

Filed on:

3:19 pm, May 27, 2022

Gas Services Department  
Railroad Commission of Texas

Texas No. 100.16.0  
(Cancels Texas No. 100.15.0)

**NuStar Logistics, L.P.**  
Containing the Rates, Rules, and Regulations  
Governing the Transportation by Pipeline of  
**CRUDE PETROLEUM**  
East Leg – South Texas  
Crude

From	To	Rate in Dollars per Barrel of 42 United States Gallons	
Oakville Junction, Live Oak County, Texas	Corpus Christi North Beach, Nueces County, Texas	[I] \$1.2600	
Pawnee Station, Live Oak County, Texas	Corpus Christi North Beach, Nueces County, Texas	Base Rate	
		[I] \$1.6485	
		Incentive Rates	
		[I] \$1.6011 <sup>1 2</sup>	[I] \$0.9981 <sup>3</sup>
Koch Pipeline Pettus Station, Bee County, Texas	Corpus Christi North Beach, Nueces County, Texas	[I] \$1.5851	
Pawnee Station, Live Oak County, Texas	Koch Pipeline Pettus Station, Bee County, Texas <sup>4</sup>	[I] \$0.5072	

Note:

<sup>1</sup> The Incentive Rate is applicable to an Incentive Shipper contracting for transportation of a minimum guaranteed volume of 25,000 barrels per day for a multi-year term.

<sup>2</sup> The Incentive Rate is applicable to an Incentive Shipper contracting under a multi-year minimum combined commitment of at least 25,000 Barrels per day for transportation under the following tariffs: This East Leg – South Texas Crude and the West Leg -South Texas Crude. Product receipts are limited to Segregated Batches of Common Stream of Light Crude Oil as defined in Special Rule 22.

<sup>3</sup> The Incentive Rate is applicable to an Incentive Shipper contracting under a multi-year minimum combined commitment of at least 50,000 Barrels per day for transportation under the following tariffs: This East Leg – South Texas Crude and the West Leg -South Texas Crude. Product receipts are limited to Segregated Batches of Common Stream of Light Crude Oil as defined in Special Rule 22.

<sup>4</sup> Carrier may offer this temporary, as-available bi-directional service in a given month, and such service shall only be provided in accordance with Rule 24 of these Rules and Regulations.

Oakville Junction, Live Oak County, Texas	Citgo Corpus Christi Refinery, Nueces County, Texas	[I] \$1.4615	
Pawnee Station, Live Oak County, Texas	Citgo Corpus Christi Refinery, Nueces County, Texas	Incentive Rate	Base Rate
		[I] \$1.7313	[I] \$1.8563
Oakville Junction, Live Oak County, Texas	Valero Corpus Christi Refinery, Nueces County, Texas	[I] \$1.4615	
Pawnee Station, Live Oak County, Texas	Valero Corpus Christi Refinery, Nueces County, Texas	Incentive Rate	Base Rate
		[I] \$1.7313	[I] \$1.8563

NuStar Logistics, L.P. P-5 Permit # 616747; P-4 Permit #: 08621, 04851 and 09196

The provisions published herein will, if effective, not result in an effect on the quality of the human environment.

ISSUED: May 27, 2022	EFFECTIVE: July 1, 2022
Issued By: Danny Oliver Executive Vice President NuStar Logistics, L.P. 19003 IH-10 West San Antonio, TX 78257	Compiled by: Adam Cummins NuStar Logistics, L.P. 19003 IH-10 West San Antonio, TX 78257 210-918-4577

SYMBOLS: [U] Unchanged rate [C] Cancel [W] Change in wording only [N] New [I] Increase [D] Decrease

## Section I

### Rules and Regulations

**The following nineteen (1-19) rules are reprinted here pursuant to the requirements of the Texas Railroad Commission Title 16 Part 1 Chapter 3 Rule § 3.71**

Carrier (herein generally referred to as "the pipeline", in this tariff) will accept Crude Petroleum (referred to variously in this tariff as "crude oil", "crude", "oil", and "marketable oil", and defined in Rule 1 below) for intrastate transportation by pipeline from the point of origin to the point of destination named in this tariff, subject to the following rules and regulations:

#### Rule 1 All Marketable Oil To Be Received For Transportation

By the term "marketable oil" is meant any crude petroleum adopted for refining or fuel purposes, properly settled and containing not more than two percent of basic sediment, water, or other impurities above a point six inches below the pipeline connection with the tank. Pipelines shall receive for transportation all such "marketable oil" tendered; but the pipeline shall not be required to receive for shipment from any one person an amount exceeding 3,000 barrels of petroleum in any one day; and, if the oil tendered for transportation differs materially in character from that usually produced in the field and being transported therefrom by the pipeline, then it shall be transported under such terms as the shipper and the owner of the pipeline may agree or the Railroad Commission of Texas ("Commission") may require.

#### Rule 2 Basic Sediment, How Determined - Temperature

In determining the amount of sediment, water, or other impurities, the pipeline is authorized to make a test of the oil offered for transportation from an average sample from each such tank, by the use of centrifugal machine, or by the use of any other appliance agreed upon by the pipeline and the shipper. The same method of ascertaining the amount of the sediment, water or other impurities shall to used in the delivery as in the receipt of oil. The pipeline shall not be required to receive for transportation, nor shall consignee be required to accept as a delivery, any oil of a higher temperature than 90 degrees Fahrenheit, except that during the summer oil shall be received at any atmospheric temperature, and may be delivered at like temperature. Consignee shall have the same right to test the oil upon delivery at destination that the pipeline has to test before receiving from the shipper.

#### Rule 3 "Barrel" Defined

For the purpose of these rules, a "barrel" of crude petroleum is declared to be 42 gallons of 231 cubic inches per gallon at sixty degrees Fahrenheit (60°F).

#### Rule 4 Oil Involved in Litigation, Etc. – Indemnity Against Loss

When any oil offered for transportation is involved in litigation, or the ownership is in dispute, or when the oil appears to be encumbered by lien or charge of any kind, the pipeline may require of shippers an indemnity bond to protect it against all loss.

#### Rule 5 Storage

The pipeline shall provide, without additional charge, sufficient storage, such as is incident and necessary to the transportation of oil, including storage at destination or so near thereto as to be available for prompt delivery to destination point, for five days from the date of order of delivery at destination.

**Rule 6 Identity of Oil, Maintenance of Oil**

The pipeline may deliver to consignee, either the identical oil received for transportation, subject to such consequences of mixing with other oil as are incident to the usual pipeline transportation, or it may make delivery from its common stock at destination; provided, if this last be done, the delivery shall be of substantially like kind and market value.

**Rule 7 Minimum Quantity To Be Received**

The pipeline shall not be required to receive less than one tank carload of oil when oil is offered for loading into tank cars at destination of the pipeline. When oil is offered for transportation for other than tank car delivery, a pipeline shall not be required to receive less than 500 barrels.

**Rule 8 Gathering Charges**

Tariffs to be filed by a pipeline shall specify separately the charges for gathering of the oil, for transportation, and for delivery.

**Rule 9 Gauging, Testing and Deductions**

(Reference Commission Special Order No. 20-63, 098, Effective June 18, 1973).

- (A) All crude oil tendered to the pipeline shall be gauged and tested by a representative of the pipeline prior to its receipt by the pipeline. The shipper may be present or represented at the gauging and testing. Quantities shall be computed from correctly compiled tank tables showing 100% of the full capacity of the tanks.
- (B) Adjustments shall be made for temperature from the nearest whole number degree to the basis of 60°F and to the nearest 5/10 API degree gravity in accordance with the volume correction Tables 5A and 6A contained in API Standard 2540, American Society for Testing Materials 01250, Institute of Petroleum 200, first edition, August 1980. The pipeline may deduct the basic sediment, water, and other impurities as shown by the centrifugal or other test agreed upon; and 1% for evaporation and loss during transportation. The net balance shall be the quantity deliverable by the pipeline. In allowing the deductions, it is not the intention of the commission to affect any tax or royalty obligations imposed by the laws of Texas on any producer or shipper of crude oil.

**Rule 10 Delivery and Demurrage**

The pipeline shall transport oil with reasonable diligence, considering the quality of the oil, the distance of transportation and other material elements, but at any time after receipt of a consignment of oil, upon 24 hours' notice to the consignee, may offer oil for delivery from its common stock at the point of destination, conformable to Rule 6 of this tariff, at a rate not exceeding 10,000 barrels per day of 24 hours. Computation of time of storage (as provided for in Rule 5 of this tariff) shall begin at the expiration of such notice. At the expiration of the time allowed in Rule 5 of this tariff for storage at destination, the pipeline may assess a demurrage charge on oil offered for delivery and remaining undelivered, at a rate for the first 10 days of \$.001 per barrel and thereafter at a rate of \$.0075 per barrel, for each day of 24 hours or fractional part thereof.

**Rule 11 Unpaid Charges, Lien For And Sale To Cover**

The pipeline shall have a lien on all oil to cover charges for transportation, including demurrage, and it may withhold delivery of oil until the charges are paid. If the charges shall remain unpaid for more than 5 days after notice of readiness to deliver, the pipeline may sell the oil at public auction

at the general office of the pipeline on any day not a legal holiday. The date for the sale shall be not less than 48 hours after publication of notice in a daily newspaper of general circulation published in San Antonio, Texas, the city where the general office of the pipeline is located. The notice shall give the time and place of the sale, and the quantity of the oil to be sold. From the proceeds of the sale, the pipeline may deduct all charges lawfully accruing, including demurrage, and all expenses of the sale. The net balance shall be paid to the person lawfully entitled thereto.

#### Rule 12 Notice Of Claims

Notice of claim for loss, damage or delay in connection with the shipment of oil must be made in writing to the pipeline within 91 days after the damage, loss, or delay occurred. If the claim is for failure to make delivery, the claim must be made within 91 days after a reasonable time for delivery has elapsed.

#### Rule 13 Telephone - Telegraph Line - Shipper To Use

If the pipeline maintains a private telegraph or telephone line, a shipper may use it without extra charge, for messages incident to shipments. However, the pipeline shall not be held liable for failure to deliver any messages away from its office or for delay in transmission or for interruption of service.

