

Bureau of Land Management

Amarillo Field Office

Helium Operations

Statistical Report

for

December - 2019



Distribution:

Fluid Minerals Group Manager, Washington Office

NMSO, New Mexico State Director

NMSO, Associate State Director

NMSO, Petroleum Engineer

Field Manager, Amarillo Field Office

Assistant Field Managers (3)

Team Leaders

-Federal Leased Lands

-Resources Evaluation & Gas Analysis

-Division Of Helium Operations, -

Engineering and Technical Support

List of Tables

Table 1 - Summary of Helium Operations

Table 2 - Bush Dome Reservoir Operations

Table 3 - Gas Volumes & Inventory

Table 4 - In Kind Helium Sales

Table 4 - Natural Gas / Natural Gas Liquid Sales

Table 5 - Conservation Crude Sales/Reserve Sell-down

Table 6 - Helium Resources Evaluation

Table 7 - Helium Storage Contract Activity

Table 8 - Compression & CHEU (Operations)

Compiled by: David Reeves

Amarillo, Texas

Issued: October 19, 2020

"Please Note: Data in this report is accurate as of print date; however all data is subject to change."

Approved for Distribution: Samuel R. M. Burton

Date: September 22, 2022

Table 1 - Summary of Helium Operations

December - 2019

Helium Enrichment Unit Operations

Gas Processed	Month	Month	Average Percent	Gross FYTD	Net FYTD
	Gross Volume	Net Helium			
Measured Plant Feed (Mcf*)	473,553	70,092	14.80%	1,211,374	177,233
Helium Product (Mcf*)	98,667	70,876	71.83%	248,691	177,940
Residue Natural Gas (Mcf*)	187,595	24	0.01%	457,561	54

* Volumes in Mcf at 14.65 psia & 60°F

Natural Gas & Liquids Produced

Gas Processed	Month	FYTD
Natural Gas Sales (Mcf****)	185,358	452,370
NGL Sales (gallons)	81,685	201,283

*** Volumes in Mcf at 14.73 psia & 60°F

Bush Dome Reservoir Operations

Conservation gases from all sources	Month	Month	Average Percent	Gross FYTD	Net FYTD
	Gross Volume	Net Helium			
Total Withdrawn (Mcf*)	476,940	70,601	14.80%	1,226,706	178,991
Crude Injection (Mcf*)	0	0	00.00%	0	0
Crude Production (Mcf*)	0	0	00.00%	0	0

* Volumes in Mcf at 14.65 psia & 60°F

Storage Operations

In Kind Helium	Month	FYTD	CYTD	Cumulative
Sale Volumes Transferred (Mcf*)	2,682	51,469	179,101	3,901,213
Sale Volumes Outstanding (Mcf*)	48,988			

* Volumes in Mcf at 14.65 psia & 60°F

Private Company Helium Storage Contracts

Contact Activity	Month	Month	Average Percent	Annual Helium FYTD
	Gross Volume	Net Helium		
Crude Acquired (Mcf*)	18,207	13,182	72.40%	23188
Crude Disposed (Mcf*)	113,968	81,664	71.66%	188748
Net Balance (Mcf*)	(95,761)	(68,482)		(165,560)
Balance of Stored Helium End Of Month (Mcf*)		2,315,796		

* Volumes in Mcf at 14.65 psia & 60°F

Revenue / Charges

Helium Storage Contracts (Charges Billed (\$))	Month	FYTD
Storage Fees Billed (\$)	\$987,503	\$2,426,057
Resource Management Fees Billed (\$)	\$274,090	\$548,192
Total Storage and RMF Collected	\$1,261,593	\$2,974,249

Conservation Helium - Natural Gas - Liquid Sales (Charges Billed (\$))

	Month	FYTD
In Kind Sales	\$4,234,910	\$4,234,910
Natural Gas & Liquid Sales	\$294,443	\$794,077

Helium Resources Evaluation

	Month	FYTD
Revenue Collected from Federal Lease Holds	\$2,049,456	\$4,774,234
Helium Sample Collection Report for month	Submitted - 0	Received - 0
		Analyzed - 7

