

Alaska Peninsula Oil and Gas Study

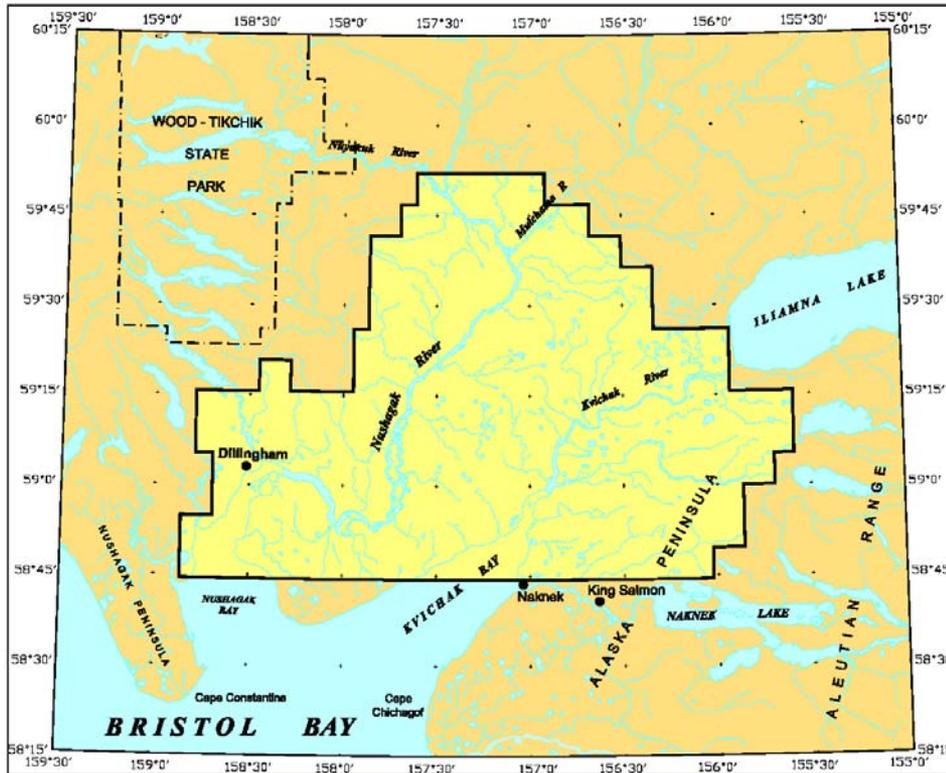
Division of Oil and Gas
September 2003



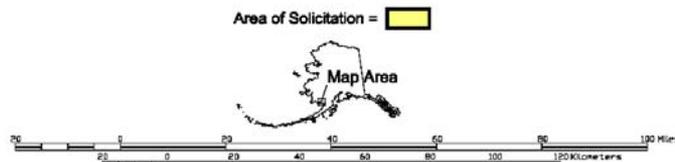
Alaska Department of
**Natural
Resources**

