



DUCK ISLAND UNIT

APPLICATION FOR THE  
FORMATION OF THE SAG DELTA NORTH  
PARTICIPATING AREA

DECISION AND FINDINGS OF THE COMMISSIONER  
ALASKA DEPARTMENT OF NATURAL RESOURCES

August 11, 1991

10/6/ D&F Appr.

DUCK ISLAND UNIT  
FORMATION OF THE SAG DELTA NORTH  
PARTICIPATING AREA

I. INTRODUCTION AND BACKGROUND

The Duck Island Unit is an oil and gas unit located on the Alaska North Slope immediately east of the Prudhoe Bay Unit. This Unit was approved by the Alaska Department of Natural Resources on August 21, 1978. Currently, the Duck Island Unit contains 14 leases encompassing approximately 35,320 acres.

The Endicott Participating Area consists of the leases and portions of leases within the Duck Island Unit that have been determined to be capable of producing or contributing to production of hydrocarbons from the Kekiktuk Conglomerate (Kekiktuk Formation) in paying quantities. Only leases that are either partially or wholly included within the Endicott Participating Area can have oil production from the Kekiktuk Formation allocated to them.

The initial Endicott Participating Area was approved by the Department of Natural Resources on February 21, 1985; the approval was made effective February 22, 1985. The initial Endicott Participating Area contains all or parts of 10 leases totaling approximately 17,209.70 acres.

On October 3, 1987, production commenced from the Kekiktuk Conglomerate of the Endicott Group, the primary producing interval underlying the Endicott Participating Area. Start-up production was about 100,000 barrels of oil per day.

II. APPLICATION FOR THE FORMATION OF THE SAG DELTA NORTH PARTICIPATING AREA

On March 15, 1991, BP Exploration (Alaska) Inc. (BPX), on behalf of itself and Cook Inlet Region, Inc. (CIRI), Doyon Limited (Doyon), and the NANA Regional Corporation, Inc. (NANA) made application for the formation of the Sag Delta North Participating Area within the Duck Island Unit boundary. The proposed Sag Delta North Participating Area incorporates both the Sag Delta North Ivishak Oil Pool (Ivishak Formation) and the Sag Delta North Alapah Oil Pool (Alapah Formation). The combined pools have been designated the Sag Delta North Reservoir, and BPX proposes to combine the two pools into one participating area, the Sag Delta North Participating Area within the Duck Island Unit.

The leases proposed for inclusion in the Sag Delta North Participating Area along with the proposed tract allocation schedule for the leases are listed in Attachment 1. The Sag Delta

North Reservoir underlies Tracts No. 13 and 15 of the Unit. Tract 13, ADL 34633, reserves a 12.5% royalty to the State, while Tract 15, ADL 312828, is a net profit share lease with a 20% royalty and a 79.59350% net profit share reserved to the State.

The application included proposed exhibits and amendments to the Duck Island Unit Agreement, geological and geophysical data of the proposed participating area, a copy of the well test allocation methodology for allocating production between the Endicott and Ivishak Oil Pools, a copy of the Sag Delta North Special Provisions to the Duck Island Unit Operating Agreement, an equalization methodology for hydrocarbon liquid and gas production, and proposed methods for gas disposition, gas reserve debit recording, and gas balancing.

The Sag Delta North Participating Area was proposed to be effective as of July 1, 1991, the day after the conclusion of the 24 month long-term production test of the Sag Delta North Reservoir. The tract allocation factors are proposed to be retroactive and effective as of the first day of hydrocarbon liquids production from the Sag Delta North Reservoir, which commenced on July 30, 1989.

### III. GEOLOGICAL AND ENGINEERING CHARACTERISTICS, AND PREVIOUS EXPLORATION OF THE PROPOSED PARTICIPATING AREA

In June 1989, BPX submitted a lease plan of operations for a long term production test of the Sag Delta 9 Reservoir underlying Duck Island Unit Tracts 13 and 15. The Sag Delta 9 lease operation was to test the possibility of sustained production of hydrocarbons from the Sag Delta 9 Reservoir within the unit area. Production fluids from the Sag Delta 9 well were commingled with the production from the Endicott Participating Area (EPA) for processing in the Endicott production facilities.

The quantities of Sag Delta 9 Reservoir fluids were determined by individual well-test calibrated choke correlations. Well tests were conducted at least twice a month during the term of the test period. Allocation of gas and hydrocarbon liquids between the two tracts was based on the individual well tests and accepted oil industry engineering and allocation practices, and an initially proposed 25%/75% split between Tract No. 13 and Tract No. 15, respectively. Since Endicott and Sag Delta 9 production are commingled in the unit production facilities prior to metering, the well test allocation procedure also determines the allocation of hydrocarbon liquids between the Sag Delta 9 Reservoir and the Endicott Participating Area (EPA).

Additionally, the gas and water produced from the Sag Delta 9 Reservoir is processed at the EPA facilities and used for Endicott area operations, or reinjected into the EPA.

On June 15, 1989, a meeting was held between BPX and representatives of the Division of Oil and Gas to discuss the geological and engineering aspects of the proposed long term test. Confidential geological, geophysical and engineering information was presented in support of the reservoir structure and extent of the accumulation area.

On July 5, 1989, the Division of Oil and Gas conditionally approved the proposed long term test of the Sag Delta 9 Reservoir for a period of 24 months. Production from the Sag Delta No. 9 well began on July 30, 1989.

On December 7, 1989, a meeting was held between BPX and Division of Oil and Gas staff to discuss the current status of the Sag Delta 9 Reservoir test. Issues discussed were production performance of the Sag Delta No.9 well to date, review and update of short and long term test objectives, and well testing/allocation of production procedures. Another meeting to discuss the reservoir performance and status was held on May 17, 1990. Issues discussed at this meeting included the Sag Delta No. 9 well production performance to date, additional geological and fluid contact data, and future test plans for the drilling of additional wells to further evaluate the Sag Delta 9 Reservoir. Further discussion also took place concerning the proper methodology for the allocation of hydrocarbons between the EPA and the Sag Delta 9 reservoir. BPX advocated a volume accounting methodology based on individual well test allocations.

On July 3, 1990, the division approved the use of volume accounting based on well test allocations as the measurement methodology for allocating gas and hydrocarbon fluids between the Ivishak and Endicott Oil Pools within the Duck Island Unit. One of the terms and conditions of the well test allocation methodology approval was that production from the Ivishak Oil Pool would not continue beyond the 24 month test period without the formation and approval of a participating area for the reservoir. The March 15, 1991 application proposes to form a participating area for the combined Ivishak and Alapah Oil Pools (the Sag Delta North Reservoir) in the Duck Island Unit. Attachments to the participating area application provide the geological, geophysical, and engineering information in support of the participating area. These data include geologic logs of the wells in the Sag Delta North accumulation, stratigraphy and reservoir zonation data, estimates of the original oil in place in the Sag Delta North Reservoir, and structure and isopach maps of the Ivishak and Alapah formations.

In addition, the division has over 22 months of production history from the producing wells in the proposed participating area.

#### IV. DISCUSSION OF THE PARTICIPATING AREA DECISION CRITERIA

11 AAC 83.351(a) provides that, upon formation, a participating area may include only land reasonably known to be underlain by hydrocarbons and known or reasonably estimated through use of geological, geophysical, or engineering data to be capable of producing or contributing to the production of hydrocarbons in paying quantities. "Paying quantities" is defined by 11 AAC 83.395(4) to mean:

quantities sufficient to yield a return in excess of operating costs, even if drilling and equipment costs may never be repaid and the undertaking as a whole may ultimately result in a loss; quantities are insufficient to yield a return in excess of operating costs unless those quantities, not considering the costs of transportation and marketing, will produce sufficient revenue to induce a prudent operator to produce those quantities.

An application for approval of a participating area must be evaluated under these standards, as well as those of 11 AAC 83.303.

Under 11 AAC 83.303, the Commissioner of the Department of Natural Resources will approve a proposed participating area if the commissioner finds that the participating area is necessary or advisable to protect the public interest. To find that a proposed participating area is necessary or advisable to protect the public interest, the commissioner must find that the proposed participating area will: (1) promote the conservation of all natural resources; (2) promote the prevention of economic and physical waste; and (3) provide for the protection of all parties of interest, including the state.