*Rounded to nearest dollar

Table 2 - Bush Dome Reservoir Operations

December - 2019

		Gross Withdrawal		Net Helium Withdrawal		Nitrogen		Methane	Methane	Ethane plus		Other (CO2, Ar, H2)	
		Month	Cumulative	Month	Cumulative	Month	Cumulative	Month	Cumulative	Month	Cumulative	Month	Cumulative
TOTAL		476,940	245,641,221	70,601	45,396,162	117,834	60,558,945	256,082	124,887,877	27,545	12,708,506	4,879	2,089,731
BIVINS A-3	Dec-19	0	10,961,114	0	3,548,629	0	2,772,147	0	4,159,384	0	407,301	0	73,653
BIVINS A-6	Dec-19	45,594	13,346,867	16,048	7,612,219	11,354	3,286,737	16,028	2,160,969	1,800	218,823	365	68,119
BIVINS A-13	Dec-19	32,957	9,874,671	9,798	4,907,905	8,250	2,528,653	13,134	2,139,742	1,521	238,851	253	59,520
BIVINS A-14	Dec-19	37,834	11,163,020	8,371	5,938,894	9,264	2,818,116	17,831	2,106,196	2,005	228,827	363	70,988
BIVINS A-4	Dec-19	30,554	14,933,748	2,792	2,545,507	7,297	3,615,598	18,241	7,843,360	1,869	793,172	355	136,111
BUSH A-2	Dec-19	5,413	14,097,416	231	2,023,602	1,354	3,462,448	3,418	7,700,390	375	794,669	34	116,308
Injection	Dec-19	0	66,474,735	0	48,019,788	0	17,121,580	0	780,676	0	37	0	552,655
inj Bivins A-3	Dec-19	0	(25,652,315)	0	(18,384,452)	0	(6,554,549)	0	(332,777)	0	0	0	(380,537)
inj Bivins A-6	Dec-19	0	(24,412,686)	0	(17,669,978)	0	(6,486,588)	0	(143,192)	0	(72)	0	(112,856)
inj Bivins A-13	Dec-19	0	(6,490,417)	0	(4,706,191)	0	(1,656,853)	0	(122,391)	0	(2)	0	(4,980)
inj Bivins A-14	Dec-19	0	(6,501,333)	0	(4,767,421)	0	(1,602,106)	0	(126,303)	0	(7)	0	(5,497)
inj Bivins A-4	Dec-19	0	(2,527,801)	0	(1,848,815)	0	(601,353)	0	(42,016)	0	0	0	(35,617)
inj Bush A-2	Dec-19	0	(867,658)	0	(625,258)	0	(215,406)	0	(13,980)	0	0	0	(13,015)
Production	Dec-19	0	1,254,876	0	924,742	0	270,231	0	48,129	0	3,199	0	8,575
BIVINS A-1	Dec-19	0	2,686,608	0	48,896	0	636,995	0	1,798,415	0	175,704	0	26,597
BIVINS A-2	Dec-19	18,411	14,823,988	559	1,908,083	4,303	3,621,036	12,088	8,333,979	1,277	835,774	185	125,114
BIVINS A-5	Dec-19	24,804	17,129,680	4,330	2,243,444	6,284	4,209,815	12,645	9,561,712	1,340	967,169	205	147,540
BIVINS A-7	Dec-19	15,372	12,379,178	4,603	2,954,519	3,959	3,121,432	6,045	5,635,754	658	577,388	106	90,086
BIVINS A-9	Dec-19	28,128	11,687,052	830	231,878	7,102	2,886,060	17,938	7,679,295	2,007	783,753	252	106,068
BIVINS A-11	Dec-19	18,568	7,222,557	552	162,046	4,639	1,799,425	11,864	4,705,544	1,318	487,002	195	68,540
BIVINS A-15	Dec-19	29,740	11,231,591	491	454,799	6,838	2,667,296	19,933	7,259,019	2,091	731,066	386	119,411
BIVINS B-1	Dec-19	31,573	9,394,606	727	331,593	7,711	2,280,449	20,606	6,057,705	2,113	624,964	417	99,894
BIVINS B-2	Dec-19	27,847	7,849,715	510	147,832	6,979	1,967,757	17,882	5,091,336	1,935	528,120	541	114,670
BUSH A-1	Dec-19	0	5,721,962	0	104,140	0	1,356,677	0	3,830,281	0	374,216	0	56,647
BUSH A-3	Dec-19	27,451	13,334,425	8,618	3,257,190	6,879	3,303,376	10,583	6,041,658	1,131	615,985	240	116,216
BUSH A-4	Dec-19	23,083	9,530,538	1,671	1,655,679	5,895	2,388,826	13,901	4,913,586	1,481	505,236	135	67,212
BUSH A-5	Dec-19	41,686	18,351,421	9,731	4,260,613	10,574	4,612,486	19,080	8,480,674	2,046	871,496	255	126,152
BUSH A-8	Dec-19	15,608	5,009,111	280	91,790	3,838	1,216,958	10,123	3,298,751	1,080	335,261	287	66,352
BUSH A-9	Dec-19	0	3,860,915	0	105,037	0	930,915	0	2,537,187	0	253,463	0	34,312
BUSH A-11	Dec-19	16,760	5,130,838	361	145,319	4,016	1,227,572	11,025	3,355,444	1,110	341,983	247	60,519
BUSH B-1	Dec-19	5,557	3,507,549	97	65,615	1,297	831,635	3,715	2,343,487	389	232,419	58	34,393
FUQUA A-1	Dec-19	0	2,954,098	0	53,854	0	702,798	0	1,975,175	0	193,573	0	28,699
FUQUA A-2	Dec-19	0	132,119	0	2,404	0	31,322	0	88,458	0	8,637	0	1,297
FUQUA A-3	Dec-19	0	9,303,912	0	577,005	0	2,277,687	0	5,790,357	0	583,701	0	75,162
TT Fuel	Dec-19	0	0	0	0	0	0	0	0	0	0	0	0
field-wide pcts				14.80%	18.48%	24.71%	24.65%	53.69%	50.84%	5.78%	5.17%	1.02%	0.85%