#### Rule 14 Contracts Of Transportation

When a consignment of oil is accepted, the pipeline shall give the shipper a run ticket, and shall give the shipper a statement that shows the amount of oil received for transportation, the points of origin and destination, corrections made for temperature, deductions made for impurities, and the rate for such transportation.

#### Rule 15 Shipper's Tanks, Etc. - Inspection

When a shipment of oil has been offered for transportation, the pipeline shall have the right to go upon the premises where the oil is produced or stored, and have access to any and all tanks or storage receptacles for the purpose of making any examination, inspection, or test authorized by these Rules and Regulations.

#### Rule 16 Offers In Excess Of Facilities

If oil is offered to the pipeline for transportation in excess of the amount that can be immediately transported, the transportation furnished by the pipeline shall be apportioned among all shippers in proportion to the amounts offered by each; but no offer for transportation shall be considered beyond the amount which the person requesting the shipment then has ready for shipment by the pipeline. The pipeline shall be considered as a shipper of oil produced or purchased by itself and hold for shipment through its line, and its oil shall be entitled to participate in such apportionment.

#### Rule 17 Interchange of Tonnage

Pipelines shall provide the necessary connections and facilities for the exchange of tonnage at every locality reached by two or more pipelines, when the Commission finds that a necessity exists for connection, and under such regulations as said Commission may determine in each case.

#### Rule 18 Receipt and Delivery - Necessary Facilities For

The pipeline shall install and maintain facilities for the receipt and delivery of marketable crude petroleum of shippers at any point on its line if the Commission finds that a necessity exists therefor, and under regulations by the Commission.

Rule 19 Report Of Loss From Fire, Lightning and Leakage

- (A) The pipeline shall immediately notify the commission district office, electronically or by telephone, of each fire that occurs at any oil tank owned or controlled by the pipeline, or of any tank struck by lightning. The pipeline shall in like manner report each break or leak in any of its tanks or pipelines from which more than five barrels escape. The pipeline shall file the required information with the commission in accordance with the appropriate commission form within 30 days from the date of the spill or leak.
  
- (B) No risk of fires, storm, flood or act of God, and no risk resulting from riot, insurrection, rebellion, war, an act of the public enemy, or from quarantine or authority of law or any order, requisition or necessity of the government of the United States in time of war, shall be borne by the pipeline, nor shall any liability accrue to it from any damage thereby occasioned. If loss of any crude oil from such causes occurs after the oil has been received for transportation, and before it has been delivered to the consignee, the shipper shall bear a loss in such proportion as the amount of his shipment is to all of the oil held in transportation by the pipeline at the time of such loss, and the shipper shall be entitled to have delivered only such portion of his shipment as may remain after a deduction of his due proportion of such loss, but in such event the shipper shall be required to pay charges only on the quantity of oil delivered. This rule shall not apply if the loss occurs because of negligence of the pipeline.
  
- (C) Common carrier pipelines shall mail (return receipt requested) or hand deliver to landowners (persons who have legal title to the property in question) and residents (persons whose mailing address is the property in question) of land upon which a spill or leak has occurred, all spill or leak reports required by the commission for that particular spill or leak within 30 days of filing the required reports with the commission. Registration with the commission by landowners and residents for the purpose of receiving spill or leak reports shall be required every five years, with renewal registration starting January 1, 1999. If a landowner or resident is not registered with the commission, the common carrier is not required to furnish such reports to the resident or landowner.

## Section II

### Special Rules and Regulations

The Rules and Regulations set forth in Section 1 may be supplemented or amended by these Section II Special Rules. In the event of a conflict between the rules in Section I and the rules in Section II, the rules in Section II shall control.

#### Special Rule 1 Definitions

API	American Petroleum Institute.
API Gravity	Gravity determined in accordance with ASTM designation and expressed in degrees.
Assay	A laboratory analysis of Crude Petroleum to include API gravity, Reid vapor pressure, pour point, sediment and water content, sulfur content, viscosity at 60 degrees Fahrenheit, and other characteristics as may be required by Carrier.
ASTM	American Society for Testing Materials.
Base Period	Has the meaning set forth in Special Rule 15 Section 1.4.
Base Shipment Percentage	Has the meaning set forth in Special Rule 15 Section 1.5
CCNB	Corpus Christi North Beach.
Calculation Month	Has the meaning set forth in Special Rule 15 Section 1.6.
Capacity	The quantity of Crude Petroleum the Pipeline Segment at issue is capable of transporting under the current operating conditions.
Carrier	NuStar Logistics, L.P.
Common Stream	Crude Petroleum moved through the pipeline and pipeline facilities which is commingled or intermixed with crude petroleum of like quality and characteristics as may be determined by Carrier based on an analysis of a sample of such Crude Petroleum Assays and/or other pertinent analytical data.
Connecting Carrier	A pipeline company connected to Carrier.
Consignee	The party to whom a Shipper has ordered the delivery of Crude Petroleum.
Crude Petroleum	The direct liquid product of oil wells (b) a mixture of the direct product of oil wells and the indirect petroleum products resulting either from refining Crude Petroleum or the operation of gasoline recovery plants, gas recycling plants or distillate recovery equipment in gas and distillate fields, or broken out during the normal production or processing of natural gas, or (c) Processed

Condensate, and in each case meeting the specifications referenced in Special Rules 2 and 22.

Current Nomination Basis	Has the meaning set forth in Special Rule 15 Section 1.3.
Destination	A point named in the tariff at which point Carrier will deliver Crude Petroleum to Shipper or its Consignee after transportation from an Origin.
Gravity & Sulphur Bank	That certain bank managed to ensure that Shippers are not materially damaged or allowed to benefit from changes in quality and sulfur of Crude Petroleum in the Common Stream.
Incentive Shipper	A Shipper that is a party to a Throughput and Deficiency Agreement.
Origin	A point named in the tariff at which point Carrier will accept Crude Petroleum for transportation.
New Shipper	Has the meaning set forth in Special Rule 15 Section 1.1.
Nomination	A request by a Shipper to Carrier of a stated quantity and grade of Crude Petroleum for transportation from a specified Origin or Origins to a specified Destination or Destinations in accordance with these rules and regulations.
Pawnee – Pettus Segment	Has the meaning set forth in Rule 24 Section (B).
Pettus – CCNB Segment	Has the meaning set forth in Rule 24 Section (A).
Pipeline Segment	Section of Carrier's common carrier facilities, the limits of which are defined by two geographically identifiable points, that, because of the way that section of Carrier's common carrier facilities is designed and operated, must be treated as a unit for purposes of determining Capacity.
Processed Condensate	Liquid hydrocarbons that have been processed through a distillation tower or similar process or equipment.
Regular Shipper	Has the meaning set forth in Special Rule 15 Section 1.2.
Segregated Batch	A tender of Crude Petroleum in a batch having specific identifiable characteristics which is moved through the pipeline and pipeline facilities as a unit so as to maintain its quality and characteristics as may be determined based on analysis of a sample of such Crude Petroleum .
Shipper	A party who contracts with Carrier for transportation of Crude Petroleum, as defined herein and under the terms of this tariff.
Throughput and Deficiency Agreement	An effective Throughput and Deficiency Agreement executed between Carrier and an Incentive Shipper for the provision of service under this tariff.

Special Rule 2 Crude Petroleum, Acceptance of

(A) Carrier will reject Crude Petroleum containing more than one percent (1%) of basic sediment, water, and other impurities, except that:

1. If required by operating conditions, Carrier will reject Crude Petroleum containing less than one percent (1 %) of basic sediment, water and other impurities.
2. Sediment and water limitations of a Connecting Carrier shall be imposed upon Carrier when such limits are less than that of the Carrier, in which case the limitations of the Connecting Carrier will be applied.

(B) If required by operating conditions, Carrier will reject any and all of the following shipments:

1. Crude Petroleum having Reid vapor pressure in excess of 10 pounds above a temperature of 100 degrees Fahrenheit.
2. Crude Petroleum where the Shipper or Consignee has failed to comply with all applicable laws, rules and regulations made by any governmental authority regulating shipments of Crude Petroleum.
3. Crude Petroleum where sulfur content is greater than 0.50% by weight.

(C) Shipper shall be responsible for all reasonable expenses incurred by Carrier resulting from Carrier's receipt of any Crude Petroleum which does not comply with the requirements of Rule 2.

Special Rule 3 Additives

Crude Petroleum shall be free of any additives and inhibitors, including drag reducing agents, unless approved by Carrier.

Special Rule 4 Storage

Carrier will only provide working tankage for such storage that is incidental and necessary to the transportation of Crude Petroleum pursuant to the applicable tariff. Any additional storage in Carrier's tankage, i.e., storage beyond what is incidental and necessary to transportation pursuant to the applicable rate tariff, will be subject to the terms and conditions of Carrier's standard storage agreement and is a non-jurisdictional service.

Special Rule 5 Receipt Facilities Required

Carrier will refuse to accept Crude Petroleum for transportation unless satisfactory evidence is furnished that the Shipper or Consignee has provided the necessary tankage facilities at the Origin.

Special Rule 6 Destination Facilities Required

Carrier will refuse to accept Crude Petroleum for transportation unless satisfactory evidence is furnished that the Shipper or Consignee has provided the necessary facilities for the prompt receiving of Crude Petroleum at the Destination e.g. written confirmation by the operator of the terminal at the Destination. If the Shipper or Consignee is unable or refuses to receive said Crude Petroleum as it arrives at Destination, Carrier, if required by operating conditions, will make arrangement for disposition of the Crude Petroleum it deems appropriate in order to clear the Carrier's pipeline. Any additional expenses incurred by Carrier in making such arrangements shall be borne by the Shipper or Consignee.



#### Special Rule 7 Acceptance Free From Liens and Charges

Carrier will reject any Crude Petroleum which, when nominated for transportation, is involved in litigation, or the title of is in dispute, of which is encumbered by lien or charge of any kind, and Carrier shall require of the Shipper satisfactory evidence of the Shipper's perfect and unencumbered title or satisfactory indemnity bond to protect Carrier. By nominating Crude Petroleum, the Shipper warrants and guarantees that it owns or controls, has the right to deliver or have delivered for its account, such Crude Petroleum, and agrees to hold Carrier harmless for any and all loss, cost, liability, damage and/or expense resulting from failure of ownership or control thereto, provided, that acceptance for transportation shall not be deemed a representation by Carrier as to ownership or control.