<http://www.dog.dnr.state.ak.us/oil/products/products.htm>

Bristol Bay Basin Exploration License Study Area

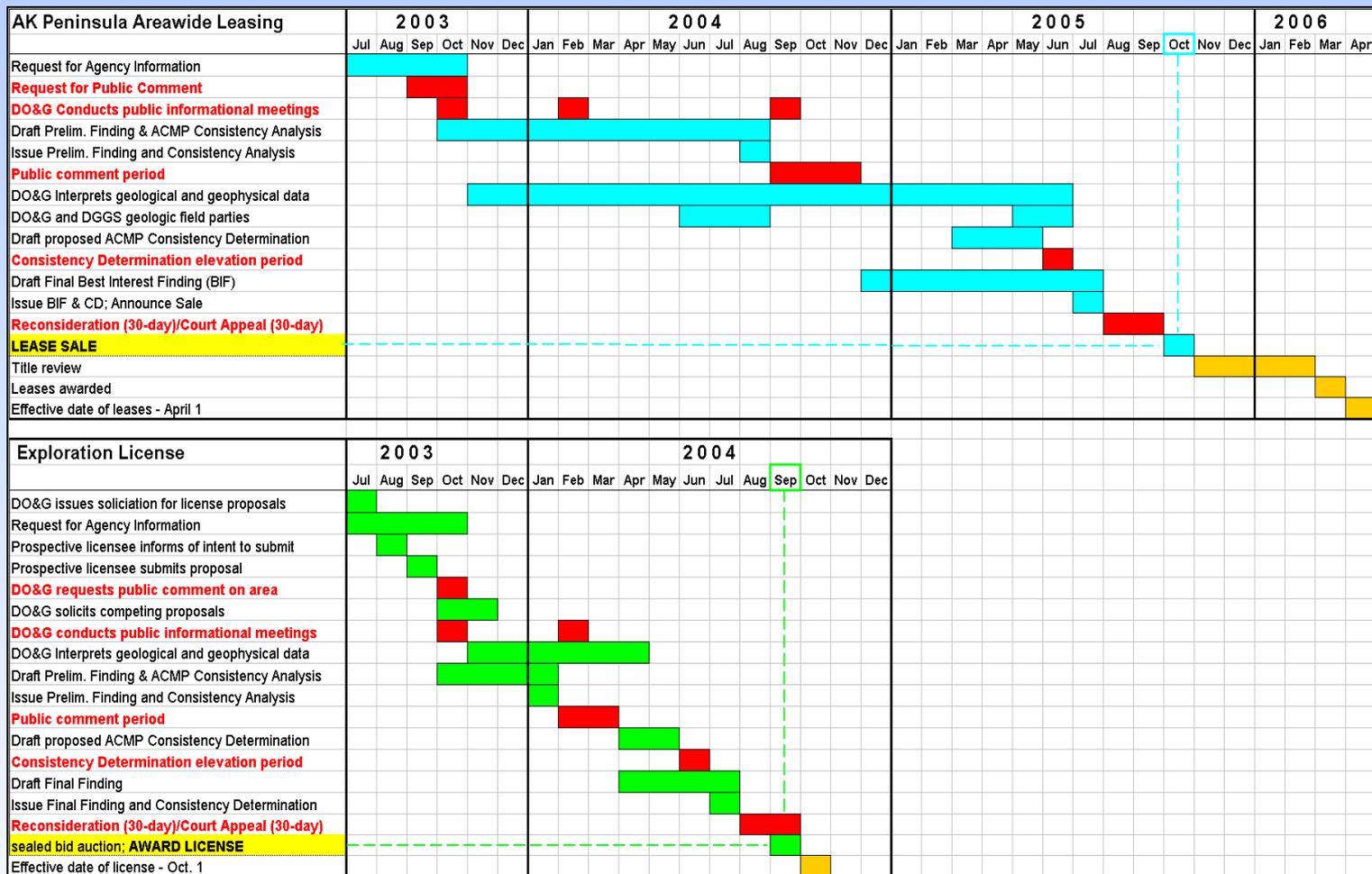


Bristol Bay Basin Exploration License Solicitation



Map created, edited, and published by the State of Alaska, Department of Natural Resources, Division of Oil and Gas.
Albers Equal-Area Conic Projection, 1927 North American Datum, Clarke 1866 ellipsoid with a central meridian of 157°15', origin latitude of 50°, northern parallel of 55°, and southern parallel of 55°.

Alaska Peninsula Areawide Oil and Gas Lease Sale and Bristol Bay Basin Exploration License Timeline



