TABLE 10-1
EXISTING OIL AND GAS DEVELOPMENT, NORTHSTAR PROJECT CUMULATIVE IMPACT AREA[1]

Unit or Area/Field	Initial Production (Year)	1996 Oil Production (MMBBL)	Estimated Remaining Reserves (end of 1996) (MMBBL)	Facilities								
				Disturbed Area (Roads, Pads, & Airstrips) (Acres)	Gravel Roads (Miles)	Pipelines (Miles)	Gravel Mines		Reserve Pits		Wells (No.)	Pads/ Platforms (No.)
							(No.)	(Acres)	(No.)	(Acres)		
Duck Island												
Endicott	1987	27.663	258	392	15	29	1	179	0	0	105	2
Sag Delta N.	1989	--[2]	--[2]	--[2]	--[2]	--[2]	--[2]	--[2]	--[2]	--[2]	--[2]	--[2]
Sag Delta	1989	--[2]	--[2]	--[2]	--[2]	--[2]	--[2]	--[2]	--[2]	--[2]	--[2]	--[2]
Prudhoe Bay												
Prudhoe Bay	1977	312.609	3,443	4,590	200	145	6	726	106	560	1,256	38
Lisburne	1981	5.139	57	213	18	50	--	--	10	16	81	5
Niakuk	1994	11.045	90	22	--	5	--	--	--	--	18	--
West Beach	1994	0.499	30	--	--	--	--	--	--	--	1	--
N. Prudhoe Bay	1993	0.129	75	--	--	--	--	--	--	--	1	--
Pt. McIntyre	1993	58.751	312	33	--	12	--	--	--	--	47	--
Kuparuk												
Kuparuk	1981	99.459	1,275	1,435	94	134	5	564	126	161	835	34
West Sak	1998	--	279	--	--	--	0	0	--	--	50	--
Milne Point												
Milne Point	1985	12.686	210	205	19	40	1	43	--	--	110	4
Cascade	1996	--	50	31	--	--	--	--	--	--	--	--
Schrader Bluff	1991	1.068	281	--	--	--	--	--	--	--	22	--
Sag River	1994	0.346	19	--	--	--	--	--	--	--	3	--
NPRA												
East Barrow	1981	--[3]	--[3]	--	--	--	--	--	--	--	--	--
South Barrow	1950	--[3]	--[3]	--	--	--	--	--	--	--	--	--
Walakpa	1993	--[3]	--[3]	--	--	--	--	--	--	--	--	--
Badami												
Badami	1998	--	120	85	4.5	35	1	89	0	0	50	2
Tarn												
Tarn	1998	--	50	73	10	10	1	--	0	0	40	2

Notes: 1 = Information in this table was developed from USDOI, BLM, 1998: IV-A-44-45. The cumulative development area and existing developments are shown on Figure 10-2.
2 = Included in Endicott details
3 = These developments produce natural gas, and do not contribute oil production to North Slope oil transportation facilities
-- = Not applicable
MMBBL = Million barrels
No. = Number
NPRA = National Petroleum Reserve, Alaska

TABLE 10-2
FORESEEABLE FUTURE ACTIONS, NORTHSTAR PROJECT CUMULATIVE IMPACT AREA[1]

