Comparative Evaluation of Four Different Sensitive Tabular Data Protection Methods Using a Real Life Table Structure of Complex Hierarchies and Links

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Abstract

The practitioners of tabular data protection methods in federal statistical agencies have some familiarity with commonly used table structures. However, they require some guidance on how to evaluate appropriateness of various sensitive tabular data methods when applied to their own table structure. With that in mind, we use a real life "typical" table structure of moderate hierarchical and linked complexity and populate it with synthetic micro data to evaluate the relative performance of four different tabular data protection methods. The methods selected for the evaluation are: 1) lp-based classical cell suppression 2) lp-based CTA (Dandekar 2001), 3) network flow-based cell suppression as implemented in DiAna, a software product made available to other Federal statistical agencies by the US Census Bureau and 4) a micro data level noise addition method documented in a US Census Bureau research paper. The outcome from the comparative evaluation is available from http://mysite.verizon.net/vze7w8vk/

Introduction

To allow comparison of various sensitive tabular data protection methods on a consistent basis, the statistical disclosure control/limitation (SDC/SDL) researchers have long used public domain artificial (synthetic) data sets available from http://webpages.ull.es/users/casc/ website. The format used by these data sets, however, fails to convey visualization aspects of inherent complexities associated with various structural details typical of public use tables. The practitioners of tabular data protection methods are usually familiar with their own table structures. However, they require some assistance to evaluate appropriateness of proposed SDL methods when applied to their own table structure. As a first step to get around this problem, in this paper we use a real life table structure of moderate hierarchical and linked complexity and populate it with artificial (synthetic non-real) data to evaluate the relative performance of four different tabular data protection methods.

Table Structure

The templates for the hypothetical linked tables containing hierarchical structure selected for the comparative evaluation are in the Appendix. Appendix A shows column headings of these tables. The rows of the actual tables show geography in a hierarchical structure. However, only US totals are shown in Appendix A. The tables appear as two separate three-dimensional tables: Table 1 "Volumes by Grade, Sales Type, PAD District, and State" and Table 2 "Volumes by Formulation, Sales Type, PAD District, and State". For analytical purposes, these two tables could be considered as two three-dimensional linked portions of a four-dimensional table with missing two-way interactions between grade and formulation. The tables consist of two independent (separable) components, namely, "Sales to End Users" and "Sales for Resale". The later component offers a far greater challenge for the sensitive data protection task and therefore is selected for the comparative evaluation.

The four-dimensional table template, without "Sales to End Users" stand alone part of the published table, is populated with artificial micro-data to create this example. The resulting table contains a total of 1556 non-zero cells. The p percent rule with p=10% is used to identify sensitive tabular cells. There are a total of 78 sensitive cells requiring protection from statistical disclosure. Appendix C illustrates the size relationship of sensitive cells and non-sensitive cells in the table. Appendix B is in two parts and contains only a partial listing of Table 1 to illustrate the format used to display the outcome from the four different data protection methods. The entire populated table structure containing artificial data is available in the public domain to SDL researchers from the web site http://mysite.verizon.net/vze7w8vk/ . Part 1 of Appendix B, displays the outcome from classical lp-based cell suppression method in first four columns. Sensitive cells are identified by a symbol 'w'. Non sensitive cells requiring suppression are identified by a symbol 's'. The last four columns of the table display the cell value adjustments from the CTA method. In these columns, the controlled tabular adjustment values to sensitive cells have been shown by a symbol 'w'. Adjustments to non-sensitive values are displayed by using symbol 'A'. Similarly, part 2 of

Appendix B displays the outcome from DiAna software (network flow model) in the first four columns. Sensitive cells are identified by the symbol ‘p’. Suppressed non-sensitive cells are identified by symbol ‘c’. The last four columns of the table display the adjustments to cell value from the noise method.

Tabular Data Protection Methods

The methods selected for the comparative evaluation are: 1) classical lp-based cell suppression 2) lp-based CTA 3) DiAna’s network flow-based cell suppression and 4) micro data level noise addition method described in a US Census Bureau research paper.

The classical lp-based cell suppression method used for the evaluation is similar to that used by CONFID at Statistics Canada since the mid-80. The selection of the complementary cell suppression pattern is done by using a cost proportional to the table cell value as an objective function. This results in higher preference for smaller tabular cells as complementary suppression cells.

The controlled tabular adjustments (CTA) a.k.a. synthetic tabular data method used is the one documented in Dandekar (2001) and Dandekar/Cox (2002) . Large size non-sensitive table cells are targeted for adjustments by using a cost function which is a reciprocal of the table cell value. Such an approach results in relatively small percentage changes in the cell values and therefore, reduces the overall degradation in the accuracy of the statistical information imbedded in table cell values.

The network flow model in the DiAna software uses a minimal cost flow (mcf) based algorithm from the University of Texas to develop a complementary cell suppression pattern. The PC version of the software used for this evaluation targets smaller sized cells to develop a complementary cell suppression pattern.

The micro data level noise addition method as described in the paper http://www.census.gov/srd/papers/pdf/bte9601.pdf is used for this evaluation. Micro data is perturbed by an average of 10% and standard deviation of 0.005 by using a normal distribution.

Comparative Evaluation – Cell Suppression Methods

Complementary cell suppression methods have been used by statistical agencies for many years. Both network flow (DiAna) and classical simplex-based linear programming (Statistics Canada) methods have been used to develop cell suppression patterns. There are pros and cons associated with both methods. Network flow methods are computationally far more efficient than simplex based LP methods and therefore are preferred for large tasks. Auditing of a cell suppression pattern to identify potential problems arising from either insufficient or lack of protection from disclosure is a recommended follow-up procedural step to both cell suppression methods.

Our comparative evaluation of the two suppression methods shows that the DiAna’s network flow based procedure results in 479 cells (31% of total non-zero cells) being suppressed. The classical LP based procedure results in 294 cell (19% of total non-zero cells) suppressions. The suppression count includes 78 sensitive cells. A relatively large number of cell suppressions associated with the network flow model is due to the sequential “one two-dimensional section at a time” procedure used by the network flow model. The software also lacks the capability to identify and remove un-necessary secondary cell suppressions. The classical LP-based procedure in the first pass suppresses 321 cells. The second pass through the procedure, which is commonly referred to as a “clean-up” procedure, reduces the suppressions to 294.

Comparative Evaluation – Noise vs CTA

The ultimate objective of the noise method and the CTA method is to protect the sensitive tabular data by a sufficient distortion of sensitive tabular cell values without adversely affecting the overall quality of the published non-sensitive tabular cells. The noise method takes an ***indirect approach*** in an ***attempt*** to achieve that objective by a systematic distortion of related micro data records. The CTA method, on the other hand, takes a ***direct approach*** to achieve that objective by first adjusting the values for sensitive tabular cells by a ***precise*** amount determined by use of the linear cell sensitivity rule. The non-sensitive tabular cells are adjusted “minimally” by using some predetermined criteria. For the noise method, there is no known systematic procedure to determine a direct one-to-one mathematical/statistical relationship between micro data distributional characteristics and the highly aggregated multi-variate public use table structure.[1] As a result of the "ad hoc" nature of the noise method, it does not guarantee enough distortion (therefore, protection from statistical disclosure) of sensitive tabular cells. The noise method also results in unnecessary changes in values for non-sensitive tabular cells. In theory, one advantage of applying methods, like noise addition, directly to micro data is that all tables produced from the micro data will be protected. This would preclude the need for table specific analysis required of the other methods. However, in practice extensive quality control measures are required to ensure adequate protection from statistical disclosure of sensitive tabular cells and to avoid excessive adjustments to non-sensitive tabular cells. We have used the histogram of cell count by percent change in cell value to evaluate relative performance of the noise and the CTA method when applied to two 3-D Linked tables.

CTA vs NOISE - TABULAR DATA QUALITY

CTA frequency Distribution

% From	% To	Non-Sensitive	Sensitive
.00	.10	1235	0
.10	.50	137	1
.50	1.00	60	0
1.00	1.50	15	0
1.50	2.00	13	1
2.00	5.00	15	50
5.00	10.00	3	26
10.00	15.00	0	0
15.00	30.00	0	0
30.00	100.00	0	0

1432

Noise Frequency Distribution

% From	% To	Nonsensitive	Sensitive
.00	.10	96	1
.10	.50	272	0
.50	1.00	265	0
1.00	1.50	215	0
1.50	2.00	164	0
2.00	5.00	439	2
5.00	10.00	27	51
10.00	15.00	0	24
15.00	30.00	0	0
30.00	100.00	0	0

633

Based on 1% or less error as good data quality acceptance criteria, the CTA procedure provides 1432 (92% of total non-zero cells) good quality cells. The noise method, on the other hand, provides 633 (41% of total non-zero cells) good quality cells. Based on these statistics, it is clear that the CTA outperforms noise-based cell perturbation.

Comparative Evaluation – Cell Suppression vs Perturbation

Ease of implementation issues aside, in general in addition to protecting sensitive information, the overall objective for the cell suppression method is to "minimize" the information loss. Cell perturbation methods such as CTA or the noise method, on the other hand, are implemented to provide overall high quality information to the end users after adequately protecting imbedded sensitive information. Due to such inherent differences in the strategy, the cell suppression methodology usually targets smaller cells for complementary suppression, while perturbations are "***preferred***" to be targeted on adjusting larger non-sensitive cells. Such a preferential criterion is easy to implement in the CTA method by using an appropriate selection of the objective function. The noise method, unfortunately, does not allow for preferential treatment of tabular cells. This is further confirmed by comparing across four methods selected for the evaluation.

The network flow method performs better than the noise method (69% published cells vs. 41% good quality cells). The CTA method performs better than the classical lp-based cell suppression method (92% good quality cells vs. 81% published cells)

Expanding Table Structure to Include Missing Two Way Interactions

If for whatever reason, the agency decides to include for publication a missing two-way interaction between grades and formulation in this example, it would need to create and protect four-dimensional table structures. In Appendix D we provide a summary performance statistics related to four different tabular data protection methods when used on two 3-D linked tables and one 4-D table structure. Based on the summary performance statistics, the relative ranking of the four methods selected for the evaluation remains the same. The detailed output for the 4-D table is available on the website http://mysite.verizon.net/vze7w8vk/.

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[1] Highly disaggregated multi-variate table structure in "limiting case" approaches related micro-data and therefore exhibits micro-data characteristics.

Dream or Reality?

In an ideal situation, a cell suppression method of choice should have a computational speed which is typical of network flow models and should create a cell suppression pattern which is typical of classical lp-based cell suppression methods. A preliminary research performed by this author, during a time frame from 1996 to 1997, shows that lp-based shrinking hypercube method (abstract Dandekar 2002) has a potential to offer such an alternative. In the table below we provide a comparative evaluation of multiple exploratory runs from the lp-based shrinking hypercube method, targeted towards suppressing smaller non-sensitive tabular cells.

LP_BASED HYPERCUBE RELATIVE TO CLASSICAL LP BASED SUPPRESSION

SUPPRESSION METHOD	CELL COUNT	QUANTITY SUPPRESSED
CLASICAL LP	294	886128
HYP(4,2,0.1)	287	954602
HYP(2,5,0.5)	319	1037975
HYP(1,1,0.1)	302	961529
HYP(4,0,0.5)	292	1085394

Conclusion

In this paper we have evaluated the outcome from four different tabular data protection methods by using a common table structure of moderate hierarchical and linked complexity. Our comparative evaluation ranks the CTA highest, followed by classical lp-based cell suppression in second place, network flow based method in third place and the noise based procedure in last place.

The choice of an "***appropriate***" tabular data protection method depends on multiple factors. Factors, such as available technical skills and resources play a critical role in the selection of a method of choice for a statistical agency. We hope that the information presented in this paper will be useful for the statistical agencies in deciding on the appropriateness of their selected tabular data protection method.

References

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Appendix A—Templates, Column Headings From Two Linked Tables, Used With Geography

Table 1: Volumes by Grade, Sales Type, PAD District, and State

(Thousand Gallons per Day)

Geographic Area Month	Regular						Midgrade					
	Sales to End Users		Sales for Resale				Sales to End Users		Sales for Resale			
	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total
United States												
November 2006	45,109.5	46,307.2	34,984.4	195,329.6	31,904.2	262,218.1	6,049.4	6,116.4	2,351.5	11,172.9	–	13,524.4
October 2006	46,308.9	47,471.1	33,856.4	194,761.3	35,954.4	264,572.0	6,174.4	6,245.6	2,244.1	11,318.4	–	13,562.4
November 2005	47,001.6	48,145.3	34,836.8	190,758.1	45,057.6	270,652.6	5,602.7	5,678.0	2,779.3	12,955.6	–	15,734.9

Table 1 continue .... Volumes by Grade, Sales Type, PAD District, and State

(Thousand Gallons per Day) — Continued

Geographic Area Month	Premium						All Grades					
	Sales to End Users		Sales for Resale				Sales to End Users		Sales for Resale			
	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total
United States												
November 2006	5,014.9	5,154.0	7,381.6	20,803.2	2,722.2	30,907.0	56,173.8	57,577.5	44,717.5	227,305.7	34,626.3	306,649.5
October 2006	5,118.0	5,256.2	7,236.7	20,719.1	2,945.0	30,900.7	57,601.3	58,972.9	43,337.2	226,798.7	38,899.3	309,035.2
November 2005	5,123.1	5,271.3	7,469.8	20,249.6	2,177.3	29,896.7	57,727.4	59,094.7	45,085.9	223,963.3	47,234.9	316,284.1

Table 2: Gasoline Volumes by Formulation, Sales Type, PAD District, and State

(Thousand Gallons per Day)

Geographic Area Month	Conventional						Oxygenated					
	Sales to End Users		Sales for Resale				Sales to End Users		Sales for Resale			
	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total
United States												
November 2006	31,587.1	32,542.6	7,582.5	164,118.7	32,289.1	203,990.3	2,356.3	2,456.6	1,987.9	9,707.9	–	11,695.8
October 2006	32,839.1	33,779.2	7,805.6	164,138.6	35,224.7	207,168.9	1,849.7	1,947.0	1,330.7	9,054.5	–	10,385.2
November 2005	32,562.5	33,530.7	8,923.5	162,294.3	38,193.8	209,411.6	2,752.0	2,842.1	1,933.7	8,512.0	–	10,445.7

Table 2: continue .... Volumes by Formulation, Sales Type, PAD District, and State

(Thousand Gallons per Day) — Continued

Geographic Area Month	Reformulated						All Formulations					
	Sales to End Users		Sales for Resale				Sales to End Users		Sales for Resale			
	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total
United States												
November 2006	22,230.5	22,578.3	35,147.2	53,479.1	2,337.2	90,963.5	56,173.8	57,577.5	44,717.5	227,305.7	34,626.3	306,649.5
October 2006	22,912.6	23,246.7	34,200.9	53,605.6	3,674.6	91,481.1	57,601.3	58,972.9	43,337.2	226,798.7	38,899.3	309,035.2
November 2005	22,412.9	22,721.9	34,228.7	53,157.0	9,041.1	96,426.8	57,727.4	59,094.7	45,085.9	223,963.3	47,234.9	316,284.1

Appendix B

Part 1 – Complete Table available at: http://mysite.verizon.net/vze7w8vk/tableofcontents.pdf

Classical LP-Based Cell Suppresion vs CTA

Classical LP/CTA 01 regular

	DTW	Rack	Bulk	Total	←--- CTA Solution --→			
United States	188668.0	218471.0	170021.0	577160.0	-130.A	113.A	-61.A	-78.A
PAD District I	64625.0	72994.0	65620.0	203239.0	-8.A	69.A	-143.A	-82.A
Subdistrict IA	25314.0	28780.0	16952.0	71046.0	-8.A	8.A	0.	0.
Connecticut	6258.0	1494.0	1700.0	9452.0	0.	0.	0.	0.
Maine	3936.0	4719.0	4429.0	13084.0	0.	0.	0.	0.
Massachusetts	172.0 w	3840.0 s	.0	4012.0	-8.w	8.A	0.	0.
New Hampshire	7879.0	.0	3188.0	11067.0	0.	0.	0.	0.
Rhode Island	1748.0 s	6224.0 s	3976.0	11948.0	0.	0.	0.	0.
Vermont	5321.0	12503.0	3659.0	21483.0	0.	0.	0.	0.
Subdistrict IB	19417.0	16493.0	22335.0	58245.0	0.	48.A	-61.A	-13.A
Delaware	6978.0	2400.0	4272.0	13650.0	0.	48.A	0.	48.A
District of Columbia	2253.0	5070.0	11338.0	18661.0	0.	0.	0.	0.
Maryland	3311.0	1836.0 s	1079.0 w	6226.0	0.	0.	-60.w	-60.A
New Jersey	6875.0	.0	144.0	7019.0	0.	0.	0.	0.
New York	.0	648.0 s	784.0 w	1432.0	0.	0.	-39.w	-39.A
Pennsylvania	.0	6539.0	4718.0	11257.0	0.	0.	38.A	38.A
Subdistrict IC	19894.0	27721.0	26333.0	73948.0	0.	13.A	-82.A	-69.A
Florida	.0	10857.0	1847.0	12704.0	0.	0.	-17.A	-17.A
Georgia	9961.0	.0	.0	9961.0	0.	0.	0.	0.
North Carolina	2268.0 s	7226.0 s	8464.0 s	17958.0	0.	13.A	-65.A	-52.A
South Carolina	1195.0	5887.0	7582.0	14664.0	0.	0.	0.	0.
Virginia	3560.0	.0	3625.0	7185.0	0.	0.	0.	0.
West Virginia	2910.0 s	3751.0 s	4815.0 s	11476.0	0.	0.	0.	0.
PAD District II	76174.0	62147.0	54796.0	193117.0	-71.A	0.	126.A	55.A
Illinois	4128.0	.0	.0	4128.0	0.	0.	0.	0.
Indiana	4613.0 s	.0	3846.0 s	8459.0 s	-14.A	0.	14.A	0.
Iowa	1149.0	4196.0	4216.0 s	9561.0 s	0.	0.	0.	0.
Kansas	11996.0	10330.0	1948.0	24274.0	-57.A	0.	112.A	55.A
Kentucky	5826.0 s	2787.0 s	6523.0	15136.0	0.	0.	0.	0.
Michigan	2022.0 s	.0	6668.0 s	8690.0	0.	0.	0.	0.
Minnesota	6400.0	3694.0	1332.0	11426.0	0.	0.	0.	0.
Missouri	5915.0	10385.0	3934.0	20234.0	0.	0.	0.	0.
Nebraska	2652.0	7667.0	942.0	11261.0	0.	0.	0.	0.
North Dakota	4671.0	8286.0	.0	12957.0	0.	0.	0.	0.
Ohio	7197.0	.0	3477.0	10674.0	0.	0.	0.	0.
Oklahoma	4030.0	1864.0	4339.0	10233.0	0.	0.	0.	0.
South Dakota	24.0	11013.0	5526.0	16563.0	0.	0.	0.	0.
Tennessee	2242.0	645.0	8325.0	11212.0	0.	0.	0.	0.
Wisconsin	13309.0	1280.0 s	3720.0 s	18309.0	0.	0.	0.	0.
PAD District III	15248.0	23726.0	26417.0	65391.0	0.	-19.A	0.	-19.A
Alabama	3504.0	259.0 w	2856.0 s	6619.0	0.	25.w	0.	25.A
Arkansas	1598.0	5628.0	6358.0	13584.0	0.	0.	0.	0.
Louisiana	.0	3088.0 s	4667.0 s	7755.0	0.	0.	0.	0.
Mississippi	666.0	8925.0	2980.0	12571.0	0.	0.	0.	0.
New Mexico	8410.0	4928.0	6696.0	20034.0	0.	0.	0.	0.
Texas	1070.0	898.0 w	2860.0 s	4828.0	0.	-44.w	0.	-44.A
PAD District IV	13561.0	23112.0	8479.0	45152.0	-51.A	132.A	-44.A	37.A
Colorado	.0	8772.0	5637.0	14409.0	0.	0.	0.	0.
Idaho	925.0 s	940.0 w	890.0 w	2755.0 s	0.	94.w	-44.w	50.A
Montana	514.0 w	7358.0 s	.0	7872.0 s	-51.w	0.	0.	-51.A
Utah	5676.0 s	382.0 w	.0	6058.0 s	0.	38.w	0.	38.A
Wyoming	6446.0 s	5660.0 s	1952.0 s	14058.0	0.	0.	0.	0.
PAD District V	19060.0	36492.0	14709.0	70261.0	0.	-69.A	0.	-69.A
Alaska	.0	7948.0	4300.0	12248.0	0.	0.	0.	0.
Arizona	2721.0	828.0	2189.0	5738.0	0.	0.	0.	0.
California	3792.0	3728.0	2251.0	9771.0	0.	-69.A	0.	-69.A
Hawaii	1038.0	6141.0	327.0	7506.0	0.	0.	0.	0.
Nevada	2555.0	3522.0	.0	6077.0	0.	0.	0.	0.
Oregon	.0	14325.0	3040.0	17365.0	0.	0.	0.	0.
Washington	8954.0	.0	2602.0	11556.0	0.	0.	0.	0.

Appendix B

Part 2- Complete Table available at: http://mysite.verizon.net/vze7w8vk/tableofcontents.pdf

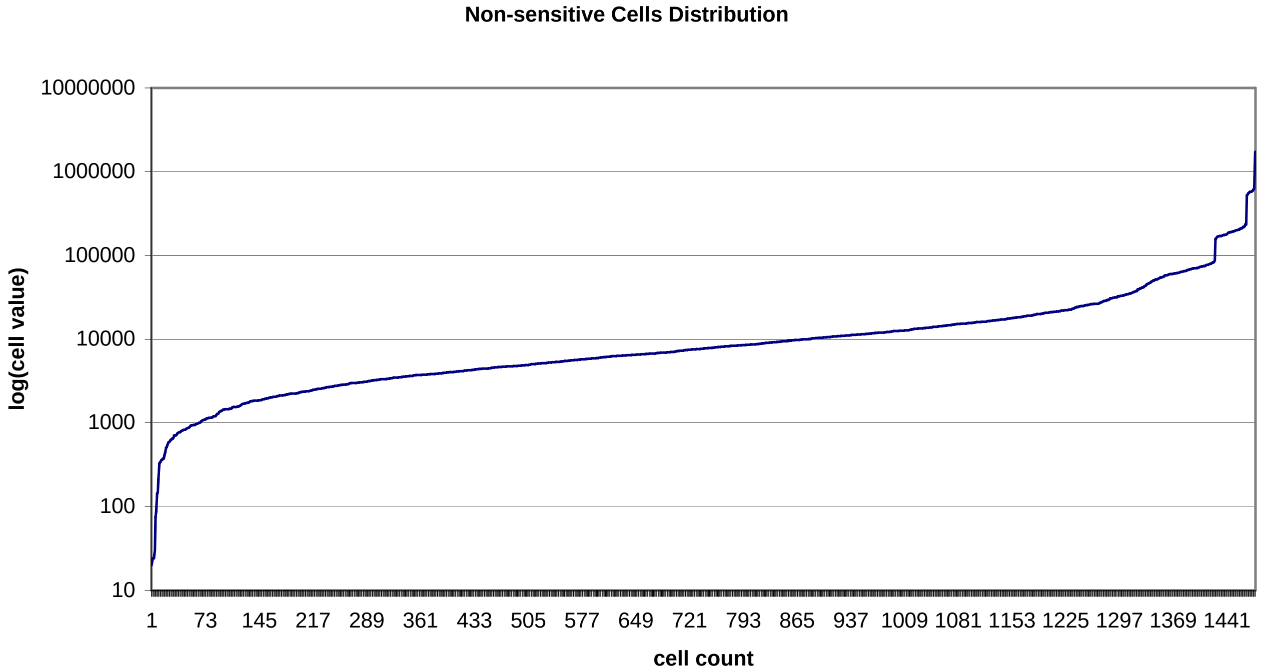
DiAna Cell Suppression Pattern vs Noise Addition

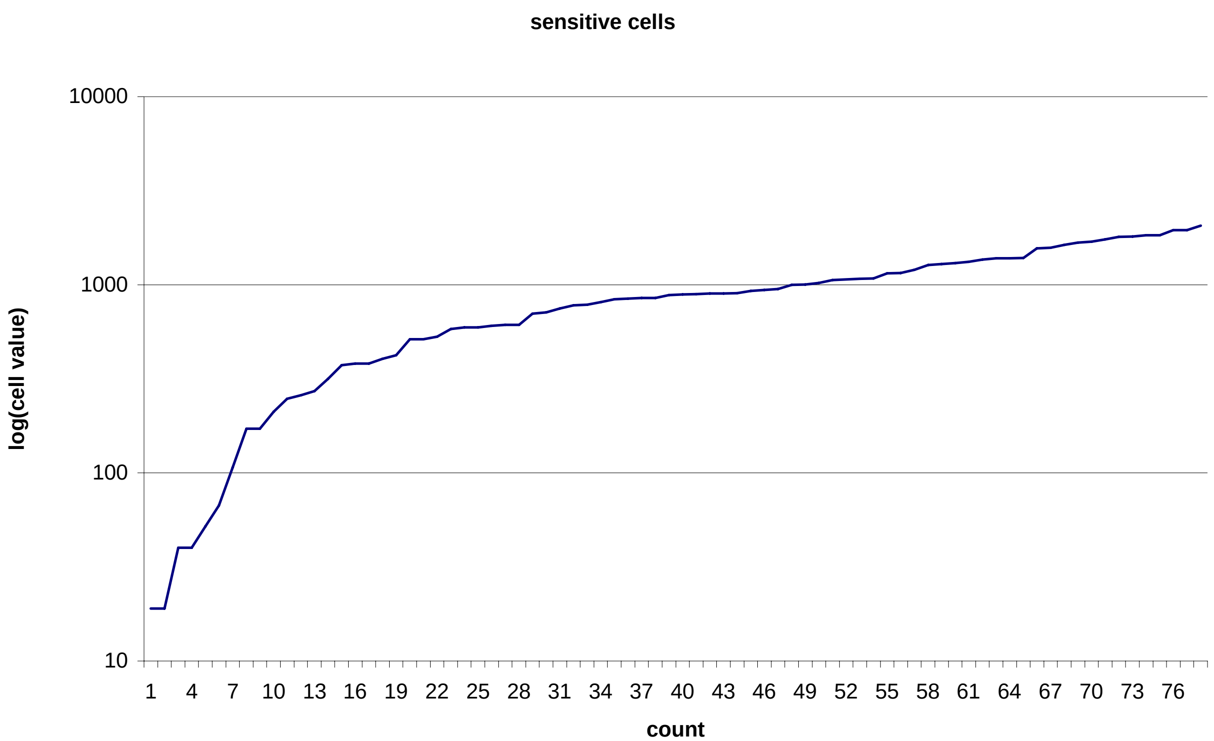
Diana/Noise 01 regular

	DTW		Rack		Bulk		Total		<--- Census' Noise Method-->			
United States	188668.		218471.		170021.		577160.		-16.	357.	81.	422.
PAD District I	64625.		72994.		65620.		203239.		-144.	219.	-53.	22.
Subdistrict IA	25314.		28780.		16952.		71046.		-267.	-115.	83.	-300.
Connecticut	6258.	C	1494.	C	1700.		9452.		-161.	-26.	-35.	-222.
Maine	3936.		4719.		4429.		13084.		150.	-69.	64.	145.
Massachusetts	172.	P	3840.	C	.		4012.		-9.	-65.	0.	-74.
New Hampshire	7879.		.		3188.		11067.		-159.	0.	81.	-78.
Rhode Island	1748.		6224.		3976.		11948.		-53.	143.	79.	168.
Vermont	5321.	C	12503.	C	3659.		21483.		-34.	-98.	-106.	-238.
Subdistrict IB	19417.		16493.		22335.		58245.		123.	51.	-137.	38.
Delaware	6978.	C	2400.	C	4272.		13650.		133.	19.	47.	200.
District of Columbia	2253.		5070.		11338.		18661.		-53.	85.	86.	118.
Maryland	3311.	C	1836.	C	1079.	P	6226.		-120.	-46.	-110.	-275.
New Jersey	6875.	C	.		144.	C	7019.		163.	0.	5.	168.
New York	.		648.	C	784.	P	1432.		0.	22.	-41.	-19.
Pennsylvania	.		6539.		4718.		11257.		0.	-30.	-124.	-154.
Subdistrict IC	19894.		27721.		26333.		73948.		0.	283.	1.	284.
Florida	.		10857.	C	1847.	C	12704.		0.	15.	-15.	1.
Georgia	9961.		.		.		9961.		93.	0.	0.	93.
North Carolina	2268.		7226.	C	8464.	C	17958.		94.	205.	-49.	250.
South Carolina	1195.		5887.		7582.		14664.		25.	-5.	165.	186.
Virginia	3560.		.		3625.		7185.		-187.	0.	-112.	-298.
West Virginia	2910.		3751.	C	4815.	C	11476.		-26.	68.	10.	52.
PAD District II	76174.		62147.		54796.		193117.		12.	186.	22.	220.
Illinois	4128.		.		.		4128.		154.	0.	0.	154.
Indiana	4613.		.		3846.	C	8459.	C	158.	0.	-112.	46.
Iowa	1149.	C	4196.	C	4216.	C	9561.		50.	-49.	60.	62.
Kansas	11996.		10330.		1948.		24274.		-62.	-156.	21.	-197.
Kentucky	5826.	C	2787.	C	6523.	C	15136.		106.	61.	-73.	94.
Michigan	2022.	C	.		6668.	C	8690.	C	73.	0.	-158.	-85.
Minnesota	6400.		3694.		1332.		11426.		-145.	110.	37.	2.
Missouri	5915.		10385.		3934.		20234.		-195.	46.	13.	-136.
Nebraska	2652.		7667.		942.		11261.		-80.	148.	32.	100.
North Dakota	4671.		8286.		.		12957.		30.	-18.	0.	12.
Ohio	7197.		.		3477.		10674.		-101.	0.	-40.	-141.
Oklahoma	4030.		1864.		4339.		10233.		46.	-52.	82.	76.
South Dakota	24.		11013.		5526.		16563.		1.	75.	94.	170.
Tennessee	2242.	C	645.	C	8325.		11212.		-70.	-14.	157.	73.
Wisconsin	13309.		1280.		3720.		18309.		47.	35.	-91.	-9.
PAD District III	15248.		23726.		26417.		65391.		30.	-233.	181.	-22.
Alabama	3504.	C	259.	P	2856.		6619.		-94.	-26.	-51.	-171.
Arkansas	1598.		5628.		6358.		13584.		11.	-43.	80.	48.
Louisiana	.		3088.	C	4667.	C	7755.		0.	-21.	115.	94.
Mississippi	666.	C	8925.	C	2980.		12571.		-23.	-218.	-155.	-396.
New Mexico	8410.		4928.		6696.		20034.		158.	121.	111.	389.
Texas	1070.	C	898.	P	2860.	C	4828.		-22.	-46.	81.	14.
PAD District IV	13561.		23112.		8479.		45152.		-106.	-133.	228.	-11.
Colorado	.		8772.		5637.		14409.		0.	-116.	129.	13.
Idaho	925.	C	940.	P	890.	P	2755.	C	-19.	100.	49.	131.
Montana	514.	P	7358.	C	.		7872.		53.	-23.	0.	30.
Utah	5676.	C	382.	P	.		6058.		-99.	-39.	0.	-138.
Wyoming	6446.		5660.	C	1952.	C	14058.	C	-41.	-54.	49.	-46.
PAD District V	19060.		36492.		14709.		70261.		192.	318.	-297.	213.
Alaska	.		7948.		4300.		12248.		0.	36.	-87.	-51.
Arizona	2721.	C	828.	C	2189.	C	5738.		82.	29.	-67.	44.
California	3792.		3728.	C	2251.	C	9771.		-84.	97.	-61.	-48.
Hawaii	1038.	C	6141.		327.	C	7506.		76.	-196.	11.	-108.
Nevada	2555.	C	3522.	C	.		6077.		-19.	56.	0.	37.
Oregon	.		14325.		3040.		17365.		0.	297.	-64.	233.
Washington	8954.		.		2602.		11556.		136.	0.	-30.	106.

