow the needed time to look at the protection and preservation of the cutthroat trout in the Spring and Beaver creeks drainage, the historically safe and healthy preservation of the livestock and other wildlife, maintaining existing allotment size and permit numbers for agriculture, and the paramount importance of safety practices, secure methods and procedures to drilling , the production procedure along with the handling and transporting of H2s sour gas in the weather conditions and prevailing wind factors in the area directly up wind of us with concerns .

Sincerely Yours,

Timothy S Thompson  
President. Cross Lazy Two L & L  
PO Bx 220  
Big Piney, Wyo 83113  
307 276 3660  
[crosslazytwo@wildblue.net](mailto:crosslazytwo@wildblue.net)

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**Appendix C**  
**Wyoming Department of Environmental Quality**  
**Air Quality Permit**

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DEPARTMENT OF ENVIRONMENTAL QUALITY  
AIR QUALITY DIVISION  
122 WEST 25TH STREET  
HERSCHLER BUILDING  
CHEYENNE, WY 82002

FAX TRANSMITTAL COVER SHEET

No. of Pages: 22 (Cover Sheet Included)

DATE: 6/19/09

TO: Cimarex Energy

PHONE NO.: 918-295-1632 FAX NO.: 918-699-5795

FROM: DEQ/AOD PHONE NO.: 307-777-7340

COMMENTS: We will be mailing out the original  
signed copies in the mail

Thanks!!

Kim

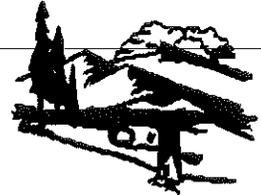
**IF YOU DID NOT RECEIVE ALL OF THE PAGES, PLEASE NOTIFY THE SENDER AS SOON AS POSSIBLE.**

OFFICE NO. (307) 777-7391

FAX NO. (307) 777-5616



# Department of Environmental Quality



To protect, conserve and enhance the quality of Wyoming's environment for the benefit of current and future generations.

Dave Freudenthal, Governor

John Corra, Director

June 18, 2009

Mr. Clay Duellman  
Special Project Manager  
Cimarex Energy Company  
15 East 5th Street, Suite 1000  
Tulsa, OK 74103

Re: Air Quality Permit CT-8093  
Cimarex Energy Company  
Permit Application AP-8093

Dear Mr. Duellman:

Enclosed is a copy of the air quality permit referenced above to construct the Riley Ridge Plant for methane and helium recovery. The facility will be capable of processing 200 MMscfd of gas produced from wells comprised primarily of carbon dioxide (CO<sub>2</sub>), nitrogen (N<sub>2</sub>), methane (CH<sub>4</sub>), helium (He), and hydrogen sulfide (H<sub>2</sub>S). Nearly all of the CO<sub>2</sub> and H<sub>2</sub>S will be extracted and injected back into the producing reservoir, the nitrogen will be extracted and vented to the atmosphere, and the helium and methane will be recovered and sold. Facility equipment will include a heat medium heater, electrical compression, propane refrigerant, a diesel or propane fired auxiliary electrical generator and an emergency flare. The Riley Ridge Plant is located in Section 16, T29N, R114W, approximately sixteen (16) miles west-southwest of Big Piney, in Sublette County, Wyoming.

Comments received during the public comment period and hearing were considered in the final permit. A copy of the decision document for this permit is included. A new condition has been added and proposed conditions have been modified in the final permit. Below is a summary of the changes.

- Condition 23 (new) establishing a VOC limit for fugitive emissions.
- Condition 25 (revised) changed to the submittal of the annual emissions inventory from January 31 to March 1 of each year.
- Condition 30 (new) to comply with applicable requirements of 40 CFR part 63, Subpart ZZZZ.
- Condition 32 (revised) to include a notification within 15 days of replacement of the Tier 0 engine.
- Condition 33 (revised) to indicate the equipment to be replaced at the respective facilities and permits which are to be modified prior to startup of the Riley Ridge Plant. The Division has also included a requirement for notification of replacement of the respective equipment at each facility within 15 days of replacement.

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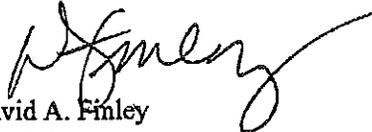
ADMIN/OUTREACH (307) 777-7937 FAX 777-3610	ABANDONED MINES (307) 777-6145 FAX 777-6462	AIR QUALITY (307) 777-7391 FAX 777-5616	INDUSTRIAL SITING (307) 777-7369 FAX 777-5973	LAND QUALITY (307) 777-7756 FAX 777-5864	SOLID & HAZ. WASTE (307) 777-7752 FAX 777-5973	WATER QUALITY (307) 777-7781 FAX 777-5973
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**Air Quality Permit CT-8093  
Cimarex Energy Company  
Response to Comments  
Page 2**

If we may be of further assistance to you, please feel free to contact this office.

Sincerely,



David A. Finley  
Administrator  
Air Quality Division

cc: Tony Hoyt

Enclosures



# Department of Environmental Quality



To protect, conserve and enhance the quality of Wyoming's environment for the benefit of current and future generations.

Dave Freudenthal, Governor

John Corra, Director

June 18, 2009

Mr. Clay Duellman  
Special Project Manager  
Cimarex Energy Company  
15 East 5th Street, Suite 1000  
Tulsa, OK 74103

Permit No. CT-8093

Dear Mr. Duellman:

The Division of Air Quality of the Wyoming Department of Environmental Quality has completed final review of Cimarex Energy Company's application to construct the Riley Ridge Plant for methane and helium recovery. The facility will be capable of processing 200 MMscfd of gas produced from wells comprised primarily of carbon dioxide (CO<sub>2</sub>), nitrogen (N<sub>2</sub>), methane (CH<sub>4</sub>), helium (He), and hydrogen sulfide (H<sub>2</sub>S). Nearly all of the CO<sub>2</sub> and H<sub>2</sub>S will be extracted and injected back into the producing reservoir, the nitrogen will be extracted and vented to the atmosphere, and the helium and methane will be recovered and sold. Facility equipment will include a heat medium heater, electrical compression, propane refrigerant, a diesel or propane fired auxiliary electrical generator and an emergency flare. The Riley Ridge Plant is located in Section 16, T29N, R114W, approximately sixteen (16) miles west-southwest of Big Piney, in Sublette County, Wyoming.

Following this agency's proposed approval of the request as published April 16, 2009 and in accordance with Chapter 6, Section 2(m) of the Wyoming Air Quality Standards and Regulations, the public was afforded a 30-day period in which to submit comments concerning the proposed new source, and a public hearing was held May 18, 2009. Public comments were received and have been considered in the final permit. Therefore, on the basis of the information provided to us, approval to construct the Riley Ridge Plant as described in the application is hereby granted pursuant to Chapter 6, Section 2 of the regulations with the following conditions:

1. That authorized representatives of the Division of Air Quality be given permission to enter and inspect any property, premise or place on or at which an air pollution source is located or is being constructed or installed for the purpose of investigating actual or potential sources of air pollution and for determining compliance or non-compliance with any rules, standards, permits or orders.
2. That all substantive commitments and descriptions set forth in the application for this permit, unless superseded by a specific condition of this permit, are incorporated herein by this reference and are enforceable as conditions of this permit.
3. That a permit to operate in accordance with Chapter 6, Section 2(a)(iii) of the WAQSR is required after a 120-day start-up period in order to operate this facility.
4. That all notifications, reports and correspondences associated with this permit shall be submitted to the Stationary Source Compliance Program Manager, Air Quality Division, 122 West 25<sup>th</sup> Street, Cheyenne, WY 82002 and a copy shall be submitted to the District Engineer, Air Quality Division, 510 Meadowview Drive, Lander, WY 82520.

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ADMIN/OUTREACH (307) 777-7937 FAX 777-3610	ABANDONED MINES (307) 777-6145 FAX 777-6462	AIR QUALITY (307) 777-7391 FAX 777-5616	INDUSTRIAL SITING (307) 777-7369 FAX 777-5973	LAND QUALITY (307) 777-7756 FAX 777-5864	SOLID & HAZ. WASTE (307) 777-7752 FAX 777-5973	WATER QUALITY (307) 777-7781 FAX 777-5973
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**Cimarex Energy Company  
Air Quality Permit CT-S093  
Page 2**

5. That written notification of the anticipated date of initial start-up, in accordance with Chapter 6, Section 2(i) of the WAQSR, is required not more than 60 days or less than 30 days prior to such date. Notification of the actual date of start-up is required within 15 days after start-up.
6. That the date of commencement of construction shall be reported to the Administrator within 30 days of commencement. In accordance with Chapter 6, Section 2(h) of the WAQSR, approval to construct or modify shall become invalid if construction is not commenced within 24 months after receipt of such approval or if construction is discontinued for a period of 24 months or more. The Administrator may extend the period based on satisfactory justification of the requested extension.
7. That performance tests be conducted, in accordance with Chapter 6, Section 2(j) of the WAQSR, within 30 days of achieving a maximum design rate but not later than 90 days following initial start-up, and a written report of the results be submitted. The operator shall provide 15 days prior notice of the test date. If a maximum design rate is not achieved within 90 days of start-up, the Administrator may require testing be done at the rate achieved and again when a maximum rate is achieved.
8. Initial performance tests, as required by Condition 7 of this permit, shall be conducted on the following source:

i. Heat Medium Heater:

NO<sub>x</sub>, CO, and VOC Emissions: Testing shall consist of three (3) 1-hour tests following EPA Reference Methods 1-4, 7E, 10, and 25.

A test protocol shall be submitted to this office for review and approval prior to testing. Notification of the test date shall be provided to the Division fifteen (15) days prior to testing. Results shall be submitted to this Division within 45 days of completion.

9. That emissions from the Heat Medium Heater shall be limited to the following:

Pollutant	lb/MMBtu	lb/hr	tpy
NO <sub>x</sub>	0.03	2.7	7.9
CO	0.08	7.5	22.3
VOC	0.0055	0.5	1.5

10. That the Heat Medium Heater shall be limited to 583.1 MMscf/year of fuel usage. Cimarex Energy Company shall install, maintain, and operate a fuel meter(s) with a continuous recording device(s) on the Heat Medium Heater. The fuel meter(s) and recording device(s) shall be maintained per manufacturer's specifications. Cimarex Energy Company shall keep and maintain records of the fuel usage of the Heat Medium Heater.

Cimarex Energy Company  
Air Quality Permit CT-8093  
Page 3

11. That Cimarex Energy Company shall follow the testing requirements as follows for the Heat Medium Heater:
- a. Annually, the Heat Medium Heater shall be tested to verify compliance with the NO<sub>x</sub> and CO limits set forth in this permit. The first annual tests are required the following calendar year after completion of the initial performance tests. Testing shall be conducted using EPA Reference Methods or a portable analyzer, following the State of Wyoming's Portable Analyzer Protocol. Notification of the test date shall be provided to the Division fifteen (15) days prior to testing. A written report of the results is to be submitted to the Division within 45 days of completion.
  - b. The Air Quality Division shall be notified within 24-hours of the heat medium heater where the testing/monitoring required by (a) of this condition shows operation outside the permitted emission limits. By no later than seven (7) calendar days of such testing/monitoring event, the owner or operator shall repair and retest/monitor the affected heater to demonstrate that the heater has been returned to operation within the permitted emission limits. Compliance with this permit condition regarding repair and retesting/monitoring shall not be deemed to limit the authority of the Air Quality Division to cite the owner or operator for an exceedance of the permitted emission limits for any testing/monitoring required by (a) of this condition which shows noncompliance.
12. That the emergency generator engine for the Riley Ridge Plant shall be less than or equal to 800 horsepower and limited to the following:
- a. Tier II certified diesel engine ( $\geq$ 750 hp)
  - b. Tier III certified diesel engine (<750 hp)
  - c. Propane fired engine equipped with an air fuel ratio controller and a NSCR catalyst

Cimarex Energy Company shall notify the Division of the engine type installed for the emergency generator within fifteen (15) days of installation. Such notification shall be submitted on a complete Engine Installation/Removal form. The form can be downloaded from the Air Quality website <http://deq.state.wy.us/aqd> or obtained from the Air Quality Division.

13. Cimarex Energy Company shall maintain documentation that the emergency generator engine is Tier II certified if a diesel fired unit greater than or equal to 750 horsepower is installed. If a diesel fired unit less than 750 horsepower is installed Cimarex Energy Company shall maintain documentation that the emergency generator engine is Tier III certified.

**Cimarex Energy Company**  
**Air Quality Permit CT-8093**  
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14. That the propane generator shall be limited to the horsepower and g/hp-hr limits in the table. Emission limits for NO<sub>x</sub>, CO, and VOCs on a pound per hour basis are established based on the g/hp-hr limits and the engine information submitted in the Engine Installation/Removal form required by Condition 12 of this permit. Compliance with the g/hp-hr limit is presumed to demonstrate compliance with the lb/hr limit as long as the engine is operated within the horsepower reported in the Engine Installation/Removal form.

hp	NO <sub>x</sub> g/hp-hr	CO g/hp-hr	VOC g/hp-hr
Max. 800	1.0	2.0	0.7

15. The emergency generator engine installed under Condition 12 shall be limited to 100 hours of operation per year. Cimarex Energy Company shall install and maintain an hour meter on the engine to demonstrate compliance with the hours limit in this condition. A record of hours of operation for the generator shall be maintained for a period of at least five (5) years and shall be made available to the Division upon request.
16. That for the emergency generator engine installed under Condition 12, Cimarex Energy Company shall operate and maintain the engine, air pollution control equipment, and monitoring equipment according to good air pollution control practices at all times, including startup, shutdown, and malfunction. Records of any maintenance or corrective actions shall be kept and maintained for a period of five (5) years and shall be made available to the Division upon request.
17. That H<sub>2</sub>S emissions during power failures or upset conditions shall be controlled by the emergency flare.
18. Cimarex Energy Company shall keep and maintain records of flaring events at the Riley Ridge Plant. These records shall include:
- a. flaring events associated with malfunctions, maintenance, and/or adjustments of the compression equipment
  - b. the duration of flaring events
  - c. the amount of gas flared during the event
  - d. the reason for the flaring event
19. Cimarex Energy Company shall maintain and operate the emergency flare during all period of active operation such that the controls remain effective as viable emission control device.
20. The emergency flare shall be designed, constructed, operated and maintained to be smokeless per Chapter 3, Section 6 (b)(i) of the WAQSR, with no visible emissions except for periods not to exceed a total of five (5) minutes during any two (2) consecutive hours as determined by 40 CFR, part 60, appendix A, Method 22.
21. The presence of the emergency flare pilot flame shall be monitored using a thermocouple and continuous recording device or any other equivalent device to detect and record the presence of the flame. Records shall be maintained noting periods during active operation when the pilot flame is not present.

Cimarex Energy Company  
Air Quality Permit CT-8093  
Page 5

22. Emission control equipment, all vent lines, connections, fittings, valves, relief valves, hatches or any other appurtenance employed to contain and collect vapors and transport them to the emission control system or device, shall be maintained and operated during any time the facility is operating such that the emissions are controlled at all times. Records shall be maintained noting dates and durations of times during such operation when any control system or device or the associated containment and collection equipment is not functioning to control emissions as required by this permit.
23. That fugitive VOC emissions shall be limited to 12.2 tpy from the Riley Ridge Plant.
24. Cimarex Energy Company shall utilize a LDAR program in accordance with 40 CFR part 60, subpart VVa. Monitoring under the LDAR program shall be conducted a minimum of every six (6) months. Records of monitoring and repair measures shall be kept for a period of at least 5 years and shall be made available to the Division upon request.
25. Cimarex Energy Company shall submit by March 1 of each calendar year a report on actual VOC, NO<sub>x</sub> and SO<sub>2</sub> emissions for the facility for the previous year. This report shall include the following:
  1. Fugitive: VOC emissions shall be calculated using the methodology in the permit application, and the average measured leak detection rates for the past calendar year.
    - a. Total fugitive VOC emissions for the facility in tons per year
    - b. Average leak detection rate by equipment in ppm (equipment as defined in 40 CFR part 60, subpart VVa)
    - c. Documentation of fugitive VOC emission calculations
  2. Heat Medium Heater: VOC and NO<sub>x</sub> emissions shall be calculated based on actual fuel usage (MMBtu/yr) and the annual test results (lb/MMBtu)
    - a. Total VOC and NO<sub>x</sub> emissions in tons per year
    - b. Actual fuel usage MMSCF/yr
    - c. Average Heat Content
  3. Flare: SO<sub>2</sub> emissions calculated based on the amount of gas flared and the average H<sub>2</sub>S Content
    - a. Total SO<sub>2</sub> emissions in tons per year
    - b. Summary of information required by Condition 18 of this permit
26. Cimarex Energy Company shall comply with the applicable requirements of 40 CFR part 60, subpart Dc for the Heat Medium Heater.
27. Cimarex Energy Company shall comply with the applicable requirements of 40 CFR part 60, subpart IIII for the emergency generator engine.
28. Cimarex Energy Company shall comply with the applicable requirements of 40 CFR part 60, subpart JJJJ for the emergency generator engine.
29. Cimarex Energy Company shall comply with the applicable requirements of 40 CFR part 60, subpart Kb for the methanol storage tank.

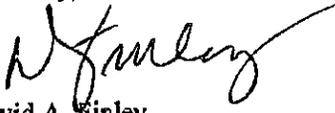
Cimarex Energy Company  
Air Quality Permit CT-8093  
Page 6

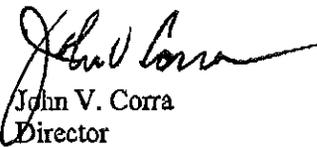
30. Cimarex Energy Company shall comply with the applicable requirements of 40 CFR part 63, subpart ZZZZ for the emergency generator engine.
31. That all records required by this permit shall be kept for a period of at least 5 years and shall be made available to the Division upon request.
32. That Cimarex Energy Company shall replace the Caterpillar 3408 Tier 0 (SN 4999) engine owned by Teletactors Incorporated with a Caterpillar 3408 Tier 3 engine. The engine replacement and Teletactors Incorporated air quality permit CT-4401 shall be modified to reflect the engine replacement prior to startup notification, under Condition 5 of this permit, for the Riley Ridge Plant. Cimarex Energy Company shall provide notification within 15 days of replacement of the Caterpillar 3408 Tier 0 (SN 4999) engine.
33. That Cimarex Energy Company shall replace the gas driven pneumatic pumps with electric pumps at the following facilities: Birch Creek Unit 98, Birch Creek Unit 108, Birch Creek Unit 116, Birch Creek Unit 117, Birch Creek Unit 129, Birch Creek Unit 130, Birch Creek Unit 133, Birch Creek Unit 138, Birch Creek Unit 140, Birch Creek Unit 141, Birch Creek Unit 149, Birch Creek Unit 191, Birch Creek Unit 192, LaBarge Unit 27, LaBarge Unit 28A, LaBarge Unit 35, and LaBarge Unit 38. The pneumatic pump replacements and Chevron USA air quality permits wv-KX9, wv-ZQ1, wv-UT2, wv-YU2, wv-1885, wv-8E2, wv-0401, wv-4566, and wv-3404 shall be modified to reflect the pneumatic pump replacement prior to startup notification, under Condition 5 of this permit, for the Riley Ridge Plant. Cimarex Energy Company shall provide notification within 15 days of replacement of the pneumatic pump(s) at each facility.

It must be noted that this approval does not relieve you of your obligation to comply with all applicable county, state, and federal standards, regulations or ordinances. Special attention must be given to Chapter 6, Section 2 of the Wyoming Air Quality Standards and Regulations, which details the requirements for compliance with conditions 3, 5, 6 and 7. Any appeal of this permit as a final action of the Department must be made to the Environmental Quality Council within sixty (60) days of permit issuance per Section 16, Chapter I, General Rules of Practice and Procedure, Department of Environmental Quality.

If we may be of further assistance to you, please feel free to contact this office.

Sincerely,

  
David A. Finley  
Administrator  
Air Quality Division

  
John V. Corra  
Director  
Dept. of Environmental Quality

cc: Tony Hoyt

Cimarex Energy Company  
 Air Quality Permit CT-8093  
 Page 7

Emission Unit	NO <sub>x</sub>		CO		VOC		SO <sub>2</sub>		PM <sub>10</sub>	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Heat Medium Heater	2.7	7.9	7.5	22.3	0.5	1.5	0.1	0.2	--	--
Emergency Generator (worst case)	8.5	0.4	4.6	0.2	--	--	--	--	0.3	<0.1
Emergency Flare	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	--	--	--	--
Tanks	--	--	--	--	<0.1	<0.1	--	--	--	--
Fugitives <sup>1</sup>	--	--	--	--	2.8	12.2	--	--	--	--
<b>Facility Total</b>	<b>11.2</b>	<b>8.3</b>	<b>12.1</b>	<b>22.6</b>	<b>3.3</b>	<b>13.7</b>	<b>0.1</b>	<b>0.2</b>	<b>0.3</b>	<b>&lt;0.1</b>

<sup>1</sup> Methanol emissions (HAPs) are estimated to be 4.0 tpy of the fugitive emissions.

**IN THE MATTER OF A PERMIT APPLICATION (AP-8093) FROM CIMAREX ENERGY COMPANY TO CONSTRUCT THE RILEY RIDGE GAS PLANT LOCATED IN SUBLETTE COUNTY, WYOMING**

**DECISION**

**I. Introduction**

The Air Quality Division received a permit application from Cimarex Energy Company on July 28, 2008 to construct the Riley Ridge Plant for methane and helium recovery. The facility will be capable of processing 200 MMscfd of gas produced from wells comprised primarily of carbon dioxide (CO<sub>2</sub>), nitrogen (N<sub>2</sub>), methane (CH<sub>4</sub>), helium (He), and hydrogen sulfide (H<sub>2</sub>S). Nearly all of the CO<sub>2</sub> and H<sub>2</sub>S will be extracted and injected back into the producing reservoir, the nitrogen will be extracted and vented to the atmosphere and the helium and methane will be recovered and sold. Facility equipment will include a heat medium heater, electrical compression, propane refrigerant, a diesel or propane fired auxiliary electrical generator and an emergency flare. The Riley Ridge Plant is located in Section 16, T29N, R114W, approximately sixteen (16) miles west-southwest of Big Piney, in Sublette County, Wyoming.

The Division conducted an analysis of this application and on April 16, 2009, published in the Pinedale Roundup, in Pinedale, Wyoming, a public notice and notice of public hearing of the proposed intent to approve the application. A copy of the application and Division's analysis was placed in the office of Sublette County Clerk in accordance with regulations. The public notice period ran from April 16, 2009 to May 18, 2009 and a public hearing was held on May 18, 2009, at the Marbleton Town Hall, located at 10700 Hwy 189, in Marbleton, Wyoming.

The Division received comments from the public during the public hearing on May 18, 2009 in Pinedale and during the public comment period. The comments received and responses to the comments are provided below.

**II. Analysis of Public Comments:**

- II.1 **Interim Policy** – Comment was received that the application submitted by Cimarex fails to comply with the Division's Interim Policy for at least three reasons: 1) the Interim Policy forbids inter-company emission reductions like the kind proposed by Cimarex; 2) the application fails to provide assurances (i.e., a "demonstration") that emissions from the facility will in fact be offset and fails to provide a meaningful opportunity to review specific and detailed proposals for offsets; 3) Cimarex makes no effort to offset significant new emissions from other project components and activities such as well drilling, operation of pipelines and other project-related facilities and construction.

**Response** – 1) Section 4 of the Interim Policy states "No trading (i.e. inter-company emissions reductions) will be allowed". The prohibition on Inter-Company trading was not intended to restrict such trades, where companies involved in a trade can reach agreement on the value of any offset involved. Nor was the policy intended to prohibit new companies from operating in Sublette County. Given Cimarex Energy Company does not operate any other facilities in Sublette County and they have reached agreement with Teletractors and Chevron to obtain offsets, the Division accepted offsets obtained through inter-company trading for this permitting action. While the Interim Policy clearly states that it is not a regulation, the Division will be issuing a letter clarifying that a Chapter 6, Section 2 (c)(ii) Demonstration that involves emission

reductions obtained through inter-company trading will be considered on a case-by-case basis. The letter will be posted on our website upon issuance.

2) The Division has established federally enforceable permit conditions to ensure that the required VOC and NO<sub>x</sub> offsets are obtained prior to the startup of the Riley Ridge Plant. Condition 31 (previously Condition 30) of the permit specifies the Tier 0 diesel engine must be replaced with a Tier 3 diesel engine and the Telectractors air quality permit modified prior to startup of the Riley Ridge Plant. Condition 32 (previously Condition 31) has been modified based on the information provided by Cimarex (Attachment A). This condition requires replacement of seventeen (17) pneumatic pumps with electric pumps at Chevron's Birch Creek and Labarge units and the Chevron air quality permits are modified prior to startup of the Riley Ridge Plant.

3) The Division considered the emissions represented in Cimarex's application associated with the operation of the Riley Ridge Plant, and did not include emissions which are considered to be secondary emissions in determining the facility's potential to emit. In Chapter 6, Section 4 of the Wyoming Air Quality Standards and Regulations (WAQSR), a facility's potential to emit is defined as follows:

*"Potential to emit" means the maximum capacity of a stationary source to emit a pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or the type or amount of material combusted, stored, or processed, shall be treated as part of its design if the limitation or the affect it would have on emissions is enforceable. Secondary emissions do not count in determining the potential to emit of a stationary source.*

In Chapter 6, Section 4 secondary emissions are defined as follows:

*"Secondary emissions" means emissions which occur as a result of the construction or operation of a major stationary source or major modification, but do not come from the major stationary source or major modification itself. For the purposes of this section, secondary emissions must be specific, well defined, quantifiable, and impact the same general areas as the stationary source or modification which causes the secondary emissions. Secondary emissions include emissions from any offsite support facility which would not be constructed or increase its emissions except as a result of the construction or modification of the major stationary source or major modification. Secondary emissions do not include any emissions which come directly from a mobile source, such as emissions from the tailpipe of a motor vehicle or from a train.*

The Division considers well drilling and completions, pipeline construction and operation, electric transmission construction to be secondary emissions and not part of the Riley Ridge Plant. Therefore, Cimarex was not required to offset these emissions because they were not considered in the potential to emit for the Riley Ridge Plant.

**II.2 Impacts from accidental release** – Comment was received that the Division must evaluate the potential public health and safety impacts from the proposed project, including a comprehensive assessment of the consequences of an accidental release of hazardous chemicals, such as the release of hydrogen sulfide (H<sub>2</sub>S), caused by equipment failure, failure of sequestration, human error, well blowouts, acts of terror, etc. In particular, the Division should require the applicant to explain how it intends to comply with the “general duty” provisions set forth in 112(r), and allow the public an opportunity to review and comment on the applicant’s statements.

**Response** – The Division does not administer the provision under §112(r) of the Clean Air Act (CAA) in Wyoming. Therefore, the Division cannot require Cimarex to provide information required under §112(r) prior to issuing a permit.

**II.3 CO<sub>2</sub> and H<sub>2</sub>S sequestration** – Comment was received that the Division should defer any further action on Cimarex’s application pending the promulgation of rules by the EPA and by DEQ governing the injection of CO<sub>2</sub> and H<sub>2</sub>S, and pending submittal of application by Cimarex for the necessary injection permits. Additionally, attachments were provided which include scoping comments provide to the Bureau of Land Management (BLM) on the Rand Butte Project.

**Response** – The Division does not have the authority to defer issuance of the air quality permit until other permits, not required by the WAQSR, are obtained. The Riley Ridge Plant complies with all applicable requirements of the WAQSR and, therefore, the Division is obligated under the Environmental Quality Act to grant the permit (W.S. 35-11-801).

**II.4 Aggregation** – Comment was received that the Riley Ridge Plant described in the public notice and analyzed by the Division is just one component of a much larger and more complex methane and helium recovery project named the Rand’s Butte Project. Emissions from the project are much greater than the limited analysis of the Riley Ridge Plant, and emission offsets proposed by Cimarex don’t come close to offsetting total project emissions. Emissions from the entire operation, including all its various components must be aggregated and offset by emission reductions elsewhere in order to avoid a significant increase in ozone forming pollutants. Further total project emissions must be aggregated for purposes of Title V and New Source Review.

**Response** – See response to Public Comment II.1 item 3 in regards to defining the potential to emit for the Riley Ridge Plant. Emission increases from any other sources that require an air quality permit will be addressed in the associated permitting action. Cimarex has addressed all emission sources associated with the Riley Ridge Plant in this permitting action.

### **III. Analysis of Comments from Cimarex:**

**III.1 LDAR Monitoring Frequency** – Compliance Partners, Inc. (CPI) commented on behalf of Cimarex requesting that the minimum frequency under the LDAR program be changed to once annually instead of semi-annually.

**Cimarex Energy Company**  
**Decision Document, Permit Application AP-8093**  
**Page 4**

**Response** – The minimum frequency under the LDAR program specified in the permit was established under BACT. Therefore, the Division has not revised the monitoring frequency in Condition 24 (proposed Condition 23). However, once Cimarex has completed at least two (2) years of monitoring the Division would be willing to discuss the possibility of revising the frequency based on monitored data.

III.2 **Annual Emission Inventory** – CPI commented on behalf of Cimarex requesting that the deadline for submitting the annual emission inventory be revised to March 1 instead of January 31 to be consistent with reporting requirements for major sources.

**Response** – Upon review of the conditions and the information required to be submitted the Division revised Condition 25 (proposed Condition 24) to require submittal of the annual emission inventory by March 1 of each year.

