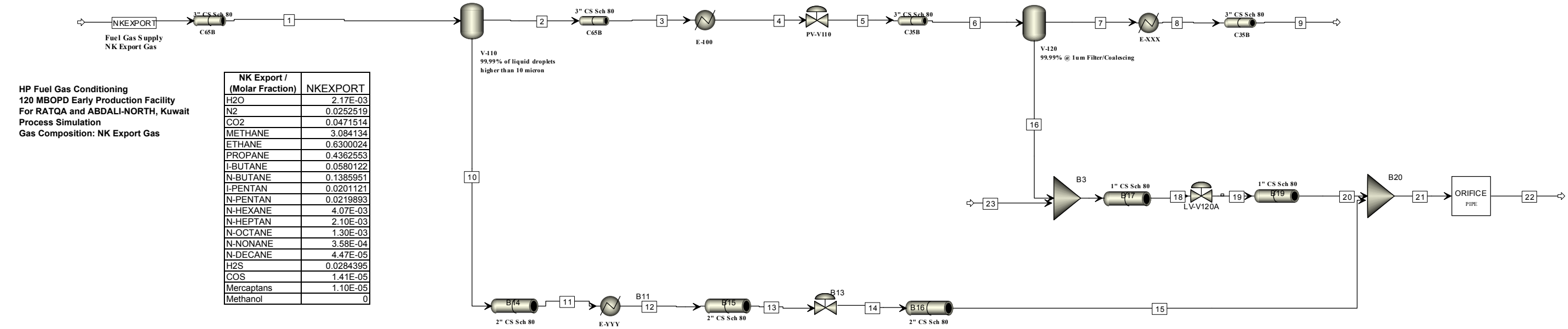


HP Fuel Gas Conditioning
 120 MBOPD Early Production Facility
 For RATQA and ABDALI-NORTH, Kuwait
 Process Simulation
 Gas Composition: NK Export Gas



NK Export / (Molar Fraction)	NKEXPORT
H2O	2.17E-03
N2	0.0252519
CO2	0.0471514
METHANE	3.084134
ETHANE	0.6300024
PROPANE	0.4362553
I-BUTANE	0.0580122
N-BUTANE	0.1385951
I-PENTAN	0.0201121
N-PENTAN	0.0219893
N-HEXANE	4.07E-03
N-HEPTAN	2.10E-03
N-OCTANE	1.30E-03
N-NONANE	3.58E-04
N-DECANE	4.47E-05
H2S	0.0284395
COS	1.41E-05
Mercaptans	1.10E-05
Methanol	0

Case 1A: 4.5 MMSCFD, 890 psig @ 31 deg F	NKEXPORT	1	2	3	4	E-100	5	6	7	E-130	8	9	10	11	E-105	12	13	14	15	16	17	18	19	20	21	22	23
Total Flow MMscfd	4.5000	4.5000	3.5585	3.5585	3.5585		3.5585	3.5585	3.5585		3.5585	3.5585	0.9415	0.9415		0.9415	0.9415	0.9415	0.9415	0.0000	0.0355	0.0355	0.0355	0.0355	0.9770	0.9770	0.0355
Total Flow lb/hr	11713.2200	11713.2200	8125.3870	8125.3870	8125.3870		8125.3870	8125.3870	8125.3870		8125.3870	8125.3870	3587.8350	3587.8350		3587.8350	3587.8350	3587.8350	3587.8350	0.0000	166.1008	166.1008	166.1008	166.1008	3753.9360	3753.9360	166.1008
Temperature F	31.0000	30.9981	30.8948	30.8939	100.0000		50.2071	50.2020	50.0195		140.0000	139.9956	30.8948	30.8948		120.0000	120.0000	55.8850	55.8850		50.0013	50.0013	42.9790	42.9790	55.1400	55.1400	50.0000
Pressure psig	890.0000	889.9742	887.9742	887.9629	885.9629		250.0000	249.9470	247.9470		245.9470	245.8812	887.9742	887.9566		882.9566	882.9230	200.0000	199.9065	247.9470	250.0000	249.9975	200.0000	199.9976	199.9065	50.2141	250.0000
Vapor Frac	0.7907	0.7907	1.0000	1.0000	1.0000		1.0000	1.0000	1.0000		1.0000	1.0000	0.0000	0.0000		0.4281	0.4262	0.6942	0.6943		0.1613	0.1613	0.2018	0.2018	0.6773	0.9777	0.1613
Density lb/cuft	6.8602	6.8599	5.1284	5.1283	3.8175		1.0906	1.0904	1.0820		0.8817	0.8815	28.1157	28.1157		12.0353	12.0345	2.1328	2.1314		10.5559	10.5557	7.6657	7.6656	2.2024	0.4426	10.5561
Average MW	23.7062	23.7062	20.7955	20.7955	20.7955		20.7955	20.7955	20.7955		20.7955	20.7955	34.7081	34.7081		34.7081	34.7081	34.7081	34.7081		42.5845	42.5845	42.5845	42.5845	34.9945	34.9945	42.5845
TDEW F	99.1390	99.1392	30.8946	30.8948	30.9124		5.6013	5.5952	5.3666		5.1361	5.1285	194.1568	194.1562		194.1222	194.1216	137.8775	137.8579		157.6184	157.6178	143.6986	143.6979	137.9442	87.6282	157.6184
Heaters Duty (KW)						130.0000				130.0000					111.0000												