Appendix C

Linked Tables 1 and 2 Cell Distribution





APPENDIX D

SUMMARY PERFORMANCE STATISTICS

TWO 3-D LINKED TABLES / 4-D ENTIRE TABLE

NETWORK FLOW MODEL

Two 3-D Linked Tables

- 28 Column Variables
- 15 Column Relations
- 78 Sensitive Cells
- 479 Suppressions
- 31% Suppressions
- 1077 Published

4-D Entire Table

- 64 Column Variables
- 48 Column Relations
- 267 Sensitive Cells
- 1844 Suppressions
- 62% Suppressed
- 1149 Published

CLASSICAL CELL SUPPRESSION

Two 3-D Linked Tables

- 1556 Non-Zero Cells
- 2707 Equations
- 78 Sensitive Cells
- 294 Suppressions
- 19% Suppressions
- 1282 Published

4-D Entire Table

- 2993 Non-Zero Cells
- 6273 Equations
- 267 Sensitive Cells
- 1143 Suppressions
- 38% Suppressions
- 1850 Published

CONTROLLED TABULAR ADJUSTMENT

Two 3-D Linked Tables

% FROM	% TO	NONSENSITIVE	SENSITIVE
.00–	.10	1235	0
.10–	.50	137	1
.50–	1.00	60	0
1.00–	1.50	15	0
1.50–	2.00	14	1
2.00–	5.00	14	50
5.00–	10.00	3	26
10.00–	15.00	0	0
15.00–	30.00	0	0
30.00–	100.00	0	0
1432 GOOD QUALITY		124 POOR QUALITY	

4-D Entire Table

% FROM	% TO	NON-SENSITIVE	SENSITIVE
.00 –	.10	1803	0
.10 –	.50	438	1
.50 –	1.00	214	0
1.00 –	1.50	97	1
1.50 –	2.00	59	0
2.00 –	5.00	103	171
5.00 –	10.00	12	94
10.00 –	15.00	0	0
15.00 –	30.00	0	0
30.00 –	100.00	0	0
2455 GOOD QUALITY		538 POOR QUALITY	

MICRO DATA LEVEL NOISE ADDITION

Two 3-D Linked Tables

% FROM	% TO	NONSENSITIVE	SENSITIVE
.00–	.10	96	1
.10–	.50	272	0
.50–	1.00	265	0
1.00–	1.50	215	0
1.50–	2.00	164	0
2.00–	5.00	439	2
5.00–	10.00	72	51
10.00–	15.00	0	24
15.00–	30.00	0	0
30.00–	100.00	0	0
633 GOOD QUALITY		923 POOR QUALITY	

4-D Entire Table

% FROM	% TO	NONSENSITIVE	SENSITIVE
.00–	.10	137	1
.10–	.50	416	0
.50–	1.00	400	0
1.00–	1.50	334	0
1.50–	2.00	322	0
2.00–	5.00	1069	2
5.00–	10.00	48	172
10.00–	15.00	0	92
15.00–	30.00	0	0
30.00–	100.00	0	0
953 GOOD QUALITY		2040 POOR QUALITY	

Comparative Evaluation of Four Different Sensitive Tabular Data Protection Methods

Using Real Life Table Structure containing two 3-D Hierarchical and Linked Tables in 4-D Space

Table of Contents

NOTATIONS: w, p = Sensitive Cell
s = Complementary Cell Suppression
A = Adjustment to non-sensitive cell

Comparative Evaluation Of FOUR Different Sensitive Tabular Data Protection Methods

LP-Based Classic Cell Suppression Vs Controlled Tabular Adjustments
And
Network Flow-Based Cell Suppression Vs Census' Noise Addition Method

Using Linked Tables 1 & 2 Table Structure and "Totally Unreal Data"
P= 10%
Guidance Matrix:
1 1 1 0
1 1 0 1

First Table

TABLE 1: VOLUMES BY *GRADE,* SALES TYPE, PAD DISTRICT, AND STATE

Geographic Area	Regular				Mid-grade				Premium				All Grades			
	DTW	RACK	BULK	TOTAL	DTW	RACK	BULK	TOTAL	DTW	RACK	BULK	TOTAL	DTW	RACK	BULK	TOTAL
United States	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx

Second Table

TABLE 2: VOLUMES BY *FORMULATION,* SALES TYPE, PAD DISTRICT, AND STATE

Geographic Area	Conventional				Oxygenated				Reformulated				All Formulations			
	DTW	RACK	BULK	TOTAL	DTW	RACK	BULK	TOTAL	DTW	RACK	BULK	TOTAL	DTW	RACK	BULK	TOTAL
United States	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx

Classical LP-Based Cell Suppresion vs CTA

Classical LP/CTA 01 regular

	DTW	Rack	Bulk	Total	←--- CTA Solution --→			
United States	188668.0	218471.0	170021.0	577160.0	-130.A	113.A	-61.A	-78.A
PAD District I	64625.0	72994.0	65620.0	203239.0	-8.A	69.A	-143.A	-82.A
Subdistrict IA	25314.0	28780.0	16952.0	71046.0	-8.A	8.A	0.	0.
Connecticut	6258.0	1494.0	1700.0	9452.0	0.	0.	0.	0.
Maine	3936.0	4719.0	4429.0	13084.0	0.	0.	0.	0.
Massachusetts	172.0 w	3840.0 s	.0	4012.0	-8.w	8.A	0.	0.
New Hampshire	7879.0	.0	3188.0	11067.0	0.	0.	0.	0.
Rhode Island	1748.0 s	6224.0 s	3976.0	11948.0	0.	0.	0.	0.
Vermont	5321.0	12503.0	3659.0	21483.0	0.	0.	0.	0.
Subdistrict IB	19417.0	16493.0	22335.0	58245.0	0.	48.A	-61.A	-13.A
Delaware	6978.0	2400.0	4272.0	13650.0	0.	48.A	0.	48.A
District of Columbia	2253.0	5070.0	11338.0	18661.0	0.	0.	0.	0.
Maryland	3311.0	1836.0 s	1079.0 w	6226.0	0.	0.	-60.w	-60.A
New Jersey	6875.0	.0	144.0	7019.0	0.	0.	0.	0.
New York	.0	648.0 s	784.0 w	1432.0	0.	0.	-39.w	-39.A
Pennsylvania	.0	6539.0	4718.0	11257.0	0.	0.	38.A	38.A
Subdistrict IC	19894.0	27721.0	26333.0	73948.0	0.	13.A	-82.A	-69.A
Florida	.0	10857.0	1847.0	12704.0	0.	0.	-17.A	-17.A
Georgia	9961.0	.0	.0	9961.0	0.	0.	0.	0.
North Carolina	2268.0 s	7226.0 s	8464.0 s	17958.0	0.	13.A	-65.A	-52.A
South Carolina	1195.0	5887.0	7582.0	14664.0	0.	0.	0.	0.
Virginia	3560.0	.0	3625.0	7185.0	0.	0.	0.	0.
West Virginia	2910.0 s	3751.0 s	4815.0 s	11476.0	0.	0.	0.	0.
PAD District II	76174.0	62147.0	54796.0	193117.0	-71.A	0.	126.A	55.A
Illinois	4128.0	.0	.0	4128.0	0.	0.	0.	0.
Indiana	4613.0 s	.0	3846.0 s	8459.0 s	-14.A	0.	14.A	0.
Iowa	1149.0	4196.0	4216.0 s	9561.0 s	0.	0.	0.	0.
Kansas	11996.0	10330.0	1948.0	24274.0	-57.A	0.	112.A	55.A
Kentucky	5826.0 s	2787.0 s	6523.0	15136.0	0.	0.	0.	0.
Michigan	2022.0 s	.0	6668.0 s	8690.0	0.	0.	0.	0.
Minnesota	6400.0	3694.0	1332.0	11426.0	0.	0.	0.	0.
Missouri	5915.0	10385.0	3934.0	20234.0	0.	0.	0.	0.
Nebraska	2652.0	7667.0	942.0	11261.0	0.	0.	0.	0.
North Dakota	4671.0	8286.0	.0	12957.0	0.	0.	0.	0.
Ohio	7197.0	.0	3477.0	10674.0	0.	0.	0.	0.
Oklahoma	4030.0	1864.0	4339.0	10233.0	0.	0.	0.	0.
South Dakota	24.0	11013.0	5526.0	16563.0	0.	0.	0.	0.
Tennessee	2242.0	645.0	8325.0	11212.0	0.	0.	0.	0.
Wisconsin	13309.0	1280.0 s	3720.0 s	18309.0	0.	0.	0.	0.
PAD District III	15248.0	23726.0	26417.0	65391.0	0.	-19.A	0.	-19.A
Alabama	3504.0	259.0 w	2856.0 s	6619.0	0.	25.w	0.	25.A
Arkansas	1598.0	5628.0	6358.0	13584.0	0.	0.	0.	0.
Louisiana	.0	3088.0 s	4667.0 s	7755.0	0.	0.	0.	0.
Mississippi	666.0	8925.0	2980.0	12571.0	0.	0.	0.	0.
New Mexico	8410.0	4928.0	6696.0	20034.0	0.	0.	0.	0.
Texas	1070.0	898.0 w	2860.0 s	4828.0	0.	-44.w	0.	-44.A
PAD District IV	13561.0	23112.0	8479.0	45152.0	-51.A	132.A	-44.A	37.A
Colorado	.0	8772.0	5637.0	14409.0	0.	0.	0.	0.
Idaho	925.0 s	940.0 w	890.0 w	2755.0 s	0.	94.w	-44.w	50.A
Montana	514.0 w	7358.0 s	.0	7872.0 s	-51.w	0.	0.	-51.A
Utah	5676.0 s	382.0 w	.0	6058.0 s	0.	38.w	0.	38.A
Wyoming	6446.0 s	5660.0 s	1952.0 s	14058.0	0.	0.	0.	0.
PAD District V	19060.0	36492.0	14709.0	70261.0	0.	-69.A	0.	-69.A
Alaska	.0	7948.0	4300.0	12248.0	0.	0.	0.	0.
Arizona	2721.0	828.0	2189.0	5738.0	0.	0.	0.	0.
California	3792.0	3728.0	2251.0	9771.0	0.	-69.A	0.	-69.A
Hawaii	1038.0	6141.0	327.0	7506.0	0.	0.	0.	0.
Nevada	2555.0	3522.0	.0	6077.0	0.	0.	0.	0.
Oregon	.0	14325.0	3040.0	17365.0	0.	0.	0.	0.
Washington	8954.0	.0	2602.0	11556.0	0.	0.	0.	0.

Classical LP/CTA 01 mid-grade

	DTW	Rack	Bulk	Total				
United States	234099.0	170421.0	209941.0	614461.0	-49.A	23.A	121.A	95.A
PAD District I	69006.0	60078.0	45675.0	174759.0	-49.A	-28.A	100.A	23.A
Subdistrict IA	23026.0	19648.0	17765.0	60439.0	-84.A	17.A	0.	-67.A
Connecticut	3672.0	10737.0	1551.0	15960.0	0.	0.	0.	0.
Maine	9886.0	2113.0	7014.0	19013.0	0.	0.	0.	0.
Massachusetts	1698.0 w	3405.0 s	.0	5103.0	-84.w	17.A	0.	-67.A
New Hampshire	1456.0	1743.0	8119.0	11318.0	0.	0.	0.	0.
Rhode Island	5604.0 s	755.0 s	.0	6359.0	0.	0.	0.	0.
Vermont	710.0	895.0	1081.0	2686.0	0.	0.	0.	0.
Subdistrict IB	33509.0	14578.0	12603.0	60690.0	0.	-32.A	18.A	-14.A
Delaware	1386.0	.0	3617.0	5003.0	0.	0.	0.	0.
District of Columbia	7460.0	4758.0	.0	12218.0	0.	0.	0.	0.
Maryland	.0	3902.0	4390.0	8292.0	0.	0.	18.A	18.A
New Jersey	4795.0	375.0 s	440.0 s	5610.0	0.	0.	0.	0.
New York	6434.0	2063.0 p	705.0 s	9202.0	0.	-32.p	0.	-32.A
Pennsylvania	13434.0	3480.0	3451.0	20365.0	0.	0.	0.	0.
Subdistrict IC	12471.0	25852.0	15307.0	53630.0	35.A	-13.A	82.A	104.A
Florida	3200.0 s	5264.0	1001.0 w	9465.0	0.	0.	82.w	82.A
Georgia	.0	2122.0	2661.0	4783.0	0.	0.	0.	0.
North Carolina	714.0 w	272.0 w	.0	986.0	35.w	-13.w	0.	22.A
South Carolina	345.0	14094.0	.0	14439.0	0.	0.	0.	0.
Virginia	4853.0	1724.0	8333.0	14910.0	0.	0.	0.	0.
West Virginia	3359.0 s	2376.0 s	3312.0 s	9047.0	0.	0.	0.	0.
PAD District II	74913.0	67732.0	78659.0	221304.0	1.A	101.A	-30.A	72.A
Illinois	316.0 w	14174.0 s	3750.0	18240.0	15.w	-14.A	0.	1.A
Indiana	839.0 w	14060.0	1905.0 s	16804.0	-83.w	0.	0.	-83.A
Iowa	3319.0	4704.0	12645.0	20668.0	0.	0.	0.	0.
Kansas	1390.0 w	7794.0	606.0 w	9790.0	69.w	0.	-30.w	39.A
Kentucky	3364.0 s	612.0 w	7962.0	11938.0	0.	61.w	0.	61.A
Michigan	9941.0 s	1080.0 w	.0	11021.0	0.	54.w	0.	54.A
Minnesota	6756.0	3833.0	22520.0	33109.0	0.	0.	0.	0.
Missouri	5075.0	1769.0	3330.0	10174.0	0.	0.	0.	0.
Nebraska	16463.0	1526.0	4481.0	22470.0	0.	0.	0.	0.
North Dakota	5772.0	5558.0	8154.0	19484.0	0.	0.	0.	0.
Ohio	10728.0	6112.0	5048.0	21888.0	0.	0.	0.	0.
Oklahoma	1480.0	3090.0	3276.0	7846.0	0.	0.	0.	0.
South Dakota	.0	1153.0	4227.0	5380.0	0.	0.	0.	0.
Tennessee	.0	1448.0	543.0	1991.0	0.	0.	0.	0.
Wisconsin	9470.0	819.0 s	212.0 s	10501.0	0.	0.	0.	0.
PAD District III	33192.0	13706.0	35889.0	82787.0	0.	0.	18.A	18.A
Alabama	9144.0	75.0	9977.0	19196.0	0.	0.	0.	0.
Arkansas	.0	.0	1448.0	1448.0	0.	0.	0.	0.
Louisiana	5772.0	3596.0	9797.0	19165.0	0.	0.	57.A	57.A
Mississippi	5261.0	6399.0	2330.0	13990.0	0.	0.	0.	0.
New Mexico	8475.0	3636.0	10033.0	22144.0	0.	0.	0.	0.
Texas	4540.0	.0	2304.0	6844.0	0.	0.	-39.A	-39.A
PAD District IV	26384.0	13793.0	33824.0	74001.0	0.	-50.A	44.A	-6.A
Colorado	9457.0	4440.0	8352.0	22249.0	0.	0.	0.	0.
Idaho	6351.0 s	9353.0	8846.0 s	24550.0	0.	-50.A	44.A	-6.A
Montana	6344.0	.0	11850.0	18194.0	0.	0.	0.	0.
Utah	4232.0 s	.0	4776.0 s	9008.0	0.	0.	0.	0.
Wyoming	.0	.0	.0	.0	0.	0.	0.	0.
PAD District V	30604.0	15112.0	15894.0	61610.0	-1.A	0.	-11.A	-12.A
Alaska	6939.0	.0	3871.0	10810.0	0.	0.	0.	0.
Arizona	583.0 s	.0	363.0 s	946.0	0.	0.	0.	0.
California	5734.0 s	3083.0 s	6579.0	15396.0	0.	0.	0.	0.
Hawaii	9123.0	147.0	2664.0	11934.0	2.A	0.	0.	2.A
Nevada	582.0 w	2606.0	2013.0 s	5201.0	-29.w	0.	29.A	0.
Oregon	4585.0	6009.0	.0	10594.0	26.A	0.	0.	26.A
Washington	3058.0	3267.0 s	404.0 w	6729.0	0.	0.	-40.w	-40.A

Classical LP/CTA 01 premium

	DTW	Rack	Bulk	Total				
United States	169122.0	166813.0	193519.0	529454.0	147.A	-236.A	72.A	-17.A
PAD District I	69900.0	54199.0	57812.0	181911.0	49.A	-16.A	81.A	114.A
Subdistrict IA	28875.0	16615.0	24200.0	69690.0	84.A	0.	0.	84.A
Connecticut	6821.0	1550.0	5602.0	13973.0	0.	0.	0.	0.
Maine	6874.0	.0	4584.0	11458.0	0.	0.	0.	0.
Massachusetts	2151.0	4280.0	4116.0	10547.0	84.A	0.	0.	84.A
New Hampshire	7900.0	5311.0	2128.0	15339.0	0.	0.	0.	0.
Rhode Island	3065.0	5474.0	2588.0	11127.0	0.	0.	0.	0.
Vermont	2064.0	.0	5182.0	7246.0	0.	0.	0.	0.
Subdistrict IB	21910.0	12103.0	17624.0	51637.0	0.	-16.A	81.A	65.A
Delaware	6632.0	804.0	3168.0	10604.0	0.	0.	0.	0.
District of Columbia	4860.0	1540.0	4012.0	10412.0	0.	0.	0.	0.
Maryland	.0	852.0 w	996.0 s	1848.0	0.	-42.w	42.A	0.
New Jersey	7186.0	625.0 s	3832.0 s	11643.0	0.	0.	0.	0.
New York	3232.0	6328.0	4740.0	14300.0	0.	26.A	39.A	65.A
Pennsylvania	.0	1954.0	876.0	2830.0	0.	0.	0.	0.
Subdistrict IC	19115.0	25481.0	15988.0	60584.0	-35.A	0.	0.	-35.A
Florida	3520.0 s	5429.0	1571.0 s	10520.0	0.	0.	-65.A	-65.A
Georgia	8613.0	2355.0	6603.0	17571.0	0.	0.	0.	0.
North Carolina	1126.0 s	.0	1306.0 w	2432.0	-35.A	0.	65.w	30.A
South Carolina	.0	11093.0	.0	11093.0	0.	0.	0.	0.
Virginia	2480.0	4088.0	.0	6568.0	0.	0.	0.	0.
West Virginia	3376.0 s	2516.0	6508.0 s	12400.0	0.	0.	0.	0.
PAD District II	48832.0	45882.0	63611.0	158325.0	97.A	-114.A	-82.A	-99.A
Illinois	4053.0 s	1200.0 w	11969.0	17222.0	0.	-60.w	0.	-60.A
Indiana	1950.0 w	.0	.0	1950.0 w	97.w	0.	0.	97.w
Iowa	412.0	5898.0	3872.0 s	10182.0 s	0.	0.	0.	0.
Kansas	3393.0 s	.0	1632.0 w	5025.0	0.	0.	-82.w	-82.A
Kentucky	.0	2984.0	4635.0	7619.0	0.	0.	0.	0.
Michigan	.0	1905.0 s	3830.0 s	5735.0	0.	-54.A	0.	-54.A
Minnesota	8071.0	5144.0	2368.0	15583.0	0.	0.	0.	0.
Missouri	4555.0	20.0	.0	4575.0	0.	0.	0.	0.
Nebraska	6310.0	5357.0	12187.0	23854.0	0.	0.	0.	0.
North Dakota	.0	8633.0	.0	8633.0	0.	0.	0.	0.
Ohio	6693.0	4371.0	6707.0	17771.0	0.	0.	0.	0.
Oklahoma	11318.0	3617.0	2664.0	17599.0	0.	0.	0.	0.
South Dakota	.0	504.0	6908.0	7412.0	0.	0.	0.	0.
Tennessee	.0	2235.0	4466.0	6701.0	0.	0.	0.	0.
Wisconsin	2077.0	4014.0 s	2373.0 s	8464.0	0.	0.	0.	0.
PAD District III	21321.0	26517.0	17132.0	64970.0	0.	-25.A	33.A	8.A
Alabama	2684.0	4674.0 s	865.0 s	8223.0	0.	-25.A	0.	-25.A
Arkansas	4400.0	9815.0	4856.0	19071.0	0.	0.	0.	0.
Louisiana	1730.0	5322.0 s	1150.0 w	8202.0	0.	0.	-57.w	-57.A
Mississippi	1010.0	792.0	.0	1802.0	0.	0.	0.	0.
New Mexico	5218.0	4822.0	8455.0	18495.0	0.	0.	0.	0.
Texas	6279.0	1092.0 s	1806.0 w	9177.0	0.	0.	90.w	90.A
PAD District IV	11355.0	9475.0	26290.0	47120.0	0.	-160.A	0.	-160.A
Colorado	2751.0	1456.0	9460.0	13667.0	0.	0.	0.	0.
Idaho	.0	3260.0 s	.0	3260.0 s	0.	0.	0.	0.
Montana	.0	1382.0 w	10045.0	11427.0 s	0.	-69.w	0.	-69.A
Utah	3720.0	1539.0 s	6016.0 s	11275.0 s	0.	0.	0.	0.
Wyoming	4884.0	1838.0 w	769.0 s	7491.0	0.	-91.w	0.	-91.A
PAD District V	17714.0	30740.0	28674.0	77128.0	1.A	79.A	40.A	120.A
Alaska	19.0	6998.0	5252.0	12269.0	1.w	0.	0.	1.A
Arizona	1120.0 s	.0	30.0 s	1150.0	0.	0.	0.	0.
California	3039.0 s	902.0 w	2412.0	6353.0	0.	79.w	0.	79.A
Hawaii	3736.0	2046.0	6026.0	11808.0	0.	0.	0.	0.
Nevada	2337.0 s	8188.0	6314.0 s	16839.0	0.	0.	0.	0.
Oregon	3038.0	12519.0	5168.0	20725.0	0.	0.	0.	0.
Washington	4425.0	87.0 s	3472.0 s	7984.0	0.	0.	40.A	40.A

Classical LP/CTA 01 All Grade

	DTW	Rack	Bulk	Total				
United States	591889.0	555705.0	573481.0	1721075.0	-32.A	-100.A	132.A	0.
PAD District I	203531.0	187271.0	169107.0	559909.0	-8.A	25.A	38.A	55.A
Subdistrict IA	77215.0	65043.0	58917.0	201175.0	-8.A	25.A	0.	17.A
Connecticut	16751.0	13781.0	8853.0	39385.0	0.	0.	0.	0.
Maine	20696.0	6832.0	16027.0	43555.0	0.	0.	0.	0.
Massachusetts	4021.0	11525.0	4116.0	19662.0	-8.A	25.A	0.	17.A
New Hampshire	17235.0	7054.0	13435.0	37724.0	0.	0.	0.	0.
Rhode Island	10417.0	12453.0	6564.0	29434.0	0.	0.	0.	0.
Vermont	8095.0	13398.0	9922.0	31415.0	0.	0.	0.	0.
Subdistrict IB	74836.0	43174.0	52562.0	170572.0	0.	0.	38.A	38.A
Delaware	14996.0	3204.0	11057.0	29257.0	0.	48.A	0.	48.A
District of Columbia	14573.0	11368.0	15350.0	41291.0	0.	0.	0.	0.
Maryland	3311.0	6590.0	6465.0	16366.0	0.	-42.A	0.	-42.A
New Jersey	18856.0	1000.0	4416.0	24272.0	0.	0.	0.	0.
New York	9666.0	9039.0	6229.0	24934.0	0.	-6.A	0.	-6.A
Pennsylvania	13434.0	11973.0	9045.0	34452.0	0.	0.	38.A	38.A
Subdistrict IC	51480.0	79054.0	57628.0	188162.0	0.	0.	0.	0.
Florida	6720.0	21550.0	4419.0	32689.0	0.	0.	0.	0.
Georgia	18574.0	4477.0	9264.0	32315.0	0.	0.	0.	0.
North Carolina	4108.0	7498.0	9770.0	21376.0	0.	0.	0.	0.
South Carolina	1540.0	31074.0	7582.0	40196.0	0.	0.	0.	0.
Virginia	10893.0	5812.0	11958.0	28663.0	0.	0.	0.	0.
West Virginia	9645.0	8643.0	14635.0	32923.0	0.	0.	0.	0.
PAD District II	199919.0	175761.0	197066.0	572746.0	27.A	-13.A	14.A	28.A
Illinois	8497.0	15374.0	15719.0	39590.0	15.A	-74.A	0.	-59.A
Indiana	7402.0	14060.0	5751.0	27213.0	0.	0.	14.A	14.A
Iowa	4880.0	14798.0	20733.0	40411.0	0.	0.	0.	0.
Kansas	16779.0	18124.0	4186.0	39089.0	12.A	0.	0.	12.A
Kentucky	9190.0	6383.0	19120.0	34693.0	0.	61.A	0.	61.A
Michigan	11963.0	2985.0	10498.0	25446.0	0.	0.	0.	0.
Minnesota	21227.0	12671.0	26220.0	60118.0	0.	0.	0.	0.
Missouri	15545.0	12174.0	7264.0	34983.0	0.	0.	0.	0.
Nebraska	25425.0	14550.0	17610.0	57585.0	0.	0.	0.	0.
North Dakota	10443.0	22477.0	8154.0	41074.0	0.	0.	0.	0.
Ohio	24618.0	10483.0	15232.0	50333.0	0.	0.	0.	0.
Oklahoma	16828.0	8571.0	10279.0	35678.0	0.	0.	0.	0.
South Dakota	24.0	12670.0	16661.0	29355.0	0.	0.	0.	0.
Tennessee	2242.0	4328.0	13334.0	19904.0	0.	0.	0.	0.
Wisconsin	24856.0	6113.0	6305.0	37274.0	0.	0.	0.	0.
PAD District III	69761.0	63949.0	79438.0	213148.0	0.	-44.A	51.A	7.A
Alabama	15332.0	5008.0	13698.0	34038.0	0.	0.	0.	0.
Arkansas	5998.0	15443.0	12662.0	34103.0	0.	0.	0.	0.
Louisiana	7502.0	12006.0	15614.0	35122.0	0.	0.	0.	0.
Mississippi	6937.0	16116.0	5310.0	28363.0	0.	0.	0.	0.
New Mexico	22103.0	13386.0	25184.0	60673.0	0.	0.	0.	0.
Texas	11889.0	1990.0	6970.0	20849.0	0.	-44.A	51.A	7.A
PAD District IV	51300.0	46380.0	68593.0	166273.0	-51.A	-78.A	0.	-129.A
Colorado	12208.0	14668.0	23449.0	50325.0	0.	0.	0.	0.
Idaho	7276.0	13553.0	9736.0	30565.0	0.	44.A	0.	44.A
Montana	6858.0 s	8740.0 s	21895.0	37493.0	-51.A	-69.A	0.	-120.A
Utah	13628.0	1921.0 s	10792.0 s	26341.0	0.	38.A	0.	38.A
Wyoming	11330.0 s	7498.0 s	2721.0 s	21549.0	0.	-91.A	0.	-91.A
PAD District V	67378.0	82344.0	59277.0	208999.0	0.	10.A	29.A	39.A
Alaska	6958.0	14946.0	13423.0	35327.0	1.A	0.	0.	1.A
Arizona	4424.0	828.0	2582.0	7834.0	0.	0.	0.	0.
California	12565.0	7713.0	11242.0	31520.0	0.	10.A	0.	10.A
Hawaii	13897.0	8334.0	9017.0	31248.0	2.A	0.	0.	2.A
Nevada	5474.0	14316.0	8327.0	28117.0	-29.A	0.	29.A	0.
Oregon	7623.0	32853.0	8208.0	48684.0	26.A	0.	0.	26.A
Washington	16437.0	3354.0	6478.0	26269.0	0.	0.	0.	0.

