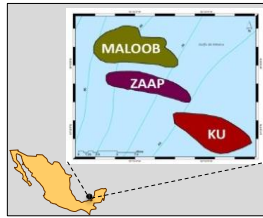
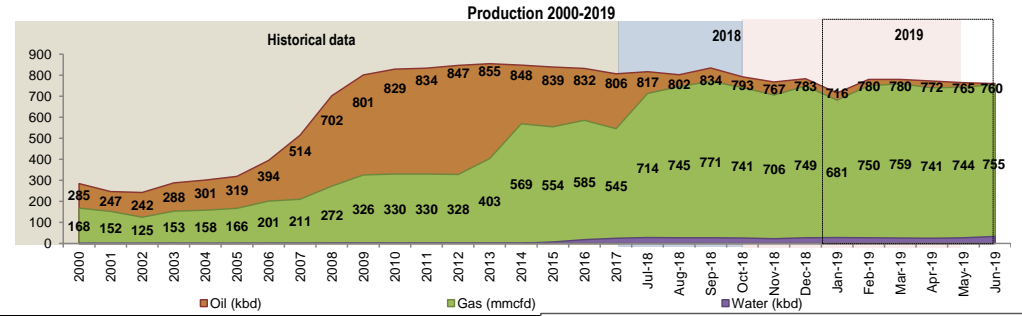


**Field Map**  
**Ku Maloob and Zaap**



**Thickness in oil window and average GOC\* speed of movement by year**

Field	Thickness <sup>2</sup> (meters) <sup>3</sup>		Average GOC speed of movement (vm/year)							
	max	min	2012	2013	2014	2015	2016	2017	2018	2019
KU	112	5	31	31	34	7	11	14	5	2
MB	285	147	40	67	22	19	18	21	24	35
ZP	189	4	14	46	46	43	46	22	16	16



**Observed production and functioning wells<sup>4</sup> (Historical and last 12 months)**

Ku, Maloob, Zaap fields	Average 2000-2010	Annual							2018												2019					
		2011	2012	2013	2014	2015	2016	2017	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19						
Oil (kbd)	447	834	847	855	848	839	832	806	817	802	834	793	767	783	716	780	780	772	765	760						
Gas (mmcf)	206	330	328	403	569	554	585	545	714	745	771	741	706	749	681	750	759	741	744	755						
Water (kbd)	0.4	1.4	1.3	1.5	1.7	6.5	17.5	25.1	27.9	27.3	26.4	25.6	22.6	26.5	27.4	26.6	26.3	24.9	27.0	33.4						
Functioning wells (no.)	75	142	157	172	175	176	177	170	173	173	174	174	173	174	172	174	173	172	173	174						

<sup>1</sup> Ku, Maloob and Zaap are the main fields in Ku-Maloob-Zaap Production Active. Information was supplied by Pemex Exploración y Producción by Pemex in monthly reports.  
<sup>2</sup> Thickness in cretaceous from Ku, Maloob, Zaap field in the reference month.  
<sup>3</sup> Information about GOC speed of movement in 2010 is not available. Estimations are based on data from 2009 and 2011.  
<sup>4</sup> Information about production in 2000-2009 comes from Base de Datos Institucional de Pemex (BDI).  
<sup>5</sup> Field pressure just considers information from Cretaceous play.  
<sup>6</sup> Cyclical wells are those that present high GWR, % water and/or salt, and therefore must be closed to be repaired.  
<sup>7</sup> What defines whether a well is above or below the GOC is the relationship between its peak and the average GOC level in the field (Maloob has 3 different zones at distinct GOC levels), thereof well distance is a reference.  
<sup>8</sup> 126 closures and reopenings are because of High Volume of Inventory.  
<sup>9</sup> 39 closures and reopenings are because of High Volume of Inventory.

**Oil-Gas relationship observed by field, averaging by well (cf/b) (Historical and last 12 months)**

Field	Average 2000-2010	Annual							2018												2019					
		2011	2012	2013	2014	2015	2016	2017 <sup>8</sup>	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19						
Ku	535	520	553	548	754	1,381	1,418	5,146	5,180	5,268	5,274	5,338	5,255	5,033	5,093	5,189	5,031	4,800	5,227	5,221						
Maloob	287	268	270	275	356	366	423	545	420	512	514	511	551	562	599	590	546	502	542	534						
Zaap	244	365	349	349	357	446	486	719.0	961.7	671.7	665	719	712	770	716	637	718	714	746	790						
Total	456	396	394	390	491	717	725	1,702	1,705	1,693	1,713	1,746	1,747	1,710	1,709	1,689	1,648	1,599	1,723	1,754						

**Pressure by field<sup>5</sup> (kg/cm<sup>2</sup>)**

Field	Average 2001-2011	2014	2015	2016	2017	2018	2019
Ku	137	120	117	114	112	109	120
Maloob	148	130	120	115	112	131	134
Zaap	146	130	123	118	115	134	136
Total	141	127	120	116	113	125	130