IV. **Division**

IV.1 Upon reviewing the proposed conditions it was noted that the permit did not include fugitive VOC limits. Based on the fact that the Division established VOC emission limits for the generator engines and heat medium heater the Division has included Condition 23 limiting fugitive VOC emissions to 12.2 tpy to be consistent.

IV.2 Upon reviewing the proposed conditions it was noted that the permit did not include the requirement to comply with the applicable requirements of 40 CFR part 63, subpart ZZZZ. EPA promulgated revisions to Subpart ZZZZ on January 18, 2008, which included area sources of HAPs. Therefore, the Division has included Condition 30 for compliance with Subpart ZZZZ.

V. **Decision:**

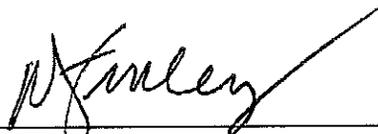
On the basis of comments received during the public comment period and at the public hearing, an analysis of those comments, and representations made by Cimarex Energy Company in the application, the Department of Environmental Quality has determined that the permit application filed by Cimarex Energy Company complies with all applicable Wyoming Air Quality Standards and Regulations and that a permit will be issued to Cimarex Energy Company allowing construction of Riley Ridge Plant as described in the application. All of the conditions proposed in the Division's analysis will be included in the permit with the following changes and additions:

1. The Division has included as a condition of the permit (Condition 23) a limit on fugitive VOC emissions. (See response to Division Comment IV.1)
2. The Division has included as a condition of the permit (Condition 30) a requirement to comply with the applicable requirements of 40 CFR part 63, subpart ZZZZ. (See response to Division Comment IV.2)
3. The Division has revised Condition 25 (proposed Condition 24) to change the submittal date of the annual emissions inventory from January 31 to March 1 of each year. (See response to Cimarex Comment III.2)

**Cimarex Energy Company**  
**Decision Document, Permit Application AP-8093**  
**Page 5**

4. The Division has revised Condition 32 (proposed Condition 30) to include a notification within 15 days of replacement of the Tier 0 engine. (See Public Comment II.1)
5. The Division has revised Condition 33 (proposed Condition 31) to indicate the equipment to be replaced at the respective facilities and permits which are to be modified prior to startup of the Riley Ridge Plant. The Division has also included a requirement for notification of replacement of the respective equipment at each facility within 15 days of replacement. (See Public Comment II.1)

Dated this 18<sup>th</sup> day of June, 2009



David A. Finley  
Administrator  
Wyoming Air Quality Division



John V. Corra  
Director  
Wyoming Department of Environmental Quality

**Attachment A**  
**Cimarex Letter**

15 East 5th Street  
Suite 1000  
Tulsa, Oklahoma 74103-4346  
PHONE 918.585.1100  
FAX 918.585.1133

June 2, 2009



Mr. Chad Schlichtemeier  
Wyoming Department of Environmental Quality  
Division of Air Quality  
122 W. 25<sup>th</sup> Street  
Herschler Bldg 2E  
Cheyenne, WY 82002



**RE: Riley Ridge Air Permit (AP-8093) Discussion**

Mr. Schlichtemeier,  
Cimarex Energy Co. is responding to your request for additional information since our public hearing on May 18, 2009. This letter addresses emissions offsets and public comments for permit approval.

**Emissions Offsets**

Cimarex Energy Co. has completed additional work with Chevron U.S.A. Inc and identified specific sources to be used to offset VOC emissions for the Riley Ridge plant. The VOC offsets will be gained by converting 17 pneumatic pumps at Chevron's Birch Creek and Labarge Units to electric driven pumps. The attached documents provide facility identification, pump model, pump use description, applicable WDEQ permit number, and the VOC emissions gained by each pump. Gas compositions are also attached for each pneumatic pump currently in use and these compositions provide the data used in the calculations to determine the VOC's being emitted.

The NOx Offsets with Teletractors Incorporated are specified with previous documentation.

All NOx and VOC emissions offsets will be in place prior to plant startup.

**Public Comments**

Cimarex Energy Co. understands air quality in Sublette County is very important and our Riley Ridge plant design demonstrates our commitment to minimize environmental impacts. Cimarex is not aware of any negative concerns related to air emissions that we have not addressed.

**Permit Approval**

Cimarex has work restrictions imposed between the winter months of November through May of each year. One month in our current work season has passed and Cimarex is eager to begin earthwork as soon as possible. Please advise if any additional data is required. Otherwise, we respectfully request permit approval as soon as possible.

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Please contact me with any questions @ (918) 295-1667.

Sincerely,



Clay Duellman  
Special Projects Manager

CC: Mr. Gary McFadden, Compliance Partners  
Mr. Patrick Shevlin, Chevron U.S.A. Inc.

CIMAREX-Offsets: Pneumatic Pump Replacement Schedule

No#	Facility ID	Date	TPY	Permit	Description
1	BCU 98		0.54	AP-KX9	Texsteam 3701 methanol pump
2	BCU 108		0.54	AP-KX9	Texsteam 3701 methanol pump
3	BCU 116		0.54	AP-KX9	Texsteam 3701 methanol pump
4	BCU 117		0.54	AP-ZQ1	Texsteam 3701 methanol pump
5	BCU 129		1.1	AP-KX9	Wilden Heat Trace Pump
6	BCU 130		0.54	AP-KX9	Texsteam 3701 methanol pump
7	BCU 133		0.54	AP-KX9	Texsteam 3701 methanol pump
8	BCU 138		1.1	WV-UT2	Wilden Heat Trace Pump
9	BCU 140		0.54	AP-KX9	Texsteam 3701 methanol pump
10	BCU 141		0.54	AP-KX9	Texsteam 3701 methanol pump
11	BCU 149		0.54	WV-YU2	Texsteam 3701 methanol pump
12	BCU 191		1.1	WV-1885	Wilden Heat Trace Pump
13	BCU 192		1.1	WV-1855	Wilden Heat Trace Pump
14	LBU 27		1.1	AP-8E2	Wilden Heat Trace Pump
15	LBU 28A		1.1	AP0-401	Wilden Heat Trace Pump
16	LBU 35		1.1	WV-4566	Wilden Heat Trace Pump
17	LBU 38		1.1	WV-3404	Wilden Heat Trace Pump
		Total	13.86		

BCU = Birch Creek Unit  
 LBU = Labarge Unit

**Pneumatic Calculations**  
**Birch Creek 149 Sample**

carbon dioxide  
 nitrogen  
 methane  
 ethane  
 propane  
 isobutane  
 butane  
 isopentane  
 pentane  
 n-hexanes  
 other hexanos  
 heptanes  
 C8+ heavies  
 benzene  
 toluene  
 ethylbenzene  
 xylenes  
 Trimethyl  
 Totals

Mol %	mw	Mol % x MW	Wt %
0.59%	44.01	0.2606913	1.4164%
0.67%	28.01	0.1878631	1.0199%
89.47%	16.04	14.350796	77.9104%
5.69%	30.07	1.7102613	9.2850%
2.19%	44.1	0.9653931	5.2411%
0.35%	58.12	0.2032456	1.1034%
0.50%	72.15	0.361299	1.9729%
0.14%	72.15	0.1014429	0.5507%
0.12%	72.15	0.0847041	0.4599%
0.04%	86.16	0.0337747	0.1834%
0.10%	86.16	0.084523	0.4589%
0.10%	100.2	0.1011018	0.5489%
0.01%	114.23	0.014393	0.0781%
0.01%	78.11	0.0067175	0.0365%
0.02%	92.13	0.016307	0.0865%
0.00%	106.17	0.000697	0.0035%
0.00%	106.17	0.003716	0.0202%
0.00%	114.24	0.0041126	0.0223%
100.00%			100.00%
3.58%			10.3683%
0.07%			0.35%

VOC (C3+)  
 HAPs (Total)

Stream Mol Wt = 18.419808

Wilden Pump (PX200 spec sheet)  
 X Factor setting, based on Ops input  
 "X Factor", air @ 48 psig  
 "X Factor", flow @ 48 psig  
 Actual Flow rate  
 Equivalent Flow Rate at Setting 4  
 Air Consumption, Setting 4 Performance Curve  
 Air Consumption, Setting 1  
 Vented SCF / year (8760 hr) =  
 Vented lb-mol/yr (@379.7 SCF/lb-mol) =  
 Total emissions, lb-mol x lb/lb-mol (lb/yr) =  
 VOC, total x wt% VOC (lbs/yr) =  
 HAPs, total x wt% HAP (lbs/yr) =

1.06 TPY  
 0.04 TPY

1  
 0.08  
 0.12  
 1 gpm  
 8.3 gpm  
 10 SCFM  
 0.8 SCFM  
 420,480  
 1107.40  
 20,398  
 2,115 or  
 72.27 or

**Texsteam Pump Calculator**  
**Birch Creek 149 Sample**

carbon dioxide  
 nitrogen  
 methane  
 ethane  
 propane  
 isobutane  
 butane  
 isopentane  
 pentane  
 n-hexanes  
 other hexanes  
 heptanes  
 C8+ heavies  
 benzene  
 toluene  
 ethylbenzene  
 xylenes  
 Trimethyl  
 Totals  
 VOC (C3+)  
 HAPs (Total)

Mol %	MMW	Mol % x MMW
0.59%	44.01	0.2608913
0.67%	28.01	0.1878631
89.47%	16.04	14.350796
5.69%	30.07	1.7102613
2.19%	44.1	0.9653931
0.35%	58.12	0.2032456
0.50%	58.12	0.2897282
0.14%	72.15	0.1014429
0.12%	72.15	0.0847041
0.04%	86.16	0.0337747
0.10%	86.16	0.084523
0.10%	100.2	0.1011018
0.01%	114.23	0.014393
0.01%	78.11	0.0067175
0.02%	92.13	0.016307
0.00%	106.17	0.000637
0.00%	106.17	0.003716
100.00%	114.24	0.0041126
3.58%		
0.07%		

Stream Mol Wt = 18.419608

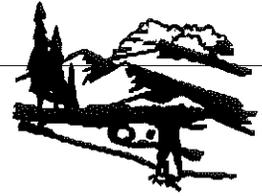
WT %	100 psig
1.4164%	550 gal
1.0199%	390
77.9104%	214,500
9.2850%	564.92
5.2411%	10,406
1.1034%	1,079 or
1.5729%	36.87 or
0.5507%	
0.4599%	
0.1834%	
0.4589%	
0.5489%	
0.0781%	
0.0365%	
0.0685%	
0.0035%	
0.0202%	
0.0223%	
100.00%	
10.3683%	
0.35%	

Texsteam 3701 Series Pumps  
 Discharge Pressure, typical -85 psig  
 Gallons of methanol pumped per year  
 SCF gas consumption per gallon (spec sheet)  
 Vented SCF / year (8760 hr) =  
 Vented lb-mol/yr (@379.7 SCF/lb-mol) =  
 Total emissions, lb-mol x lb/lb-mol (lb/yr) =  
 VOC, total x wt% VOC (lbs/yr) =  
 HAPs, total x wt% HAP (lbs/yr) =

0.54 TPY  
 0.02 TPY



# Department of Environmental Quality



To protect, conserve and enhance the quality of Wyoming's environment for the benefit of current and future generations.

Dave Freudenthal, Governor

John Corra, Director

June 18, 2009

Re: Air Quality Permit CT-8093  
Cimarex Energy Company  
Permit Application AP-8093

Dear Commenter:

Enclosed is a copy of the air quality permit referenced above to construct the Riley Ridge Plant for methane and helium recovery. The facility will be capable of processing 200 MMscfd of gas produced from wells comprised primarily of carbon dioxide (CO<sub>2</sub>), nitrogen (N<sub>2</sub>), methane (CH<sub>4</sub>), helium (He), and hydrogen sulfide (H<sub>2</sub>S). Nearly all of the CO<sub>2</sub> and H<sub>2</sub>S will be extracted and injected back into the producing reservoir, the nitrogen will be extracted and vented to the atmosphere, and the helium and methane will be recovered and sold. Facility equipment will include a heat medium heater, electrical compression, propane refrigerant, a diesel or propane fired auxiliary electrical generator and an emergency flare. The Riley Ridge Plant is located in Section 16, T29N, R114W, approximately sixteen (16) miles west-southwest of Big Piney, in Sublette County, Wyoming.

Comments received during the public comment period and hearing were considered in the final permit. A copy of the decision document for this permit is included. A new condition has been added and proposed conditions have been modified in the final permit. Below is a summary of the changes.

- Condition 23 (new) establishing a VOC limit for fugitive emissions.
- Condition 25 (revised) changed to the submittal of the annual emissions inventory from January 31 to March 1 of each year.
- Condition 30 (new) to comply with applicable requirements of 40 CFR part 63, Subpart ZZZZ.
- Condition 32 (revised) to include a notification within 15 days of replacement of the Tier 0 engine.
- Condition 33 (revised) to indicate the equipment to be replaced at the respective facilities and permits which are to be modified prior to startup of the Riley Ridge Plant. The Division has also included a requirement for notification of replacement of the respective equipment at each facility within 15 days of replacement.

If we may be of further assistance to you, please feel free to contact this office.

Sincerely,

David A. Finley  
Administrator  
Air Quality Division

cc: Tony Hoyt  
Clay Duellman, Cimarex Energy Company

Enclosures

Herschler Building • 122 West 25th Street • Cheyenne, WY 82002 • <http://deq.state.wy.us>

ADMIN/OUTREACH (307) 777-7937 FAX 777-3610	ABANDONED MINES (307) 777-6145 FAX 777-6462	AIR QUALITY (307) 777-7391 FAX 777-5616	INDUSTRIAL SITING (307) 777-7369 FAX 777-5973	LAND QUALITY (307) 777-7756 FAX 777-5864	SOLID & HAZ. WASTE (307) 777-7752 FAX 777-5973	WATER QUALITY (307) 777-7781 FAX 777-5973
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**Appendix D**  
**Cimarex Energy Emergency Contingency Plan**

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**Emergency Contingency Plan  
Rands Butte Gas Development Project**

**Sublette County, Wyoming**

**Prepared by  
SWCA Environmental Consultants  
Sheridan, Wyoming**

**for**

**Cimarex Energy  
1700 Lincoln Street, Suite 1800  
Denver, CO 80203**

**May 1, 2009**

## ***Introduction***

Cimarex Energy (Cimarex) is committed to protecting the health and safety of all who work, live, and recreate within the region. Cimarex has developed this Emergency Contingency Plan (Plan) to manage risk and mitigate emergency situations that may arise during the development and operation of the proposed Rands Butte project. The purpose of this Plan is to act as a guide for Cimarex personnel, contractors, and emergency response officials who may be in or near the project area in the event of an emergency situation occurring. For the Plan to be effective, all employees, contractors, and emergency response personnel must be familiar with and trained regarding all aspects of the Plan. The Plan will also be used in concurrence with the existing Cimarex Environmental, Safety, and Health Manual (ES&H) (Cimarex 2007).

It is the policy of Cimarex to provide a safe work environment to all employees, contractors, and local residents who work, live or recreate in or near the project area. The Plan describes how Cimarex will manage risk and emergency response associated with the project. Details of emergency response policies and procedures used for the assessment and response of the Cimarex operations will provide for a safe environment for the Rands Butte project. The Plan will ensure that Cimarex will:

- Make certain that all Cimarex employees and contractors understand working safely is necessary part of their employment and inherent risks of their jobs are managed continuously to achieve a desired level of safety.
- Provide all employees, contractors, and visitors to the project area the capabilities, knowledge, and resources necessary to respond correctly and efficiently to any emergency situation that may arise.
- Manage all aspects of the project during construction and production in a way that protects employees, contractors, the general public, and the environment with the utmost regard and accountability.
- Work with government agencies and the general public to provide an operation which performs in the highest standard and protects the environment in which it exists and will respond in a prudent manner to any emergency situation that could occur within the project area.

The Plan within this document will detail emergency responses to a hydrogen sulfide (H<sub>2</sub>S), methane, or any hazardous substance release that may occur within the project area during the construction and operation of the project. All Cimarex personnel, including company contractors, will be trained in all aspects of the project operation, operator safety, and emergency response protocol before allowing admittance to the project area. The training will be given in conjunction with the ES&H training for all new employees, visitors, and contractors. All trained Cimarex personnel and contractors will complete an annual refresher course which will cover the Cimarex ES&H and the Plan.

## ***Plan Distribution and Emergency Contact Information***

This document will be supplied to emergency agencies and to personnel within all federal, state, and local emergency agencies responsible for response to emergency conditions. These conditions may arise from any accidental release of any hazardous substances from within the project area. All pertinent emergency response agencies are included within Table 1 below as well as emergency notification outlets.

The distribution of the Plan will provide all agencies and emergency organizations with the primary information necessary to respond to any type of emergency that could occur within the project area. **An electronic copy of this manual will also be posted on the Cimarex Energy website at [www.cimarex.com](http://www.cimarex.com).** Included within this Plan is a community notification and evacuation checklist to be used by emergency personnel for the determination of necessary evacuation procedures in the event of an urgent situation which would require evacuation (See Table 2).

**Table 1. Emergency Management Contacts for Federal, State, and Local Agencies**

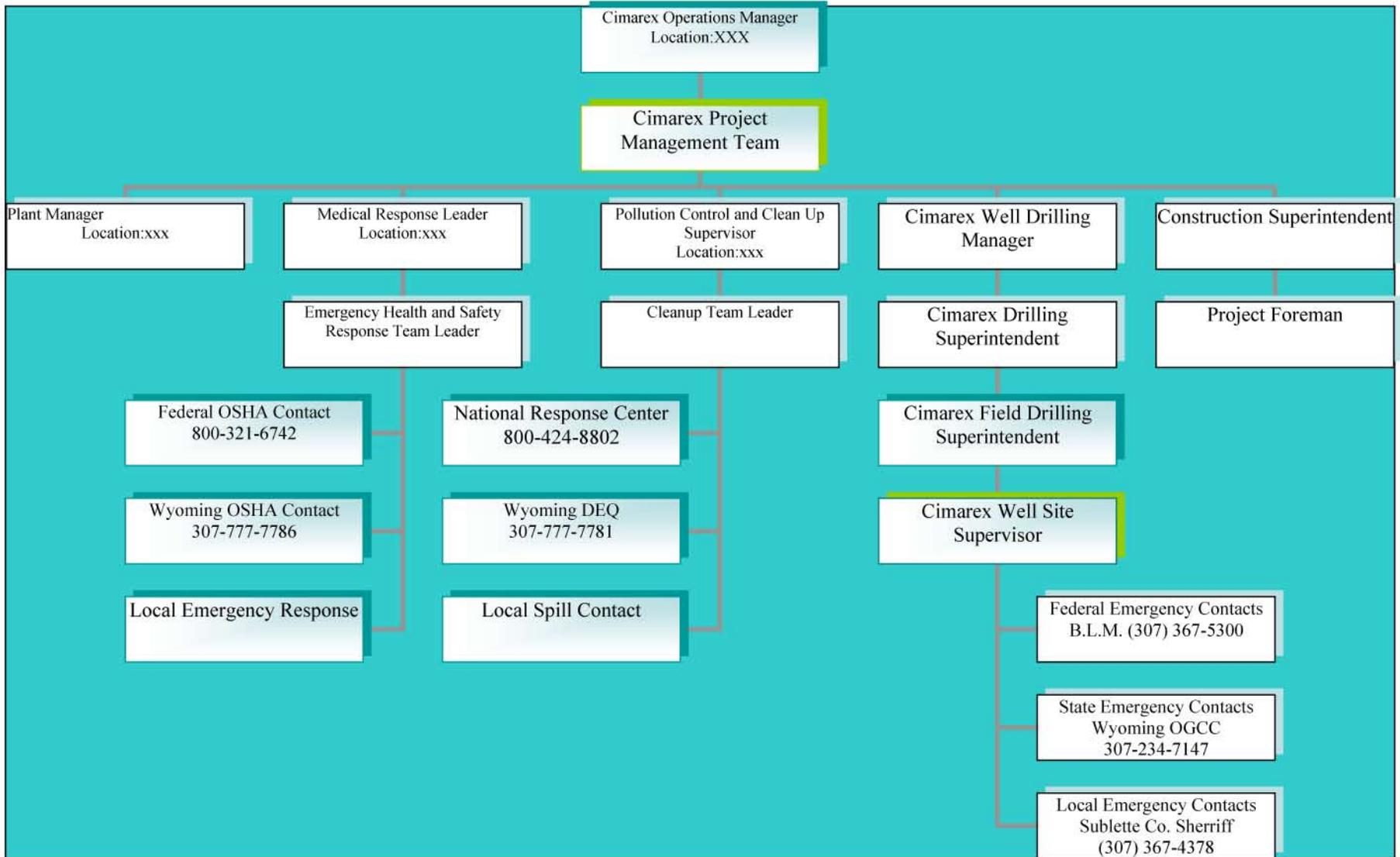
<b>Agency</b>	<b>Address</b>	<b>Phone Contact</b>	<b>Contact</b>
Sublette County Emergency Management Agency	P.O. Box 701 Pinedale, WY 82941	307-367-4378 or 307-276-5448	Emergency Response Coordinator
Sublette County Sheriff's Department	P.O. Box 701 Pinedale, WY 82941	307-367-4378 or 307-276-5448	Sublette County Sheriff
Sublette County Tip Top Search and Rescue	P.O. Box 913 Big Piney, WY 83113	307-367-4378 or 307-276-5448	Search and Rescue Coordinator
United States Forest Service	P.O. Box 218 Big Piney, WY 83113	307-276-5800	District Ranger
BLM Pinedale Resource Area	P.O. Box 768 Pinedale, WY 82941	307-367-5300	Field Manager
Wyoming Highway Patrol	P.O. Box 1260 Rock Springs, WY 82901	(800) 442-9090 or 911	Emergency Response Coordinator
City of Big Piney	P.O. Box 70, Big Piney, WY 83113	307-276-3554	Town Clerk
City of Marbleton	10700 US 189 Marbleton, WY 83113	307-276-3815	Town Clerk
Marbleton/Big Piney Medical Clinic	17 W 3rd, Marbleton, WY 83113	307-276-3306	Emergency Room
Medical Helicopter	Air Med Salt Lake City, UT	(800) 453-0120	
Pinedale Fire Department	130 S Fremont PO Box 653, Pinedale, WY 82941	(307) 367-4550	Emergency Manager

KPIN Radio	219 E Pine St, Ste 112, PO Box 2000, Pinedale, WY 82941	307-367-2000	
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### ***Emergency Organization of Cimarex Energy***

Cimarex has an existing internal organization of trained personnel to handle emergency situations at the companies Project Area. The Cimarex emergency response team is comprised of trained employees who have the knowledge and skills for handling emergency situations under varying conditions. The following emergency organizational chart (Figure 1) provides information about Cimarex's emergency organization chain-of-command which would be present during any emergency operational situations. Included within the chart are the construction, drilling, and the plant operations organizational chains with appropriate contact information.

DRAFT



**Figure 1. Cimarex Energy Emergency Response Organization Chart**

## ***Leak Detection and Alarm System***

Cimarex has established systems for the detection of gas escape, determination of the exact location and magnitude of any leak, and verification of real problems vs false alarms. Leak detection systems include the following:

- All production and processing facilities will have electronic sensors installed to continuously monitor production levels and pressure.
- Sensors will be continuously monitored at control centers located in the Methane and Helium Recovery Facility (M&HRF) and Cimarex project office located within the town of Big Piney.
- Air sensors with alarms (both visual and audible) will be located throughout the project area to detect and alert personnel of possible H<sub>2</sub>S leaks within the production and processing areas.
- Determination of leak magnitude will be made by air sensors and will be automatic.
- Audible and electronic alarms will be automatic and continuous until disengaged by the Emergency Response Facilities.
- Determination of climatic conditions affecting gas movement will be automatic based on real-time data communication from Ambient Air Quality and Air Monitoring Station.
- Data communication between air sensors and air monitoring station and the Emergency Response Centers will be instantaneous and continuous via buried fiber optic lines.
- Determination of the exact location of detected leaks will be electronic and linked to the location of the sensor.

## ***Emergency Response Facilities***

In the event that a leak is detected and verified, Cimarex has two local operational emergency response locations, each location having process shutdown and emergency response capabilities. The first emergency response site is located within the project area and would be situated in the Methane and Helium Recovery Facility (M&HRF) at Township 29 North, Range 114 West, Section 17. A second remote monitoring and emergency shutdown location would be located at the Cimarex project office located within the town of Big Piney approximately 17 miles east of the production and injection well sites and the M&HRF.

Both operation locations would continuously monitor all aspects of recovery, production, injection, and transport of raw and processed gases and by-products. All operations and current conditions will be monitored real-time and a response to any emergency situation may occur directly from an operation center upon receiving information from any sensors. All wells, including the injection well, the M&HRF, as well as an installed meteorological station located within the project area would be connected to the operation center by a buried fiber optic cable. The communication cable would provide

constant data transmissions to the control rooms. In the event of any power failure, a diesel generator, located at the M&HRF location, would supply backup power to the project area and still provide remote shutoff capabilities in the event of any emergency situation.

All Cimarex employees have the authority to shutdown any operation if they believe there are possible risks to the health or safety of personnel or the environment. Any emergency incident report or response will be directed to the Cimarex project office at the company emergency notification number. This is the same number that is posted on all Cimarex project signs positioned throughout the project area. Other contacts may include the Sublette County Sheriff's office or the Pinedale Fire Department.

ALL NUMBERS TO BE DETERMINED IN FINAL PLAN

Cimarex 24-Hour Emergency Number	(800) XXX-XXXX
Cimarex Project Office – Pinedale	(XXX) XXX-XXXX
Methane & Helium Recovery Facility	(XXX) XXX-XXXX
Cimarex Operations Manager	(XXX) XXX-XXXX (office) (XXX) XXX-XXXX (cell)
Cimarex Plant Manager	(XXX) XXX-XXXX (office) (XXX) XXX-XXXX (cell)
Drilling Superintendent	(XXX) XXX-XXXX (office) (XXX) XXX-XXXX (cell)

## ***Cimarex Notification of Emergency Agencies***

In any case of an emergency situation, Cimarex will enact the company emergency contingency response. The Cimarex Operations Manager or his designated alternate will contact the Sublette County Sheriff's Office. The Operation Manager will inform the Sheriff office the nature and extent of emergency as well as the existing site conditions. The Cimarex Operations Manager will also advise the Sheriff's office personnel as to the extent of the emergency response required and possible evacuation and project area closures necessary to protect the general public.

## ***Community Notification and Evacuation***

Any emergency situation to occur within the project area should be reported directly to Cimarex at the operations centers which are manned 24 hours per day, 7 days a week. Both the M&HRF plant and the project office located within Big Piney have emergency response and operations shutdown capabilities. The emergency contact phone numbers for each facility is listed below:

- Methane and Helium Recovery Facility Plant – (XXX)XXX-XXXX
- Cimarex Project Office, Big Piney, Wyoming – (XXX)XXX-XXXX

The Operations Manager or designate has the authority upon the report of emergency conditions to activate the emergency contingency response. The Operations Manager will notify the designated emergency response agencies to report the emergency situation and define the affected areas where public warning and evacuation may be necessary. The Operations Manager or designate will be the direct point-of-contact for Cimarex with the emergency response agency manager during existing emergency conditions.

In consultation with the emergency response agency, if an area is determined to require emergency evacuation, the area prescribed for evacuation will be defined by the Operations Manager based upon known conditions within the Project Area upon consultation with the Sublette County Sheriff's office. Evacuation information will be relayed directly to the Sublette County emergency response manager or official. The emergency response agency will use available personnel from listed agencies within Table 1 necessary to complete the evacuation order within the most prudent time frame possible. Agencies included within Table 1 include Federal, State, and Local emergency managers and personnel.

## **Emergency Response Evacuation**

### **Hydrogen Sulfide (H<sub>2</sub>S) Release**

Any release of H<sub>2</sub>S with a concentration present within the ambient atmospheric media greater than the specified 10 part per million (ppm) health threshold pose a threat to Cimarex personnel, contractors, and the general public who may be present within the

project area. At H<sub>2</sub>S atmospheric concentrations which may greater than 100 ppm, a rapid response and evacuation of possible receptors is necessary to protect human life. Procedures for an emergency area evacuation are designed to reduce the risk of exposure to all people who may be within the specified 100 and 500 ppm radius-of-exposure (ROE). The ROE for the 100 and 500 ppm concentration levels within the atmosphere may be calculated by the method outlined within the BLM Onshore Oil and Gas Order No. 6 (1990) or other applicable methods. This publication is considered the agencies standard of performance for operators, employees, and contractors completing work within areas known to produce hydrogen sulfide (H<sub>2</sub>S) or sulfur dioxide (SO<sub>2</sub>) during potential flaring operations. These ROE levels of concentrations produce areas where possible injury or death of receptors may occur if protective measures or evacuations are not employed when the emergency conditions occur.

The ROE calculated for 100 and 500 ppm H<sub>2</sub>S concentration levels is Figure 2. The concentration values are applicable to the specified equations when H<sub>2</sub>S concentrations are less than 10% of the total gas stream volume. The equations for the specified concentrations are for a:

- 100 ppm ROE, where loss of smell occurs within minutes and death occurs within 48 hours,

$$\text{ROE} = [(1.589)(\text{H}_2\text{S concentration})(Q)]^{0.6258}$$

or,

- 500 ppm ROE, where dizziness occurs and breathing may cease in minutes,

$$\text{ROE} = [(0.4546)(\text{H}_2\text{S concentration})(Q)]^{0.6258}$$

Where:

H<sub>2</sub>S concentration = decimal equivalent of mole or volume fractions of H<sub>2</sub>S in gaseous mixture.