Classical LP/CTA 02 Conventional

	DTW		Rack		Bulk		Total				
United States	233472.0		200510.0		189281.0		623263.0	-175.A	-286.A	-20.A	-481.A
PAD District I	68198.0		70091.0		55844.0		194133.0	-21.A	-107.A	45.A	-83.A
Subdistrict IA	18833.0		32486.0		16044.0		67363.0	0.	-77.A	45.A	-32.A
Connecticut	5274.0		6611.0	s	4129.0	s	16014.0	0.	0.	0.	0.
Maine	1672.0		3008.0		.0		4680.0	0.	0.	0.	0.
Massachusetts	2010.0		6548.0		.0		8558.0	0.	0.	0.	0.
New Hampshire	6069.0		374.0	w	2232.0	s	8675.0	0.	-18.w	0.	-18.A
Rhode Island	3808.0		9506.0		2815.0		16129.0	0.	-59.A	0.	-59.A
Vermont	.0		6439.0		6868.0		13307.0	0.	0.	45.A	45.A
Subdistrict IB	24411.0		9950.0		20109.0		54470.0	0.	-26.A	0.	-26.A
Delaware	2184.0		1840.0	s	1804.0	s	5828.0	0.	-20.A	0.	-20.A
District of Columbia	3892.0		.0		7340.0		11232.0	0.	0.	0.	0.
Maryland	.0		5738.0	s	1941.0	s	7679.0	0.	0.	0.	0.
New Jersey	5261.0		625.0		.0		5886.0	0.	0.	0.	0.
New York	3705.0		67.0	w	4780.0	s	8552.0	0.	-6.w	0.	-6.A
Pennsylvania	9369.0		1680.0	s	4244.0	s	15293.0	0.	0.	0.	0.
Subdistrict IC	24954.0		27655.0		19691.0		72300.0	-21.A	-4.A	0.	-25.A
Florida	5865.0		12510.0		1613.0		19988.0	0.	0.	0.	0.
Georgia	10443.0		2122.0		6223.0		18788.0	25.A	-88.A	0.	-63.A
North Carolina	930.0	w	845.0	w	4633.0	s	6408.0	-46.w	84.w	0.	38.A
South Carolina	.0		9802.0		.0		9802.0	0.	0.	0.	0.
Virginia	4216.0		.0		2486.0		6702.0	0.	0.	0.	0.
West Virginia	3500.0	s	2376.0	s	4736.0	s	10612.0	0.	0.	0.	0.
PAD District II	81809.0		63212.0		73202.0		218223.0	14.A	-29.A	14.A	-1.A
Illinois	7240.0	s	5456.0	s	2975.0		15671.0	15.A	0.	0.	15.A
Indiana	1288.0	w	5561.0		1680.0	w	8529.0	-64.w	0.	84.w	20.A
Iowa	596.0		5008.0		10282.0		15886.0	0.	0.	0.	0.
Kansas	2756.0		5844.0		3130.0		11730.0	0.	0.	-68.A	-68.A
Kentucky	.0		612.0	w	9280.0	s	9892.0	0.	61.w	0.	61.A
Michigan	4351.0	s	1800.0	w	8260.0		14411.0	0.	-90.w	0.	-90.A
Minnesota	11902.0		2428.0		17184.0		31514.0	0.	0.	0.	0.
Missouri	9693.0		3750.0		.0		13443.0	0.	0.	0.	0.
Nebraska	14640.0		3233.0		8340.0		26213.0	0.	0.	0.	0.
North Dakota	1276.0	w	13743.0		1140.0	s	16159.0	63.w	0.	0.	63.A
Ohio	10999.0		6112.0		5141.0		22252.0	0.	0.	0.	0.
Oklahoma	3732.0		4214.0		3550.0		11496.0	0.	0.	0.	0.
South Dakota	.0		1153.0	s	40.0	w	1193.0	0.	0.	-2.w	-2.A
Tennessee	.0		1055.0		510.0		1565.0	0.	0.	0.	0.
Wisconsin	13336.0		3243.0	s	1690.0	s	18269.0	0.	0.	0.	0.
PAD District III	32837.0		31206.0		23139.0		87182.0	1.A	0.	-66.A	-65.A
Alabama	15332.0		334.0		5273.0		20939.0	0.	0.	0.	0.
Arkansas	4368.0	s	8042.0		2881.0	s	15291.0	1.A	0.	0.	1.A
Louisiana	.0		4994.0		5895.0		10889.0	0.	0.	0.	0.
Mississippi	2571.0	s	11737.0		1326.0	w	15634.0	0.	0.	-66.w	-66.A
New Mexico	7810.0		6099.0		3972.0		17881.0	0.	0.	0.	0.
Texas	2756.0		.0		3792.0		6548.0	0.	0.	0.	0.
PAD District IV	13773.0		10181.0		19060.0		43014.0	-51.A	-160.A	0.	-211.A
Colorado	4240.0		3951.0		7876.0		16067.0	0.	0.	0.	0.
Idaho	5578.0	s	3010.0	s	.0		8588.0	0.	0.	0.	0.
Montana	514.0	w	1382.0	w	6680.0		8576.0	-51.w	-69.w	0.	-120.A
Utah	1398.0		.0		2552.0		3950.0	0.	0.	0.	0.
Wyoming	2043.0	s	1838.0	w	1952.0		5833.0	0.	-91.w	0.	-91.A
PAD District V	36855.0		25820.0		18036.0		80711.0	-118.A	10.A	-13.A	-121.A
Alaska	2205.0	s	4240.0	s	8388.0		14833.0	0.	0.	0.	0.
Arizona	1367.0		.0		.0		1367.0	0.	0.	0.	0.
California	4592.0	s	107.0	w	.0		4699.0	0.	10.w	0.	10.A
Hawaii	11231.0		6288.0		3482.0		21001.0	0.	0.	0.	0.
Nevada	2483.0		8397.0		5404.0		16284.0	0.	0.	-13.A	-13.A
Oregon	4725.0		6788.0		.0		11513.0	-118.A	0.	0.	-118.A
Washington	10252.0		.0		762.0		11014.0	0.	0.	0.	0.

Classical LP/CTA 02 Oxygenated

	DTW	Rack	Bulk	Total				
United States	185909.0	157406.0	176052.0	519367.0	161.A	72.A	227.A	460.A
PAD District I	62713.0	59801.0	51566.0	174080.0	13.A	12.A	86.A	111.A
Subdistrict IA	36179.0	20682.0	21112.0	77973.0	-8.A	96.A	-53.A	35.A
Connecticut	5530.0	5886.0	1644.0	13060.0	0.	0.	0.	0.
Maine	12772.0	1478.0	3159.0	17409.0	0.	0.	0.	0.
Massachusetts	172.0 w	1572.0 w	3048.0 s	4792.0 s	-8.w	78.w	-53.A	17.A
New Hampshire	6448.0	4444.0	7408.0	18300.0	0.	18.A	0.	18.A
Rhode Island	6609.0	2354.0 s	3749.0	12712.0 s	0.	0.	0.	0.
Vermont	4648.0 s	4948.0	2104.0 s	11700.0	0.	0.	0.	0.
Subdistrict IB	16120.0	12775.0	12539.0	41434.0	0.	0.	38.A	38.A
Delaware	5396.0	.0	5313.0	10709.0	0.	0.	0.	0.
District of Columbia	5118.0	2725.0	940.0	8783.0	0.	0.	0.	0.
Maryland	.0	.0	932.0	932.0	0.	0.	0.	0.
New Jersey	3737.0	.0	3832.0	7569.0	0.	0.	0.	0.
New York	1869.0	2124.0 s	744.0 s	4737.0	0.	0.	0.	0.
Pennsylvania	.0	7926.0 s	778.0 w	8704.0	0.	0.	38.w	38.A
Subdistrict IC	10414.0	26344.0	17915.0	54673.0	21.A	-84.A	101.A	38.A
Florida	855.0	3469.0	959.0	5283.0	0.	0.	0.	0.
Georgia	2965.0	1472.0 s	852.0 s	5289.0	0.	0.	0.	0.
North Carolina	974.0 s	6653.0 s	3325.0 s	10952.0	0.	-84.A	0.	-84.A
South Carolina	1540.0	8716.0	2862.0	13118.0	0.	0.	0.	0.
Virginia	3869.0	3724.0 s	1022.0 w	8615.0	0.	0.	51.w	51.A
West Virginia	211.0 w	2310.0 s	8895.0	11416.0	21.w	0.	50.A	71.A
PAD District II	70903.0	41637.0	63903.0	176443.0	90.A	16.A	-43.A	63.A
Illinois	1257.0 s	748.0 w	8994.0	10999.0	0.	-74.w	0.	-74.A
Indiana	2889.0 s	7304.0	4071.0 s	14264.0	64.A	0.	-70.A	-6.A
Iowa	2113.0	4459.0	5890.0	12462.0	0.	0.	0.	0.
Kansas	2976.0	5421.0 s	808.0 w	9205.0	0.	0.	80.w	80.A
Kentucky	9190.0	2142.0 s	3821.0 s	15153.0	0.	0.	0.	0.
Michigan	6538.0 s	1185.0 s	.0	7723.0	0.	90.A	0.	90.A
Minnesota	4295.0	2781.0	4650.0	11726.0	0.	0.	0.	0.
Missouri	4878.0	2965.0	3712.0	11555.0	0.	0.	0.	0.
Nebraska	6235.0	2974.0	6418.0	15627.0	0.	0.	0.	0.
North Dakota	2264.0 s	3856.0	3832.0 s	9952.0	0.	0.	0.	0.
Ohio	9932.0	1821.0	8186.0	19939.0	0.	0.	0.	0.
Oklahoma	10858.0	2493.0	3276.0	16627.0	0.	0.	0.	0.
South Dakota	.0	2040.0 s	4950.0 s	6990.0	0.	0.	0.	0.
Tennessee	530.0 w	1448.0 s	4233.0	6211.0	26.w	0.	0.	26.A
Wisconsin	6948.0 s	.0	1062.0 w	8010.0	0.	0.	-53.w	-53.A
PAD District III	10582.0	14268.0	24802.0	49652.0	0.	0.	142.A	142.A
Alabama	.0	.0	7556.0	7556.0	0.	0.	0.	0.
Arkansas	928.0 s	2520.0 s	5697.0	9145.0	0.	0.	0.	0.
Louisiana	.0	6205.0	4003.0	10208.0	0.	0.	0.	0.
Mississippi	2233.0 s	.0	2424.0 s	4657.0	0.	0.	144.A	144.A
New Mexico	7421.0	4451.0	5082.0	16954.0	0.	0.	0.	0.
Texas	.0	1092.0 s	40.0 w	1132.0	0.	0.	-2.w	-2.A
PAD District IV	20750.0	15061.0	17089.0	52900.0	0.	44.A	0.	44.A
Colorado	.0	7132.0	.0	7132.0	0.	0.	0.	0.
Idaho	1698.0 s	892.0 w	6724.0	9314.0	0.	44.w	0.	44.A
Montana	362.0 s	5498.0 s	6898.0	12758.0	0.	0.	0.	0.
Utah	12230.0	1539.0	3467.0	17236.0	0.	0.	0.	0.
Wyoming	6460.0	.0	.0	6460.0	0.	0.	0.	0.
PAD District V	20961.0	26639.0	18692.0	66292.0	58.A	0.	42.A	100.A
Alaska	4734.0	2844.0 s	3595.0 s	11173.0	0.	0.	0.	0.
Arizona	2353.0 s	.0	1433.0	3786.0 s	0.	0.	0.	0.
California	3836.0 s	1863.0 s	5099.0	10798.0	0.	0.	0.	0.
Hawaii	2614.0 s	.0	2544.0 s	5158.0	0.	0.	0.	0.
Nevada	2991.0	4707.0	423.0 w	8121.0 s	-29.A	0.	42.w	13.A
Oregon	1742.0 w	17225.0	3040.0 s	22007.0	87.w	0.	0.	87.A
Washington	2691.0	.0	2558.0	5249.0	0.	0.	0.	0.

Classical LP/CTA 02 Reformulated

	DTW	Rack	Bulk	Total				
United States	172508.0	197789.0	208148.0	578445.0	-18.A	114.A	-75.A	21.A
PAD District I	72620.0	57379.0	61697.0	191696.0	0.	120.A	-93.A	27.A
Subdistrict IA	22203.0	11875.0	21761.0	55839.0	0.	6.A	8.A	14.A
Connecticut	5947.0	1284.0 s	3080.0 s	10311.0	0.	0.	0.	0.
Maine	6252.0	2346.0	12868.0	21466.0	0.	0.	0.	0.
Massachusetts	1839.0 s	3405.0 s	1068.0 w	6312.0 s	0.	-53.A	53.w	0.
New Hampshire	4718.0	2236.0 s	3795.0 s	10749.0	0.	0.	0.	0.
Rhode Island	.0	593.0 w	.0	593.0 w	0.	59.w	0.	59.w
Vermont	3447.0 s	2011.0	950.0 p	6408.0	0.	0.	-45.p	-45.A
Subdistrict IB	34305.0	20449.0	19914.0	74668.0	0.	26.A	0.	26.A
Delaware	7416.0	1364.0 w	3940.0 s	12720.0	0.	68.w	0.	68.A
District of Columbia	5563.0	8643.0	7070.0	21276.0	0.	0.	0.	0.
Maryland	3311.0	852.0 w	3592.0 s	7755.0	0.	-42.w	0.	-42.A
New Jersey	9858.0	375.0	584.0	10817.0	0.	0.	0.	0.
New York	4092.0	6848.0	705.0	11645.0	0.	0.	0.	0.
Pennsylvania	4065.0	2367.0 s	4023.0 s	10455.0	0.	0.	0.	0.
Subdistrict IC	16112.0	25055.0	20022.0	61189.0	0.	88.A	-101.A	-13.A
Florida	.0	5571.0	1847.0	7418.0	0.	0.	0.	0.
Georgia	5166.0	883.0 w	2189.0 s	8238.0	-25.A	88.w	0.	63.A
North Carolina	2204.0	.0	1812.0	4016.0	46.A	0.	0.	46.A
South Carolina	.0	12556.0	4720.0	17276.0	0.	0.	0.	0.
Virginia	2808.0	2088.0 s	8450.0 s	13346.0	0.	0.	-51.A	-51.A
West Virginia	5934.0	3957.0 s	1004.0 w	10895.0	-21.A	0.	-50.w	-71.A
PAD District II	47207.0	70912.0	59961.0	178080.0	-77.A	0.	43.A	-34.A
Illinois	.0	9170.0	3750.0	12920.0	0.	0.	0.	0.
Indiana	3225.0	1195.0	.0	4420.0	0.	0.	0.	0.
Iowa	2171.0	5331.0	4561.0	12063.0	0.	0.	0.	0.
Kansas	11047.0	6859.0 s	248.0 w	18154.0	12.A	0.	-12.w	0.
Kentucky	.0	3629.0	6019.0	9648.0	0.	0.	0.	0.
Michigan	1074.0	.0	2238.0	3312.0	0.	0.	0.	0.
Minnesota	5030.0	7462.0	4386.0	16878.0	0.	0.	0.	0.
Missouri	974.0	5459.0	3552.0	9985.0	0.	0.	0.	0.
Nebraska	4550.0	8343.0	2852.0	15745.0	0.	0.	0.	0.
North Dakota	6903.0	4878.0	3182.0	14963.0	-63.A	0.	0.	-63.A
Ohio	3687.0	2550.0	1905.0	8142.0	0.	0.	0.	0.
Oklahoma	2238.0	1864.0	3453.0	7555.0	0.	0.	0.	0.
South Dakota	24.0	9477.0	11671.0	21172.0	0.	0.	2.A	2.A
Tennessee	1712.0 s	1825.0 s	8591.0	12128.0	-26.A	0.	0.	-26.A
Wisconsin	4572.0 s	2870.0 s	3553.0 s	10995.0	0.	0.	53.A	53.A
PAD District III	26342.0	18475.0	31497.0	76314.0	-1.A	-44.A	-25.A	-70.A
Alabama	.0	4674.0	869.0	5543.0	0.	0.	0.	0.
Arkansas	702.0 p	4881.0 s	4084.0 s	9667.0	-1.p	0.	0.	-1.A
Louisiana	7502.0	807.0	5716.0	14025.0	0.	0.	0.	0.
Mississippi	2133.0 s	4379.0	1560.0 w	8072.0	0.	0.	-78.w	-78.A
New Mexico	6872.0	2836.0	16130.0	25838.0	0.	0.	0.	0.
Texas	9133.0	898.0 w	3138.0 s	13169.0	0.	-44.w	53.A	9.A
PAD District IV	16777.0	21138.0	32444.0	70359.0	0.	38.A	0.	38.A
Colorado	7968.0	3585.0	15573.0	27126.0	0.	0.	0.	0.
Idaho	.0	9651.0	3012.0	12663.0	0.	0.	0.	0.
Montana	5982.0	1860.0	8317.0	16159.0	0.	0.	0.	0.
Utah	.0	382.0 w	4773.0 s	5155.0	0.	38.w	0.	38.A
Wyoming	2827.0	5660.0 s	769.0 s	9256.0	0.	0.	0.	0.
PAD District V	9562.0	29885.0	22549.0	61996.0	60.A	0.	0.	60.A
Alaska	19.0 w	7862.0	1440.0 s	9321.0	1.w	0.	0.	1.A
Arizona	704.0 s	828.0	1149.0	2681.0 s	0.	0.	0.	0.
California	4137.0	5743.0	6143.0	16023.0	0.	0.	0.	0.
Hawaii	52.0 w	2046.0	2991.0 s	5089.0	2.w	0.	0.	2.A
Nevada	.0	1212.0	2500.0 s	3712.0 s	0.	0.	0.	0.
Oregon	1156.0 w	8840.0	5168.0 s	15164.0	57.w	0.	0.	57.A
Washington	3494.0	3354.0	3158.0	10006.0	0.	0.	0.	0.

Classical LP/CTA 02 All Formulations

	DTW	Rack	Bulk	Total				
United States	591889.0	555705.0	573481.0	1721075.0	-32.A	-100.A	132.A	0.
PAD District I	203531.0	187271.0	169107.0	559909.0	-8.A	25.A	38.A	55.A
Subdistrict IA	77215.0	65043.0	58917.0	201175.0	-8.A	25.A	0.	17.A
Connecticut	16751.0	13781.0	8853.0	39385.0	0.	0.	0.	0.
Maine	20696.0	6832.0	16027.0	43555.0	0.	0.	0.	0.
Massachusetts	4021.0	11525.0	4116.0	19662.0	-8.A	25.A	0.	17.A
New Hampshire	17235.0	7054.0	13435.0	37724.0	0.	0.	0.	0.
Rhode Island	10417.0	12453.0	6564.0	29434.0	0.	0.	0.	0.
Vermont	8095.0	13398.0	9922.0	31415.0	0.	0.	0.	0.
Subdistrict IB	74836.0	43174.0	52562.0	170572.0	0.	0.	38.A	38.A
Delaware	14996.0	3204.0	11057.0	29257.0	0.	48.A	0.	48.A
District of Columbia	14573.0	11368.0	15350.0	41291.0	0.	0.	0.	0.
Maryland	3311.0	6590.0	6465.0	16366.0	0.	-42.A	0.	-42.A
New Jersey	18856.0	1000.0	4416.0	24272.0	0.	0.	0.	0.
New York	9666.0	9039.0	6229.0	24934.0	0.	-6.A	0.	-6.A
Pennsylvania	13434.0	11973.0	9045.0	34452.0	0.	0.	38.A	38.A
Subdistrict IC	51480.0	79054.0	57628.0	188162.0	0.	0.	0.	0.
Florida	6720.0	21550.0	4419.0	32689.0	0.	0.	0.	0.
Georgia	18574.0	4477.0	9264.0	32315.0	0.	0.	0.	0.
North Carolina	4108.0	7498.0	9770.0	21376.0	0.	0.	0.	0.
South Carolina	1540.0	31074.0	7582.0	40196.0	0.	0.	0.	0.
Virginia	10893.0	5812.0	11958.0	28663.0	0.	0.	0.	0.
West Virginia	9645.0	8643.0	14635.0	32923.0	0.	0.	0.	0.
PAD District II	199919.0	175761.0	197066.0	572746.0	27.A	-13.A	14.A	28.A
Illinois	8497.0	15374.0	15719.0	39590.0	15.A	-74.A	0.	-59.A
Indiana	7402.0	14060.0	5751.0	27213.0	0.	0.	14.A	14.A
Iowa	4880.0	14798.0	20733.0	40411.0	0.	0.	0.	0.
Kansas	16779.0	18124.0	4186.0	39089.0	12.A	0.	0.	12.A
Kentucky	9190.0	6383.0	19120.0	34693.0	0.	61.A	0.	61.A
Michigan	11963.0	2985.0	10498.0	25446.0	0.	0.	0.	0.
Minnesota	21227.0	12671.0	26220.0	60118.0	0.	0.	0.	0.
Missouri	15545.0	12174.0	7264.0	34983.0	0.	0.	0.	0.
Nebraska	25425.0	14550.0	17610.0	57585.0	0.	0.	0.	0.
North Dakota	10443.0	22477.0	8154.0	41074.0	0.	0.	0.	0.
Ohio	24618.0	10483.0	15232.0	50333.0	0.	0.	0.	0.
Oklahoma	16828.0	8571.0	10279.0	35678.0	0.	0.	0.	0.
South Dakota	24.0	12670.0	16661.0	29355.0	0.	0.	0.	0.
Tennessee	2242.0	4328.0	13334.0	19904.0	0.	0.	0.	0.
Wisconsin	24856.0	6113.0	6305.0	37274.0	0.	0.	0.	0.
PAD District III	69761.0	63949.0	79438.0	213148.0	0.	-44.A	51.A	7.A
Alabama	15332.0	5008.0	13698.0	34038.0	0.	0.	0.	0.
Arkansas	5998.0	15443.0	12662.0	34103.0	0.	0.	0.	0.
Louisiana	7502.0	12006.0	15614.0	35122.0	0.	0.	0.	0.
Mississippi	6937.0	16116.0	5310.0	28363.0	0.	0.	0.	0.
New Mexico	22103.0	13386.0	25184.0	60673.0	0.	0.	0.	0.
Texas	11889.0	1990.0	6970.0	20849.0	0.	-44.A	51.A	7.A
PAD District IV	51300.0	46380.0	68593.0	166273.0	-51.A	-78.A	0.	-129.A
Colorado	12208.0	14668.0	23449.0	50325.0	0.	0.	0.	0.
Idaho	7276.0	13553.0	9736.0	30565.0	0.	44.A	0.	44.A
Montana	6858.0 s	8740.0 s	21895.0	37493.0	-51.A	-69.A	0.	-120.A
Utah	13628.0	1921.0 s	10792.0 s	26341.0	0.	38.A	0.	38.A
Wyoming	11330.0 s	7498.0 s	2721.0 s	21549.0	0.	-91.A	0.	-91.A
PAD District V	67378.0	82344.0	59277.0	208999.0	0.	10.A	29.A	39.A
Alaska	6958.0	14946.0	13423.0	35327.0	1.A	0.	0.	1.A
Arizona	4424.0	828.0	2582.0	7834.0	0.	0.	0.	0.
California	12565.0	7713.0	11242.0	31520.0	0.	10.A	0.	10.A
Hawaii	13897.0	8334.0	9017.0	31248.0	2.A	0.	0.	2.A
Nevada	5474.0	14316.0	8327.0	28117.0	-29.A	0.	29.A	0.
Oregon	7623.0	32853.0	8208.0	48684.0	26.A	0.	0.	26.A
Washington	16437.0	3354.0	6478.0	26269.0	0.	0.	0.	0.