In evaluating the above criteria, the commissioner will consider: (1) the environmental costs and benefits; (2) the geological and engineering characteristics of the potential hydrocarbon accumulation or reservoir(s) proposed for inclusion in the participating area; (3) prior exploration activities in the proposed participating area; (4) the applicant's plans for exploration or development of the proposed participating area; (5) the economic costs and benefits to the state; and (6) any other relevant factors (including mitigation measures) the commissioner determines necessary or advisable to protect the public interest. A discussion of these criteria and considerations follows.

##### (A) Promote the Conservation of Natural Resources.

The formation of participating areas within unit areas to develop and operate hydrocarbon bearing reservoirs within the unit boundary is a well accepted means of hydrocarbon conservation. A single

participating area which encompasses the Alapah and Ivishak Oil Pools will provide for a more efficient, integrated approach to development of the Sag Delta North Reservoir, through a comprehensive operating agreement and plan of development governing that production, and by avoiding unnecessary duplication of development efforts on and beneath the surface.

Furthermore, the production of hydrocarbon liquids from another participating area through the existing production and processing facilities within the Duck Island Unit reduces the environmental impact of the additional production. Formation of the Sag Delta North Participating Area provides the most practical method for maximizing oil and gas recovery from the Duck Island Unit area, while at the same time minimizing negative impacts on other resources.

(B) The Prevention of Economic and Physical Waste.

The proposed participating area encompasses the entire hydrocarbon bearing portion of the Sag Delta North Reservoir that can be produced economically. Formation of the participating area provides for the equitable division of costs and an equitable allocation of hydrocarbon shares, and sets forth a diligent development plan which maximizes physical and economic recovery from the combined Ivishak and Alapah Formations.

The formation of the Sag Delta North Participating Area and utilization of facility sharing opportunities provides a means through which an economically marginal hydrocarbon accumulation can be developed. ~~All Sag Delta North wells have been, or will be, drilled from the Endicott Main Production Island,~~ with the exception of the discovery well Sag 9 which was drilled from Endeavor Island. Available, unused Endicott Main Production Island drilling slots were utilized to eliminate the requirement for construction of an additional drilling island which would have promoted both economic and physical waste.

The combination of the Alapah and Ivishak Oil Pools into the same participating area allows for production of the smaller Alapah reserves, which for economic reasons would not be produced otherwise. Hydrocarbon production from each oil pool will be commingled downhole to maximize hydrocarbon recovery and minimize the number of production wells required, thereby minimizing both the requirement for downhole equipment in drilling and completion operations and the requirement for additional surface flowlines.

(C) The Protection of All Parties in Interest, Including the State.

One aim of the formation of participating areas within approved oil and gas units is the protection of the economic interests of all

working owners of the reservoir(s) forming the participating area. By combining their interests and operating under the terms of the Unit Agreement and Unit Operating Agreement, each individual working interest owner is assured an equitable allocation of costs and revenues commensurate with the value of its lease(s).

The state's economic interest is furthered by the maximization of hydrocarbon recovery under the leases of the Sag Delta North Participating Area and the additional production-based revenue derived from that production.

In reviewing the above criteria, the following factors were considered:

(1) The Environmental Costs and Benefits

Facility sharing by the two participating areas within the Duck Island Unit eliminates duplication of surface activities and results in significant reductions in the amount of surface area altered by oil and gas development. The development of the Sag Delta North Reservoir will not alter the existing configuration of the Endicott causeway and islands, and no additional impacts to nearshore habitat or biological resources will occur because of the additional production.

(2) The Geological and Engineering Characteristics of the Reservoir.

A listing of the geological and engineering characteristics that substantiate the proposed Sag Delta North Participating Area are:

The Sag Delta North Reservoir contains hydrocarbons reservoirs in both the Carboniferous Alapah Formation and the Triassic Ivishak Formation.

The Sag Delta North Reservoir limits are defined by faults and the truncation of the reservoir is defined by unconformities. Shales deposited upon regional unconformities provide the trap for hydrocarbons. Well control (Sag Delta 9, Sag Delta North 1, Sag Delta North 2, Sag Delta North 3, and Sag Delta North 4), and 3-D seismic coverage reasonably verify the areal limits of the accumulations.

A 24 month performance test of the Sag Delta Reservoir produced sufficient quantities of hydrocarbons to induce the working interest owners in the Sag Delta Reservoir to continue producing the reservoir by the formation of a participating area.

(3) Prior Exploration and Development Activities in the Proposed Area.

Five wells have been drilled in the proposed SDNPA. The area has been operating for the last 24 months under an approved lease plan of operations that was designed to test the possibility of sustained production of hydrocarbons from the Ivishak and Alapah Formations. The results of the Sag 9 Tract Operation proved that a prudent operator would continue producing the Sag Delta North Reservoir by forming a participating area.

(4) The applicant's plans for exploration or development of the participating area.

There are currently no further plans for exploration within Tracts 13 and 15; any wells drilled in addition to the five wells currently in place will be considered incremental development wells, necessary for optimized exploitation of hydrocarbons or required for secondary recovery processes. Additional development wells, if any, will be drilled from the Endicott Main Production Island.

A waterflood has been implemented in the proposed participating area and the hydrocarbon liquids production rate will be maximized prior to Endicott field decline, consistent with prudent reservoir management practices.

Subject to the terms and conditions listed in Article V, the plan of development for the proposed SDNPA meets the criteria of 11 AAC 83.343.

(5) The economic costs and benefits to the State.

Approval of the SDNPA is to the economic benefit of the State because it promotes the ultimate physical recovery of hydrocarbons from the Sag Delta North Reservoir and the Duck Island Unit, and thereby the production-based revenues accruing to the State. The State's long-term royalty and net profit share are enhanced because ~~over 93% of the production from the proposed participating area is from a net profit share lease, ADL 312828 (Tract 15), with a 20% royalty and 79.59% net profit rate.~~ The potential to share in the net profit of ADL 312828 is further enhanced by its inclusion in both the Endicott Participating Area and the Sag Delta North Participating Area of the Duck Island Unit.

Any additional administrative burdens associated with the new participating area and net profit share leases within the participating area are far outweighed by the additional royalty and tax benefits derived from the participating area production.



(6) Any other relevant factors (including mitigation measures) the commissioner determines necessary or advisable to protect the public interest.

These factors are discussed in Article V below.

#### V. OTHER ISSUES PERTINENT TO THE SAG DELTA NORTH PARTICIPATING AREA APPLICATION

In a letter dated April 30, 1991 to BPX (Attachment 3), the division noted a number of concerns with the application for the formation of the Sag Delta North Participating Area. The issues addressed in the letter were (1) the unit operator, the Sag Delta North operator; (2) criteria appropriate for the expansion or contraction of participating areas; (3) net profit share leases (NPSLs), the regulations established for the administration of NPSLs (11 AAC 83.201 - 11 AAC 83.295), and the Sag Delta North Special Provisions of the Duck Island Unit Operating Agreement; (4) the Sag Delta North plan of development; (5) gas disposition and gas volume accounting between the Endicott Participating Area (EPA) and the proposed Sag Delta North Participating Area (SDNPA); and (6) quality adjustments for oil gravity differences between the Sag Delta North Reservoir and Endicott Formation.

A meeting was held between BPX and the division on May 14, 1991 to discuss the concerns raised in the April 30, 1991 letter. Subsequent to the May 14, 1991 meeting, BPX submitted a written response, dated May 28, 1991, to the State's concerns with the participating area application.

BPX's May 28, 1991 responses (Attachment 4) concerning the unit operator (item 1), the regulations governing participating areas (item 2), and some of the NPSL issues (items 6, 7, 13 & 14) are satisfactory to the division.

With respect to the other NPSL issues addressed in the division's April 30, 1991 letter, the division approves this decision with the acknowledgement that to the extent the Sag Delta North Special Provisions to the Duck Island Unit Operating Agreement and the net profit share lease regulations (11 AAC 83.201 - 11 AAC 83.295) conflict, the NPSL regulations shall control (item 3). With regard to BPX's responses to items #4 and #5, the division requires submission of all reports detailing the equalization of costs amongst the Duck Island Unit working interest owners required because of the formation of the Sag Delta North Participating Area, and a "hard copy" of the monthly joint interest billing summaries supplied to the Sag Delta North owners. The "hard copy" joint interest summaries should be supplied for the balance of 1991.