#### Special Rule 8 Gauging, Measurement

No charge shall be made by Carrier for metering Crude Petroleum upon receipt or delivery. Crude Petroleum tendered to Carrier for transportation shall be measured by meter prior to its receipt from Shipper. Quantities shall be determined by dynamic or static measurement methods in accordance with appropriate American Petroleum Institute (API) standards, latest revision and adjusted to base (reference or standard) conditions. Quantities shall be metered on a one hundred percent (100%) volume basis at the observed fluid temperature. Carrier will correct this one hundred percent volume basis for temperatures from observed degrees Fahrenheit to 60 degrees Fahrenheit. (60°F.) The temperature corrected volume or Total Calculated Volume (TCV) shall be the quantity upon which transportation charges will be assessed. Measurement by the Carrier shall be conclusive and binding absent fraud or manifest error of amount tendered, regardless if Shipper or their representative is present.

Carrier will adjust any overage or shortage of Crude Petroleum with Shippers to allow for inherent losses or gains, including but not limited to shrinkage, evaporation, interface mixture, product measurements and other physical losses not due to negligence of Carrier. The adjustments for losses or gains will be allocated by grade by month, among the Shippers in the proportion that the total number of barrels of a given grade delivered out of the system, by grade, for each Shipper bears to the total number of barrels of that grade delivered out of the system for all Shippers.

#### Special Rule 9 Evidence of Receipts and Deliveries

Crude Petroleum received from Shipper and Crude Petroleum delivered to Consignee shall, in each instance, be evidenced by tickets or Carrier's statements containing data essential to the determination of quantity.

#### Special Rule 10 Operation

A. General. Carrier will operate the pipeline both as a Common Stream operation and as a Segregated Batch operation.

B. Common Stream Operation. Shippers will be required, as a condition of nominating Crude Petroleum to be transported as a Common Stream, to participate in a Gravity and Sulfur Bank set forth in this Rule 10 and Exhibits A-D (collectively, the "Rules"). The tables of gravity and sulfur differential values per barrel as attached hereto as Exhibits B and C are incorporated herein and made a part of this Rule.

The weighted average gravity differential value per barrel (for two or more gravities of Crude Petroleum), as hereinafter referred to, shall be obtained in the following manner: Multiply the gravity differential values per barrel by the number of barrels to which such gravity differential values are applicable and then divide the total of the resultant gravity differential values in dollars and cents by the total of the applicable barrels.

Applicable barrels and gravities shall be the net barrels at 60° Fahrenheit (with no deduction for loss allowance) and the gravities recorded by the operator at points where it customarily records gravities and quantities.

The weighted average sulfur differential value per barrel (for two or more sulfur contents of crude petroleum), as hereinafter referred to, shall be obtained in the following manner: Multiply the sulfur differential values per barrel by the number of barrels to which such sulfur differential values are applicable and then divide the total of the resultant sulfur differential values in dollars and cents by the total of the applicable barrels.

Applicable barrels and sulfur content shall be the net barrels at 60° Fahrenheit (with no deduction for loss allowance) and the sulfur content recorded by a competent laboratory for samples obtained by the operator at points where it customarily measures and samples receipts for custody transfer.

Sulfur content as furnished by the laboratory at the true gravity shall be adjusted to reflect its comparison to the reference crude at 35.5° gravity. The adjustment to the test sulfur content shall be made by establishing a ratio of weight per gallon for the gravity of the sample to weight per gallon for the gravity of the reference crude of 35.5° gravity. The Table of Ratio Factors for Sulfur Adjustments is attached hereto as Exhibit D and made a part of these Rules.

The ratio thus obtained will be applied against the tested sulfur content of the sample to obtain the adjusted sulfur content (gravity ratio x tested sulfur content= adjusted sulfur content). The adjusted sulfur content will then be used to obtain the sulfur differential value per barrel from the table of sulfur differential values per barrel (Exhibit C).

Adjustment between Shippers shall be computed as follows:

- I. Compute the weighted average gravity differential value per barrel of the barrels received from each Shipper. Compute the weighted average sulfur differential value per barrel of the barrels received from each Shipper.
- II. Compute the weighted average gravity differential value per barrel of the composite Common Stream receipts. III. Determine the following:
  - A. If the weighted average gravity differential value per barrel of a Shipper as so determined under Paragraph I above shall be greater than the weighted average gravity differential value per barrel of the aforementioned Common Stream Crude Petroleum as determined under Paragraph II, the difference in cents per barrel shall be calculated and Shipper shall be credited an amount calculated by multiplying said difference in gravity differential value per barrel by the applicable barrels.
  - B. If the weighted average gravity differential value per barrel of a Shipper is less than the weighted average gravity differential value per barrel of the aforementioned Common Stream Crude Petroleum, the difference shall be calculated as above outlined and Shipper debited for such difference
- IV. Compute the weighted average sulfur differential value per barrel of the composite Common Stream receipts.
  - A. If the weighted average sulfur differential value per barrel of a Shipper as so determined under Paragraph I above shall be greater than the weighted average sulfur differential value per barrel of the aforementioned

Common Stream Crude Petroleum as determined under Paragraph II, the difference in cents per barrel shall be calculated and Shipper shall be debited an amount calculated by multiplying said difference in sulfur differential value per barrel by the applicable barrels.

- B. If the weighted average sulfur differential value per barrel of a Shipper is less than the weighted average sulfur differential value per barrel of the aforementioned Common Stream Crude Petroleum, the difference shall be calculated as above outlined and Shipper shall be credited for such difference.

A sample calculation is attached as Exhibit A.

These calculations shall be made for each calendar month and the algebraic sum of the adjustments for the system shall be zero  $\pm$  one dollar. If a Shipper shall have a net debit balance in combining the two adjustments made above, the balance shall be remitted to the clearinghouse within twenty (20) days from receipt of statement of such debit. If Shipper shall have a credit, the clearinghouse shall remit the amount thereof after receipt by the clearinghouse of the sums from those Shippers having debits as calculated above.

Carrier will only be liable to Shipper for any errors to the Gravity and Sulfur Bank to the extent resulting from fraud, Carrier's gross negligence, or willful misconduct. Shipper must make any claims for such errors by written notice to Carrier within ninety (90) days of the date of the Gravity and Sulfur Bank invoice and Shipper irrevocably waives any claim for which the required notice is not provided within the required time. Any Shipper receiving a windfall from an error in Gravity and Sulfur Bank calculation agrees to refund such windfall, with the adjustment reflected on a future invoice. If the error cannot be reasonably determined, all Shippers agree to a settlement reallocation, and adjustments will be reflected on a future invoice.

C. Segregated Batch. Shippers will be required, as a condition of nominating Crude Petroleum to be transported as a Segregated Batch, to be able to receive the Segregated Batch. Carrier will operate the pipeline as a batched system maintaining the integrity of each Segregated Batch to the extent possible and in accordance with its policies.

#### Special Rule 11 Duty of Carrier

- (A) Carrier shall not be required to transport Crude Petroleum except with reasonable diligence, considering the quality of the Crude Petroleum, the distance of transportation and other material elements, and will not accept Crude Petroleum to be transported in time for any particular market.
- (B) For Segregated Batch movements, Carrier will use reasonable care to transport Crude Petroleum received to the Destination with a minimum contamination and mixing, and will attempt to maintain the identity of each shipment
- (C) For Common Stream movements, Carrier will not be required to deliver the identical Crude Petroleum received, and Carrier will not be liable for damage or loss, including but not limited to consequential, incidental, direct or indirect damages or damage or lost profits, caused by contamination, discoloration, deterioration, a change in density, or other change in quality of a Shipper's Crude Petroleum resulting from Carrier's transportation of the Crude Petroleum.
- (D). Carrier may suspend transportation services on the Pipeline Segment in order to comply with applicable Laws of any Governmental Authority, to perform maintenance, testing, inspections, or repairs, or to prevent injuries to persons, damage to property, or harm to the environment, without incurring any obligation for any liabilities.

### Special Rule 12 Claims

Notice of claims for loss or damage in connection with shipments must be made to Carrier in writing within nine (9) months and one day after same shall have accrued, or, in case of failure to make delivery, within nine (9) months and one day after a reasonable time for delivery shall have elapsed. Such claims, fully amplified, must be filed with Carrier within nine (9) months and one day thereafter, and unless so made and filed, Carrier shall be wholly released and discharged therefrom and shall not be liable therefore in any court of justice. No suit at law or in equity shall be maintained upon any claim unless instituted within two (2) years and one (1) day after the cause of action accrued. Any such loss or damage shall be determined solely on the basis of volumetric loss and not on the monetary value of the Crude Petroleum.

### Special Rule 13 Application of Rates from and to Intermediate Points

For Crude Petroleum accepted for transportation from any point on Carrier's lines not named in a particular tariff which is intermediate to a point from which rates are published there, through such unnamed point, Carrier will apply from such unnamed point the rates published therein from the next more distant point specified in such tariff. For Crude Petroleum accepted for transportation to any point not named in a particular tariff which is intermediate to a point to which rates are published in said tariffs, through such named point, the rate published therein to the next more distant point specified in the tariff will apply. Carrier will file a tariff publication applicable to the transportation movements within 30 days of the start of the service if the intermediate point is to be used on a continuous basis for more than 30 days.

### Special Rule 14 Line Fill and Tank Bottom Inventory Requirements

Carrier will require each Shipper to supply a pro rata share of Crude Petroleum necessary for pipeline and tankage fill to ensure efficient operation of the pipeline system prior to delivery. Crude Petroleum provided by Shippers for this purpose may be withdrawn only after: (1) shipments have ceased and Shippers have notified Carrier in writing, on no less than thirty (30) days notice, to discontinue shipments in Carrier's system; and (2) Shipper balances have been reconciled between Shippers and Carrier. Carrier shall require advance payment of transportation charges on the volumes to be cleared from Carrier's system, and any unpaid accounts receivable, before final delivery will be made. Carrier shall have thirty (30) days from the receipt of sold notice to complete administrative and operational requirements incidental to Shipper withdrawal.