CTA frequency Distribution

Frequency Count :

% From	% To	Non-Sensitive	Sensitive
.00 -	.10	1235	0
.10 -	.50	137	1
.50 -	1.00	60	0
1.00 -	1.50	15	0
1.50 -	2.00	13	1
2.00 -	5.00	15	50
5.00 -	10.00	3	26
10.00 -	15.00	0	0
15.00 -	30.00	0	0
30.00 -	100.00	0	0

Audit of Classical Cell Suppression Pattern

Option: 3.0000000000 **294 SUPPRESSIONS**

Bound Type: L

Job Parameters: o

Iteration	# Of Suppressions	Quantity Suppressed
1	321	976218.000
2	294	886128.000

Tolerence: 0.000000000000000E+000

				Lower B	True	Upper B	%low	%up
1	Sps00001	0	0	440.000<	1804.000<	3644.000	75.6	100.0
2	Sps00002	0	0	.000<	2787.000<	3399.000	100.0	22.0
3	Sps00003	0	0	717.000<	2189.000<	3041.000	67.2	38.9
4	Sps00004	0	0	1816.000<	3724.000<	4746.000	51.2	27.4
5	Sps00005	0	0	1016.000<	2614.000<	2666.000	61.1	2.0
6	Sps00006	0	0	6512.000<	7226.000<	7498.000	9.9	3.8
7	Sps00007	0	0	5438.000<	6653.000<	7498.000	18.3	12.7

8	Sps00008	0	0	3209.000<	3821.000<	5963.000	16.0	56.1
9	Sps00009	0	0	3479.000<	3751.000<	4465.000	7.3	19.0
10	Sps00010	0	0	1336.000<	2310.000<	2521.000	42.2	9.1
11	Sps00011	0	0	8036.000<	9941.000<	11021.000	19.2	10.9
12	Sps00012	0	0	3166.000<	4351.000<	6151.000	27.2	41.4
13	Sps00013	0	0	6051.000<	6859.000<	7107.000	11.8	3.6
14	Spw00014	0	0	896.000<	1068.000<	2018.000	16.1	89.0
15	Sps00015	0	0	.000<	769.000<	2607.000	100.0	100.0
16	Sps00016	0	0	387.000<	769.000<	3497.000	49.7	100.0
17	Sps00017	0	0	1333.000<	1440.000<	1459.000	7.4	1.3
18	Spw00018	0	0	979.000<	1572.000<	3926.000	37.7	100.0
19	Sps00019	0	0	.000<	4613.000<	5141.000	100.0	11.4
20	Sps00020	0	0	.000<	4053.000<	4369.000	100.0	7.8
21	Sps00021	0	0	.000<	1257.000<	2005.000	100.0	59.5
22	Sps00022	0	0	5461.000<	6351.000<	7276.000	14.0	14.6
23	Sps00023	0	0	5216.000<	5578.000<	7276.000	6.5	30.4
24	Sps00024	0	0	2210.000<	3138.000<	3178.000	29.6	1.3
25	Sps00025	0	0	2952.000<	3039.000<	3941.000	2.9	29.7
26	Sps00026	0	0	1741.000<	3312.000<	4313.000	47.4	30.2
27	Sps00027	0	0	3028.000<	3846.000<	5751.000	21.3	49.5
28	Spw00028	0	0	.000<	1680.000<	2968.000	100.0	76.7
29	Sps00029	0	0	4178.000<	6016.000<	6785.000	30.6	12.8
30	Sps00030	0	0	553.000<	583.000<	946.000	5.1	62.3
31	Sps00031	0	0	1126.000<	2353.000<	2776.000	52.1	18.0
32	Sps00032	0	0	2626.000<	4674.000<	4933.000	43.8	5.5
33	Sps00033	0	0	3510.000<	4667.000<	5817.000	24.8	24.6
34	Sps00034	0	0	273.000<	648.000<	1088.000	57.9	67.9
35	Sps00035	0	0	2510.000<	4216.000<	8088.000	40.5	91.8
36	Sps00036	0	0	7138.000<	9280.000<	9892.000	23.1	6.6
37	Sps00037	0	0	941.000<	2571.000<	3897.000	63.4	51.6
38	Sps00038	0	0	942.000<	2022.000<	3927.000	53.4	94.2
39	Sps00039	0	0	668.000<	1280.000<	4067.000	47.8	100.0
40	Sps00040	0	0	1905.000<	3243.000<	4933.000	41.3	52.1
41	Spw00041	0	0	.000<	1288.000<	2968.000	100.0	100.0
42	Sps00042	0	0	2787.000<	3393.000<	4783.000	17.9	41.0
43	Sps00043	0	0	3307.000<	4232.000<	5122.000	21.9	21.0
44	Sps00044	0	0	.000<	2133.000<	2835.000	100.0	32.9
45	Sps00045	0	0	5432.000<	5604.000<	6359.000	3.1	13.5
46	Sps00046	0	0	5500.000<	6948.000<	7478.000	20.8	7.6
47	Sps00047	0	0	5864.000<	6314.000<	7246.000	7.1	14.8
48	Sps00048	0	0	2519.000<	3520.000<	5091.000	28.4	44.6
49	Sps00049	0	0	10121.000<	14174.000<	14490.000	28.6	2.2
50	Sps00050	0	0	4199.000<	5456.000<	6204.000	23.0	13.7
51	Sps00051	0	0	.000<	440.000<	815.000	100.0	85.2
52	Sps00052	0	0	4379.000<	6611.000<	6985.000	33.8	5.7
53	Sps00053	0	0	.000<	362.000<	2060.000	100.0	100.0
54	Spw00054	0	0	.000<	778.000<	845.000	100.0	8.6
55	Sps00055	0	0	1810.000<	4244.000<	5924.000	57.4	39.6
56	Sps00056	0	0	4738.000<	6538.000<	7723.000	27.5	18.1
57	Sps00057	0	0	2783.000<	4071.000<	5751.000	31.6	41.3
58	Sps00058	0	0	.000<	30.000<	393.000	100.0	100.0
59	Sps00059	0	0	1015.000<	4014.000<	5445.000	74.7	35.7

60	Sps00060	0	0	2365.000<	3267.000<	3354.000	27.6	2.7
61	Sps00061	0	0	942.000<	2373.000<	5372.000	60.3	100.0
62	Spw00062	0	0	532.000<	1062.000<	2510.000	49.9	100.0
63	Spw00063	0	0	477.000<	852.000<	1292.000	44.0	51.6
64	Spw00064	0	0	.000<	852.000<	4444.000	100.0	100.0
65	Sps00065	0	0	993.000<	1748.000<	1920.000	43.2	9.8
66	Spp00066	0	0	.000<	950.000<	1122.000	100.0	18.1
67	Sps00067	0	0	.000<	1092.000<	1990.000	100.0	82.2
68	Sps00068	0	0	164.000<	1092.000<	1132.000	85.0	3.7
69	Sps00069	0	0	.000<	3260.000<	4200.000	100.0	28.8
70	Sps00070	0	0	264.000<	1712.000<	2242.000	84.6	31.0
71	Sps00071	0	0	7921.000<	8846.000<	9736.000	10.5	10.1
72	Sps00072	0	0	3797.000<	4950.000<	4990.000	23.3	.8
73	Sps00073	0	0	556.000<	996.000<	1371.000	44.2	37.7
74	Sps00074	0	0	.000<	2354.000<	2947.000	100.0	25.2
75	Spw00075	0	0	.000<	1306.000<	2432.000	100.0	86.2
76	Sps00076	0	0	3629.000<	4633.000<	5689.000	21.7	22.8
77	Sps00077	0	0	.000<	925.000<	1815.000	100.0	96.2
78	Sps00078	0	0	.000<	819.000<	1031.000	100.0	25.9
79	Sps00079	0	0	3886.000<	4776.000<	5701.000	18.6	19.4
80	Sps00080	0	0	2045.000<	4773.000<	5155.000	57.2	8.0
81	Sps00081	0	0	1180.000<	2870.000<	4208.000	58.9	46.6
82	Sps00082	0	0	.000<	363.000<	393.000	100.0	8.3
83	Sps00083	0	0	3233.000<	3405.000<	4160.000	5.1	22.2
84	Sps00084	0	0	1051.000<	3405.000<	3998.000	69.1	17.4
85	Sps00085	0	0	4786.000<	5676.000<	6601.000	15.7	16.3
86	Sps00086	0	0	2758.000<	4084.000<	5714.000	32.5	39.9
87	Sps00087	0	0	2086.000<	3359.000<	5644.000	37.9	68.0
88	Spw00088	0	0	.000<	211.000<	1185.000	100.0	100.0
89	Sps00089	0	0	4042.000<	4572.000<	6020.000	11.6	31.7
90	Sps00090	0	0	577.000<	3364.000<	3976.000	82.8	18.2
91	Sps00091	0	0	1396.000<	1836.000<	2211.000	24.0	20.4
92	Sps00092	0	0	2146.000<	5738.000<	6590.000	62.6	14.8
93	Sps00093	0	0	.000<	2232.000<	2606.000	100.0	16.8
94	Sps00094	0	0	.000<	87.000<	989.000	100.0	100.0
95	Sps00095	0	0	.000<	755.000<	927.000	100.0	22.8
96	Spw00096	0	0	.000<	890.000<	1815.000	100.0	100.0
97	Sps00097	0	0	.000<	1126.000<	2432.000	100.0	100.0
98	Sps00098	0	0	.000<	974.000<	1185.000	100.0	21.7
99	Sps00099	0	0	4165.000<	5322.000<	6472.000	21.7	21.6
100	Spw00100	0	0	.000<	1276.000<	2416.000	100.0	89.3
101	Sps00101	0	0	1070.000<	2910.000<	4488.000	63.2	54.2
102	Sps00102	0	0	2526.000<	3500.000<	3711.000	27.8	6.0
103	Spw00103	0	0	.000<	1001.000<	2572.000	100.0	100.0
104	Sps00104	0	0	757.000<	1120.000<	1150.000	32.4	2.7
105	Sps00105	0	0	808.000<	2856.000<	3115.000	71.7	9.1
106	Spw00106	0	0	.000<	1364.000<	3204.000	100.0	100.0
107	Sps00107	0	0	1405.000<	2337.000<	2787.000	39.9	19.3
108	Sps00108	0	0	.000<	1905.000<	2723.000	100.0	42.9
109	Sps00109	0	0	.000<	2142.000<	2754.000	100.0	28.6
110	Sps00110	0	0	2570.000<	3472.000<	3559.000	26.0	2.5
111	Spw00111	0	0	1248.000<	1742.000<	2898.000	28.4	66.4

112	Sps00112	0	0	1081.000<	2013.000<	2463.000	46.3	22.4
113	Sps00113	0	0	1273.000<	2500.000<	2923.000	49.1	16.9
114	Sps00114	0	0	1089.000<	1941.000<	5533.000	43.9	100.0
115	Sps00115	0	0	889.000<	1839.000<	2011.000	51.7	9.4
116	Sps00116	0	0	4.000<	2236.000<	2610.000	99.8	16.7
117	Sps00117	0	0	4403.000<	6446.000<	6960.000	31.7	8.0
118	Sps00118	0	0	3421.000<	3795.000<	6027.000	9.9	58.8
119	Sps00119	0	0	2901.000<	3957.000<	4961.000	26.7	25.4
120	Sps00120	0	0	.000<	1539.000<	4649.000	100.0	100.0
121	Sps00121	0	0	4002.000<	4780.000<	4847.000	16.3	1.4
122	Sps00122	0	0	2000.000<	2040.000<	3193.000	2.0	56.5
123	Sps00123	0	0	499.000<	3376.000<	5503.000	85.2	63.0
124	Spw00124	0	0	.000<	316.000<	4369.000	100.0	100.0
125	Sps00125	0	0	6492.000<	7240.000<	8497.000	10.3	17.4
126	Sps00126	0	0	.000<	375.000<	815.000	100.0	100.0
127	Sps00127	0	0	3457.000<	3832.000<	4272.000	9.8	11.5
128	Sps00128	0	0	1932.000<	2104.000<	3054.000	8.2	45.2
129	Sps00129	0	0	606.000<	865.000<	2913.000	29.9	100.0
130	Sps00130	0	0	1662.000<	2376.000<	2648.000	30.1	11.4
131	Sps00131	0	0	1161.000<	2376.000<	3221.000	51.1	35.6
132	Spp00132	0	0	.000<	702.000<	2835.000	100.0	100.0
133	Sps00133	0	0	1629.000<	3200.000<	4201.000	49.1	31.3
134	Spw00134	0	0	.000<	748.000<	2005.000	100.0	100.0
135	Sps00135	0	0	848.000<	3080.000<	3454.000	72.5	12.1
136	Sps00136	0	0	.000<	1680.000<	4114.000	100.0	100.0
137	Sps00137	0	0	6052.000<	6224.000<	6979.000	2.8	12.1
138	Sps00138	0	0	2193.000<	2233.000<	3161.000	1.8	41.6
139	Spw00139	0	0	132.000<	582.000<	1514.000	77.3	100.0
140	Spw00140	0	0	.000<	898.000<	1990.000	100.0	100.0
141	Spw00141	0	0	858.000<	898.000<	1826.000	4.5	100.0
142	Sps00142	0	0	.000<	928.000<	968.000	100.0	4.3
143	Sps00143	0	0	330.000<	705.000<	1145.000	53.2	62.4
144	Sps00144	0	0	.000<	212.000<	1031.000	100.0	100.0
145	Sps00145	0	0	2745.000<	3553.000<	3801.000	22.7	7.0
146	Sps00146	0	0	1295.000<	1825.000<	3273.000	29.0	79.3
147	Sps00147	0	0	.000<	2367.000<	4114.000	100.0	73.8
148	Sps00148	0	0	3755.000<	4129.000<	6361.000	9.1	54.1
149	Sps00149	0	0	933.000<	3720.000<	4332.000	74.9	16.5
150	Sps00150	0	0	.000<	1690.000<	3028.000	100.0	79.2
151	Spw00151	0	0	.000<	1080.000<	2985.000	100.0	100.0
152	Sps00152	0	0	.000<	1185.000<	2985.000	100.0	100.0
153	Sps00153	0	0	7859.000<	7926.000<	8704.000	.8	9.8
154	Spw00154	0	0	31.000<	883.000<	2355.000	96.5	100.0
155	Sps00155	0	0	.000<	1153.000<	1193.000	100.0	3.5
156	Sps00156	0	0	3509.000<	4815.000<	5941.000	27.1	23.4
157	Sps00157	0	0	3680.000<	4736.000<	5740.000	22.3	21.2
158	Sps00158	0	0	.000<	1571.000<	2572.000	100.0	63.7
159	Spw00159	0	0	.000<	612.000<	3399.000	100.0	100.0
160	Spw00160	0	0	.000<	612.000<	2754.000	100.0	100.0
161	Sps00161	0	0	.000<	1448.000<	1978.000	100.0	36.6
162	Sps00162	0	0	1768.000<	2860.000<	3758.000	38.2	31.4
163	Sps00163	0	0	4381.000<	6508.000<	9385.000	32.7	44.2

164	Sps00164	0	0	2737.000<	2844.000<	2863.000	3.8	.7
165	Spw00165	0	0	858.000<	1560.000<	3693.000	45.0	100.0
166	Sps00166	0	0	677.000<	744.000<	1522.000	9.0	100.0
167	Sps00167	0	0	.000<	7358.000<	9254.000	100.0	25.8
168	Sps00168	0	0	5214.000<	5826.000<	8613.000	10.5	47.8
169	Sps00169	0	0	910.000<	1284.000<	3516.000	29.1	100.0
170	Sps00170	0	0	3042.000<	4368.000<	5998.000	30.4	37.3
171	Sps00171	0	0	1496.000<	2424.000<	2464.000	38.3	1.7
172	Sps00172	0	0	2492.000<	2544.000<	4142.000	2.0	62.8
173	Sps00173	0	0	1027.000<	1952.000<	2842.000	47.4	45.6
174	Sps00174	0	0	3800.000<	5498.000<	5860.000	30.9	6.6
175	Spw00175	0	0	530.000<	892.000<	2590.000	40.6	100.0
176	Sps00176	0	0	1251.000<	2881.000<	4207.000	56.6	46.0
177	Sps00177	0	0	4763.000<	6668.000<	7748.000	28.6	16.2
178	Sps00178	0	0	.000<	1840.000<	3204.000	100.0	74.1
179	Sps00179	0	0	4256.000<	5660.000<	8628.000	24.8	52.4
180	Sps00180	0	0	2932.000<	5660.000<	6042.000	48.2	6.7
181	Sps00181	0	0	185.000<	625.000<	1000.000	70.4	60.0
182	Sps00182	0	0	3275.000<	3447.000<	4397.000	5.0	27.6
183	Spw00183	0	0	242.000<	1632.000<	2238.000	85.2	37.1
184	Sps00184	0	0	4674.000<	5168.000<	6324.000	9.6	22.4
185	Spw00185	0	0	.000<	248.000<	1056.000	100.0	100.0
186	Sps00186	0	0	2480.000<	2520.000<	3448.000	1.6	36.8
187	Spw00187	0	0	.000<	606.000<	1996.000	100.0	100.0
188	Sps00188	0	0	2276.000<	4023.000<	6390.000	43.4	58.8
189	Sps00189	0	0	7338.000<	8464.000<	9770.000	13.3	15.4
190	Sps00190	0	0	2269.000<	3325.000<	4329.000	31.8	30.2
191	Spw00191	0	0	.000<	272.000<	986.000	100.0	100.0
192	Spw00192	0	0	.000<	1150.000<	2307.000	100.0	100.0
193	Sps00193	0	0	2750.000<	3830.000<	5735.000	28.2	49.7
194	Sps00194	0	0	2098.000<	3048.000<	3220.000	31.2	5.6
195	Spw00195	0	0	.000<	530.000<	1978.000	100.0	100.0
196	Sps00196	0	0	3576.000<	3595.000<	3702.000	.5	3.0
197	Sps00197	0	0	2556.000<	3832.000<	4972.000	33.3	29.7
198	Spw00198	0	0	317.000<	404.000<	1306.000	21.5	100.0
199	Sps00199	0	0	.000<	1905.000<	2985.000	100.0	56.7
200	Spw00200	0	0	.000<	1800.000<	2985.000	100.0	65.8
201	Spw00201	0	0	.000<	1004.000<	2060.000	100.0	100.0
202	Spw00202	0	0	.000<	374.000<	2606.000	100.0	100.0
203	Spw00203	0	0	244.000<	1950.000<	5822.000	87.5	100.0
204	Spw00204	0	0	.000<	40.000<	1193.000	100.0	100.0
205	Sps00205	0	0	281.000<	704.000<	1931.000	60.1	100.0
206	Spw00206	0	0	884.000<	1200.000<	5253.000	26.3	100.0
207	Sps00207	0	0	1066.000<	2088.000<	3996.000	48.9	91.4
208	Spw00208	0	0	.000<	1838.000<	2607.000	100.0	41.8
209	Spw00209	0	0	1324.000<	1838.000<	3881.000	28.0	100.0
210	Sps00210	0	0	6542.000<	8450.000<	9472.000	22.6	12.1
211	Sps00211	0	0	1346.000<	2124.000<	2191.000	36.6	3.2
212	Sps00212	0	0	1209.000<	2889.000<	4177.000	58.2	44.6
213	Spw00213	0	0	.000<	902.000<	989.000	100.0	9.6
214	Spw00214	0	0	.000<	107.000<	126.000	100.0	17.8
215	Spw00215	0	0	.000<	714.000<	986.000	100.0	38.1

216	Sps00216	0	0	3698.000<	4648.000<	4820.000	20.4	3.7
217	Spw00217	0	0	704.000<	1079.000<	1519.000	34.8	40.8
218	Spw00218	0	0	.000<	1022.000<	2930.000	100.0	100.0
219	Sps00219	0	0	.000<	3592.000<	4444.000	100.0	23.7
220	Spw00220	0	0	908.000<	1806.000<	2898.000	49.7	60.5
221	Sps00221	0	0	.000<	2043.000<	2557.000	100.0	25.2
222	Spw00222	0	0	21.000<	839.000<	2744.000	97.5	100.0
223	Spw00223	0	0	.000<	1156.000<	1650.000	100.0	42.7
224	Spw00224	0	0	.000<	593.000<	2947.000	100.0	100.0
225	Spw00225	0	0	.000<	845.000<	2060.000	100.0	100.0
226	Spw00226	0	0	.000<	1382.000<	8019.000	100.0	100.0
227	Spw00227	0	0	.000<	1382.000<	1896.000	100.0	37.2
228	Sps00228	0	0	690.000<	2268.000<	4108.000	69.6	81.1
229	Spw00229	0	0	719.000<	930.000<	1904.000	22.7	100.0
230	Sps00230	0	0	1938.000<	3088.000<	4245.000	37.2	37.5
231	Spw00231	0	0	.000<	40.000<	968.000	100.0	100.0
232	Sps00232	0	0	1312.000<	3010.000<	3372.000	56.4	12.0
233	Sps00233	0	0	1884.000<	3040.000<	3534.000	38.0	16.3
234	Sps00234	0	0	.000<	3872.000<	5578.000	100.0	44.1
235	Spw00235	0	0	.000<	808.000<	1056.000	100.0	30.7
236	Sps00236	0	0	1393.000<	2991.000<	3043.000	53.4	1.7
237	Sps00237	0	0	.000<	852.000<	2324.000	100.0	100.0
238	Sps00238	0	0	2996.000<	3083.000<	3985.000	2.8	29.3
239	Sps00239	0	0	.000<	1140.000<	2416.000	100.0	100.0
240	Sps00240	0	0	.000<	1472.000<	2324.000	100.0	57.9
241	Spw00241	0	0	.000<	382.000<	4649.000	100.0	100.0
242	Spw00242	0	0	.000<	382.000<	3110.000	100.0	100.0
243	Spw00243	0	0	.000<	1326.000<	2956.000	100.0	100.0
244	Sps00244	0	0	4221.000<	4240.000<	4347.000	.4	2.5
245	Sps00245	0	0	3953.000<	4881.000<	4921.000	19.0	.8
246	Spw00246	0	0	.000<	19.000<	126.000	100.0	100.0
247	Spw00247	0	0	.000<	940.000<	4200.000	100.0	100.0
248	Sps00248	0	0	3085.000<	3840.000<	4012.000	19.7	4.5
249	Sps00249	0	0	1844.000<	1863.000<	1970.000	1.0	5.7
250	Sps00250	0	0	2098.000<	2205.000<	2224.000	4.9	.9
251	Spw00251	0	0	.000<	1390.000<	1996.000	100.0	43.6
252	Spp00252	0	0	1623.000<	2063.000<	2438.000	21.3	18.2
253	Spw00253	0	0	.000<	67.000<	845.000	100.0	100.0
254	Spw00254	0	0	.000<	514.000<	2557.000	100.0	100.0
255	Spw00255	0	0	.000<	514.000<	1896.000	100.0	100.0
256	Sps00256	0	0	3729.000<	3836.000<	3855.000	2.8	.5
257	Sps00257	0	0	1124.000<	2264.000<	3540.000	50.4	56.4
258	Sps00258	0	0	.000<	1698.000<	2060.000	100.0	21.3
259	Sps00259	0	0	5173.000<	5421.000<	6229.000	4.6	14.9
260	Spw00260	0	0	.000<	172.000<	927.000	100.0	100.0
261	Spw00261	0	0	.000<	172.000<	1122.000	100.0	100.0
262	Spw00262	0	0	.000<	423.000<	1650.000	100.0	100.0
263	Sps00263	0	0	4832.000<	5734.000<	5821.000	15.7	1.5
264	Sps00264	0	0	4573.000<	4592.000<	4699.000	.4	2.3
265	Sps00265	0	0	2100.000<	3940.000<	5304.000	46.7	34.6
266	Spw00266	0	0	344.000<	784.000<	1159.000	56.1	47.8
267	Spw00267	0	0	943.000<	1698.000<	1870.000	44.5	10.1

268	Spw00268	0	0	.000<	52.000<	1650.000	100.0	100.0
269	Spw00269	0	0	.000<	259.000<	2307.000	100.0	100.0
270	Sps00270	0	0	4587.000<	8459.000<	10165.000	45.8	20.2
271	Sps00271	0	0	7855.000<	9561.000<	13433.000	17.8	40.5
272	Sps00272	0	0	1815.000<	2755.000<	6015.000	34.1	100.0
273	Sps00273	0	0	1235.000<	7872.000<	9254.000	84.3	17.6
274	Sps00274	0	0	4786.000<	6058.000<	9435.000	21.0	55.7
275	Spw00275	0	0	244.000<	1950.000<	5822.000	87.5	100.0
276	Sps00276	0	0	6310.000<	10182.000<	11888.000	38.0	16.8
277	Sps00277	0	0	.000<	3260.000<	4200.000	100.0	28.8
278	Sps00278	0	0	10045.000<	11427.000<	18064.000	12.1	58.1
279	Sps00279	0	0	7898.000<	11275.000<	12547.000	30.0	11.3
280	Sps00280	0	0	6344.000<	6858.000<	8901.000	7.5	29.8
281	Sps00281	0	0	9287.000<	11330.000<	11844.000	18.0	4.5
282	Sps00282	0	0	6697.000<	8740.000<	9254.000	23.4	5.9
283	Sps00283	0	0	1539.000<	1921.000<	4649.000	19.9	100.0
284	Sps00284	0	0	4256.000<	7498.000<	9923.000	43.2	32.3
285	Sps00285	0	0	8064.000<	10792.000<	11174.000	25.3	3.5
286	Sps00286	0	0	2339.000<	2721.000<	5449.000	14.0	100.0
287	Sps00287	0	0	4199.000<	4792.000<	7146.000	12.4	49.1
288	Sps00288	0	0	10358.000<	12712.000<	13305.000	18.5	4.7
289	Sps00289	0	0	2559.000<	3786.000<	4209.000	32.4	11.2
290	Sps00290	0	0	7698.000<	8121.000<	9348.000	5.2	15.1
291	Sps00291	0	0	3958.000<	6312.000<	6905.000	37.3	9.4
292	Spw00292	0	0	.000<	593.000<	2947.000	100.0	100.0
293	Sps00293	0	0	2258.000<	2681.000<	3908.000	15.8	45.8
294	Sps00294	0	0	2485.000<	3712.000<	4135.000	33.1	11.4

DiAna Cell Suppression Pattern vs Noise Addition

Diana/Noise 01 regular

	DTW		Rack		Bulk		Total		<--- Census' Noise Method-->			
United States	188668.		218471.		170021.		577160.		-16.	357.	81.	422.
PAD District I	64625.		72994.		65620.		203239.		-144.	219.	-53.	22.
Subdistrict IA	25314.		28780.		16952.		71046.		-267.	-115.	83.	-300.
Connecticut	6258.	C	1494.	C	1700.		9452.		-161.	-26.	-35.	-222.
Maine	3936.		4719.		4429.		13084.		150.	-69.	64.	145.
Massachusetts	172.	P	3840.	C	.		4012.		-9.	-65.	0.	-74.
New Hampshire	7879.		.		3188.		11067.		-159.	0.	81.	-78.
Rhode Island	1748.		6224.		3976.		11948.		-53.	143.	79.	168.
Vermont	5321.	C	12503.	C	3659.		21483.		-34.	-98.	-106.	-238.
Subdistrict IB	19417.		16493.		22335.		58245.		123.	51.	-137.	38.
Delaware	6978.	C	2400.	C	4272.		13650.		133.	19.	47.	200.
District of Columbia	2253.		5070.		11338.		18661.		-53.	85.	86.	118.
Maryland	3311.	C	1836.	C	1079.	P	6226.		-120.	-46.	-110.	-275.
New Jersey	6875.	C	.		144.	C	7019.		163.	0.	5.	168.
New York	.		648.	C	784.	P	1432.		0.	22.	-41.	-19.
Pennsylvania	.		6539.		4718.		11257.		0.	-30.	-124.	-154.
Subdistrict IC	19894.		27721.		26333.		73948.		0.	283.	1.	284.
Florida	.		10857.	C	1847.	C	12704.		0.	15.	-15.	1.
Georgia	9961.		.		.		9961.		93.	0.	0.	93.
North Carolina	2268.		7226.	C	8464.	C	17958.		94.	205.	-49.	250.
South Carolina	1195.		5887.		7582.		14664.		25.	-5.	165.	186.
Virginia	3560.		.		3625.		7185.		-187.	0.	-112.	-298.
West Virginia	2910.		3751.	C	4815.	C	11476.		-26.	68.	10.	52.
PAD District II	76174.		62147.		54796.		193117.		12.	186.	22.	220.
Illinois	4128.		.		.		4128.		154.	0.	0.	154.
Indiana	4613.		.		3846.	C	8459.	C	158.	0.	-112.	46.
Iowa	1149.	C	4196.	C	4216.	C	9561.		50.	-49.	60.	62.
Kansas	11996.		10330.		1948.		24274.		-62.	-156.	21.	-197.
Kentucky	5826.	C	2787.	C	6523.	C	15136.		106.	61.	-73.	94.
Michigan	2022.	C	.		6668.	C	8690.	C	73.	0.	-158.	-85.
Minnesota	6400.		3694.		1332.		11426.		-145.	110.	37.	2.
Missouri	5915.		10385.		3934.		20234.		-195.	46.	13.	-136.
Nebraska	2652.		7667.		942.		11261.		-80.	148.	32.	100.
North Dakota	4671.		8286.		.		12957.		30.	-18.	0.	12.
Ohio	7197.		.		3477.		10674.		-101.	0.	-40.	-141.
Oklahoma	4030.		1864.		4339.		10233.		46.	-52.	82.	76.
South Dakota	24.		11013.		5526.		16563.		1.	75.	94.	170.
Tennessee	2242.	C	645.	C	8325.		11212.		-70.	-14.	157.	73.
Wisconsin	13309.		1280.		3720.		18309.		47.	35.	-91.	-9.
PAD District III	15248.		23726.		26417.		65391.		30.	-233.	181.	-22.
Alabama	3504.	C	259.	P	2856.		6619.		-94.	-26.	-51.	-171.
Arkansas	1598.		5628.		6358.		13584.		11.	-43.	80.	48.
Louisiana	.		3088.	C	4667.	C	7755.		0.	-21.	115.	94.
Mississippi	666.	C	8925.	C	2980.		12571.		-23.	-218.	-155.	-396.
New Mexico	8410.		4928.		6696.		20034.		158.	121.	111.	389.
Texas	1070.	C	898.	P	2860.	C	4828.		-22.	-46.	81.	14.
PAD District IV	13561.		23112.		8479.		45152.		-106.	-133.	228.	-11.
Colorado	.		8772.		5637.		14409.		0.	-116.	129.	13.
Idaho	925.	C	940.	P	890.	P	2755.	C	-19.	100.	49.	131.
Montana	514.	P	7358.	C	.		7872.		53.	-23.	0.	30.
Utah	5676.	C	382.	P	.		6058.		-99.	-39.	0.	-138.
Wyoming	6446.		5660.	C	1952.	C	14058.	C	-41.	-54.	49.	-46.
PAD District V	19060.		36492.		14709.		70261.		192.	318.	-297.	213.
Alaska	.		7948.		4300.		12248.		0.	36.	-87.	-51.
Arizona	2721.	C	828.	C	2189.	C	5738.		82.	29.	-67.	44.
California	3792.		3728.	C	2251.	C	9771.		-84.	97.	-61.	-48.
Hawaii	1038.	C	6141.		327.	C	7506.		76.	-196.	11.	-108.
Nevada	2555.	C	3522.	C	.		6077.		-19.	56.	0.	37.
Oregon	.		14325.		3040.		17365.		0.	297.	-64.	233.
Washington	8954.		.		2602.		11556.		136.	0.	-30.	106.