*** VAPOR PHASE ***																											
Total Flow MMscfd	3.5581	3.5582	3.5585	3.5585	3.5585		3.5585	3.5585	3.5585		3.5585	3.5585	0.0000	0.0000		0.4012	0.4012	0.6536	0.6537		0.0057	0.0057	0.0072	0.0072	0.6617	0.9552	0.0057
MUMX cP	0.0127	0.0127	0.0127	0.0127	0.0130		0.0107	0.0107	0.0107		0.0121	0.0121	0.0127	0.0127		0.0139	0.0139	0.0100	0.0100		0.0101	0.0101	0.0098	0.0098	0.0100	0.0091	0.0101
ZMX	0.6947	0.6947	0.6953	0.6953	0.8169		0.9224	0.9224	0.9229		0.9553	0.9553	0.6953	0.6953		0.6765	0.6765	0.8847	0.8847		0.8616	0.8616	0.8778	0.8778	0.8843	0.9498	0.8616
CPCVMX	1.9636	1.9636	1.9613	1.9612	1.5521		1.3531	1.3531	1.3524		1.2882	1.2882	1.9612	1.9612		1.7772	1.7771	1.3099	1.3098		1.3556	1.3556	1.3282	1.3282	1.3108	1.1978	1.3556
Total Flow lb/hr	8126.1090	8126.1410	8125.3870	8125.3650	8125.3870		8125.3870	8125.3870	8125.3870		8125.3870	8125.3870	0.0090	0.0090		1206.8670	1206.9580	2010.8630	2011.4430		17.0128	17.0132	21.7978	21.7979	2034.9150	3594.5941	17.0123
Density lb/cuft	5.1439	5.1438	5.1284	5.1283	3.8175		1.0906	1.0904	1.0820		0.8817	0.8815	5.1282	5.1282		5.8442	5.8439	1.2291	1.2286		1.5187	1.5187	1.2554	1.2554	1.2303	0.4240	1.5187
Average MW	20.7998	20.7997	20.7955	20.7955	20.7955		20.7955	20.7955	20.7955		20.7955	20.7955	27.3967	27.3967		27.3967	27.3967	28.0248	28.0244		27.0371	27.0372	27.6892	27.6894	28.0081	34.2724	27.0370
QVALNET Btu/lb	20185.3800	20185.3800	20185.5900	20185.6000	20185.5900		20185.5900	20185.5900	20185.5900		20185.5900	20185.5900	20185.5900	20185.5900		19868.4200	19868.4200	19836.4500	19836.4000		19797.8800	19797.8800	19768.6600	19768.6600	19835.5100	19740.0624	19797.8900
PHYDRATE psig	66.0071	66.0073	66.0204	66.0205	985.3039		251.4168	251.3180	247.7854		985.3039	985.3039	66.0205	66.0205		985.3039	985.3039	253.8986	253.8835		166.3676	166.3673	90.5426	90.5410	239.3980	222.1097	166.3533
THYDRATE F	64.7964	64.7960	64.7698	64.7694	64.7466		50.1342	50.1316	50.0279		49.9234	49.9198	64.7694	64.7694		67.6509	67.6507	52.7589	52.7534		55.4375	55.4374	52.7630	52.7629	52.7612	35.9338	55.4375
*** LIQUID PHASE ***																											
Total Flow lb/hr	3587.1130	3587.0810		0.0220									3587.8350	3587.8260		2380.9690	2380.8770	1576.9720	1576.3920		149.0880	149.0876	144.3030	144.3029	1719.0210	159.3421	149.0885
Density lb/cuft	28.0942	28.0946		28.1158									28.1160	28.1160		25.9922	25.9926	34.1389	34.1402		32.8887	32.8887	33.5174	33.5174	34.0966	38.2926	32.8887