If Shipper's inventory balance drops below its pro rata portion of the volume of Crude Petroleum necessary for the efficient operation of Carrier's pipeline system, Carrier will require Shipper to provide the necessary volume to meet its pro rata portion of such volume of Crude Petroleum.

### Special Rule 15 Proration of Pipeline Capacity

When a quantity of Crude Petroleum is nominated by Shippers to Carrier which exceeds the Capacity of any Pipeline Segment from an Origin to a Destination, Crude Petroleum nominated by each Shipper for transportation from that Origin to that Destination will be transported in such quantities and at such times to the limit of Carrier's Capacity in a manner determined by Carrier to be equitable to all Shippers. The details of Special Rule 15 are set out in the following paragraphs through 2.9:

#### 1.0 Definitions

- 1.1 "New Shipper" means a Shipper that has not delivered Crude Petroleum to any Destination on the Pipeline Segment to be prorationed within the Base Period. A

Shipper that becomes a New Shipper shall remain one for the following 12 consecutive months.

- 1.2 "Regular Shipper" means a Shipper that is not a New Shipper.
  - 1.3 "Current Nomination Basis" means that the portion of Capacity available pursuant to paragraph 2.2 contained in Special Rule 15 to New Shippers will be allocated among all New Shippers in proportion to the volumes of Crude Petroleum nominated by each New Shipper for that month in accordance with Special Rule 16.
  - 1.4 "Base Period" is the 12-calendar-month period just preceding the Calculation Month. Individual months within the Base Period are designated by Nos. 1 through 12, with "Month 1" being the most recent Base Period month and "Month 12" being the oldest Base Period month.
  - 1.5 "Base Shipment Percentage" for each Regular Shipper is the total deliveries of Crude Petroleum to all Destinations on the Pipeline Segment to be prorated by the Regular Shipper during the Base Period divided by the lessor of (a) twelve or (b) the number of Base Period month within which the Regular Shipper first delivered Crude Petroleum to a Destination on the Pipeline Segment to be prorated.
  - 1.6 "Calculation Month" is the calendar month immediately preceding the month for which Capacity is being prorated.
- 2.0 Prorating of Capacity
- 2.1 When Capacity will be prorated. Carrier will allocate Capacity among all Shippers for any month for which the Carrier reasonably determines that the aggregate volume of Crude Petroleum that all Shippers nominate to all Destinations in a Pipeline Segment exceeds Capacity. Proration will be applied separately to each Pipeline Segment where a need for prorating shall arise.
  - 2.2 Availability and Allocation of Capacity to New Shippers. Up to ten (10) percent of Capacity shall be made available to New Shippers and will be prorated among them on a Current Nomination Basis.
  - 2.3 Availability of Capacity to Regular Shippers. After the allocation of the portion of Capacity to New Shippers that is required by paragraph 2.2, the remaining portion of Capacity for that month shall be available to Regular Shippers who have nominated volumes for that month.
  - 2.4 Allocation to each Regular Shipper. Such remaining portion of Capacity shall be allocated among Regular Shippers in proportion to their Base Shipment Percentages. In the event that the volume of Crude Petroleum that would be allocated to a Shipper on the basis of its Base Shipment Percentage is greater than the volume it nominates, the difference between its volume calculated on the basis of its Base Shipment Percentage and its volume nominated will be reallocated among all other Regular Shippers in proportion to their Base Shipment Percentages. Any remaining prorated allocation of Capacity after this reallocation among all Regular Shippers in proportion to their Base Shipment Percentages shall be made available to New Shippers and will be prorated among them on a Current Nomination Basis.
  - 2.5 Basis of allocation: notification. When prorating of Capacity is in effect, Capacity shall be allocated among eligible Shippers on a monthly basis and Carrier shall use reasonable efforts to notify each Shipper entitled to an allocation

of a portion of Capacity of the amount of its allocation no later than the 25<sup>th</sup> day of the month proceeding the month for which the allocation is made.

- 2.6 Good Faith Nominations. Carrier will accept only good faith Nominations from Shippers and Carrier shall use whatever reasonable means necessary to determine whether Nominations are made in good faith. Shipper has an obligation to cooperate with Carrier inquiries regarding Good Faith Nominations. Good Faith means the non-contingent ability and willingness of Shipper to deliver to Carrier at the Origins specified in the Nomination all of the Barrels tendered during the month for which the Nomination is made.
- 2.7 Failure to use allocated portion of Capacity. If a New Shipper making a Good Faith Nomination fails to deliver, at the Origins specified by it in its Nomination, Crude Petroleum sufficient to fill the portion of Capacity allocated to it and such failure has not been caused by force majeure, Carrier will reduce such Shipper's allocation for the next proration period after the end of the month during which such failure occurred for which such Shipper nominates as a New Shipper by the allocated portion of Capacity not utilized.
- 2.8 Transfer of Base Shipment Percentage or allocated portion of Capacity; use of affiliates. Neither a Shipper's Base Shipment Percentage nor volumes allocated to it during a period when prorationing is in effect shall be assigned, conveyed, loaned, transferred to, or used in any manner by, another Shipper. However, a Shipper's Base Shipment Percentage or its allocation may be transferred as an incident of the bona fide transfer if the Shipper's business or to a successor to the Shipper's business by the operation of law, such as an executor or trustee in bankruptcy. A Shipper may not use an affiliated or cooperating entity to increase its Base Shipment Percentage or its allocated portion of Capacity. All transfers made pursuant to this section shall be irrevocable.
- 2.9 Enhancement of Allocation. In no event will an allocation to a Shipper be used in such a manner that will enhance the allocation of another Shipper beyond the allocation that such Shipper would be entitled to under this policy. Carrier may require written assurances from a responsible officer of Shipper regarding its use of its allocated portion of Capacity stating that Shipper has not violated this policy. In the event any Shipper shall, by any device, scheme or arrangement whatsoever, attempt to transfer all or any part of its allocated portion of Capacity to any other Shipper in violation of this policy, or in the event any Shipper shall attempt to receive and use such portion of Capacity, the portion of Capacity allocated to such Shipper will be reduced in the next month that is subject to prorationing after the date that the violation is discovered by a volume equal to such attempted transfer.

**Special Rule 16 Nominations; Minimum Quantity**

Crude Petroleum will be transported by Carrier only under a Nomination accepted by Carrier. Any Shipper desiring to tender Crude Petroleum for transportation shall make such Nomination to Carrier in writing on or before 4:15 PM central standard time, the last working day prior to 22nd day of the month preceding the month during which the transportation under the tender is to begin; except that, if space is available for current movement and at the sole discretion of Carrier, a Shipper may tender Crude Petroleum for transportation after 4:15 PM central standard time on the 22nd day of the month preceding the month during which the transportation under the tender is to begin. A "working day" shall be a Monday, Tuesday, Wednesday, Thursday or Friday of a calendar week, except when a Federal holiday falls on such day of the week.

Nominations for the transportation of Crude Petroleum for which Carrier has facilities will be accepted into the pipeline under the tariff in quantities of not less than the following from one Shipper to one Consignee and Destination as operations permit and provided, with respect to Nominations for Common Stream transportation, such Crude Petroleum is of similar quality and characteristics as is being transported from Origin to Destination:

	Minimum Aggregate Nomination
Common Stream	5,000 barrels per day
Segregated Batch	50,000 barrels

Before Carrier will accept a Nomination from a new Shipper, such Shipper (i) will comply with Special Rule 18(a); (ii) will demonstrate to Carrier the adequacy of such Shipper's facilities as referenced in Special\_Rule 5 and Special Rule 6; and (iii) will provide any other information reasonably requested by Carrier.

**Special Rule 17 Application of Rates**

Crude Petroleum accepted for gathering and/or transportation shall be subject to the rates in effect on the date of delivery by Carrier, irrespective of the date of the tender.

**Special Rule 18 Payment of Carrier Charges**

- (A) Prior to becoming a Shipper, a prospective Shipper must submit to Carrier financial information to establish creditworthiness. The type of information from a prospective Shipper requests include but are not limited to: most recent year end financials, 10K reports or other filings with regulatory agencies and bank references. If, in the reasonable opinion of Carrier: (i) Shipper is not creditworthy, or (ii) if an existing Shipper's credit deteriorates, Carrier shall require such Shipper to prepay all transportation and other fees and lawful charges accruing on Crude Petroleum delivered and accepted by Carrier or supply an irrevocable letter of credit from a bank acceptable to Carrier, with terms in a form acceptable to Carrier.
- (B) The Shipper shall pay all transportation and other fees and lawful charges accruing on Crude Petroleum delivered to and accepted by Carrier for shipment by the due date stated in Carrier's invoice.
- (C) If charges are not paid by the due date stated on the invoice, Carrier shall assess finance charges on the entire past due balance (including principal and accumulated but unpaid finance charges) until paid in full, at a rate equal to 125% of the prime rate of interest as reported in the Wall Street Journal as of first of the month in which the charges are due or the maximum finance rate allowed by applicable law, whichever is less.

- (D) Carrier reserves the right to withhold an amount of Crude Petroleum belonging to Shipper from delivery that would be sufficient to cover all unpaid charges due to Carrier from Shipper until all such unpaid charges have been paid. Furthermore, Carrier shall retain a perfected possessory lien under Chapter 9 of the Uniform Commercial Code, as applicable, on an amount of a Shipper's Crude Petroleum in Carrier's possession sufficient to secure payment of any and all amounts owed by such Shipper to Carrier. Carrier reserves the right to set-off any such charges against any monies owed to Shipper by Carrier or any Crude Petroleum of Shipper in Carrier's custody. If said charges remain unpaid ten (10) days after the due date therefor, Carrier shall have the right, through an agent, to sell such Crude Petroleum at public auction, on any day not a legal holiday, in not less than forty-eight (48) hours after publication of notice of such sale in a daily newspaper of general circulation published in the town or city where the sale is to be held, stating the time, place of sale, and the quantity and location of Crude Petroleum to be sold. At said sale, Carrier shall have the right to bid, and if the highest bidder, to become the purchaser. From the proceeds of said sale, Carrier will pay itself the transportation and all other lawful charges, including expenses incident to said sale, and the balance remaining, if any, shall be held for Shipper or whomsoever may be lawfully entitled thereto.