Q = maximum volume of gas available for escape in cubic feet per day at 14.73 psia and 60°F.

The ROE will define the specific areal extent where evacuation and limited or restricted access may be required. Climatic conditions will require that evacuation occur in downwind corridors of ROE first. Ongoing assessment of climatic conditions within the project area will assure that evacuations activity occurs in areas that are impacted if climatic conditions change within the project area. Based upon Cimarex (2008) calculation for specified gas escape rates and H<sub>2</sub>S concentrations, the ROE parameters calculated are included within Table 2.

**Table 2. Calculated Parameters for Radius of Exposures of Designated H<sub>2</sub>S Releases<sup>1</sup>**

H <sub>2</sub> S Concentration	Gas Escape Rate (scfd <sub>2</sub> )	ROE Concentration (ppm)	
		100	500
		Distance, feet (miles)	Distance, feet (miles)
0.04617	4 x 10 <sup>7</sup>	11,153 (2.1)	5,096 (1.0)
0.04617	6 x 10 <sup>7</sup>	17,210 (3.3)	7,864 (1.5)
0.04617	8 x 10 <sup>7</sup>	22,181 (4.2)	10,136 (1.9)

<sup>1</sup> At 14.73 psia and 60°F

<sup>2</sup> Standard Cubic Feet per Day

Entry into the evacuation area will be restricted to personnel and emergency response officials who have training and safety equipment sufficient to protect them from existing environmental conditions. The access into the Project Area will be limited with the implementation of security road blocks located at the project ingress/egress sites. Because of the remoteness of the Rands Butte project site, the access to the M&HRF as well as the H<sub>2</sub>S production wells and H<sub>2</sub>S and CO<sub>2</sub> pipeline and injection well area may be limited by closing project gates. If the calculated ROE defines the evacuation area to extend beyond the limits of the Project Area gates, additional road blocks will be required to restrict access into impacted areas. See Figure 2 for H<sub>2</sub>S radius of exposure (ROE) limits for the 100 and 500 ppm concentration of a potential release from within the Methane & Helium Recovery Facility (M&HRF) area.

All persons leaving the project area from an existing road block will be logged into an emergency response log book (Table 3). Any road block security personnel will require constant radio contact with the emergency management agency to record all persons (project personnel, contractors, and general public) leaving the restricted area. The security officer at each roadblock site should also have available to them a portable air monitoring and a breathing apparatus for personal safety. The security personnel will be under direct supervision of the emergency response agency and will restrict access based upon communication from the emergency manager.

### **Leak Monitoring and Response**

Cimarex will design the M&HRF plant and all associated facilities with the highest standards available within the industry. All facilities will have production and processing monitors to survey production levels and detect any possible leaks or losses within the gas stream. Air sensors with alarms (both visual and audible) will be located throughout the project area to detect and alert personnel of possible H<sub>2</sub>S leaks within the production and processing areas. These sensors will be stationed to take into account the prevailing climatic conditions as well as the layout of the production facilities. This will provide monitoring coverage and detection capabilities throughout the production area.

The plant operation will be under continuous monitoring at both the M&HRF and the project office. Any operation or production deviation determined to be an emergency condition may require immediate remote shutdown of the operation of the plant. This shutdown may be completed from either Cimarex operation location.

Well drilling rigs that drill within a known area of H<sub>2</sub>S must take special precautions to protect the personnel who operate the equipment or are near the drill site. Personnel who are working within close proximity of the drill rig must have a portable sensor available to them to check for possible H<sub>2</sub>S levels. If the ambient H<sub>2</sub>S concentration is above the 10 ppm threshold, all personnel near the drill rigs must have personnel air support systems available nearby at all times. Other personnel protection devices for well drilling crews should include:

- A reliable 24-hour communication connection to project office for rapid contact with Operations Manager
- Each drill rig will be equipped with a continuous electronic H<sub>2</sub>S detection system that will activate an audible and visual alarm system. The sensors will be located in areas where H<sub>2</sub>S will be detected at the surface.
- A flagging system, which is in compliance with the BLM Onshore Order #6 will be implemented at all drill rigs in operation and will be used to notify nearby personnel according to flag color displayed.

Green Flag – Potential Danger

Yellow Flag – Moderate Danger

Red Flag – Extreme Danger – Do not Approach

- An evacuation plan, route, and safe area will always be prepared and available to all personnel working on the drill rig. Respiratory protective equipment which meets NIOSH/MSHA standards will be available to all personnel at the designated safe area.
- The area near the drill rig will be marked with warning signage which declares the H<sub>2</sub>S dangers and that the area is designated as a “No Smoking Area”.
- All personnel who enter the project area will be trained in emergency conditions, safety, and response to protect themselves as well as others who may need assistance.

All drill rig operation and safety procedures will be under the authority of the Cimarex Well Field supervisor. The supervisor will report directly to the Cimarex Well Drilling Manager. The well field supervisor will be responsible for notifying and maintaining contact with the well drilling manager during all drilling setup and operations.

## **Methane Release**

Because of the explosive potential of the methane product being transported within the product pipeline, constant monitoring of the pipeline and all associated equipment will occur throughout the length of the pipeline. The pipeline will be instrumented and monitored continuously for potential leaks. If a leak is determined or reported during operation, the transmission line will be shutdown and the source of the leak shall be determined.

Methane gas, though not an asphyxiant in open areas, may cause loss of consciousness in confined areas. Because methane is generally heavier than air, the leaking product may stay close to ground level as it moves down wind, away from the source. All confined areas require the use of portable measuring devices to detect the presence of natural gas. An emergency response to a potential methane release from the transmission pipeline to nearby areas requires significant knowledge in emergency response procedures but the area of concern is limited to a much smaller zone where injury or death may occur from thermal explosion developing in response to methane ignition and combustion. Figure 3 and 4 shows a thermal buffer zone that is associated with the buried methane pipeline where atmospheric concentration of methane could persist after a release and pose a thermal explosion potential. Thermal and concussion damage to structures or biological receptors from an explosion may occur at significant distance from the point of ignition of the methane source. Because of this threat, if any personnel or general public are within a close proximity to the pipeline and within the 1-mile buffer will be notified by the emergency management agency to evacuate the area. The evacuation area will be secured until the gas leak source has been located and repaired.

## **Hazardous Substance Release**

All chemicals stored within the project area during construction and operations must be handled according to label directions for each chemical. All chemicals present within the project area must also have a Material Safety Data Sheet (MSDS) located in a specified central location where access to during an emergency situation would be possible. These MSDS must be kept up to date and any new chemical added to the project area must have an MSDS added to the existing catalogue. All lists of hazardous substances stored within the project area must be updated at a minimum of once per month unless chemicals are added more often. If that is occurring then the chemical list must be updated more frequently.

All hazardous chemicals, as defined by the EPA Hazardous Substances Reportable Quantities and the Emergency Planning and Community Right to Know Act (EPCRA) list within 40 CFR Part 302-312 (USEPA 2001), stored at quantities greater than the reportable quantities must be reported as required by the EPCRA regulations. Any release of a hazardous substance above a specified reportable quantity for the hazardous substance must be reported to the EPA. Any spill must be cleaned up immediately based upon information that is available in the MSDS. If any spill is of a sufficient quantity to require notification and possible emergency response, the emergency response agency within Sublette County must be notified immediately upon discovery of the release. All

hazardous substances that are recovered during the cleanup must be handled and disposed of in accordance with available information. Any emergency response necessary will be based upon information available regarding the specific hazardous substance and after consultation of Cimarex Operations Manager and the Sublette County Emergency Response official.

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## References

Bureau of Land Management, November 23, 1990. Onshore Oil and Gas Order No. 6, Hydrogen Sulfide Operations, 43 CFR 3160. Federal Register, Volume 55, Number 226.

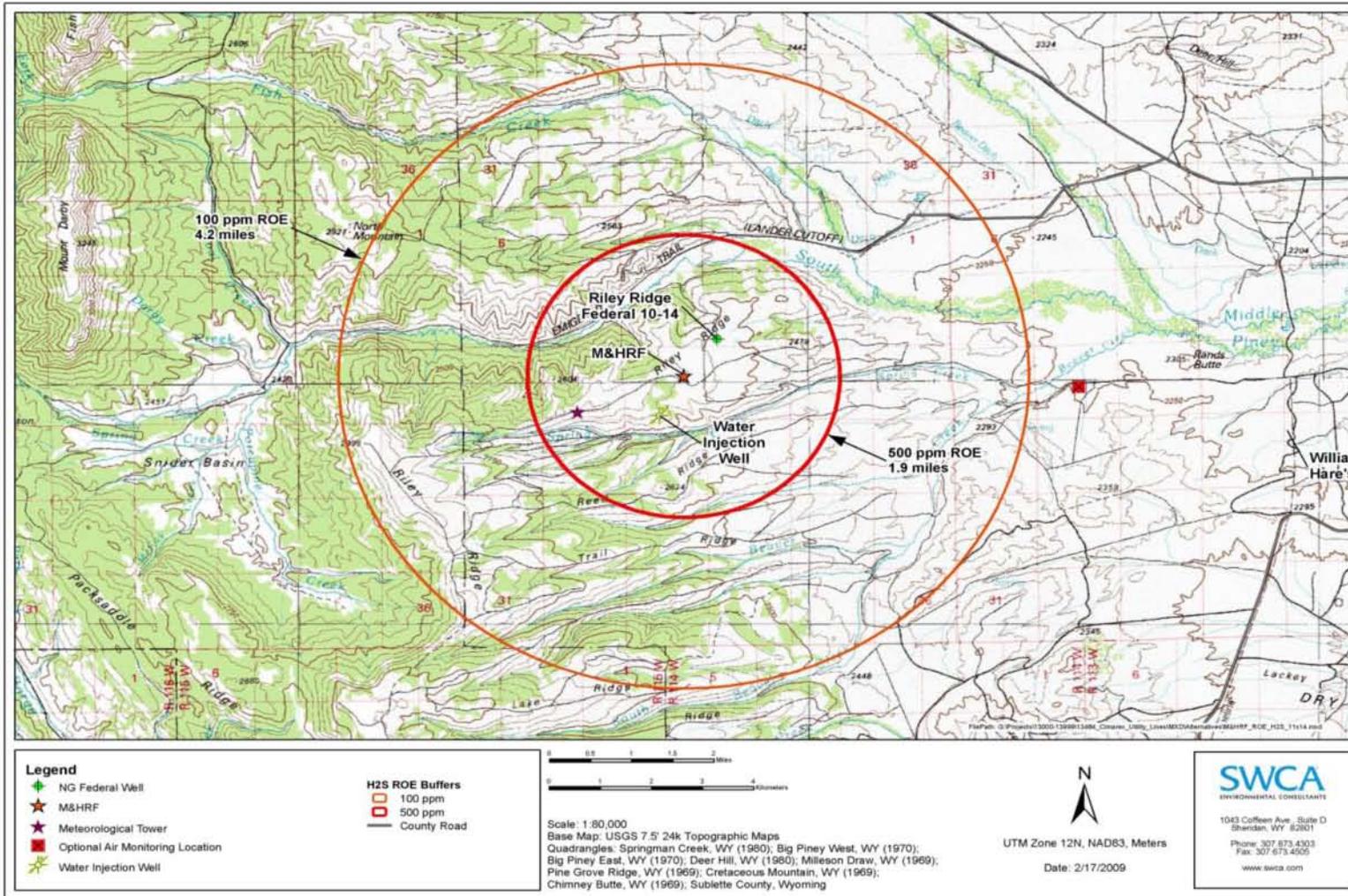
Cimarex Energy, October 2007. Environmental, Safety and Health Manual, Attachment #6, Application for Permit to Drill (APD RR 20-14).

Cimarex Energy, April 2008. H<sub>2</sub>S Drilling Operation Plan, Riley Ridge Project, As Attached to Application for Permit to Drill (APD RR 20-14).

U.S. Environmental Protection Agency, October 2001. List of Lists, Consolidated List of Chemicals Subject to the Emergency Planning and Community Right to Know Act (EPCRA) and Section 112(r) of the Clean Air Act, EPA 550-B-01-003. Office of Solid Waste and Emergency Response, Washington DC.

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Figure 2. ROE for 100 and 500 PPM for M&HRF Area



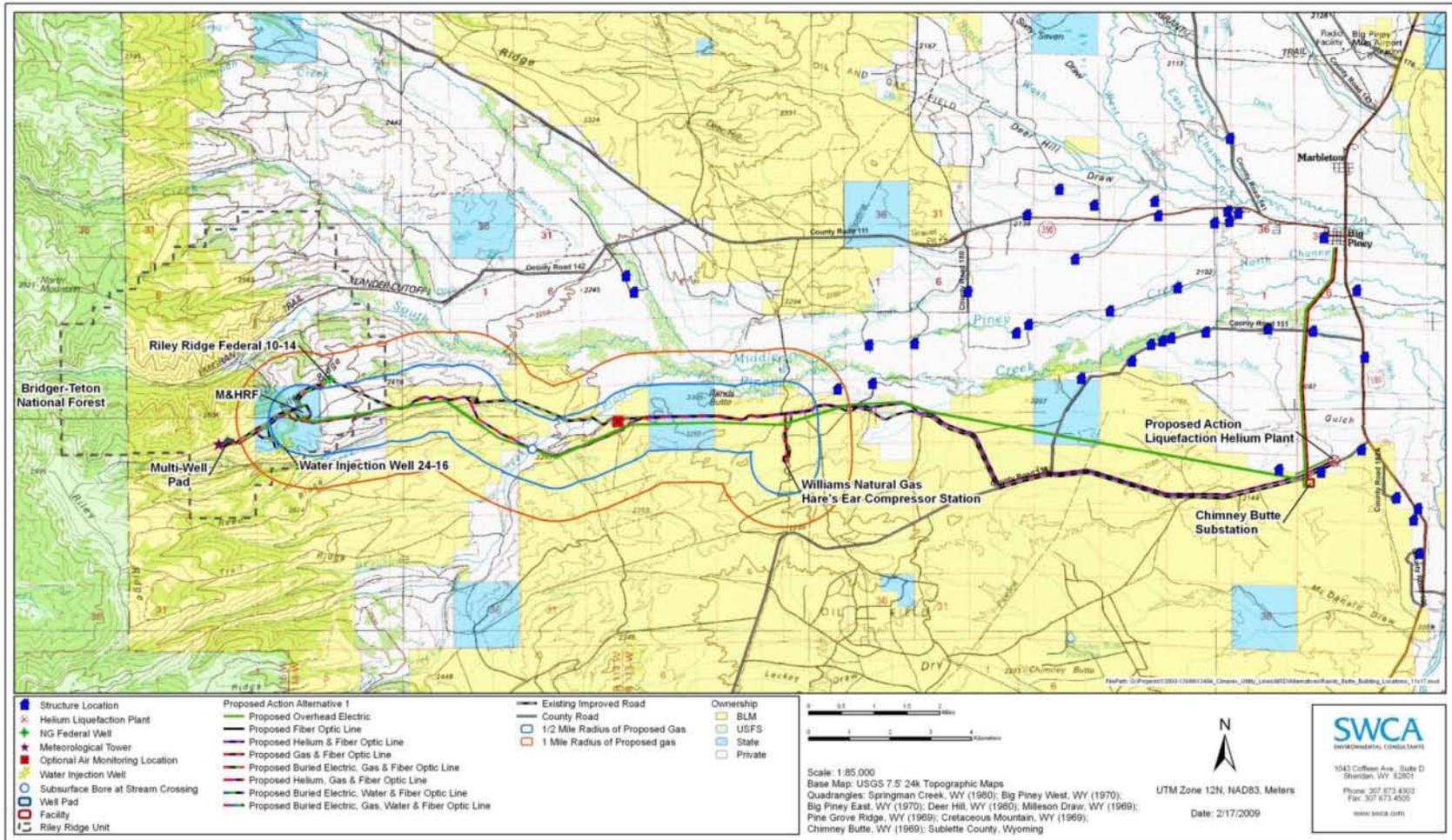
Map 4-7. H2S Radius of Exposure.

**Table 3. Notification Table for Residents and Business within Cimarex M&HRF Area**

Name	Address	Contact Information	Type	Location	Status *			Comments
					<input type="checkbox"/> N	<input type="checkbox"/> E	<input type="checkbox"/> C	
Pamela Hamilton	414 S Piney Fish Creek Road, Big Piney, WY	(307) 276-5424	Residence/Part-Time	4.2 Miles northeast of M&HRF	<input type="checkbox"/> N	<input type="checkbox"/> E	<input type="checkbox"/> C	Located on northeast edge of 100 ppm H <sub>2</sub> S ROE
Exxon Plant	1482 County Road 23 134 LaBarge, WY	(307) 386-2266 (307) 386-9283	Business		<input type="checkbox"/> N	<input type="checkbox"/> E	<input type="checkbox"/> C	
Exxon Plant	911 Hogsback Ridge, LaBarge, WY	(307) 386-2262 (307) 386-2263	Business		<input type="checkbox"/> N	<input type="checkbox"/> E	<input type="checkbox"/> C	
Exxon Plant	US Highway 189, LaBarge, WY	(307) 386-9285	Business		<input type="checkbox"/> N	<input type="checkbox"/> E	<input type="checkbox"/> C	
					<input type="checkbox"/> N	<input type="checkbox"/> E	<input type="checkbox"/> C	
					<input type="checkbox"/> N	<input type="checkbox"/> E	<input type="checkbox"/> C	
					<input type="checkbox"/> N	<input type="checkbox"/> E	<input type="checkbox"/> C	
					<input type="checkbox"/> N	<input type="checkbox"/> E	<input type="checkbox"/> C	
					<input type="checkbox"/> N	<input type="checkbox"/> E	<input type="checkbox"/> C	
					<input type="checkbox"/> N	<input type="checkbox"/> E	<input type="checkbox"/> C	

\* N = Notified    E = Evacuated    C = Cleared to Return

Figure 3. Methane Pipeline with 1/2 and 1-Mile Exposure Buffers and Nearby Structures



Rands Butte Area Structure Locations

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**Appendix E**  
**ALOHA Hazardous Gas Dispersion Model**

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# **Dispersion Modeling of Hydrogen Sulfide at Cimarex Rands Butte Project Using ALOHA**

Prepared for

**Cimarex Energy**

Prepared by

**SWCA Environmental Consultants**

January 2010

**Dispersion Modeling of Hydrogen Sulfide at Cimarex Rands  
Butte Project Using ALOHA**

Prepared for  
**Bureau of Land Management  
Pinedale Field Office**

Prepared by  
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**January 2010**

## **1.0 INTRODUCTION**

The proposed development and production of the complex gas mixture of the Madison Formation has been proposed by the Cimarex Energy (Cimarex) in the Rands Butte Gas Development Project (Project) Environmental Assessment, located in southwestern Sublette County, Wyoming. The Project would produce a gas mixture that includes the presence of hydrogen sulfide (H<sub>2</sub>S), carbon dioxide (CO<sub>2</sub>), and natural gas, as well as helium and other natural gas liquids such as ethane, propane, and butane. Development and production of large reserves of natural gas and helium from the Madison Formation has been hampered by the presence of high concentrations of CO<sub>2</sub>, a greenhouse gas, and toxic H<sub>2</sub>S gas.

The presence of H<sub>2</sub>S within the gas stream presents threats to human health as well as other biological receptors. Re-injection of H<sub>2</sub>S and CO<sub>2</sub> back to the Madison Formation is the proposed method of disposal through the use of an acid-gas injection well. This acid-gas would comprise a mixture of 94% CO<sub>2</sub> and 6% H<sub>2</sub>S. If a release of H<sub>2</sub>S were to occur at concentrations above levels considered to be a risk to an organism's health, a rapid response to a possible emergency situation and evacuation may be necessary.

An applied model, the ALOHA (Areal Locations of Hazardous Atmospheres) model, is presented in this study which predicts the areal extent of a leak or rupture of the proposed Project. The purpose for the application of the ALOHA Model is to provide predictive estimates of potential impacts to human health and safety for the general public. Model output was in the form of 17 dispersion diagrams of the distance from area of leakage to levels of concern for H<sub>2</sub>S under a range of atmospheric conditions commonly occurring in the Rands Butte Project Area (RBPA).

With the use of a predictive air dispersion model, it can be shown that a release of a chemical, in this case H<sub>2</sub>S, will disperse out from the source in a predictive nature. The output produced from the predictive air dispersion model is presented within this report.

## **2.0 ALOHA MODEL DESCRIPTION**

The ALOHA Model, developed jointly by the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Environmental Protection Agency (EPA), is a computer program designed to model potential chemical releases, as well as thermal radiation and overpressure related to toxic chemical releases resulting from, fires, and/or explosions (EPA and NOAA 2007).

### **2.1 MODEL DEVELOPMENT AND PURPOSE**

ALOHA is a dispersion model that requires the input of simple, easily obtainable local data to determine areas of concerns regarding significant threshold values for toxicity for a chemical of concern. These data include climatic conditions such as ambient air temperature, wind speed, as well as atmospheric stability. Other data inputs include the chemical of concern, the source, and physical properties of the release such as temperature and pressure of the chemical, and volume of chemical released.

Dispersion through the lower atmosphere is the movement of a mass of air and the chemicals in that mass by both advection (downwind) and diffusion (crosswind) (EPA and NOAA 2007). ALOHA applies two types of models to calculate the downwind movement and concentration levels of gaseous dispersion: Gaussian and heavy gas dispersion model. Gaussian dispersion assumes the development of a normal bell-shaped concentration level as the chemical moves downwind. The concentration axis perpendicular to the downwind air movement spreads out at the same time the peak of the bell curve becomes shallower. The concentration levels of the toxic air mass decrease as the chemical disperses downwind. A heavy gas dispersion model assumes that at the first release of a heavy gas, which is heavier than the surrounding air mass, the gas will sink and slowly spread out downwind. As the gas cloud starts to disperse downwind, the gas cloud becomes more diluted and accelerates dispersion of the gas by diffusion.

ALOHA will also model a chemical that is a gas under normal pressure and temperature but is stored or transported as a liquid under high pressure. If a release occurs when the chemical is pressurized, a two-phased release of both a liquid and a gas will occur. This is termed a flash-boiling release as the liquid rapidly vaporizes to a gas as the product disperses from the release site. The relatively low concentration of H<sub>2</sub>S in the byproduct gas stream under investigation for the Rands Butte Project, in combination with the high concentration of CO<sub>2</sub> which remains gaseous under high pressure, eliminates the concern for flash-boiling release in the model.

## **2.2 MODEL LIMITATIONS**

Because ALOHA is a simple dispersion model not requiring detailed input, it has limitations in predicting actual conditions which may occur under the following environmental conditions:

- very low wind speeds;
- very stable atmospheric conditions;
- wind shifts;
- particulates or chemical mixing; or
- concentration patchiness, particularly near the release source; or
- terrain steering effects (EPA and NOAA 2007).

Based on these factors the model for the Project included only wind speeds of a minimum 5 miles per hour (mph), unstable atmospheric conditions, and only the chemical release of H<sub>2</sub>S were included in the model to reduce the effect of these limitations. However, since the Project source location for H<sub>2</sub>S gas leak occurs near steep terrain with potential for downslope gas dispersion effects, model results will not be completely accurate and final interpretation of gas dispersion for the Project must take into account the drainage patterns of the Project Area.

### **3.0 MODEL INPUTS FOR THE CIMAREX PROJECT**

Because of ALOHA's limitations in modeling chemical mixtures, only the H<sub>2</sub>S component of the gas stream was modeled. Since the Cimarex Project is a continuous stream process and does not hold sour gas in tanks during processing, the inflow and outflow pipelines would contain the largest volume of sour gas at any given time. In the event of a pipeline rupture the total volume of H<sub>2</sub>S that could be released into the atmosphere is calculated based upon the following parameters:

- Area of pipe, assuming complete rupture;
- Length of pipeline containing acid-gas;
- Total volume of pipeline;
- Gas release duration;
- Gas release rate;
- The concentration of H<sub>2</sub>S in pipeline.

SWCA evaluated the Cimarex proposed sour gas operations to determine the parameters to input into the ALOHA model to estimate the maximum potential gas dispersal using these parameters. Three scenarios were evaluated and modeled as possible worst case gas release scenarios:

- A rupture at the sour gas pipeline;
- A rupture at the acid-gas injection wellhead or acid-gas pipeline without added check valve technology;
- A rupture at the acid-gas pipeline with added check valve technology.

The operation of the Madison Formation production wells would deliver raw sour-gas to the M&HRF plant for processing. The 1.45 mile pipeline would carry a gas stream containing an H<sub>2</sub>S concentration of approximately 3.6% by volume. During normal production, based upon the total length (7,656 ft) and inside diameter of the pipeline (5.187 in), the total volume of H<sub>2</sub>S would be just over 44 cubic. Based on this calculation, a release of H<sub>2</sub>S from the production wells and the adjoining sour-gas production pipeline would not result in a worst case scenario.

Due to the gas stream processing at the M&HRF (i.e., the removal of the salable methane and helium, as well as the produced water), the H<sub>2</sub>S concentration transported to the acid-gas injection well will be greater than the concentrations transport from the gas wells to the M&HRF. Gas processing at the M&HRF would increase the concentration of H<sub>2</sub>S as a component of the waste gas stream, and transport it under pressure to the acid-gas injection wellhead for disposal. The total distance from the M&HRF to the acid-gas injection well is 1.45 miles (7,656 feet) and would contain the highest expected concentration and volume of H<sub>2</sub>S, consisting of a mixture of CO<sub>2</sub> (94%) and 110 cubic feet of H<sub>2</sub>S (6%). The acid-gas mixture would be transported to the acid-gas well in a 6.625-inch outside diameter pipeline; the inside diameter of the pipeline is

5.1870 inches, and would be injected at the well head under a constant pressure of 2,250 pounds per square inch-gauge (psig).

Cimarex design includes a check valve feature in the acid-gas pipeline leading from the M&HRF to the injection wellhead and other sour gas pipelines. A check valve is a mechanical valve located mid-way in the pipeline length, which allows gas to flow in one direction only from the M&HRF to the injection well. If the direction of gas flow reverses because of a potential failure of the pipeline including a pipeline rupture, the valve closes and isolates gas behind the valve, effectively cutting the potential volume of the release in half. The total volume of gas released from the pipeline with an installed check valve would therefore be about 55 cubic feet at any given time of operation, based on pipeline diameter and operational pressure.

Based on these evaluations, the worst worst-case scenario for gas release would occur at the acid gas injection pipeline without the added check valve technology. The total volume of H<sub>2</sub>S that could be released into the atmosphere in the worst case scenario is calculated based upon the following parameters:

- Area of pipe, assuming complete rupture: 0.239 square foot (34.47 square inches).
- Length of pipeline containing acid-gas: 7,656 feet.
- Total volume of pipeline: 1,830 cubic feet.
- Concentration of H<sub>2</sub>S in pipeline: 6% of gas.
- Gas release duration: 1 minute.
- Gas release rate: 85.3 pounds/second.

Based on the worst-case calculation the total volume of gas released would be 5,119 pounds and 110 cubic feet of H<sub>2</sub>S. However, model runs were also included for the lower total volume calculations of 55 cubic feet and 44 cubic feet of H<sub>2</sub>S.

In addition to the three potential volumes of a potential gas release, other model inputs included the following parameters and variables that are typical of the RBPA and would affect the distance of dispersal should an accidental release occur:

- Wind direction (West);
- Wind speed (5 and 30 miles per hour (mph));
- Air temperature (0, 45, 75 degrees Fahrenheit (°F ));
- Atmosphere stability (Unstable and Moderately unstable);
- Humidity (25% and 50%); and
- Cloud cover (0% and 50%).

## 4.0 MODEL OUTPUTS FOR THE CIMAREX PROJECT

The ALOHA model output includes H<sub>2</sub>S levels of concentration (LOCs) based upon concentration levels of increasing threat to safety for any biological receptors which may be located within the specific LOC. Distances from the H<sub>2</sub>S source to the extent where the LOC is expected to be present are based upon model inputs. Table 1 shows the levels of concentration and toxicity for H<sub>2</sub>S. Based on this information, concentrations of 10 parts per million (ppm), 100 ppm, and 500 ppm were identified as output LOCs.

**Table 1. Hydrogen Sulfide Physical Effects at Specified Concentrations.**

Concentrations (ppm)	Physical Effects
0.13	Minimal perceptible odor.
10	Obvious and unpleasant odor. OSHA Permissible Exposure Limit (PEL) (8-hour exposure).
15	OSHA Short-term Exposure Limit (15-minute exposure).
100	Impairs the sense of smell in 3 to 15 minutes. Immediately dangerous to life and health.
500	Dizziness, breathing stops in a few minutes. Needs prompt artificial respiration.
700	Unconscious quickly. Death would result if not recued promptly.
1000	Unconscious immediately, followed by death within minutes.

\*Table obtained from ConocoPhillips EP Lower 48 Health, Safety, and Environmental Handbook (2006).

ppm = parts per million

Table 2 provides a list of inputs for each successive model run based on a range of climatic conditions which could be encountered at the RBPA. The model output for each set of conditions is shown graphically in Section 5.0. Results for the distance to LOC from each ALOHA model run are also listed within the table.

ALOHA modeling results show the volume of H<sub>2</sub>S present (110 cubic feet) during the operation of the RBPA. A release of this volume of gas at the following climatic conditions would be considered the worst-case scenario:

- west wind of 30 mph;
- air temperature of 45 degrees Fahrenheit or greater; and
- a moderately unstable atmosphere.