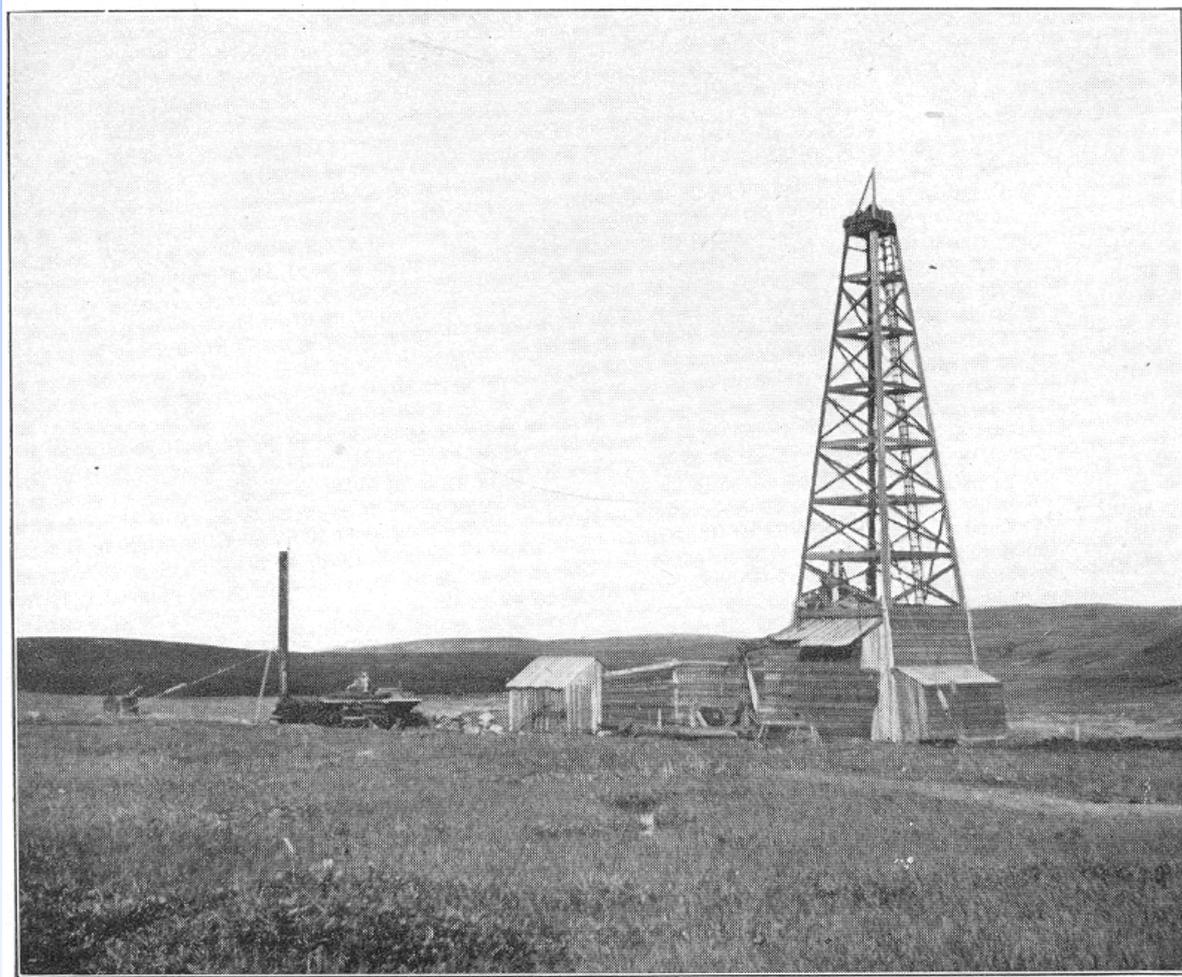
Onshore Exploration Well Typical Permit Process

Typical Permit Process - Onshore Exploration Well on the AK Peninsula														
ID	NAME	M	J	J	A	S	O	N	D	J	F	M	A	M
1	Preapplication Conference		■											
2*	ACMP Consistency Determination - AS 46.40			■	■	■	■	■						
3	DNR DO&G - Lease Plan of Operations Review				■	■	■	■						
4	DNR Parks - Cultural Resource Survey		■											
5	DNR DMLW - Temporary Water Use Permit				■	■	■	■						
6	DEC - Oil Spill Discharge and Contingency Plan				■	■	■	■						
7	DEC - Solid Waste Disposal Permit				■	■	■	■						
8	DEC - Wastewater Disposal Permit				■	■	■	■						
9	ADNR - Title 41 Anadromous Fish Stream				■	■	■	■						
10	Army Corps of Engineers - Section 404 Permit			■	■	■	■	■						
11	AOGCC -Conservation Order							■						
12	AOGCC - Permit to Drill								■					
13	AOGCC - Application for Sundry Approval									■				
14	Construction and Drilling										■	■	■	■
15	Demobilization and Rehabilitation												■	■