The division also requires submission of the schedule(s) of equalization of pre-unitized hydrocarbon liquids and gas produced from the Sag Delta North Reservoir (the overlift/underlift schedule for hydrocarbon liquids and gas disposition and debit report for the gas). Under Article 37.13 of the Sag Delta North Special Provisions to the Duck Island Unit Operating Agreement, the schedules are to be provided to the SDNPA owners on or about 45 days after the effective date of this decision; they shall be provided to the division at the same time.

BPX in its application for the formation of the SDNPA requested that the plan of development for the Sag Delta North Reservoir be approved for the life of the SDNPA, with an estimate of the field life extending to 1995. The division will approve the plan of development through December 31, 1995 subject to the following terms and conditions:

- 1) If the Sag Delta North Reservoir life extends beyond December 31, 1995, BPX, the unit operator, is to submit a new plan at least 90 days before the expiration date of the previously approved plan.

- 2) The division does not recognize nor approve those aspects of the plan that deal with agreements amongst the working interest owners, specifically the Agreement for Sharing Endicott Area Equipment for Sag Delta 9 Tract Operation and any amendments thereto.

- 3) Gas that is flared for any reason other than safety purposes as directed by the Alaska Oil and Gas Conservation Commission (AOGCC) is not deemed to be unavoidably lost for royalty and net profit share accounting purposes. The use of royalty free gas for Duck Island Unit operations (fuel and flare) must be proportioned between the two participating areas within the unit. The basis of proportionality for the fuel gas used in unit operations during a month shall be each participating area's fraction of the total hydrocarbon liquids produced through the Endicott Production Facilities that month. The basis of proportionality for the flare gas in any month shall be each participating area's fraction of the total produced gas processed through the Endicott facilities that month.

The Alaska Oil and Gas Conservation Commission has authorized the flare of a specific amount of gas for safety flare purposes. Any excess flare gas above the authorized amount is subject to a royalty payment.

To properly account for the gas disposition between the Endicott and Sag Delta North Participating Areas, BPX will be required to submit, by month, the gas disposition and gas reserve debit report included as Attachment 2.

BPX requested that EPC's share of the gas used for power generation, i.e. power for the Endicott Pipeline, be listed under the category of "Less Fuel Gas Used." This gas is not required for Unit operations; it is gas sold and subject to royalty payment. Therefore, the gas used for power generation sold to the Endicott Pipeline must be accounted for separately, and not as "fuel gas used."

Two additional issues need to be addressed as part of the application for the formation of the SDNPA. These are: 1) the well test allocation methodology for the SDN Reservoir and 2) the field cost allowance for royalty hydrocarbons produced for the SDNPA.

The well test allocation methodology approved by the State on July 3, 1989, and later amended on August 2, 1989, concerned the allocation of gas and hydrocarbon liquid production between the Ivishak and Endicott oil pools within the Duck Island Unit. Since the SDN Reservoir combines the Ivishak and Alapah Formations, the July 3, 1989<sup>90</sup> and August 2, 1989<sup>90</sup> approvals are further amended to allow the use of the well test allocation methodology as acceptable and satisfactory for royalty purposes for allocating hydrocarbon production between the Sag Delta North Participating Area and the Endicott Participating Area within the Duck Island Unit.

It is also understood by the division that the meter allocation factor for the Sag Delta North Participating Area will continue to be fixed at 1.0, i.e., the SDNPA production volume is determined using well test data, and not subsequently adjusted using a meter allocation factor. The division will continue to require submission of monthly production reports and well test data for the SDNPA wells.

Finally, for the royalty hydrocarbon liquids produced from the SDNPA, the field cost allowance will continue to be as stated in the division's July 3, 1989 approval of the Sag Delta 9 lease plan of operations. Item 2 states:

The field cost allowance for royalty hydrocarbon liquids will be as specified in Exhibit G of the Duck Island Unit Agreement for the DL-1 lease ADL 34633 (Tract 13). With respect to DMEM-1-79A lease ADL 312828 (Tract 15), royalty in value and royalty in kind will be free and clear of any processing fee as provided for in Paragraph 10 and Paragraph 12(b) of the lease form.

## VI. FINDINGS AND DECISION

Considering the facts discussed in this document and the administrative record, I hereby make findings and impose conditions as follows:

1. The proposed participating area, the Sag Delta North Participating Area, meets the requirements of 11 AAC 83.303.
2. The available geological, geophysical and engineering data submitted demonstrate that a paying quantities certification is appropriate for the wells in the Sag Delta North Reservoir and that the acreage is capable of sustained production or contributing to sustained production in sufficient quantities to justify the formation of the Sag Delta North Participating Area within the Duck Island Unit.
3. The geological and engineering data support the combination of the Ivishak Formation and Alapah Formation into one participating area. The limited areal extent and low recoverable oil in place makes separate development of the Alapah accumulation uneconomic. The surface and downhole commingling of production from the Ivishak and Alapah accumulations will enhance the recovery of Alapah reserves which might otherwise not be produced if not for the downhole commingling and the combination of the two reservoirs into one participating area.
4. The available geological, geophysical and engineering data submitted in support of the proposed participating area justify the inclusion of Tract 13, ADL 34633, and Tract 15, ADL 312828, within the Sag Delta North Participating Area. Under the terms of the applicable regulations governing formation and operation of oil and gas units (11 AAC 83.301 - 11 AAC 83.395) and the terms and conditions under which these lands were leased from the State of Alaska, the following lands are to be included in the Sag Delta North Participating Area:

T.12.N., R.16.E., U.M., Sec. 25: NE 1/4  
(ADL 34633 (Tract 13));

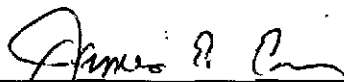
T.12.N., R.17.E., U.M.,  
    Sec. 19: E/2 Within 3 Mile Limit,  
            W/2 Within 3 Mile Limit;  
    Sec. 20: SW 1/4 Within 3 Mile Limit,  
    Sec. 29: N/2 Within 3 Mile Limit,  
    Sec. 30: N/2;

T.12.N., R.16.E., U.M., Sec 24: E/2  
(ADL 312828 (Tract 15)).

5. The proposed participating area encompasses the hydrocarbon bearing portion of the Sag Delta North Reservoir that can be produced at this time. Formation of the participating area provides for the equitable division of costs and an equitable allocation of hydrocarbon shares, and sets forth a diligent development plan which maximizes physical and economic recovery from the combined Ivishak and Alapah Formations.
6. The production of hydrocarbon liquids from the Sag Delta North Participating Area through the existing production and processing facilities within the Duck Island Unit reduces the environmental impact of the additional production. Utilization of existing facilities will avoid unnecessary duplication of development efforts on and beneath the surface.
7. The well test allocation methodology approved on July 3, 1989 and later amended on August 2, 1989 continues to be acceptable and satisfactory, based on the 24 month Sag Delta 9 test, for royalty purposes for allocating gas and hydrocarbon liquids production between the Sag Delta North Participating Area and the Endicott Participating Area within the Duck Island Unit.
8. Pursuant to 11 AAC 83.351(b), the Ivishak and Alapah Formations shall be combined into one participating area, the Sag Delta North Participating Area. Furthermore, downhole commingling of the Ivishak and Alapah Formations shall be approved as part of the Sag Delta North Participating Area.
9. Pursuant to 11 AAC 83.351(a) and 11 AAC 83.371(a), the proposed or revised division of interest or formula allocating hydrocarbon production and operating costs among the leases in the Sag Delta North Participating Area shall be as set out in Attachment 1 to this Decision and Findings (Exhibit C to the Duck Island Unit Agreement, Tract Participation for the Sag Delta North Participating Area).
10. Within 45 days of the effective date of this Decision and Findings, the Unit Operator shall submit to the State the overlift/underlift schedule for the equalization of pre-unitized hydrocarbon liquids and gas produced from the Sag Delta North Reservoir reflected in the revised tract allocation formula.
11. The well test allocation methodology approved by the State on July 3, 1989, and later amended on August 2, 1989 is further amended to allow the use of the well test allocation methodology as acceptable and satisfactory for royalty purposes for allocating gas and hydrocarbon liquids production between the Sag Delta North Participating Area and the Endicott Participating Area within the Duck Island Unit.

