

COGCC OIL AND GAS FIELD SCOUT CARD

Date 04/18/2016
Document No. 2056121

FIELD NAME BUZZARD CREEK
FIELD NUMBER 9500

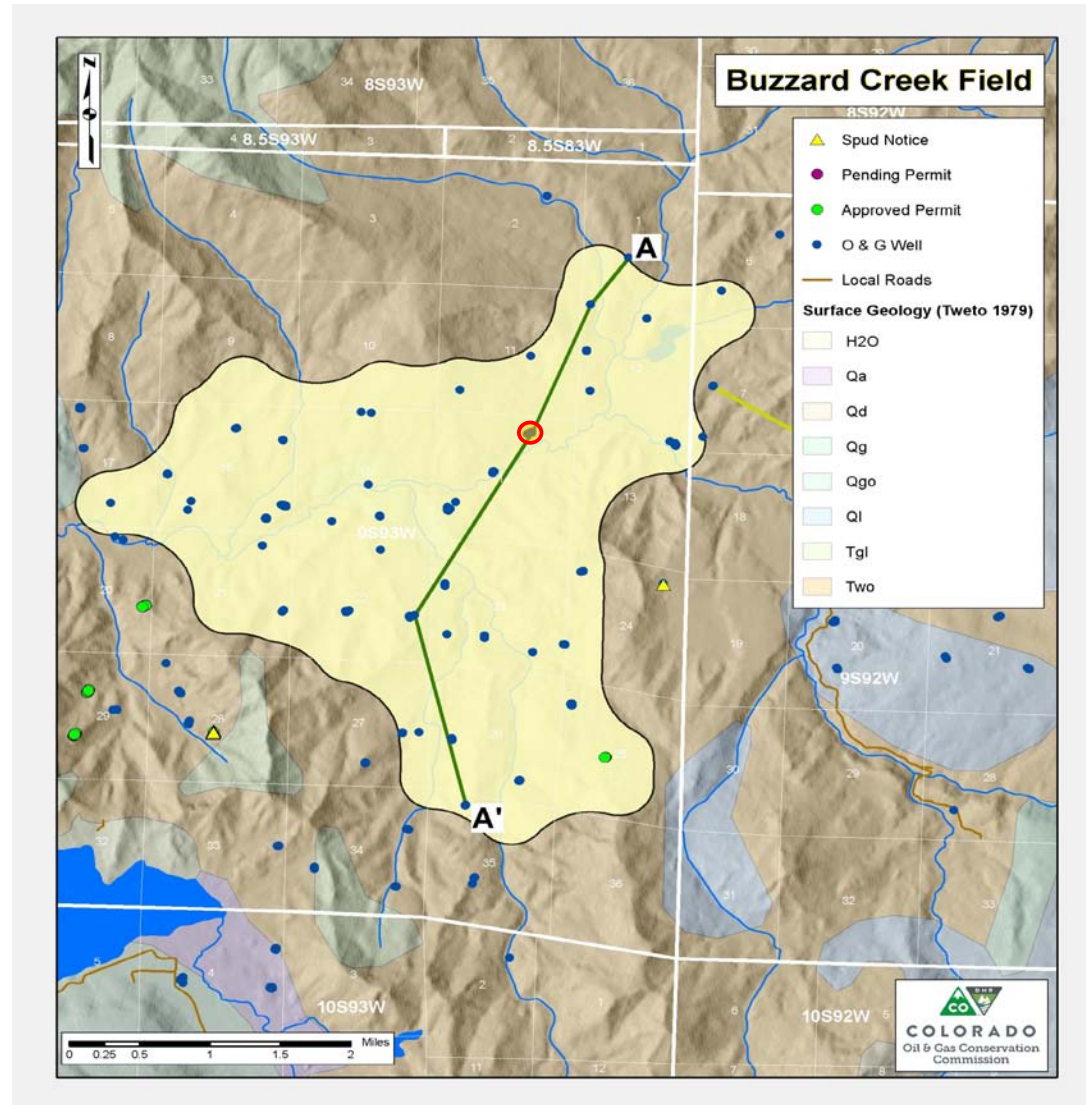
LOCATION
Basin Piceance
Township(s) 9S
Range(s) 92W to 93W

SURFACE GEOLOGY

Surface Geology consists of alluvium in the central, northeastern, and western portions of the field, underlain by the Wasatch Formation. The Wasatch Formation outcrops at surface throughout most of the field. The Green River Formation outcrops near the southwestern boundary of the field.

GEOLOGIC STRUCTURE

None present within this field or nearby on COGCC's 250K GIS Geology layer.