Latest estimates of reserves and feed to HEU

Based on NITEC's 2003 reserves study
from NITEC's interim report

As of EOM Dec-19

Volumes in BCF

Initial Gas In Place	330.040	
Produced 1924 to 1961	48.830	
Injected 1924 to 1961	0.450	
Remaining Gas In Place 1961	281.660	
Left Behind Pipe, 1961	82.060	=====> 1.500 BCF of contained helium
Remaining in Place, 1961	199.600	
Gas In Place 1961	199.600	
Produced 1961 to July 2002	82.450	
Injected 1961 to July 2002	64.510	Net Helium
Remaining Gas In Place July 2002	181.660	33.997
Produced July 2002 through Dec 2002	1.096	0.743
Production 2003 - 18	108.029	26.256
Injection 2003 - 18	(1.423)	(1.159)
Produced to Date 2019	5.276	0.793
Injected to Date 2019	0.000	0.000
Amount of Raw Gas Available to CHEU	68.681	=====> 7.364 total helium in reservoir
Estimated Bottom Hole Pressure	253.018	est z-factor 0.980

* All volumes on Table 2 are reported in Mcf at 14.65 psia & 60°F

Table 3 - Gas Volumes & Inventory

December - 2019

Crude Helium Enrichment Unit Operations

		Gross Withdrawal		Net Helium Withdrawal		Nitrogen		Methane		Ethane plus		Other (CO2, Ar, H2)	
		Month	Cumulative	Month	Cumulative	Month	Cumulative	Month	Cumulative	Month	Cumulative	Month	Cumulative
Measured Feed	Dec-19	473,553	110,529,760	70,092	25,358,330	116,997	27,655,695	254,271	51,054,579	27,348	5,485,726	4,844	975,430
Calculated Feed	Dec-19	476,940	110,419,050	70,601	25,355,978	117,834	27,621,268	256,082	50,960,372	27,545	5,503,575	4,879	977,858
Feed to Box	Dec-19	472,715	109,685,038	70,601	25,356,156	117,834	27,621,350	256,082	50,960,418	27,545	5,503,569	653	243,545
Cheu Product	Dec-19	98,667	32,229,418	70,876	24,990,565	24,902	6,376,599	2,257	639,505	2	927	631	221,822
Residue	Dec-19	187,595	50,631,667	24	2,226	5,192	1,234,000	165,217	44,924,355	17,163	4,469,822	0	1,265
Cold Box Vent	Dec-19	71,153	18,048,138	179	91,862	60,467	16,000,881	10,492	1,893,451	0	245	15	61,698
Flare/Boot Strap	Dec-19	71,153	8,564,387	179	52,641	60,467	7,255,883	10,492	1,155,620	0	93,711	15	6,531
Fuel From Cheu	Dec-19	7,841	1,504,977	4	507	203	43,311	6,324	1,219,393	1,310	241,766	0	0
Shrinkage/Loss	Dec-19	8,496	594,028	0	0	0	0	0	0	8,496	594,028	0	0
Unaccounted*	Dec-19	89,794	4,422,235	(1,170)	163,831	24,825	3,112,663	66,138	1,140,871	(0)	974	1	3,897

*Before October 2004, the values are estimated

Storage Operations

Inventory (contained helium)

	Government	Private