MUMX cP	0.0308	0.0308		0.0309									0.0309	0.0309		0.0289	0.0289	0.1096	0.1096		0.0934	0.0934	0.1050	0.1050	0.1093	0.2013	0.0934
Total Flow gal/min	15.9188	15.9184		0.0001									15.9096	15.9096		11.4207	11.4200	5.7591	5.7568		0.5652	0.5652	0.5368	0.5368	6.2856	0.5188	0.5652

Case 1B: 4.5 MMSCFD, 890 psig @ 131 deg F	NKEXPORT	1	2	3	4	E-100	5	6	7	E-130	8	9	10	11	E-105	12	13	14	15	16	17	18	19	20	21	22	23
Total Flow MMscfd	4.5000	4.5000	4.5000	4.5000	4.5000		4.5000	4.5000	4.5000		4.5000	4.5000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total Flow lb/hr	11713.2200	11713.2200	11713.2200	11713.2200	11713.2200		11713.2200	11713.2200	11713.2200		11713.2200	11713.2200	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Temperature F	131.0000	130.9979	130.8609	130.8588	130.7216		78.4322	78.4224	78.2317		140.0000	139.9911															50.0000
Pressure psig	890.0000	889.9719	887.9719	887.9436	885.9436		250.0000	249.8991	247.8991		245.8991	245.7814	887.9719								247.8991						250.0000
Vapor Frac	1.0000	1.0000	1.0000	1.0000	1.0000		1.0000	1.0000	1.0000		1.0000	1.0000	1.0000														
Density lb/cuft	4.2558	4.2557	4.2461	4.2460	4.2364		1.1888	1.1883	1.1790		1.0204	1.0200															
Average MW	23.7062	23.7062	23.7062	23.7062	23.7062		23.7062	23.7062	23.7062		23.7062	23.7062															42.5845
TDEW F																											
Heaters Duty (KW)	99.1390	99.1392	99.1543	99.1545	99.1691		76.8639	76.8532	76.6399		76.4247	76.4120															
*** VAPOR PHASE ***						0.0000				129.0000					0.0000												
Total Flow MMscfd	4.5000	4.5000	4.5000	4.5000	4.5000		4.5000	4.5000	4.5000		4.5000	4.5000															
MUMX cP	0.0134	0.0134	0.0134	0.0134	0.0134		0.0108	0.0108	0.0108		0.0118	0.0118															
ZMX	0.7950	0.7950	0.7952	0.7952	0.7955		0.9141	0.9141	0.9147		0.9407	0.9408															
CPCVMX	1.5215	1.5215	1.5210	1.5210	1.5204		1.3152	1.3152	1.3145		1.2681	1.2680															
Total Flow lb/hr	11713.2200	11713.2200	11713.2200	11713.2200	11713.2200		11713.2200	11713.2200	11713.2200		11713.2200	11713.2200															
Density lb/cuft	4.2558	4.2557	4.2461	4.2460	4.2364		1.1888	1.1883	1.1790		1.0204	1.0200															
Average MW	23.7062	23.7062	23.7062	23.7062	23.7062		23.7062	23.7062	23.7062		23.7062	23.7062															
QVALNET Btu/lb	20045.4200	20045.4200	20045.4200	20045.4200	20045.4200		20045.4200	20045.4200	20045.4200		20045																