

**Stingray Pipeline Company, L.L.C.**  
**Comparative Balance Sheet**

Line No.	Description	FERC Account	February 28, 2007	February 29, 2008
<b>Utility Plant</b>				
1	Utility Plant	101, 106	\$ 311,249,725	\$ 340,885,524
2	Construction Work in Progress	107	30,082,068	1,460,223
3	Total Utility Plant		<u>\$ 341,331,793</u>	<u>\$ 342,345,747</u>
4	(Less) Accum. Provision for Depr. Amort. Depl.	108, 111	271,769,121	275,041,874
5	Net Utility Plant		<u>\$ 69,562,672</u>	<u>\$ 67,303,873</u>
<b>Current and Accrued Assets</b>				
6	Current Account Receivable - Trade		\$ 4,592,213	\$ 1,940,276
7	Other Accounts Receivable	143	522,003	841,074
8	Accounts Receivable from Associated Companies	146	9,812	69,648
9	Plant Materials and Operating Supplies	154	139,605	139,605
10	Prepayments	165	37,486	39,555
11	Miscellaneous Current and Accrued Assets	174	1,260,005	524,793
12	Total Current and Accrued Assets		<u>\$ 6,561,124</u>	<u>\$ 3,554,951</u>
<b>Deferred Debits</b>				
13	Other Regulatory Assets	182.3	\$ 132,386	\$ 173,598
14	Accumulated Deferred Income Taxes	190	\$ 4,918,974	\$ 4,989,857
15	Total Deferred Debits		<u>\$ 5,051,360</u>	<u>\$ 5,163,455</u>
16	Total Assets and Other Debits		<u><u>\$ 81,175,156</u></u>	<u><u>\$ 76,022,279</u></u>
<b>Proprietary Capital</b>				
17	Other Paid-In Capital	208 - 211	\$ 78,212,386	\$ 78,212,386
18	Retained Earnings	215, 215.1, 216	(30,598,146)	(36,721,356)
19	Total Proprietary Capital		<u>\$ 47,614,240</u>	<u>\$ 41,491,030</u>
<b>Other Noncurrent Liabilities</b>				
20	Obligations Under Capital Leases - Noncurrent	227	\$ 5,287,868	\$ 5,054,639
21	Asset Retirement Obligations	230	4,943,278	4,311,182
22	Total Other Noncurrent Liabilities		<u>\$ 10,231,146</u>	<u>\$ 9,365,821</u>
<b>Current and Accrued Liabilities</b>				
23	Accounts Payable to Associated Companies	234	\$ 9,820	\$ 379,339
24	Customer Deposits	235	84,032	-
25	Miscellaneous Current and Accrued Liabilities	242	1,496,980	1,100,472
26	Obligations Under Capital Leases - Current	243	629,279	676,785
27	Total Current and Accrued Liabilities		<u>\$ 2,220,111</u>	<u>\$ 2,156,596</u>
<b>Deferred Credits</b>				
28	Other Regulatory Liabilities	254	\$ 9,411,059	\$ 9,830,960
29	Accumulated Deferred Taxes - Other Property	282	11,685,067	13,322,025
30	Accumulated Deferred Taxes - Other	283	13,533	(144,153)
31	Total Deferred Credits		<u>\$ 21,109,659</u>	<u>\$ 23,008,832</u>
32	Total Liabilities and Other Credits		<u><u>\$ 81,175,156</u></u>	<u><u>\$ 76,022,279</u></u>

**STINGRAY PIPELINE COMPANY L.L.C.**  
**Notes to the Financial Statements**

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**1) ORGANIZATION AND BUSINESS**

Stingray Pipeline Company, L.L.C. (the Company or Stingray) operates a regulated natural gas pipeline system (the Stingray System) engaged in the transmission of natural gas in the Louisiana and Texas offshore Gulf of Mexico areas. The Stingray System consists of (i) 361 miles of 6 to 36-inch diameter pipeline that transports natural gas from the High Island Offshore System, or HIOS, West Cameron, East Cameron, Garden Banks and Vermilion lease areas in the Gulf of Mexico to onshore transmission systems in Louisiana, (ii) 43 miles of 16 to 20-inch diameter pipeline connecting platforms and leases in the Garden Banks Block 191 and 72 areas to the Stingray System, and (iii) 13 miles of 16-inch diameter pipeline connecting the El Paso Energy Partners L.P. platform at East Cameron Block 373 to the Stingray System at East Cameron Block 338.