12. The meter allocation factor for the Sag Delta North Participating Area will continue to be fixed at 1.0, i.e., the SDNPA production volume is determined using well test data, and not subsequently adjusted using a meter allocation factor. The unit operator will continue to provide the division with the monthly production reports and well test data for the SDNPA wells.
13. The field cost allowance for royalty hydrocarbon liquids will be as specified in Exhibit G of the Duck Island Unit Agreement for the DL-1 lease ADL 34633 (Tract 13). With respect to DMEM-1-79A lease ADL 312828 (Tract 15), royalty in value and royalty in kind will be free and clear of any processing fee as provided for in Paragraph 10 and Paragraph 12(b) of the lease form.
14. Diligent exploration and delineation of the Sag Delta North Reservoir underlying the approved participating area (ADLs 34633 and 312828) are to be conducted by the Unit Operator under the Duck Island Unit plans of development and operation approved by the State.
15. The plan of development for the Sag Delta North Participating Area, subject to the terms and conditions listed in Article V of this Decision and Findings, meets the requirements of 11 AAC 83.303 and 11 AAC 83.343. The plan is approved for the period August 12, 1991 through December 31, 1995. Annual updates to the plan of development shall be submitted in accordance with 11 AAC 83.343.
16. Tract 15, ADL 312828, is a net profit share lease include within the Sag Delta North Participating Area. To the extent the Sag Delta North Special Provisions to the Duck Island Unit Operating Agreement and the net profit share lease regulations (11 AAC 83.201 - 11 AAC 83.295) conflict, the NPSL regulations shall control.
17. Concerning ADL 312848, within 45 days of the effective date of this Decision and Findings, the Unit Operator shall submit to the State all reports detailing the equalization of costs amongst the Duck Island Unit working interest owners required because of the formation of the Sag Delta North Participating Area, and a "hard copy" of the monthly joint interest billing summary supplied to the Sag Delta North owners.
18. The Sag Delta North Participating Area within the Duck Island Unit is effective 12:01 a.m. August 12, 1991.

For these reasons and subject to the conditions and limitations noted, I hereby approve the Sag Delta North Participating Area within the Duck Island Unit.

  
James E. Eason, Director  
Division of Oil and Gas

August 11, 1991  
Date

For: Harold C. Heinze, Commissioner  
Alaska Department of Natural Resources

Attachments: Tract Participations for the Sag Delta North Participating Area

Endicott and Sag Delta North Gas Disposition and Reserves Debit Report

April 30, 1991 Division of Oil and Gas letter to BPX

May 28, 1991 BPX Response

DIU.SDNAPPRV.txt

# Attachment 1

## Tract Participations for the Sag Delta North Participating Area

Tract No.	ADL No.	Description of Tract within Participating Area	Tract Participation %
13	34633	Sec 25: NE 1/4 T.12.N., R.16.E., U.M.	6.6356
15	312828	Sec. 19: E/2 Within 3 Mile Limit W/2 Within 3 Mile Limit Sec. 20: SW 1/4 Within 3 Mile Limit Sec. 29: N/2 Within 3 Mile Limit Sec. 30: N/2 T.12.N., R.17.E., U. M.  Sec. 24: E/2 T.12.N., R.16.E., U. M.	93.3644
			<u>100.0000</u>



BP EXPLORATION (ALASKA) INC. - Volume Accounting  
 Endicott & Sag Delta North Gas Disposition & Reserve Debit Report  
 Volumes are in MCF at 14.65 PSIA - calculations subject to revision when finalized

Month Year

ADNR Revised  
 6/26/91

Page 1

	BPXA	EXXON	UNION	AMOCO	COOK INLET	NANA REGIONAL	DOVAN LTD	ARCO	TOTAL
ENDICOTT OWNERSHIP %	56.7825	21.0206	10.5174	10.4940	0.6456	0.3874	0.1291	0.0234	100.0000
SDN OWNERSHIP %	96.6250				1.8750	1.1250	0.3750		100.0000

95.7906

Total Gas Produced

SOG Gas Production EPA  
 SOG Gas Production SDN

Less Fuel Gas Used for Area Operations

For Power Generation  
 For other uses  
 Total Gas Fuel Used

EPA Share of Fuel Gas Used for Area Operations

For Power Generation  
 For other uses  
 Total EPA Fuel Gas

SDN Share of Fuel Gas Used for Area Operations

For Power Generation  
 For other uses  
 Total SDN Fuel Gas

Less Power Generation Sales EPC 12.8%

(Subject to Royalty Payment)

EPA Share  
 SDN Share

Less Flare Gas

Authorized Flare  
 Excess Flare Subject to Tax & Royalty  
 Excess Flare sub. to Tax & Penalty  
 Total Flare Gas

EPA Share of Flare Gas

Authorized Flare  
 Excess Flare Subject to Tax & Royalty  
 Excess Flare sub. to Tax & Penalty  
 EPA Total Flare Gas

SDN Share of Flare Gas

Authorized Flare  
 Excess Flare Subject to Tax & Royalty  
 Excess Flare sub. to Tax & Penalty  
 SDN Total Flare Gas

Less NGLs (mcf equivalent)

EPA NGLs  
 SDN NGLs

Balance to Injection

EPA Net Injection  
 YTD  
 ITD

SDN Net Injection

YTD  
 ITD

	BPXA	EXXON	UNION	AMOCO	COOK INLET	NANA REGIONAL	DOYAN LTD	ARCO	TOTAL
ENDICOTT OWNERSHIP %	56.7825	21.0206	10.5174	10.4940	0.6456	0.3874	0.1291	0.0234	100.0000
SDN OWNERSHIP %	96.6250				1.8750	1.1250	0.3750		100.0000

**Total EPA SOG Reserve Gas Debits**

Month  
YTD  
ITD

**Total SDN SOG Reserve Gas Debits**

Month  
YTD  
ITD

**Total SDN SOG Reserves Injected Into EPA Reservoir**

Month  
YTD  
ITD

**Total SDN SOG Sold from EPA Reservoir**

Month  
YTD  
ITD

# STATE OF ALASKA

## DEPT. OF NATURAL RESOURCES

### DIVISION OF OIL AND GAS

WALTER J. HICKEL, GOVERNOR

P.O. BOX 107034  
ANCHORAGE, ALASKA 99510-7034  
PHONE: (907) 762-2553

(907)762-2546

April 30, 1991

BP Exploration (Alaska) Inc.  
900 East Benson Blvd.  
P.O.Box 196612  
Anchorage, Alaska 99519-6612

Attention: S. L. Harvey

Subject: Sag Delta North  
Participating Area Application


Dear Ms. Harvey:

A number of concerns have been raised in the Division of Oil and Gas' review of the application for the formation of the Sag Delta North Participating Area within the Duck Island Unit. The issues are attached to this letter. I suggest that the State and BPX meet to discuss these issues.

Please call me at your earliest convenience to arrange the meeting.

If you have any questions on any of these items, please contact me at 762-2546.

Sincerely,

  
Michael D. Kotowski  
Units Manager

Attachment

cc: T. N. Tyler - BPX  
Bonnie Johannsen - ADOL

Sdnresp.txt

**Application for Formation of  
Sag Delta North Participating Area  
Within the Duck Island Unit**

An initial review of the Application has raised the following concerns:

1. Paragraph 31.8 of the Sag Delta North Special Provision to the Duck Island Unit Operating Agreement (hereinafter the "Special Provision") states:

The Sag Delta North Operator shall possess all rights and assume all duties of the Unit Operator as specified in the General Provisions of the Duck Island Unit Agreement, to the extent that such provisions are applicable to the Sag Delta North Operations.

While the Duck Island Unit working interest owners generally assign rights and delegate duties amongst themselves, the State is not willing to have multiple unit operators for different parts or functions of the unit. The State requires a single unit operator to which all notices may be sent for all purposes.

2. Paragraph 33.10 of the Special Provisions states:

The Sag Delta North Owners may, by approval of 100 percent of the Sag Delta North Area Voting Interests, enlarge the Sag Delta North Participating Area. Such enlargements shall be on the basis of participation and other terms and conditions determined by the Sag Delta Owners, including provision for the allocation of the Sag Delta North Tract Participation to the added area.