Diana/Noise 01 mid-grade

	DTW		Rack		Bulk		Total		<--- Census' Noise Method-->			
United States	234099.		170421.		209941.		614461.		-1011.	-129.	638.	-502.
PAD District I	69006.		60078.		45675.		174759.		256.	-263.	274.	267.
Subdistrict IA	23026.		19648.		17765.		60439.		32.	0.	62.	94.
Connecticut	3672.	C	10737.		1551.	C	15960.		-106.	-166.	-11.	-283.
Maine	9886.		2113.		7014.		19013.		-23.	111.	153.	241.
Massachusetts	1698.	P	3405.	C	.		5103.		92.	70.	0.	163.
New Hampshire	1456.		1743.		8119.		11318.		38.	19.	-64.	-7.
Rhode Island	5604.		755.		.		6359.		16.	-16.	0.	0.
Vermont	710.	C	895.	C	1081.	C	2686.		15.	-18.	-16.	-20.
Subdistrict IB	33509.		14578.		12603.		60690.		346.	-138.	218.	426.
Delaware	1386.	C	.		3617.	C	5003.		-49.	0.	55.	6.
District of Columbia	7460.		4758.		.		12218.		125.	-39.	0.	86.
Maryland	.		3902.		4390.		8292.		0.	-82.	63.	-19.
New Jersey	4795.	C	375.	C	440.	C	5610.		-67.	-8.	-9.	-84.
New York	6434.	C	2063.	P	705.	C	9202.		164.	-97.	-24.	43.
Pennsylvania	13434.		3480.	C	3451.	C	20365.		173.	87.	133.	393.
Subdistrict IC	12471.		25852.		15307.		53630.		-121.	-124.	-6.	-252.
Florida	3200.	C	5264.	C	1001.	P	9465.		-65.	-22.	-66.	-153.
Georgia	.		2122.	C	2661.	C	4783.		0.	-99.	-54.	-153.
North Carolina	714.	P	272.	P	.		986.		38.	-14.	0.	24.
South Carolina	345.		14094.		.		14439.		-12.	122.	0.	110.
Virginia	4853.		1724.		8333.		14910.		18.	-48.	197.	167.
West Virginia	3359.	C	2376.	C	3312.	C	9047.		-101.	-63.	-84.	-248.
PAD District II	74913.		67732.		78659.		221304.		-230.	299.	45.	114.
Illinois	316.	P	14174.	C	3750.	C	18240.		16.	184.	81.	282.
Indiana	839.	P	14060.		1905.	C	16804.		-88.	77.	-49.	-61.
Iowa	3319.		4704.		12645.		20668.		-129.	-204.	213.	-120.
Kansas	1390.	P	7794.		606.	P	9790.	C	-70.	46.	32.	9.
Kentucky	3364.	C	612.	P	7962.		11938.		-84.	64.	-67.	-88.
Michigan	9941.	C	1080.	P	.		11021.		16.	55.	0.	71.
Minnesota	6756.		3833.		22520.		33109.		-187.	-7.	13.	-181.
Missouri	5075.		1769.		3330.		10174.		9.	-16.	-41.	-49.
Nebraska	16463.		1526.		4481.		22470.		50.	-53.	-131.	-134.
North Dakota	5772.		5558.		8154.		19484.		101.	-79.	-23.	-1.
Ohio	10728.		6112.		5048.		21888.		236.	160.	-43.	353.
Oklahoma	1480.		3090.		3276.		7846.		30.	-43.	-85.	-98.
South Dakota	.		1153.		4227.		5380.		0.	106.	151.	257.
Tennessee	.		1448.		543.	C	1991.	C	0.	38.	0.	38.
Wisconsin	9470.		819.		212.		10501.		-129.	-29.	-5.	-163.
PAD District III	33192.		13706.		35889.		82787.		-419.	-7.	-297.	-723.
Alabama	9144.		75.		9977.		19196.		65.	2.	-66.	1.
Arkansas	.		.		1448.		1448.		0.	0.	-43.	-43.
Louisiana	5772.	C	3596.		9797.	C	19165.		-111.	21.	-84.	-173.
Mississippi	5261.		6399.		2330.		13990.		-42.	-38.	-93.	-172.
New Mexico	8475.		3636.		10033.		22144.		-238.	8.	-95.	-325.
Texas	4540.	C	.		2304.	C	6844.		-93.	0.	83.	-10.
PAD District IV	26384.		13793.		33824.		74001.		-321.	-176.	132.	-366.
Colorado	9457.		4440.		8352.		22249.		-193.	-118.	-145.	-456.
Idaho	6351.	C	9353.		8846.	C	24550.		-23.	-59.	192.	111.
Montana	6344.	C	.		11850.	C	18194.		-99.	0.	57.	-42.
Utah	4232.	C	.		4776.	C	9008.		-7.	0.	27.	20.
Wyoming	.		.		.		.		0.	0.	0.	0.
PAD District V	30604.		15112.		15894.		61610.		-297.	19.	483.	205.
Alaska	6939.	C	.		3871.	C	10810.		-33.	0.	158.	125.
Arizona	583.	C	.		363.	C	946.		23.	0.	13.	36.
California	5734.	C	3083.	C	6579.		15396.		-161.	-100.	165.	-96.
Hawaii	9123.		147.	C	2664.	C	11934.		68.	5.	92.	166.
Nevada	582.	P	2606.	C	2013.	C	5201.		31.	52.	12.	94.
Oregon	4585.		6009.		.		10594.		-99.	6.	0.	-93.
Washington	3058.	C	3267.	C	404.	P	6729.		-125.	56.	43.	-26.

Diana/Noise 01   premium

	DTW		Rack		Bulk		Total		<--- Census' Noise Method-->			
United States	169122.		166813.		193519.		529454.		-215.	-649.	-1207.	-2071.
PAD District I	69900.		54199.		57812.		181911.		-576.	261.	-455.	-771.
Subdistrict IA	28875.		16615.		24200.		69690.		-338.	50.	-406.	-694.
Connecticut	6821.		1550.	C	5602.	C	13973.		-216.	46.	-38.	-207.
Maine	6874.		.		4584.		11458.		-48.	0.	-156.	-204.
Massachusetts	2151.	C	4280.	C	4116.	C	10547.		-84.	-150.	-132.	-366.
New Hampshire	7900.		5311.		2128.		15339.		21.	54.	56.	130.
Rhode Island	3065.	C	5474.		2588.	C	11127.		44.	100.	-14.	130.
Vermont	2064.	C	.		5182.	C	7246.		-55.	0.	-121.	-176.
Subdistrict IB	21910.		12103.		17624.		51637.		-141.	-54.	-128.	-323.
Delaware	6632.		804.	C	3168.	C	10604.		-75.	-21.	53.	-43.
District of Columbia	4860.		1540.		4012.		10412.		-78.	31.	20.	-26.
Maryland	.		852.	P	996.	C	1848.		0.	43.	-41.	1.
New Jersey	7186.		625.	C	3832.	C	11643.		94.	-13.	-57.	24.
New York	3232.		6328.		4740.		14300.		-82.	-114.	-132.	-328.
Pennsylvania	.		1954.	C	876.	C	2830.		0.	20.	30.	50.
Subdistrict IC	19115.		25481.		15988.		60584.		-97.	264.	78.	245.
Florida	3520.	C	5429.		1571.	C	10520.		-26.	69.	-48.	-5.
Georgia	8613.		2355.	C	6603.	C	17571.		-158.	47.	69.	-42.
North Carolina	1126.	C	.		1306.	P	2432.		60.	0.	-69.	-9.
South Carolina	.		11093.		.		11093.		0.	112.	0.	112.
Virginia	2480.		4088.		.		6568.		-64.	-12.	0.	-76.
West Virginia	3376.	C	2516.	C	6508.		12400.		91.	48.	126.	266.
PAD District II	48832.		45882.		63611.		158325.		556.	-475.	-200.	-118.
Illinois	4053.	C	1200.	P	11969.	C	17222.		97.	-62.	48.	83.
Indiana	1950.	P	.		.		1950.	P	102.	0.	0.	102.
Iowa	412.	C	5898.		3872.	C	10182.		-11.	-115.	81.	-45.
Kansas	3393.	C	.		1632.	P	5025.	C	-32.	0.	1.	-31.
Kentucky	.		2984.	C	4635.	C	7619.		0.	78.	-72.	6.
Michigan	.		1905.	C	3830.	C	5735.	C	0.	-98.	-79.	-178.
Minnesota	8071.		5144.		2368.		15583.		103.	-17.	-61.	25.
Missouri	4555.		20.		.		4575.		-10.	1.	0.	-10.
Nebraska	6310.		5357.		12187.		23854.		97.	-118.	-183.	-204.
North Dakota	.		8633.		.		8633.		0.	-279.	0.	-279.
Ohio	6693.		4371.		6707.		17771.		158.	10.	-224.	-56.
Oklahoma	11318.		3617.		2664.		17599.		-18.	140.	94.	216.
South Dakota	.		504.		6908.		7412.		0.	-17.	3.	-15.
Tennessee	.		2235.	C	4466.	C	6701.	C	0.	3.	94.	97.
Wisconsin	2077.		4014.		2373.		8464.		70.	0.	99.	169.
PAD District III	21321.		26517.		17132.		64970.		-215.	-256.	-12.	-483.
Alabama	2684.	C	4674.	C	865.	C	8223.		-68.	-83.	-31.	-183.
Arkansas	4400.		9815.		4856.		19071.		-80.	103.	20.	43.
Louisiana	1730.	C	5322.	C	1150.	P	8202.		-38.	-188.	59.	-167.
Mississippi	1010.	C	792.	C	.		1802.		-66.	-13.	0.	-80.
New Mexico	5218.		4822.		8455.		18495.		-69.	-112.	34.	-148.
Texas	6279.		1092.	C	1806.	P	9177.		107.	37.	-93.	51.
PAD District IV	11355.		9475.		26290.		47120.		-82.	-98.	-275.	-455.
Colorado	2751.		1456.		9460.		13667.		-41.	25.	-66.	-82.
Idaho	.		3260.	C	.		3260.	C	0.	-90.	0.	-90.
Montana	.		1382.	P	10045.	C	11427.		0.	-73.	-153.	-227.
Utah	3720.		1539.	C	6016.	C	11275.		-78.	-53.	-118.	-250.
Wyoming	4884.		1838.	P	769.	C	7491.	C	38.	93.	63.	194.
PAD District V	17714.		30740.		28674.		77128.		101.	-81.	-264.	-244.
Alaska	19.	P	6998.		5252.	C	12269.		-2.	69.	94.	162.
Arizona	1120.	C	.		30.	C	1150.		34.	0.	1.	35.
California	3039.	C	902.	P	2412.	C	6353.		-50.	95.	-123.	-79.
Hawaii	3736.	C	2046.	C	6026.		11808.		142.	36.	-72.	106.
Nevada	2337.	C	8188.		6314.	C	16839.		-79.	-2.	-30.	-112.
Oregon	3038.		12519.		5168.		20725.		142.	-276.	-93.	-227.
Washington	4425.	C	87.	C	3472.	C	7984.		-87.	-3.	-40.	-130.

Diana/Noise 01 All Grade

	DTW		Rack		Bulk		Total	<--- Census' Noise Method-->			
United States	591889.		555705.		573481.		1721075.	-1242.	-421.	-489.	-2152.
PAD District I	203531.		187271.		169107.		559909.	-464.	216.	-234.	-482.
Subdistrict IA	77215.		65043.		58917.		201175.	-573.	-65.	-261.	-900.
Connecticut	16751.		13781.		8853.		39385.	-483.	-146.	-84.	-713.
Maine	20696.		6832.		16027.		43555.	79.	42.	61.	182.
Massachusetts	4021.	C	11525.		4116.	C	19662.	-1.	-144.	-132.	-278.
New Hampshire	17235.		7054.		13435.		37724.	-101.	73.	72.	45.
Rhode Island	10417.	C	12453.		6564.	C	29434.	7.	226.	65.	298.
Vermont	8095.		13398.		9922.		31415.	-75.	-116.	-243.	-434.
Subdistrict IB	74836.		43174.		52562.		170572.	328.	-141.	-46.	141.
Delaware	14996.		3204.		11057.		29257.	9.	-2.	155.	162.
District of Columbia	14573.		11368.		15350.		41291.	-6.	77.	107.	178.
Maryland	3311.	C	6590.		6465.	C	16366.	-120.	-85.	-88.	-293.
New Jersey	18856.		1000.		4416.		24272.	190.	-20.	-61.	108.
New York	9666.	C	9039.		6229.	C	24934.	82.	-189.	-197.	-304.
Pennsylvania	13434.		11973.		9045.		34452.	173.	78.	38.	290.
Subdistrict IC	51480.		79054.		57628.		188162.	-219.	423.	73.	277.
Florida	6720.		21550.		4419.		32689.	-91.	62.	-128.	-157.
Georgia	18574.		4477.		9264.		32315.	-65.	-52.	15.	-102.
North Carolina	4108.		7498.		9770.		21376.	192.	191.	-118.	265.
South Carolina	1540.		31074.		7582.		40196.	14.	229.	165.	408.
Virginia	10893.		5812.		11958.		28663.	-233.	-60.	86.	-207.
West Virginia	9645.		8643.		14635.		32923.	-35.	53.	53.	70.
PAD District II	199919.		175761.		197066.		572746.	339.	10.	-133.	216.
Illinois	8497.		15374.		15719.		39590.	267.	122.	129.	518.
Indiana	7402.		14060.		5751.		27213.	172.	77.	-161.	88.
Iowa	4880.	C	14798.	C	20733.		40411.	-90.	-368.	354.	-104.
Kansas	16779.		18124.		4186.		39089.	-163.	-110.	54.	-219.
Kentucky	9190.		6383.		19120.		34693.	21.	202.	-212.	12.
Michigan	11963.		2985.		10498.		25446.	89.	-43.	-237.	-192.
Minnesota	21227.		12671.		26220.		60118.	-230.	86.	-11.	-154.
Missouri	15545.		12174.		7264.		34983.	-196.	30.	-28.	-195.
Nebraska	25425.		14550.		17610.		57585.	66.	-23.	-282.	-239.
North Dakota	10443.		22477.		8154.		41074.	131.	-376.	-23.	-268.
Ohio	24618.		10483.		15232.		50333.	294.	170.	-307.	156.
Oklahoma	16828.		8571.		10279.		35678.	59.	46.	90.	194.
South Dakota	24.		12670.		16661.		29355.	1.	164.	248.	412.
Tennessee	2242.	C	4328.	C	13334.		19904.	-70.	27.	251.	208.
Wisconsin	24856.		6113.		6305.		37274.	-12.	7.	3.	-2.
PAD District III	69761.		63949.		79438.		213148.	-604.	-496.	-129.	-1228.
Alabama	15332.		5008.	C	13698.	C	34038.	-97.	-108.	-148.	-353.
Arkansas	5998.		15443.		12662.		34103.	-69.	60.	57.	48.
Louisiana	7502.		12006.		15614.		35122.	-149.	-187.	90.	-246.
Mississippi	6937.		16116.		5310.		28363.	-131.	-269.	-248.	-648.
New Mexico	22103.		13386.		25184.		60673.	-150.	17.	50.	-83.
Texas	11889.		1990.	C	6970.	C	20849.	-8.	-8.	71.	54.
PAD District IV	51300.		46380.		68593.		166273.	-509.	-407.	84.	-832.
Colorado	12208.		14668.		23449.		50325.	-234.	-209.	-82.	-525.
Idaho	7276.		13553.		9736.		30565.	-41.	-49.	242.	152.
Montana	6858.		8740.		21895.		37493.	-46.	-96.	-96.	-238.
Utah	13628.		1921.		10792.		26341.	-184.	-92.	-91.	-368.
Wyoming	11330.		7498.		2721.		21549.	-4.	39.	112.	147.
PAD District V	67378.		82344.		59277.		208999.	-4.	256.	-78.	175.
Alaska	6958.		14946.		13423.		35327.	-35.	105.	166.	236.
Arizona	4424.		828.	C	2582.	C	7834.	140.	29.	-54.	115.
California	12565.		7713.		11242.		31520.	-295.	91.	-19.	-223.
Hawaii	13897.		8334.		9017.		31248.	286.	-155.	31.	163.
Nevada	5474.		14316.		8327.		28117.	-67.	106.	-19.	20.
Oregon	7623.		32853.		8208.		48684.	44.	26.	-157.	-87.
Washington	16437.		3354.	C	6478.	C	26269.	-76.	53.	-27.	-50.

Diana/Noise 02 Conventional

	DTW		Rack		Bulk		Total		<--- Census' Noise Method-->			
United States	233472.		200510.		189281.		623263.		-1571.	-1107.	-1750.	-4429.
PAD District I	68198.		70091.		55844.		194133.		-833.	-462.	-722.	-2017.
Subdistrict IA	18833.		32486.		16044.		67363.		-459.	-132.	-359.	-951.
Connecticut	5274.		6611.		4129.		16014.		-143.	-38.	-91.	-272.
Maine	1672.	C	3008.	C	.		4680.		-42.	39.	0.	-3.
Massachusetts	2010.	C	6548.	C	.		8558.		70.	-134.	0.	-64.
New Hampshire	6069.	C	374.	P	2232.	C	8675.		-183.	19.	-38.	-202.
Rhode Island	3808.	C	9506.		2815.	C	16129.		-160.	100.	-37.	-97.
Vermont	.		6439.		6868.		13307.		0.	-120.	-193.	-313.
Subdistrict IB	24411.		9950.		20109.		54470.		162.	-298.	-334.	-470.
Delaware	2184.	C	1840.	C	1804.	C	5828.		34.	-73.	51.	12.
District of Columbia	3892.		.		7340.		11232.		-103.	0.	-64.	-167.
Maryland	.		5738.	C	1941.	C	7679.		0.	-128.	-106.	-234.
New Jersey	5261.	C	625.	C	.		5886.		68.	-13.	0.	55.
New York	3705.	C	67.	P	4780.	C	8552.		75.	7.	-148.	-66.
Pennsylvania	9369.		1680.	C	4244.	C	15293.		88.	-91.	-67.	-71.
Subdistrict IC	24954.		27655.		19691.		72300.		-535.	-31.	-30.	-596.
Florida	5865.	C	12510.		1613.	C	19988.		-120.	-74.	-82.	-275.
Georgia	10443.		2122.		6223.		18788.		-220.	-99.	107.	-211.
North Carolina	930.	P	845.	P	4633.		6408.		47.	85.	-139.	-8.
South Carolina	.		9802.		.		9802.		0.	120.	0.	120.
Virginia	4216.	C	.		2486.	C	6702.		-157.	0.	44.	-113.
West Virginia	3500.	C	2376.	C	4736.	C	10612.		-86.	-63.	41.	-109.
PAD District II	81809.		63212.		73202.		218223.		-242.	-16.	-768.	-1026.
Illinois	7240.	C	5456.	C	2975.		15671.		246.	109.	48.	404.
Indiana	1288.	P	5561.		1680.	P	8529.		67.	-11.	-89.	-33.
Iowa	596.	C	5008.	C	10282.		15886.		-1.	-28.	96.	67.
Kansas	2756.	C	5844.		3130.	C	11730.		36.	5.	-20.	21.
Kentucky	.		612.	P	9280.	C	9892.		0.	64.	-205.	-141.
Michigan	4351.	C	1800.	P	8260.	C	14411.		-2.	-101.	-160.	-263.
Minnesota	11902.		2428.		17184.		31514.		-179.	-36.	12.	-203.
Missouri	9693.		3750.		.		13443.		-116.	-77.	0.	-193.
Nebraska	14640.		3233.		8340.		26213.		-100.	-44.	-197.	-341.
North Dakota	1276.	P	13743.		1140.	C	16159.		-66.	-220.	-40.	-326.
Ohio	10999.		6112.	C	5141.	C	22252.		-44.	160.	-212.	-96.
Oklahoma	3732.		4214.		3550.		11496.		-40.	13.	54.	27.
South Dakota	.		1153.	C	40.	P	1193.		0.	106.	2.	108.
Tennessee	.		1055.	C	510.	C	1565.		0.	-22.	-9.	-31.
Wisconsin	13336.		3243.	C	1690.	C	18269.		-42.	67.	-50.	-25.
PAD District III	32837.		31206.		23139.		87182.		-359.	-256.	-388.	-1003.
Alabama	15332.		334.	C	5273.	C	20939.		-97.	-24.	-63.	-184.
Arkansas	4368.	C	8042.		2881.	C	15291.		-81.	-18.	-71.	-170.
Louisiana	.		4994.		5895.		10889.		0.	-166.	-59.	-226.
Mississippi	2571.	C	11737.	C	1326.	P	15634.		-47.	-147.	-68.	-262.
New Mexico	7810.		6099.		3972.		17881.		-199.	100.	-71.	-169.
Texas	2756.	C	.		3792.	C	6548.		65.	0.	-57.	8.
PAD District IV	13773.		10181.		19060.		43014.		-164.	74.	-86.	-176.
Colorado	4240.		3951.		7876.		16067.		-88.	-124.	-177.	-389.
Idaho	5578.	C	3010.	C	.		8588.	C	-100.	178.	0.	77.
Montana	514.	P	1382.	P	6680.		8576.		53.	-73.	58.	38.
Utah	1398.	C	.		2552.	C	3950.		32.	0.	-16.	16.
Wyoming	2043.	C	1838.	P	1952.	C	5833.	C	-61.	93.	49.	82.
PAD District V	36855.		25820.		18036.		80711.		26.	-448.	215.	-207.
Alaska	2205.	C	4240.	C	8388.		14833.		47.	-85.	175.	137.
Arizona	1367.	C	.		.		1367.	C	48.	0.	0.	48.
California	4592.	C	107.	P	.		4699.	C	-101.	12.	0.	-90.
Hawaii	11231.		6288.	C	3482.	C	21001.		165.	-191.	-3.	-29.
Nevada	2483.	C	8397.	C	5404.	C	16284.		-74.	-83.	16.	-140.
Oregon	4725.		6788.		.		11513.		-106.	-101.	0.	-207.
Washington	10252.		.		762.		11014.		47.	0.	26.	73.

Diana/Noise 02 Oxygenated

	DTW		Rack		Bulk		Total		<--- Census' Noise Method-->			
United States	185909.		157406.		176052.		519367.		366.	291.	-61.	597.
PAD District I	62713.		59801.		51566.		174080.		151.	-246.	161.	67.
Subdistrict IA	36179.		20682.		21112.		77973.		143.	-327.	3.	-181.
Connecticut	5530.		5886.		1644.		13060.		-202.	-141.	-29.	-372.
Maine	12772.		1478.	C	3159.	C	17409.		-25.	7.	67.	48.
Massachusetts	172.	P	1572.	P	3048.	C	4792.	C	-9.	-81.	-78.	-168.
New Hampshire	6448.	C	4444.	C	7408.		18300.		155.	-65.	30.	120.
Rhode Island	6609.		2354.	C	3749.	C	12712.	C	167.	61.	102.	331.
Vermont	4648.	C	4948.	C	2104.	C	11700.		58.	-107.	-89.	-139.
Subdistrict IB	16120.		12775.		12539.		41434.		-33.	72.	-69.	-31.
Delaware	5396.	C	.		5313.	C	10709.		-87.	0.	22.	-65.
District of Columbia	5118.		2725.		940.		8783.		7.	47.	24.	78.
Maryland	.		.		932.		932.		0.	0.	-72.	-72.
New Jersey	3737.	C	.		3832.	C	7569.		-20.	0.	-57.	-77.
New York	1869.	C	2124.	C	744.	C	4737.		67.	-98.	-25.	-56.
Pennsylvania	.		7926.	C	778.	P	8704.		0.	123.	39.	162.
Subdistrict IC	10414.		26344.		17915.		54673.		42.	9.	227.	278.
Florida	855.	C	3469.	C	959.	C	5283.		29.	-13.	-31.	-16.
Georgia	2965.		1472.	C	852.	C	5289.		61.	-41.	-22.	-2.
North Carolina	974.	C	6653.	C	3325.		10952.		52.	107.	68.	226.
South Carolina	1540.		8716.		2862.		13118.		14.	68.	96.	177.
Virginia	3869.	C	3724.		1022.	P	8615.		-135.	-6.	53.	-88.
West Virginia	211.	P	2310.	C	8895.		11416.		21.	-104.	63.	-20.
PAD District II	70903.		41637.		63903.		176443.		383.	333.	0.	716.
Illinois	1257.	C	748.	P	8994.		10999.		21.	75.	-1.	95.
Indiana	2889.	C	7304.		4071.	C	14264.		102.	114.	-72.	144.
Iowa	2113.		4459.		5890.		12462.		-88.	-103.	92.	-99.
Kansas	2976.	C	5421.	C	808.	P	9205.		-78.	-36.	87.	-27.
Kentucky	9190.		2142.	C	3821.	C	15153.		21.	75.	59.	155.
Michigan	6538.	C	1185.	C	.		7723.		52.	57.	0.	109.
Minnesota	4295.		2781.		4650.		11726.		55.	55.	-94.	17.
Missouri	4878.		2965.		3712.		11555.		-29.	65.	-81.	-45.
Nebraska	6235.		2974.		6418.		15627.		190.	-91.	6.	104.
North Dakota	2264.	C	3856.	C	3832.	C	9952.		57.	-114.	98.	41.
Ohio	9932.		1821.	C	8186.	C	19939.		210.	62.	-25.	247.
Oklahoma	10858.		2493.		3276.		16627.		68.	84.	-85.	66.
South Dakota	.		2040.	C	4950.	C	6990.		0.	54.	-103.	-49.
Tennessee	530.	P	1448.	C	4233.	C	6211.		-27.	38.	63.	74.
Wisconsin	6948.	C	.		1062.	P	8010.		-171.	0.	54.	-117.
PAD District III	10582.		14268.		24802.		49652.		-94.	125.	-70.	-39.
Alabama	.		.		7556.		7556.		0.	0.	-147.	-147.
Arkansas	928.	C	2520.	C	5697.	C	9145.		-24.	89.	34.	100.
Louisiana	.		6205.	C	4003.	C	10208.		0.	7.	156.	163.
Mississippi	2233.	C	.		2424.	C	4657.		-92.	0.	-99.	-191.
New Mexico	7421.		4451.		5082.		16954.		22.	-9.	-17.	-4.
Texas	.		1092.	C	40.	P	1132.		0.	37.	2.	39.
PAD District IV	20750.		15061.		17089.		52900.		-16.	-153.	104.	-65.
Colorado	.		7132.		.		7132.		0.	-78.	0.	-78.
Idaho	1698.	C	892.	P	6724.	C	9314.	C	59.	48.	127.	234.
Montana	362.	C	5498.	C	6898.		12758.		9.	-70.	10.	-52.
Utah	12230.	C	1539.	C	3467.	C	17236.		-216.	-53.	-32.	-302.
Wyoming	6460.	C	.		.		6460.	C	133.	0.	0.	133.
PAD District V	20961.		26639.		18692.		66292.		-58.	232.	-256.	-81.
Alaska	4734.	C	2844.	C	3595.	C	11173.		-80.	145.	-72.	-7.
Arizona	2353.	C	.		1433.	C	3786.	C	71.	0.	-13.	58.
California	3836.	C	1863.	C	5099.		10798.	C	-132.	26.	-162.	-268.
Hawaii	2614.	C	.		2544.	C	5158.		119.	0.	-70.	49.
Nevada	2991.	C	4707.		423.	P	8121.		7.	140.	45.	191.
Oregon	1742.	P	17225.		3040.	C	22007.		90.	-79.	-64.	-53.
Washington	2691.		.		2558.		5249.		-131.	0.	80.	-51.