Beginning inventory	2,756,457	2,381,596
net acceptances + redeliveries	0	0
In Kind Transfers	(2,682)	2,682
Conservation Crude Sales	0	0
Gain/loss	(2,852)	
Ending Inventory	2,750,923	2,315,795
Total Helium in Reservoir	7,364,191	
Total Helium in Storage	5,066,718	
Helium in native gas	2,297,472	

Crude Helium Pipeline

	Gross	Net Helium	Percent
Beginning inventory	37,042	26,519	71.59%
Measured to Pipeline (Private Plants)	18,207	13,182	72.40%
Measured from Pipeline (Private Plant:	113,970	81,665	71.65%
HEU Production	98,667	70,876	71.83%
Injection	0	0	00.00%
Production	0	0	
Ending Inventory	36,301	26,060	71.79%
Gain/Loss	(3,646)	(2,852)	

Tuck Triqq Reservoir Operations

Native Gas (Gross)	Month	Since Field	
		Fiscal Year	Discovery
Total in place, beg. of period	5,198,688	5,198,688	5,890,000
Recoverable in place, beg. of period	4,528,688	4,528,688	5,220,000
Production during period to date	0	0	691,312
Total in place, end of month	5,198,688	5,198,688	5,198,688
Recoverable in place, end of month	4,528,688	4,528,688	4,528,688

* All volumes on Table 3 are reported in Mcf at 14.65 psia & 60°F

Table 4 - In Kind Helium Sales

December - 2019

	NASA*	Navy*	Army*	Air Force*	DOE*	Other Fed*	Subtotal*	In Kind+	Charges Billed (\$)**		
In Kind Helium									(billed quarterly)		
Airgas Merchant Gases, Contract no. INC18-0102											
Month											
FYTD											
Air Liquide Helium America, Inc., Contract no. INC18-0104											
Month											
FYTD											
Air Products, L.P., Contract no. INC18-0105											
Month											
FYTD											
Messer, LLC, Contract no. INC18-0106											
Month											
FYTD											
Praxair, Inc., Contract no. INC18-0112											
Month											
FYTD											
Matheson Tri-Gas, Inc., Contract no. INC18-0114											
Month											
FYTD											
Global Gases America, Contract no. INC18-0116											
Month											
FYTD											
Month	0	0	0	0	0	0	0	0	\$0		
FYTD	0	0	0	0	0	0	0	0	\$0		
Total month	20,294	52	0	0	0	24,933	45,279	44,578	\$4,234,910		
Total FYTD	20,294	52	0	0	0	24,933	45,279	44,578	\$4,234,910		
Total CYTD	78,155	185	0	0	0	99,010	177,350	174,603	\$16,583,883		
Cumulative	2,153,360	108,870	450	271,593	422,045	1,055,937	4,012,254	3,950,126	\$244,954,337		
In Kind Transfers								Month	FYTD	CYTD	Cumulative
Transferred								2,682	51,469	179,101	3,901,213
Volume outstanding								48,988			