However, 11 AAC 83.356(c) states:

A participating area must be expanded to include acreage reasonably estimated through use of geological, geophysical, or engineering data to be capable of producing or contributing to the production of hydrocarbons in paying quantities, and must be contracted to exclude acreage reasonably proven through use of geological, geophysical, or engineering data to be incapable of producing hydrocarbons in paying quantities, subject to approval by the commissioner. A revised division of interest or formula allocating production and costs must be submitted for approval under 11 AAC 83.371 at the time of expansion or contraction of a participating area.

To the extent that Paragraph 33.10 of the Special Provisions and 11 AAC 83.351(c) conflict, 11 AAC 83.351(c) shall control. Accordingly, the participating area shall be expanded or contracted using the standard set forth in the regulation, regardless of whether 100 percent of the Sag Delta North voting interests consent.

3. To the extent that the Special Provision and the net profit share lease regulations (11 AAC 83.201 - 11 AAC 83.295) conflict, the net profit share lease regulations shall control. The Special Provisions shall not be interpreted to amend or alter the effect of the net profit share lease regulations. For example, the equalization of pre-unitization costs under Article 36 of the Special Provisions shall not be used to circumvent the exclusion set forth in 11 AAC 83.217(5). 11 AAC 83.217(5) excludes expenses incurred before the effective date of the net profit share lease (Tract 15) when determining net profit share payments due the State.

4. If a working interest owner incurred an expense and debited it to either its NPSL development account or production revenue account, then was reimbursed for the expense through the equalization of costs, that working interest owner must credit its development or production revenue account in an amount which includes both the reimbursed expense and any inflation equivalent thereon.

5. Annual joint interest billing tapes shall be submitted to the division by July 1 of each year for the preceding calendar year. Any amendment to any tape subsequent to the date of submittal shall be submitted within 60 days of amendment.

6. For NPSL accounting purposes a presumption shall arise that any expense not allowed as a joint interest expense may not be debited to a development or production revenue account. Any NPSL report filed with the State which reflects the debiting of an expense not allowed as a joint interest expense shall include as an attachment to the report a detailed explanation of the nature and amount of the expense, the reason why it was incurred, and all benefits derived from incurring the expense.

7. Overhead fee which may be debited for NPSL accounting purposes, Special Provision paragraph 34.6. The NPSL regulations on allowable overhead, absent commissioner approval of a different formula, are 11 AAC 83.240(d) (operating - 9%) and 11 AAC 83.219(f) (development - 3%). Either the operating (9%) or the development rate (3%), whichever applies, will be applied to all the direct charges as set out in Exhibit I, Section II of the Duck Island Unit Operating Agreement.

8. The plan of development, if approved, shall be approved through a date no later than December 31, 1995. The plan of development shall not be approved for the life of the Sag Delta North Participating Area, as requested.

Furthermore, the SDN Plan of Development must be consistent with items #9 and #10 below, i.e. gas disposition for area operations must be proportionate between the two participating areas within the unit.

9. Special Provisions paragraph 37.10 and Exhibits 34-A and 34-B will not be approved as submitted. This paragraph and the exhibits purport to allow Sag Delta North working interest owners to use gas from the Sag Delta North participating area to meet their obligation to supply fuel gas for Endicott area operations, without restrictions. As with flared gas, fuel gas must be proportionate. See formula for flared gas in paragraph 37.10.

10. Gas volume accounting form. To properly account for the gas disposition between the Endicott and the proposed Sag Delta North Participating Areas (Special Provisions 37.9, 37.10 & 37.11), the division proposes the revised Gas Debit Report format for Endicott and Sag Delta North. The revised format removes Power Generation Sales EPC 12.5% from the Fuel Gas for Area Operations category and places it in a separate category subject to EPA and SDN allocation.

11. Quality Bank Adjustments. How does BPX propose to make these adjusts for royalty reporting purposes?

12. Attachment #4 of the March 15, 1991 Sag Delta North Participating Area Application details the distribution of stock tank oil in place. What is the distribution of the STOOIP by Tract?

13. Paragraph 5 of the Amendment to Agreement for Sharing Endicott Area Equipment for Sag Delta 9 Tract Operations discusses the per barrel fee for processing Sag Delta North Participating Area hydrocarbon liquids through the Endicott Area Equipment. The processing fee has a fixed capital component and an adjustable expense component. The State reserves the right to determine the appropriateness of capital and expense components for any royalty valuation or NPSL accounting purposes.

14. Similarly with respect to Paragraph 6 of the Amendment, approval of the Sag Delta North Participating Area should not be construed as acquiescence in allowance of deduction of "Make Whole Payments" for royalty valuation or NPSL accounting purposes.

15. 11 AAC 83.303 requires a written discussion of the criteria set forth in subsections (a) and (b) of that regulation before: (1) a participating area is approved, (2) a unit agreement is amended, or (3) a plan of development is approved. BP should submit a written discussion addressing the criteria of 11 AAC 83.303(a) and (b) on the proposed participating area, amendments to unit agreement, and plan of development.

	BPXA	EXXON	UNION	AMOCO	COOK INLET	NANA REGIONAL	DOYAN LTD	ARCO	TOTAL
ENDICOTT OWNERSHIP %	56.7825	21.0206	10.5174	10.4940	0.6456	0.3874	0.1291	0.0234	100.0000
SDN OWNERSHIP %	96.6250				1.8750	1.1250	0.3750		100.0000

Total Gas Produced

SOG Gas Production EPA

SOG Gas Production SDN

Less Fuel Gas Used for Area Operations

For Power Generation

For other uses

Total Gas Fuel Used

EPA Share of Fuel Gas Used for Area Operations

For Power Generation

For other uses

Total EPA Fuel Gas

SDN Share of Fuel Gas Used for Area Operations

For Power Generation

For other uses

Total SDN Fuel Gas

Less Flare Gas

Authorized Flare

Excess Flare Subject to Tax

Excess Flare sub. to Tax & Penalty

Total Flare Gas

EPA Share of Flare Gas

Authorized Flare

Excess Flare Subject to Tax

Excess Flare sub. to Tax & Penalty

EPA Total Flare Gas

SDN Share of Flare Gas

Authorized Flare

Excess Flare Subject to Tax

Excess Flare sub. to Tax & Penalty

SDN Total Flare Gas

Power Generation Sales EPC 12.8%

EPA Share

SDN Share

Less NGLs (mcf equivalent)

EPA NGLs

SDN NGLs

Balance to Injection

EPA Net Injection

YTD

ITD

SDN Net Injection

YTD

ITD

Total EPA SOG Reserve Gas Debits

Month

YTD

ITD

Total SDN SOG Reserve Gas Debits

Month

YTD

ITD



**BP EXPLORATION**

BP Exploration (Alaska) Inc.  
900 East Benson Boulevard  
P.O. Box 196612  
Anchorage, Alaska 99519-6612  
(907) 561-5111

May 28, 1991

Michael D. Kotowski, Units Manager  
Division of Oil & Gas  
Alaska Department of Natural Resources  
P.O. Box 107034  
Anchorage, Alaska 99510-7034

RECEIVED  
JUN 3 1991  
DIV. OF OIL & GAS

Response to Comments on the  
Application for the Formation of the Proposed Sag Delta North Participating Area  
within the Duck Island Unit

Dear Mr. Kotowski:

In response to concerns raised by the Department of Natural Resources, Division of Oil and Gas, in review of the application for formation of the Sag Delta North Participating Area within the Duck Island Unit, and the subsequent May 14, 1991 meeting between DNR and BPX to discuss these concerns, BP Exploration (Alaska), Inc. respectfully submits the following responses. Each concern is sequentially listed below and is addressed on a point by point basis; as outlined in your April 30, 1991 correspondence to S.L. Harvey, of BPX, in reference to the Sag Delta North Participating Area Application.