Diana/Noise 02 Reformulated

	DTW		Rack		Bulk		Total		<--- Census' Noise Method-->			
United States	172508.		197789.		208148.		578445.		-37.	395.	1322.	1681.
PAD District I	72620.		57379.		61697.		191696.		217.	924.	327.	1468.
Subdistrict IA	22203.		11875.		21761.		55839.		-257.	394.	95.	232.
Connecticut	5947.		1284.		3080.		10311.		-137.	33.	37.	-68.
Maine	6252.	C	2346.		12868.	C	21466.		147.	-4.	-6.	137.
Massachusetts	1839.		3405.	C	1068.	P	6312.	C	-62.	70.	-54.	-46.
New Hampshire	4718.	C	2236.	C	3795.	C	10749.		-73.	119.	80.	126.
Rhode Island	.		593.	P	.		593.	P	0.	64.	0.	64.
Vermont	3447.	C	2011.	C	950.	P	6408.		-132.	111.	39.	17.
Subdistrict IB	34305.		20449.		19914.		74668.		200.	85.	356.	641.
Delaware	7416.		1364.	P	3940.	C	12720.		62.	72.	81.	215.
District of Columbia	5563.		8643.		7070.		21276.		90.	30.	147.	267.
Maryland	3311.	C	852.	P	3592.	C	7755.		-120.	43.	90.	13.
New Jersey	9858.		375.	C	584.	C	10817.		143.	-8.	-4.	131.
New York	4092.	C	6848.	C	705.	C	11645.		-60.	-99.	-24.	-183.
Pennsylvania	4065.		2367.	C	4023.	C	10455.		85.	47.	66.	198.
Subdistrict IC	16112.		25055.		20022.		61189.		275.	445.	-125.	595.
Florida	.		5571.	C	1847.	C	7418.		0.	149.	-15.	134.
Georgia	5166.		883.	P	2189.	C	8238.		93.	89.	-71.	111.
North Carolina	2204.		.		1812.		4016.		93.	0.	-47.	47.
South Carolina	.		12556.		4720.		17276.		0.	41.	69.	111.
Virginia	2808.		2088.		8450.		13346.		59.	-54.	-12.	-7.
West Virginia	5934.		3957.	C	1004.	P	10895.		29.	220.	-50.	199.
PAD District II	47207.		70912.		59961.		178080.		197.	-307.	636.	526.
Illinois	.		9170.		3750.		12920.		0.	-61.	81.	20.
Indiana	3225.		1195.		.		4420.		2.	-26.	0.	-24.
Iowa	2171.		5331.		4561.		12063.		0.	-237.	165.	-71.
Kansas	11047.		6859.	C	248.	P	18154.		-121.	-79.	-13.	-213.
Kentucky	.		3629.		6019.		9648.		0.	64.	-66.	-2.
Michigan	1074.	C	.		2238.	C	3312.		39.	0.	-77.	-38.
Minnesota	5030.		7462.		4386.		16878.		-106.	67.	71.	32.
Missouri	974.		5459.		3552.		9985.		-51.	42.	53.	44.
Nebraska	4550.		8343.		2852.		15745.		-23.	112.	-91.	-2.
North Dakota	6903.		4878.	C	3182.	C	14963.		141.	-42.	-82.	17.
Ohio	3687.		2550.	C	1905.	C	8142.		128.	-52.	-71.	6.
Oklahoma	2238.		1864.		3453.		7555.		31.	-52.	121.	101.
South Dakota	24.		9477.		11671.		21172.		1.	4.	349.	354.
Tennessee	1712.	C	1825.	C	8591.		12128.		-43.	11.	197.	164.
Wisconsin	4572.	C	2870.	C	3553.		10995.		201.	-59.	-1.	140.
PAD District III	26342.		18475.		31497.		76314.		-150.	-365.	330.	-186.
Alabama	.		4674.	C	869.	C	5543.		0.	-83.	62.	-22.
Arkansas	702.	P	4881.	C	4084.	C	9667.		36.	-11.	94.	118.
Louisiana	7502.		807.	C	5716.	C	14025.		-149.	-28.	-7.	-184.
Mississippi	2133.	C	4379.	C	1560.	P	8072.		8.	-122.	-81.	-195.
New Mexico	6872.		2836.		16130.		25838.		27.	-75.	138.	89.
Texas	9133.	C	898.	P	3138.	C	13169.		-72.	-46.	125.	8.
PAD District IV	16777.		21138.		32444.		70359.		-329.	-328.	67.	-591.
Colorado	7968.		3585.		15573.		27126.		-146.	-7.	95.	-58.
Idaho	.		9651.	C	3012.	C	12663.		0.	-275.	115.	-160.
Montana	5982.		1860.		8317.		16159.		-108.	47.	-163.	-224.
Utah	.		382.	P	4773.	C	5155.		0.	-39.	-43.	-82.
Wyoming	2827.		5660.	C	769.	C	9256.		-75.	-54.	63.	-67.
PAD District V	9562.		29885.		22549.		61996.		28.	472.	-37.	463.
Alaska	19.	P	7862.		1440.	C	9321.		-2.	45.	63.	107.
Arizona	704.	C	828.	C	1149.	C	2681.		21.	29.	-41.	8.
California	4137.	C	5743.	C	6143.		16023.		-62.	53.	143.	134.
Hawaii	52.	P	2046.	C	2991.	C	5089.		3.	36.	104.	143.
Nevada	.		1212.	C	2500.	C	3712.		0.	49.	-80.	-31.
Oregon	1156.	P	8840.		5168.	C	15164.		60.	206.	-93.	174.
Washington	3494.		3354.	C	3158.	C	10006.		9.	53.	-133.	-72.

Diana/Noise 02 All Formulations

	DTW	Rack	Bulk	Total	<--- Census' Noise Method-->			
United States	591889.	555705.	573481.	1721075.	-1242.	-421.	-489.	-2152.
PAD District I	203531.	187271.	169107.	559909.	-464.	216.	-234.	-482.
Subdistrict IA	77215.	65043.	58917.	201175.	-573.	-65.	-261.	-900.
Connecticut	16751.	13781.	8853.	39385.	-483.	-146.	-84.	-713.
Maine	20696.	6832.	16027.	43555.	79.	42.	61.	182.
Massachusetts	4021. C	11525.	4116. C	19662.	-1.	-144.	-132.	-278.
New Hampshire	17235.	7054.	13435.	37724.	-101.	73.	72.	45.
Rhode Island	10417. C	12453.	6564. C	29434.	7.	226.	65.	298.
Vermont	8095.	13398.	9922.	31415.	-75.	-116.	-243.	-434.
Subdistrict IB	74836.	43174.	52562.	170572.	328.	-141.	-46.	141.
Delaware	14996.	3204.	11057.	29257.	9.	-2.	155.	162.
District of Columbia	14573.	11368.	15350.	41291.	-6.	77.	107.	178.
Maryland	3311. C	6590.	6465. C	16366.	-120.	-85.	-88.	-293.
New Jersey	18856.	1000.	4416.	24272.	190.	-20.	-61.	108.
New York	9666. C	9039.	6229. C	24934.	82.	-189.	-197.	-304.
Pennsylvania	13434.	11973.	9045.	34452.	173.	78.	38.	290.
Subdistrict IC	51480.	79054.	57628.	188162.	-219.	423.	73.	277.
Florida	6720.	21550.	4419.	32689.	-91.	62.	-128.	-157.
Georgia	18574.	4477.	9264.	32315.	-65.	-52.	15.	-102.
North Carolina	4108.	7498.	9770.	21376.	192.	191.	-118.	265.
South Carolina	1540.	31074.	7582.	40196.	14.	229.	165.	408.
Virginia	10893.	5812.	11958.	28663.	-233.	-60.	86.	-207.
West Virginia	9645.	8643.	14635.	32923.	-35.	53.	53.	70.
PAD District II	199919.	175761.	197066.	572746.	339.	10.	-133.	216.
Illinois	8497.	15374.	15719.	39590.	267.	122.	129.	518.
Indiana	7402.	14060.	5751.	27213.	172.	77.	-161.	88.
Iowa	4880. C	14798. C	20733.	40411.	-90.	-368.	354.	-104.
Kansas	16779.	18124.	4186.	39089.	-163.	-110.	54.	-219.
Kentucky	9190.	6383.	19120.	34693.	21.	202.	-212.	12.
Michigan	11963.	2985.	10498.	25446.	89.	-43.	-237.	-192.
Minnesota	21227.	12671.	26220.	60118.	-230.	86.	-11.	-154.
Missouri	15545.	12174.	7264.	34983.	-196.	30.	-28.	-195.
Nebraska	25425.	14550.	17610.	57585.	66.	-23.	-282.	-239.
North Dakota	10443.	22477.	8154.	41074.	131.	-376.	-23.	-268.
Ohio	24618.	10483.	15232.	50333.	294.	170.	-307.	156.
Oklahoma	16828.	8571.	10279.	35678.	59.	46.	90.	194.
South Dakota	24.	12670.	16661.	29355.	1.	164.	248.	412.
Tennessee	2242. C	4328. C	13334.	19904.	-70.	27.	251.	208.
Wisconsin	24856.	6113.	6305.	37274.	-12.	7.	3.	-2.
PAD District III	69761.	63949.	79438.	213148.	-604.	-496.	-129.	-1228.
Alabama	15332.	5008. C	13698. C	34038.	-97.	-108.	-148.	-353.
Arkansas	5998.	15443.	12662.	34103.	-69.	60.	57.	48.
Louisiana	7502.	12006.	15614.	35122.	-149.	-187.	90.	-246.
Mississippi	6937.	16116.	5310.	28363.	-131.	-269.	-248.	-648.
New Mexico	22103.	13386.	25184.	60673.	-150.	17.	50.	-83.
Texas	11889.	1990. C	6970. C	20849.	-8.	-8.	71.	54.
PAD District IV	51300.	46380.	68593.	166273.	-509.	-407.	84.	-832.
Colorado	12208.	14668.	23449.	50325.	-234.	-209.	-82.	-525.
Idaho	7276.	13553.	9736.	30565.	-41.	-49.	242.	152.
Montana	6858.	8740.	21895.	37493.	-46.	-96.	-96.	-238.
Utah	13628.	1921.	10792.	26341.	-184.	-92.	-91.	-368.
Wyoming	11330.	7498.	2721.	21549.	-4.	39.	112.	147.
PAD District V	67378.	82344.	59277.	208999.	-4.	256.	-78.	175.
Alaska	6958.	14946.	13423.	35327.	-35.	105.	166.	236.
Arizona	4424.	828. C	2582. C	7834.	140.	29.	-54.	115.
California	12565.	7713.	11242.	31520.	-295.	91.	-19.	-223.
Hawaii	13897.	8334.	9017.	31248.	286.	-155.	31.	163.
Nevada	5474.	14316.	8327.	28117.	-67.	106.	-19.	20.
Oregon	7623.	32853.	8208.	48684.	44.	26.	-157.	-87.
Washington	16437.	3354. C	6478. C	26269.	-76.	53.	-27.	-50.

Noise Frequency Distribution

% from	% To	nonsensitive	Sensitive
.00-	.10	96	1
.10-	.50	272	0
.50-	1.00	265	0
1.00-	1.50	215	0
1.50-	2.00	164	0
2.00-	5.00	439	2
5.00-	10.00	27	51
10.00-	15.00	0	24
15.00-	30.00	0	0
30.00-	100.00	0	0
100.00-	999.00	0	0

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Audit of Diana Cell Suppression Pattern

479 Suppressions and Three Exact Disclosures

Tolerence: 0.000000000000000E+000

1	SpC00001	0	0	4708.000<	6258.000<	7325.000	24.8	17.1
2	SpC00002	0	0	2605.000<	3672.000<	5222.000	29.1	42.2
3	SpC00003	0	0	427.000<	1494.000<	3044.000	71.4	100.0
4	SpC00004	0	0	.000<	1550.000<	2617.000	100.0	68.8
5	SpC00005	0	0	1.000<	1551.000<	2618.000	99.9	68.8
6	SpC00006	0	0	4535.000<	5602.000<	7152.000	19.0	27.7
7	SpC00007	0	0	194.000<	1672.000<	4680.000	88.4	100.0
8	SpC00008	0	0	3244.000<	6252.000<	7730.000	48.1	23.6
9	SpC00009	0	0	.000<	3008.000<	4486.000	100.0	49.1
10	SpC00010	0	0	.000<	1478.000<	4486.000	100.0	100.0
11	SpC00011	0	0	151.000<	3159.000<	4637.000	95.2	46.8
12	SpC00012	0	0	11390.000<	12868.000<	15876.000	11.5	23.4
13	SpP00013	0	0	.000<	172.000<	2617.000	100.0	100.0
14	SpP00014	0	0	803.000<	1698.000<	2139.000	52.7	26.0
15	SpC00015	0	0	.000<	2151.000<	5450.000	100.0	100.0
16	SpC00016	0	0	.000<	2010.000<	4414.000	100.0	100.0
17	SpP00017	0	0	.000<	172.000<	2564.000	100.0	100.0
18	SpC00018	0	0	1839.000<	4021.000<	6253.000	54.3	55.5
19	SpC00019	0	0	1395.000<	3840.000<	4012.000	63.7	4.5

20	SpC00020	0	0	2964.000<	3405.000<	4300.000	13.0	26.3	
21	SpC00021	0	0	3213.000<	4280.000<	5830.000	24.9	36.2	
22	SpC00022	0	0	4144.000<	6548.000<	8558.000	36.7	30.7	
23	SpP00023	0	0	.000<	1572.000<	6526.000	100.0	100.0	
24	SpC00024	0	0	.000<	3405.000<	5066.000	100.0	48.8	
25	SpC00025	0	0	1884.000<	4116.000<	6298.000	54.2	53.0	
26	SpC00026	0	0	620.000<	3048.000<	6298.000	79.7	100.0	
27	SpP00027	0	0	.000<	1068.000<	2564.000	100.0	100.0	
28	SpC00028	0	0	1884.000<	4116.000<	6298.000	54.2	53.0	
29	SpC00029	0	0	4199.000<	4792.000<	7146.000	12.4	49.1	
30	SpC00030	0	0	3958.000<	6312.000<	6905.000	37.3	9.4	
31	SpC00031	0	0	2889.000<	6069.000<	8675.000	52.4	42.9	
32	SpC00032	0	0	3838.000<	6448.000<	9581.000	40.5	48.6	
33	SpC00033	0	0	279.000<	4718.000<	9136.000	94.1	93.6	
34	SpP00034	0	0	.000<	374.000<	2564.000	100.0	100.0	
35	SpC00035	0	0	1311.000<	4444.000<	7054.000	70.5	58.7	
36	SpC00036	0	0	.000<	2236.000<	5743.000	100.0	100.0	
37	SpC00037	0	0	.000<	2232.000<	4414.000	100.0	97.8	
38	SpC00038	0	0	1613.000<	3795.000<	6027.000	57.5	58.8	
39	SpC00039	0	0	833.000<	3065.000<	5247.000	72.8	71.2	
40	SpC00040	0	0	1576.000<	3808.000<	5990.000	58.6	57.3	
41	SpC00041	0	0	8185.000<	10417.000<	12599.000	21.4	20.9	
42	SpC00042	0	0	.000<	2354.000<	2947.000	100.0	25.2	
43	SpP00043	0	0	.000<	593.000<	2947.000	100.0	100.0	
44	SpC00044	0	0	406.000<	2588.000<	4820.000	84.3	86.2	
45	SpC00045	0	0	633.000<	2815.000<	5047.000	77.5	79.3	
46	SpC00046	0	0	3749.000<	3749.000<	3749.000	.0	.0	**
47	SpC00047	0	0	4382.000<	6564.000<	8796.000	33.2	34.0	
48	SpC00048	0	0	10358.000<	12712.000<	13305.000	18.5	4.7	
49	SpP00049	0	0	.000<	593.000<	2947.000	100.0	100.0	
50	SpC00050	0	0	4426.000<	5321.000<	5762.000	16.8	8.3	
51	SpC00051	0	0	.000<	710.000<	2672.000	100.0	100.0	
52	SpC00052	0	0	997.000<	2064.000<	3614.000	51.7	75.1	
53	SpC00053	0	0	1687.000<	4648.000<	7430.000	63.7	59.9	
54	SpC00054	0	0	665.000<	3447.000<	6408.000	80.7	85.9	
55	SpC00055	0	0	12062.000<	12503.000<	13398.000	3.5	7.2	
56	SpC00056	0	0	.000<	895.000<	1336.000	100.0	49.3	
57	SpC00057	0	0	1216.000<	4948.000<	6959.000	75.4	40.6	
58	SpC00058	0	0	.000<	2011.000<	5743.000	100.0	100.0	
59	SpC00059	0	0	14.000<	1081.000<	2631.000	98.7	100.0	
60	SpC00060	0	0	3632.000<	5182.000<	6249.000	29.9	20.6	
61	SpC00061	0	0	490.000<	2104.000<	3054.000	76.7	45.2	
62	SpP00062	0	0	.000<	950.000<	2564.000	100.0	100.0	
63	SpC00063	0	0	6174.000<	6978.000<	8364.000	11.5	19.9	
64	SpC00064	0	0	.000<	1386.000<	2190.000	100.0	58.0	
65	SpC00065	0	0	.000<	2184.000<	4081.000	100.0	86.9	
66	SpC00066	0	0	3499.000<	5396.000<	7580.000	35.2	40.5	
67	SpC00067	0	0	1014.000<	2400.000<	3204.000	57.7	33.5	
68	SpC00068	0	0	.000<	804.000<	2190.000	100.0	100.0	
69	SpC00069	0	0	.000<	1840.000<	3204.000	100.0	74.1	
70	SpP00070	0	0	.000<	1364.000<	3204.000	100.0	100.0	
71	SpC00071	0	0	2813.000<	3617.000<	5003.000	22.2	38.3	

72	SpC00072	0	0	1782.000<	3168.000<	3972.000	43.8	25.4
73	SpC00073	0	0	.000<	1804.000<	5828.000	100.0	100.0
74	SpC00074	0	0	3129.000<	5313.000<	7210.000	41.1	35.7
75	SpC00075	0	0	2100.000<	3940.000<	5304.000	46.7	34.6
76	SpC00076	0	0	1822.000<	3311.000<	4930.000	45.0	48.9
77	SpC00077	0	0	1822.000<	3311.000<	4930.000	45.0	48.9
78	SpC00078	0	0	1822.000<	3311.000<	4930.000	45.0	48.9
79	SpC00079	0	0	840.000<	1836.000<	2688.000	54.2	46.4
80	SpP00080	0	0	.000<	852.000<	1848.000	100.0	100.0
81	SpC00081	0	0	657.000<	5738.000<	6590.000	88.6	14.8
82	SpP00082	0	0	.000<	852.000<	5933.000	100.0	100.0
83	SpP00083	0	0	.000<	1079.000<	2007.000	100.0	86.0
84	SpC00084	0	0	.000<	996.000<	1848.000	100.0	85.5
85	SpC00085	0	0	1089.000<	1941.000<	7022.000	43.9	100.0
86	SpC00086	0	0	.000<	3592.000<	5933.000	100.0	65.2
87	SpC00087	0	0	4846.000<	6465.000<	7954.000	25.0	23.0
88	SpC00088	0	0	6060.000<	6875.000<	7019.000	11.9	2.1
89	SpC00089	0	0	4651.000<	4795.000<	5610.000	3.0	17.0
90	SpC00090	0	0	4886.000<	5261.000<	5845.000	7.1	11.1
91	SpC00091	0	0	3153.000<	3737.000<	4112.000	15.6	10.0
92	SpC00092	0	0	.000<	375.000<	959.000	100.0	100.0
93	SpC00093	0	0	41.000<	625.000<	1000.000	93.4	60.0
94	SpC00094	0	0	41.000<	625.000<	1000.000	93.4	60.0
95	SpC00095	0	0	.000<	375.000<	959.000	100.0	100.0
96	SpC00096	0	0	.000<	144.000<	959.000	100.0	100.0
97	SpC00097	0	0	.000<	440.000<	959.000	100.0	100.0
98	SpC00098	0	0	3457.000<	3832.000<	4416.000	9.8	15.2
99	SpC00099	0	0	3457.000<	3832.000<	4416.000	9.8	15.2
100	SpC00100	0	0	.000<	584.000<	959.000	100.0	64.2
101	SpC00101	0	0	4815.000<	6434.000<	7923.000	25.2	23.1
102	SpC00102	0	0	2183.000<	3705.000<	5574.000	41.1	50.4
103	SpC00103	0	0	.000<	1869.000<	3391.000	100.0	81.4
104	SpC00104	0	0	2473.000<	4092.000<	5581.000	39.6	36.4
105	SpC00105	0	0	8047.000<	9666.000<	11155.000	16.7	15.4
106	SpC00106	0	0	.000<	648.000<	1432.000	100.0	100.0
107	SpP00107	0	0	1279.000<	2063.000<	2711.000	38.0	31.4
108	SpP00108	0	0	.000<	67.000<	6369.000	100.0	100.0
109	SpC00109	0	0	1346.000<	2124.000<	4737.000	36.6	100.0
110	SpC00110	0	0	1324.000<	6848.000<	7693.000	80.7	12.3
111	SpP00111	0	0	.000<	784.000<	1432.000	100.0	82.7
112	SpC00112	0	0	.000<	705.000<	2516.000	100.0	100.0
113	SpC00113	0	0	.000<	4780.000<	6369.000	100.0	33.2
114	SpC00114	0	0	.000<	744.000<	3391.000	100.0	100.0
115	SpC00115	0	0	.000<	705.000<	7848.000	100.0	100.0
116	SpC00116	0	0	4740.000<	6229.000<	7848.000	23.9	26.0
117	SpC00117	0	0	2604.000<	3480.000<	4639.000	25.2	33.3
118	SpC00118	0	0	795.000<	1954.000<	2830.000	59.3	44.8
119	SpC00119	0	0	.000<	1680.000<	5924.000	100.0	100.0
120	SpC00120	0	0	5313.000<	7926.000<	8704.000	33.0	9.8
121	SpC00121	0	0	.000<	2367.000<	6390.000	100.0	100.0
122	SpC00122	0	0	2292.000<	3451.000<	4327.000	33.6	25.4
123	SpC00123	0	0	.000<	876.000<	2035.000	100.0	100.0

124	SpC00124	0	0	.000<	4244.000<	5924.000	100.0	39.6
125	SpP00125	0	0	.000<	778.000<	3391.000	100.0	100.0
126	SpC00126	0	0	.000<	4023.000<	6390.000	100.0	58.8
127	SpC00127	0	0	1629.000<	3200.000<	6036.000	49.1	88.6
128	SpC00128	0	0	684.000<	3520.000<	5091.000	80.6	44.6
129	SpC00129	0	0	3059.000<	5865.000<	6720.000	47.8	14.6
130	SpC00130	0	0	.000<	855.000<	3661.000	100.0	100.0
131	SpC00131	0	0	8896.500<	10857.000<	12704.000	18.1	17.0
132	SpC00132	0	0	3417.000<	5264.000<	7224.500	35.1	37.2
133	SpC00133	0	0	1622.000<	3469.000<	5283.000	53.2	52.3
134	SpC00134	0	0	3757.000<	5571.000<	7418.000	32.6	33.2
135	SpC00135	0	0	.000<	1847.000<	3807.500	100.0	100.0
136	SpP00136	0	0	.000<	1001.000<	4419.000	100.0	100.0
137	SpC00137	0	0	.000<	1571.000<	4407.000	100.0	100.0
138	SpC00138	0	0	758.000<	1613.000<	4419.000	53.0	100.0
139	SpC00139	0	0	.000<	959.000<	2833.000	100.0	100.0
140	SpC00140	0	0	.000<	1847.000<	3661.000	100.0	98.2
141	SpC00141	0	0	.000<	2122.000<	4407.000	100.0	100.0
142	SpC00142	0	0	70.000<	2355.000<	4477.000	97.0	90.1
143	SpC00143	0	0	.000<	1472.000<	2324.000	100.0	57.9
144	SpP00144	0	0	31.000<	883.000<	2355.000	96.5	100.0
145	SpC00145	0	0	376.000<	2661.000<	4783.000	85.9	79.7
146	SpC00146	0	0	4481.000<	6603.000<	8888.000	32.1	34.6
147	SpC00147	0	0	.000<	852.000<	2324.000	100.0	100.0
148	SpC00148	0	0	717.000<	2189.000<	3041.000	67.2	38.9
149	SpP00149	0	0	.000<	714.000<	986.000	100.0	38.1
150	SpC00150	0	0	854.000<	1126.000<	1840.000	24.2	63.4
151	SpP00151	0	0	.000<	930.000<	1775.000	100.0	90.9
152	SpC00152	0	0	129.000<	974.000<	1904.000	86.8	95.5
153	SpC00153	0	0	6512.000<	7226.000<	7498.000	9.9	3.8
154	SpP00154	0	0	.000<	272.000<	986.000	100.0	100.0
155	SpP00155	0	0	.000<	845.000<	1775.000	100.0	100.0
156	SpC00156	0	0	5723.000<	6653.000<	7498.000	14.0	12.7
157	SpC00157	0	0	8192.000<	8464.000<	9178.000	3.2	8.4
158	SpP00158	0	0	592.000<	1306.000<	1578.000	54.7	20.8
159	SpC00159	0	0	3194.000<	4216.000<	6027.000	24.2	43.0
160	SpC00160	0	0	2058.000<	3869.000<	4891.000	46.8	26.4
161	SpC00161	0	0	675.000<	2486.000<	3508.000	72.8	41.1
162	SpP00162	0	0	.000<	1022.000<	2833.000	100.0	100.0
163	SpC00163	0	0	1237.000<	3359.000<	5644.000	63.2	68.0
164	SpC00164	0	0	1091.000<	3376.000<	5498.000	67.7	62.9
165	SpC00165	0	0	1651.000<	3500.000<	3711.000	52.8	6.0
166	SpP00166	0	0	.000<	211.000<	2060.000	100.0	100.0
167	SpC00167	0	0	1632.000<	3751.000<	5439.500	56.5	45.0
168	SpC00168	0	0	.000<	2376.000<	6617.000	100.0	100.0
169	SpC00169	0	0	394.000<	2516.000<	4801.000	84.3	90.8
170	SpC00170	0	0	1446.000<	2376.000<	3221.000	39.1	35.6
171	SpC00171	0	0	461.000<	2310.000<	2521.000	80.0	9.1
172	SpC00172	0	0	2901.000<	3957.000<	4961.000	26.7	25.4
173	SpC00173	0	0	3126.500<	4815.000<	6934.000	35.1	44.0
174	SpC00174	0	0	1193.000<	3312.000<	5000.500	64.0	51.0
175	SpC00175	0	0	3680.000<	4736.000<	5740.000	22.3	21.2

176	SpP00176	0	0	.000<	1004.000<	2060.000	100.0	100.0	
177	SpP00177	0	0	.000<	316.000<	4369.000	100.0	100.0	
178	SpC00178	0	0	.000<	4053.000<	4369.000	100.0	7.8	
179	SpC00179	0	0	6492.000<	7240.000<	8497.000	10.3	17.4	
180	SpC00180	0	0	.000<	1257.000<	2005.000	100.0	59.5	
181	SpC00181	0	0	10783.000<	14174.000<	14586.000	23.9	2.9	
182	SpP00182	0	0	788.000<	1200.000<	4591.000	34.3	100.0	
183	SpC00183	0	0	4199.000<	5456.000<	6204.000	23.0	13.7	
184	SpP00184	0	0	.000<	748.000<	2005.000	100.0	100.0	
185	SpC00185	0	0	1521.000<	3750.000<	6804.000	59.4	81.4	
186	SpC00186	0	0	8915.000<	11969.000<	14198.000	25.5	18.6	
187	SpP00187	0	0	.000<	839.000<	2744.000	100.0	100.0	
188	SpP00188	0	0	45.000<	1950.000<	2789.000	97.7	43.0	
189	SpP00189	0	0	.000<	1288.000<	2968.000	100.0	100.0	
190	SpC00190	0	0	1209.000<	2889.000<	4177.000	58.2	44.6	
191	SpC00191	0	0	3007.000<	3846.000<	5751.000	21.8	49.5	
192	SpC00192	0	0	.000<	1905.000<	2744.000	100.0	44.0	
193	SpP00193	0	0	.000<	1680.000<	2968.000	100.0	76.7	
194	SpC00194	0	0	2783.000<	4071.000<	5751.000	31.6	41.3	
195	SpC00195	0	0	7620.000<	8459.000<	10364.000	9.9	22.5	
196	SpP00196	0	0	45.000<	1950.000<	2789.000	97.7	43.0	
197	SpC00197	0	0	.000<	1149.000<	3803.000	100.0	100.0	
198	SpC00198	0	0	.000<	412.000<	3803.000	100.0	100.0	
199	SpC00199	0	0	.000<	596.000<	2838.000	100.0	100.0	
200	SpC00200	0	0	4284.000<	4880.000<	7122.000	12.2	45.9	
201	SpC00201	0	0	1954.000<	4196.000<	4792.000	53.4	14.2	
202	SpC00202	0	0	2766.000<	5008.000<	5604.000	44.8	11.9	
203	SpC00203	0	0	12556.000<	14798.000<	15394.000	15.2	4.0	
204	SpC00204	0	0	3804.000<	4216.000<	7607.000	9.8	80.4	
205	SpC00205	0	0	481.000<	3872.000<	4284.000	87.6	10.6	
206	SpP00206	0	0	.000<	1390.000<	2539.000	100.0	82.7	
207	SpC00207	0	0	2244.000<	3393.000<	4783.000	33.9	41.0	
208	SpC00208	0	0	1700.000<	2756.000<	5732.000	38.3	100.0	
209	SpC00209	0	0	.000<	2976.000<	4032.000	100.0	35.5	
210	SpC00210	0	0	5173.000<	5421.000<	9205.000	4.6	69.8	
211	SpC00211	0	0	3075.000<	6859.000<	7107.000	55.2	3.6	
212	SpP00212	0	0	.000<	606.000<	2238.000	100.0	100.0	
213	SpP00213	0	0	.000<	1632.000<	2238.000	100.0	37.1	
214	SpC00214	0	0	154.000<	3130.000<	4186.000	95.1	33.7	
215	SpP00215	0	0	.000<	808.000<	4032.000	100.0	100.0	
216	SpP00216	0	0	.000<	248.000<	4032.000	100.0	100.0	
217	SpC00217	0	0	7794.000<	9790.000<	10333.000	20.4	5.5	
218	SpC00218	0	0	4482.000<	5025.000<	7021.000	10.8	39.7	
219	SpC00219	0	0	5214.000<	5826.000<	8810.000	10.5	51.2	
220	SpC00220	0	0	380.000<	3364.000<	3976.000	88.7	18.2	
221	SpC00221	0	0	2787.000<	2787.000<	2787.000	.0	.0	**
222	SpP00222	0	0	.000<	612.000<	3596.000	100.0	100.0	
223	SpC00223	0	0	.000<	2984.000<	3596.000	100.0	20.5	
224	SpP00224	0	0	.000<	612.000<	2754.000	100.0	100.0	
225	SpC00225	0	0	.000<	2142.000<	2754.000	100.0	28.6	
226	SpC00226	0	0	3539.000<	6523.000<	7135.000	45.7	9.4	
227	SpC00227	0	0	4023.000<	4635.000<	7619.000	13.2	64.4	