Stingray is a wholly owned subsidiary of Starfish Pipeline Company, LLC (Starfish). Starfish was formed on December 8, 2000 under the provisions of the Delaware Limited Liability Company Act. Starfish is owned 50% each by MarkWest Energy Partners, L.P. (MarkWest) and Enbridge Offshore Pipelines (Gas Transmission) L.L.C. ("Enbridge"), an affiliate of Enbridge (U.S.) Inc.

**2) SIGNIFICANT ACCOUNTING POLICIES**

**Financial Statement Presentation**

The Company's financial statements and supporting schedules were prepared in accordance with the Uniform System of Accounts as prescribed by the Federal Energy Regulatory Commission (FERC). The Uniform System of Accounts is a comprehensive basis of accounting other than generally accepted accounting principles (GAAP).

**Use of Estimates and Significant Risks**

The preparation of financial statements in conformity with FERC regulations requires management to make estimates and assumptions that affect the reported amounts of certain assets and liabilities, the disclosure of contingent assets and liabilities at the date of the financial statements and the related reported amounts of revenue and expenses during the reporting period. Such estimates and assumptions include those made in areas of FERC regulations, fair value of financial instruments, future cash flows associated

## **STINGRAY PIPELINE COMPANY L.L.C.**

### **Notes to the Financial Statements**

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with assets, useful lives for depreciation and potential environmental liabilities. Actual results could differ from those estimates. Management believes that the estimates are reasonable.

Development and production of natural gas in the service area of the pipeline are subject to, among other factors, prices for natural gas and federal and state energy policy, none of which are within Stingray's control.

#### **Cash and Cash Equivalents**

All highly liquid investments with maturity of three months or less when purchased are considered to be cash equivalents. Stingray has a cash management agreement with Starfish where Starfish handles all routine cash management functions on behalf of Stingray.

#### **Allowance for Doubtful Accounts**

Allowances have been established for losses on accounts, which may become uncollectible. Collectability is reviewed regularly and the allowance is adjusted as necessary, primarily under the specific identification method.

#### **Pipelines, Plant and Equipment**

Pipelines, plant and equipment consist of natural gas pipeline assets that are recorded at cost when originally devoted to service. Pipelines, plant and equipment include an Allowance for Funds Used During Construction (AFUDC). The rates used in the calculation of AFUDC are determined in accordance with guidelines established by FERC. Effective 2003, with the Rate Case settlement, the pipeline and related facilities are depreciated on the straight-line method over 100 years.

Leased property and equipment are capitalized, as appropriate, and the present value of the related lease payments is recorded as a liability. Amortization of capitalized lease assets is computed on a straight-line method over the term of the lease and recorded as a component of depreciation expense. Improvements to leased properties are amortized over their useful lives or the lease period, whichever is shorter.

Stingray records depreciation using the group method of depreciation which is commonly used by pipelines, utilities and similar entities. Under the group method, upon the disposition of property, plant and equipment, the cost less net proceeds is typically charged to accumulated depreciation and no gain or loss on disposal is recognized. However, when a separately identifiable

## STINGRAY PIPELINE COMPANY L.L.C. Notes to the Financial Statements

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group of assets, such as a stand-alone pipeline system is sold or disposed of, Stingray will recognize a gain or loss in the Statements of Income for the difference between the cash received and the net book value of the assets sold.