#### Special Rule 19 Liability of Carrier

- (A) Carrier shall not be liable for any delay in delivery of or any loss of Crude Petroleum caused by acts of God, acts of government, acts of terrorists, storm, flood, extreme weather, fire, explosion, by acts of war, terrorism, quarantine, authority of law, by breakdown or accident to machinery or equipment, or by act of default of Shipper or Consignee resulting from any other cause reasonably beyond the control of Carrier and not due to the negligence of Carrier, whether similar or dissimilar to the causes herein enumerated. Any such loss shall be apportioned by Carrier to each Shipper of Crude Petroleum in the proportion to Shipper's total volume transported in the calendar month in which such loss occurs. Shipper shall be entitled to receive only that portion of its Crude Petroleum remaining after deducting such Shipper's proportion of such loss, as above determined. Carrier shall prepare and submit a statement to each Shipper showing the apportionment of any such loss of Crude Petroleum.
- (B) To the maximum extent permitted by law, Shipper shall release, indemnify, defend and hold harmless Carrier, its Affiliates and its Representatives from and against all actions, claims, cause of action, costs, demands, obligations, losses, lawsuits, liabilities, fines, penalties, damages and expenses (including court costs, defense costs and reasonable attorneys' fees and expenses) of any kind or character arising from or related to: (1) the negligent or willful acts or omissions on the part of Shipper, its employees, agents or contractors (including, but not limited to, any contractors transporting products(s) to or from any location on Carrier's System); and/or (2) liability arising from the chemical characteristics of Crude Petroleum, except to the extent such liability arises from Carrier's negligence.

#### Special Rule 20 Scheduling of Delivery

When Shippers request delivery from the pipeline at a Destination of a volume of Crude Petroleum greater than can be immediately delivered, Carrier shall schedule delivery. Carrier shall not be liable for any delay in delivery resulting from such scheduling of delivery.

#### Special Rule 21 Pipage Agreement

Separate agreements in accordance with this tariff and these regulations covering further details will be required by Carrier before any duty for transportation shall arise.



Special Rule 22 Establishment of Grades

Carrier will from time to time determine which grades of Crude Petroleum it will regularly transport as a Common Stream and as a Segregated Batch between particular Origins and Destinations on its pipelines.

Common Stream grades are:

Grade	Minimum API Gravity	Maximum API Gravity
Crude Oil		Less than or equal to 45 API
Light Crude Oil	Greater than 45 API	Less than or equal to 55 API
Condensate	Greater than 55 API	

Segregated grades are:

Grade	Minimum API Gravity	Maximum API Gravity
Processed Condensate	Greater than 40 API	Less than or equal to 60 API

Special Rule 23 Processed Condensate Export

For avoidance of doubt, Carrier is not the exporter of Processed Condensate transported through the pipeline and is not responsible for compliance with any applicable law with respect to the export of Processed Condensate.

Special Rule 24 Bi-Directional Routing

- (A) Carrier's system is designed and intended to provide transportation service in a westward direction from Koch Pipeline Pettus Station, Bee County, Texas to Corpus Christi North Beach, Nueces County, Texas ("Pettus – CCNB Segment"). The terms of service and rate transportation movement are set forth in this tariff.
- (B) Carrier does, however, have the capability to temporarily reverse the flow to offer transportation service in an eastwards direction using a section of its pipeline extending between Pawnee Station, Live Oak County, Texas and Koch Pipeline Pettus Station ("Pawnee – Pettus Segment").
- (C) A Shipper desiring to make a westward shipment on the Pettus – CCNB Segment in a month should submit a Nomination for such service in accordance with Special Rule 16 of this tariff. A Shipper desiring to make an eastward shipment on the Pawnee – Pettus Segment in a month should submit a Nomination for such service in accordance with Special Rule 16, and specify that the requested shipment will need bi-directional service under this Special Rule 24.
- (D) Following the receipt of all such Nomination for service, Carrier will make a determination as to whether it can temporarily reverse part of the Pettus – CCNB Segment during the requested month in order to offer eastward transportation services on the Pawnee – Pettus Segment, in addition to offering the primary westward transportation services on the Pettus – CCNB Segment. Carrier will consider, among other things, the following factors when determining whether to reverse part of the Pettus – CCNB Segment: the level of Nominations received for westward transportation service on the Pettus – CCNB Segment, the level of Nominations received for eastward transportation service on the Pawnee – Pettus Segment, and the expense that will be required to perform the reversal of part of the Pettus – CCNB Segment. Carrier will reverse part of the Pettus – CCNB Segment in a given month only when and to the extent that all volumes of Crude Petroleum nominated for westward transportation service on the Pettus - CCNB Segment can be accepted by Carrier without prorationing and there is sufficient remaining capacity to provide temporary eastward transportation service on the Pawnee – Pettus Segment.
- (E) Carrier will notify all interested parties no later than the 27th day of the month preceding the month of transportation as to whether Carrier will temporarily reverse part of the Pettus - CCNB Segment during the requested month and offer transportation service in an eastward direction on the Pawnee – Pettus Segment, in addition to offering the primary westward transportation services on the Pettus - CCNB Segment.

EXHIBIT A

GRAVITY BANKS AND SULFUR BANKS EXAMPLE CALCULATION

LOCATION	SHIPPER	BBL'D RECEIVED	Tested % SULFUR	API GRAV	EXHIBIT D RATIO TO 35.5 WT.	Adjusted % SULFUR	EXHIBIT C SULFUR DIFF	EXHIBIT B GRAVITY DIFF	BBL'S REC'D x SULFUR DIFF	BBL'S REC'D x GRAV DIFF
JONES LEASE	A	155,000.00	0.20	45.0	0.94614	0.19	1.19	\$5.10	184,450.00	790,500.00
ABC TRUCK ACT	B	165,341.60	0.30	36.0	0.99702	0.30	1.30	\$5.02	214,944.08	830,014.83
SMITH LEASE	C	82,658.40	0.40	30.0	1.03416	0.41	1.41	\$4.25	116,548.34	351,298.20
		<u>403,000.00</u>							<u>515,942.42</u>	<u>1,971,813.03</u>

COMMON STREAM WEIGHTED AVERAGE GRAVITY VALUE: 1,971,813.03/403,000 = 4.892836308  
COMMON STREAM WEIGHTED AVERAGE SULFUR VALUE: 515,942.42/403,000 = 1.280254154

JONES LEASE	SHIPPER A	WEIGHTED AVERAGE GRAVITY VALUE: 790,500.00/155,000 =		5.10	
		CALCULATION: (4.892836308 - 5.10) x 155,000 =			(\$32,110.37)
		WEIGHTED AVERAGE SULFUR VALUE: 184,450.00/155,000 =		1.19	
		CALCULATION: (1.19 - 1.280254154) x 155,000 =			(\$13,989.39)
		CURRENT MONTH QUALITY BANK AMOUNT:			<u>(\$46,099.77)</u>
ABC TRUCK ACT	SHIPPER B	WEIGHTED AVERAGE GRAVITY VALUE: 830,014.83/165,341.6 =		5.02	
		CALCULATION: (4.892836308 - 5.02) x 165,341.6 =			(\$21,025.45)
		WEIGHTED AVERAGE SULFUR VALUE: 214,944.08/165,341.6 =		1.30	
		CALCULATION: (1.30 - 1.280254154) x 165,341.6 =			\$3,264.81
		CURRENT MONTH QUALITY BANK AMOUNT:			<u>(\$17,760.64)</u>
SMITH LEASE	SHIPPER C	WEIGHTED AVERAGE GRAVITY VALUE: 351,298.20/82,658.4 =		4.25	
		CALCULATION: (4.892836308 - 4.25) x 82,658.4 =			\$53,135.82
		WEIGHTED AVERAGE SULFUR VALUE: 116,548.34/82,658.4 =		1.41	
		CALCULATION: (1.41 - 1.280254154) x 82,658.4 =			\$10,724.58
		CURRENT MONTH QUALITY BANK AMOUNT:			<u>\$63,860.40</u>
				BANK SUM	\$0.00

**EXHIBIT B - ADJUSTMENT AUTHORIZATION TABLES OF DIFFERENTIALS FOR USE IN DETERMINING  
ADJUSTMENTS FOR DIFFERENCE IN GRAVITY OF CRUDE PETROLEUM**