* Volumes in Mcf at 14.7 psia & 70°F

**Rounded to nearest dollar

+ Volumes in Mcf at 14.65 psia & 60°F

Natural Gas / Natural Gas Liquid Sales

	Natural Gas (Mcf)***	NGLs (gal)	Decatherms	Avg Btu Value	Charges Billed (\$)**
El Paso Natural Gas					
Provides Measured Firm/Interruptible Transportation Services (billed monthly)					
Month	185,358	---	203,894	1,100	\$0
FYTD	452,370	---	498,239	1,101	\$0
Cumulative	49,968,408	---	54,413,008	1,089	(\$5,088,325)
Minerals Management Service					
No Longer Provides Natural Gas Marketing Services					
Cumulative	---	---	---	---	(\$179,913)
ETC Marketing Ltd					
Purchaser - Natural Gas					
Month	---	---	203,300	\$1.195671	\$243,080
FYTD	---	---	507,100	\$1.322586	\$670,683
Cumulative	---	---	54,312,459	\$4.076732	\$220,590,803
Sandstone					
Purchaser - Natural Gas Liquids					
Month	---	81,685	8,836	\$5.812909	\$51,363
FYTD	---	201,283	21,794	\$5.661812	\$123,394
Cumulative	---	15,649,104	1,668,436	\$10.345607	\$17,260,983
Total					
	Natural Gas (Mcf)***	NGLs (gal)	Purchased (Dth's)	\$\$ Per Unit (\$\$/Dth)	Total (\$)
Total month	185,358	81,685	212,136	\$1.387990	\$294,443
Total FYTD	452,370	201,283	528,894	\$1.501391	\$794,077
Total CYTD	2,256,412	903,022	2,620,994	\$1.078671	\$2,827,190
Cumulative	49,968,408	15,649,104	55,980,895	\$4.169460	\$232,583,548

*** Volumes in Mcf at 14.73 psia & 60°F

**Rounded to nearest dollar

Table 5 - Conservation Crude Sales/Reserve Sell-down

December - 2019

Helium & Natural Gas Sales

This Table has been suspended as of 9/30/2018, BLM is no longer selling crude helium on the Open Market per Helium Stewardship Act of 2013.

Table 6 - Helium Resources Evaluation

December - 2019

All Volumes in Mcf at 14.7 psia & 70°F

Revenue Collected From Federal Leaseholds	Month*	FYTD*
Fee Sales & Royalties	\$2,045,015	\$4,707,683
Natural Gas Royalties (1)	\$0	\$0
Natural Gas Rentals	\$0	\$0
Other	\$66,550	\$188,742
Revenue Collected from Federal Lease Holds	\$2,049,456	\$4,774,234

*Totals do not sum

Helium Analysis and Evaluation	Month	FYTD
Number of Sample Request Letters Sent	0	0
Number of Samples Received	0	0
Number of Samples Analyzed	0	0
Total Number of Samples Analyzed For Resources Division	0	0
Total Number of Other Samples Analyzed (2)	7	33

U. S. Helium Production

<i>Domestic</i>	FY Volume	CY Volume
2013 Helium Sold	4,725,187	4,623,130
2014 Helium Sold	4,279,765	4,166,708
2015 Helium Sold	3,815,746	3,463,698
2016 Helium Sold	3,282,185	3,466,014
2017 Helium Sold	4,559,100	4,644,278
Estimated Helium Resources as of 12/31/2016 (Mcf)		723,000,000

	FY-2017	CY-2017
U.S. Helium Exports (3)	2,520,645	2,451,207
US Helium Imports	731,407	666,908

(1) Includes drip gas sales & other miscellaneous gas sales.

(2) Includes pipeline, field survey, and other requested analyses.

(3) Data from Department of Commerce - Bureau of the Census.