The model predicts that location of any biological receptor within a 10 ppm LOC may require notification and/or evacuation within a range of 1.3- to 3.8-mile distance from the potential H<sub>2</sub>S release. The area where the safety of any human may be in question and an evacuation may be necessary ranges from 0.63 to 1.50 miles from a potential source. A mandatory evacuation for any biological receptor would be necessary within distances of 0.27 to 0.73 mile from a potential release of H<sub>2</sub>S. Areal extent diagrams for the LOCs under different modeled conditions are presented in Section 5.0 of this report.

The nearest residences from any production activities within the RBPA site are about 4.2 miles from the M&HRF site. The ALOHA Model indicates that greatest distance of dispersal from any potential release source of H<sub>2</sub>S with a LOC for human health and safety within the RBPA site is 3.8 miles. Based upon the results of this modeling study, no mandatory evacuations of the general public would be necessary should a leak occur from the Project, unless real-time site monitoring of onsite conditions decrease.

This predictive model indicates that, in the rare event of an accidental severe leak or rupture, the proposed Project would not endanger human health and safety of the general public within the RBPA. With the added check valve technology, H<sub>2</sub>S monitoring equipment, automatic shut down, and emergency response measures contained in the Cimarex Emergency Contingency Plan, the general public would not be in danger in the event of a H<sub>2</sub>S leak in the future. However, any personnel working outdoors in the vicinity of the M&HRF, acid-gas injection well or sour gas wells would require immediate personal protective measures, as identified in the Emergency and Contingency Plan.

**Table 2. ALOHA Model Output for Climatic Conditions with Levels of Concentration Distance.**

Figure #	Volume of H <sub>2</sub> S Release (cf)	Wind Direction	Wind Speed (mph)	Air Temperature (°F)	Atmosphere Stability*	Humidity (%)	Cloud Cover (%)	Level of Concentration Distances (miles)		
								10 ppm	100 ppm	500 ppm
1	110	W	5	75	B	25	50	2.80	1.30	0.73
2	110	W	30	75	D	25	50	3.80	1.50	0.64
3	110	W	5	75	B	50	0	2.80	1.30	0.73
4	110	W	30	75	D	50	0	3.80	1.50	0.63
5	55	W	5	75	B	25	50	2.60	1.10	0.61
6	55	W	30	75	D	25	50	2.90	1.00	0.44
7	110	W	5	45	B	50	50	2.70	1.30	0.72
8	110	W	30	45	D	50	50	3.70	1.40	0.62
9	55	W	5	45	B	25	50	2.60	1.20	0.63
10	55	W	30	45	D	25	50	2.80	1.00	0.43
11	110	W	5	0	B	5	50	1.30	0.63	0.36
12	110	W	30	0	D	5	50	2.80	1.00	0.40
13	55	W	5	0	B	25	50	1.40	0.66	0.38
14	55	W	30	0	D	25	50	2.10	0.70	0.27
15	44	W	30	75	D	25	50	2.70	0.92	0.39
16	44	W	30	45	D	25	50	2.00	0.64	0.25
17	44	W	30	0	D	25	50	1.90	0.61	0.24

\* B = Unstable; D = Moderately Unstable

°F = degrees Fahrenheit

cf = cubic feet

mph = miles per hour

ppm = parts per million

W = west

## **5.0 ALOHA MODEL OUTPUT DIAGRAMS FOR CIMAREX PROJECT**

The diagrams that follow show the three identified LOCs for potential release of H<sub>2</sub>S under specified atmospheric conditions and leak parameters, as identified in Table 1.

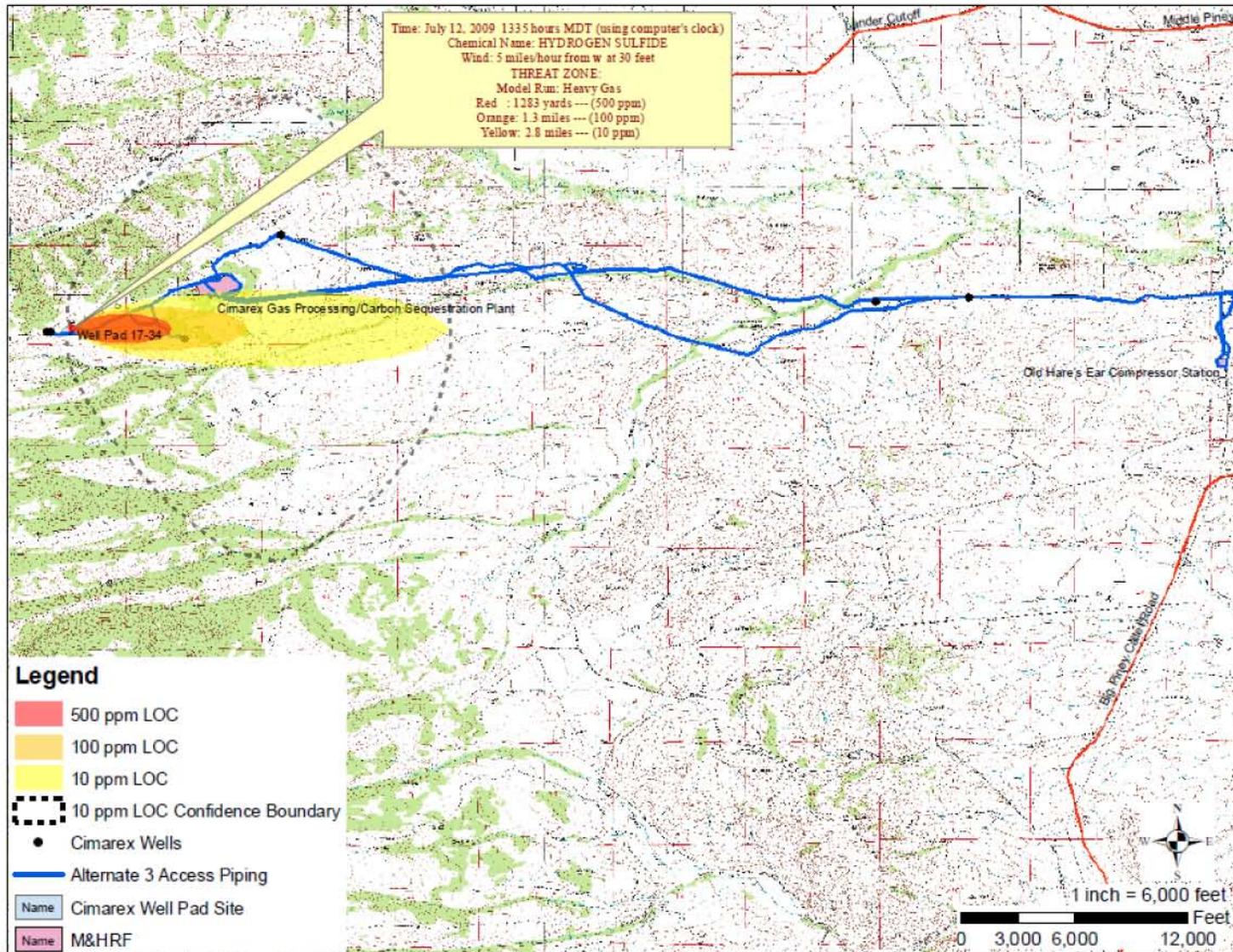


Figure 1. Modeled LOC for H<sub>2</sub>S Release at Acid-gas Injection Well (No Check Valve) with West Wind at 5 mph, 75° F, Unstable Atmosphere, 25% Humidity, and 50% Cloud Cover.

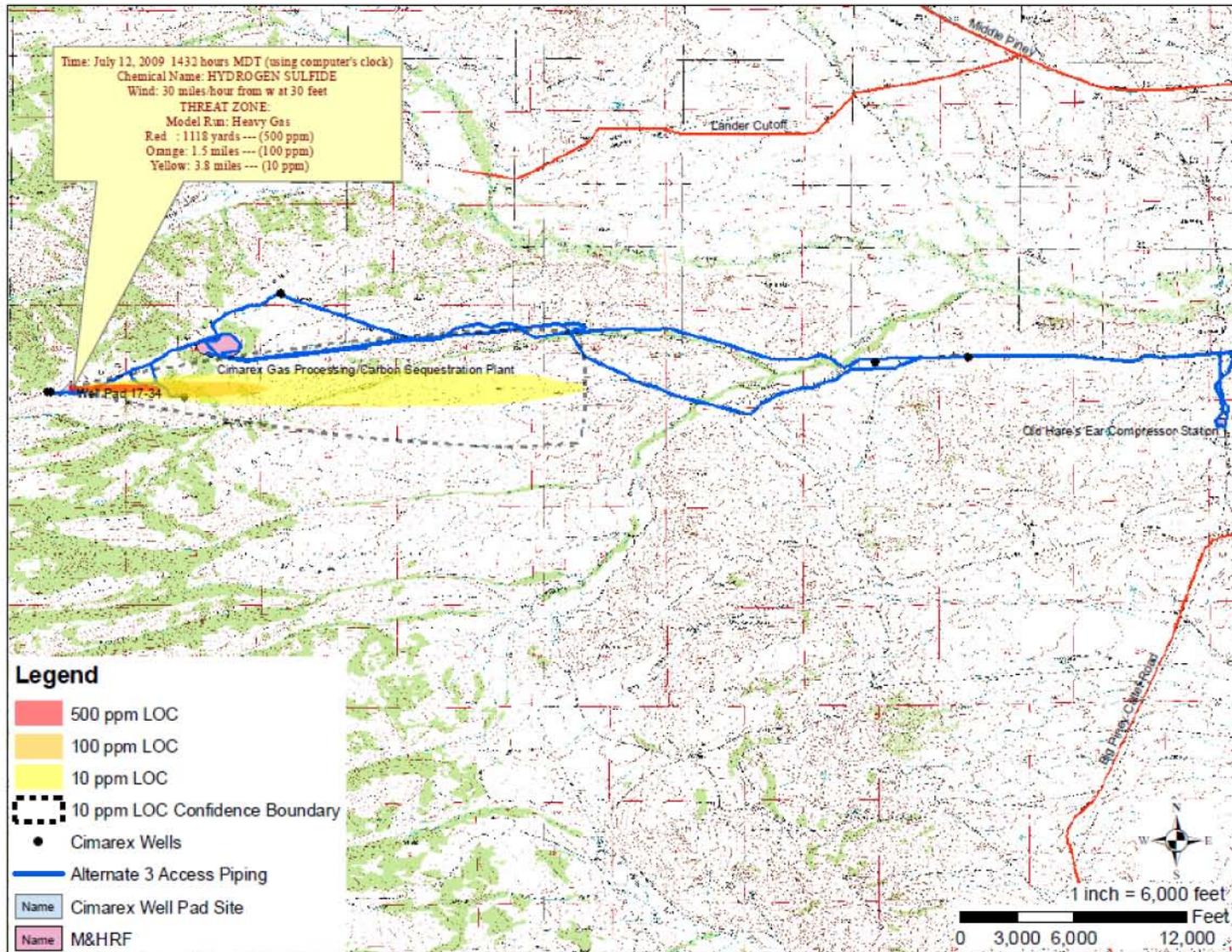


Figure 2. Modeled LOC for H<sub>2</sub>S Release at Acid-gas Injection Well (No Check Valve) with West Wind at 30 mph, 75° F, Moderately Unstable Atmosphere, 25% Humidity, and 50% Cloud Cover.

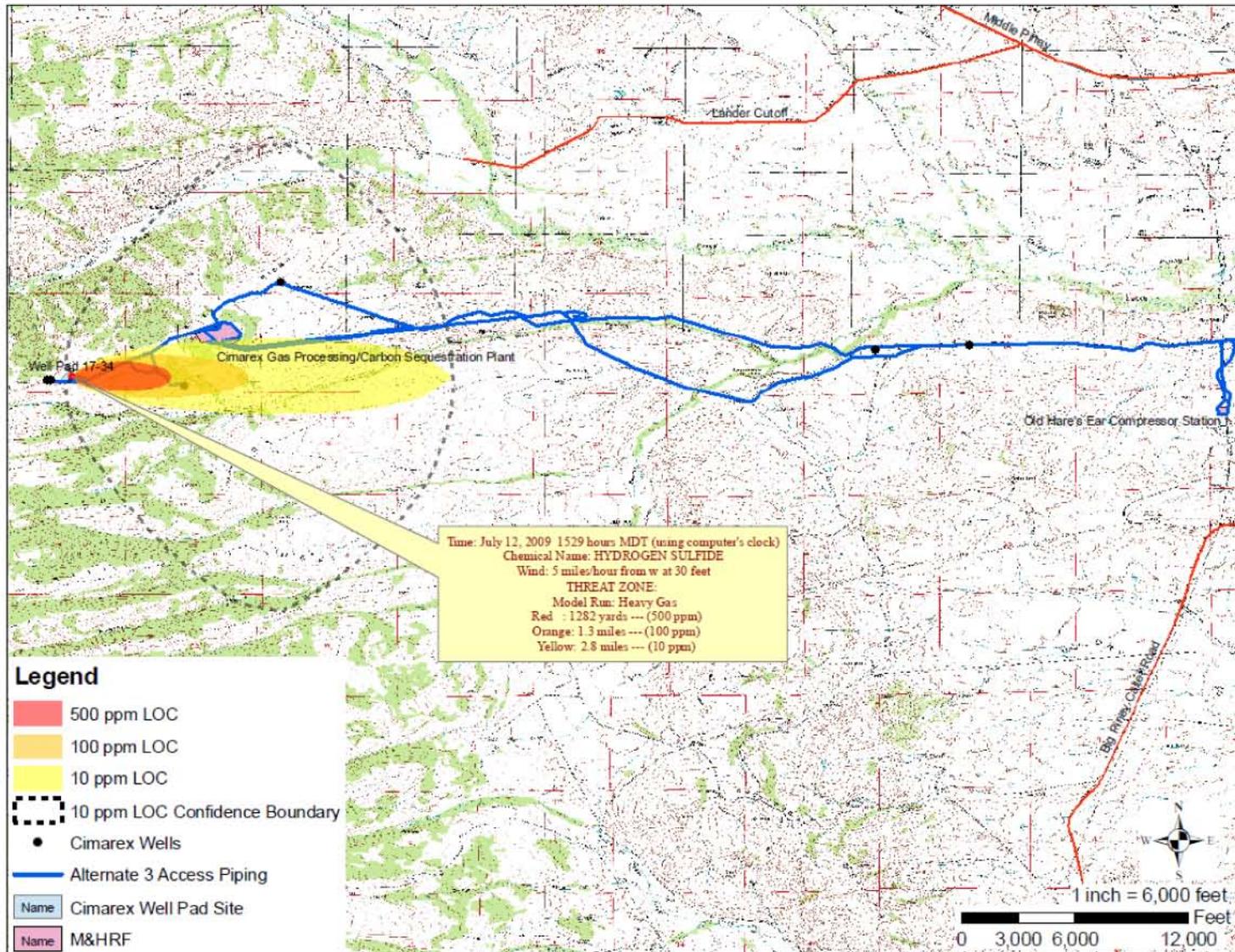


Figure 3. Modeled LOC for H<sub>2</sub>S Release at Acid-gas Injection Well (No Check Valve) with West Wind at 5 mph, 75° F, Unstable Atmosphere, 50% Humidity, and 0% Cloud Cover.

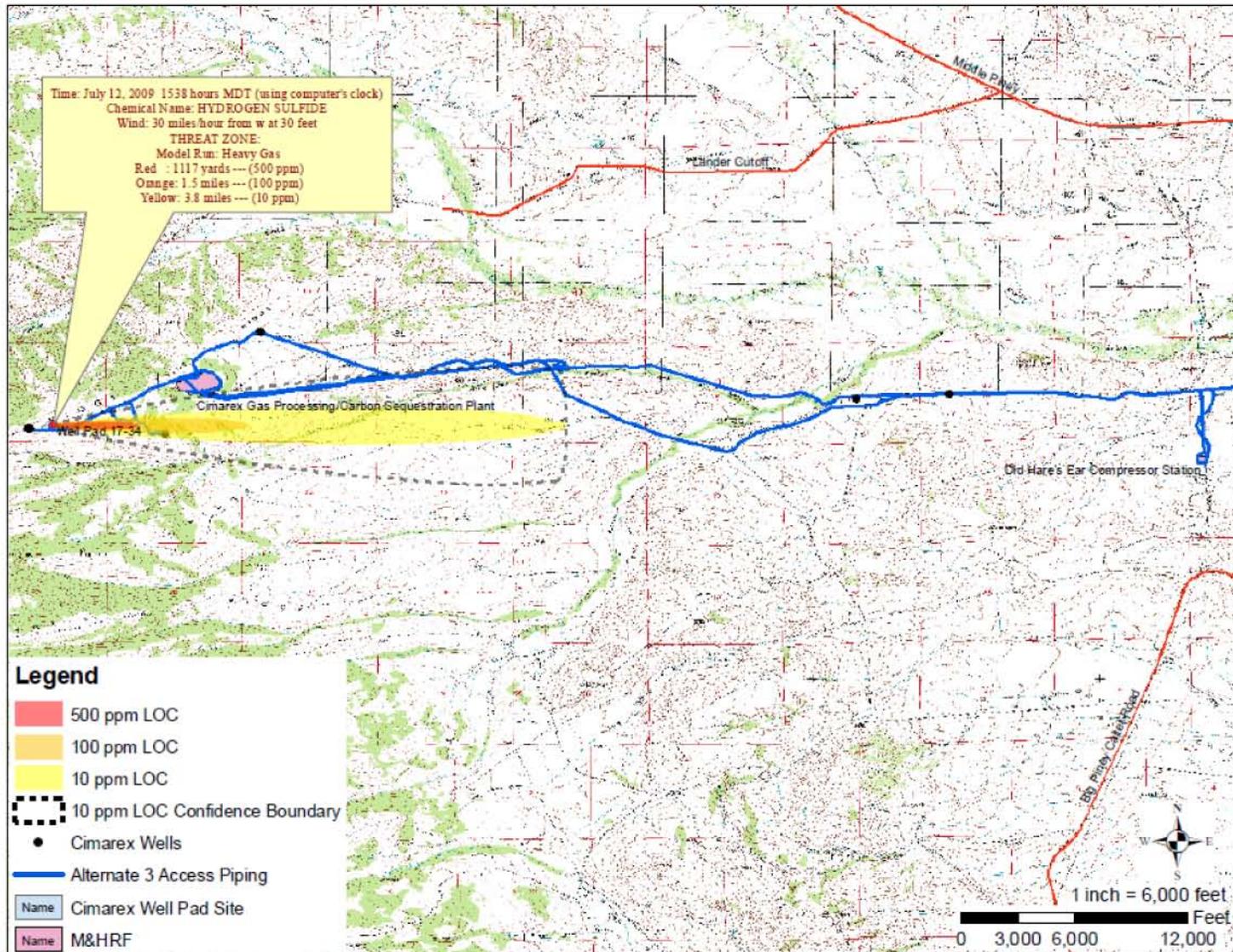


Figure 4. Modeled LOC for H<sub>2</sub>S Release at Acid-gas Injection Well (No Check Valve) with West Wind at 30 mph, 75° F, Moderately Unstable Atmosphere, 50% Humidity, and 0% Cloud Cover.

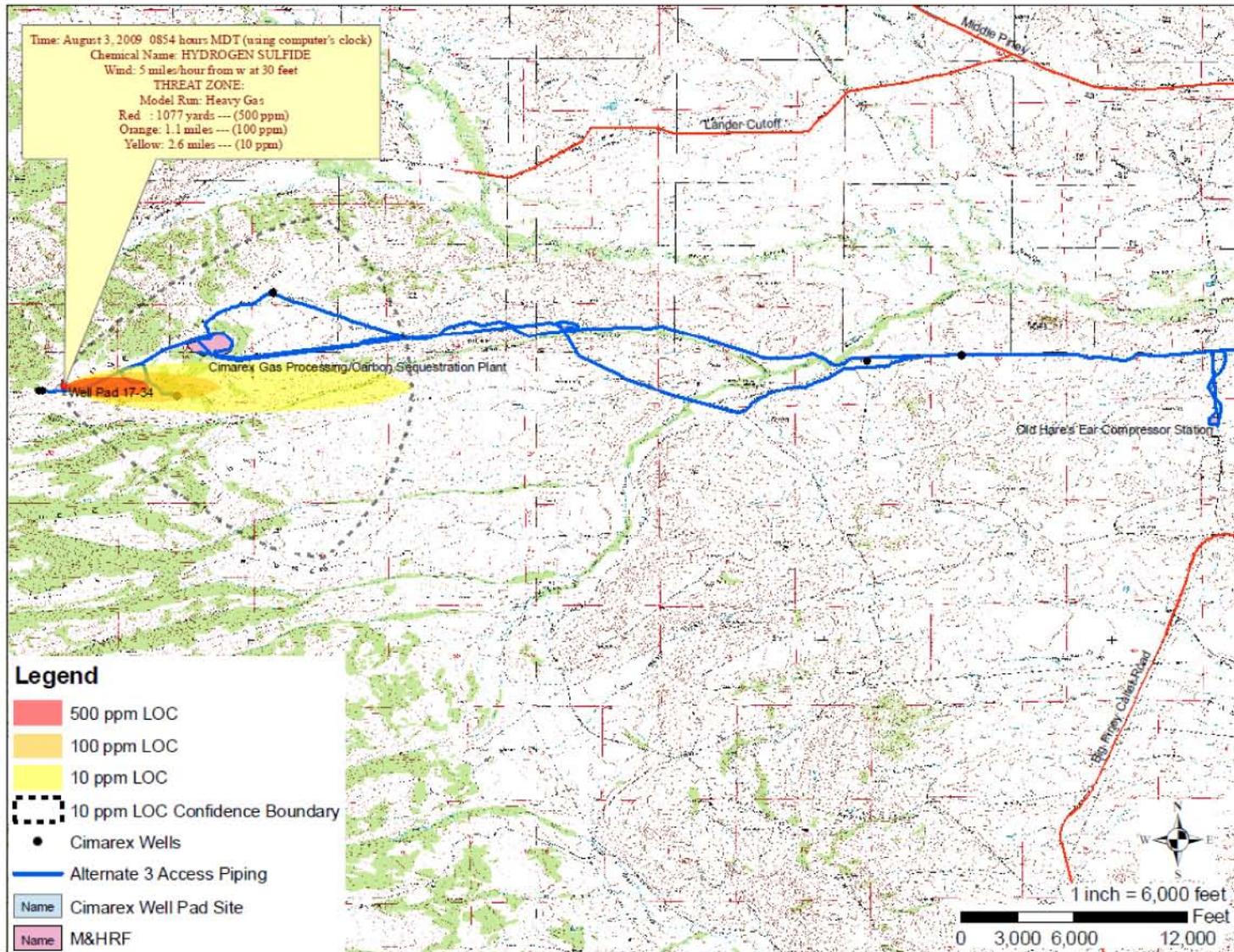


Figure 5. Modeled LOC for H<sub>2</sub>S Release at Acid-gas Injection Well (With Check Valve) with West Wind at 5 mph, 75° F, Unstable Atmosphere, 25% Humidity, and 50% Cloud Cover.

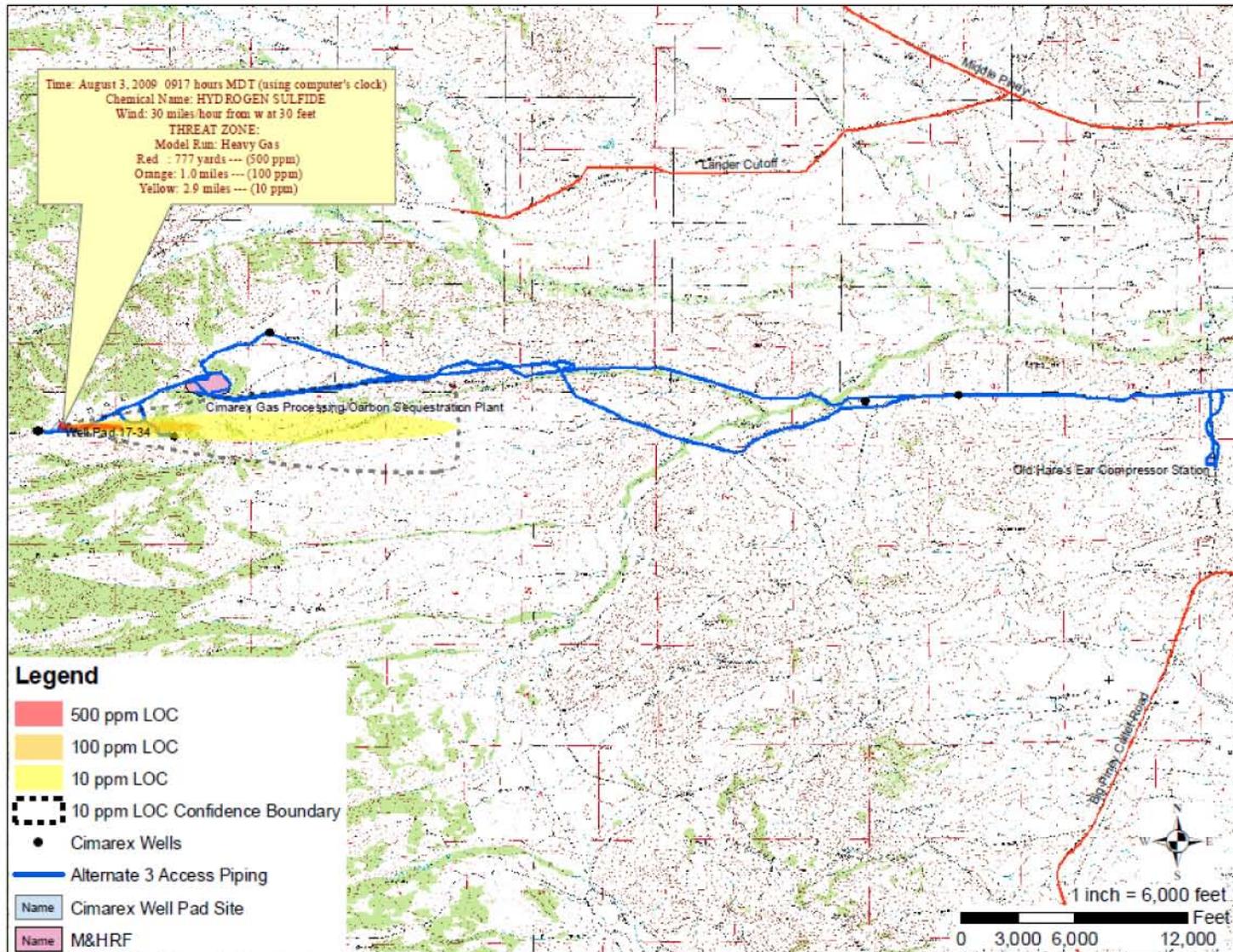


Figure 6. Modeled LOC for H<sub>2</sub>S Release at Acid-gas Injection Well (No Check Valve) with West Wind at 30 mph, 75° F, Moderately Unstable Atmosphere, 25% Humidity, and 50% Cloud Cover.

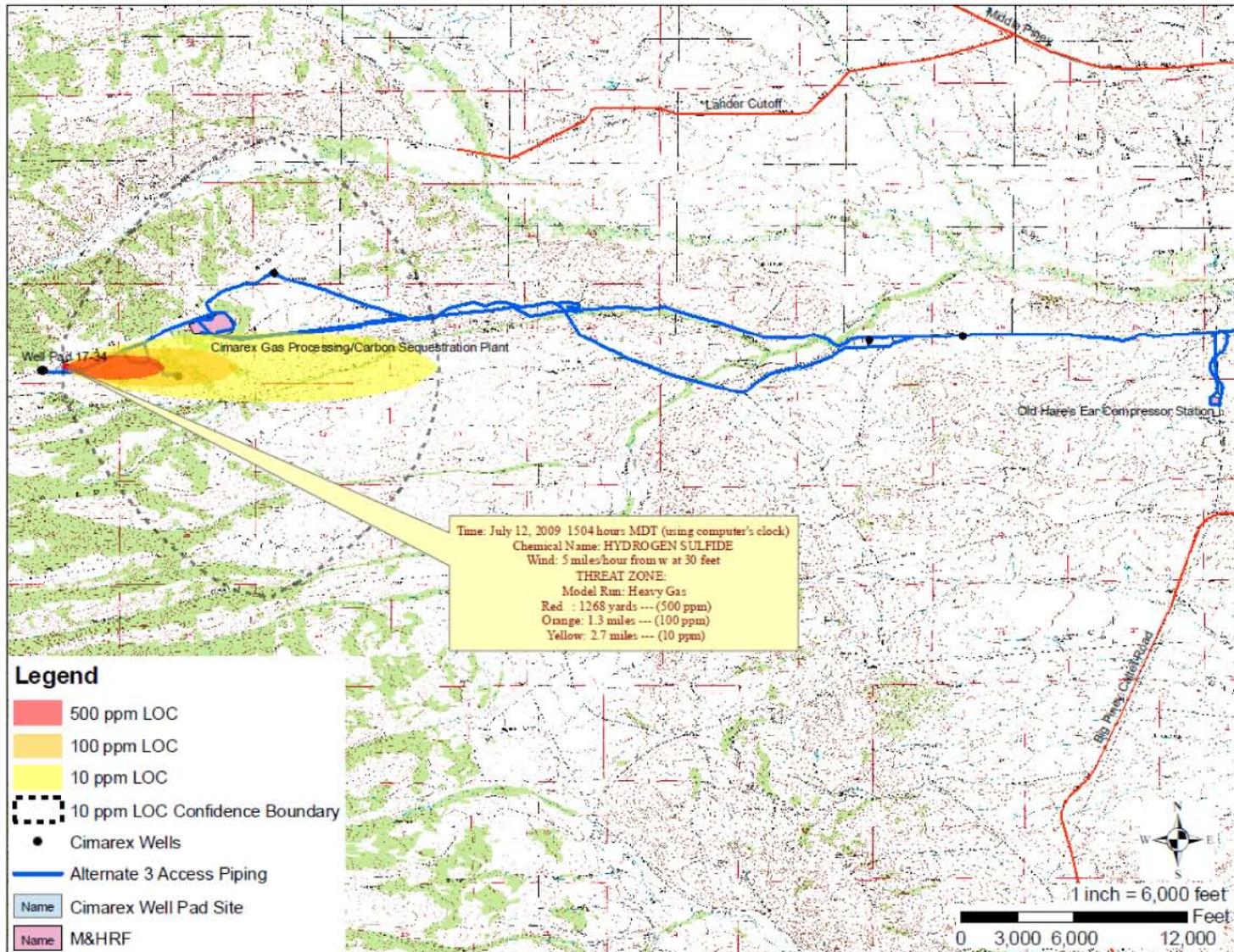


Figure 7. Modeled LOC for H<sub>2</sub>S Release at Acid-gas Injection Well (No Check Valve) with West Wind at 5 mph, 45° F, Unstable Atmosphere, 50% Humidity, and 50% Cloud Cover.

