

EXPLANATION OF DATA TABLES FOR SHUMAGIN-KODIAK SHELF ASSESSMENT PROVINCE

RESULTS

LOG-N PARAMS (PORE)

Key mathematic parameters that describe log-normal probability distributions for volume of hydrocarbon-bearing rock, in acre-feet, for each play as reported in the **PORE** module of **GRASP**.

mu

Natural logarithm of F50 value of log-normal distribution for volume of hydrocarbon-bearing rock, or “ μ ”, for the subject play. **mu** = $\ln F50$. [Note: distribution **mean** = $e^{(\mu + 0.5[\text{sig. sq.}])}$.]

sig. sq.

The variance of the log-normal distribution for volume of hydrocarbon-bearing rock, or “ σ^2 ”, for the subject play. **sig. sq.** = $\{\ln [0.5((F50/F16)+(F84/F50))]\}^2$.

N (MPRO)

Number of hydrocarbon pools calculated for the plays by the **MPRO** module of **GRASP** from inputs for probability distributions of prospect numbers and geologic chances of success (approximately the product of play and prospect chances of success). The maximum (**Max**) number of pools for each play was entered into the **MONTE1** module of **GRASP** to fix the number of pools aggregated to calculate play resources.

Reserves

Sums of recoverable oil and gas volumes for pools within the play, including both proven and inferred reserve categories. A “prop” entry indicates that the reserve data are proprietary.

BCF

Billions of cubic feet of gas, recoverable, at standard (surface) conditions (here fixed at a temperature of 60° Fahrenheit or 520° Rankine, and 14.73 psi atmospheric pressure).

MMB

Millions of barrels of oil, recoverable, at standard (surface) conditions.

Undiscovered Potential

Risked, undiscovered, conventionally recoverable oil and gas resources of the play, here reported at **Means** of probability distributions.

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Mean Pool Sizes of Ranks 1 to 3 Unrisked (or conditional) mean volumes of recoverable oil and gas in the three largest pools in the play.

PLAY INPUT DATA

F100.....F00 Fractiles for values within probability distributions entered to **GRASP** for calculations of play resources. Four-point distributions (F100, F50, F02, F00) generally indicate that calculations were conducted using log-normal mathematics. Eight-point distributions generally indicate that calculations were conducted using Monte Carlo mathematics. Choice of mathematic approach was in most cases the option of the assessor.

Prospect Area Maximum area of prospect closure, or area within spill contour, in acres. Probability distributions for prospect areas were generally based on distributions assembled independently for each play from large numbers of prospects mapped with seismic reflection data.

Trap Fill Trap fill fraction, or fraction of prospect area in which the reservoir is predicted to be saturated by hydrocarbons.

Pool Area Areal extent of hydrocarbon-saturated part of prospect, in acres. Calculated using **PRASS**, or **SAMPLER** module of **GRASP**, to integrate input probability distributions for prospect areas and trap fill fractions.

Pay Thickness Thickness of hydrocarbon-productive part of reservoir within pool areas, in feet. Probability distributions for prospect areas, trap fill fractions, and pay thicknesses are integrated in the **PORE** module of **GRASP**, to calculate a probability distribution for volume of hydrocarbon-bearing rock, in feet, within the play as reported above under **LOG-N PARAMS (PORE)**.

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Oil Yield (Recov. B/Acre-Feet)	Oil, in barrels at standard (surface) conditions, recoverable from a volume of one acre-foot of oil-saturated reservoir in the subsurface. Oil yield probability distributions were generally calculated in a separate exercise using PRASS to integrate input probability distributions for porosities, oil saturations, oil shrinkage factors (or “Formation Volume Factors”), and oil recovery efficiencies.
Gas Yield (MMCF/Ac.-Ft.)	Gas, in millions of cubic feet at standard (surface) conditions, recoverable from a volume of one acre-foot of gas-saturated reservoir in the subsurface. Distributions were generally calculated in a separate exercise using PRASS to integrate input probability distributions for porosities, gas saturations, reservoir pressures, reservoir temperatures (in degrees Rankine), gas deviation (“Z”) factors, combustible fractions (that exclude noncombustibles such as carbon dioxide, nitrogen, etc.), and gas recovery efficiencies.
Solution Gas-Oil Ratio (CF/B)	Quantity of gas dissolved in oil in the reservoir that separates from the oil when brought to standard (surface) conditions, in cubic feet recovered per barrel of produced oil.
Gas Cond. (B/MMCF)	Quantity of liquids or condensate dissolved in gas in the reservoir that separates from the gas when brought to standard (surface) conditions, in barrels recovered per million cubic feet of produced gas.
Number of Prospects.....	Probability distributions for numbers of prospects in plays, generally ranging from minimum values (F99) representing the numbers of mapped prospects, to maximum values (F00) that include speculative estimates for the numbers of additional prospects that remain unidentified (generally stratigraphic prospects, geophysically indefinite prospects, or prospects expected in areas with no seismic coverage).