API GRAVITY	DIFF. PER BBL	API GRAVITY	DIFF. PER BBL	API GRAVITY	DIFF. PER BBL	API GRAVITY	DIFF. PER BBL
10.0	1.250	16.0	2.150	22.0	3.050	28.0	3.950
10.1	1.265	16.1	2.165	22.1	3.065	28.1	3.965
10.2	1.280	16.2	2.180	22.2	3.080	28.2	3.980
10.3	1.295	16.3	2.195	22.3	3.095	28.3	3.995
10.4	1.310	16.4	2.210	22.4	3.110	28.4	4.010
10.5	1.325	16.5	2.225	22.5	3.125	28.5	4.025
10.6	1.340	16.6	2.240	22.6	3.140	28.6	4.040
10.7	1.355	16.7	2.255	22.7	3.155	28.7	4.055
10.8	1.370	16.8	2.270	22.8	3.170	28.8	4.070
10.9	1.385	16.9	2.285	22.9	3.185	28.9	4.085
11.0	1.400	17.0	2.300	23.0	3.200	29.0	4.100
11.1	1.415	17.1	2.315	23.1	3.215	29.1	4.115
11.2	1.430	17.2	2.330	23.2	3.230	29.2	4.130
11.3	1.445	17.3	2.345	23.3	3.245	29.3	4.145
11.4	1.460	17.4	2.360	23.4	3.260	29.4	4.160
11.5	1.475	17.5	2.375	23.5	3.275	29.5	4.175
11.6	1.490	17.6	2.390	23.6	3.290	29.6	4.190
11.7	1.505	17.7	2.405	23.7	3.305	29.7	4.205
11.8	1.520	17.8	2.420	23.8	3.320	29.8	4.220
11.9	1.535	17.9	2.435	23.9	3.335	29.9	4.235
12.0	1.550	18.0	2.450	24.0	3.350	30.0	4.250
12.1	1.565	18.1	2.465	24.1	3.365	30.1	4.265
12.2	1.580	18.2	2.480	24.2	3.380	30.2	4.280
12.3	1.595	18.3	2.495	24.3	3.395	30.3	4.295
12.4	1.610	18.4	2.510	24.4	3.410	30.4	4.310
12.5	1.625	18.5	2.525	24.5	3.425	30.5	4.325
12.6	1.640	18.6	2.540	24.6	3.440	30.6	4.340
12.7	1.655	18.7	2.555	24.7	3.455	30.7	4.355
12.8	1.670	18.8	2.570	24.8	3.470	30.8	4.370
12.9	1.685	18.9	2.585	24.9	3.485	30.9	4.385
13.0	1.700	19.0	2.600	25.0	3.500	31.0	4.400
13.1	1.715	19.1	2.615	25.1	3.515	31.1	4.415
13.2	1.730	19.2	2.630	25.2	3.530	31.2	4.430
13.3	1.745	19.3	2.645	25.3	3.545	31.3	4.445
13.4	1.760	19.4	2.660	25.4	3.560	31.4	4.460
13.5	1.775	19.5	2.675	25.5	3.575	31.5	4.475
13.6	1.790	19.6	2.690	25.6	3.590	31.6	4.490
13.7	1.805	19.7	2.705	25.7	3.605	31.7	4.505
13.8	1.820	19.8	2.720	25.8	3.620	31.8	4.520
13.9	1.835	19.9	2.735	25.9	3.635	31.9	4.535
14.0	1.850	20.0	2.750	26.0	3.650	32.0	4.550
14.1	1.865	20.1	2.765	26.1	3.665	32.1	4.565
14.2	1.880	20.2	2.780	26.2	3.680	32.2	4.580
14.3	1.895	20.3	2.795	26.3	3.695	32.3	4.595
14.4	1.910	20.4	2.810	26.4	3.710	32.4	4.610
14.5	1.925	20.5	2.825	26.5	3.725	32.5	4.625
14.6	1.940	20.6	2.840	26.6	3.740	32.6	4.640
14.7	1.955	20.7	2.855	26.7	3.755	32.7	4.655
14.8	1.970	20.8	2.870	26.8	3.770	32.8	4.670
14.9	1.985	20.9	2.885	26.9	3.785	32.9	4.685
15.0	2.000	21.0	2.900	27.0	3.800	33.0	4.700
15.1	2.015	21.1	2.915	27.1	3.815	33.1	4.715
15.2	2.030	21.2	2.930	27.2	3.830	33.2	4.730
15.3	2.045	21.3	2.945	27.3	3.845	33.3	4.745
15.4	2.060	21.4	2.960	27.4	3.860	33.4	4.760
15.5	2.075	21.5	2.975	27.5	3.875	33.5	4.775
15.6	2.090	21.6	2.990	27.6	3.890	33.6	4.790
15.7	2.105	21.7	3.005	27.7	3.905	33.7	4.805
15.8	2.120	21.8	3.020	27.8	3.920	33.8	4.820
15.9	2.135	21.9	3.035	27.9	3.935	33.9	4.835

EXHIBIT B (CONTINUED)

ADJUSTMENT AUTHORIZATION TABLES OF DIFFERENTIALS FOR USE IN DETERMINING  
ADJUSTMENTS FOR DIFFERENCE IN GRAVITY OF CRUDE PETROLEUM

API GRAVITY	DIFF. PER BBL	API GRAVITY	DIFF. PER BBL	API GRAVITY	DIFF. PER BBL	API GRAVITY	DIFF. PER BBL
34.0	4.850	40.0	5.100	46.0	4.950	52.0	4.050
34.1	4.865	40.1	5.100	46.1	4.935	52.1	4.035
34.2	4.880	40.2	5.100	46.2	4.920	52.2	4.020
34.3	4.895	40.3	5.100	46.3	4.905	52.3	4.005
34.4	4.910	40.4	5.100	46.4	4.890	52.4	3.990
34.5	4.925	40.5	5.100	46.5	4.875	52.5	3.975
34.6	4.940	40.6	5.100	46.6	4.860	52.6	3.960
34.7	4.955	40.7	5.100	46.7	4.845	52.7	3.945
34.8	4.970	40.8	5.100	46.8	4.830	52.8	3.930
34.9	4.985	40.9	5.100	46.9	4.815	52.9	3.915
35.0	5.000	41.0	5.100	47.0	4.800	53.0	3.900
35.1	5.000	41.1	5.100	47.1	4.785	53.1	3.885
35.2	5.000	41.2	5.100	47.2	4.770	53.2	3.870
35.3	5.000	41.3	5.100	47.3	4.755	53.3	3.855
35.4	5.000	41.4	5.100	47.4	4.740	53.4	3.840
35.5	5.000	41.5	5.100	47.5	4.725	53.5	3.825
35.6	5.000	41.6	5.100	47.6	4.710	53.6	3.810
35.7	5.000	41.7	5.100	47.7	4.695	53.7	3.795
35.8	5.000	41.8	5.100	47.8	4.680	53.8	3.780
35.9	5.000	41.9	5.100	47.9	4.665	53.9	3.765
36.0	5.020	42.0	5.100	48.0	4.650	54.0	3.750
36.1	5.020	42.1	5.100	48.1	4.635	54.1	3.735
36.2	5.020	42.2	5.100	48.2	4.620	54.2	3.720
36.3	5.020	42.3	5.100	48.3	4.605	54.3	3.705
36.4	5.020	42.4	5.100	48.4	4.590	54.4	3.690
36.5	5.020	42.5	5.100	48.5	4.575	54.5	3.675
36.6	5.020	42.6	5.100	48.6	4.560	54.6	3.660
36.7	5.020	42.7	5.100	48.7	4.545	54.7	3.645
36.8	5.020	42.8	5.100	48.8	4.530	54.8	3.630
36.9	5.020	42.9	5.100	48.9	4.515	54.9	3.615
37.0	5.040	43.0	5.100	49.0	4.500	55.0	3.600
37.1	5.040	43.1	5.100	49.1	4.485		
37.2	5.040	43.2	5.100	49.2	4.470		
37.3	5.040	43.3	5.100	49.3	4.455		
37.4	5.040	43.4	5.100	49.4	4.440		
37.5	5.040	43.5	5.100	49.5	4.425		
37.6	5.040	43.6	5.100	49.6	4.410		
37.7	5.040	43.7	5.100	49.7	4.395		
37.8	5.040	43.8	5.100	49.8	4.380		
37.9	5.040	43.9	5.100	49.9	4.365		
38.0	5.060	44.0	5.100	50.0	4.350		
38.1	5.060	44.1	5.100	50.1	4.335		
38.2	5.060	44.2	5.100	50.2	4.320		
38.3	5.060	44.3	5.100	50.3	4.305		
38.4	5.060	44.4	5.100	50.4	4.290		
38.5	5.060	44.5	5.100	50.5	4.275		
38.6	5.060	44.6	5.100	50.6	4.260		
38.7	5.060	44.7	5.100	50.7	4.245		
38.8	5.060	44.8	5.100	50.8	4.230		
38.9	5.060	44.9	5.100	50.9	4.215		
39.0	5.080	45.0	5.100	51.0	4.200		
39.1	5.080	45.1	5.085	51.1	4.185		
39.2	5.080	45.2	5.070	51.2	4.170		
39.3	5.080	45.3	5.055	51.3	4.155		
39.4	5.080	45.4	5.040	51.4	4.140		
39.5	5.080	45.5	5.025	51.5	4.125		
39.6	5.080	45.6	5.010	51.6	4.110		
39.7	5.080	45.7	4.995	51.7	4.095		
39.8	5.080	45.8	4.980	51.8	4.080		
39.9	5.080	45.9	4.965	51.9	4.065		

For API GRAVITY values above 55.0° API the differential continues to decline 0.015/bbl. per 0.1° API GRAVITY.

EXHIBIT C

ADJUSTMENT AUTHORIZATION TABLES OF DIFFERENTIALS FOR USE IN DETERMINING  
ADJUSTMENTS FOR DIFFERENCE IN SULFUR CONTENT OF CRUDE PETROLEUM