**Annual change in pressure by field (%)**

Field	Acum. 2001-2011	2014	2015	2016	2017	2018	2019	Acum. 2001-2019
Ku	-21.2%	0.0%	-2.8%	-2.1%	-2.2%	-2.2%	10.1%	-21.5%
Maloob	-22.6%	0.4%	-7.5%	-4.2%	-3.3%	17.3%	2.1%	-17.6%
Zaap	-24.7%	1.6%	-5.3%	-4.2%	-2.8%	16.5%	1.8%	-18.3%
Total	-19.4%	0.7%	-5.2%	-3.5%	-2.8%	10.6%	4.3%	-27.3%

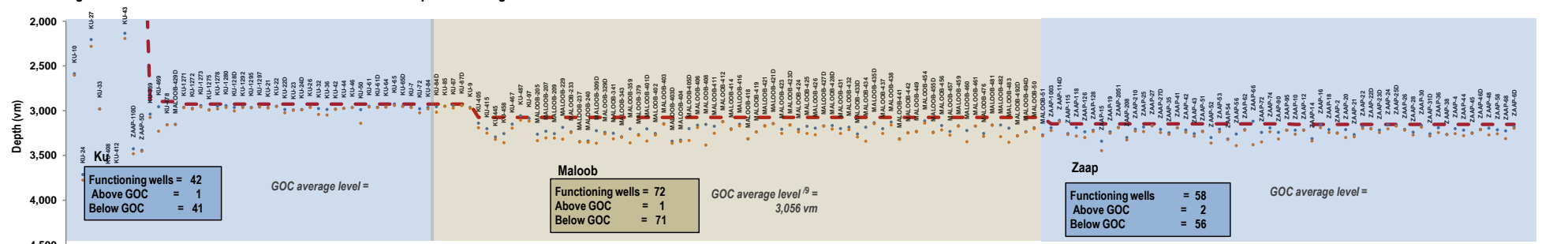
**Closure and reopening of wells 2018-2019<sup>6</sup> (no.)**

Concept	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
Closure	11	3	1	6	40	12	91	17	3	5	5	7	201
Reopening	3	13	3	0	43	8	90	11	8	2	7	4	192

**Completion and Major well repairs (no.)**

Activity	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
Completion	1	0	1	1	0	0	1	0	0	0	0	0	4
Major repairs	1	0	0	0	1	2	0	0	0	0	0	0	4

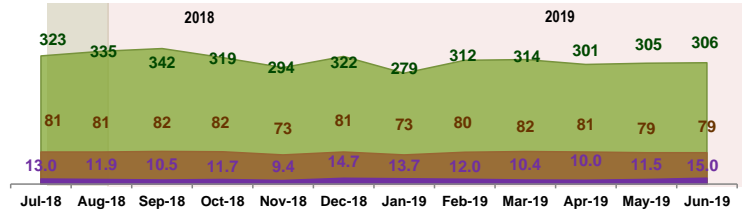
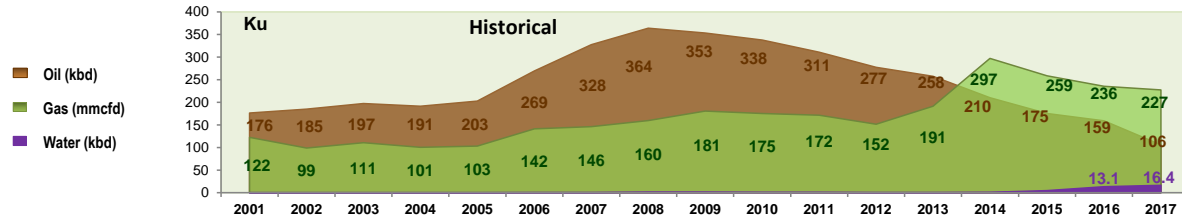
**Functioning wells distribution in this month and its distance with respect to average GOC in each field<sup>7</sup>**



\* Abbreviations: GOC= Gas-Oil contact, vm= vertical meters, vm/year= vertical meters per year, kbd= thousand barrels per day, mmcf= million cubic feet per day, cf/b= cubic feet per barrel, no.= number, kg/cm<sup>2</sup>=kilogram per square centimeter