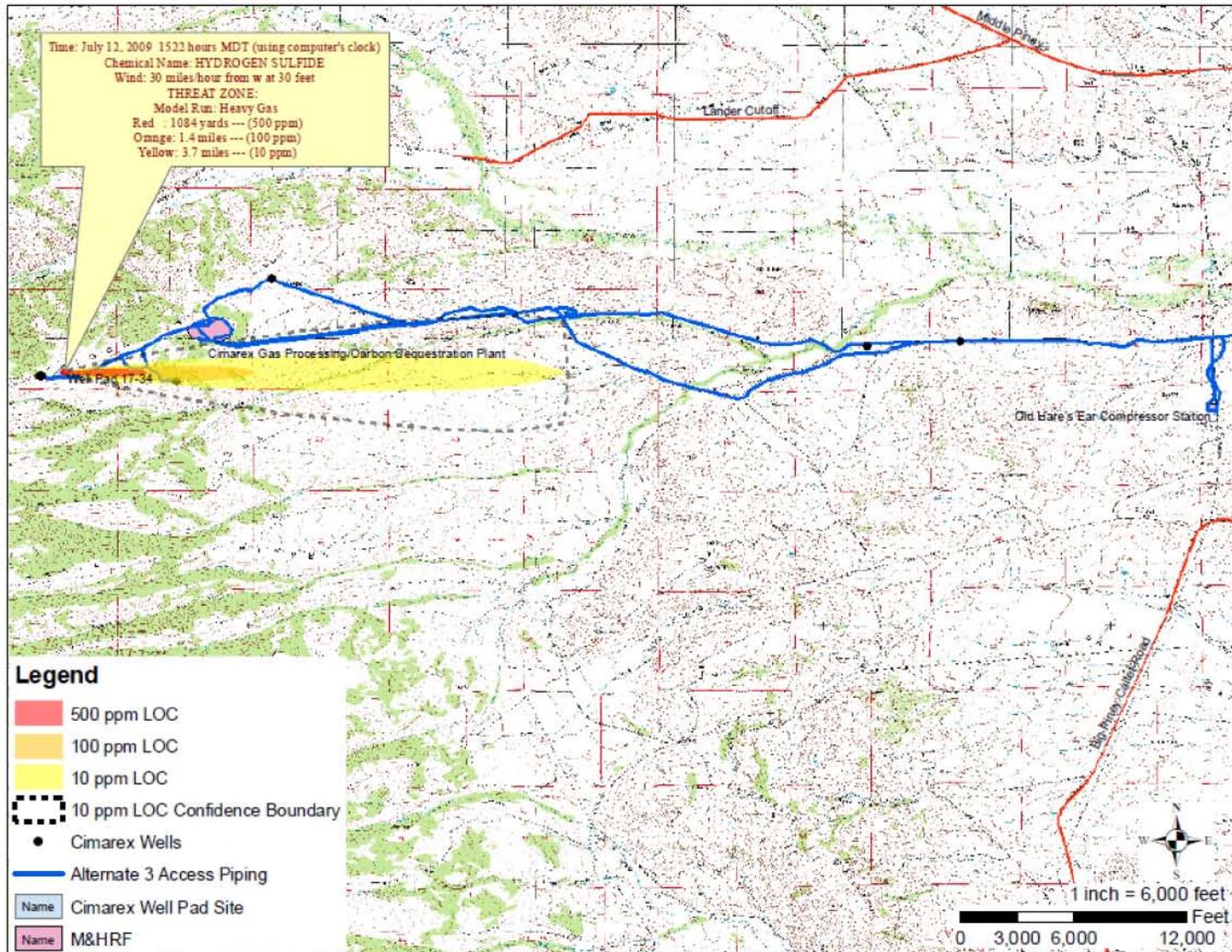


Figure 8. Modeled LOC for H<sub>2</sub>S Release at Acid-gas Injection Well (No Check Valve) with West Wind at 30 mph, 45° F, Moderately Unstable Atmosphere, 50% Humidity, and 50% Cloud Cover.

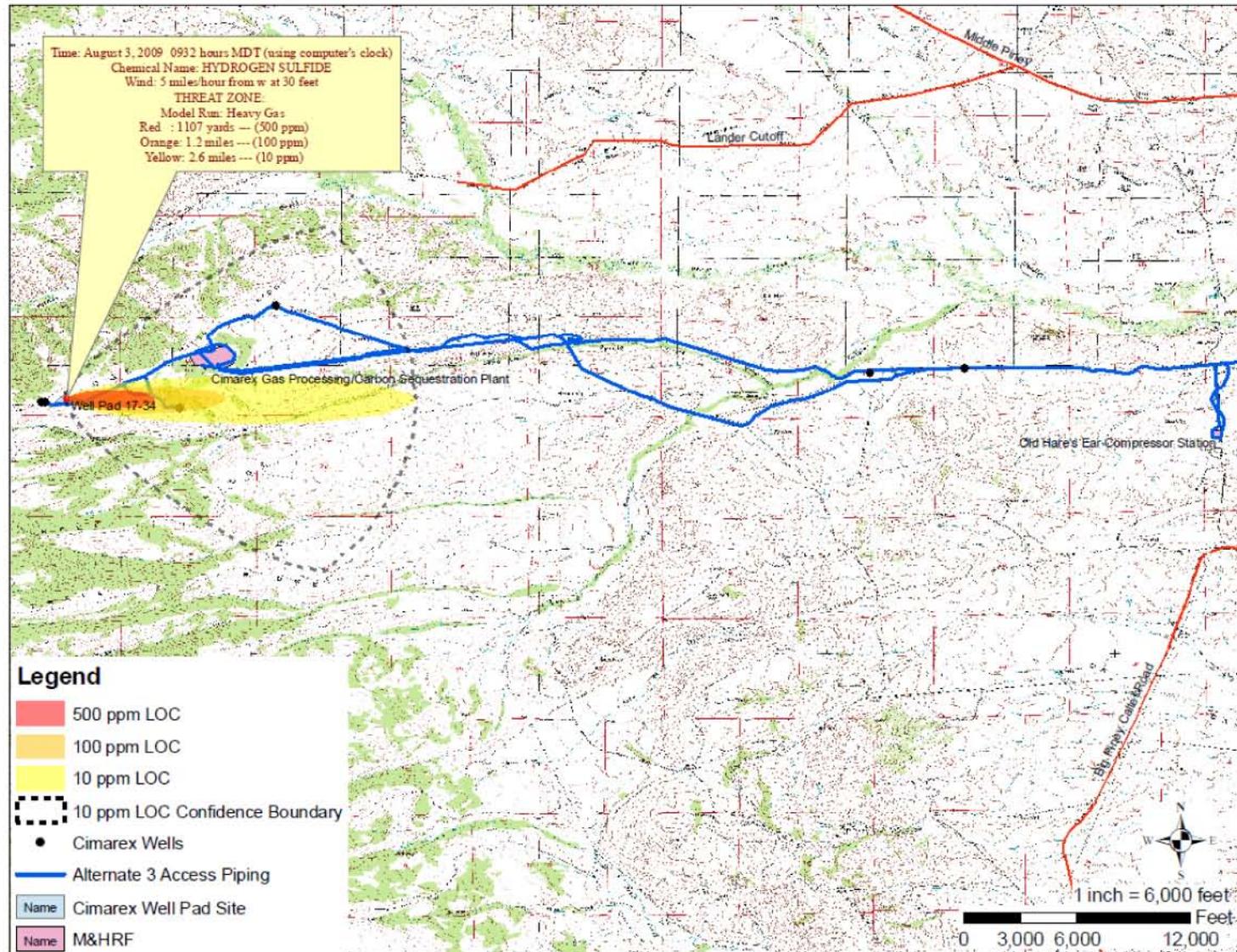


Figure 9. Modeled LOC for H<sub>2</sub>S Release at Acid-gas Injection Well (With Check Valve) with West Wind at 5 mph, 45° F, Unstable Atmosphere, 25% Humidity, and 50% Cloud Cover.

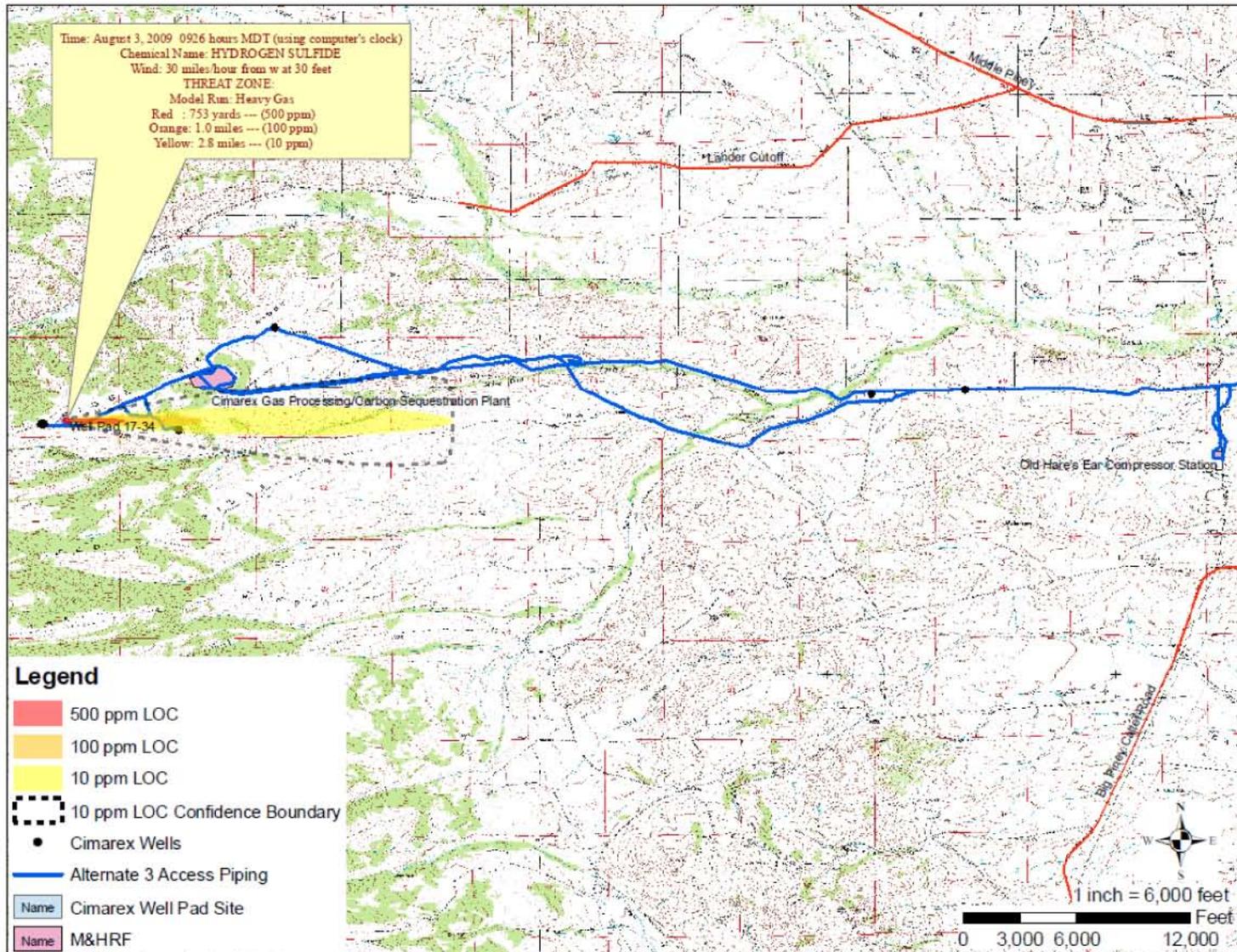


Figure 10. Modeled LOC for H<sub>2</sub>S Release at Acid-gas Injection Well (With Check Valve) with West Wind at 30 mph, 45° F, Moderately Unstable Atmosphere, 25% Humidity, and 50% Cloud Cover.

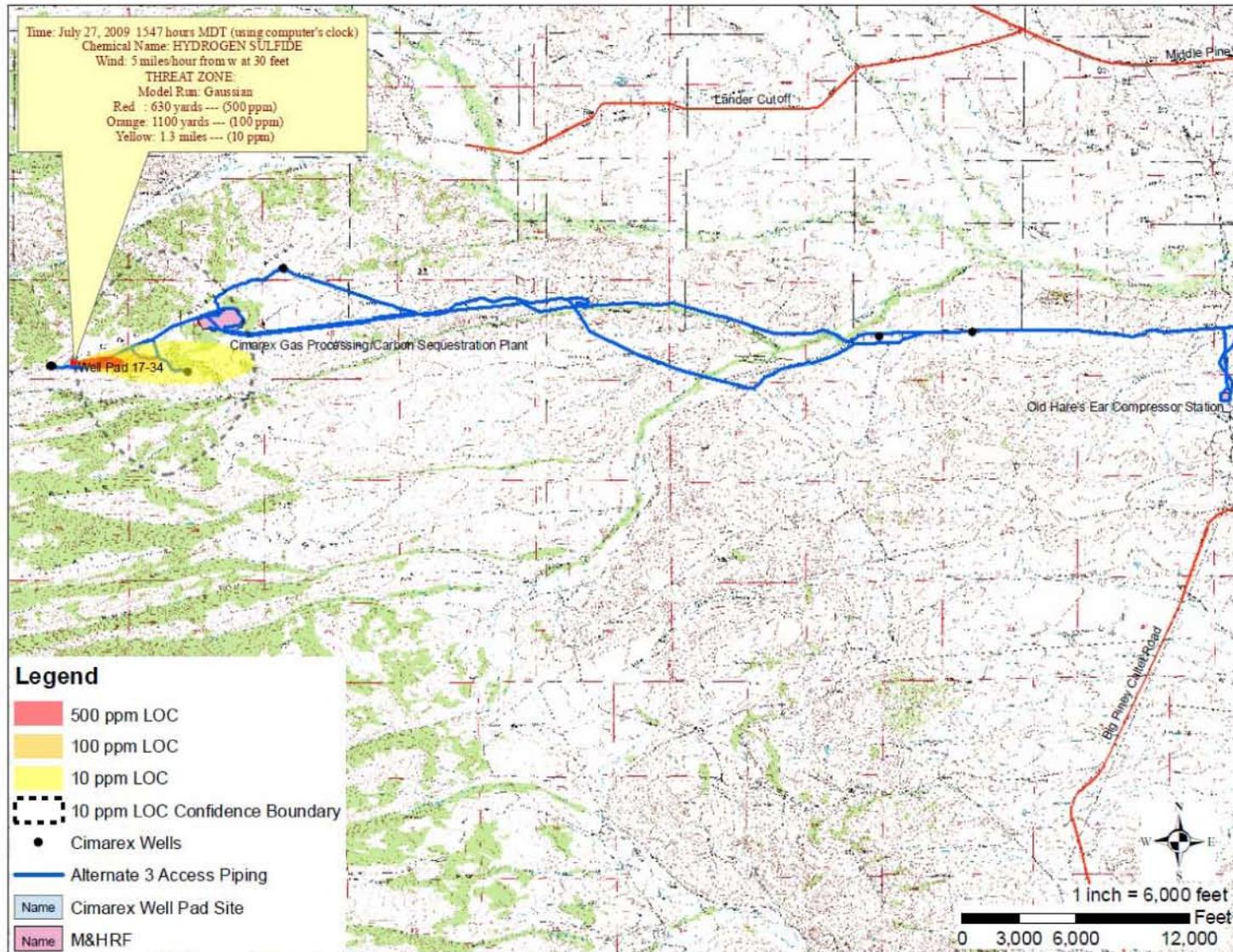


Figure 11. Modeled LOC for H<sub>2</sub>S Release at Acid-gas Injection Well (No Check Valve) with West Wind at 5 mph, 0° F, Unstable Atmosphere, 5% Humidity, and 50% Cloud Cover.

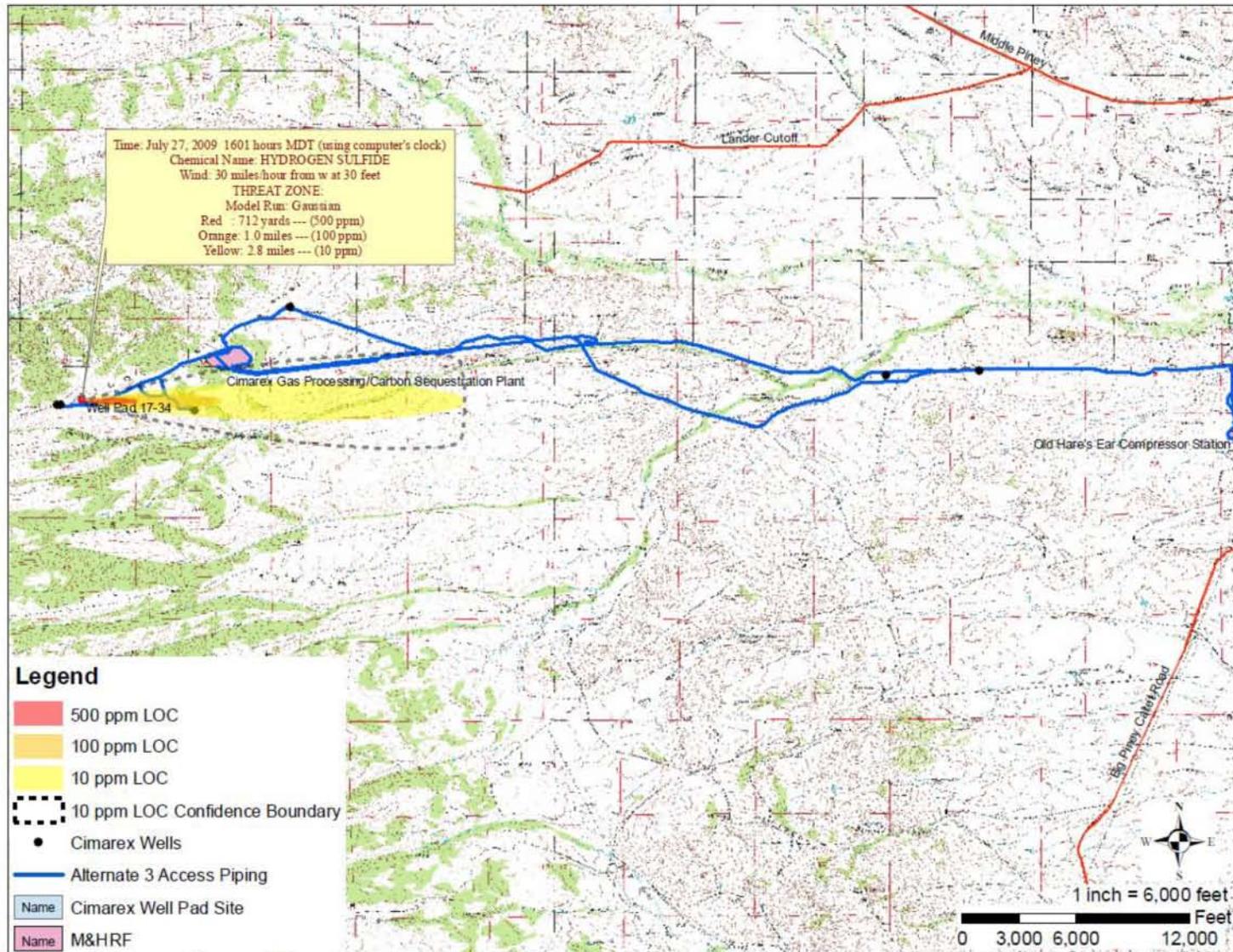


Figure 12. Modeled LOC for H<sub>2</sub>S Release at Acid-gas Injection Well (No Check Valve) with West Wind at 30 mph, 0° F, Moderately Unstable Atmosphere, 5% Humidity, and 50% Cloud Cover.

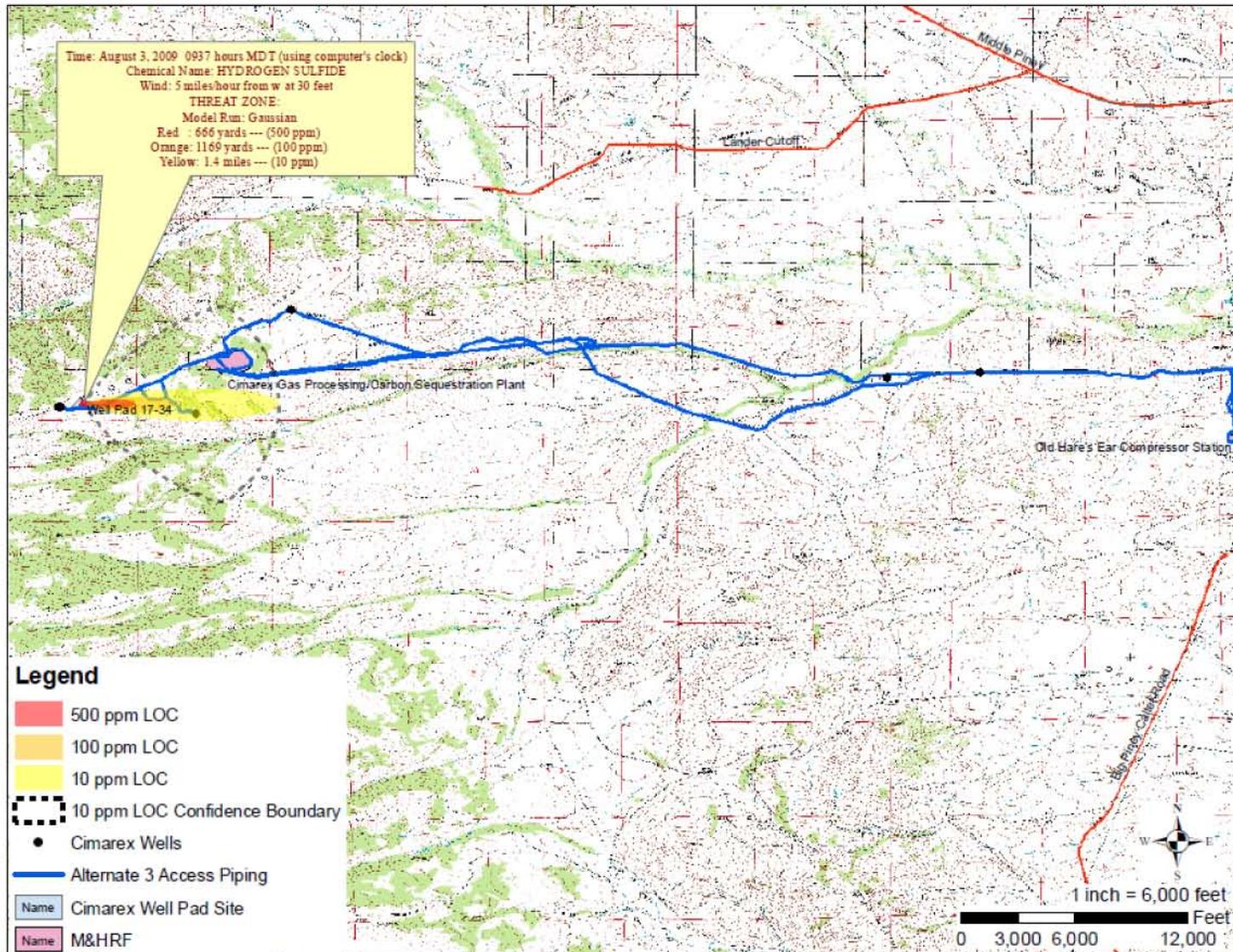


Figure 13. Modeled LOC for H<sub>2</sub>S Release at Acid-gas Injection Well (With Check Valve) with West Wind at 5 mph, 0° F, Unstable Atmosphere, 25% Humidity, and 50% Cloud Cover.

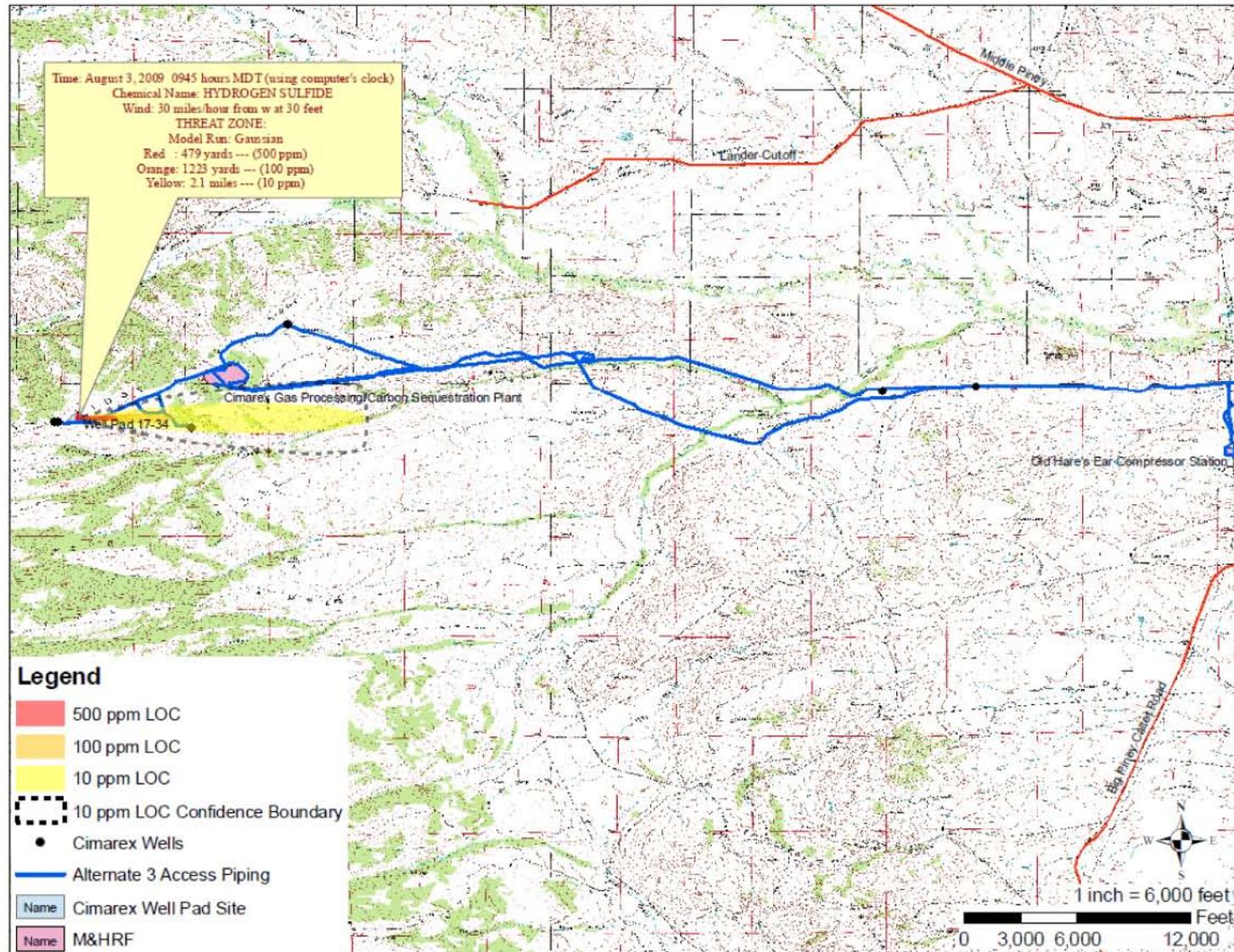


Figure 14. Modeled LOC for H<sub>2</sub>S Release at Acid-gas Injection Well (With Check Valve) with West Wind at 30 mph, 0° F, Moderately Unstable Atmosphere, 25% Humidity, and 50% Cloud Cover.

