

COGCC OIL AND GAS FIELD SCOUT CARD

Revised 04/18/2016
Document No. 2056123

FIELD NAME **VEGA**
FIELD NUMBER **85930**

LOCATION

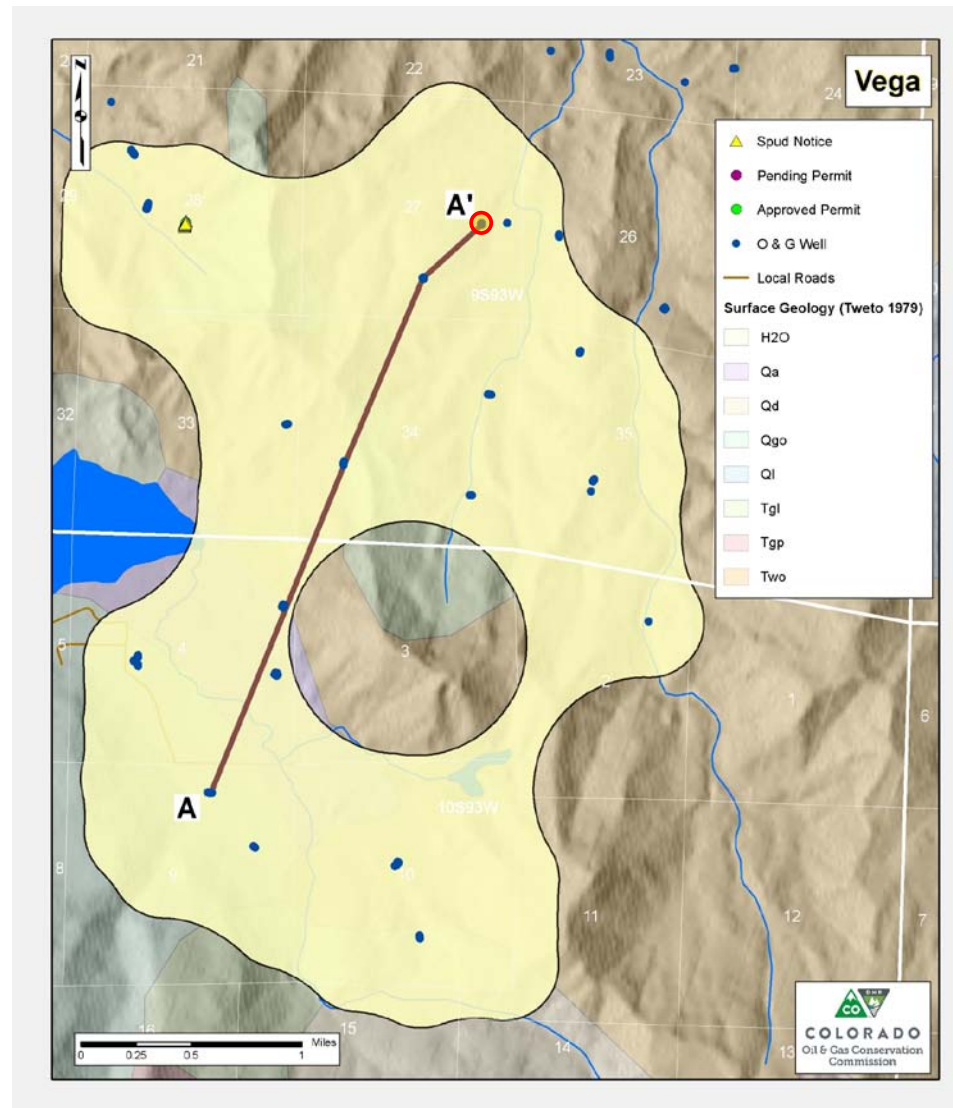
Basin Piceance
Township(s) 9S to 10S
Range(s) 93W

SURFACE GEOLOGY

Surface Geology generally consists of alluvium in the southwestern portion of the field, underlain by the Wasatch Formation. The Green River Formation outcrops, overlying the Wasatch Formation, in the north-central and northwestern portions of the field. Glacial drift overlies the Wasatch Formation in the extreme southern portion of the field.