### **Impairment of Long-Lived Assets**

Stingray evaluates its assets for impairment when events or circumstances indicate that the carrying values may not be recovered. These events include market declines that are believed to be other than temporary, changes in the manner in which Stingray intends to use a long-lived asset and adverse changes in the legal or business environment, such as adverse actions by regulators. When an event occurs, Stingray evaluates the recoverability of its carrying value based on its long-lived assets' ability to generate future cash flows on an undiscounted basis. If impairment is indicated Stingray will adjust the carrying value of assets downward.

### **Asset Retirement Obligations**

Effective January 1, 2003, Stingray adopted Order No. 631, "Accounting, Financial Reporting, and Rate Filing Requirements For Asset Retirement Obligations". Order No. 631 requires the recording of liabilities equal to the fair value of asset retirement obligations and corresponding additional asset costs. The obligations included are those for which there is a legal obligation as a result of existing or enacted law, statute or contract. Over time, the liability would be accreted to its present value, and the capitalized cost would be depreciated over the useful life of the related asset. Upon settlement of the liability, an entity would either settle the obligation for its recorded amount or recognize a gain or loss. Stingray's assets fall under the jurisdiction of the Department of Transportation and the Minerals Management Service (MMS). The MMS requires the ultimate abandonment of offshore facilities when they are no longer in use or when suspension for future utilization cannot be justified.

Costs related to the retirement of the Stingray System are provided for in the rates charged to shippers, as allowed by the FERC. The amounts charged to shippers for the costs related to the retirement of the Stingray System differ from the period costs recognized in accordance with Order No. 631, and therefore, result in a difference in the timing of recognition of period costs for financial reporting and rate-making purposes. Stingray recognizes a regulatory asset or liability for differences in the timing of recognition of the

## **STINGRAY PIPELINE COMPANY L.L.C. Notes to the Financial Statements**

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period costs associated with asset retirement obligations for financial reporting and rate-making purposes.

### **Income Taxes**

The Company is treated as a tax partnership under the provisions of the Internal Revenue Code. Accordingly, the Company is not subject to federal taxation. Instead, the tax obligation incurred through operations of the Company is reported on the tax returns of the member. However, for accounting and rate purposes, the Company is treated as if it were a corporation that would require comprehensive tax allocation procedures.

Comprehensive tax allocation procedures require recording a full provision for all income tax effects of temporary differences between the recorded amounts on the books of the Company and amounts reported for income tax purposes on the tax returns of each corporate tax-paying member.

### **Revenue Recognition**

Revenue from pipeline transportation of hydrocarbons is recognized upon receipt of the hydrocarbons into the pipeline system.

In the course of providing transportation services to customers, Stingray may receive different quantities of gas from shippers than the quantities delivered on behalf of those shippers. These transactions result in imbalances (gains and losses), which are settled in-kind through a fuel gas and unaccounted-for gas tracking mechanism, negotiated cash-outs between parties, or are subject to a cash-out procedure included in Stingray's tariff. The gas imbalance asset (miscellaneous current and accrued assets, Account 174) represents the cumulative amount of fuel gas and unaccounted-for gas as well as other imbalance gains and losses to be recovered from shippers in future periods under mechanisms provided for by the tariff. Gas imbalances in-kind payables (miscellaneous current and accrued liabilities, Account 242) represent natural gas volumes owed to Stingray's customers, and are valued at an average monthly index price, which was \$7.7150 per dth for the month of February 2008.

**STINGRAY PIPELINE COMPANY L.L.C.**  
**Notes to the Financial Statements**

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**Environmental Costs**

Stingray records environmental liabilities at their undiscounted amounts when environmental assessments indicate that remediation efforts are probable and the costs can be reasonably estimated. Estimates of our liabilities are based on currently available facts, existing technology and presently enacted laws and regulations, and include estimates of associated legal costs. As of February 29, 2008, Stingray had no liabilities recognized for environmental costs.