228	SpC00228	0	0	7138.000<	9280.000<	9892.000	23.1	6.6	
229	SpC00229	0	0	3209.000<	3821.000<	5963.000	16.0	56.1	
230	SpC00230	0	0	942.000<	2022.000<	3927.000	53.4	94.2	
231	SpC00231	0	0	8036.000<	9941.000<	11021.000	19.2	10.9	
232	SpC00232	0	0	928.000<	4351.000<	7225.000	78.7	66.1	
233	SpC00233	0	0	4738.000<	6538.000<	7723.000	27.5	18.1	
234	SpC00234	0	0	.000<	1074.000<	3312.000	100.0	100.0	
235	SpP00235	0	0	.000<	1080.000<	2985.000	100.0	100.0	
236	SpC00236	0	0	.000<	1905.000<	2985.000	100.0	56.7	
237	SpP00237	0	0	.000<	1800.000<	2985.000	100.0	65.8	
238	SpC00238	0	0	.000<	1185.000<	2985.000	100.0	100.0	
239	SpC00239	0	0	2858.000<	6668.000<	8587.000	57.1	28.8	
240	SpC00240	0	0	1911.000<	3830.000<	7640.000	50.1	99.5	
241	SpC00241	0	0	7186.000<	8260.000<	10498.000	13.0	27.1	
242	SpC00242	0	0	.000<	2238.000<	3312.000	100.0	48.0	
243	SpC00243	0	0	6785.000<	8690.000<	9529.000	21.9	9.7	
244	SpC00244	0	0	4896.000<	5735.000<	7640.000	14.6	33.2	
245	SpP00245	0	0	.000<	1276.000<	2416.000	100.0	89.3	
246	SpC00246	0	0	1124.000<	2264.000<	3540.000	50.4	56.4	
247	SpC00247	0	0	674.000<	3856.000<	8247.000	82.5	100.0	
248	SpC00248	0	0	487.000<	4878.000<	8060.000	90.0	65.2	
249	SpC00249	0	0	.000<	1140.000<	2416.000	100.0	100.0	
250	SpC00250	0	0	.000<	3832.000<	8154.000	100.0	100.0	
251	SpC00251	0	0	.000<	3182.000<	7573.000	100.0	100.0	
252	SpC00252	0	0	.000<	6112.000<	10483.000	100.0	71.5	
253	SpC00253	0	0	.000<	1821.000<	10007.000	100.0	100.0	
254	SpC00254	0	0	.000<	2550.000<	4455.000	100.0	74.7	
255	SpC00255	0	0	770.000<	5141.000<	11253.000	85.0	100.0	
256	SpC00256	0	0	.000<	8186.000<	10007.000	100.0	22.2	
257	SpC00257	0	0	.000<	1905.000<	4455.000	100.0	100.0	
258	SpC00258	0	0	.000<	1153.000<	1193.000	100.0	3.5	
259	SpC00259	0	0	2000.000<	2040.000<	3193.000	2.0	56.5	
260	SpP00260	0	0	.000<	40.000<	1193.000	100.0	100.0	
261	SpC00261	0	0	3797.000<	4950.000<	4990.000	23.3	.8	
262	SpC00262	0	0	.000<	2242.000<	2838.000	100.0	26.6	
263	SpP00263	0	0	.000<	530.000<	2838.000	100.0	100.0	
264	SpC00264	0	0	.000<	1712.000<	2838.000	100.0	65.8	
265	SpC00265	0	0	.000<	2242.000<	2838.000	100.0	26.6	
266	SpC00266	0	0	49.000<	645.000<	2887.000	92.4	100.0	
267	SpC00267	0	0	2235.000<	2235.000<	2235.000	.0	.0	**
268	SpC00268	0	0	.000<	1055.000<	1565.000	100.0	48.3	
269	SpC00269	0	0	.000<	1448.000<	3033.000	100.0	100.0	
270	SpC00270	0	0	699.000<	1825.000<	3537.000	61.7	93.8	
271	SpC00271	0	0	3732.000<	4328.000<	6570.000	13.8	51.8	
272	SpC00272	0	0	.000<	543.000<	2539.000	100.0	100.0	
273	SpC00273	0	0	2470.000<	4466.000<	5009.000	44.7	12.2	
274	SpC00274	0	0	.000<	510.000<	1565.000	100.0	100.0	
275	SpC00275	0	0	3178.000<	4233.000<	4743.000	24.9	12.0	
276	SpC00276	0	0	1448.000<	1991.000<	3987.000	27.3	100.0	
277	SpC00277	0	0	4705.000<	6701.000<	7244.000	29.8	8.1	
278	SpC00278	0	0	5258.000<	6948.000<	8010.000	24.3	15.3	
279	SpC00279	0	0	3510.000<	4572.000<	6262.000	23.2	37.0	

280	SpC00280	0	0	2181.000<	3243.000<	4933.000	32.7	52.1
281	SpC00281	0	0	1180.000<	2870.000<	3932.000	58.9	37.0
282	SpC00282	0	0	.000<	1690.000<	2752.000	100.0	62.8
283	SpP00283	0	0	.000<	1062.000<	2752.000	100.0	100.0
284	SpC00284	0	0	764.000<	3504.000<	3763.000	78.2	7.4
285	SpC00285	0	0	2425.000<	2684.000<	5424.000	9.6	100.0
286	SpP00286	0	0	.000<	259.000<	2999.000	100.0	100.0
287	SpC00287	0	0	.000<	4674.000<	5798.000	100.0	24.0
288	SpC00288	0	0	.000<	334.000<	4027.000	100.0	100.0
289	SpC00289	0	0	.000<	4674.000<	5543.000	100.0	18.6
290	SpC00290	0	0	2052.000<	5008.000<	5873.000	59.0	17.3
291	SpC00291	0	0	.000<	865.000<	3821.000	100.0	100.0
292	SpC00292	0	0	1580.000<	5273.000<	5607.000	70.0	6.3
293	SpC00293	0	0	.000<	869.000<	5543.000	100.0	100.0
294	SpC00294	0	0	12833.000<	13698.000<	16654.000	6.3	21.6
295	SpC00295	0	0	.000<	4368.000<	5998.000	100.0	37.3
296	SpC00296	0	0	.000<	928.000<	3161.000	100.0	100.0
297	SpP00297	0	0	.000<	702.000<	5998.000	100.0	100.0
298	SpC00298	0	0	1673.000<	2520.000<	7401.000	33.6	100.0
299	SpC00299	0	0	.000<	4881.000<	5728.000	100.0	17.4
300	SpC00300	0	0	1251.000<	2881.000<	7249.000	56.6	100.0
301	SpC00301	0	0	.000<	5697.000<	7472.000	100.0	31.2
302	SpC00302	0	0	.000<	4084.000<	9667.000	100.0	100.0
303	SpC00303	0	0	4702.000<	5772.000<	7502.000	18.5	30.0
304	SpC00304	0	0	.000<	1730.000<	2800.000	100.0	61.8
305	SpC00305	0	0	228.000<	3088.000<	5056.000	92.6	63.7
306	SpC00306	0	0	3354.000<	5322.000<	8182.000	37.0	53.7
307	SpC00307	0	0	1284.000<	6205.000<	7012.000	79.3	13.0
308	SpC00308	0	0	.000<	807.000<	5728.000	100.0	100.0
309	SpC00309	0	0	2699.000<	4667.000<	7527.000	42.2	61.3
310	SpC00310	0	0	8067.000<	9797.000<	10867.000	17.7	10.9
311	SpP00311	0	0	.000<	1150.000<	2048.000	100.0	78.1
312	SpC00312	0	0	3196.000<	4003.000<	8924.000	20.2	100.0
313	SpC00313	0	0	795.000<	5716.000<	6523.000	86.1	14.1
314	SpC00314	0	0	.000<	666.000<	1676.000	100.0	100.0
315	SpC00315	0	0	.000<	1010.000<	1676.000	100.0	65.9
316	SpC00316	0	0	.000<	2571.000<	6937.000	100.0	100.0
317	SpC00317	0	0	.000<	2233.000<	3161.000	100.0	41.6
318	SpC00318	0	0	.000<	2133.000<	4027.000	100.0	88.8
319	SpC00319	0	0	7915.000<	8925.000<	9591.000	11.3	7.5
320	SpC00320	0	0	126.000<	792.000<	1802.000	84.1	100.0
321	SpC00321	0	0	8044.000<	11737.000<	12071.000	31.5	2.8
322	SpC00322	0	0	4045.000<	4379.000<	8072.000	7.6	84.3
323	SpP00323	0	0	.000<	1326.000<	3814.000	100.0	100.0
324	SpC00324	0	0	1496.000<	2424.000<	4657.000	38.3	92.1
325	SpP00325	0	0	.000<	1560.000<	3814.000	100.0	100.0
326	SpC00326	0	0	.000<	1070.000<	2800.000	100.0	100.0
327	SpC00327	0	0	2810.000<	4540.000<	5610.000	38.1	23.6
328	SpC00328	0	0	.000<	2756.000<	6548.000	100.0	100.0
329	SpC00329	0	0	5341.000<	9133.000<	11889.000	41.5	30.2
330	SpP00330	0	0	.000<	898.000<	2048.000	100.0	100.0
331	SpC00331	0	0	.000<	1092.000<	2898.000	100.0	100.0

332	SpC00332	0	0	.000<	1092.000<	1132.000	100.0	3.7
333	SpP00333	0	0	.000<	898.000<	4946.000	100.0	100.0
334	SpC00334	0	0	1125.000<	1990.000<	4946.000	43.5	100.0
335	SpC00335	0	0	.000<	2860.000<	4828.000	100.0	68.8
336	SpC00336	0	0	1234.000<	2304.000<	4034.000	46.4	75.1
337	SpP00337	0	0	.000<	1806.000<	2898.000	100.0	60.5
338	SpC00338	0	0	.000<	3792.000<	6548.000	100.0	72.7
339	SpP00339	0	0	.000<	40.000<	1132.000	100.0	100.0
340	SpC00340	0	0	.000<	3138.000<	7828.000	100.0	100.0
341	SpC00341	0	0	4014.000<	6970.000<	7835.000	42.4	12.4
342	SpC00342	0	0	.000<	925.000<	1694.000	100.0	83.1
343	SpC00343	0	0	5582.000<	6351.000<	7276.000	12.1	14.6
344	SpC00344	0	0	.000<	5578.000<	7276.000	100.0	30.4
345	SpC00345	0	0	.000<	1698.000<	7276.000	100.0	100.0
346	SpP00346	0	0	.000<	940.000<	4200.000	100.0	100.0
347	SpC00347	0	0	.000<	3260.000<	4200.000	100.0	28.8
348	SpC00348	0	0	1098.000<	3010.000<	4141.000	63.5	37.6
349	SpP00349	0	0	148.000<	892.000<	2945.000	83.4	100.0
350	SpC00350	0	0	7343.000<	9651.000<	11431.000	23.9	18.4
351	SpP00351	0	0	121.000<	890.000<	1815.000	86.4	100.0
352	SpC00352	0	0	7921.000<	8846.000<	9615.000	10.5	8.7
353	SpC00353	0	0	4416.000<	6724.000<	8504.000	34.3	26.5
354	SpC00354	0	0	1232.000<	3012.000<	5320.000	59.1	76.6
355	SpC00355	0	0	1815.000<	2755.000<	6015.000	34.1	100.0
356	SpC00356	0	0	.000<	3260.000<	4200.000	100.0	28.8
357	SpC00357	0	0	2128.000<	8588.000<	10631.000	75.2	23.8
358	SpC00358	0	0	7271.000<	9314.000<	15774.000	21.9	69.4
359	SpP00359	0	0	.000<	514.000<	2978.000	100.0	100.0
360	SpC00360	0	0	3880.000<	6344.000<	6858.000	38.8	8.1
361	SpP00361	0	0	.000<	514.000<	876.000	100.0	70.4
362	SpC00362	0	0	.000<	362.000<	876.000	100.0	100.0
363	SpC00363	0	0	4894.000<	7358.000<	7872.000	33.5	7.0
364	SpP00364	0	0	868.000<	1382.000<	3846.000	37.2	100.0
365	SpP00365	0	0	1020.000<	1382.000<	1896.000	26.2	37.2
366	SpC00366	0	0	4984.000<	5498.000<	5860.000	9.3	6.6
367	SpC00367	0	0	11336.000<	11850.000<	14314.000	4.3	20.8
368	SpC00368	0	0	7581.000<	10045.000<	10559.000	24.5	5.1
369	SpC00369	0	0	4137.000<	5676.000<	6058.000	27.1	6.7
370	SpC00370	0	0	3850.000<	4232.000<	5771.000	9.0	36.4
371	SpC00371	0	0	.000<	1398.000<	2167.000	100.0	55.0
372	SpC00372	0	0	11461.000<	12230.000<	13628.000	6.3	11.4
373	SpP00373	0	0	.000<	382.000<	1921.000	100.0	100.0
374	SpC00374	0	0	.000<	1539.000<	1921.000	100.0	24.8
375	SpC00375	0	0	.000<	1539.000<	1921.000	100.0	24.8
376	SpP00376	0	0	.000<	382.000<	1921.000	100.0	100.0
377	SpC00377	0	0	3237.000<	4776.000<	5158.000	32.2	8.0
378	SpC00378	0	0	5634.000<	6016.000<	7555.000	6.3	25.6
379	SpC00379	0	0	1783.000<	2552.000<	3950.000	30.1	54.8
380	SpC00380	0	0	1687.000<	3467.000<	5775.000	51.3	66.6
381	SpC00381	0	0	3234.000<	4773.000<	5155.000	32.2	8.0
382	SpC00382	0	0	.000<	2043.000<	8503.000	100.0	100.0
383	SpC00383	0	0	.000<	6460.000<	8503.000	100.0	31.6

384	SpC00384	0	0	1631.000<	5660.000<	7498.000	71.2	32.5
385	SpP00385	0	0	.000<	1838.000<	5867.000	100.0	100.0
386	SpP00386	0	0	1069.000<	1838.000<	3236.000	41.8	76.1
387	SpC00387	0	0	4262.000<	5660.000<	6429.000	24.7	13.6
388	SpC00388	0	0	1027.000<	1952.000<	2721.000	47.4	39.4
389	SpC00389	0	0	.000<	769.000<	1694.000	100.0	100.0
390	SpC00390	0	0	554.000<	1952.000<	2721.000	71.6	39.4
391	SpC00391	0	0	.000<	769.000<	2167.000	100.0	100.0
392	SpC00392	0	0	10798.000<	14058.000<	14998.000	23.2	6.7
393	SpC00393	0	0	6551.000<	7491.000<	10751.000	12.5	43.5
394	SpC00394	0	0	3790.000<	5833.000<	12293.000	35.0	100.0
395	SpC00395	0	0	.000<	6460.000<	8503.000	100.0	31.6
396	SpC00396	0	0	3121.000<	6939.000<	6958.000	55.0	.3
397	SpP00397	0	0	.000<	19.000<	3837.000	100.0	100.0
398	SpC00398	0	0	167.000<	2205.000<	4068.000	92.4	84.5
399	SpC00399	0	0	1431.000<	4734.000<	6791.000	69.8	43.5
400	SpP00400	0	0	.000<	19.000<	1459.000	100.0	100.0
401	SpC00401	0	0	2377.000<	4240.000<	6278.000	43.9	48.1
402	SpC00402	0	0	806.000<	2844.000<	4707.000	71.7	65.5
403	SpC00403	0	0	3852.000<	3871.000<	7689.000	.5	98.6
404	SpC00404	0	0	1434.000<	5252.000<	5271.000	72.7	.4
405	SpC00405	0	0	3576.000<	3595.000<	5035.000	.5	40.1
406	SpC00406	0	0	.000<	1440.000<	1459.000	100.0	1.3
407	SpC00407	0	0	2328.000<	2721.000<	4424.000	14.4	62.6
408	SpC00408	0	0	.000<	583.000<	946.000	100.0	62.3
409	SpC00409	0	0	.000<	1120.000<	1150.000	100.0	2.7
410	SpC00410	0	0	.000<	1367.000<	4424.000	100.0	100.0
411	SpC00411	0	0	.000<	2353.000<	4424.000	100.0	88.0
412	SpC00412	0	0	.000<	704.000<	2354.000	100.0	100.0
413	SpC00413	0	0	.000<	828.000<	2681.000	100.0	100.0
414	SpC00414	0	0	.000<	828.000<	2681.000	100.0	100.0
415	SpC00415	0	0	.000<	828.000<	2681.000	100.0	100.0
416	SpC00416	0	0	.000<	2189.000<	3410.000	100.0	55.8
417	SpC00417	0	0	.000<	363.000<	946.000	100.0	100.0
418	SpC00418	0	0	.000<	30.000<	1150.000	100.0	100.0
419	SpC00419	0	0	729.000<	1433.000<	3083.000	49.1	100.0
420	SpC00420	0	0	.000<	1149.000<	2681.000	100.0	100.0
421	SpC00421	0	0	729.000<	2582.000<	3410.000	71.8	32.1
422	SpC00422	0	0	.000<	1367.000<	4424.000	100.0	100.0
423	SpC00423	0	0	729.000<	3786.000<	5153.000	80.7	36.1
424	SpC00424	0	0	2496.000<	5734.000<	8773.000	56.5	53.0
425	SpC00425	0	0	.000<	3039.000<	6277.000	100.0	100.0
426	SpC00426	0	0	.000<	4592.000<	6066.000	100.0	32.1
427	SpC00427	0	0	431.000<	3836.000<	8756.000	88.8	100.0
428	SpC00428	0	0	3714.000<	4137.000<	6068.000	10.2	46.7
429	SpC00429	0	0	1392.000<	3728.000<	5979.000	62.7	60.4
430	SpC00430	0	0	44.000<	3083.000<	6321.000	98.6	100.0
431	SpP00431	0	0	.000<	902.000<	2027.000	100.0	100.0
432	SpP00432	0	0	.000<	107.000<	3901.000	100.0	100.0
433	SpC00433	0	0	.000<	1863.000<	3901.000	100.0	100.0
434	SpC00434	0	0	3812.000<	5743.000<	6166.000	33.6	7.4
435	SpC00435	0	0	.000<	2251.000<	4587.000	100.0	100.0

436	SpC00436	0	0	76.000<	2412.000<	4663.000	96.8	93.3
437	SpC00437	0	0	1642.000<	4699.000<	6066.000	65.1	29.1
438	SpC00438	0	0	9431.000<	10798.000<	13855.000	12.7	28.3
439	SpC00439	0	0	.000<	1038.000<	1185.000	100.0	14.2
440	SpC00440	0	0	3589.000<	3736.000<	4774.000	3.9	27.8
441	SpC00441	0	0	312.000<	2614.000<	2666.000	88.1	2.0
442	SpP00442	0	0	.000<	52.000<	2354.000	100.0	100.0
443	SpC00443	0	0	.000<	147.000<	1185.000	100.0	100.0
444	SpC00444	0	0	1008.000<	2046.000<	2193.000	50.7	7.2
445	SpC00445	0	0	3245.000<	6288.000<	8334.000	48.4	32.5
446	SpC00446	0	0	.000<	2046.000<	5089.000	100.0	100.0
447	SpC00447	0	0	180.000<	327.000<	1365.000	45.0	100.0
448	SpC00448	0	0	1626.000<	2664.000<	2811.000	39.0	5.5
449	SpC00449	0	0	1436.000<	3482.000<	6525.000	58.8	87.4
450	SpC00450	0	0	2492.000<	2544.000<	4846.000	2.0	90.5
451	SpC00451	0	0	.000<	2991.000<	5089.000	100.0	70.1
452	SpC00452	0	0	705.000<	2555.000<	3986.000	72.4	56.0
453	SpP00453	0	0	.000<	582.000<	4445.000	100.0	100.0
454	SpC00454	0	0	324.000<	2337.000<	3399.500	86.1	45.5
455	SpC00455	0	0	2060.000<	2483.000<	4414.000	17.0	77.8
456	SpC00456	0	0	1060.000<	2991.000<	3414.000	64.6	14.1
457	SpC00457	0	0	2091.000<	3522.000<	5372.000	40.6	52.5
458	SpC00458	0	0	756.000<	2606.000<	4037.000	71.0	54.9
459	SpC00459	0	0	5897.000<	8397.000<	9609.000	29.8	14.4
460	SpC00460	0	0	.000<	1212.000<	3712.000	100.0	100.0
461	SpC00461	0	0	.000<	2013.000<	3075.500	100.0	52.8
462	SpC00462	0	0	5251.500<	6314.000<	8327.000	16.8	31.9
463	SpC00463	0	0	2361.000<	5404.000<	7450.000	56.3	37.9
464	SpP00464	0	0	.000<	423.000<	2354.000	100.0	100.0
465	SpC00465	0	0	.000<	2500.000<	3712.000	100.0	48.5
466	SpP00466	0	0	544.000<	1742.000<	2898.000	68.8	66.4
467	SpP00467	0	0	.000<	1156.000<	2354.000	100.0	100.0
468	SpC00468	0	0	1884.000<	3040.000<	4238.000	38.0	39.4
469	SpC00469	0	0	3970.000<	5168.000<	6324.000	23.2	22.4
470	SpC00470	0	0	.000<	3058.000<	6729.000	100.0	100.0
471	SpC00471	0	0	754.000<	4425.000<	7483.000	83.0	69.1
472	SpC00472	0	0	.000<	3267.000<	4182.000	100.0	28.0
473	SpC00473	0	0	.000<	87.000<	2027.000	100.0	100.0
474	SpC00474	0	0	1501.000<	3354.000<	4182.000	55.2	24.7
475	SpC00475	0	0	1501.000<	3354.000<	4182.000	55.2	24.7
476	SpP00476	0	0	.000<	404.000<	3837.000	100.0	100.0
477	SpC00477	0	0	.000<	3472.000<	5729.000	100.0	65.0
478	SpC00478	0	0	2330.000<	3158.000<	5011.000	26.2	58.7
479	SpC00479	0	0	5650.000<	6478.000<	8331.000	12.8	28.6

CLASSICAL LINEAR PROGRAMMING MODELS

(SUPPRESSION AND CTA)

ON

FOUR DIMENSIONAL TABLE STRUCTURE

TO INCLUDE TWO-WAY INTERACTIONS BETWEEN FUEL GRADE AND FORMULATIONS

Classical LP 4D Solid   Regular Fuel   Conventional Fuel

	DTW	Rack	Bulk	Total	<------- CTA			---------->
United States	68018	78993	48652	195663	-103.	189.	77.	163.
PAD District I	21038	31461	20442	72941	-53.	203.	-1.	149.
Subdistrict IA	10849	16320	5075	32244	0.	0.	-22.	-22.
Connecticut	3032	0	1700	4732	0.	0.	0.	0.
Maine	0	1305	0	1305	0.	0.	0.	0.
Massachusetts	0	3840s	0	3840s	0.	0.	0.	0.
New Hampshire	6069	0	0	6069	0.	0.	0.	0.
Rhode Island	1748	5631s	227w	7606s	0.	0.	-22.	-22.
Vermont	0	5544s	3148s	8692	0.	0.	0.	0.
Subdistrict IB	3453	4236	8089	15778	79.	119.	21.	219.
Delaware	798w	1036w	0	1834s	79.	51.	0.	130.
District of Colu	0	0	3328	3328	0.	0.	0.	0.
Maryland	0	1836s	609w	2445s	0.	0.	60.	60.
New Jersey	2655s	0	0	2655s	0.	0.	0.	0.
New York	0	0	784w	784w	0.	0.	-39.	-39.
Pennsylvania	0	1364w	3368s	4732s	0.	68.	0.	68.
Subdistrict IC	6736	10905	7278	24919	-132.	84.	0.	-48.
Florida	0	6636s	0	6636s	0.	0.	0.	0.
Georgia	1830s	0	0	1830s	0.	0.	0.	0.
North Carolina	930w	845w	3327	5102s	-46.	84.	0.	38.
South Carolina	0	3424	0	3424	0.	0.	0.	0.
Virginia	1736w	0	140	1876s	-86.	0.	0.	-86.
West Virginia	2240s	0	3811	6051s	0.	0.	0.	0.
PAD District II	28805	16268	22105	67178	0.	9.	84.	93.
Illinois	4128	0	0	4128	0.	0.	0.	0.
Indiana	1288w	0	1680w	2968	64.	0.	84.	148.
Iowa	184w	588w	436s	1208s	9.	-29.	0.	-20.
Kansas	0	4100s	1700s	5800	0.	0.	0.	0.
Kentucky	0	0	4164	4164	0.	0.	0.	0.
Michigan	0	0	4430	4430	0.	0.	0.	0.
Minnesota	1215s	1210s	1332s	3757	0.	0.	0.	0.
Missouri	1908	3750	0	5658	0.	0.	0.	0.
Nebraska	2652	0	942	3594	0.	0.	0.	0.
North Dakota	1276w	5340s	0	6616s	-63.	38.	0.	-25.
Ohio	5227	0	2181s	7408s	0.	0.	0.	0.
Oklahoma	1440s	0	3550s	4990	0.	0.	0.	0.
South Dakota	0	0	0	0	0.	0.	0.	0.
Tennessee	0	0	0	0	0.	0.	0.	0.
Wisconsin	9487	1280	1690	12457	-10.	0.	0.	-10.
PAD District III	4574s	14977	3391s	22942	0.	-25.	-6.	-31.
Alabama	3504s	259w	0	3763s	0.	-25.	0.	-25.
Arkansas	0	3692	0	3692	0.	0.	0.	0.
Louisiana	0	1575s	1405s	2980	0.	0.	0.	0.
Mississippi	0	5338	0	5338	0.	0.	0.	0.
New Mexico	0	4113	0	4113	0.	0.	0.	0.
Texas	1070s	0	1986s	3056s	0.	0.	-6.	-6.
PAD District IV	3670s	3886	1952s	9508	-134.	-94.	0.	-228.
Colorado	0	2946s	0	2946s	0.	0.	0.	0.
Idaho	925s	940w	0	1865s	0.	-94.	0.	-94.
Montana	514w	0	0	514w	-51.	0.	0.	-51.
Utah	1398	0	0	1398	0.	0.	0.	0.
Wyoming	833w	0	1952s	2785	-83.	0.	0.	-83.
PAD District V	9931	12401	762	23094	84.	96.	0.	180.
Alaska	0	4240	0	4240	0.	0.	0.	0.
Arizona	1367	0	0	1367	0.	0.	0.	0.
California	102w	0	0	102w	5.	0.	0.	5.
Hawaii	792w	6141	0	6933s	79.	-4.	0.	75.
Nevada	476s	486w	0	962s	0.	24.	0.	24.
Oregon	0	1534w	0	1534w	0.	76.	0.	76.
Washington	7194	0	762	7956	0.	0.	0.	0.