GEOLOGIC STRUCTURE

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



○ Type Log Well

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STRATIGRAPHY				A - Southwest			A' - Northeast	
				API Number =>	077-08096	077-08132	077-09289	077-09288
All depths are measured depths				Surface Elevation =>	8,150	8,140	7,896	7,720
				Well Type =>	Vertical	Vertical	Vertical	Directional
Group	Formation	Interval/Member	Isolation Concern	Log Top	Log Top	Log Top	Log Top	
	Alluvium		Water	0				
	Glacial Drift		Water					
	Green River		Water					
	Wasatch	Upper	Shallow Water		0	0	0	
	Wasatch	G-Sand*	None	2,652/2,860*	3,036/3200*		2,845/2,976*	
	Wasatch	Fort Union*	None	3,123*	3,540*		3,340*	
	Wasatch	Middle	None					
	Wasatch	Lower*	Water	4,050*	4,410*		4,163*	
Mesaverde	Williams Fork	Ohio Creek	Water / UIC	4,221*	4,615*		4,501*	
Mesaverde	Williams Fork	U. Mesaverde	Water / UIC	4,630*	5,034*		4,930*	
Mesaverde	Williams Fork	Top of Gas	Gas			6,442	6,160	
Mesaverde	Williams Fork	Cameo	Gas			7,747	7,535	
Mesaverde	Iles	Rollins	Gas	7,550*	8,060*	8,052	7,911	
Mesaverde	Iles	Cozette	Gas	8,090	8,585	8,637	8,521	
Mesaverde	Iles	Corcoran	Gas	8,290	8,766	8,824	8,707	
	Mancos		Possible Gas					
	Niobrara		Possible Gas					

Annotated Type Log for 077-09288: COGCC Document Number 2056082

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 in the adjacent Buzzard Creek Field to the north, 077-08637, NWNE 14-9S-93W; "Lower" Wasatch, as shown herein for water isolation, is not recognized in geologic literature)

WATER RESOURCE ISOLATION

Alluvium, glacial drift, 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 590' (likely Wasatch)

PRODUCING ZONE ISOLATION

Primary Objectives: Mesaverde Group (Williams Fork, Cameo, Rollins, Cozette, and Corcoran)

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UNDERGROUND INJECTION CONTROL