**Fair Value of Financial Instruments**

The reported amounts of financial instruments such as cash and cash equivalents, receivables, and current liabilities approximate fair value because of their short maturities.

**3) RELATED PARTY TRANSACTIONS**

**Operating and Administrative Expense**

Stingray has no employees, operating, maintenance and general and administrative services are provided to Stingray under service agreements with an Enbridge affiliate. Substantially all operating and administrative expenses were incurred through services provided under this agreement. At February 29, 2008, Stingray had affiliate receivables of \$69,648 relating to these agreements. At February 29, 2008, Stingray had affiliate payables of \$379,338 relating to these agreements.

**4) ACCRUED OTHER RECEIVABLES**

Stingray operates an on-shore separation facility and charges the owners a fee for normal operations and any direct cost relating to repairs and maintenance of the facility. Included in accrued other receivables are \$151,732 related to these activities in February 2008.

**STINGRAY PIPELINE COMPANY L.L.C.**  
**Notes to the Financial Statements**

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**5) CAPITAL LEASES**

Stingray leases a 36-inch pipeline from Natural Gas Pipeline Company of America (NGPL) that connects Stingray's pipeline system to onshore Louisiana. In June 1999, the lease agreement with NGPL was extended for an additional 14 years beginning December 1, 1999 through November 30, 2013, with an option to purchase the asset at the expiration of the lease. Accordingly, Stingray accounts for this lease as a capital lease. The present value of the lease payments under the capital lease is recorded as other current and non-current liabilities in the accompanying balance sheet.

Future minimum lease payments under capital leases are as follows:

	(in thousands)
2008	1,073
2009	1,073
2010	1,073
2011	1,073
2012	1,073
Thereafter	2,056
Total minimum lease payments	<hr/> 7,421
Less amount representing interest	(1,690)
Present value of minimum lease payments, including current maturities of \$677	<hr/> \$5,731

**STINGRAY PIPELINE COMPANY L.L.C.**  
**Notes to the Financial Statements**

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**6) REGULATORY MATTERS**

**Regulatory Environment**

The FERC has jurisdiction over Stingray with respect to transportation of gas, rates and charges, construction of new facilities, extension or abandonment of service facilities, accounts and records, depreciation and amortization policies and certain other matters.

An annual charge (ACA) totaling \$297,597 and \$226,948 was paid to the FERC for fiscal year 2007 and 2006, respectively. This charge, to be recovered from customers through rates, was recorded as a regulatory asset and will be amortized over twelve months. At February 29, 2008, the balance of this account was \$173,598 (account 182.3). Through February 29, 2008, \$49,599 was recorded as amortization expenses.

**7) COMMITMENTS AND CONTINGENCIES**

In the ordinary course of business, Stingray and its subsidiaries are subject to various laws and regulations including regulations of the FERC. In the opinion of management, compliance with existing laws and regulations will not materially affect the financial position, the results of operations or cash flows of Stingray.

Various legal actions, which have arisen in the ordinary course of business, are pending with respect to the assets of Stingray. Management believes that the ultimate disposition of these actions, either individually or in aggregate, will not have a material adverse effect on the financial position, the results of operations or cash flows of Stingray.

**STINGRAY PIPELINE COMPANY, L.L.C.**

Description of Company Operations

STATEMENT O	Description of Service Area and Operations
Part (1)	Detailed System Map
Part (2)	List of Major Expansions and Retirements
Part (3)	Description of System Design and Operating Methods

## **STINGRAY PIPELINE COMPANY, L.L.C.**

### **Description of Company Operations**

Stingray Pipeline Company, L.L.C. (“Stingray”) is a natural gas company that owns and operates dual-phase pipeline facilities engaged in the transmission of a blended stream of un-dehydrated natural gas and injected condensate liquids from areas offshore of Louisiana and Texas in the Gulf of Mexico to points onshore in Louisiana. The Stingray system is effectively a large supply aggregation system that collects offshore production from producers’ platforms and delivers that production to onshore gas treatment and gas processing plants for processing. Following receipt of the gas from these plants, Stingray can deliver the processed gas to ANR Pipeline Company, Bridgeline Pipeline, L.P., Natural Gas Pipeline Company of America, Sea Robin Pipeline Company, LLC, and Tennessee Gas Pipeline Company.