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Probabilities for Oil, Gas, or Mixed Pools

Oil (OPROB)	Fraction of hydrocarbon pools that consist entirely of oil, with no free gas present. Typically, an undersaturated oil pool.
Gas (GPROB)	Fraction of hydrocarbon pools consisting entirely of gas, with no free oil present.
Mixed (MXPROB)	Fraction of hydrocarbon pools that contain both oil and gas as free phases, the gas usually present as a gas cap overlying the oil.
Fraction of Net Pay to Oil (OFRAC)	When a hydrocarbon pool is modeled as a mixed case, with both oil and gas present, the fraction of pool volume that is saturated by oil in the subsurface.
Play Chance Success	Probability that the play contains <u>at least one</u> pool of technically-recoverable hydrocarbons (that would flow into a conventional wellbore in a flow test or during production).
Prospect Chance Success	The fraction of prospects within the play that are predicted to contain hydrocarbon pools, <u>given the condition</u> that at least one pool of technically-recoverable hydrocarbons occurs within the play.
<u>Play Type (E-F-C)</u>	Play classification scheme.
E	Established play, in which significant numbers of fields have been discovered, providing the assessor with data for pool size distributions and reservoirs sufficient to allow the assessor to model the play with confidence.
F	Frontier play, where exploration activities are at an early stage. Some wells have already been drilled to test the play concept but no commercial fields have been established.

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C

Conceptual play, hypothesized by analysts based on the subsurface geologic knowledge of the area. Such plays remain hypothetical and the play concept has not been tested.

SHUMAGIN-KODIAK SHELF

SHUMAGIN-KODIAK SHELF											
				Log-N Params.							
				PORE		N (MPRO)		Reserves		Undiscovered Potential	
Play				Ac/Ft	Ac/Ft	No. Pools		Gas	Oil	Gas	Oil
No.	Area	UAI Code	Name	mu	sig. sq.	Mean	Max	(BCF)	(MMB)	(BCF)	(MMB)
1	Shumagin-Kodiak	UASH0100	Neogene Structural Play	12.178	2.143	11	71	--	--	2650	7

MEAN POOL SIZES OF RANKS 1 TO 3														
			Pool #1		Pool #2		Pool #3		INPUT DATA					
PLAY			Gas	Oil	Gas	Oil	Gas	Oil	Prospect Area (Acres)					
No.	Name		(BCF)	(MMB)	(BCF)	(MMB)	(BCF)	(MMB)	F100	F95	F75	F50	F25	F05
1	Neogene Structural Play		2007	52	845	23	600	16	309			7460		

INPUT DATA														
PLAY			Prospect Area (Acres)				Trap Fill (Dec. Frac.)							
No.	Name		F02	F01	F00	F100	F95	F75	F50	F25	F05	F02	F01	F00
1	Neogene Structural Play		116200		180000	0.10			0.30			0.75		1.00

INPUT DATA																
PLAY			Pool Area (Acres)							Pay Thickness (Feet)						
No.	Name		F100	F95	F75	F50	F25	F05	F02	F01	F00	F100	F95	F75	F50	F25
1	Neogene Structural Play		15			2110			32300		295000	9			90	

INPUT DATA																		
PLAY			Pay Thickness (Feet)				Oil Yield (Recov. B/Acre-Foot)						Gas Yield (MMCF/Ac.-Ft)					
No.	Name		F05	F02	F01	F00	F100	F95	F75	F50	F25	F05	F01	F00	F100	F95	F75	F50
1	Neogene Structural Play			330		480	--	--	--	--	--	--	--	--	0.032	0.115	0.206	0.310

SHUMAGIN-KODIAK SHELF

INPUT DATA																	
PLAY		Gas Yield (MMCF/Ac.-Ft)				Solution Gas Oil Ratio (CF/B)								Gas Cond. (B/MMCF)			
No.	Name	F25	F05	F01	F00	F100	F95	F75	F50	F25	F05	F01	F00	F100	F95	F75	F50
1	Neogene Structural Play	0.467	0.839	1.266	2.936	--	--	--	--	--	--	--	--	6	13	19	24

INPUT DATA													
PLAY		Gas Cond. (B/MMCF)				Number of Prospects in Play							
No.	Name	F25	F05	F01	F00	F99	F95	F75	F50	F25	F05	F01	F00
1	Neogene Structural Play	31	46	60	110	65	71	100	130	190	230	238	240

INPUT DATA								
PLAY		Probabilities for Oil, Gas, or Mixed Pools			Fraction of Net	Play	Prospect	Play Type
No.	Name	Oil (OPROB)	Gas (GPROB)	Mixed (MXPROB)	Pay to Oil (OFRAC)	Chance Success	Chance Success	E - F - C
1	Neogene Structural Play	0.00	1.00	0.00	0.00	0.40	0.20	C