PERCENT SULFUR	DIFF. PER BBL	PERCENT SULFUR	DIFF. PER BBL	PERCENT SULFUR	DIFF. PER BBL	PERCENT SULFUR	DIFF. PER BBL	PERCENT SULFUR	DIFF. PER BBL
0.00	1.000	0.60	1.600	1.20	2.200	1.80	2.800	2.40	3.400
0.01	1.010	0.61	1.610	1.21	2.210	1.81	2.810	2.41	3.410
0.02	1.020	0.62	1.620	1.22	2.220	1.82	2.820	2.42	3.420
0.03	1.030	0.63	1.630	1.23	2.230	1.83	2.830	2.43	3.430
0.04	1.040	0.64	1.640	1.24	2.240	1.84	2.840	2.44	3.440
0.05	1.050	0.65	1.650	1.25	2.250	1.85	2.850	2.45	3.450
0.06	1.060	0.66	1.660	1.26	2.260	1.86	2.860	2.46	3.460
0.07	1.070	0.67	1.670	1.27	2.270	1.87	2.870	2.47	3.470
0.08	1.080	0.68	1.680	1.28	2.280	1.88	2.880	2.48	3.480
0.09	1.090	0.69	1.690	1.29	2.290	1.89	2.890	2.49	3.490
0.10	1.100	0.70	1.700	1.30	2.300	1.90	2.900	2.50	3.500
0.11	1.110	0.71	1.710	1.31	2.310	1.91	2.910	2.51	3.510
0.12	1.120	0.72	1.720	1.32	2.320	1.92	2.920	2.52	3.520
0.13	1.130	0.73	1.730	1.33	2.330	1.93	2.930	2.53	3.530
0.14	1.140	0.74	1.740	1.34	2.340	1.94	2.940	2.54	3.540
0.15	1.150	0.75	1.750	1.35	2.350	1.95	2.950	2.55	3.550
0.16	1.160	0.76	1.760	1.36	2.360	1.96	2.960	2.56	3.560
0.17	1.170	0.77	1.770	1.37	2.370	1.97	2.970	2.57	3.570
0.18	1.180	0.78	1.780	1.38	2.380	1.98	2.980	2.58	3.580
0.19	1.190	0.79	1.790	1.39	2.390	1.99	2.990	2.59	3.590
0.20	1.200	0.80	1.800	1.40	2.400	2.00	3.000	2.60	3.600
0.21	1.210	0.81	1.810	1.41	2.410	2.01	3.010	2.61	3.610
0.22	1.220	0.82	1.820	1.42	2.420	2.02	3.020	2.62	3.620
0.23	1.230	0.83	1.830	1.43	2.430	2.03	3.030	2.63	3.630
0.24	1.240	0.84	1.840	1.44	2.440	2.04	3.040	2.64	3.640
0.25	1.250	0.85	1.850	1.45	2.450	2.05	3.050	2.65	3.650
0.26	1.260	0.86	1.860	1.46	2.460	2.06	3.060	2.66	3.660
0.27	1.270	0.87	1.870	1.47	2.470	2.07	3.070	2.67	3.670
0.28	1.280	0.88	1.880	1.48	2.480	2.08	3.080	2.68	3.680
0.29	1.290	0.89	1.890	1.49	2.490	2.09	3.090	2.69	3.690
0.30	1.300	0.90	1.900	1.50	2.500	2.10	3.100	2.70	3.700
0.31	1.310	0.91	1.910	1.51	2.510	2.11	3.110	2.71	3.710
0.32	1.320	0.92	1.920	1.52	2.520	2.12	3.120	2.72	3.720
0.33	1.330	0.93	1.930	1.53	2.530	2.13	3.130	2.73	3.730
0.34	1.340	0.94	1.940	1.54	2.540	2.14	3.140	2.74	3.740
0.35	1.350	0.95	1.950	1.55	2.550	2.15	3.150	2.75	3.750
0.36	1.360	0.96	1.960	1.56	2.560	2.16	3.160	2.76	3.760
0.37	1.370	0.97	1.970	1.57	2.570	2.17	3.170	2.77	3.770
0.38	1.380	0.98	1.980	1.58	2.580	2.18	3.180	2.78	3.780
0.39	1.390	0.99	1.990	1.59	2.590	2.19	3.190	2.79	3.790
0.40	1.400	1.00	2.000	1.60	2.600	2.20	3.200	2.80	3.800
0.41	1.410	1.01	2.010	1.61	2.610	2.21	3.210	2.81	3.810
0.42	1.420	1.02	2.020	1.62	2.620	2.22	3.220	2.82	3.820
0.43	1.430	1.03	2.030	1.63	2.630	2.23	3.230	2.83	3.830
0.44	1.440	1.04	2.040	1.64	2.640	2.24	3.240	2.84	3.840
0.45	1.450	1.05	2.050	1.65	2.650	2.25	3.250	2.85	3.850
0.46	1.460	1.06	2.060	1.66	2.660	2.26	3.260	2.86	3.860
0.47	1.470	1.07	2.070	1.67	2.670	2.27	3.270	2.87	3.870
0.48	1.480	1.08	2.080	1.68	2.680	2.28	3.280	2.88	3.880
0.49	1.490	1.09	2.090	1.69	2.690	2.29	3.290	2.89	3.890
0.50	1.500	1.10	2.100	1.70	2.700	2.30	3.300	2.90	3.900
0.51	1.510	1.11	2.110	1.71	2.710	2.31	3.310	2.91	3.910
0.52	1.520	1.12	2.120	1.72	2.720	2.32	3.320	2.92	3.920
0.53	1.530	1.13	2.130	1.73	2.730	2.33	3.330	2.93	3.930
0.54	1.540	1.14	2.140	1.74	2.740	2.34	3.340	2.94	3.940
0.55	1.550	1.15	2.150	1.75	2.750	2.35	3.350	2.95	3.950
0.56	1.560	1.16	2.160	1.76	2.760	2.36	3.360	2.96	3.960
0.57	1.570	1.17	2.170	1.77	2.770	2.37	3.370	2.97	3.970
0.58	1.580	1.18	2.180	1.78	2.780	2.38	3.380	2.98	3.980
0.59	1.590	1.19	2.190	1.79	2.790	2.39	3.390	2.99	3.990

**EXHIBIT D**

**RATIO FACTORS FOR SULFUR ADJUSTMENT WEIGHT OF CRUDE BY GRAVITY TO REFERENCE  
BASE OF 35.5<sup>0</sup> API GRAVITY ADJUSTMENT AUTHORIZATION**

API GRAVITY	RATIO TO 35.5° WT.	API GRAVITY	RATIO TO 35.5° WT.	API GRAVITY	RATIO TO 35.5° WT.	API GRAVITY	RATIO TO 35.5° WT.	API GRAVITY	RATIO TO 35.5° WT.	API GRAVITY	RATIO TO 35.5° WT.
10.0	1.18044	16.0	1.13239	22.0	1.08802	28.0	1.04706	34.0	1.00907	40.0	0.97378
10.1	1.17959	16.1	1.13168	22.1	1.08731	28.1	1.04649	34.1	1.00850	40.1	0.97321
10.2	1.17888	16.2	1.13083	22.2	1.08661	28.2	1.04578	34.2	1.00780	40.2	0.97264
10.3	1.17803	16.3	1.13012	22.3	1.08590	28.3	1.04507	34.3	1.00723	40.3	0.97208
10.4	1.17718	16.4	1.12927	22.4	1.08519	28.4	1.04451	34.4	1.00666	40.4	0.97151
10.5	1.17633	16.5	1.12856	22.5	1.08448	28.5	1.04380	34.5	1.00609	40.5	0.97094
10.6	1.17548	16.6	1.12785	22.6	1.08377	28.6	1.04323	34.6	1.00539	40.6	0.97038
10.7	1.17463	16.7	1.12700	22.7	1.08320	28.7	1.04252	34.7	1.00482	40.7	0.96981
10.8	1.17378	16.8	1.12629	22.8	1.08249	28.8	1.04181	34.8	1.00425	40.8	0.96924
10.9	1.17307	16.9	1.12558	22.9	1.08179	28.9	1.04125	34.9	1.00369	40.9	0.96867
11.0	1.17222	17.0	1.12473	23.0	1.08108	29.0	1.04054	35.0	1.00298	41.0	0.96811
11.1	1.17137	17.1	1.12403	23.1	1.08037	29.1	1.03997	35.1	1.00241	41.1	0.96754
11.2	1.17052	17.2	1.12332	23.2	1.07966	29.2	1.03926	35.2	1.00184	41.2	0.96697
11.3	1.16967	17.3	1.12247	23.3	1.07895	29.3	1.03855	35.3	1.00128	41.3	0.96641
11.4	1.16896	17.4	1.12176	23.4	1.07824	29.4	1.03799	35.4	1.00057	41.4	0.96584
11.5	1.16811	17.5	1.12105	23.5	1.07753	29.5	1.03728	35.5	1.00000	41.5	0.96527
11.6	1.16726	17.6	1.12020	23.6	1.07682	29.6	1.03671	35.6	0.99943	41.6	0.96471
11.7	1.16641	17.7	1.11949	23.7	1.07612	29.7	1.03600	35.7	0.99887	41.7	0.96414
11.8	1.16570	17.8	1.11878	23.8	1.07541	29.8	1.03544	35.8	0.99816	41.8	0.96357
11.9	1.16485	17.9	1.11793	23.9	1.07470	29.9	1.03473	35.9	0.99759	41.9	0.96300
12.0	1.16400	18.0	1.11722	24.0	1.07413	30.0	1.03416	36.0	0.99702	42.0	0.96244
12.1	1.16315	18.1	1.11651	24.1	1.07342	30.1	1.03345	36.1	0.99646	42.1	0.96187
12.2	1.16244	18.2	1.11580	24.2	1.07271	30.2	1.03288	36.2	0.99589	42.2	0.96145
12.3	1.16159	18.3	1.11495	24.3	1.07201	30.3	1.03218	36.3	0.99518	42.3	0.96088
12.4	1.16074	18.4	1.11425	24.4	1.07130	30.4	1.03161	36.4	0.99461	42.4	0.96031
12.5	1.16003	18.5	1.11354	24.5	1.07059	30.5	1.03090	36.5	0.99405	42.5	0.95974
12.6	1.15918	18.6	1.11283	24.6	1.06988	30.6	1.03033	36.6	0.99348	42.6	0.95918
12.7	1.15833	18.7	1.11198	24.7	1.06931	30.7	1.02962	36.7	0.99291	42.7	0.95861
12.8	1.15748	18.8	1.11127	24.8	1.06860	30.8	1.02906	36.8	0.99220	42.8	0.95804
12.9	1.15677	18.9	1.11056	24.9	1.06790	30.9	1.02835	36.9	0.99164	42.9	0.95748
13.0	1.15592	19.0	1.10985	25.0	1.06719	31.0	1.02778	37.0	0.99107	43.0	0.95691
13.1	1.15521	19.1	1.10900	25.1	1.06648	31.1	1.02707	37.1	0.99050	43.1	0.95648
13.2	1.15436	19.2	1.10829	25.2	1.06577	31.2	1.02651	37.2	0.98994	43.2	0.95592
13.3	1.15351	19.3	1.10758	25.3	1.06520	31.3	1.02580	37.3	0.98937	43.3	0.95535
13.4	1.15280	19.4	1.10687	25.4	1.06449	31.4	1.02523	37.4	0.98880	43.4	0.95478
13.5	1.15195	19.5	1.10617	25.5	1.06378	31.5	1.02452	37.5	0.98809	43.5	0.95422
13.6	1.15110	19.6	1.10532	25.6	1.06308	31.6	1.02395	37.6	0.98753	43.6	0.95365
13.7	1.15039	19.7	1.10461	25.7	1.06251	31.7	1.02339	37.7	0.98696	43.7	0.95308
13.8	1.14954	19.8	1.10390	25.8	1.06180	31.8	1.02268	37.8	0.98639	43.8	0.95266
13.9	1.14883	19.9	1.10319	25.9	1.06109	31.9	1.02211	37.9	0.98583	43.9	0.95209
14.0	1.14798	20.0	1.10248	26.0	1.06038	32.0	1.02140	38.0	0.98526	44.0	0.95152
14.1	1.14713	20.1	1.10177	26.1	1.05967	32.1	1.02084	38.1	0.98469	44.1	0.95096
14.2	1.14642	20.2	1.10106	26.2	1.05911	32.2	1.02013	38.2	0.98412	44.2	0.95039
14.3	1.14557	20.3	1.10021	26.3	1.05840	32.3	1.01956	38.3	0.98356	44.3	0.94982
14.4	1.14486	20.4	1.09950	26.4	1.05769	32.4	1.01899	38.4	0.98285	44.4	0.94940
14.5	1.14401	20.5	1.09880	26.5	1.05698	32.5	1.01828	38.5	0.98228	44.5	0.94883
14.6	1.14330	20.6	1.09809	26.6	1.05641	32.6	1.01772	38.6	0.98172	44.6	0.94826
14.7	1.14245	20.7	1.09738	26.7	1.05571	32.7	1.01715	38.7	0.98115	44.7	0.94770
14.8	1.14174	20.8	1.09667	26.8	1.05500	32.8	1.01644	38.8	0.98058	44.8	0.94713
14.9	1.14089	20.9	1.09596	26.9	1.05443	32.9	1.01588	38.9	0.98001	44.9	0.94670
15.0	1.14018	21.0	1.09525	27.0	1.05372	33.0	1.01517	39.0	0.97945	45.0	0.94614
15.1	1.13933	21.1	1.09454	27.1	1.05301	33.1	1.01460	39.1	0.97888	45.1	0.94557
15.2	1.13863	21.2	1.09383	27.2	1.05245	33.2	1.01403	39.2	0.97831	45.2	0.94500
15.3	1.13777	21.3	1.09313	27.3	1.05174	33.3	1.01332	39.3	0.97775	45.3	0.94444
15.4	1.13707	21.4	1.09242	27.4	1.05103	33.4	1.01276	39.4	0.97718	45.4	0.94401
15.5	1.13622	21.5	1.09171	27.5	1.05046	33.5	1.01219	39.5	0.97661	45.5	0.94344
15.6	1.13551	21.6	1.09086	27.6	1.04975	33.6	1.01148	39.6	0.97605	45.6	0.94288
15.7	1.13466	21.7	1.09015	27.7	1.04904	33.7	1.01091	39.7	0.97548	45.7	0.94231
15.8	1.13395	21.8	1.08944	27.8	1.04848	33.8	1.01035	39.8	0.97491	45.8	0.94189
15.9	1.13324	21.9	1.08873	27.9	1.04777	33.9	1.00964	39.9	0.97434	45.9	0.94132