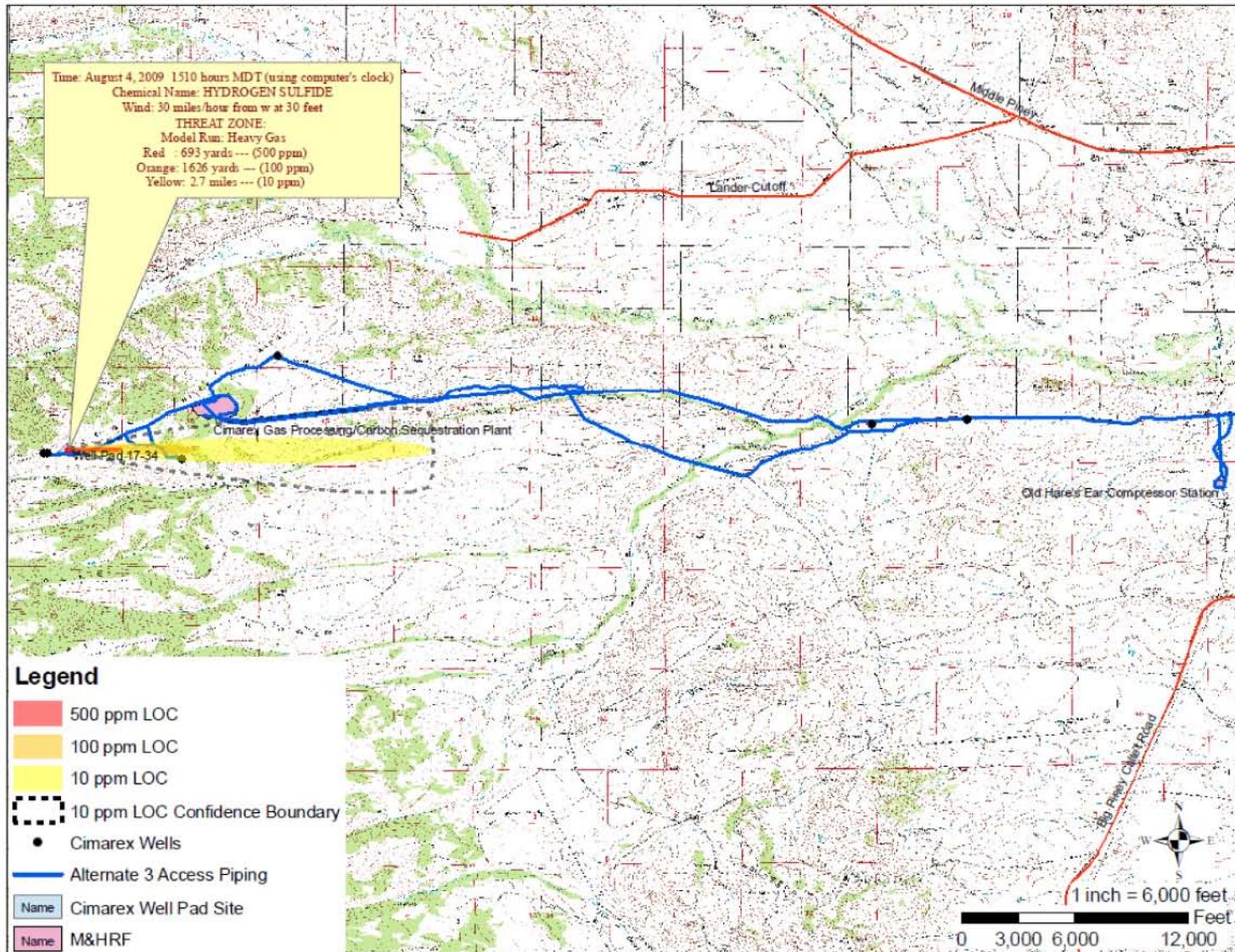


Figure 15. Modeled LOC for H<sub>2</sub>S Release at Sour Gas Production Well with West Wind at 30 mph, 75° F, Moderately Unstable Atmosphere, 25% Humidity, and 50% Cloud Cover.

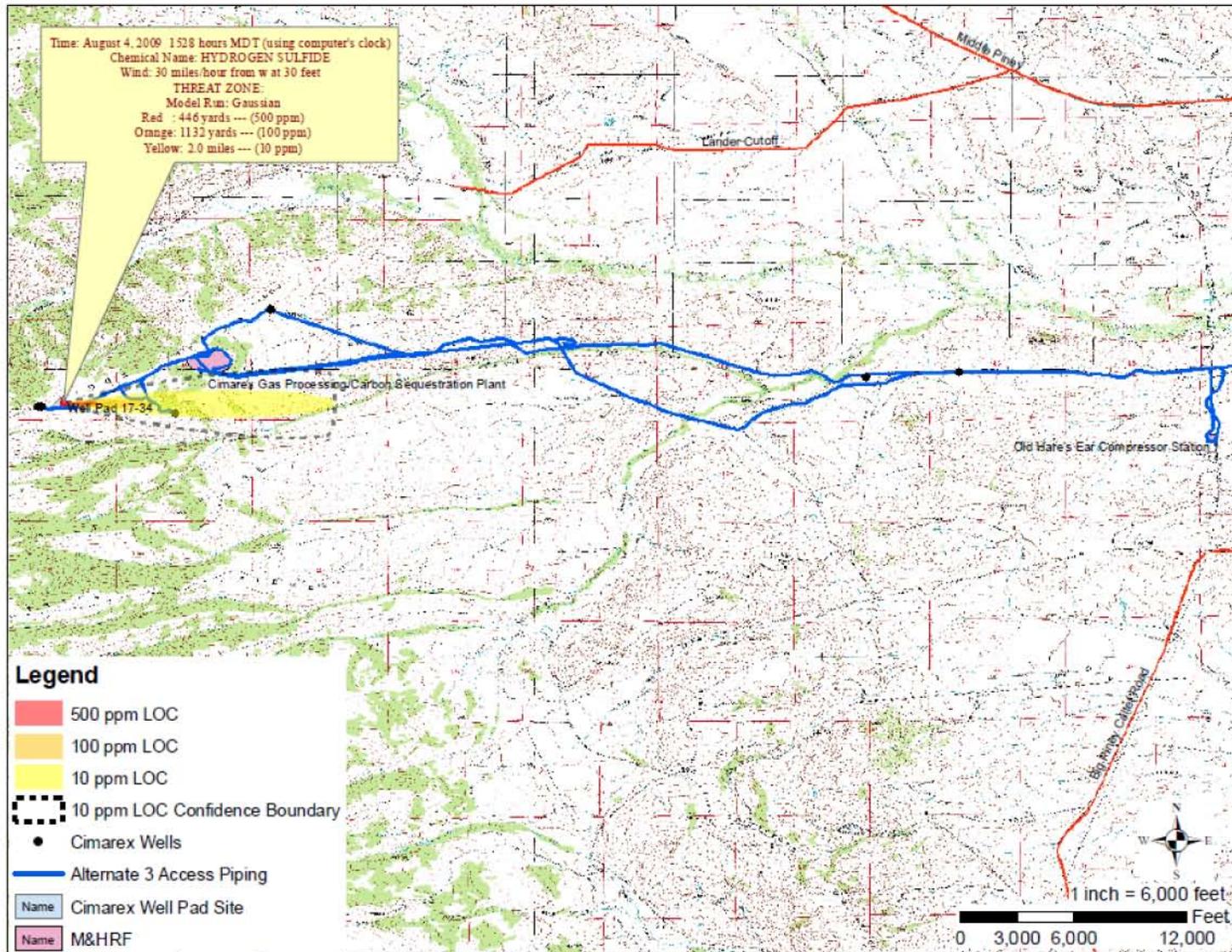


Figure 16. Modeled LOC for H<sub>2</sub>S Release at Sour Gas Production Well with West Wind at 30 mph, 45° F, Moderately Unstable Atmosphere, 25% Humidity, and 50% Cloud Cover.

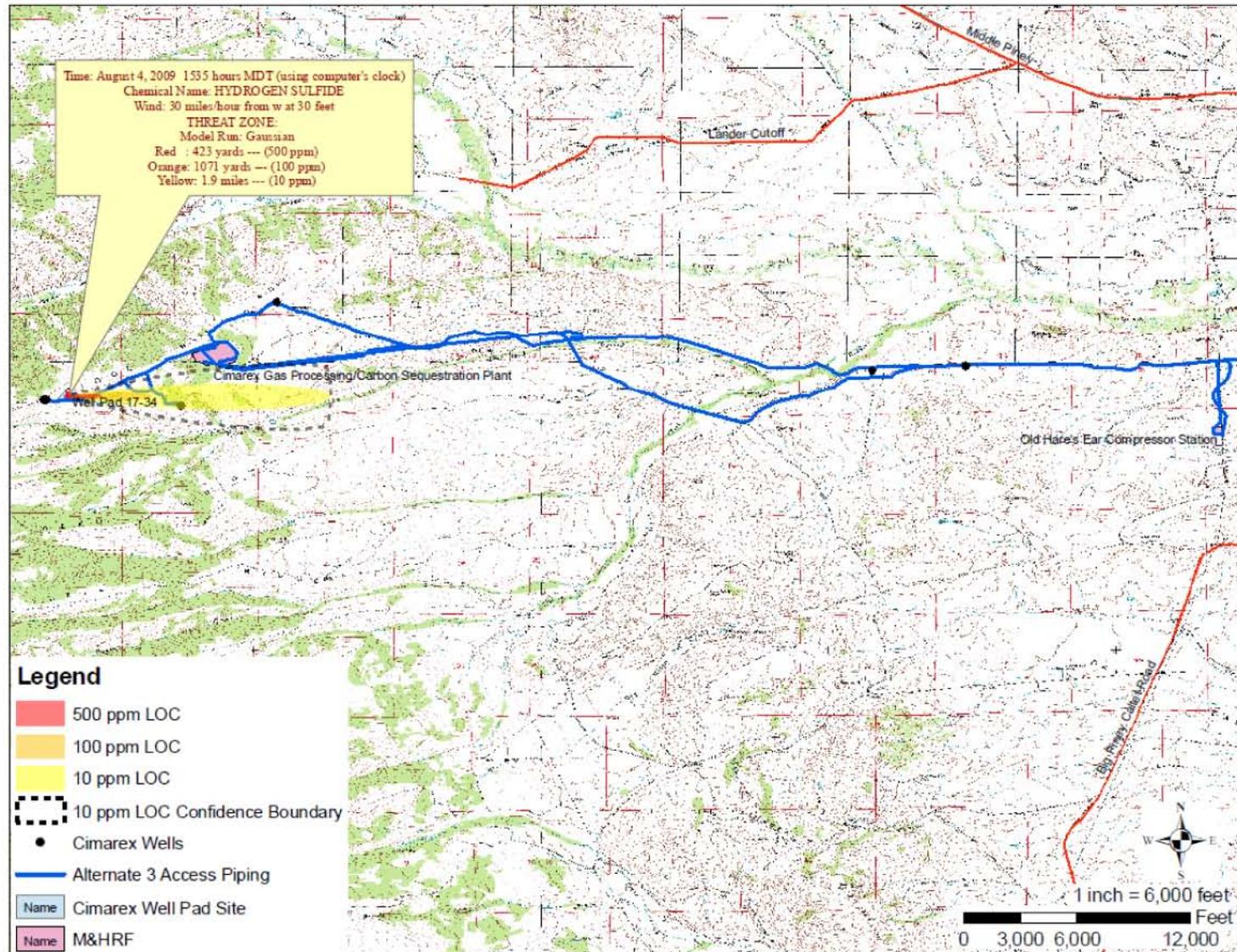


Figure 17. Modeled LOC for H<sub>2</sub>S Release at Sour Gas Production Well with West Wind at 30 mph, 0° F, Moderately Unstable Atmosphere, 25% Humidity, and 50% Cloud Cover.

## **6.0 REFERENCES**

U.S. Environmental Protection Agency and National Oceanic and Atmospheric Agency (EPA and NOAA). 2007. ALOHA User Manual. The Cameo Software System, Washington, DC.

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**Appendix F**  
**BLM Pinedale Field Office Best Management Practices**

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## APPENDIX 3—MITIGATION GUIDELINES AND OPERATING STANDARDS APPLIED TO SURFACE DISTURBING AND DISRUPTIVE ACTIVITIES

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The purposes of the Mitigation Guidelines, Outcomes, and Operating Standards are (1) to reserve, for the Bureau of Land Management (BLM), the right to modify the operations of all surface and other human presence disturbance activities as part of the statutory requirements for environmental protection, and (2) to inform a potential lessee, permittee, or operator of the requirements that must be met when using BLM-administered public lands. These guidelines have been written in a format that will allow for (1) their direct use as stipulations and (2) the addition of specific or specialized mitigation following the submission of a detailed plan of development or other project proposal, and an environmental analysis.

Operating standards are given as acceptable methods for mitigating anticipated effects and achieving the desired plan outcomes but are not prescribed as the only method for achieving the outcomes. These measures will provide the BLM and other land users, including industry, greater adaptability in protecting surface resources by emphasizing the intent or outcome of mitigation. This mitigation strategy will help the BLM make decisions effectively by using a rigorous combination of management, research, and monitoring so that credible information is gained and management activities can be modified, over time, based on continuous experience.

The mitigations are requirements, procedures, management practices, or design features that the BLM, through the record of decision (ROD), could adopt as operational requirements. These requirements will be addressed through the permitting process. An oil and gas lease does not in itself authorize any on-the-ground activity. Seismic operations, drilling, pipeline construction, and other development activities require additional land use authorizations. Any applicant requesting such authorization must address the operating standards either before submitting the application (e.g., for wildlife surveys) or as part of the application proposal. The applicability of the mitigating operating standards goes beyond the oil and gas lease to any permitted activity where the requirement is relevant.

Operating standards are listed that could be applied to exploratory oil and gas drilling and other operations. When drilling intensity proceeds to the development stage, additional environmental analysis will be necessary. The operating standards could be revised at the gas field development environmental impact statement (EIS) stage if necessary.

These guidelines and standards could be applied to surface disturbing and human presence activities such as oil and gas development, road or pipeline construction, range improvements, forest management, vegetation treatment, and permitted recreation activities. They are designed to protect resources such as soils and vegetation, wildlife habitat, or cultural or historic properties. The use and application of specific mitigation measures will be made during the environmental process for individual proposals. Mitigation measures and operating standards could change or be modified, based on new information.

The mitigation guidelines are used in two ways in the Resource Management Plan (RMP) and EIS process: (1) as part of the planning criteria in developing the RMP alternatives and (2) in the analytical processes of developing the alternatives and analyzing the impacts of the alternatives. In the first case, an assumption is made that one or more of the mitigations will be included appropriately as conditions of relevant actions being proposed or considered in each alternative. In the second case, the mitigations are used to (1) develop a baseline for measuring and comparing impacts among the alternatives; (2) identify other actions and alternatives that should be considered, and (3) help determine whether more stringent or less stringent mitigations should be considered.

Those resource activities or programs currently without a standardized set of permit or operation stipulations can use the mitigation guidelines as stipulations or as conditions of approval, or as a baseline for developing specific stipulations for a given activity or program.

BLM may add additional site-specific restrictions as deemed necessary by further environmental analysis and as developed through consultation with other federal, state, and local regulatory and resource agencies. Laws or regulations may require other federal, state, and local permits (e.g., Clean Water Act Section 404) for an oil and gas or other project to proceed. Specific state permits may be required when the state has primary authority, under federal or state law or regulation, to enforce the provision in question. Specific permits issued by federal agencies other than the BLM could include permit conditions that are more stringent than those presented below.

## PERMITTING AND AUTHORIZATION PROCESS

The operating standards identified in the following sections will not be attached as stipulations on oil and gas leases. The oil and gas lease is a binding agreement between BLM and the lessee that does not authorize subsequent surface disturbing activity. All surface disturbing activities (e.g., exploratory drilling, road/pipeline construction, or seismic operations) require additional authorization(s) issued subsequent to leasing. This authorization or permitting process, which includes permits, leases, and rights-of-way, is a multistep process as follows:

- **Perform Preapplication Consultation.** The BLM meets and consults with the potential applicant and other affected parties before submission of any written application(s). At the time of the preapplication consultation, the applicant is informed of BLM procedures and operating requirements, including any other federal, state, or local permit requirements so that any inadequacies and deficiencies in the verbal proposal can be addressed with the submittal of the application. Also at this time, the BLM, the applicant, and other affected parties may visit the proposed site to identify unknown issues.
- **Review Written Application for Completeness.** Based on an initial review of the written application, additional information may be requested, or application may be rejected.
- **Evaluate Application.** A BLM Interdisciplinary (ID) Team reviews the proposal to—
  - Determine if the proposal complies with the **Outcome and Operating Standards**; this may be accomplished by adhering to the recommended requirements/standards or by the use of new techniques/practices that meet the objective(s).
  - Based on additional analysis (e.g., National Environmental Policy Act [NEPA] of 1969, environmental assessment [EA] or EIS), identify any new mitigations that may be required based on site and project-specific information, including any new issues identified throughout this process.
  - Identify appropriate monitoring levels to determine the effectiveness of the mitigations.
- **Issue Authorization.** Issue authorization with appropriate terms and conditions of approval identified or attached.

## Exception Process

The permitting process, in conjunction with lease stipulations and operating standards that are focused on resource management objectives, should result in the need for few exceptions. However, the need to

consider exceptions and/or modifications will remain on a case-by-case basis. The following guidelines will be used for considering and granting exceptions to the proposed stipulations or operating standards.

If an exception to a stipulation, condition of approval, or operating standard is requested and before an exception may be granted, the lessee and permittee shall demonstrate to the satisfaction of the Authorized Officer (AO) that implementation of the stipulation or operating standard:

- (1) Is technically not feasible, or (2) is economically prohibitive, or (3) an environmentally preferable alternative is available; and
- The alternative proposed by the lessee/permittee fully satisfies the objective/outcome of the lease stipulation or operating standard.

The lessee/permittee shall notify the AO in a timely manner that an exception will be requested. In demonstrating to the AO that the proposal meets the above criteria, the lessee/permittee shall provide sufficient documentation (e.g., technical reports, new/revised procedures, results of scientific research) to allow for a thorough review and evaluation of the proposal.

Before consideration or granting of an exception to a stipulation, condition of approval, or operating standard, consultation requirements must be met. The AO shall consult with appropriate federal, state, and local regulatory and resource agencies before an exception may be granted. The AO's power to grant exceptions to an operating standard is limited to those subjects, uses, and permits over which the BLM has authority. Exceptions to this consultation may be granted in emergencies involving human health and safety. The granting of an exception will not require a modification/amendment to the land use plan because exceptions will be consistent with the land use plan in achievement of the management objective.

The BLM may also initiate an exception to a stipulation, condition of approval, or operating standard when information (e.g., technical reports, new/revised procedures, or results of scientific research) becomes available that demonstrates that the proposal satisfies the objective of the operating standard and meets the management objectives for the area in which the alternative is proposed. Exceptions will be considered, evaluated, and processed in accordance with Appendix 8.

Waiver of, or exception(s) to, the no surface occupancy (NSO) requirement will be subject to the same test used to initially justify its imposition. If, upon evaluation of a site-specific proposal, it is found that less restrictive mitigation would adequately protect the public interest or value of concern, then a waiver or exception to the NSO requirement is possible. The record must show that because conditions or uses have changed, less restrictive requirements will protect the public interest. An environmental analysis must be conducted and documented to provide a basis for a waiver or exception to an NSO planning decision. Modification of the NSO requirement will pertain to only refinement or correction of the location(s) to which it applied. If the waiver, exception, or modification is found to be consistent with the intent of the planning decision, it may be granted. If the waiver, exception, or modification is found inconsistent with the intent of the planning decision, a plan amendment will be required before the waiver, exception, or modification could be granted.

Please refer to Appendix 8 for further information on exceptions.

## MITIGATIONS

### General Guidelines

Proposed project development will require the appropriate level of environmental review in accordance with applicable federal, state, and local regulations.

Removal and disturbance of vegetation will be kept to a minimum through construction site management (e.g., using previously disturbed areas and existing easements, limiting equipment/materials storage yard and staging area size).

Where necessary, areas to be disturbed will require inventories or special studies to determine the extent of site-specific impacts and appropriate mitigation. Operators will be required to complete inventories or short-term special studies under guidelines provided by the BLM or as developed through the AM planning process.

There will be no well location or production facility surface occupancy within one-quarter mile of an occupied dwelling to prevent damage to human health and safety and/or other resources. Any surface use or occupancy within such special areas is prohibited or, if absolutely necessary, strictly controlled.

No surface disturbance is permitted on slopes in excess of 25 percent unless erosion controls can be ensured and adequate revegetation is expected. Engineering proposals and revegetation and restoration plans are required in these areas.

Unnecessary topographic alterations will be mitigated by avoiding, where possible, steep slopes, rugged topography, and perennial and ephemeral/intermittent drainages, and by minimizing the area disturbed. Alternative methods of construction to minimize environmental impacts may also be used.

Construction with frozen material or during periods when the soil material is saturated or when watershed damage is likely to occur is prohibited, unless or until an operator, permittee, or his/her designated representative and the surface management agency, prior to development, arrive at an acceptable plan for mitigation of anticipated impacts.

### Air Quality

Air quality mitigation will be voluntary or required by the BLM.

In accordance with Wyoming Air Quality Standards and Regulations, Chapter 3, Section 2(f), the emission of fugitive dust will be limited by all persons handling, transporting, or storing any material to prevent unnecessary amounts of particulate matter from becoming airborne to the extent that ambient air standards described in these regulations are exceeded.

Necessary air quality permits to construct, test, and operate facilities will be obtained from the Wyoming Department of Environmental Quality-Air Quality Division (WDEQ-AQD). All internal combustion equipment will be kept in good working order. Best available control technology (BACT) will be implemented as required by WDEQ-AQD.

Operators will comply with all applicable local, state, tribal, and federal air quality laws, statutes, regulations, standards, and implementation plans, including Wyoming Ambient Air Quality Standards (WAAQS) and National Ambient Air Quality Standards (NAAQS).

To avoid the incremental risk of exposure to carcinogenic toxins from producing wells, no well will be located closer than 0.25 mile from a dwelling or residence. At 0.25 mile, the incremental risk increase for the most likely exposure scenario is below the designated threshold level of less than 1 additional person per million.

To avoid incremental risk of exposure to carcinogenic toxins from compressor facilities, any compressor facility located closer than 4 miles to a dwelling or residence will require additional NEPA analysis prior to the final selection of the site and authorization to construct.

## **Cultural/Paleontological Resources**

If effects to paleontological values, or objects of historic or scientific interest are observed, the operator will be required to immediately contact the BLM and the operator will be required to cease any operations that would result in the destruction of or adverse impact to these values.

In areas of paleontological sensitivity, the BLM will make a determination as to whether a survey by a qualified paleontologist is necessary prior to the disturbance. In some cases, construction monitoring, project relocation, data recovery, or other mitigation will be required to ensure that significant paleontological resources are avoided or recovered during construction.

If paleontological resources are uncovered during surface-disturbing activities, operators will suspend operations at the site that would further disturb such materials and immediately contact the BLM AO, who will arrange for a determination of significance, and, if necessary, recommend a recovery or avoidance plan. Mitigation of impacts to paleontological resources will be conducted on a case-by-case basis, and operators will either avoid or protect paleontological resources.

Areas underlain by either the Wasatch or Green River formations have a high potential for containing vertebrate paleontological resources (fossils) and must be surveyed by a qualified paleontologist before surface disturbing activities will be authorized. Based on the results of the paleontological survey, additional monitoring and/or mitigation will be necessary. All major pipelines (12" and larger) will have paleontological open trench inspections and geologic research to resolve mapping issues discovered during the paleontological overview in the Jonah Field. Other actions, such as onsite project monitors by professional paleontologists while surface disturbing activities are occurring, and/or spot-checks of spoil piles, pits, and trenches prior to backfilling will become more common and will be considered standard stipulations within the Blue Rim-Ross Butte Management Area.

Operators will follow the Section 106 compliance process prior to any surface-disturbing activity and will either avoid or protect cultural resource properties as determined through consultation with the Wyoming State Historic Preservation Office (SHPO).

Operators will halt construction activities at the site of previously undetected cultural resources discovered during construction. The BLM will be notified immediately, and consultation with SHPO and, if necessary, the Advisory Council, will be initiated to determine proper mitigation measures pursuant to 36 Code of Federal Regulations (CFR) 800.11 or other treatment plans, programmatic agreements, or discovery plans that may direct such efforts. Construction will not resume until a Notice to Proceed is issued by the BLM.

In culturally sensitive soils, if cultural resources are located within frozen soils or sediments precluding the ability to adequately record or evaluate the find, construction work will cease and the site will be protected for the duration of frozen soil conditions. Following natural thaw, recordation, evaluation and recommendations concerning further management will be made to the BLM AO, who will consult with

affected parties. Construction work will be suspended until management of the threatened site has been finalized.

Should future work identify any traditional Native American religious or sacred sites, consultation among the BLM, the affected Native American group, the Wyoming SHPO and the project proponent will occur to resolve conflicts. This consultation will occur on a case-by-case basis or in conformance with an approved Native American Concerns Agreement Document.

Operators should inform their employees, contractors, and subcontractors about relevant federal regulations intended to protect archaeological and cultural resources. All personnel should be informed that collecting artifacts (including arrowheads) is a violation of federal law and that employees engaged in this activity may be subject to disciplinary action, which could include dismissal.

Equipment operators should be informed that a cultural resource could be found anywhere; and if they uncover a site during construction, surface disturbing activities at the site must be halted immediately and the BLM notified.

Historic trails will be avoided. Surface disturbing activities will avoid areas within one-quarter mile of a trail unless such disturbance will not be visible from the trail or will occur in an existing visual intrusion area. Historic trails will not be used as haul roads. Placement of facilities outside one-quarter mile that are within view of the Lander Trail will be located to blend the site and facilities in with the background.

The selective use of locked gates, where practicable, could be used to protect any significant cultural sites found during inventories. This approach is more commonly used as a seasonal restriction to protect wildlife during winter months, but some applications may also present themselves from a cultural resources standpoint.

## **Fire and Forestry**

Coniferous timber stands should contain a 40-percent or greater post-harvest canopy cover with patch sizes between 26 and 60 acres to meet seasonal elk habitat requirements where feasible and compatible with other timber management goals (USDA 1981).

The leaving of dead and dying trees, trees with heart rot, and other standing unmerchantable timber may be required to meet the ecological needs of numerous wildlife species, including woodpeckers, owls, and many neotropical migrants, in all timber management activities.

Prescribed burning will be conducted when soil moisture is adequate for the regrowth of plants in arid regions, provided this requirement is compatible with other prescription burn needs (USDA 2004).

## **Roads and Transportation**

Roads created for commercial timber harvesting will be closed and rehabilitated as soon as possible after the end of timber harvesting. Areas could be subject to travel exclusions, closures, and/or other travel restrictions during sensitive periods.

The project proponent could be required to develop a coordinated travel management plan before surface disturbing activities are authorized.

Transportation plans will be required to maintain the largest undisturbed blocks of habitat possible and to minimize the acres of disturbance from roads, pipelines, power lines, and other facilities within and/or associated with the proposed project area.

Closure and reclamation of unnecessary roads will be required to reduce fragmentation and restore habitat integrity while reducing the potential for wildlife disturbances.

All new roads will be constructed to meet the design requirements of the BLM Manual 9113. New main artery roads will be designed to reduce sediment, salt, and phosphate loading to the Green and New Fork Rivers. Where necessary, running surfaces of the roads will be graveled if the base does not already contain sufficient aggregate.

If necessary, roads will be treated to suppress dust. Treatment could include gravel, mag-water, or in rare cases, paving of roads.

The use of existing two-track and unconstructed roads will be encouraged where such roads would withstand the proposed access activity, would provide a safe route for ingress and egress, would not result in offsite sediment discharge, could be effectively reclaimed, and would result in minimal, if any, new surface disturbance.

The operator will regularly maintain all lease roads in a safe, usable condition. A regular maintenance program will include, but not be limited to, blading, ditching, culvert installation, drainage installation, surfacing, and cattleguards, as needed. Design, construction, and maintenance of the road will be in compliance with the standards contained in BLM Manual, Section 9113 (Roads), and in the latest version of the "Gold Book," *Oil and Gas Surface Operating Standards for Oil and Gas Exploration and Development*.

At the discretion of the BLM AO, road construction may be required to be monitored by a qualified individual agreed to by the BLM AO and the operator. A certified civil engineer is to submit a statement that the road was built as designed within 15 days after the road has been constructed. Compaction of the subgrade with water and heavy equipment to a density higher than the surrounding subsurface is required during construction.

Project-related travel will be limited to only that necessary for efficient project operation during periods when soils are saturated and excessive rutting could occur.

Where deemed necessary and effective by the BLM AO, locked gates will be installed on oil field roads (with structures added to prevent drive-arounds) to reduce traffic and protect other resources (e.g., wildlife, cultural resources) from impacts caused by increased vehicle traffic and human presence. The need and location of locked gates will be determined during the transportation planning process. To control or reduce sediment from roads, guidance involving proper road placement and buffer strips to stream channels, graveling, proper drainage, seasonal closure, and in some cases, redesign or closure of old roads will be developed when necessary. Construction may also be prohibited during periods when soil material is saturated, frozen, or when watershed damage is likely to occur.

Available topsoil will be stripped from all road corridors prior to commencement of construction activities and will be redistributed and reseeded on backslope areas of the borrow ditch after completion of road construction activities. Borrow ditches will be reseeded in the first appropriate season after initial disturbance.