○ Type Log Well

**COGCC OIL AND GAS FIELD SCOUT CARD
BUZZARD CREEK #9500**

STRATIGRAPHY				A - South			A' - North		
				API Number =>	077-09476	077-09708	077-08753	077-05106	077-08850
All depths are measured depths				Surface Elevation =>	7,956	7,641	7,407	7,592	7,716
				Well Type =>	Directional	Directional	Directional	Vertical	Directional
Group	Formation	Interval/Member	Isolation Concern	Log Top	Log Top	Log Top	Log Top	Log Top	
	Alluvium		Water						
	Green River		Water						
	Wasatch	Upper	Shallow Water	0	0	0	0	0	
	Wasatch	G-Sand*	Possible Gas	2,886/2,998*		2,600/2,728*	2,670/2,810*		
	Wasatch	Fort Union*	None	3,290*		3,109*	3,210*		
	Wasatch	Middle	None						
	Wasatch	Lower*	Water	4,434*	4,180*	4,407*	4,164*		
Mesaverde	Williams Fork	Ohio Creek	Water / UIC	4,730*	4,566*	4,606*	4,440*		
Mesaverde	Williams Fork	U. Mesaverde	Water	5,152*	4,945	4,940*	4,890*		
Mesaverde	Williams Fork	Top of Gas**	Gas	6,652 tog**		6,316 tp**		6,430 tp**	
Mesaverde	Williams Fork	Cameo	Gas	7,835	7,205	7,532			
Mesaverde	Iles	Rollins	Gas	8,201	7,925	7,920	8,005*	8,361	
Mesaverde	Iles	Cozzette	Gas / UIC	8,725	8,531	8,470	8,530*	8,890	
Mesaverde	Iles	Corcoran	Gas	8,902	8,702	8,640	8,720*	9,090	
	Mancos		Possible Gas	9,043*	8,926				
	Morapos		Possible Gas		9,535				
	Niobrara		Possible Gas		12,057				
	Frontier		Possible Gas		13,206				
Dakota	Dakota		Possible Gas						

Annotated Type Log for 077-08753: COGCC Document Number 2056078

Stippled cells indicate that the respective log top was not apparent on logs or the top may be covered by a shallower casing string above the logged interval. "Middle Wasatch" is an interval that may include multiple formation members, and therefore, log tops are not presented for the Middle Wasatch.

* COGCC log picks (Wasatch G-Sand [top of upper and lower intervals] and Fort Union are not commonly recognized by operators in this field; however, Wasatch G is completed in a shallow well, 077-08637, NWNE 14-9S-93W; "Lower" Wasatch, as shown herein for water isolation, is not recognized in geologic literature)

** Top of Gas (tog), as reported by operator or top Williams Fork production perforation (tp)

WATER RESOURCE ISOLATION

Alluvium, Green River, Upper Wasatch (weathered portion in which water supply wells are screened), Lower Wasatch, Ohio Creek, and Upper Mesaverde
The deepest water well within the vicinity of the field is 310' (likely Wasatch)

PRODUCING ZONE ISOLATION

Primary Objectives: Mesaverde Group (Williams Fork, Cameo, Rollins, Cozzette, and Corcoran)
Secondary Objectives: Wasatch (G-Sand) and Mancos (A-Sand and B-Sand)

**COGCC OIL AND GAS FIELD SCOUT CARD
BUZZARD CREEK #9500**

UNDERGROUND INJECTION CONTROL

API Number	Well Name and Number	Type	Zone	Sample Top	Sample Bottom	TDS	Source
077-08765	Buzzard Creek 22-3	Disposal	Ohio Creek	N/A	N/A	7,000 (est.)	2.5 miles south ¹
077-07331	Buzzard Creek #14-6	Source	Williams Fork	5,941	7,245	28,435	SEP - 7/22/2008
077-08728	Buzzard Creek #14-1	Source	Williams Fork	6,135	7,682	25,100	TANK - 7/22/2008
077-08730	Buzzard Creek #15-10	Source	Williams Fork	6,146	7,228	30,094	SEP - 7/22/2008
077-08722	Buzzard Creek #12-5	Source	Williams Fork	6,234	7,541	18,265	SEP - 7/22/2008
077-08627	Buzzard Creek #15-15	Source	Williams Fork	6,400	7,605	40,524	SEP - 7/22/2008
077-10091	Bruton #19-10C	Source	Williams Fork	6,539	7,729	23,523	SEP - 6/18/2012
077-10092	Bruton #30-02B	Source	Williams Fork	6,585	7,749	21,918	SEP - 6/18/2012
077-10093	Bruton #19-06C	Source	Williams Fork	6,594	7,897	24,211	SEP - 6/18/2012
077-08737	Buzzard Creek #16-12	Source	Williams Fork - Cozette	5,846	8,050	26,159	WH - 7/23/2008
077-08844	Currier Fed #10-15 (BC15)	Source	Williams Fork - Cozette	6,495	8,748	27,479	WH - 7/23/2008
077-08754	Buzzard Creek #15-16	Source	Williams Fork - Iles	6,204	8,604	25,194	SEP - 7/22/2008
077-08881	Currier #9-15 (BB16)	Source	Williams Fork - Iles	6,357	8,696	21,690	WH - 7/23/2008
077-08732	Buzzard Creek #15-12	Source	Williams Fork - Iles	6,412	8,450	10,081	WH - 7/23/2008
077-08850	Currier #1-13 (BK1)	Source	Williams Fork - Iles	6,430	9,228	20,135	SEP - 7/22/2008
077-08750	Buzzard Creek #16-10	Source	Williams Fork - Iles	6,434	8,560	24,305	WH - 7/23/2008
077-08746	Buzzard Creek #21-1	Source	Williams Fork - Iles	6,485	8,571	36,352	WH - 7/23/2008
077-08836	Werne #14-12 (BL14-9)	Source	Williams Fork - Iles	6,502	8,396	31,018	SEP - 7/22/2008
077-08731	Buzzard Creek #16-1	Source	Williams Fork - Iles	6,668	8,346	6,275	WH - 7/23/2008
077-05106	Buzzard Creek #12-4	Disposal	Cozette	8,562	8,566	30,203	SEP - 7/22/2008
077-08723	Buzzard Creek #12-12	Source	Cozette - Corcoran	6,382	8,701	16,812	SEP - 7/22/2008
077-10094	Bruton #19-14B	Source	Mancos			23,883	SEP - 6/18/2012