EXHIBIT D (CONTINUED)

RATIO FACTORS FOR SULFUR ADJUSTMENT WEIGHT OF CRUDE BY GRAVITY TO REFERENCE  
BASE OF 35.5° API GRAVITY ADJUSTMENT AUTHORIZATION

API GRAVITY	RATIO TO 35.5° WT.	API GRAVITY	RATIO TO 35.5° WT.	API GRAVITY	RATIO TO 35.5° WT.	API GRAVITY	RATIO TO 35.5° WT.	API GRAVITY	RATIO TO 35.5° WT.
46.0	0.94075	52.0	0.90999	58.0	0.88108	64.0	0.85400	70.0	0.82849
46.1	0.94018	52.1	0.90943	58.1	0.88085	64.1	0.85358	70.1	0.82807
46.2	0.93976	52.2	0.90900	58.2	0.88009	64.2	0.85315	70.2	0.82764
46.3	0.93919	52.3	0.90843	58.3	0.87966	64.3	0.85273	70.3	0.82721
46.4	0.93863	52.4	0.90801	58.4	0.87923	64.4	0.85230	70.4	0.82679
46.5	0.93806	52.5	0.90744	58.5	0.87867	64.5	0.85188	70.5	0.82651
46.6	0.93763	52.6	0.90702	58.6	0.87824	64.6	0.85145	70.6	0.82608
46.7	0.93707	52.7	0.90645	58.7	0.87782	64.7	0.85103	70.7	0.82566
46.8	0.93650	52.8	0.90602	58.8	0.87739	64.8	0.85046	70.8	0.82537
46.9	0.93607	52.9	0.90546	58.9	0.87697	64.9	0.85004	70.9	0.82495
47.0	0.93551	53.0	0.90503	59.0	0.87654	65.0	0.84961	71.0	0.82452
47.1	0.93494	53.1	0.90446	59.1	0.87597	65.1	0.84918	71.1	0.82410
47.2	0.93437	53.2	0.90404	59.2	0.87555	65.2	0.84876	71.2	0.82367
47.3	0.93395	53.3	0.90361	59.3	0.87512	65.3	0.84833	71.3	0.82325
47.4	0.93338	53.4	0.90305	59.4	0.87456	65.4	0.84791	71.4	0.82282
47.5	0.93281	53.5	0.90262	59.5	0.87413	65.5	0.84746	71.5	0.82240
47.6	0.93239	53.6	0.90206	59.6	0.87371	65.6	0.84706	71.6	0.82197
47.7	0.93182	53.7	0.90163	59.7	0.87328	65.7	0.84663	71.7	0.82155
47.8	0.93125	53.8	0.90106	59.8	0.87286	65.8	0.84621	71.8	0.82112
47.9	0.93083	53.9	0.90064	59.9	0.87229	65.9	0.84578	71.9	0.82084
48.0	0.93026	54.0	0.90007	60.0	0.87186	66.0	0.84536	72.0	0.82041
48.1	0.92970	54.1	0.89965	60.1	0.87144	66.1	0.84493	72.1	0.81999
48.2	0.92927	54.2	0.89922	60.2	0.87087	66.2	0.84451	72.2	0.81956
48.3	0.92870	54.3	0.89865	60.3	0.87045	66.3	0.84408	72.3	0.81914
48.4	0.92814	54.4	0.89823	60.4	0.87002	66.4	0.84366	72.4	0.81871
48.5	0.92771	54.5	0.89766	60.5	0.86960	66.5	0.84323	72.5	0.81828
48.6	0.92714	54.6	0.89724	60.6	0.86917	66.6	0.84281	72.6	0.81800
48.7	0.92672	54.7	0.89681	60.7	0.86875	66.7	0.84238	72.7	0.81758
48.8	0.92615	54.8	0.89624	60.8	0.86818	66.8	0.84196	72.8	0.81715
48.9	0.92558	54.9	0.89582	60.9	0.86775	66.9	0.84153	72.9	0.81673
49.0	0.92516	55.0	0.89525	61.0	0.86733	67.0	0.84111	73.0	0.81630
49.1	0.92459	55.1	0.89483	61.1	0.86690	67.1	0.84068	73.1	0.81602
49.2	0.92403	55.2	0.89440	61.2	0.86648	67.2	0.84026	73.2	0.81559
49.3	0.92360	55.3	0.89383	61.3	0.86591	67.3	0.83983	73.3	0.81517
49.4	0.92303	55.4	0.89341	61.4	0.86549	67.4	0.83940	73.4	0.81474
49.5	0.92261	55.5	0.89285	61.5	0.86506	67.5	0.83898	73.5	0.81432
49.6	0.92204	55.6	0.89242	61.6	0.86464	67.6	0.83855	73.6	0.81403
49.7	0.92147	55.7	0.89199	61.7	0.86421	67.7	0.83813	73.7	0.81361
49.8	0.92105	55.8	0.89157	61.8	0.86378	67.8	0.83770	73.8	0.81318
49.9	0.92048	55.9	0.89114	61.9	0.86322	67.9	0.83728	73.9	0.81276
50.0	0.92006	56.0	0.89057	62.0	0.86279	68.0	0.83685	74.0	0.81233
50.1	0.91949	56.1	0.89015	62.1	0.86237	68.1	0.83643	74.1	0.81191
50.2	0.91892	56.2	0.88958	62.2	0.86194	68.2	0.83600	74.2	0.81162
50.3	0.91850	56.3	0.88916	62.3	0.86152	68.3	0.83558	74.3	0.81120
50.4	0.91793	56.4	0.88873	62.4	0.86109	68.4	0.83515	74.4	0.81077
50.5	0.91751	56.5	0.88816	62.5	0.86067	68.5	0.83473	74.5	0.81049
50.6	0.91694	56.6	0.88774	62.6	0.86010	68.6	0.83430	74.6	0.81006
50.7	0.91651	56.7	0.88717	62.7	0.85967	68.7	0.83388	74.7	0.80964
50.8	0.91595	56.8	0.88675	62.8	0.85925	68.8	0.83345	74.8	0.80921
50.9	0.91552	56.9	0.88632	62.9	0.85882	68.9	0.83303	74.9	0.80879
51.0	0.91495	57.0	0.88575	63.0	0.85840	69.0	0.83260		
51.1	0.91439	57.1	0.88533	63.1	0.85797	69.1	0.83218		
51.2	0.91396	57.2	0.88490	63.2	0.85755	69.2	0.83175		
51.3	0.91339	57.3	0.88448	63.3	0.85712	69.3	0.83147		
51.4	0.91297	57.4	0.88391	63.4	0.85670	69.4	0.83104		
51.5	0.91240	57.5	0.88349	63.5	0.85613	69.5	0.83062		
51.6	0.91198	57.6	0.88292	63.6	0.85571	69.6	0.83019		
51.7	0.91141	57.7	0.88249	63.7	0.85528	69.7	0.82977		
51.8	0.91099	57.8	0.88207	63.8	0.85485	69.8	0.82934		
51.9	0.91042	57.9	0.88150	63.9	0.85443	69.9	0.82892		