Unit or Area/Field	Initial Production Expected (Year)	Estimated Reserves (MMBBL)	Nature of Activity Expected from 1999 Through 2015	Facilities								
				Disturbed Area[2] (Acres)	Gravel Roads (Miles)	Pipelines (Miles)	Gravel Mines		Reserve Pits		Wells (No.)	Pads/ Platforms (No.)
							(No.)	(Acres)	(No.)	(Acres)		
Currently Proposed Projects												
Northstar	2001	158	Development Drilling & Production (active proposals currently under consideration)	20	0	28	1	36	0	0	23	1
Alpine	2000	250-300	Development Drilling & Production (active project currently under development)	97	3	34	0	0	0	0	150	2
Liberty	Before 2015	120	Development Drilling & Production (active proposal currently under consideration)	16	0	6	1	45	0	0	23	1
Known Discoveries/Potential Future Projects												
Colville River Fiord	Before 2015	--[3]	Resource Evaluation, Planning, Development (Production after 2010)	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]
Kuukpik Kalubik	Before 2015	--[3]	Resource Evaluation, Planning, Development (Production after 2010)	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]
Colville Delta	Before 2015	--[3]	Resource Evaluation, Planning, Development (Production after 2010)	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]
Point Thomson Sourdough	Before 2015	--[3]	Resource Evaluation, Planning, Development (Production after 2010)	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]
Pt. Thomson	Before 2015	200-300	Resource Evaluation, Planning, Development (Production after 2010)	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]
Flaxman 1	Before 2015	--[3]	Resource Evaluation, Planning, Development (Production after 2010)	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]
Gwydyr Bay Gwydyr Bay	Before 2015	--[3]	Resource Evaluation, Planning, Development (Production after 2010)	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]
Mikkelson	Before 2015	--[3]	Resource Evaluation, Planning, Development (Production after 2010)	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]
Yukon Gold	Before 2015	--[3]	Resource Evaluation, Planning, Development (Production after 2010)	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]
Pete's Wicked	Before 2015	--[3]	Resource Evaluation, Planning, Development (Production after 2010)	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]

TABLE 10-2 (Cont.)
FORESEEABLE FUTURE ACTIONS, NORTHSTAR PROJECT CUMULATIVE IMPACT AREA[1]

Unit or Area/Field	Initial Production Expected (Year)	Estimated Reserves (MMBBL)	Nature of Activity Expected from 1999 Through 2015	Facilities								
				Disturbed Area[2] (Acres)	Gravel Roads (Miles)	Pipelines (Miles)	Gravel Mines (No.)	Gravel Mines (Acres)	Reserve Pits (No.)	Reserve Pits (Acres)	Wells (No.)	Pads/ Platforms (No.)
Known discoveries/Potential Future Projects (Cont.)												
Sandpiper	Before 2015	--[3]	Three delineation wells planned for Year 2000. DPP submitted to MMS	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]
Kuvlum	Before 2015	--[3]	Resource Evaluation, Planning, Development (Production after 2010)	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]
Hammerhead	Before 2015	--[3]	Resource Evaluation, Planning, Development (Production after 2010)	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]
Lease Sales and Resource Evaluation Areas												
Alaska State Lease Sales No. 87	--[4]	Moderate to High Potential	Seismic exploration, exploration and delineation wells, production facilities	--	--	--	--	--	--	--	--	--
North Slope Areawide	--[4]	Moderate to High Potential	Seismic exploration, exploration and delineation wells	--	--	--	--	--	--	--	--	--
Beaufort Sea Areawide	--[4]	Moderate to High Potential	Seismic exploration, exploration and delineation wells	--	--	--	--	--	--	--	--	--
North Slope Foothills Areawide	--[4]	Moderate Potential	Seismic exploration, exploration and delineation wells	--	--	--	--	--	--	--	--	--
Federal NPRA Northeast Planning Area	--[4]	130-600	Seismic exploration, exploration and delineation wells	--	--	--	--	--	--	--	--	--
Western Planning Area	--[4]	130-1200	Seismic exploration, exploration and delineation wells	--	--	--	--	--	--	--	--	--

TABLE 10-2 (Cont.)
FORESEEABLE FUTURE ACTIONS, NORTHSTAR PROJECT CUMULATIVE IMPACT AREA[1]

Unit or Area/Field	Initial Production Expected (Year)	Estimated Reserves (MMBBL)	Nature of Activity Expected from 1999 Through 2015	Facilities								
				Disturbed Area[2] (Acres)	Gravel Roads (Miles)	Pipelines (Miles)	Gravel Mines (No.)	Gravel Mines (Acres)	Reserve Pits (No.)	Reserve Pits (Acres)	Wells (No.)	Pads/ Platforms (No.)
Lease Sales and Resource Evaluation Areas (Cont.)												
Federal OCS Lease Sales												
Lease Sale 176	2006	350-670	Seismic exploration, shallow hazards surveys, exploration and delineation wells, production facilities	--	--	96-258	--	--	--	--	87-111	3-5
Lease Sale 176	--[4]	To be determined	Seismic exploration, shallow hazards surveys, exploration and delineation wells	--	--	--	--	--	--	--	--	--