The Stingray system consists of (i) 361 miles of 6 to 36-inch diameter pipeline that transports natural gas from the High Island Offshore System, or HIOS, and West Cameron, East Cameron, Garden Banks and Vermilion lease areas in the Gulf of Mexico to onshore transmission systems in Louisiana, (ii) 43 miles of 16 to 20-inch diameter pipeline connecting platforms and leases in Garden Banks Blocks 191 and 72 areas to other Stingray lines, and (iii) 13 miles of 16-inch diameter pipeline connecting the El Paso Energy Partners L.P. platform at East Cameron Block 373 to the 16-inch line at East Cameron Block 338. There are other production platforms that connect to the Stingray system via pipelines that are owned by entities other than Stingray.

**STINGRAY PIPELINE COMPANY, L.L.C.**

**Detailed System Map**

Not applicable since no significant changes have occurred since the filing of  
Stingray's last FERC Form No. 2.

**STINGRAY PIPELINE COMPANY, L.L.C.**

**List of Major Expansions and Retirements  
Since Last General Rate Case**

**Expansion Filings**

**CP99-497**

Stingray filed an Annual Report for activities performed during the calendar year 1998 pursuant to Section 157.207 (under authority issued in Docket No. CP91-1505). Stingray reported the construction of one 6-inch receipt meter located at Vermilion Block 214 "A" which was placed in service December 11, 1998 at a cost of \$55,934.

**CP00-202**

Stingray filed an Annual Report and a Supplemental Report for calendar year 1999 activities pursuant to Section 157.207 (under authority issued in Docket No. CP91-1505). Stingray reported therein: 1) acquisition of a dual 4-inch meter from Natural Gas Pipeline of America located in East Cameron Block 286 effective January 14, 1999 at a cost of \$10.00; and, 2) acquisition of a dual 6-inch meter from Natural Gas Pipeline of America located in Vermilion Block 214 "A" effective March 8, 1999 at a cost of \$10.00.

**CP03-259**

Stingray's Annual Report of activities completed during 2002 pursuant to Section 157.207 (under authority issued in Docket No. CP91-1505) included construction of a 36 inch x 8 inch hot tap and auxiliary/appurtenant facilities at West Cameron Block 459 to receive Spinnaker production. The project was placed in service January 20, 2002 at a cost of \$861,282, which was partially offset by Contribution in Aid of Construction (CIAC) of \$320,000.

**CP04-162**

Stingray filed an Annual Report for activities performed during the calendar year 2003 pursuant to Section 157.207 (under authority issued in Docket No. CP91-1505). Stingray reported the construction of an interconnect (delivery point) to Sea Robin Pipeline Company located at the East Cameron Block 338 "A" platform. The 10-inch ultrasonic meter, with auxiliary equipment, was placed in service on January 14, 2003 and cost \$2,461,381.