On newly constructed roads and permanent roads, the placement of topsoil, seeding, and stabilization will be required on all cut and fill slopes unless conditions prohibit this (e.g., rock). No unnecessary side-casting of material (e.g., maintenance) on steep slopes will be allowed. Snow removal plans may be required so that snow removal does not adversely affect reclamation efforts or resources adjacent to the road.

Reclamation of abandoned roads will include requirements for reshaping, recontouring, resurfacing with topsoil, installation of water bars, and seeding on the contour. Road beds, well pads, and other compacted areas will be ripped to a 2-foot depth on 1.5-foot centers to reduce compaction prior to spreading the topsoil across the disturbed area. Stripped vegetation will be spread over the disturbance for nutrient recycling, where practical. Fertilization or fencing of these disturbances will not normally be required. Additional erosion control measures (e.g., fiber matting) and road barriers to discourage travel may be required. As deemed necessary by the BLM AO, graveled roads, well pads, and other sites will be stripped of usable gravel and hauled to new construction sites prior to ripping. The removal of structures such as bridges, culverts, cattleguards, and signs usually will be required.

Road closures may be implemented during crucial periods (e.g., wildlife winter periods, spring runoff, calving and fawning seasons, saturated soil conditions).

Individual road design plans for new and/or improved roads will be submitted for approval as components of APDs or ROW permits. Plans must be approved prior to initiation of work. Operators will schedule a review of plans with sufficient time to obtain BLM approval prior to commencement of work.

Existing roads will be used to the maximum extent possible and upgraded as necessary.

Operators will comply with existing federal, state, and county requirements and restrictions to protect road networks and the traveling public.

Roads and pipelines will be located adjacent to existing linear facilities wherever practical.

As deemed necessary by the BLM AO, operators and/or their contractors will post appropriate warning signs and require project vehicles to adhere to appropriate speed limits on project-required roads.

The application of produced water on roads for use in dust suppression activities on BLM-administered public lands will not be allowed unless total dissolved solids (TDS) are less than 400 mg/l (state standard for the Colorado River drainage), the water does not contain hazardous material, and prior approval is obtained from BLM and WDEQ.

Appropriate dust suppressants will be applied to oil and gas field and other roads as necessary. Depending on the site and amount of traffic, suppressants could include water or mag water. In some cases, paving of roads could be required to control dust, provide all-weather access, and reduce road maintenance.

## **Pipelines**

Channel crossings by pipelines will be constructed so that the pipe is buried at a depth sufficient to ensure the pipeline does not become exposed.

Channel crossings by roads and pipelines will be constructed perpendicular to flow. Streams/channels crossed by roads will have culverts installed at all appropriate locations as specified in the BLM Manual 9112-Bridges and Major Culverts (USDI, BLM 1990) and Manual 9113-Roads (USDI, BLM 1985). All

stream crossing structures will be designed to carry the 25-year discharge event or other capacities as directed by the BLM.

Wetland areas will be crossed during dry conditions (i.e., late summer, fall, or dry winters); winter construction activities will occur only prior to soil freezing or after soils have thawed.

On ditches exceeding 24 inches in width, 6 to 12 inches of surface soil will be salvaged where possible on the entire right-of-way. When pipelines and communication lines are buried, at least 30 inches of backfill will be on top of the pipe. Backfill should not extend above the original ground level after the fill has settled. Guides for construction and water bar placement are found in “Surface Operating Standards for Oil and Gas Exploration and Development” (USDA 1978). Bladed surface materials will be re-spread on the cleared route once construction is completed. Disturbed areas that have been reclaimed may need to be fenced when the route is near livestock watering areas.

Pipeline ROWs will be located to minimize soil disturbance. Mitigation will include locating pipeline ROWs adjacent to access roads to minimize ROW disturbance widths, or routing pipeline ROWs directly to minimize disturbance lengths. In some cases, it may be appropriate to place pipelines directly on the surface.

Existing crowned and ditched roads will be used for access where possible to minimize surface disturbances. Clearing of pipeline and communication line rights-of-way will be accomplished with the least degree of disturbance to topsoil. Where topsoil removal is necessary, it will be stockpiled (wind-rowed) and re-spread over the disturbance after construction and backfilling are completed. Vegetation removed from the right-of-way will also be re-spread to provide protection, nutrient recycling, and a seed source.

Temporary disturbances that do not require major excavation (e.g., small pipelines and communication lines) may be stripped of vegetation to ground level using mechanical treatment, leaving topsoil intact and root mass relatively undisturbed.

Trees, shrubs, and ground cover (not to be cleared from rights-of-way) will require protection from construction damage. Backfilling to preconstruction condition (in a similar sequence and density) will be required. The restoration of normal surface drainage also will be required.

To promote soil stability, the compaction of backfill over the trench will be required (not to extend above the original ground level after the fill has settled). Wheel or other method of compacting the pipeline trench backfill will be required at two levels to reduce trench settling and water channeling; once after 3 feet of fill has been replaced and once within 6 to 12 inches of the surface. Water bars, mulching, and terracing will be required, as needed, to minimize erosion. In-stream protection structures (e.g., drop structures) may be required in drainages crossed by a pipeline to prevent erosion. The fencing of linear disturbances near livestock watering areas may be required.

During saturated soil conditions vehicular activity will be confined to roads designed and constructed for all-weather access (e.g., paved, graveled, and “mag-water” surfaced roads).

Crossings of ephemeral, intermittent, and perennial streams associated with road and utility line construction will generally be restricted until after spring runoff, when normal flows are established.

Pipeline projects should be conducted to allow natural movement of livestock through the field. Gaps should be provided in the trenching process to allow cows to move, or get pipeline projects completed while cattle are not on the allotment.

## Livestock Grazing

Livestock grazing management will be conducted to meet the Standards for Healthy Rangelands.

Improvements for livestock grazing management will be constructed and managed to meet the Standards for Healthy Rangelands.

Springs and seeps used for livestock water sources will be fenced to protect these water sources and to maintain unrestricted flow rates.

Livestock grazing Best Management Practices (BMP) will be implemented to maintain or restore habitat conditions for various fish and wildlife species.

Rangeland and vegetation monitoring will be conducted to detect changes in grazing use, trend, and range conditions. These data will be used to support and direct grazing management decisions consistent with national policy. These efforts will help ensure that livestock grazing meets objectives for rangeland health and resolves conflicts with wildlife habitats or may provide a benefit to wildlife habitats.

Existing fences will be reconstructed or modified to meet BLM “wildlife friendly” standards to reduce or offset impacts to wildlife where determined necessary.

All water development activities for livestock grazing use that exceed the minimum depletion level established by USFWS must comply with all USFWS fees and prescribed mitigations to offset water depletion in the Colorado River.

Surface disturbing activities will be coordinated with livestock grazing permittees to minimize the effects of the surface disturbance on other approved operations. To the maximum extent practicable, this effort will include consulting on scheduling of operations to mutually minimize effects.

Any damage to the function of range improvements (e.g., fence damage, cattle guard cleaning, livestock loss) from other approved operations will be repaired immediately or remedied by the operator causing the damage.

All range improvements (stock water tanks, pipelines, corrals, etc.) will be avoided by 500 feet unless no other alternative is available and impacts can be mitigated as per the BLM AO.

When industrial use dominates an allotment to the point of making it unsuitable for livestock grazing, BLM will consider granting special non-use so that livestock could be removed without penalty for a specified amount of time.

Where development is intense, operators will hold semi-annual or annual operator meetings with grazing permittees. Operators will identify an employee to coordinate with grazing permittees on these issues.

Compensation will be provided by operators for cattle lost to oil and gas activities (includes deaths from pits and animals struck on roads). This will be addressed in the same manner as a road maintenance agreement, with operators making payment based on their level of activity, not on the proximity to the dead animal.

Oil and gas or other operations will be conducted so as to retain access to cattle movement corridors (trails) so that livestock can be managed.

Pipeline projects will be conducted to allow natural movement of livestock through the field. Gaps will be provided in the trenching process to allow cows to move or get pipeline projects completed while cattle are not on the allotment.

Well pads, pits, and other facilities that could be hazardous to livestock will be fenced to keep livestock out and the fences maintained in functioning condition.

Operators will mitigate all energy development related impacts to agricultural operations, in order to maintain the viability of working landscapes.

Grazing management decisions will be based on monitoring data, both short-term and long-term, which will be jointly developed by grazing permittees and the appropriate federal land management agency. Protocols for monitoring will be consistent with the Memorandum of Understanding in place between the National Public Lands Council and the BLM.

A menu of incentive based mitigation and conservation measures will be developed that will encourage local, private land owners to participate.

A program will be developed for local landowners to participate in conservation efforts including a local initiative to develop and implement Contracts for Environmental Services as a means to preserve Sublette County's working landscapes, working ranches, and open space values.

Acceptable levels of grazing will be maintained to benefit both sage grouse and agricultural operations.

Effective communication and cooperation with grazing permittees will be maintained.

Meet with permittees, at minimum twice annually, before turnout to schedule maintenance activities and after the grazing season to discuss monitoring.

A mitigation plan will be developed with state and local representatives to maintain existing ranch lands.

Loss of ranches due to impacts from energy development will be monitored.

A fund will be established to develop range improvement projects away from individual oil and gas developments.

All pads will be completely fenced and existing range improvements will be monitored and maintained. All new fences will adhere to standards provided by BLM Handbook H-1742-1. Fences will be maintained.

## **Minerals**

Drilling of multiple well bores from a single well pad will be required, unless it were shown to be infeasible.

Well locations and associated disturbances that are dry holes or abandoned producers will be reclaimed as soon as practicable.

Reserve pits, evaporation ponds, or other oil and gas related pits shall be designed and operated in a manner that deters or prevents access to birds, waterfowl, livestock and wildlife. Pit netting is an example of a measure to accomplish this requirement.

## Project Siting and Operation

In conformance with Onshore Oil and Gas Order No. 1, operators will prepare and submit individual comprehensive drill site design plans for BLM approval. These plans will show the drill location layout over the existing topography, dimension of the location, volumes and cross-sections of cut and fill, location and dimensions of reserve pits, existing drainage patterns, and access road egress and ingress. Plans will be submitted and approved prior to initiation of construction.

The operator will submit to the BLM AO within 30 days of pad construction a digital as-built file of the following: the perimeter of the pad measured at the base of fill slopes and at the head of cut slopes, including all associated soil pile locations and the centerline of the access road. The operator will also submit to the BLM AO within 30 days of drilling, a digital file of the surface location of the well head(s). The digital depiction will be in one of the following file formats: shapefile format (\*.shp), geodatabase (\*.gdb), or AutoCADD (\*.dwg), and should come with defined projections in NAD83 UTM Zone 12 N.

Operators will contact the BLM AO's field representative no earlier than 15 days and no later than 3 working days prior to commencement of construction activities. Construction under adverse conditions may require additional mitigation measures.

Prior to the onset of drilling, a "stock tight" fence will be installed on three sides of the reserve pit. This fence will be woven wire at least 28 inches high and within 4 inches of ground surface, with two strands of barbed wire above the woven wire with 10-inch spacing. The fence corners will be double H-brace panels constructed with treated wood corner posts or steel pipe posts of at least 4-inch outside diameter (see Gold Book, pgs 16-18). The corner brace posts will be securely set at a minimum of 30 inches in the ground. Metal T-posts are not allowed for corner panel construction, but they may be used between corner panels. The fourth side of the reserve pit will be fenced after the drilling rig moves off the location. The fence will be located a maximum of 5 feet from the edge of the reserve pit. The double H-braces will be used on all corners of the pit area. The operator will implement measures to prevent wildlife and livestock from entering the reserve area during drilling and well completion operations before the fourth side of the fence has been constructed.

All reserve pits must be lined. Reserve pit liners must have a mullen burst strength that is equal to or exceeds 300 pounds, a puncture strength that is equal to or exceeds 160 pounds, and grab tensile strengths that are equal to or exceed 150 pounds. Verified test results will be conducted according to ASTM test standards. The liner must be totally resistant to deterioration by hydrocarbons.

Liners must be installed over smooth fill subgrade that is free of pockets, loose rocks, or other materials that could damage the liner. Sand, sifted dirt, or bentonite are suggested.

Reserve pit side slopes will not exceed a 1:1 ratio. End slopes will not exceed a 3:1 ratio.

Oil-based muds used for drilling operations should be environmentally acceptable.

All oil-based mud drilling operations will be completed through a closed mud system, and all oil-based mud will be contained in the closed system.

The closed drilling system will be equipped with appropriate drip pans, liners, and catchments under probable leak sources as needed to prevent the oil-based drilling mud and cuttings from reaching the reserve pit and/or ground surface of the drill pad.

Any cuttings dropped or mud spilled will be cleaned up immediately and placed in the approved containment device. All spills exceeding one barrel outside the containment devices will be reported to the BLM within 8 hours.

All BPO equipment, as well as all elastomers in the mud system, will be suitable for oil-based mud.

Well control training of the rig crews will include coverage of the additional hazards associated with oil-based mud.

The operator will exercise extreme caution to avoid discharging oil-based drilling mud into the reserve pit. Should an event occur in which it is necessary for oil-based mud to be discharged to the reserve pit, the operator will immediately initiate the following actions:

- The reserve pit will be secured to prevent birds and other wildlife from getting into the oil-contaminated cuttings, fluids, and mud.
- The operator will submit a plan to the BLM-PFO describing how the contaminated pit will be managed (i.e., will the contaminated material/fluids be treated in place, and if so by what method; or will the contaminants be removed to a WDEQ-approved disposal facility).

Operators will submit a Sundry Notice describing how the oil contaminated drill cuttings will be treated to assure the oil stays contained in the cuttings and where the cuttings ultimately will be stored (i.e., buried in the flare pit, buried in a separate “on-location” pit, or removed to a WDEQ-approved disposal site. Any on location disposal sites for the oil contaminated drill will be lined with a 12-mil or stronger impervious liner compatible with oils. A liner meeting this specification also will be placed under any temporary storage area for the oil contaminated cuttings.

Oil-based mud drilling system shall not be used for drilling through formations containing fresh water aquifers. Prior to drilling surface casing with a rig that has been using oil-based mud, the pumps, pump lines and tanks will be cleaned to ensure that **NO** oil-based mud is in the system during surface drilling operations of the new well.

Surface casing shall be set to a depth below all potential sources of usable or potable drinking water. All surface casing shall be cemented from total depth back to surface. In the event surface casing cannot be set to this depth, the subsequent casing string shall be cemented from its total depth to at least 100 feet above the surface casing shoe. In the event surface casing cementing does not reach the surface, that casing shall be remedially cemented by squeeze or top cementing as approved by the BLM FO.

If drilling fluids are transferred from one well to the next well in the drilling plan, then the fluids will be tested immediately before transfer or at the time following last pit usage based on WDEQ Guideline 8 parameters. This water analysis standard is incorporated in a packet submitted by Western Environmental Services and Testing, Inc., as part of its water analysis packages. Any other company conducting water testing also will need to test for the elements listed in the WDEQ Guideline 8 parameters.

To ensure the timely review of the water quality data, the operator is required to have a WDEQ approved firm contracted to conduct water samples and to send a copy of water quality test results to the BLM PFO at the same time that they are sent to the operator.

Operators will construct reserve pits with 2 feet of freeboard in cut areas or in compacted and stabilized fill. Reserve pits will not be located in areas in which groundwater is less than 50 feet from the surface. A closed system will be required if water shows in the conductor hole.

Produced water from oil and gas operations will be disposed of in accordance with the requirements of Onshore Oil and Gas Order #7.

Any drilling fluids pit that shows indications of containing hazardous wastes will be tested for the Toxicity Characteristic Leaching Procedure constituents. If analysis proves positive, the fluids will be disposed of in an approved manner. The cost of the testing and disposal will be borne by the potentially responsible party.

Wells, pipelines, and ancillary facilities will be designed and constructed such that they will not be damaged by moderate earthquakes. Any facilities defined as critical according to the Uniform Building Code will be constructed in accordance with applicable Uniform Building Code Standards for Seismic Risk Zone 2B.

Before conducting any reserve pit evaporation, by means other than natural evaporation, the operator will submit a Sundry Notice for Authorized Officer approval. The Sundry Notice will provide a detailed description of the drying method. The operator is required to obtain authorization from the WOGCC for pit fluid treatment by means other than natural evaporation.

Sewage disposal facilities will be in accordance with state and local regulations.

Trash will be contained in a portable trash cage. The trash cage will be emptied in a WDEQ approved sanitary landfill.

Slope, grade, and other construction control stakes (e.g., exterior boundary centerline) will be placed, as necessary, to ensure construction in accordance with the surface use plan. The cut and fill slopes and spoil storage areas will be marked with a stake and/or lath at a minimum of 50-foot intervals. The tops of the stakes or laths will be painted or flagged in a distinctive color. All boundary stakes and/or laths will be maintained in place until final construction cleanup is completed. If stakes are disturbed, they will be replaced before proceeding with construction.

Drilling, well completion, and workover lights will be shrouded and directed on to the drilling platform and/or well pad, to the extent allowed by safety requirements, so that lights/glare are not directed away from the well pad.

## **Production Facilities**

All storage tank batteries, including drain sumps and sludge holdings at compressor facilities, installed on location and designed to contain any oil, glycol, produced water, or other fluid that may constitute a hazard to public health or safety, will be surrounded by a secondary means of containment for the entire contents of the largest single tank in use plus 1 foot of freeboard for precipitation or 110 percent of the capacity of the largest vessel. The appropriate containment and/or diversionary structures or equipment, including walls and floor, to prevent discharged fluid from reaching ground, surface, or navigable waters, will be impervious to any oil, glycol, produced water, or other fluid for 72 hours and will be constructed so that any discharge from a primary containment system (e.g., tank or pipe) will not drain, infiltrate, or otherwise escape to ground, surface, or navigable waters before cleanup is completed.

Treaters, dehydrators, and other production facilities installed on location that have the potential to leak or spill oil, glycol, produced water, or other fluid that may constitute a hazard to public health or safety, will be placed on or within an appropriate containment and/or diversionary structure to prevent spilled or leaking fluid from reaching ground, surface, or navigable waters. The appropriate containment and/or diversionary structure will be sufficiently impervious to oil, glycol, produced water, or other fluid and

will be installed so that any spill or leakage will not drain, infiltrate, or otherwise escape to ground, surface, or navigable waters before cleanup is completed.

All aboveground permanent structures (permanent means onsite for longer than 90 days) not subject to safety requirements will be painted by the operator to blend with the natural color of the landscape. New production facilities will be painted a noncontrasting color that is harmonious with the surrounding landscape as specified and approved by the BLM on a case-specific basis.

Stream sediment, phosphate, and salinity load will be reduced where possible. In areas in which groundwater exists 50 feet or less from the surface (WOGCC), produced water from oil and gas operations will be disposed of in an approved closed storage system or by other acceptable means complying with Onshore Order #7.

Where the depth to groundwater is less than 100 feet and soil permeability is more than 0.1 foot/day, plants, mills, or associated tailings ponds and sewage lagoons will not be allowed.

Proper containment of oil and produced water in tanks, drilling fluids in reserve pits, and locating staging areas for storage of equipment away from drainages will prevent potential contaminants from entering surface waters.

All new production facilities construction that has open-vent exhaust stacks will be equipped to prevent bird and bat entry or perching on the stack.

A sundry notice must be submitted and approved prior to any pit closures or reclamation work.

In the event that any hydrocarbon material is released into the reserve or production pits, it will be removed within 24 hours of the discharge event. Any pits that have or ever have had hydrocarbons shall be netted or otherwise secured to prevent birds or wildlife from entering them.

All secondary containment structures will be designed to prevent bird, animal, or livestock entry.

If directional drilling is not possible, facilities will be co-located on a centralized pad as much as possible to decrease truck trips and human disturbance during wildlife sensitive time periods.

## **Recreation**

Operators will restrict off-road vehicle (OHV) activity by employees and contract workers to the immediate area of authorized activity or existing roads and trails.

## **Socioeconomics**

Mitigate negative effects from growth; it will be necessary to calculate net costs and/or benefits. The BLM/operators will use the population projections developed in Chapter 4, and estimate effects to the counties based on current service and housing levels identified in Chapter 3. Where net effects are negative, the BLM/operators shall identify potential solutions to avoid such effects, or to reduce the impact.

Socioeconomic monitoring will follow the Pinedale Socioeconomic Monitoring Plan (6-24-08) developed by Dr. Robert Winthrop. Monitoring reports will be submitted to the BLM and cooperating agencies annually.

## Soils

Soil retention measures, such as silt fencing, contour furrows, or hydromulching, shall be implemented on erosive soils at the time of disturbance.

Revegetation shall be initiated on exposed soils on portions of the disturbance no longer needed for operations (e.g., cut and fill slopes, portions of well pads not needed for production operations) within one growing season of the time the disturbance is no longer needed for operations. Interim reclamation (i.e., site stabilization/soil retention seeding) shall be conducted on disturbed areas that are needed for future planned operations but will not be occupied for one or more growing seasons.

Upland soils classified as highly erodible in the order three soil survey will be avoided.

Slopes greater than 10 percent and with south-facing aspects with sensitive or highly erosive soils and areas with biological crusts will be avoided.

Before a surface disturbing activity is authorized, topsoil depth will be determined. The amount of topsoil to be removed, along with topsoil placement areas, will be specified in the authorization. The uniform distribution of topsoil over the area to be reclaimed will be required, unless conditions warrant a varying depth. On large surface-disturbing projects (e.g., gas processing plants) topsoil will be stockpiled and seeded to reduce erosion. Where feasible, topsoil stockpiles will be designed to maximize surface area to reduce impacts to soil microorganisms. Stockpiles remaining less than 2 years are best for soil microorganism survival and native seed viability.

Emphasis will be placed on the reduction of soil erosion and sediment into the Green River Basin watershed. Of particular importance will be those areas with saline soils or those areas with highly erodible soils. Critical erosion condition areas will continue to be identified during soil surveys, monitoring, site specific project analysis, and activity plan development for the purpose of avoidance and special management.

Operators will avoid adverse impacts to soils by—

- Minimizing disturbance, avoiding construction with frozen soil material
- Avoiding areas with high erosion potential (e.g., unstable soil, dunal areas, slopes greater than 25 percent, floodplains), where possible
- Salvaging and selectively handling topsoil from disturbed areas
- Adequately protecting stockpiled topsoil and replacing it on the surface during reclamation
- Leaving the soil intact (scalping only) during pipeline construction, where possible
- Using appropriate erosion and sedimentation control techniques, including, but not limited to, diversion terraces, riprap, and matting
- Promptly revegetating disturbed areas using adapted species
- Applying temporary erosion control measures (e.g., temporary vegetation cover)
- Applying biodegradable mulch, netting, or soil stabilizers
- Constructing barriers as appropriate in certain areas to minimize wind and water erosion and sedimentation prior to vegetation establishment.

Management of the soil resource will continue to be based on the following: 1) evaluation and interpretation of soils in relation to project design and development; 2) identification and inventory of soils for baseline data; and 3) identification and implementation of methods to reduce accelerated erosion.

Evaluation and interpretation involves identifying soil properties that influence their use and recommendations for development while minimizing soil loss. Projects will be examined on a site-specific basis, evaluating the potential for soil loss, and the compatibility of soil properties with project design. Stipulations and mitigating measures are provided on a case-by-case basis to ensure soil conservation and practical management. Projects requiring soil interpretations include construction of linear right-of-way facilities (i.e., pipelines, roads, railroads, and power transmission lines); construction of water impoundments; rangeland manipulation through fire or mechanical treatments; construction of plant site facilities, pump stations, well pads and associated disturbances; and reclamation projects.

BLM will require each individual right-of-way, APD, or other application to include a reclamation plan approved by the BLM. Each Master Development Plan for projects that cumulatively disturb more than 10 acres will be required to submit an Erosion, Revegetation and Restoration Plan (ERRP) consistent with BLM guidance. Prior to new disturbance, ERRPs will be approved by the BLM Authorized Officer.

Notice of any spill or leakage, as defined in BLM NTL 3A, will be immediately reported by the operator to the AO and other such federal and state officials (e.g., WDEQ) as required by law. Verbal notice will be given as soon as possible, but within 24 hours, and verbal notices will be confirmed in writing within 72 hours of any such occurrence. Any accidental soil contamination by spills of petroleum products or other hazardous materials will be cleaned up and the soil disposed of or rehabilitated according to WDEQ Solid Waste Guidelines (#2) for petroleum contaminated soils.

## Visual Resource Management

Visual Resource Management (VRM) class objectives and design considerations should be considered early in the project planning process. Approval of well pad locations, new roads, buried pipelines, or other facilities will be conditioned upon the operator developing a visual resource protection plan, acceptable to BLM, for the mitigation of anticipated impacts. To minimize visual impacts, authorization of well pad locations, new roads, CPFs, buried pipelines, etc. will require the operator to demonstrate to the AO's satisfaction that the location and/or facilities have reasonably incorporated visual design considerations that mitigate unnecessary visual impacts.

Within VRM Class II and III areas, during onsite reviews, the BLM and the operator will evaluate potential disturbances and impacts to visual resources using the VRM Contrasting Rating Process and forms as required and described in Handbook H-8431-1. Identify appropriate mitigation and reevaluate until it is demonstrated that VRM management class objectives are met. Three-dimensional design and visual analysis software could be used to analyze impacts, develop mitigation plans, and prepare visual simulations. Digital terrain information could cover the project area viewshed with engineered site plans being entered into the Geographic Information System (GIS) 3D model allowing for comprehensive analysis and determining cumulative impacts. Mitigation techniques will include, but not be limited to new roads that are designed so that they conform with the landscape, incorporating curves to eliminate distant, straight line impacts; every opportunity will be taken to reclaim existing road ROWs that are not used when new roads are designed over them; revegetation will be initiated as soon as possible after disturbance; pipeline ROWs will be located within existing ROWs whenever possible; and aboveground facilities not requiring safety coloration will be painted with appropriate BLM-specified nonreflective standard environmental colors (i.e., Carlsbad Canyon, Shale Green or Desert Brown, or other specified standard environmental color). Topographic screening, vegetation manipulation, project scheduling, and traffic control procedures will all be employed as deemed appropriate by the BLM to further reduce visual impacts.

Low profile tanks will be required wherever visual sensitivity is an issue and/or wherever deemed appropriate mitigation to help maintain the visual integrity and basic characteristics of the landscape.

Within VRM Class IV areas, the BLM and operators will implement BMPs including, but not limited to the following: utilize existing topography to screen roads, pipeline corridors, drill rigs, wells, and production facilities from view, where practical. Operators will paint all aboveground production facilities with appropriate colors (Carlsbad Canyon, Shale Green or Desert Brown, or other specified standard environmental color) specified by the BLM to blend with adjacent terrain, except for structures that require safety coloration in accordance with OSHA requirements.

Avoid the introduction of new, linear visual intrusions on the landscape. New roads and pipeline corridors, to the extent practicable, will follow contours and use topography as screening. New pipelines will be combined with existing or proposed roads and, wherever possible, new cross-county pipeline corridors will be avoided.

If BLM allows a well pad to be developed in any area managed for visual resources, roads and well pads may need to be surfaced with materials that reduce visual contrast. For example, in the VRM Class II area near Pinedale, the subsoil material (Wasatch Formation) can be very light in color and thus contrasts with surrounding undisturbed areas. Mixing topsoil with gravel (1-inch deep) in highly visible areas will help to reduce contrast. Operators will be required to investigate the feasibility of applying this opportunity of surfacing roads and well pads with materials closer in color and texture to the surrounding landscape.

## **Watershed and Water**

Approved surface disturbing management actions in stream corridors (within the “high bank” of any ephemeral or intermittent stream course, or within the high bank +50 feet of any perennial stream) shall be designed and implemented to protect fish spawning, fry, and other important fish life stages and habitats within the stream or connected streams and to maintain fish passage.

All disturbance occurring within the high bank +50 feet shall be reclaimed to meet the PFC standards.

Crossings of perennial streams will be located within existing “linear disturbance corridors” where possible. Should such a corridor not exist on a particular stream or with a reasonable distance of the proposed crossing, the crossing shall be located at a point to minimize disturbance to the stream channel and associated riparian habitat and maintain an adequate amount of unrestricted water flow to maintain fish passage during and after construction.

Horizontal directional drilling shall be used for all pipeline crossings of perennial streams and their associated riparian habitats, unless the operator/permittee/right-of-way holder can demonstrate to the AO’s satisfaction that this procedure is not economically or technically feasible for a given crossing.

Upland erosion from surface disturbing activities must be controlled effectively and not allowed to be transported to stream systems.

Prudent use of erosion control measures, including diversion terraces, riprap, matting, temporary sediment traps, and water bars will be employed as necessary. These erosion control measures will be used as appropriate to control surface runoff generated at well locations. The type and location of sediment control structure, including construction methods, will be described in APD and ROW plans. If necessary, to reduce suspended sediment loads and remove potential contaminants, Operators may treat diverted water in detention ponds prior to release to meet applicable state or federal standards.

BMP project proponents/operators/permittees will be required to control sediment from all construction sites.

Operators will prepare Stormwater Pollution Prevention Plans (SWPPP) for their respective areas of field development as required by WDEQ National Pollution Discharge Elimination System (NPDES) permit requirements.

Any industrial water wells and any tanks, pumps, hoses, pipes, or other associated connections will include check valves, backflow preventers, or other devices that secure the well against discharge of fluids into the well.

All water used for the drilling of the surface casing must comply with all requirements concerning water quality as set forth by WOGCC Regulations.

All water used in association with this project will be permitted through the Wyoming State Engineer's Office.