- "1. *Paragraph 31.8 of the Sag Delta North Special Provisions to the Duck Island Unit Operating Agreement (hereinafter the "Special Provision") states:*

*The Sag Delta North Operator shall possess all rights and assume all duties of the Unit Operator as specified in the General Provisions of the Duck Island Unit Agreement, to the extent that such provisions are applicable to the Sag Delta North Operations.*

*While the Duck Island Unit working interest owners generally assign rights and delegate duties amongst themselves, the State is not willing to have multiple unit operators for different parts or functions of the unit. The State requires a single unit operator to which all notices may be sent for all purposes."*

BPX's Response: Sections 7.1 and 31.6 of the DIUOA specifically state that BPX is designated as the Unit Operator. Since both the Endicott and Sag Delta North Participating Areas have the same operator there appears to be no conflict in BP's opinion. Further, because designation or change of Unit Operator requires commissioner's approval, the state would have an opportunity to raise any concerns it may have with respect to multiple operators should there be a proposed change to the status quo. The State should send all unit notices relating to the Sag Delta North Participating Area to BPX, the Unit Operator.

- "2. *Paragraph 33.10 of the Special Provisions states:*

*The Sag Delta North Owners may, by approval of 100 percent of the Sag Delta North Area Voting Interests, enlarge the Sag Delta North Participating Area. Such enlargements shall*

1955/SLH

Attachment 4



*be on the basis of participation and other terms and conditions determined by the Sag Delta Owners, including provision for the allocation of the Sag Delta North Tract Participation to the Added area.*

*However, 11 AAC 83.351(c) states:*

*A participating area must be expanded to include acreage reasonably estimated through use of geological, geophysical, or engineering data to be capable of producing or contributing to the production of hydrocarbons in paying quantities, and must be contracted to exclude acreage reasonably proven through use of geological, geophysical, or engineering data to be incapable of producing hydrocarbons in paying quantities, subject to approval by the commissioner. A revised division of interest or formula allocating production and costs must be submitted for approval under 11 AAC 83.371 at the time of expansion or contraction of a participating area.*

*To the extent that Paragraph 33.10 of the Special Provisions and 11 AAC 83.351(c) conflict, 11 AAC 83.351(c) shall control. Accordingly, the participating area shall be expanded or contracted using the standard set forth in the regulation, regardless of whether 100 percent of the Sag Delta North voting interests consent."*

**BPX's Response:** Section 33.10 of the Sag Delta North Special Provisions was incorporated into the operating agreement to address one of the Native Corporation's concerns; ensuring that all Sag Delta North Working Interest Owners have a vote in any unforeseen obligations as a result of a participating area expansion. Furthermore, BPX acknowledges and accepts its responsibility to abide by the Alaska Administrative Code, per Paragraph 1 of the Duck Island Unit Agreement and Section 3.1 of the Duck Island Unit Operating Agreement.

- "3. *To the extent that the Special Provision and the net profit share lease regulations (11 AAC 83.201 - 11 AAC 83.295) conflict, the net profit share lease regulations shall control. The Special Provisions shall not be interpreted to amend or alter the effect of the net profit share lease regulations. For example, the equalization of pre-unitization costs under Article 36 of the Special Provisions shall not be used to circumvent the exclusion set forth in 11 AAC 83.217(5). 11 AAC 83.217(5) excludes expenses incurred before the effective date of the net profit share lease (Tract 15) when determining net profit share payments due the State."*

**BPX's Response:** BPX acknowledges and accepts its responsibility to abide by the Alaska Administrative Code, per Paragraph 1 of the Duck Island Unit Agreement and Section 3.1 of the Duck Island Unit Operating Agreement.

- "4. *If a working interest owner incurred an expense and debited it to either its NPSL development account or production revenue account, then was reimbursed for the expense through the equalization of costs, that working interest owner must credit its development of production revenue account in an amount which includes both the reimbursed expense and any inflation equivalent thereon."*

**BPX's Response:** BPX plans to proceed with NPSL equalization accounting in accordance with 11 AAC 83.212 (d) "DEVELOPMENT ACCOUNT" for any equalization of costs which require an amendment of NPSL filings; each reimbursed working interest owner will credit its

account by both the reimbursed expense and any interest accrued on that reimbursed expense.

If equalization of costs is accounted for in the NPSL filings as a current adjustment, then each reimbursed working interest owner will credit its account by both the reimbursed expense and any inflation equivalent accrued on that reimbursed expense.

- "5. *Annual joint interest billing tapes shall be submitted to the division by July 1 of each year for the preceding calendar year. Any amendment to any tape subsequent to the date of submittal shall be submitted within 60 days of amendment.*"

BPX's Response: As a result of the May 14, 1991 meeting, BPX was informed that it is standard procedure for Arco to supply the State with joint interest billing tapes for Kuparuk and that this approach aides in minimizing both the State and working interest owner's time spent auditing. BPX pointed out that annual joint interest tapes are supplied to the working interest owners for the Endicott Participating Area; however, upon further review and discussion with BPX's joint interest billing staff it was learned that annual joint interest tapes are not currently supplied to the Sag Delta North Working Interest Owners. Billing tapes are not expected to be supplied in the future for the Sag Delta North Participating Area, due to the limited volume of accounting. The Sag Delta North Working Interest Owners are supplied with a hard copy joint interest billing summary each month. BPX is willing to supply the State with the same information that is currently supplied to the Sag Delta North Working Interest Owners. BPX recommends that the State request specific information on an as needed basis.

Amendments to joint interest billing are not made retroactively by adjusting earlier monthly billing summaries; rather, any changes are made by crediting or debiting the appropriate AFE at the time the amendment to the billing has been determined. Amendments to the Sag Delta North joint interest billing will be reflected in the hard copy summaries.

Furthermore, all records required to be maintained under 11 AAC 83.245 (e) & (f) "REPORTING AND PAYMENT REQUIREMENTS" have been, and shall continue to be, made available for inspection and copying by representatives of the state during normal business hours.

- "6. *For NPSL accounting purposes a presumption shall arise that any expense not allowed as a joint interest expense may not be debited to a development or production revenue account. Any NPSL report filed with the State which reflects the debiting of an expense not allowed as a joint interest expense shall include as an attachment to the report a detailed explanation of the nature and amount of the expense, the reason why it was incurred, and all benefits derived from incurring the expense.*"

BPX's Response: BPX does not anticipate debiting any non-joint interest expenses for the Sag Delta North Participating Area to the NPSL development or production revenue account. BPX shall comply with all

applicable State regulations regarding NPSL accounting and reporting requirements.

- "7. *Overhead fee which may be debited for NPSL accounting purposes, Special Provision paragraph 34.6. The NPSL regulations on allowable overhead, absent commissioner approval of a different formula, are 11 AAC 83.240(d) (operating - 9%) and 11 AAC 83.219 (f) (development - 3%). Either the operating (9%) or the development rate (3%), which ever applies, will be applied to all the direct charges as set out in Exhibit I, Section II of the Duck Island Unit Operating Agreement."*

BPX's Response: Per the two Alaska Administrative Codes cited above, it is within the commissioner's discretion to utilize the overhead rate within a unit operating agreement. The overhead rate applicable to both development costs and direct operating costs for the Net Profit Share Lease, ADL 312828 was determined to be that overhead fee specified in the Duck Island Unit Operating Agreement, per November 29, 1988 letter from J. E. Eason, the Director of the Division of Oil and Gas, Department of Natural Resources to the Standard Alaska Production Company.

- "8. *The plan of development, if approved, shall be approved through a date no later than December 31, 1995. The plan of development shall not be approved for the life of the Sag Delta North Participating Area, as requested.*

*Furthermore, the SDN Plan of Development must be consistent with items #9 and #10 below, i.e. gas disposition for area operations must be proportionate between the two participating areas within the unit."*

BPX's Response: BPX concurs on the first point and will plan to submit another, updated Plan of Development for the Sag Delta North Participating Area December 31, 1995, if field life extends beyond that date. Please refer to items #9 and #10 for a discussion on the gas disposition methodology.

- "9. *Special Provisions paragraph 37.10 and Exhibits 34-A and 34-B will not be approved as submitted. This paragraph and the exhibits purport to allow Sag Delta North working interest owners to use gas from the Sag Delta North participating area to meet their obligation to supply fuel gas for Endicott area operations, without restrictions. As with flared gas, fuel gas must be proportionate. See formula for flared gas in paragraph 37.10."*

BPX's Response: Foremost, BPX would like to clarify that the facility sharing agreement does not require SDN to supply fuel gas to the Endicott Facilities. The facility sharing agreement allows Endicott Owners whom are also Sag Delta North Owners, at their option, to take their Sag Delta North gas in kind and use it to meet their obligation to supply fuel gas for Endicott Area Operations.