CP05-384

Stingray filed an Annual Report for calendar year 2004 activities and included previously omitted projects completed in calendar year 2003 pursuant to Section 157.207 (under authority issued in Docket No. CP91-1505). Stingray reported therein the addition of subsea tie-ins to existing taps on its system plus the installation of electronic flow measurement (EFM) and communications equipment on the producers' meters located on production platforms for: 1) Gryphon Exploration Company in West Cameron Block 543 for production from West Cameron Block 567 with in-service date of October 18, 2004 and cost of \$36,699 offset by \$30,000 CIAC; 2) Newfield Exploration Company at West Cameron Block 44 for production from West Cameron Block 22 with in-service date of August 9, 2004 and cost of \$44,720 offset by \$20,000 CIAC; 3) Petsec Energy Inc. in Vermilion Block 258G with in-service date of July 19, 2004 and cost of \$35,168 offset by \$30,000 CIAC; 4) Newfield in West Cameron Block 95 with in-service date of December 29, 2003 reimbursed by \$20,000 CIAC; 5) Forest Oil Corporation in West Cameron Block 630 with in-service date of December 30, 2003 reimbursed by \$20,000 CIAC; 6) Union Oil Company of California at West Cameron Block 44 with in-service date of June 18, 2003 and cost of \$40,629 offset by \$20,000 CIAC; and 7) ATP Oil & Gas Corporation at Garden Banks Block 191 for platform located in Garden Banks Block 142 with in-service date of December 18, 2003 reimbursed by \$20,000 CIAC; plus a receipt point established for Kerr-McGee by modifying existing facilities at Garden Banks Block 191 effective December 11, 2003 at a cost of \$1,034,162.

CP06-173

Stingray filed an Annual Report for calendar year 2005 activities pursuant to Section 157.207 (under authority issued in Docket No. CP91-1505) and reported creation of a receipt point for Newfield at an existing tap in West Cameron Block 95 by installing EFM and communications equipment on Newfield's platform with in-service date of June 25, 2005 reimbursed by \$25,000 CIAC.

CP07-304

Stingray's Annual Report of activities completed during 2006 pursuant to Section 157.207 (under authority issued in Docket No. CP91-1505) included the following subsea tie-ins to existing taps plus EFM and communication equipment installed on production platforms: 1) receipt point for SPN Resources, LLC in East Cameron Block 257 placed in service on July 23, 2006 at a cost of \$30,531 offset by \$25,000 CIAC; 2) receipt point established for Hunt Oil Company at West Cameron Block 9A with in-service date of November 5, 2006 and cost of \$57,055 to be reimbursed by customer CIAC; 3) receipt point for El Paso Production Company in West Cameron Block 62 placed in service on May 8, 2006 with the cost of \$305,008 reimbursed by customer; offset by \$25,000 CIAC; 4) receipt point for BHP Billiton Petroleum (Americas) Inc. in West Cameron Block 96 placed in service on May 8, 2006 with 100% reimbursement of the \$46,832 cost from the producer.

CP07-378

Stingray filed a Supplement to its Annual Report for calendar year 2005 activities pursuant to Section 157.207 (under authority issued in Docket No. CP91-1505) to report creation of a receipt point for Helis Oil & Gas Company, L.L.C. at an existing tap in West Cameron Block 44 by adding a subsea tie-in and installing EFM and communications equipment on the producer's platform in West Cameron Block 21 with in-service date of December 25, 2005 and cost of \$30,740 reimbursed by a \$25,000 CIAC payment.

CP08-319

Stingray filed an Annual Report for activities performed during the calendar year 2007 pursuant to Section 157.207 (under authority issued in Docket No. CP91-1505). Stingray's report included: 1) creation of a receipt point for El Paso E&P Company, L.P. at an existing tap in West Cameron Block 95 by adding a subsea tie-in and installing EFM and communications equipment on the producer's platform with in-service date of May 8, 2007 and cost of \$30,912 reimbursed by the producer; and 2) installation of receipt point facilities consisting of a 12x8-inch tap, EFM and communications equipment in West Cameron Block 132 with an in-service date of June 9, 2007 and a reimbursable cost of \$1,450,703.

**Abandonment Filings**

CP01-243

Stingray filed an Annual Report for activities performed during the calendar year 2000 pursuant to Section 157.207 (under authority issued in Docket No. CP91-1505). Stingray reported the abandonment in place of 3,400 feet of its 20-inch pipeline in Vermilion Block 247 effective March 28, 2000 due to the removal of Taylor Energy's host platform in the same block.