Table 7 - Helium Storage Contract Activity

December - 2019

All Volumes in Mcf at 14.65 psia & 60°F

	Metered Gas						Transferred Gas		Stored Helium EOM	Charges Billed (\$)**	
	Gross Gas	Helium % Month	Helium	FYTD	Helium CYTD	Cumulative	Month	Cumulative		Month	FYTD
Total All Contracts*											
Crude Acquired	18,207	72.4%	13,182	23,188	114,719	27,480,941	30,089	61,314,006			
Crude Disposed	113,968	71.7%	81,664	188,748	886,695	54,997,158	27,407	26,951,416		\$987,502.81	Storage Fees
Grade-A Rdlvrd	0		0	0	0	1,478,718				<u>\$274,090.06</u>	RMF Fees
Net/Balance	(95,761)		(68,482)	(165,560)	(771,976)	(28,994,935)	2,682	34,362,590	2,315,796	\$1,261,592.87	\$2,974,249
Total Prior Contracts (TERMINATED)											
Crude Acquired				0	0	17,406,129	0	18,235,232			
Crude Disposed				0	0	11,830,863	0	19,187,102			
Grade-A Rdlvrd				0	0	1,478,718					
Number of trailers				0	0	9,834			0		
Messer, LLC, Contract no. 3249											
Crude Acquired											
Crude Disposed											
Net/Balance											
Praxair, Inc., Contract no. 3251											
Crude Acquired											
Crude Disposed											
Net/Balance											
Air Products, L.P., Contract no. 3256											
Crude Acquired											
Crude Disposed											
Net/Balance											
Air Liquide Helium America, Inc., Contract no. 3284											
Crude Acquired											
Crude Disposed											
Net/Balance											
Keyes Helium Co., LLC, Contract no. 3287											
Crude Acquired											
Crude Disposed											
Net/Balance											
Matheson Tri-Gas, Inc., Contract no. 3288											
Crude Acquired											
Crude Disposed											
Net/Balance											
Airgas Merchant Gases, Contract no. 3290											
Crude Acquired											
Crude Disposed											
Net/Balance											
Global Gases America, Contract no. 3293											
Crude Acquired											
Crude Disposed											
Net/Balance											
Scout Energy Partners, Contract no. 3294											
Crude Acquired											
Crude Disposed											
Net/Balance											
IACX Energy, Contract no. 3297											
Crude Acquired											
Crude Disposed											
Net/Balance											
Uniper Global Commodities North America LLC, Contract no. 3298											
Crude Acquired											
Crude Disposed											
Net/Balance											

Government Helium	
Remaining Crude Acquired beginning of the month	2,756,457
Crude Disposed: In Kind Sales transferred for the month	(2,682)
Conservation Crude Sales/Reserve Sell Down transferred (month)	0
Gains and Losses for the month	(2,852)
Net/Balance of Purchased Helium Remaining for Sale	2,750,923

*Includes In Kind and Conservation Crude transfers from Government storage

**Rounded to nearest dollar

** New Contracts

Table 8 - Compression & CHEU (Operations)

December - 2019

Field/CHEU Compressor Operations		Month	FYTD	Cumulative
Spot gas fuel price *	\$ per/MMBTU	\$1.20		
Fuel used * (now includes field compression well head)	total MMBTU	9,064	23,538	2,019,553
#1 Compressor run time *	hours	350	1,070	124,614
#2 Compressor run time *	hours	384	1,644	85,390
#3 Compressor run time *	hours	732	1,268	70,123

* Field/CHEU Compressor Operations based on Dec 19 activity

Crude Helium Enrichment Unit (CHEU) CHEU Runtime	Month		FYTD		Cumulative
	Runtime Hrs	Percent	Runtime Hrs	Percent	Runtime Hrs
Processing feed gas	744	100.0%	1,992	90.2%	140,096
Producing residue gas	744	100.0%	1,945	88.1%	136,894
Producing helium product	726	97.5%	1,867	84.6%	132,981
Producing natural gas liquids	741	99.6%	1,928	87.3%	132,238

CHEU Utility Usage	Month	FYTD	Cumulative
CheU Fuel Gas (Mcf) usage Dec 19	3,383	29,463	675,570
CheU Pure Water Usage (gallons) Dec 19	437	1,445	327,238
Electricity Metered (Kwh) CHEU consumed Nov 19	2,184,997	6,636,777	219,832,404

Booster Compressor operations and Usage	Month	FYTD	Cumulative
Electricity Metered (Kwh) Booster Compressor consumed Nov 19	88,744	123,138	123,138