"Source" wells are sorted in order from shallowest to deepest "Sample Top" depth

(1) TDS concentration reportedly estimated from wells located approximately 2.5 miles to the south

COMMISSION ORDER SUMMARY (Significant Engineering and Spacing Issues)

369-1 (4/20/1981)	Mesaverde Group: Recognizes all Mesaverde Group formations as a Common Source of supply. Establishes 320-acre drilling and spacing units, 600' from unit line.
369-2 (9/20/2004)	Establishes a Bradenhead Monitoring Area, including the Buzzard Creek Field.
369-3 (5/25/2007)	Mesaverde Group: Amends prior orders to allow 20-acre spacing in certain parts of the field, 200' from unit line, 400' well-to-well spacing and one pad per quarter-quarter.
Various	Mesaverde Group: Amends prior orders to allow 10-acre spacing in certain parts of the field, 100' / 200' from unit lines and one pad per quarter-quarter.
369-9 (1/23/2012)	Mesaverde Group and Deeper Formations: Establishes 160-acre drilling and spacing units for vertical and directional wells targeting the Mesaverde Group and Deeper formation objectives (Mancos, Morapos, Niobrara, and Frontier), 600' from unit line, 100' well-to-well spacing and one pad per quarter-quarter.

**COGCC OIL AND GAS FIELD SCOUT CARD
BUZZARD CREEK #9500**

HISTORIC WELL CONSTRUCTION

Surface casing setting depths generally range from 400' to 2,400', with greater than 1,000' set in most wells. Production casing generally terminates in the Iles or underlying Mancos formations. Production casing cement may be limited to coverage of the producing intervals, and coverage may be lacking across parts of the Mesaverde Group and Wasatch Formation.

NEW WELL CONSTRUCTION (effective 04/18/2016)

Minimum surface casing of 5% TVD required for well control in Mesa County (10% TVD recommended) and to cover water resources in the upper interval of the Wasatch Formation. Recommend setting depth of 1,000' or greater, based on potential water resources apparent on induction logs with shallow-set surface casing. Full cement coverage of the Mesaverde Group and Ohio Creek is required in the Piceance Basin through 2015. New Standards require cementing intermediate (if used) or production casing at least 200' above Lower Wasatch sands, as shown on the annotated type log for this field. Cement coverage (stage cement or increased primary cement for intermediate [if used] or production casing) is also required across the Wasatch G within one mile of productive Wasatch G wells.

PLUGGING OBJECTIVES

Plug(s) above Mancos and other deeper formations (if penetrated) to address potential future horizontal wells; plug above Mesaverde Group completions; plug across Ohio Creek and across Lower Wasatch (squeeze to 200' above Lower Wasatch if no annular cement coverage); Wasatch G plug if productive within one mile; stray gas isolation squeezes (if no annular cement) or in-casing stabilization plugs (if annular cement present) at 3,000-foot intervals if plugs are not already planned in those intervals as described above; surface casing shoe plug and surface plug. Larger surface casing shoe plugs should be considered for wells with less than 1,000' of surface casing.

NOTES

This field is located within the Bradenhead Monitoring Area. Special requirements and Form 2 Conditions of Approval apply.

Well Control: Controlled gas kick reported for 077-09912 on 3/29/2011 while drilling in the Mancos Formation.