Note: 1 = The cumulative development area and proposed and future projects are shown on Figure 10-2.
2 = Roads, pads and airstrips
3 = Specific reserve estimates and development proposals are not presently available.
4 = No specific projects have been identified and initial production dates cannot be accurately estimated. Most production associated with these lease sales is likely to occur after 2015.

-- = No specific information is currently available.
MMBBL = Million barrels
No. = Number
NPRA = National Petroleum Reserve, Alaska
OCS = Outer Continental Shelf

Source: USDOI, BLM, 1998: IV-A-41-52.

TABLE 10-3
OIL RESERVES AND RESOURCES ESTIMATES,
NORTHSTAR PROJECT CUMULATIVE IMPACT AREA

Activity	Oil Production (MMBBL)
Past Production (Through 1996)	
Onshore	11,230
Offshore	340
Subtotal	11,570
Expected Future Production	
Onshore – existing fields	6,320
Offshore – existing fields	260
Onshore – planned fields	365
Offshore – planned fields	265
Subtotal	7,210
Possible Future Production	
Onshore	1,850
Offshore	460
OCS projects in currently unleased areas	1,200
Subtotal	3,510
Future NPRA Leasing	
Northeast Planning Area	130-600
Western Planning Area	130-1,200
Subtotal	260-1,800
Speculative Future Production	
Onshore	4,000
Offshore	2,000
Subtotal	6,000

Notes: MMBBL = Million barrels
NPRA = National Petroleum Reserve, Alaska
OCS = Outer Continental Shelf

Source: USDOI, BLM, 1998: Tables IV.A.5-4 and IV.A.5-7

TABLE 10-4
CUMULATIVE SPILL RISK (NORTHSTAR INCLUDED)
1997 TO 2020

Development	Production Rate (Bbbl)	Spill Rate (spills/Bbbl)	Data Source	Expected Value (8)
Existing				
Onshore production pads	3.814	0.0599	North Slope [3]	0.2285
Onshore pipelines [1]	3.971	0.086	North Slope	0.5564
Offshore pads	0.157	0.0599	North Slope [3]	0.0094
Subtotal				0.7943
Proposed/New				
Onshore production pads	1.337	0.0599	North Slope [3]	0.0801
Onshore pipelines [1]	2.499	0.086	North Slope	0.2149
Offshore pads	1.162	0.45	MMS	0.5229
Offshore pipelines [2]	1.162	1.32	MMS	1.5338
Subtotal				2.2518
Cumulative, statistically expected value				3.046

Notes:

1 = This entry presents spill risk associated with existing and proposed/new production separately, though some of the new production will be transported through existing onshore pipelines. This is intended to illustrate the contribution of proposed/new development to pipeline spill risk, though some of the pipelines may already exist.

2 = This volume is double-counted in the onshore pipeline total, since all offshore production will ultimately be transported in onshore pipelines. To avoid double counting, the onshore pipeline contribution to the total expected value was reduced by the offshore throughput. For this reason, the total (cumulative) expected value is not the sum of all entries in the expected value column.

3 = This spill rate was calculated based on the observed occurrence of zero large spills (>1,000 bbls) during the history of North Slope oil production. Since 11.57 billion barrels of oil have been produced and no major production pad spills have occurred, this spill rate was computed as the spill rate which results in a 50 percent probability that zero large spills (>1,000 bbls) would be observed with a total production of 11.57 billion barrels.