The Sag Delta North Special Provisions and the amendments to the DIUA, are consistent with the rights and obligations of the unit operator as described in Paragraph 8 of the DIUA "Rights and Obligations of the Unit Operator:

" Except as otherwise specifically provided herein, the exclusive right, privilege, and duty of exercising any and all rights of the parties hereto which are necessary or convenient for prospecting for, producing, storing, allocating, and distributing the unitized substances are hereby delegated to and shall be exercised by the Unit Operator as herein provided."

As a result of the May 14, 1991 meeting, BPX was informed that DNR was concerned with the royalty reporting of any Sag Delta North gas which was transferred to the Endicott Production Facilities and utilized for fuel, in excess of its "proportionate share". BPX requested further clarification of the definition of "proportionate share". Specifically, what is the basis for proportionality (i.e. oil, gas or water allocation)? Would the "proportionate share" be computed on a monthly or annual basis? BPX also recommended that M.D. Kotowski discuss this issue with D. Platt of the Department of Revenue to ensure that the restrictions and guidelines imposed are consistent between the two State agencies.

- "10. *Gas volume accounting form. To properly account for the gas disposition between the Endicott and the proposed Sag Delta North Participating Areas (Special Provisions 37.9, 37.10 & 37.11), the division proposes the revised Gas Debit Report format for Endicott and Sag Delta North. The revised format removes Power Generation Sales EPC 12.8% from the Fuel Gas for Area Operations category and places it in a separate category subject to EPA and SDN allocation.*"

BPX's Response: BPX concurs that a line should be added for "Power Gen Sales" under both the "SDN Share of Fuel Gas Used", and the "EPA Share of Fuel Gas Used" as the proposed 3rd Amendment to the DIUA requires that SDN transferred gas be used for sales first if a working interest owner selling gas to EPC owns an interest in SDN.

BPX also recommends that EPC's share of the fuel gas required for power generation or "EPC's Share of Power Gen (12.8%)" be specifically listed under the category "Less Fuel Gas Used".

BPX also recommends two other lines should be added to the gas reserve debit form to account for Sag Delta North gas which is transferred from the SDN PA to the Endicott PA, entitled "Total SDN SOG Reserves Injected into EPA Reservoir" and "Total SDN SOG Sold from EPA Reservoir" (refer to the attached template).

M.D. Kotowski took it as an action item to review the proposed revisions to the Gas Reserve Debit template and to contact BPX with his approval or recommendations.

- "11. *Quality Bank Adjustments. How does BPX propose to make these adjusts for royalty reporting purposes?"*

BPX's Response: Monthly Netback Schedules will be re-filed in the following year to account for the past year's Quality Bank Adjustment.

- "12. *Attachment #4 of the March 15, 1991 Sag Delta North Participating Area Application details the distribution of stock tank oil in place. What is the distribution of the STOOIP by Tract?"*

BPX's Response: Refer to the attached table.

- "13. *Paragraph 5 of the Amendment to Agreement for Sharing Endicott Area Equipment for Sag Delta 9 Tract Operations discusses the per barrel fee for processing Sag Delta North Participating Area hydrocarbon liquids through the Endicott Area Equipment. The processing fee has a fixed capital component and an adjustable expense component. The State reserves the right to determine the appropriateness of capital and expense components for any royalty valuation or NPSL accounting purposes."*

BPX's Response: BPX acknowledges that the State retains its normal audit rights to determine the "appropriateness" of our accounting or interpretation of capital or expense components for royalty or NPSL filing.

BPX, as a Sag Delta North Owner, treats the processing fee as 100 % expense. The methodology used to compute the processing fee, to be paid to Endicott Owners by the Sag Delta North Owners, incorporated a capital and expense component. As to the SDN Owners, the processing fee has no characteristics of a capital costs, but rather is solely an expense; the Sag Delta North Owners are not actually "buying-into" or acquiring interest in the Endicott Facilities via payment of the processing fee. The capital component of the processing fee is essentially a fee for renting facilities which the Endicott Participating Area has capitalized. The expense component of the processing fee is adjusted annually to account for unexpected fluctuations in operating expenses as the Endicott Facility ages.

- "14. *Similarly with respect to Paragraph 6 of the Amendment, approval of the Sag Delta North Participating Area should not be construed as acquiescence in allowance of deduction of "Make Whole Payments" for royalty valuation or NPSL accounting purposes."*

BPX's Response: BPX's acknowledges that the State retains its normal audit rights to determine the "appropriateness" of our accounting procedures.

- "15. *11 AAC 83.303 requires a written discussion of the criteria set forth in subsections (a) and (b) of that regulation before: (1) a participating area is approved, (2) a unit agreement is amended, or (3) a plan of development is approved. BP should submit a written discussion addressing the criteria of 11 AAC 83.303 (a) and (b) on the proposed participating area, amendments to unit agreement, and plan of development."*

BPX's Response:

The findings should reflect the following:

**(A) Promote the conservation of all natural resources including all or part of an oil or gas pool, field, or like area.**

- The formation of participating areas to develop and operate a hydrocarbon bearing reservoirs is a well accepted means of hydrocarbon conservation.
- A single participating area which encompasses the Alapah and Ivishak Oil Pools will provide for a more efficient, integrated approach to development of the Sag Delta North Reservoir, through a comprehensive operating agreement and plan of development governing that production and by avoiding unnecessary duplication of development efforts on and beneath the surface.
- A single participating area, which encompasses the Alapah and Ivishak Oil Pools, promotes efficient and productive exploitation of hydrocarbons from the leased area.

**(B) Promote the prevention of economic and physical waste.**

- The proposed participating area encompasses the entire hydrocarbon bearing portion of the Sag Delta North Reservoir that can be produced economically.
- Formation of the Sag Delta North Participating Area and utilization of facility sharing opportunities provides a means through which an economically marginal hydrocarbon accumulation can be developed. A "stand-alone" Sag Delta North project would be uneconomic, due to the capital costs incurred.
- All Sag Delta North wells have been, or will be, drilled from the Endicott Main Production Island, with the exception of the discovery well Sag 9 which was drilled from Endeavor Island. Available, unused Endicott Main Production Island drilling slots were utilized to eliminate the requirement for construction of an additional drilling island which would have promoted both economic and physical waste.
- The proposed Sag Delta North Reservoir incorporates both the Ivishak Oil Pool and the Alapah Oil Pool. Hydrocarbon production from each oil pool will be commingled downhole to maximize ultimate yield and minimize the number of production wells required; thereby, minimizing both the requirement for downhole equipment in drilling and completion operations and the requirement for additional surface flowlines.
- Incorporating both the Alapah and Ivishak Oil Pools into the same participating area allows for production of the Alapah reserves, which would not be produced otherwise.

- Establishment of the Sag Delta North Participating Area, which incorporates leases of different ownership percentages, will make it economically feasible to engage in pressure maintenance and secondary recovery operations.

**(C) Provide for the protection of all parties of interest including the State.**

- The previously approved Sag 9 Tract Operation test period of 24 months has effectively proven that the Sag Delta North Reservoir is capable of producing oil and gas in paying quantities and will provide substantial revenue to the state in the form of royalty payments, NPSL revenue, and production taxation.
- The proposed Sag Delta North Participating Area includes a NPSL Tract ( ADL 312828) at 20% royalty and a 79.59% NP rate, and a non-NPSL Tract (ADL 34633) at a 12.5 % royalty rate. A severance tax rate of 12.25% for oil and 10% for gas is also imposed on both tracts.
- Downhole commingling of the Alapah Oil Pool and the Ivishak Oil Pool maximizes hydrocarbon recovery from the Alapah Oil Pool which would otherwise be uneconomic to develop. Maximizing hydrocarbon recovery is beneficial to all parties of interest.
- Formation of a participating area aims at protecting the interests of all the affected parties by eliminating the competition of divergent interests in producing a common reservoir, while retaining separate allocations for the equitable divisions of costs and benefits based on original ownership of the resource.
- The State's interest is protected by approval rights, granted in the Alaska Administrative Code, over the allocation formulas for production and costs for the Sag Delta North Reservoir, per 11 AAC 83.371 "Allocation of Production and Costs" and 11 AAC 83.385 "Modification of Unit Agreement".