All water wells must be constructed and operated according to all requirements of the Wyoming State Engineer's Office and shall be equipped with measures and equipment to prevent backflow and/or siphoning into the well.

## **Wetlands, Riparian Areas, and Floodplains**

All surface disturbance, permanent facilities, etc., will remain a minimum of 500 feet away from the edge of surface waters, riparian areas, wetlands, and 100-year floodplains unless it is determined through site-specific analysis, approved in writing by the BLM AO, that no practicable alternative to the proposed action exists. If such a circumstance exists, then all practicable measures to mitigate possible harm to these areas must be employed. These mitigating measures will be determined on a case-by-case basis and may include, but are not limited to, diking, lining, screening, mulching, terracing, and diversions.

Floodplains by their very nature are unsafe locations for permanent structures. With an inundation of flood waters, soils disturbed by construction could experience a rate of erosion greater than undisturbed sites. Additional concern exists over the potential for floodwaters to aid in the dispersal of hazardous materials that may be stored within such structures. Therefore, floodplains will have no permanent structures constructed within their boundaries unless it can be demonstrated on a case-by-case basis that there is no physically practical alternative. In cases in which floodplain construction is approved, additional constraints could be applied.

Floodplain Executive Order 11988 (Section 2.a.(2)) states in summary that if the HEAD OF THE AGENCY finds that the only practicable alternative consistent with the law and the policy set forth in the Order requires siting in a floodplain, the agency will, prior to taking action, 1) design or modify its action in order to minimize potential harm...and 2) prepare and circulate a notice containing an explanation of why the action proposed is to be located in the floodplain.

Floodplain Executive Order 11988 (Section 3), in reference to federal real property and facilities, states that agencies will, if facilities are to be located in a floodplain (i.e., no practicable alternative), apply flood protection measures to new construction or rehabilitate existing structures, elevate structures rather than fill the land, provide flood height potential markings on facilities to be used by the public, and when the property is proposed for lease, easement, right of way, or disposal, the agency has to attach restriction on uses in the conveyance, etc., or withhold from such conveyance.

Any disturbances to wetlands and/or waters of the U.S. will be coordinated with the COE, and 404 permits will be secured as necessary prior to disturbance.

Operators will evaluate all project facility sites for occurrence of waters of the U.S. special aquatic sites, and wetlands, per COE requirements. All project activities will be located outside these sensitive areas, where practical.

Where disturbance of wetlands, riparian areas, streams, and ephemeral/intermittent stream channels cannot be avoided, COE Section 404 permits will be obtained by the operator as necessary.

## **Discharge of Produced, Treated, or Other Waters**

Operators or pipeline contractors will comply with state and federal regulations for water discharged into an established drainage channel. The rate of discharge will not exceed the capacity of the channel to convey the increased flow without creating alterations to the channel that could create a trend towards failing Wyoming Rangeland Standards. Waters that do not meet applicable state or federal standards will be treated or disposed of at approved facilities. The disposal of all water (hydrostatic test water, stormwater, produced water) will be conducted in conformance with WDEQ-Water Quality Division (WQD), BLM Onshore Oil and Gas Order No. 7, and WOGCC rules and regulations.

**Channel Discharge Plans:** Plans for any proposed discharge of produced water to channels on public lands will at a minimum contain provisions for the following:

The proposed discharged water will meet or exceed all state-approved standards for quality and be of equal or better quality than the proposed receiving waters at the point of confluence.

A survey and evaluation of the public land portion of the channel from the proposed point of discharge to the downstream extent of BLM-administered public lands that encompass the drainage or the confluence of the nearest perennial water with an upstream source of flow that will provide a dilution of at least 10:1 for produced water from all sources to the channel in question at the point of confluence.

The evaluation will address channel geometry and record current locations (by GPS, monumenting, photo points) and nature of key features such as vegetative communities, headcuts, depositional areas, existing wetlands, any other discharges, etc.

A certified laboratory report showing the components and quality of the water to be discharged will be provided to the BLM with sufficient time prior to initial discharge of produced water to allow for analysis. Subsequent reports will be provided to the BLM not more than 2 weeks past the date of the survey.

Channels on public lands receiving produced water discharges will be resurveyed annually at a minimum, or as requested by the AO, by the project proponent in the manner described above. The need to take corrective actions will be determined by the BLM.

Adequate design to minimize erosion at the point of discharge and to prevent channel drops (headcuts) from traveling up channel under augmented and natural flow conditions.

A method to control, in a timely manner, accelerated channel erosion. Corrective actions could include but are not limited to engineered structures, vegetation augmentation, or elimination of the discharge to the affected channel.

An acknowledgement that discharging to public lands, including discharge in an open channel, is a privilege that is revocable at any time by the AO.

The design of the discharge plan must be such that the *Wyoming Standards for Rangeland Health* are not violated.

Vegetation, land form, rocks, and/or large woody debris associated with the channel in question throughout the length of the channel as described previously shall be maintained in a condition sufficient to dissipate stream energy, filter sediment, aid groundwater recharge, aid in floodplain development, stabilize stream banks, and maintain channel characteristics.

**Upland Discharge Plans:** Plans for any proposed discharge of produced water onto uplands will, at a minimum, contain provisions for the following:

- An acknowledgement that the purpose of the discharge is for vegetation reclamation only
- Another avenue for the discharge of the water or the ability to immediately stop the flow
- Certification that the water meets or exceeds WDEQ standards
- Information to support analysis that application of the water to the soil will not negatively affect soil quality, including infiltration or fertility
- Information to support analysis that vegetative diversity and productivity and soil health and structure will not be negatively affected
- No surface runoff from the reclamation site
- An approved revegetation plan that includes a weed management plan
- A monitoring plan and provisions for prompt action to address errors
- A timeline to assure that irrigation efforts will be used for initial establishment of vegetation communities, not to maintain them.

## Wildlife

### General Wildlife

Well locations and associated road and pipeline routes will be selected and designed to avoid disturbances to areas of high wildlife value (e.g., raptor nest sites, wetland areas).

Avoid activities and facilities that create barriers to the seasonal movements of big game and livestock.

Reserve, workover, and production pits potentially hazardous to wildlife will be adequately protected (e.g., fencing, netting) to prohibit wildlife access as directed by the BLM in consultation with WGFD.

Wildlife-proof fencing will be used on reclaimed areas, in accordance with standards specified in *BLM Fencing Handbook* 1741-1, if it is determined that wildlife species are impeding successful vegetation establishment.

ROW fencing associated with this project will be kept to a minimum; if necessary, fences will consist of four-strand barbed wire meeting WGFD approval and *BLM Fencing Handbook* 1741-1 standards for facilitating wildlife movement.

For all breeding birds observed, additional surveys will be conducted immediately prior to construction activities to search for active nest sites.

To avoid potentially significant noise impacts, compressor engines will be located 2,500 feet or more from a dwelling or residence and from sage-grouse leks.

Activities in crucial habitats will be avoided when practicable.

Wildlife habitat mitigation will be carried out as quickly as possible or at the same time as the disturbance.

Locatable mineral development activities will not be allowed within identified big game parturition areas between May 1 and June 30 or within raptor nesting areas from February 1 to July 31.

Power lines will be buried or otherwise constructed or modified to reduce impacts to wildlife where possible.

Crucial wildlife winter ranges and nesting habitats could be treated with nitrogen fertilizers.

For additional wildlife mitigation measures, the Wyoming Game and Fish's document titled *Recommendations for Development of Oil and Gas Resources within Crucial and Important Wildlife Habitats* (WGFD 2004) may be consulted.

### **T&E and Special Status Species**

If while conducting operations, substantial unanticipated environmental effects to listed, proposed, or candidate species are observed (whether effects are direct or indirect), formal consultation with U.S. Fish and Wildlife Service (USFWS) will be initiated immediately in addition to cessation of all such operations.

USFWS and WGFD consultation and coordination will be conducted for all mitigation activities relating to raptors and threatened and endangered (T&E) species and their habitats, and all permits required for movement, removal, and/or establishment of raptor nests will be pursued if they meet USFWS migratory bird office requirements.

Co-location of cell towers and other communication facilities will be encouraged to mitigate impacts within potential raptor habitat.

Areas containing open, streamside deciduous woodlands with low scrub vegetation, deciduous riparian woodlands, cottonwood stands or willow thickets must be surveyed for the Yellow-billed cuckoo. A minimum of three and a maximum of five censuses should be carried out from June 15 to August 10, with at least 12 days between successive census attempts.

Surveys for T&E and candidate wildlife species will be implemented in areas of potential habitat by a qualified biologist prior to disturbance. Findings will be reviewed by the BLM prior to or as components of ROW applications and APD review processes. If T&E and/or candidate species are found in the area, consultation with the USFWS will be initiated, and construction activities will be curtailed until there is concurrence between BLM and USFWS, on what activities can be authorized.

Proposed construction sites in the development area will be examined prior to surface-disturbing activities to confirm the presence or absence of prairie dog colonies. Confirmation will be made of white-tailed

prairie dog colony/complex size, burrow density, and any other data to indicate whether the criteria for black-footed ferret habitat, established in the USFWS guidelines, are present. If prairie dog colony/complex meets the USFWS criteria, a qualified biologist will locate all project components to avoid direct, indirect and cumulative impacts to the colony/complex. If this is not practical or possible, black-footed ferret surveys of the prairie dog colony/complex, where required by the USFWS, will be conducted in accordance with USFWS guidelines and requirements. The results of the survey will be provided to the USFWS in accordance with Section 7 of the ESA, as amended, and Interagency Cooperation Regulations. If a black-footed ferret or its sign is found during the survey, the BLM AO will stop all action on the application in hand. New roads and trails should not cross colonies.

A survey for black-footed ferret is required prior to approval of construction activities within nonblock cleared habitats.

The USFWS has determined that any withdrawal of water from the Colorado River System (surface or groundwater) will jeopardize the endangered Colorado pikeminnow, humpback chub, bonytail, and razorback sucker. The USFWS Colorado River Endangered Fish Recovery Program requires a depletion fee be paid by the proponent to help support the recovery program. The fee is required for each acre-foot of water depletion where the depletion of water is in excess of 100 acre-feet from the Colorado River system.

Operators will finance site-specific surveys for special status plant species (SSPS) prior to any surface disturbance in areas determined by the BLM to contain potential habitat for such species (Directive USDI-BLM 6840). These surveys will be completed by a qualified botanist as authorized by the BLM and this botanist will be subject to BLM's SSPS survey policy requirements. Data from these surveys will be provided to the BLM, and if any SSPS or habitats are found, BLM recommendations for avoidance or mitigation will be implemented.

Areas containing moist soils in mesic or wet meadows, subirrigated or seasonally flooded soils in valley bottoms, gravel bars, old oxbows, or floodplains bordering springs, lakes, rivers or perennial streams between 1,780 and 6,800 feet in elevation must be avoided for Ute ladies' tresses.

## **Migratory Birds**

Bald eagles roost, perch, feed, and nest along the Green and New Fork Rivers. To ensure continued protection of this species, no surface disturbing or human activities will be authorized between November 1 and April 1 within 1 mile of known bald eagle winter use areas. All surface-disturbing or human activity, including construction of roads, pipelines, well pads, drilling, completion, or workover operations, will be seasonally restricted from February 1 through August 15 within 1.0 mile of all active eagle nests. An active eagle nest is one that has been occupied once in the past 5 years.

Permanent (life of the project) and high profile structures such as well locations, roads, buildings, storage tanks, overhead power lines, etc., and other structures requiring repeated human presence will not be constructed within 1,000 feet (1,400 feet for ferruginous hawks; 2,600 feet for bald eagles) of active raptor nests. Wells that must be located closer than 2,600 feet (but will not be allowed closer than 2,000 feet) of a bald eagle nest will be out of the direct line of sight of the nest; will have no human activity at the well site from February 1 through August 15 except in the case of an emergency; and will locate production facilities off-site or at a central production facility location at a distance of 2,600 feet or more from the nest. In these cases, the USFWS will be contacted to ensure compliance under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

All surface-disturbing activity (e.g., road, pipeline, well pad construction, drilling, completion, workover operations) will be seasonally restricted from February 1 through July 31 within a 0.5-mile radius of all active raptor nests, except that ferruginous hawk nests will be seasonally restricted from March 1 through July 31 and the seasonal buffer will be 1.0 mile. An active raptor nest is defined as a nest that has been occupied within the past 3 years. The seasonal buffer distance and exclusion dates applicable may vary depending on such factors as the activity status of the nest, species involved, prey availability, natural topographic barriers, line-of-site distance(s), and other conflicting issues such as cultural values, steep slopes, etc.

Raptor nest surveys will be conducted for active nests within a 0.5- to 1.0-mile radius of proposed surface use or activity areas if such activities are proposed to be conducted between February 1 and July 31 or as required in the Pinedale Field Office raptor survey protocol.

The buffer distance for raptors may vary depending on the species involved, prey availability, natural topographic barriers, line-of-sight distances, and other conflicting issues (e.g., cultural values, steep slopes). Linear disturbances such as pipelines and seismic activity could be granted exceptions as long as they will not adversely affect the raptor(s).

Surface disturbing and human activities are not allowed between November 1 and April 1 within one mile of known bald eagle winter use areas.

Surface disturbing and human activities within one mile of an active bald eagle nest will be restricted from February 1 to August 15.

Activities or surface use are not allowed from March 15 to August 15 for the protection of migratory bird nests in accordance with the Migratory Bird Treaty Act. A nest survey must be conducted prior to construction from March 15 to August 15. If a nest is present and active, monitoring will need to be done until the young have fledged. Contact a BLM wildlife biologist prior to conducting nest surveys.

Habitat alterations within 2.5 miles of a bald eagle nest, or 0.5 miles from the stream bank of all streams within 2.5 miles of the nest, will be restricted to protect bald eagle foraging/concentration areas year-round.

Surface disturbing and disruptive activities will be prohibited within 0.5 miles of burrowing owl nesting habitat from April 1 through August 15.

For surface disturbing activities, surveys will be conducted within suitable plover habitat by a qualified biologist in accordance with USFWS 1999 guidelines. (A copy of the guidelines may be obtained from the USFWS, BLM, or WGFD). Two types of surveys may be conducted: 1) surveys to determine the presence/absence of breeding plovers (i.e., displaying males and foraging adults), or 2) surveys to determine nest density.

If surface disturbing activity is requested to take place in mountain plover habitat between April 10 and July 10, presence/absence surveys are required. Survey results will determine when activities are proposed.

Surveys to determine presence/absence of the plover will be conducted between April 10 through July 10 throughout the breeding range.

Visual observation of the area should be made within 0.25 mile of the proposed action to detect the presence of plovers.

A site must be surveyed for plover three times during the survey window, with each survey separated by at least 14 days.

Initiation of the project should occur as near to completion of the plover survey as possible (within 2 days for seismic exploration; a 14-day period may be appropriate for other projects).

If active plover nest is found in the survey area, the planned activity should be delayed 37 days, or one week post-hatching. If a brood of flightless chicks is observed, activities should be delayed at least 7 days.

Plover surveys will be conducted during early courtship and territorial establishment. Throughout the breeding range, this period extends from approximately mid-April through early July. However, the specific breeding period depends on latitude, elevation, and weather.

Plover surveys will be conducted between local sunrise and 10:00 a.m., and between 5:30 p.m. and sunset (periods of horizontal light to facilitate spotting the white breast of the adult plovers).

Drive transects within the project area to minimize early flushing. Flushing distances for mountain plovers may be within 3 meters (9 to 10 feet) for vehicles, but plovers often flush at 50 to 100 meters (164 to 328 feet) when approached by humans on foot.

In cases where an exception will be provided to the proponent during the April 10 to July 10 breeding and nesting time period, BLM personnel will adhere to approved protocols describing survey protocol for exceptions.

To control the population of mosquitos that might spread West Nile virus, larvicidal briquettes will be placed in standing water pools as appropriate. Adult mosquitos could also be treated with insecticides if necessary.

## **Greater Sage-Grouse**

No surface disturbance within one-quarter mile of an occupied greater sage-grouse lek will be permitted. Linear disturbances such as pipelines and seismic activity could be granted exceptions outside the breeding season if they are determined not to have associated long-term, continuous activity that could impact breeding success.

Permanent, high-profile structures such as buildings and storage tanks will not be constructed within 0.25 mile of an occupied greater sage-grouse lek.

In selecting a site for a compressor facility, a well pad or other permanent facility, the distance from the edge of a an occupied greater sage-grouse lek will be sufficient to result in a noise level increase from operating facilities no greater than 10 decibels (dBA) above background (i.e., 39 dBA background + 10 dBA = 49 dBA). Further restrictions may be required if the species is determined by the USFWS to be eligible for listing as either threatened or endangered pursuant to the Endangered Species Act. Monitoring will be required by BLM to determine which leks in the PAPA are occupied and which have been abandoned.

If existing information is not current, field evaluations for greater sage-grouse leks and/or nests will be conducted by a qualified biologist prior to the start of activities in potential greater sage-grouse habitat. These field evaluations for leks and/or nests will be conducted if project activities are planned in potential greater sage-grouse habitat between March 15 and July 15. BLM wildlife biologists will ensure that such surveys are conducted using proper survey methods.

Operators will be required to apply noise mitigation at well locations, as determined necessary by the BLM AO, on a case-by-case basis.

Wyoming Executive Order 2008-2, and the Wyoming Stipulations for Development in Core Sage-Grouse Population Areas, will be considered when permitting activities.

## **Sagebrush Habitats**

These guidelines (Bohne et al. 2007) include an approach to identify sage-grouse issues in landscape scale assessments, proposed habitat project planning and implementation and to build a safety net into the process to maintain or enhance sage-grouse populations. This is an approach that can be used to identify sage-grouse habitat issues and resolve conflicts in the development of vegetative treatment prescriptions, and it should be an integral part of the NEPA process where appropriate. The Wyoming Guidelines for Managing Sagebrush Communities with an Emphasis on Fire Management (Wyoming Interagency Vegetation Committee 2002:12) provides a list of nine decision elements that should be considered when evaluating a potential sagebrush treatment. In addition to those nine elements, assessing the need for a vegetation treatment involves a general assessment of the landscape and its use by sage-grouse. The following evaluation criteria should also be considered when developing vegetation treatments in occupied sage-grouse habitat:

- 1) Determine if sage-grouse (or other species of interest) seasonal habitats are present, the condition of these habitats, and the relative level of importance of these habitats. In the case of sage-grouse, it is important to know whether the population is resident or migratory when evaluating potential habitats affected by proposed actions.
- 2) Identify how much of the sage-grouse habitat in the area has been impacted previously by fire (prescribed or wild), other habitat conversions, habitat losses, or fragmentation, preferably using a GIS-based analysis.
- 3) Determine how much of the area is likely to burn in future wildfire and at what scale (a risk assessment).
- 4) Identify the short-term (1–14 years) and mid-term effects (15–30 years) of prescribed fires or other treatments on vegetation and key wildlife species.
- 5) Assess the presence of undesirable plant species (e.g., cheatgrass, invasive noxious weeds, rabbitbrush, juniper and other conifer invasion) and the risk of these species increasing under current management and/or as a result of the proposed treatment.
- 6) Determine the likely response of desirable species of vegetation that are present to the type and intensity of treatment being proposed.
- 7) Provide a clear statement of the intended objectives of the prescribed treatment, provide a rationale for the treatment, and identify impacts to sage-grouse and other species of interest as part of the management prescription and environmental assessment.
- 8) Establish overall goals along with measurable objectives and an adequate monitoring plan (adequate in terms of funding as well as quantifying the effects of treatment).
- 9) Identify mitigation measures (if any) needed to offset potential adverse impacts on sage-grouse habitat.

10) Develop a post treatment management plan that will ensure desired vegetative responses can be achieved and maintained.

No sagebrush control work should occur where live sagebrush cover is less than 20% (Bohne 2007).

If the herbaceous understory is depleted (reduced number of grass and forb species present), providing limited or inadequate cover, and the shrub canopy is too dense, then some vegetative treatment may be needed to restore the stand to its potential productivity and value for sage-grouse and other wildlife species. In this situation, the guidelines recommend treating no more than 20% of nesting and early brood-rearing habitat (Bohne 2007).

Sagebrush restoration techniques should be considered in areas in which sagebrush has been removed or severely fragmented by past management practices. If 40% or more of the breeding habitat of a population or subpopulation has been lost, the guidelines by Connelly et al. (2000) recommend that the remaining habitat should be protected from additional loss or degradation. In these situations, sagebrush restoration should be the priority land treatment to restore suitable shrub densities and understory vegetation to provide effective sage-grouse habitat (Bohne 2007).

## Reclamation

All disturbances will be limited to the minimum necessary to enable production of the resource.

All disturbances will be returned to the approximate predisturbance contour of the land.

Predisturbance land use will be returned to the maximum extent practicable.

Where approved disturbance prohibits maintenance of use, offsite mitigation could be considered.

Reclamation will be designed to restore the affected lands to predisturbance land uses once a project is completed. While surface-disturbing or disruptive activities continue, land uses will be mitigated using revegetation, stabilization, erosion control, and habitat enhancement.

Experimental methods to maintain or reclaim wildlife habitat or improve reclamation science are encouraged to be tested on small areas within the planning area. When scientifically proven effective for a reclamation objective, these methods may be incorporated into proven reclamation methods.

All reclamation of disturbed lands will be conducted with a diverse mix of noninvasive, certified weed-free seed demonstrated effective for post-disturbance land uses and approved by the AO. In designated crucial and important wildlife habitats, this seed mix should be designed to restore predisturbance wildlife use.

A site-specific reclamation plan should be prepared for each well pad, pipeline, road, or other surface disturbing activities prior to authorization and should include the following:

- Top soil storage techniques
- Description of native vegetation disturbed, including species and composition
- Need to collect native seed
- Need for irrigation and fertilization
- Need for fencing
- Proposed recontouring plans and seeding/planning procedures
- Definition of success

- Plans for reseeding if reclamation fails.

BLM will require each individual right-of-way, APD, or other application to include a reclamation plan approved by the BLM.

### **Site Stabilization**

On existing well pads that are not be fully developed by the second winter following construction, all bare ground will have at least a 75-percent protective cover that may include but not be limited to organic mulch, herbaceous vegetation, jute matting, or other erosion-preventative fabric. Protective cover may be excluded on active work sites (up to the wellhead with production equipment) if justified by the operator and with BLM concurrence.

During the period when an existing well pad is not being fully developed, there will be no sediment discharge from the existing pad. Operators will modify all existing well pads to achieve zero sediment discharge for a 25-year storm or snowmelt event.

Access road(s) leading to the temporarily stabilized well pad will have protective cover to the same levels required on the well pad.

Disturbed channel beds will be reshaped to their approximate original configuration.

Streams, wetlands, and riparian areas disturbed during project construction will be restored to as near pre-project conditions as practical, and if impermeable soils contributed to wetland formation, soils will be compacted to reestablish impermeability.

Areas will be recontoured and BLM-approved species will be used for reclamation.

Reclamation activities will begin on disturbed wetland areas immediately after completion of project activities.

Upon completion of construction and/or production activities, operators will restore the topography to near preexisting contours at well sites, access roads, pipelines, and other facility sites.

All roads on federal lands not required for routine operation and maintenance of producing wells, ancillary facilities, livestock grazing administration, or necessary recreation access will be reclaimed as directed by the BLM. These roads will be permanently blocked, recontoured, reclaimed, and revegetated by the operators, as will disturbed areas associated with permanently plugged and abandoned wells.

Disturbances should be reclaimed or managed for zero sediment discharge. All excavations and pits should be closed by backfilling and contouring to conform to surrounding terrain. On well pads and larger locations, the surface use plan will include objectives for successful reclamation such as soil stabilization, plant community composition, and desired vegetation density and diversity.

On producing locations, operators will be required to reduce slopes to original contours (not to exceed 3:1 slopes). Areas not used for production purposes will be backfilled and blended into the surrounding terrain, reseeded, and erosion control measures installed. Erosion control measures will be required after slope reduction. Facilities will be required to approach zero runoff from the location to avoid contamination and water quality degradation downstream. Mulching, erosion control measures, and fertilization may be required to achieve acceptable stabilization.

Abandoned sites must be satisfactorily rehabilitated in accordance with a plan approved by the BLM. Soil samples may be analyzed to determine reclamation potential, appropriate reseeding species, and nutrient deficits. Tests may include pH, mechanical analysis, electrical conductivity, and sodium content. Terraces or elongated water breaks will be constructed after slope reduction.

All reclamation is expected to be accomplished as soon as possible after the disturbance occurs with efforts continuing until a satisfactory revegetation cover is established and the site is stabilized (3 to 5 years). Only areas needed for construction will be allowed to be disturbed.

On all areas to be reclaimed, seed mixtures will be required to be site specific and composed of native species. Seed mixtures also will be required to include species promoting soil stability. A predisturbance species composition list must be developed for each site if the project encompasses an area in which several different plant communities present. Livestock palatability and wildlife habitat needs will be given consideration in seed mix formulation. BLM guidance for native seed use is BLM Manual 1745 (Introduction, Transplant, Augmentation, and Reestablishment of Fish, Wildlife, and Plants), and Executive Order No. 11987 (Exotic Organisms).

If deemed necessary, approved sterile seed mix could be considered for use in site stabilization during reclamation.

Interseeding, secondary seeding, or staggered seeding may be required to accomplish revegetation objectives. During rehabilitation of areas in important wildlife habitat, provision will be made for the establishment of native browse and forb species, if determined to be beneficial for the habitat affected. Follow-up seeding or corrective erosion control measures may be required on areas of surface disturbance which experience reclamation failure.

Any mulch and mineral material (sand and gravel) used will be certified weed free and free from mold or fungi. Mulch may include native hay, small grain straw, wood fiber, live mulch, cotton, jute, synthetic netting, and rock. Straw mulch should contain fibers long enough to facilitate crimping and provide the greatest cover.

## **Noxious Weeds**

Operators will monitor noxious weed occurrence on the project area and implement a noxious weed control program in cooperation with the BLM and Sublette County to ensure noxious weed invasion does not become a problem. Weed-free certification by county extension agents will be required for grain or straw used for mulching revegetated areas. Gravel and other surfacing materials used for the project will be free of noxious weeds.

The operator, grantee, or lessee will be responsible for the control of all noxious weed infestations on surface disturbances. Prior to any treatment, the operator, grantee, or lessee will be responsible for submission of Pesticide Use Proposals and subsequent Pesticide Use Reports. Control measures will adhere to those allowed in the *Final Vegetation Treatments Using Herbicides on BLM in 17 Western States Programmatic EIS* (June 2007) and ROD (September 2007), *Rock Springs District Noxious Weed Control EA* (USDI 1982a), or the *Regional Northwest Area Noxious Weed Control Program EIS* (USDI 1987). Herbicide approvals and treatments will be monitored by the BLM AO. Herbicide applications will be kept at least 500 feet from known SSPS populations. Aerial application of chemicals is prohibited within one-quarter mile of special status plant locations, or other distance deemed safe by the BLM AO.

## Hazardous Waste Disposal

Operators will use WDEQ-approved portable sanitation facilities at drill sites; place warning signs near hazardous areas and along roadways; place dumpsters at each construction site to collect and store garbage and refuse; ensure that all refuse and garbage is transported to a state-approved sanitary landfill for disposal; and institute a Hazard Communication Program for its employees and require subcontractor programs in accordance with OSHA (29 CFR 1910.1200).

In accordance with 29 CFR 1910.1200, a Material Safety Data Sheet for every chemical or hazardous material brought on-site will be kept on file at the operator's field office.

Chemical and hazardous materials will be inventoried and reported in accordance with the SARA Title III (40 CFR 335). If quantities exceeding 10,000 pounds or the threshold planning quantity are to be produced or stored, the appropriate Section 311 and 312 forms will be submitted at the required times to the State and County Emergency Management Coordinators and the local fire departments.

Any hazardous wastes, as defined by the Resource Conservation and Recovery Act of 1976 (RCRA), as amended, will be transported and/or disposed of in accordance with all applicable federal, state, and local regulations.

Owners or operators of onshore facilities (any facility of any kind, or drilling or workover rigs), which because of their location could be reasonably expected to discharge oil in harmful quantities (as defined in 40 CFR part 110 and 112.3) into or upon navigable waters of the United States or adjoining shorelines, will prepare a Spill Prevention Control and Countermeasure Plan (SPCC Plan) in accordance with 40 CFR 112.7. Owners or operators of drilling or workover rigs need not prepare a new SPCC Plan each time the facility is moved to a new site. The SPCC Plan may be a general plan, using good engineering practices (40 CFR 112.3 (a), (b), and (c)). Owners or operators of a facility for which an SPCC Plan is required will maintain a complete copy of the SPCC Plan at such facility if the facility is normally attended at least 8 hours per day, or at the nearest field office if the facility is not so attended (40 CFR 112.3(e)).

SPCC Plans will be implemented and adhered to in a manner such that any spill or accidental discharge of oil will be remediated. An orientation should be conducted by the operators to ensure that project personnel are aware of the potential impacts that can result from accidental spills and that they know the appropriate recourse if a spill occurs. Where applicable and/or required by law, streams at pipeline crossings will be protected from contamination by pipeline shutoff valves or other systems capable of minimizing accidental discharge. If reserve pit leakage is detected, operations at the site will be curtailed, as directed by the BLM, until the leakage is corrected.

All natural gas wells will be cased and cemented to protect subsurface mineral and freshwater zones. Unproductive wells and wells that have completed their intended purpose will be properly abandoned and plugged using procedures identified by the Office of State Oil and Gas Supervisor, Rules and Regulations of WOGCC and the BLM.