bbls = Barrels

Bbbl = Billion barrels

TABLE 10-5
CUMULATIVE SPILL RISK WITHOUT NORTHSTAR
1997 TO 2020

Development	Production Rate (Bbbl)	Spill Rate (spills/Bbbl)	Data Source	Expected Value (8)
Existing				
Onshore production pads	3.814	0.0599	North Slope [3]	0.2285
Onshore pipelines [1]	3.971	0.086	North Slope	0.5564
Offshore pads	0.157	0.0599	North Slope [3]	0.0094
Subtotal				0.7943
Proposed/New				
Onshore production pads	1.337	0.0599	North Slope [3]	0.0801
Onshore pipelines [1]	2.341	0.086	North Slope	0.2013
Offshore pads	1.004	0.45	MMS	0.4518
Offshore pipelines [2]	1.004	1.32	MMS	1.3253
Subtotal				1.9722
Cumulative, statistically expected value				2.767

Notes:

1 = This entry presents spill risk associated with existing and proposed/new production separately, though some of the new production will be transported through existing onshore pipelines. This is intended to illustrate the contribution of proposed/new development to pipeline spill risk, though some of the pipelines may already exist.

2 = This volume is double-counted in the onshore pipeline total, since all offshore production will ultimately be transported in onshore pipelines. To avoid double counting, the onshore pipeline contribution to the total expected value was reduced by the offshore throughput. For this reason, the total (cumulative) expected value is not the sum of all entries in the expected value column.

3 = This spill rate was calculated based on the observed occurrence of zero large spills (>1,000 bbls) during the history of North Slope oil production. Since 11.57 billion barrels of oil have been produced and no major production pad spills have occurred, this spill rate was computed as the spill rate which results in a 50 percent probability that zero large spills (>1,000 bbls) would be observed with a total production of 11.57 billion barrels.

bbls = Barrels

Bbbl = Billion barrels

TABLE 10-6
CUMULATIVE OIL SPILL PROBABILITIES (ONE OR MORE SPILLS)
1997 TO 2020

Development	Cumulative Probability Without Northstar		Cumulative Probability With Northstar	
	Expected Value (8)	Probability 1 or more spills >1,000 bbl	Expected Value (8)	Probability 1 or more spills > 1,000 bbl
Existing Development				
Onshore spills	0.7849	54.5%	0.7849	54.4%
Offshore spills	0.0094	0.9%	0.0094	0.9%
Subtotal - Existing	0.7943	54.8%	0.7943	54.8%
Proposed/New Development				
Onshore spills	0.2814	24.5%	0.2950	25.5%
Offshore spills	1.7771	83.1%	2.0567	87.2%
Subtotal - Proposed/New	1.9722	86.1%	2.2518	89.5%
Cumulative Probability	2.767	93.7%	3.046	95.2%

Notes: > = Greater than
bbl = Barrels
% = Percent

TABLE 10-7
CUMULATIVE PROBABILITY OF MULTIPLE SPILLS
WITHIN A 5-YEAR PERIOD [1]

Development	Cumulative Probability Without Northstar			Cumulative Probability With Northstar		
	5-Year Production (Bbbl)	Expected Value (8)	Probability of 2 or more spills >1,000 bbl	5-Year Production (Bbbl)	Expected Value (8)	Probability of 2 or more spills >1,000 bbl
Existing Development						
Onshore spills	0.829	0.1706	1.3%	0.829	0.1706	1.3%
Offshore spills	0.034	0.0020	0.0%	0.034	0.0020	0.0%
Subtotal – Existing		0.1727	1.3%		0.1727	1.3%
Proposed/New Development						
Onshore spills	0.291	0.0612	0.2%	0.291	0.0658	0.2%
Offshore spills	0.218	0.3859	5.8%	0.271	0.4797	8.4%
Subtotal – Proposed/New		0.4283	6.9%		0.5221	9.7%
Cumulative Probability		0.6010	12.2%		0.6948	15.4%

Notes: 1 = Total production within a 5-year period is computed as 21.74% of the total production projected for the period 1997 to 2020. Total Northstar production over a 5-year period is estimated as 33.3% of the 158-million barrel total Northstar production, as 52.7 million barrels.
bbl = Barrels
% = Percent
> = Greater than
Bbbl = Billion barrels