Project: Onshore Permitting Activity Public Notice

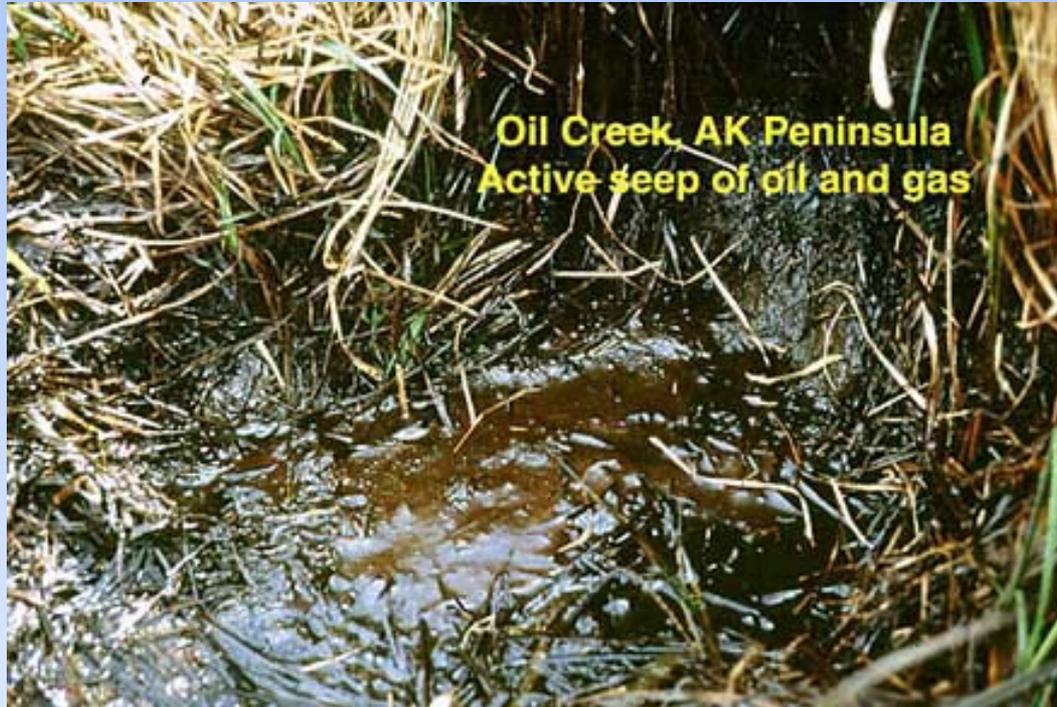
Date:9/03/03 * Only for activity within the Coastal Zone.

Oil Derrick at Puale Bay (1903)



The Petroleum Fields of the Pacific Coast of Alaska, USGS Bulletin No. 250, 1905, Plate VII