CP05-384

Stingray filed an Annual Report for activities performed during the calendar year 2004 pursuant to Section 157.207 (under authority issued in Docket No. CP91-1505). Stingray reported the abandonment in place of approximately 3,087 feet of its 8-inch pipeline connecting the East Cameron Block 286A platform effective September 6, 2004.

CP07-304

Stingray reported the following abandonment projects in its Annual Report for activities performed during the calendar year 2006 pursuant to Section 157.207 (under authority issued in Docket No. CP91-1505): 1) abandonment in place of approximately 946 feet of 6-inch supply lateral in West Cameron Block 146 due to platform damage from Hurricane Rita and its subsequent removal. The abandonment was completed July 24, 2006; and 2) replacement of a hurricane-damaged 12-inch, 2,775 foot supply lateral from the "A" platform in Vermilion Block 321 with a 6-inch diameter line of the same length completed September 18, 2006.

CP08-151

On April 14, 2008, Stingray filed for Section 7 authorization to abandon a portion of its offshore and onshore compression. The request included obsolete compressor units that had been temporarily deactivated pursuant to authorization received July 13, 2004 in Docket No. CP04-149. Upon approval by the Commission, the abandonment of 4 onshore units and 4 offshore units originally installed in the 1970's will reduce Stingray's system capacity from 1.12 Bcf per day to approximately 0.65 Bcf per day.

**STINGRAY PIPELINE COMPANY, L.L.C.**

**Design and Operation of the System**

The design of the Stingray system is based on transporting historical flow and/or maximum contract quantity from each location on the same day. Historically, each shipper has taken gas from its producers at the maximum deliverability. The system design transportation capacity, assuming the approval of the proposed abandonment in Docket No. CP08-151, is 650 Mmcf per day. The system capacity allows for compressor fuel based upon a consumption rate of 240 cubic feet per horsepower per day.

The Panhandle Flow Formula shown on Page 2 of this Exhibit is used in the pipeline pressure loss calculation. The flow efficiency is based on the curve on Page 3 of 4 of this Exhibit. This curve was obtained from operational experience.

Horsepower calculations are based on the horsepower per million curve on Page 4 of this Exhibit. The centrifugal horsepower per million curve was obtained from experience of operation.

Design, fabrication, construction, testing, operation, and maintenance are done in compliance with the applicable standards of the Department of Transportation Minimum Federal Safety Standards, Title 49 Code of Federal Regulations, Part 192.

(i) Assumptions, Bases, Formulae for Flow Diagram Data

(a) The Flow formula used in the capacity studies of the Stingray Pipeline Company's system is the Panhandle flow Formula.

$$Q = (443.65)(e) \left[ \frac{T_o}{P_o} \right]^{1.07881} \left[ \frac{(P_1)^2 - (P_2)^2}{G^{0.8539} T_f L} \right]^{0.5394} d^{2.6182}$$

where:  $P_1$  = Inlet Pressure (psia)  
 $P_2$  = Outlet Pressure (psia)  
 $Q$  = Volume of gas Flowing Per Day (Saturated Std. Cu. Ft.; 14.73 psia 60°F)  
 $d$  = Inside Pipe diameter (inches)  
 $L$  = Length of Pipe (miles)

and where the following substitutions have been made:

$T_o$ , Base Measurement Temperature = 520° R  
 $P_o$ , Base Measurement Pressure = 14.73 psia  
 $T_f$ , Mean Flowing Temperature = 520° R  
 $G$ , Specific Gravity of Gas (Air = 1.00) = .0578  
 $e$ , Flow Efficiency and Super Compressibility Correction

The equation then simplifies to:

$$Q = (892.66)e \left[ \frac{(P_1)^2 - (P_2)^2}{L} \right]^{0.5394} d^{2.6182}$$

or

$$\frac{(P_1)^2 - (P_2)^2}{L} \left[ \frac{Q}{(892.66)e \times d^{2.6182}} \right]^{0.8539}$$



