

U.S. Patent No. 8,505,332
Claim 5
Goldsmith CO2Flex® Plant
(Ector County, Texas)

Claim 5	Goldsmith Processing Plant (Ector County, Texas) Ex. 2058, Goldsmith Processing Plant, Process Flow Diagram, Project No. 5100928 (March 13, 2012 – Final Design)
Claim 5 [5.1] The method of claim 1, wherein the sweet NGL rich stream comprises from 20 molar percent to 40 molar percent of the C3+ hydrocarbons from the carbon dioxide recycle stream, and	The composition for the Stream No. 1 “Carbon Dioxide Recycle Stream” is shown in EX2058 (“Goldsmith Processing Plant, Process Flow Diagram”) at Page 2. The composition for the Stream No. 25 “Sweet NGL Rich Stream” is shown in EX2058 at Page 6. The calculations on the attached spreadsheet confirm that the Stream No. 25 “Sweet NGL Rich Stream” has 76.5 molar percent of the C3+ hydrocarbons from the Stream No. 1 “Carbon Dioxide Recycle Stream,” above the limit of the 20-40 molar percent range specified in this Claim 5. (See O8, which is the sum of M8:M15 divided by the sum of C8:C15.)

Claim 5	Goldsmith Processing Plant (Ector County, Texas) Ex. 2058, Goldsmith Processing Plant, Process Flow Diagram, Project No. 5100928 (March 13, 2012 – Final Design)
[5.2] wherein the purified carbon dioxide recycle stream comprises at least 94 molar percent of the carbon dioxide,	The composition for the Stream No. 22 “Purified Carbon Dioxide Recycle Stream” is shown in EX2058 at Page 2. The calculations on the attached spreadsheet confirm that the Stream No. No. 22 “Purified Carbon Dioxide Recycle Stream” has 99.6 molar percent of the carbon dioxide from the Stream No. 1 “Carbon Dioxide Recycle Stream,” which is within the at least 94 molar percent specified in this Claim 5. (See F5, which is E5/C5.)
[5.3] at least 94 molar percent of the methane, and	The calculations on the attached spreadsheet confirm that the Stream No. No. 22 “Purified Carbon Dioxide Recycle Stream” has 100 molar percent of the methane from the Stream No. 1 “Carbon Dioxide Recycle Stream,” which is within the at least 94 molar percent specified in this Claim 5. (See F6, which is E6/C6.)
[5.4] at least 93 molar percent of the ethane from the carbon dioxide recycle stream.	The calculations on the attached spreadsheet confirm that the Stream No. No. 22 “Purified Carbon Dioxide Recycle Stream” has 99.2 molar percent of the ethane from the Stream No. 1 “Carbon Dioxide Recycle Stream,” which is within the at least 93 molar percent specified in this Claim 5. (See F7, which is E7/C7.)

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	A	B	C	D	E	F	G
1	EX2058	Carbon Dioxide Recycle Stream 1		Purified CO2 Recycle Stream 22			
2		Molar Flow = 3306 lbmol/hr		Molar Flow = 3170 lbmol/hr			C3-C8
3		Mole Frac.	lbmol/hr	Mole Frac.	lbmol/hr	%	Disregarded
4	N	2.072	6,850	2.1600	6,847	100.0%	
5	CO2	84.937	280,802	88.2000	279,594	99.6%	
6	C1	5.458	18,044	5.6900	18,037	100.0%	
7	C2	1.624	5,369	1.6800	5,326	99.2%	
8	C3	1.474	4,873	0.9980	3,164	64.9%	23.8%
9	i-C4	0.289	955	0.0419	133	13.9%	
10	n-C4	0.837	2,767	0.0367	116	4.2%	
11	i-C5	0.369	1,220	0.0001	0	0.0%	
12	n-C5	0.309	1,022	0.0000	0	0.0%	
13	n-C6	0.996	3,293	0.0000	0	0.0%	
14	n-C7	0.070	231	0.0000	0	0.0%	
15	n-C8	0.000	0	0.0000	0	0.0%	
16	H2O	0.392	1,296	0.0001	0	0.0%	
17	H2S	1.175	3,885	1.1500	3,646	0.0%	
18		100.002		98.8068			

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	A	H	I	J	K	L	M	N	O
1	EX2058	Sour NGL Rich Stream 12			Sweet NGL Rich Stream 25				
2		Molar Flow = 117 lbmol/hr			Molar Flow = 110 lbmol/hr			C3-C8	
3		Mole Frac.	lbmol/hr	%	C3-C8	Mole Frac.	lbmol/hr	%	Recovered
4	N	0.0000	0	0.0%		0.00000071	0	0.0%	
5	CO2	4.7900	560	0.2%		0.000044	0	0.0%	
6	C1	0.0002	0	0.0%		0.00025	0	0.0%	
7	C2	0.2270	27	0.5%		0.24	26	0.5%	
8	C3	14.5000	1,697	34.8%	75.9%	16	1,760	36.1%	76.5%
9	i-C4	7.0000	819	85.7%		7.5	825	86.3%	
10	n-C4	22.6000	2,644	95.6%		24	2,640	95.4%	
11	i-C5	10.4000	1,217	99.7%		11	1,210	99.2%	
12	n-C5	8.6900	1,017	99.5%		9.3	1,023	100.1%	
13	n-C6	28.0000	3,276	99.5%		30	3,300	100.2%	
14	n-C7	1.9600	229	99.1%		2.1	231	99.8%	
15	n-C8	0.0000	0	0.0%		0	0	0.0%	
16	H2O	0.1200	14	0.0%		0.11	12	0.0%	
17	H2S	1.7000	199	0.0%		0.00015	0		
18		99.9872				100.2504			

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	A	P	Q	R
1	EX2058	Acid Gas Stream 36		
2		Molar Flow = 8.2 lbmol/hr		
3		Mole Frac.	lbmol/hr	
4	N	0.0000	0	0.0%
5	CO2	69.0000	566	0.2%
6	C1	0.0000	0	0.0%
7	C2	0.0099	0	0.0%
8	C3	0.1900	2	0.0%
9	i-C4	0.0250	0	0.0%
10	n-C4	0.0990	1	0.0%
11	i-C5	0.0094	0	0.0%
12	n-C5	0.0092	0	0.0%
13	n-C6	0.0110	0	0.0%
14	n-C7	0.0001	0	0.0%
15	n-C8	0.0000	0	0.0%
16	H2O	6.4000	52	0.0%
17	H2S	24.0000	197	0.0%
18				