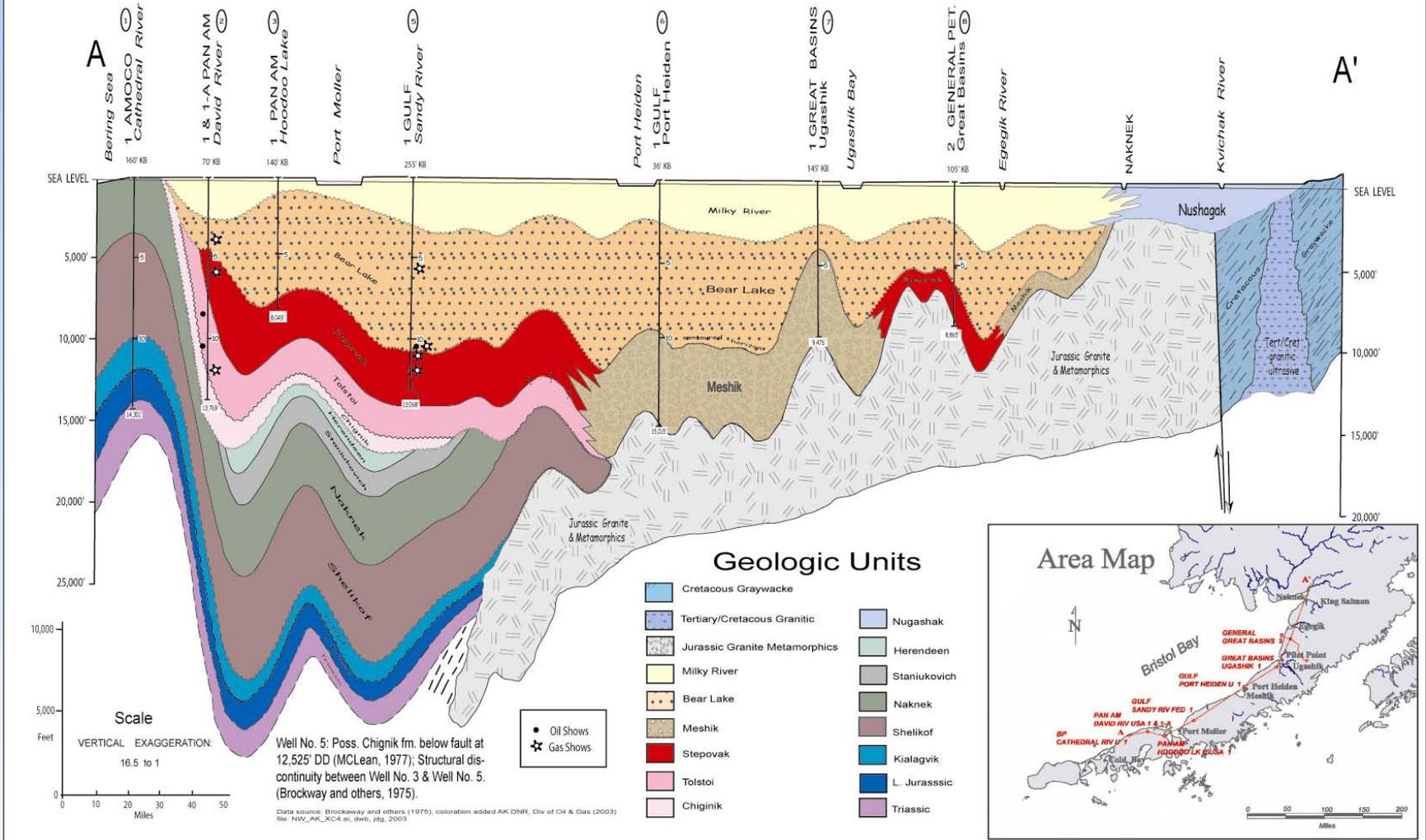
Active Oil and Gas Seep



Brown oil and natural gas (fizzy bubbles) comes out of this hole in the ground continuously. There are several oil creeks in Alaska - not a very original name. This particular oil creek feeds into Puale Bay on the western side of the Alaska Peninsula. There is continuous seepage of oil into the creek throughout its upper part. The lower part of the creek is a salmon spawning area where salmon runs are counted by the State of Alaska.