API Number	Well Name and Number	Type	Zone	Sample Top	Sample Bottom	TDS	Source
077-09042	Vega Unit #34-13D	Disposal	Ohio Creek ¹	4,724	5,023	13,300	SWAB - 7/17/2009 ²
077-09042	Vega Unit #34-13D	Disposal	Ohio Creek ¹	4,724	5,023	15,200	SWAB - 7/18/2009 ²
077-08132	Vega Unit #2	Disposal	Ohio Creek ^{1,3}	4,925	5,062	16,900	SWAB - 12/5/2008
077-09042	Vega Unit #34-13D	Disposal	Williams Fork ⁴	5,039	5,039	6,999	FB avg - 11/7/2006
077-08132	Vega Unit #2	Disposal	Williams Fork ^{3,4}	5,184	5,450	21,567	SWAB - 5/16/2011
077-08132	Vega Unit #2	Disposal	Williams Fork ^{3,4}	5,184	5,450	23,341	SWAB - 5/19/2011
077-08132	Vega Unit #2	Disposal	Williams Fork ^{3,4}	5,184	5,450	21,799	SWAB - 5/20/2011
077-08934	Vega #10-23	Source	Williams Fork	6,230	7,606	22,794	SEP - 8/18/2008
077-08920	Vega #34-14	Source	Williams Fork	6,400	7,976	25,409	SEP - 8/18/2008
077-08933	Vega Unit #10-33	Source	Williams Fork	6,741	7,533	22,220	WH - 11/29/2007
077-09093	Vega Unit #10-131	Source	Williams Fork - Rollins	6,000	7,965	17,965	SEP - 8/18/2008
077-09465	Vega #4-234	Source	Williams Fork - Rollins	6,118	7,743	20,265	SEP - 8/18/2008
077-09238	Vega Unit #4-241	Source	Williams Fork - Rollins	6,226	7,700	21,925	SEP - 8/18/2008
077-09461	Vega #4-331	Source	Williams Fork - Rollins	6,266	7,945	17,190	SEP - 8/18/2008
077-09003	Vega Unit #34-124	Source	Williams Fork - Rollins	6,342	8,286	16,945	WH - 11/29/2007
077-09117	Vega Unit #34-431	Source	Williams Fork - Rollins	6,644	8,137	27,494	SEP - 8/18/2008
077-09242	Vega Unit #10-124	Source	Williams Fork - Rollins	6,689	7,982	24,827	WH - 11/29/2007
077-09452	Vega Fed #34-224	Source	Williams Fork - Rollins	6,789	8,336	27,245	SEP - 8/18/2008
077-09190	Vega Unit #9-321	Source	Williams Fork - Rollins	6,856	7,775	18,273	WH - 11/29/2007
077-08928	Vega Unit #4-34	Source	Williams Fork - Rollins	6,999	7,876	19,188	WH - 11/29/2007
077-09193	Vega Unit #9-224	Source	Williams Fork - Rollins	7,073	7,984	17,856	WH - 11/29/2007
077-09194	Vega Unit #4-244	Source	Williams Fork - Rollins	7,091	7,965	17,089	WH - 11/29/2007
077-09192	Vega Unit #9-221	Source	Williams Fork - Rollins	7,106	7,960	17,713	WH - 11/29/2007
077-09191	Vega Unit #4-341	Source	Williams Fork - Rollins	7,178	8,052	21,650	WH - 11/29/2007
077-09123	Vega Unit #9-421	Source	Williams Fork - Iles	5,862	8,253	20,735	WH - 11/29/2007
077-09134	Vega Unit #34-421	Source	Williams Fork - Iles	6,668	8,652	29,400	SEP - 8/18/2008
077-08929	Vega Unit #9-31	Source	Williams Fork - Iles	6,774	8,406	21,550	WH - 11/29/2007
077-09001	Vega Unit #33-42	Source	Williams Fork - Iles	6,888	8,853	26,398	SEP - 8/18/2008
077-08927	Vega Unit #10-22	Source	Williams Fork - Iles	6,938	8,416	26,458	WH - 11/29/2007

Aquifer Exemption: Ohio Creek 1/4-mile radius around Vega Unit 34-13D (077-09042).

Data in this table is listed first by zone from shallowest to deepest, then by Sample Top depth.

- (1) Designated the Wasatch Formation by the operator, but in 2015 COGCC staff contends that this interval is primarily Ohio Creek with some U. Mesaverde.
- (2) Injectivity tests reported on production records prior to this 2009 sample but after the 2006 sample. This timing may have created higher TDS artificially.
- (3) Vega Unit #2 (077-08132) perforations added on 6/15/2011, but no pre-injection water sample in the file for the new interval from 4,410' to 4,914' (Lower Wasatch & Ohio Creek).
- (4) Designated the Ohio Creek Formation by the operator, but in 2015 COGCC staff contends that this interval is entirely below the Ohio Creek Formation in the interval commonly designated Williams Fork or Upper Mesaverde by most operators.

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COMMISSION ORDER SUMMARY (Significant Engineering and Spacing Issues)

399-1 (5/10/1983)	Mesaverde Group: Recognizes all Mesaverde Group formations as a Common Source of supply. Establishes 320-acre drilling and spacing units, 600' from unit line.
1-107 (9/20/2004)	Establishes a Bradenhead Monitoring Area, including the Vega Field.
Various	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.
399-8 (9/19/2011)	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): establishes 10-acre spacing, 600' from unit line, 100' well-to-well spacing and one pad per quarter-quarter.

HISTORIC WELL CONSTRUCTION

Other than one older well with a surface casing set at 1049', surface casing setting depths generally range from 1,800' to 2,300'. 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. Full cement coverage of the Mesaverde Group and Ohio Creek is required in the Piceance Basin through 2015. Active UIC wells are also completed in the L. Wasatch and Ohio Creek Formations in this field. 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.

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); 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 (may be a concern with shallow-set surface casing < 2,000 feet); surface casing shoe plug and surface plug.

NOTES

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