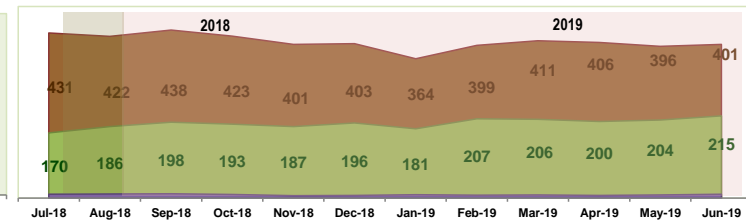
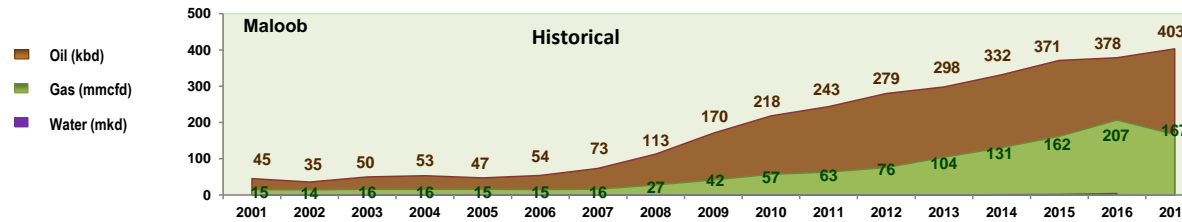
## National Commission of Hydrocarbons Ku-Malooob-Zaap Fields<sup>1</sup> Operational Report, updated June 2019

**Observed production and functioning wells, by field (Historic and last 12 months)**



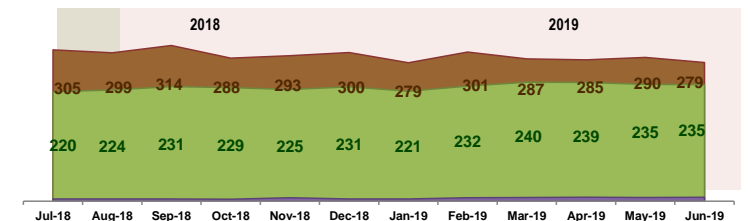
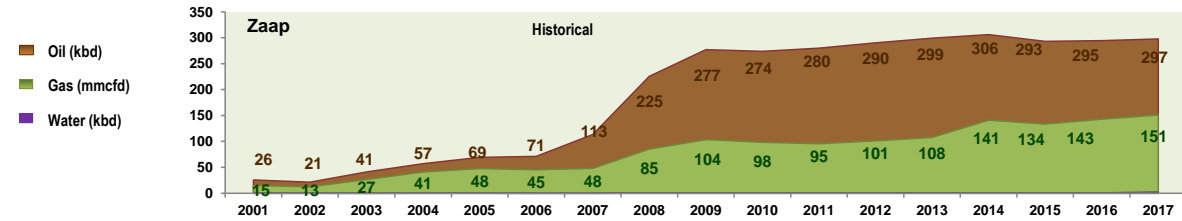
Ku	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Oil (kbd)	176	185	197	191	203	269	328	364	353	338	311	277	258	210	175	159	106
Gas (mmcf)	122	99	111	101	103	142	146	160	181	175	172	152	191	297	259	236	227
Water (kbd)	0.0	0.0	0.0	0.0	0.0	0.1	0.1	1.2	1.1	0.7	0.9	0.6	0.5	0.6	4.5	13.1	16.4
Functioning wells (no.)	28	28	30	31	36	45	51	54	55	53	48	51	58	56	50	45	39

	2017						2018					
	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19
Oil (kbd)	81	81	82	82	73	81	73	80	82	81	79	79
Gas (mmcf)	323	335	342	319	294	322	279	312	314	301	305	306
Water (kbd)	13.0	11.9	10.5	11.7	9.4	14.7	13.7	12.0	10.4	10.0	11.5	15.0
Functioning wells (no.)	40	41	42	42	42	42	41	41	41	41	41	42



Maloob	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Oil (kbd)	45	35	50	53	47	54	73	113	170	218	243	279	298	332	371	378	403
Gas (mmcf)	15	14	16	16	15	15	16	27	42	57	63	76	104	131	162	207	167
Water (kdb)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.4	0.2	0.5	1.1	3.9	6.3
Functioning wells (no.)	8	7	9	10	11	13	19	27	33	39	44	51	57	61	72	76	74

	2017						2018					
	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19
Oil (kbd)	431	422	438	423	401	403	364	399	411	406	396	401
Gas (mmcf)	170	186	198	193	187	196	181	207	206	200	204	215
Water (kdb)	10.1	10.7	11.4	9.8	6.2	7.3	9.2	7.5	8.2	6.7	7.9	10.5
Functioning wells (no.)	74	74	74	74	73	74	73	74	73	72	72	72



Zaap	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2016	2017	
Oil (kbd)	26	21	41	57	69	71	113	225	277	274	280	290	299	306	293	295	297
Gas (mmcf)	15	13	27	41	48	45	48	85	104	98	95	101	108	141	134	143	151
Water (kdb)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.4	0.3	0.4	0.7	0.7	0.9	0.6	2.4
Functioning wells (no.)	4	3	6	7	10	13	26	39	45	48	50	55	57	58	55	56	56

	2017						2018					
	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19
Oil (kbd)	305	299	314	288	293	300	279	301	287	285	290	279
Gas (mmcf)	220	224	231	229	225	231	221	232	240	239	235	235
Water (kdb)	4.8	4.7	4.5	4.1	7.0	4.6	4.5	7.1	7.6	8.1	7.6	7.9
Functioning wells (no.)	59	58	58	58	58	58	58	59	59	59	60	60