Alaska Peninsula Geologic Cross Section

Northwestern Side of Alaska Peninsula - Schematic Structure Sections



COMPOSITE STRATIGRAPHIC SECTION

BRISTOL BAY & ALASKA PENINSULA REGIONS, ALASKA

AGE		LITHOLOGY	FORMATION	DESCRIPTION	
CENOZOIC	TERTIARY	PLEISTOCENE	Quaternary - Recent	Unconsolidated sediments and volcanics.	
			Volcanics 1000 ±	<i>Unconformity</i>	
	MIOCENE		Milky River Fm (Tpm)	3000' +	Conglomerates, sandstones, and mudstones; clastic fraction volcanic derived; fossiliferous; shallow marine environment.
			<i>Unconformity</i>		
			Bear Lake Fm (Tmb)	5000' +	Sandstones, conglomerates and thin mudstones, locally volcanic derived, locally fossiliferous; transitional environment.
			Unga Cgl Mbr. (Tmbu)		Sandstones and conglomerates with interbedded siltstones, mudstones and coals, fossiliferous; transitional environment.
	OLIGOCENE		Shepovak Fm. (Tos)	5,000' +	Volcanic sandstones and conglomerates with interbedded thick units of black siltstone; all rock types locally carbonaceous with seams of lignite in upper part of sequence; locally highly fossiliferous; volcanic flows near base of unit and sills rare throughout, predominantly of marine origin.
			Meshik Fm. (Tom)		Volcanic conglomerates, sandstone, volcanic breccias, andesitic-basaltic extrusive volcanics, or local siltstone and shale; present on surface and in sub-surface from Chignik Bay northeast to Ugashik Lakes areas; probably equivalent to the Stapovak Formations and upper part of Tolstoi Formation.
	Eocene		Tolstoi Fm. (Tet)	5,000' +	Siltstones with interbedded volcanic sandstones and conglomerates, flows, sills and volcanic breccia, non-marine to brackish water environment; marine fossils are rare, plant fossils common and very abundant in lower part of sequence.
	MESOZOIC	LATE CRET.	SENOGMAN	Hoodoo Fm. (Kh)	2,000' +
Chignik Fm. (Kc)				1500' +	Sandstone, siltstone and minor mudstone and conglomerate; shallow marine environment.
Coal Valley Mbr. (Kcc)				1000' (cf. the Chignik Formation)	Conglomerates, sandstone and coal, non marine environment.
Herendeen Ls. (KH)				500'	Calcareous with thin bedded limestone, abundant inorganic pyrites, shallow marine environment.
EARLY CRET.		NEOCOMAN	Staniukovich Fm (JKs)	2000'	Feldspathic sandstones and arkoses, thin siltstones, locally abundant Buchia, shallow marine in origin.
LATE JURASSIC		MAMMILLARIS, PORTLANDIAN	Naknek FM (Jn)	5000' to 10,000'	Claystone and siltstones predominate in upper part of unit; lower part of unit consists largely of feldspathic sandstones with some interbedded claystone, siltstone and conglomerate; locally abundant Buchia and belemnites; shallow marine to neritic environment.
			Chisik Cgl. Mbr. (Jnc)	400'	Pebble to boulder conglomerate of largely granitic debris at base of Naknek Formation; outcrops north of Wide Bay area.
			Shale	1800' +	Siltstone and shale, with lenses of limestone, abundant fossils; marine environment.
			MIDDLE JURASSIC	CALLOWAN	Shelikof Fm. (Js)
SS & Cgl.		4000' +			
EARLY JURASSIC	BLAZON	Kiatagvik Fm. (Jk)	1750'	Siltstone, sandy siltstone, sandstone, ash beds with abundant calcareous concretions, and fossils, marine environment.	
		<i>Unconformity</i>			
		Slate, small scattered outcrops of Early Jurassic, Triassic and Permian sediments & Early Jurassic granitic rocks.		Limestone, chert, volcanic-rich rocks; outcrop at Puale Bay northward.	

Alaska Peninsula Stratigraphic Section

Alaska Peninsula/ Bristol Bay Basin Hydrocarbon Potential

- **Numerous oil seeps are present along the southern half of the Alaska Peninsula.**
- **26 wells have been drilled onshore since 1903, the latest being the Amoco Becharof #1 in 1985. One offshore stratigraphic test was drilled in 1983, the ARCO North Aleutian COST Well #1.**
- **The northern half of the Alaska Peninsula is a low relief coastal plain underlain by a thick sequence (18,000+ feet) of Tertiary strata that is contiguous with the Bristol Bay Basin to the north. Here the setting is very good for both structural and stratigraphic traps as well as the likelihood of encountering good to locally excellent reservoir quality rocks.**

Alaska Peninsula/ Bristol Bay Basin Hydrocarbon Potential

- **Reservoir quality should be considered the highest risk as rocks derived from volcanic and plutonic source areas may give rise to pore plugging cements and clays.**
- **Oil and gas shows are evident in many of the wells. No commercial flow of oil has been proven to date.**
- **Hydrocarbon source rocks of Tertiary age appear to be largely gas prone. Deeper Mesozoic strata may have both gas and oil generating potential.**
- **Seismic control on the Alaska Peninsula is largely poor and archaic. Latest technology in seismic acquisition and processing is needed to further define prospects.**