**In reviewing the above criteria, the following factors were considered:**

**(1) The environmental costs and benefits of unitized exploration or development**

- Facility sharing eliminates duplication of surface activities and results in significant reductions in the amount of surface area altered by oil and gas development.
- The Sag Delta North development will not alter the existing configuration of the Endicott causeway and islands. No impacts to nearshore habitat or biological resources will occur.

- BP Exploration operates the western half of the Prudhoe Bay oil field and operates the Endicott project. BP Exploration will be the Sag Delta North Participating Area Operator and will operate this project in a manner that minimizes environmental impacts.

**(2) The geological and engineering characteristics of the potential hydrocarbon accumulation or reservoir proposed for unitization.**

- Refer to the geological, geophysical and reservoir engineering data submitted to Harold Heinz, March 15, 1991 in reference to the "Application for the Formation of the Proposed Sag Delta North Participating Area within the Duck Island Unit", Attachments 1-9.

- Refer to the geological and geophysical data submitted to Harold Heinz, April 5, 1991 in reference to the "Additional Information Requested by DNR for the Application for the Formation of the Proposed Sag Delta North Participating Area within the Duck Island Unit", Attachments 4-12.

- Refer to the "Sag Delta North Testimony for Pool Rules", presented by BPX to the AOGCC, March 12, 1991.

A summary of the geological and engineering characteristics are listed below:

- The Sag Delta North Reservoir contains hydrocarbons reservoided in both the Carboniferous Alapah Formation and the Triassic Ivishak Formation.
- The delineation of the Sag Delta North Reservoir is based on four wells, 5-03/SD-09, 2-38/SN-01, 1-17/SN-02 and 2-32/SN-03.
- The Sag Delta North Reservoir limits are defined by faults and the truncation of the reservoir is defined by unconformities. Shales deposited upon regional unconformities provide the trap for hydrocarbons.
- Pressure isolation has been observed between the Alapah and Ivishak sands; thus, two separate oil pools were designated.
- A common oil water contact of 10112' TVDSS is estimated for the Ivishak Oil Pool. Unique oil water contacts were used for each porosity zone in the Alapah Oil Pool.
- The API gravity of the Alapah Oil Pool is approximately 28-29° API, whereas, the API gravity of the Ivishak Oil Pool is approximately 25° API.



- Production from Alapah and Ivishak Oil Pools will be downhole commingled and surface commingled with the Endicott Oil Pool.
- Sag Delta North production will utilize the existing Endicott production and injection facilities.
- Sag Delta North production will be allocated on the basis of test separator measurements of oil and gas; water volumes will be determined by centrifugation of separator samples.
- Minimum well spacing is 40 acres to maximize oil recovery.
- Water injection has been initiated to enhance hydrocarbon recovery.

**(4) Prior exploration activities in the proposed unit area**

- In the immediate vicinity three exploration wells were drilled: Sag 9, OCS-Y-0191#1, and OCS-Y-0191#2. The Sag Delta North reservoir description has also benefited from the information obtained from all the Endicott Participating Area exploration and development wells drilled to date.

**(5) The applicant's plans for exploration or development of the unit area.**

Refer to Exhibits 34-A "Sag Delta North Development Objectives" and 34-B "Plan of Development for the Sag Delta North Reservoir" of the Sag Delta North Special Provisions to the Duck Island Unit Operating Agreement. The salient points are listed below:

- There are currently no further plans for exploration within Tracts 13 and 15; any wells drilled in addition to the five wells currently in place will be considered incremental development wells, necessary for optimized exploitation of hydrocarbons or required for secondary recovery processes. Additional development wells will be drilled from the Endicott Main Production Island.
- Sag Delta North unitized substances from the Alapah and Ivishak Oil Pools, will be commingled and produced through the Endicott Facilities. Hydrocarbon liquids will be processed to pipeline specifications and transported to TAPS Pump Station #1. Gas will be compressed, conditioned and processed through a natural gas recovery facility.
- The hydrocarbon liquids production rate will be maximized prior to Endicott field decline, consistent with prudent reservoir management practices, at which time, Sag Delta North production will be limited to the conditions established in the Agreement for

**Sharing Endicott Area Equipment for Sag Delta 9 Tract Operation and any amendments thereto.**

- Processed gas from the Sag Delta North Reservoir may be used to by the Sag Delta North Owners to meet their obligation to supply fuel gas for Endicott area operations and/or be injected into the Endicott and/or Sag Delta North Reservoir.

- Artificial lift may be utilized to maximize hydrocarbon liquid production from high water cut wells.

- Economic recovery of hydrocarbon liquids and gas has been studied and a waterflood has been implemented.

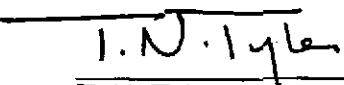
**(6) The economic costs and benefits to the state.**

- It is to the State's advantage to promote and encourage the development and production of Sag Delta North's hydrocarbon accumulation, as the State's royalty and tax revenues are enhanced.

**(7) Any other relevant factors including measures to mitigate impacts identified above, the commissioner determines necessary or advisable to protect the public interest.**

Please contact myself at 564-4525 or Susan Harvey at 564-4549 if you have any questions regarding these responses or if you require further information to process the application.

Sincerely,

  
\_\_\_\_\_  
T. N. Tyler  
Manager, Endicott Development

xc: Sag Delta North Owners  
Bill Van Dyke - DNR  
Bonnie Johannsen-DNR  
Bob Synder - DNR

## Endicott &amp; Sag Delta North Gas Disposition &amp; Reserve Debit Report

Volumes are in MCF at 14.65 PSIA - calculations subject to revision when finalized

	BPXA	EXXON	UNION	ARCO	DOCK	NANA	BOYON	ARGO	TOTAL
ENDICOTT OWNERSHIP %	54.2925	31.2306	10.5174	19.2541	5.1454	8.3874	6.1291	6.0224	100.0000
SDN OWNERSHIP %	26.3250				1.8750	1.1250	0.1750		100.0000

## Total Gas Produced

SOG Gas Production EPA  
SOG Gas Production SDN

## Less Fuel Gas Used

For Power Generation  
EPC's Share of Power Gen (12.6%)  
For other uses  
Total Gas Fuel Used

## EPA Share of Fuel Gas Used

Power Generation  
Power Gen Sales to EPC  
For other uses  
Total EPA Fuel Gas

## SDN Share of Fuel Gas Used

For Power Generation  
Power Gen Sales to EPC  
For other uses  
Total SDN Fuel Gas

## Less Flare Gas

Authorized Flare  
Excess Flare Subject to Tax  
Excess Flare sub. to Tax & Penalty  
Total Flare Gas

## EPA Share of Flare Gas

Authorized Flare  
Excess Flare Subject to Tax  
Excess Flare sub. to Tax & Penalty  
EPA Total Flare Gas

## SDN Share of Flare Gas

Authorized Flare  
Excess Flare Subject to Tax  
Excess Flare sub. to Tax & Penalty  
SDN Total Flare Gas

## Less NGLs (mcf equivalent)

EPA NGLs  
SDN NGLs

## Balance to Injection

EPA Net Injection  
YTD  
ITD

SDN Net Injection  
YTD  
ITD

## Total EPA SOG Reserve Gas Debits

February  
YTD  
ITD

## Total SDN SOG Reserve Gas Debits

February  
YTD  
ITD

## Total SDN SOG Reserves Transferred into EPA Reserves

February  
YTD  
ITD

## Total SDN SOG Debt from EPA Reserves

February  
YTD  
ITD

Sag Delta North  
Distribution of Stock Tank Original Oil in Place by Lease (BBLs)

<u>Reservoir Zone</u>	<u>Tract 15</u>	<u>Tract 13</u>	<u>Total</u>
Upper Sand	4,387,214	311,920	4,699,134
Lower Sand B	6,017,459	517,549	6,535,008
Lower Sand A	2,710,249	102,636	2,812,885
Alapah	<u>3,451,776</u>	<u>271,116</u>	<u>3,722,892</u>
Total	16,566,698	1,203,221	17,769,919