Classical LP 4D Solid   Mid-grade Fuel   Conventional Fuel

	DTW	Rack	Bulk	Total	<-------	CTA	---------	->
United States	107895	64619	77070	249584	42.	-169.	116.	-11.
PAD District I	26330	25496	11603	63429	32.	-24.	82.	90.
Subdistrict IA	5552	10072	4821	20445	32.	-18.	0.	14.
Connecticut	382w	6345s	1551s	8278	38.	0.	0.	38.
Maine	1672	1703	0	3375	0.	0.	0.	0.
Massachusetts	1698w	0	0	1698w	84.	0.	0.	84.
New Hampshire	0	374w	2232s	2606	0.	-18.	0.	-18.
Rhode Island	1800w	755s	0	2555	-90.	0.	0.	-90.
Vermont	0	895	1038s	1933s	0.	0.	0.	0.
Subdistrict IB	16318	3969	1942	22229	0.	-6.	0.	-6.
Delaware	1386	0	1144s	2530s	0.	0.	0.	0.
District of Colu	0	0	0	0	0.	0.	0.	0.
Maryland	0	3902s	798s	4700s	0.	0.	0.	0.
New Jersey	1878s	0	0	1878s	0.	0.	0.	0.
New York	3685s	67w	0	3752s	0.	-6.	0.	-6.
Pennsylvania	9369	0	0	9369	0.	0.	0.	0.
Subdistrict IC	4460	11455	4840	20755	0.	0.	82.	82.
Florida	3200s	4920s	1001w	9121s	0.	0.	82.	82.
Georgia	0	2122s	1493s	3615s	0.	0.	0.	0.
North Carolina	0	0	0	0	0.	0.	0.	0.
South Carolina	0	2037s	0	2037s	0.	0.	0.	0.
Virginia	0	0	2346s	2346s	0.	0.	0.	0.
West Virginia	1260s	2376s	0	3636s	0.	0.	0.	0.
PAD District II	33222	26575	34578	94375	15.	-159.	-32.	-176.
Illinois	316w	5456s	0	5772s	15.	0.	0.	15.
Indiana	0	5561	0	5561	0.	0.	0.	0.
Iowa	0	425	9674	10099	0.	0.	0.	0.
Kansas	0	1744s	606w	2350s	0.	0.	-30.	-30.
Kentucky	0	612w	4117s	4729	0.	-61.	0.	-61.
Michigan	4351	0	0	4351	0.	0.	0.	0.
Minnesota	5448s	1218w	13484	20150	0.	-60.	0.	-60.
Missouri	5075	0	0	5075	0.	0.	0.	0.
Nebraska	8852	0	3081	11933	0.	0.	0.	0.
North Dakota	0	385w	1140s	1525s	0.	-38.	0.	-38.
Ohio	5772	6112	2436	14320	0.	0.	0.	0.
Oklahoma	0	3090	0	3090	0.	0.	0.	0.
South Dakota	0	1153s	40w	1193	0.	0.	-2.	-2.
Tennessee	0	0	0	0	0.	0.	0.	0.
Wisconsin	3408s	819s	0	4227s	0.	0.	0.	0.
PAD District III	17649	7580	15077	40306	0.	0.	66.	66.
Alabama	9144s	75s	4819s	14038	0.	0.	0.	0.
Arkansas	0	0	470	470	0.	0.	0.	0.
Louisiana	0	1106s	4490s	5596	0.	0.	0.	0.
Mississippi	2571s	6399	1326w	10296	0.	0.	66.	66.
New Mexico	5934	0	3972	9906	0.	0.	0.	0.
Texas	0	0	0	0	0.	0.	0.	0.
PAD District IV	8893	2070	12676	23639	0.	0.	0.	0.
Colorado	4240	0	5076	9316	0.	0.	0.	0.
Idaho	4653	2070	0	6723	0.	0.	0.	0.
Montana	0	0	6476s	6476s	0.	0.	56.	56.
Utah	0	0	1124w	1124w	0.	0.	-56.	-56.
Wyoming	0	0	0	0	0.	0.	0.	0.
PAD District V	21801	2898	3136	27835	-5.	14.	0.	9.
Alaska	2205	0	3136	5341	0.	0.	0.	0.
Arizona	0	0	0	0	0.	0.	0.	0.
California	4490	0	0	4490	-5.	0.	0.	-5.
Hawaii	7463	147	0	7610	0.	0.	0.	0.
Nevada	0	2606s	0	2606s	0.	0.	0.	0.
Oregon	4585	145w	0	4730s	0.	14.	0.	14.
Washington	3058	0	0	3058	0.	0.	0.	0.

Classical LP 4D Solid Premium Fuel Conventional Fuel

	DTW	Rack	Bulk	Total	<-------	CTA	---------->	
United States	57559	56898	63559	178016	-131.	-122.	86.	-167.
PAD District I	20830	13134	23799	57763	37.	-45.	-22.	-30.
Subdistrict IA	2432	6094	6148	14674	0.	-13.	43.	30.
Connecticut	1860s	266w	878w	3004	-13.	-13.	43.	17.
Maine	0	0	0	0	0.	0.	0.	0.
Massachusetts	312s	2708s	0	3020s	0.	0.	0.	0.
New Hampshire	0	0	0	0	0.	0.	0.	0.
Rhode Island	260w	3120s	2588	5968s	13.	0.	0.	13.
Vermont	0	0	2682s	2682s	0.	0.	0.	0.
Subdistrict IB	4640	1745	10078	16463	37.	15.	0.	52.
Delaware	0	804s	660s	1464s	0.	0.	0.	0.
District of Colu	3892	0	4012	7904	0.	0.	0.	0.
Maryland	0	0	534s	534s	0.	0.	0.	0.
New Jersey	728w	625s	0	1353s	36.	0.	0.	36.
New York	20w	0	3996s	4016s	1.	0.	0.	1.
Pennsylvania	0	316w	876s	1192s	0.	15.	0.	15.
Subdistrict IC	13758	5295	7573	26626	0.	-47.	-65.	-112.
Florida	2665	954w	612s	4231s	0.	-47.	0.	-47.
Georgia	8613	0	4730	13343	0.	0.	0.	0.
North Carolina	0	0	1306w	1306w	0.	0.	-65.	-65.
South Carolina	0	4341s	0	4341s	0.	0.	0.	0.
Virginia	2480	0	0	2480	0.	0.	0.	0.
West Virginia	0	0	925	925	0.	0.	0.	0.
PAD District II	19782	20369	16519	56670	-52.	-89.	134.	-7.
Illinois	2796s	0	2975	5771s	0.	0.	0.	0.
Indiana	0	0	0	0	0.	0.	0.	0.
Iowa	412s	3995s	172s	4579s	0.	0.	0.	0.
Kansas	2756	0	824w	3580s	-52.	0.	82.	30.
Kentucky	0	0	999	999	0.	0.	0.	0.
Michigan	0	1800w	3830s	5630	0.	-90.	0.	-90.
Minnesota	5239s	0	2368s	7607	0.	0.	0.	0.
Missouri	2710	0	0	2710	0.	0.	0.	0.
Nebraska	3136	3233	4317	10686	0.	0.	0.	0.
North Dakota	0	8018	0	8018	0.	0.	0.	0.
Ohio	0	0	524w	524w	0.	0.	52.	52.
Oklahoma	2292s	1124w	0	3416	0.	-56.	0.	-56.
South Dakota	0	0	0	0	0.	0.	0.	0.
Tennessee	0	1055	510	1565	0.	0.	0.	0.
Wisconsin	441s	1144w	0	1585s	0.	57.	0.	57.
PAD District III	10614s	8649	4671s	23934	-80.	0.	45.	-35.
Alabama	2684s	0	454w	3138s	4.	0.	-45.	-41.
Arkansas	4368s	4350	2411s	11129	0.	0.	0.	0.
Louisiana	0	2313	0	2313	0.	0.	0.	0.
Mississippi	0	0	0	0	0.	0.	0.	0.
New Mexico	1876	1986	0	3862	0.	0.	0.	0.
Texas	1686w	0	1806w	3492s	-84.	0.	90.	6.
PAD District IV	1210s	4225	4432s	9867	0.	22.	-71.	-49.
Colorado	0	1005s	2800	3805s	0.	0.	0.	0.
Idaho	0	0	0	0	0.	0.	0.	0.
Montana	0	1382w	204s	1586s	0.	-69.	0.	-69.
Utah	0	0	1428w	1428w	0.	0.	-71.	-71.
Wyoming	1210s	1838w	0	3048	0.	91.	0.	91.
PAD District V	5123	10521	14138	29782	-36.	-10.	0.	-46.
Alaska	0	0	5252	5252	0.	0.	0.	0.
Arizona	0	0	0	0	0.	0.	0.	0.
California	0	107w	0	107w	0.	-10.	0.	-10.
Hawaii	2976s	0	3482	6458s	-29.	0.	0.	-29.
Nevada	2007s	5305s	5404	12716	0.	0.	0.	0.
Oregon	140w	5109s	0	5249s	-7.	0.	0.	-7.
Washington	0	0	0	0	0.	0.	0.	0.

Classical LP 4D Solid   All Fuel Grades   Conventional Fuel

	DTW	Rack	Bulk	Total	<------- CTA			--------->
United States	233472	200510	189281	623263	-192.	-102.	279.	-15.
PAD District I	68198	70091	55844	194133	16.	134.	59.	209.
Subdistrict IA	18833	32486	16044	67363	32.	-31.	21.	22.
Connecticut	5274s	6611	4129s	16014	25.	-13.	43.	55.
Maine	1672	3008	0	4680	0.	0.	0.	0.
Massachusetts	2010s	6548s	0	8558	84.	0.	0.	84.
New Hampshire	6069	374w	2232s	8675	0.	-18.	0.	-18.
Rhode Island	3808s	9506s	2815s	16129	-77.	0.	-22.	-99.
Vermont	0	6439s	6868s	13307	0.	0.	0.	0.
Subdistrict IB	24411	9950	20109	54470	116.	128.	21.	265.
Delaware	2184s	1840s	1804s	5828s	79.	51.	0.	130.
District of Colu	3892	0	7340	11232	0.	0.	0.	0.
Maryland	0	5738s	1941s	7679	0.	0.	60.	60.
New Jersey	5261s	625s	0	5886s	36.	0.	0.	36.
New York	3705s	67w	4780s	8552	1.	-6.	-39.	-44.
Pennsylvania	9369	1680s	4244s	15293	0.	83.	0.	83.
Subdistrict IC	24954	27655	19691	72300	-132.	37.	17.	-78.
Florida	5865s	12510s	1613s	19988	0.	-47.	82.	35.
Georgia	10443s	2122s	6223s	18788	0.	0.	0.	0.
North Carolina	930w	845w	4633s	6408	-46.	84.	-65.	-27.
South Carolina	0	9802	0	9802	0.	0.	0.	0.
Virginia	4216s	0	2486s	6702	-86.	0.	0.	-86.
West Virginia	3500s	2376s	4736	10612	0.	0.	0.	0.
PAD District II	81809	63212	73202	218223	-37.	-239.	186.	-90.
Illinois	7240s	5456s	2975	15671	15.	0.	0.	15.
Indiana	1288w	5561	1680w	8529	64.	0.	84.	148.
Iowa	596s	5008s	10282	15886	9.	-29.	0.	-20.
Kansas	2756	5844s	3130s	11730	-52.	0.	52.	0.
Kentucky	0	612w	9280s	9892	0.	-61.	0.	-61.
Michigan	4351	1800w	8260s	14411	0.	-90.	0.	-90.
Minnesota	11902	2428	17184	31514	0.	-60.	0.	-60.
Missouri	9693	3750	0	13443	0.	0.	0.	0.
Nebraska	14640	3233	8340	26213	0.	0.	0.	0.
North Dakota	1276w	13743	1140s	16159	-63.	0.	0.	-63.
Ohio	10999	6112	5141	22252	0.	0.	52.	52.
Oklahoma	3732s	4214s	3550s	11496	0.	-56.	0.	-56.
South Dakota	0	1153s	40w	1193	0.	0.	-2.	-2.
Tennessee	0	1055	510	1565	0.	0.	0.	0.
Wisconsin	13336	3243	1690	18269	-10.	57.	0.	47.
PAD District III	32837	31206	23139	87182	-80.	-25.	105.	0.
Alabama	15332	334	5273	20939	4.	-25.	-45.	-66.
Arkansas	4368s	8042	2881s	15291	0.	0.	0.	0.
Louisiana	0	4994	5895	10889	0.	0.	0.	0.
Mississippi	2571s	11737	1326w	15634	0.	0.	66.	66.
New Mexico	7810	6099	3972	17881	0.	0.	0.	0.
Texas	2756	0	3792	6548	-84.	0.	84.	0.
PAD District IV	13773	10181	19060	43014	-134.	-72.	-71.	-277.
Colorado	4240	3951	7876	16067	0.	0.	0.	0.
Idaho	5578s	3010s	0	8588s	0.	-94.	0.	-94.
Montana	514w	1382w	6680	8576	-51.	-69.	56.	-64.
Utah	1398	0	2552s	3950s	0.	0.	-127.	-127.
Wyoming	2043	1838w	1952s	5833	-83.	91.	0.	8.
PAD District V	36855	25820	18036	80711	43.	100.	0.	143.
Alaska	2205	4240	8388	14833	0.	0.	0.	0.
Arizona	1367	0	0	1367	0.	0.	0.	0.
California	4592s	107w	0	4699	0.	-10.	0.	-10.
Hawaii	11231	6288	3482	21001	50.	-4.	0.	46.
Nevada	2483	8397	5404	16284	0.	24.	0.	24.
Oregon	4725s	6788s	0	11513	-7.	90.	0.	83.
Washington	10252	0	762	11014	0.	0.	0.	0.

Classical LP 4D Solid   Regular Fuel   Oxygenated Fuel

	DTW	Rack	Bulk	Total	<-------	CTA	----------	-->
United States	65199	61476	46217	172892	-32.	-60.	86.	-6.
PAD District I	20261	21138	15495	56894	-6.	0.	-14.	-20.
Subdistrict IA	9808	7920	7566	25294	85.	0.	0.	85.
Connecticut	3226	1494	0	4720	0.	0.	0.	0.
Maine	3936	1478	405	5819	0.	0.	0.	0.
Massachusetts	172w	0	0	172w	-8.	0.	0.	-8.
New Hampshire	600	0	3188	3788	0.	0.	0.	0.
Rhode Island	0	0	3749s	3749s	0.	0.	0.	0.
Vermont	1874w	4948	224s	7046s	93.	0.	0.	93.
Subdistrict IB	4469	4140	1742	10351	0.	0.	-14.	-14.
Delaware	1396s	0	332w	1728s	0.	0.	33.	33.
District of Colu	2253	0	940	3193	0.	0.	0.	0.
Maryland	0	0	470w	470w	0.	0.	-47.	-47.
New Jersey	820s	0	0	820s	0.	0.	0.	0.
New York	0	0	0	0	0.	0.	0.	0.
Pennsylvania	0	4140	0	4140	0.	0.	0.	0.
Subdistrict IC	5984	9078	6187	21249	-91.	0.	0.	-91.
Florida	0	933s	0	933s	0.	0.	0.	0.
Georgia	2965s	0	0	2965s	0.	0.	0.	0.
North Carolina	0	6381s	3325	9706s	0.	0.	0.	0.
South Carolina	1195	0	2862	4057	0.	0.	0.	0.
Virginia	1824w	0	0	1824w	-91.	0.	0.	-91.
West Virginia	0	1764s	0	1764s	0.	0.	0.	0.
PAD District II	25351	17899	11314	54564	-26.	0.	38.	12.
Illinois	0	0	0	0	0.	0.	0.	0.
Indiana	2889s	0	2166s	5055	0.	0.	0.	0.
Iowa	0	3056s	3780s	6836	0.	0.	0.	0.
Kansas	2976	2586	0	5562	0.	0.	0.	0.
Kentucky	5826	2142	0	7968	0.	0.	0.	0.
Michigan	948	0	0	948	0.	0.	0.	0.
Minnesota	155s	2484s	0	2639	0.	0.	0.	0.
Missouri	3033s	2645	382w	6060	0.	0.	38.	38.
Nebraska	0	0	0	0	0.	0.	0.	0.
North Dakota	2264s	2946s	0	5210s	0.	0.	0.	0.
Ohio	1970	0	1296s	3266s	0.	0.	0.	0.
Oklahoma	1720	0	0	1720	0.	0.	0.	0.
South Dakota	0	2040	0	2040	0.	0.	0.	0.
Tennessee	530w	0	3690s	4220	-26.	0.	0.	-26.
Wisconsin	3040s	0	0	3040s	0.	0.	0.	0.
PAD District III	5724s	2328	8592s	16644	0.	0.	18.	18.
Alabama	0	0	2856s	2856s	0.	0.	0.	0.
Arkansas	928s	0	3252s	4180	0.	0.	0.	0.
Louisiana	0	1513	0	1513	0.	0.	0.	0.
Mississippi	666	0	1420w	2086s	0.	0.	71.	71.
New Mexico	4130s	815	1024w	5969	0.	0.	-51.	-51.
Texas	0	0	40w	40w	0.	0.	-2.	-2.
PAD District IV	8628s	9644	890w	19162	0.	0.	44.	44.
Colorado	0	4146	0	4146	0.	0.	0.	0.
Idaho	0	0	890w	890w	0.	0.	44.	44.
Montana	0	5498	0	5498	0.	0.	0.	0.
Utah	4278	0	0	4278	0.	0.	0.	0.
Wyoming	4350s	0	0	4350s	0.	0.	0.	0.
PAD District V	5235	10467	9926	25628	0.	-60.	0.	-60.
Alaska	0	606w	3595	4201s	0.	-60.	0.	-60.
Arizona	1150s	0	1040	2190s	0.	0.	0.	0.
California	0	0	2251	2251	0.	0.	0.	0.
Hawaii	246s	0	0	246s	0.	0.	0.	0.
Nevada	2079	3036s	0	5115s	0.	0.	0.	0.
Oregon	0	6825s	3040	9865s	0.	0.	0.	0.
Washington	1760	0	0	1760	0.	0.	0.	0.

Classical LP 4D Solid   Mid-grade Fuel   Oxygenated Fuel

	DTW	Rack	Bulk	Total	<------- CTA			--------->
United States	66647	49891	57979	174517	11.	201.	-106.	106.
PAD District I	22318	21420	12455	56193	-14.	78.	-3.	61.
Subdistrict IA	11352	5761	4870	21983	0.	0.	0.	0.
Connecticut	0	4392	0	4392	0.	0.	0.	0.
Maine	5382	0	2754	8136	0.	0.	0.	0.
Massachusetts	0	0	0	0	0.	0.	0.	0.
New Hampshire	1456	1369	2092	4917	0.	0.	0.	0.
Rhode Island	3804	0	0	3804	0.	0.	0.	0.
Vermont	710	0	24	734	0.	0.	0.	0.
Subdistrict IB	7651	7891	3251	18793	0.	99.	-38.	61.
Delaware	0	0	2473s	2473s	0.	0.	0.	0.
District of Colu	2865s	2415	0	5280s	0.	0.	0.	0.
Maryland	0	0	0	0	0.	0.	0.	0.
New Jersey	2917	0	0	2917	0.	0.	0.	0.
New York	1869s	1996w	0	3865s	0.	99.	0.	99.
Pennsylvania	0	3480s	778w	4258s	0.	0.	-38.	-38.
Subdistrict IC	3315	7768	4334	15417	-14.	-21.	35.	0.
Florida	0	344w	0	344w	0.	-34.	0.	-34.
Georgia	0	0	0	0	0.	0.	0.	0.
North Carolina	714w	272w	0	986	-35.	13.	0.	-22.
South Carolina	345	5428s	0	5773s	0.	0.	0.	0.
Virginia	2045s	1724	1022w	4791s	0.	0.	51.	51.
West Virginia	211w	0	3312s	3523s	21.	0.	-16.	5.
PAD District II	25828	14860	26223	66911	0.	128.	0.	128.
Illinois	0	748w	0	748w	0.	74.	0.	74.
Indiana	0	7304	1905	9209	0.	0.	0.	0.
Iowa	2113s	0	2110s	4223	0.	0.	0.	0.
Kansas	0	2835s	0	2835s	0.	0.	0.	0.
Kentucky	3364	0	2687	6051	0.	0.	0.	0.
Michigan	5590	1080w	0	6670s	0.	54.	0.	54.
Minnesota	1308	0	4650	5958	0.	0.	0.	0.
Missouri	0	300	3330	3630	0.	0.	0.	0.
Nebraska	4285s	850s	1278	6413	0.	0.	0.	0.
North Dakota	0	295s	3832s	4127s	0.	0.	0.	0.
Ohio	3780	0	2612	6392	0.	0.	0.	0.
Oklahoma	1480	0	3276	4756	0.	0.	0.	0.
South Dakota	0	0	0	0	0.	0.	0.	0.
Tennessee	0	1448s	543s	1991	0.	0.	0.	0.
Wisconsin	3908s	0	0	3908s	0.	0.	0.	0.
PAD District III	3641	6126	8557	18324	0.	0.	0.	0.
Alabama	0	0	4700s	4700s	0.	0.	0.	0.
Arkansas	0	0	0	0	0.	0.	0.	0.
Louisiana	0	2490	2853s	5343s	0.	0.	0.	0.
Mississippi	1100	0	1004s	2104s	0.	0.	0.	0.
New Mexico	2541	3636	0	6177	0.	0.	0.	0.
Texas	0	0	0	0	0.	0.	0.	0.
PAD District IV	6292	3427	9118	18837	0.	-44.	-164.	-208.
Colorado	0	2535s	0	2535s	0.	0.	0.	0.
Idaho	1698	892w	5834s	8424	0.	-44.	0.	-44.
Montana	362	0	1882w	2244s	0.	0.	-94.	-94.
Utah	4232	0	1402w	5634s	0.	0.	-70.	-70.
Wyoming	0	0	0	0	0.	0.	0.	0.
PAD District V	8568	4058	1626	14252	25.	39.	61.	125.
Alaska	4734	0	0	4734	0.	0.	0.	0.
Arizona	348w	0	363s	711s	17.	0.	0.	17.
California	1244w	1068w	436w	2748	62.	53.	-21.	94.
Hawaii	1660w	0	0	1660w	-83.	0.	0.	-83.
Nevada	582w	0	423w	1005s	29.	0.	42.	71.
Oregon	0	2990s	0	2990s	0.	-14.	0.	-14.
Washington	0	0	404w	404w	0.	0.	40.	40.

Classical LP 4D Solid   Premium Fuel   Oxygenated Fuel

	DTW	Rack	Bulk	Total	<------- CTA			--------->
United States	54063	46039	71856	171958	161.	103.	-270.	-6.
PAD District I	20134	17243	23616	60993	13.	108.	-121.	0.
Subdistrict IA	15019	7001	8676	30696	0.	78.	-98.	-20.
Connecticut	2304s	0	1644s	3948	0.	0.	0.	0.
Maine	3454	0	0	3454	0.	0.	0.	0.
Massachusetts	0	1572w	3048s	4620s	0.	78.	-6.	72.
New Hampshire	4392	3075s	2128s	9595	0.	0.	0.	0.
Rhode Island	2805s	2354s	0	5159s	0.	0.	0.	0.
Vermont	2064s	0	1856w	3920	0.	0.	-92.	-92.
Subdistrict IB	4000	744	7546	12290	0.	-24.	-23.	-47.
Delaware	4000	0	2508s	6508s	0.	0.	0.	0.
District of Colu	0	310s	0	310s	0.	0.	0.	0.
Maryland	0	0	462w	462w	0.	0.	-23.	-23.
New Jersey	0	0	3832	3832	0.	0.	0.	0.
New York	0	128w	744s	872s	0.	6.	0.	6.
Pennsylvania	0	306w	0	306w	0.	-30.	0.	-30.
Subdistrict IC	1115	9498	7394	18007	13.	54.	0.	67.
Florida	855s	2192s	959s	4006s	0.	0.	0.	0.
Georgia	0	1472s	852	2324s	0.	0.	0.	0.
North Carolina	260w	0	0	260w	13.	0.	0.	13.
South Carolina	0	3288s	0	3288s	0.	0.	0.	0.
Virginia	0	2000	0	2000	0.	0.	0.	0.
West Virginia	0	546w	5583s	6129s	0.	54.	0.	54.
PAD District II	19724	8878	26366	54968	-97.	29.	-133.	-201.
Illinois	1257s	0	8994	10251s	0.	0.	0.	0.
Indiana	0	0	0	0	0.	0.	0.	0.
Iowa	0	1403	0	1403	0.	0.	0.	0.
Kansas	0	0	808w	808w	0.	0.	-80.	-80.
Kentucky	0	0	1134	1134	0.	0.	0.	0.
Michigan	0	105s	0	105s	0.	0.	0.	0.
Minnesota	2832s	297w	0	3129	0.	29.	0.	29.
Missouri	1845	20	0	1865	0.	0.	0.	0.
Nebraska	1950w	2124	5140s	9214	-97.	0.	0.	-97.
North Dakota	0	615	0	615	0.	0.	0.	0.
Ohio	4182s	1821s	4278s	10281s	0.	0.	0.	0.
Oklahoma	7658	2493	0	10151	0.	0.	0.	0.
South Dakota	0	0	4950	4950	0.	0.	0.	0.
Tennessee	0	0	0	0	0.	0.	0.	0.
Wisconsin	0	0	1062w	1062w	0.	0.	-53.	-53.
PAD District III	1217s	5814	7653s	14684	46.	0.	-46.	0.
Alabama	0	0	0	0	0.	0.	0.	0.
Arkansas	0	2520	2445	4965	0.	0.	0.	0.
Louisiana	0	2202s	1150w	3352s	0.	0.	-57.	-57.
Mississippi	467w	0	0	467w	46.	0.	0.	46.
New Mexico	750s	0	4058s	4808	0.	0.	11.	11.
Texas	0	1092s	0	1092s	0.	0.	0.	0.
PAD District IV	5830s	1990	7081s	14901	0.	45.	70.	115.
Colorado	0	451w	0	451w	0.	45.	0.	45.
Idaho	0	0	0	0	0.	0.	0.	0.
Montana	0	0	5016s	5016s	0.	0.	0.	0.
Utah	3720	1539s	2065s	7324s	0.	0.	70.	70.
Wyoming	2110s	0	0	2110s	0.	0.	0.	0.
PAD District V	7158	12114	7140	26412	199.	-79.	-40.	80.
Alaska	0	2238s	0	2238s	0.	0.	0.	0.
Arizona	855s	0	30s	885s	0.	0.	0.	0.
California	2592s	795w	2412s	5799	0.	-79.	0.	-79.
Hawaii	708w	0	2544s	3252s	35.	0.	0.	35.
Nevada	330w	1671s	0	2001s	-16.	0.	0.	-16.
Oregon	1742w	7410s	0	9152s	87.	0.	0.	87.
Washington	931w	0	2154s	3085s	93.	0.	-40.	53.

Classical LP 4D Solid   All Fuel Grades   Oxygenated Fuel

	DTW	Rack	Bulk	Total	<------- CTA ---------->			
United States	185909	157406	176052	519367	140.	244.	-290.	94.
PAD District I	62713	59801	51566	174080	-7.	186.	-138.	41.
Subdistrict IA	36179	20682	21112	77973	85.	78.	-98.	65.
Connecticut	5530s	5886	1644s	13060	0.	0.	0.	0.
Maine	12772	1478	3159	17409	0.	0.	0.	0.
Massachusetts	172w	1572w	3048s	4792	-8.	78.	-6.	64.
New Hampshire	6448	4444s	7408s	18300	0.	0.	0.	0.
Rhode Island	6609s	2354s	3749s	12712s	0.	0.	0.	0.
Vermont	4648	4948	2104s	11700s	93.	0.	-92.	1.
Subdistrict IB	16120	12775	12539	41434	0.	75.	-75.	0.
Delaware	5396s	0	5313	10709s	0.	0.	33.	33.
District of Colu	5118s	2725s	940	8783	0.	0.	0.	0.
Maryland	0	0	932	932	0.	0.	-70.	-70.
New Jersey	3737s	0	3832	7569s	0.	0.	0.	0.
New York	1869s	2124s	744s	4737	0.	105.	0.	105.
Pennsylvania	0	7926s	778w	8704	0.	-30.	-38.	-68.
Subdistrict IC	10414	26344	17915	54673	-92.	33.	35.	-24.
Florida	855s	3469s	959s	5283	0.	-34.	0.	-34.
Georgia	2965s	1472s	852	5289	0.	0.	0.	0.
North Carolina	974s	6653s	3325	10952	-22.	13.	0.	-9.
South Carolina	1540	8716	2862	13118	0.	0.	0.	0.
Virginia	3869s	3724	1022w	8615	-91.	0.	51.	-40.
West Virginia	211w	2310s	8895s	11416	21.	54.	-16.	59.
PAD District II	70903	41637	63903	176443	-123.	157.	-95.	-61.
Illinois	1257s	748w	8994	10999	0.	74.	0.	74.
Indiana	2889s	7304	4071s	14264	0.	0.	0.	0.
Iowa	2113s	4459s	5890s	12462	0.	0.	0.	0.
Kansas	2976	5421s	808w	9205	0.	0.	-80.	-80.
Kentucky	9190	2142	3821	15153	0.	0.	0.	0.
Michigan	6538	1185	0	7723	0.	54.	0.	54.
Minnesota	4295	2781	4650	11726	0.	29.	0.	29.
Missouri	4878s	2965	3712s	11555	0.	0.	38.	38.
Nebraska	6235s	2974s	6418s	15627	-97.	0.	0.	-97.
North Dakota	2264s	3856	3832s	9952	0.	0.	0.	0.
Ohio	9932s	1821s	8186s	19939	0.	0.	0.	0.
Oklahoma	10858	2493	3276	16627	0.	0.	0.	0.
South Dakota	0	2040	4950	6990	0.	0.	0.	0.
Tennessee	530w	1448s	4233s	6211	-26.	0.	0.	-26.
Wisconsin	6948s	0	1062w	8010	0.	0.	-53.	-53.
PAD District III	10582	14268	24802	49652	46.	0.	-28.	18.
Alabama	0	0	7556s	7556s	0.	0.	0.	0.
Arkansas	928s	2520	5697s	9145	0.	0.	0.	0.
Louisiana	0	6205s	4003s	10208	0.	0.	-57.	-57.
Mississippi	2233s	0	2424s	4657s	46.	0.	71.	117.
New Mexico	7421	4451	5082	16954	0.	0.	-40.	-40.
Texas	0	1092s	40w	1132s	0.	0.	-2.	-2.
PAD District IV	20750	15061	17089	52900	0.	1.	-50.	-49.
Colorado	0	7132	0	7132	0.	45.	0.	45.
Idaho	1698	892w	6724s	9314s	0.	-44.	44.	0.
Montana	362	5498	6898	12758	0.	0.	-94.	-94.
Utah	12230	1539s	3467s	17236s	0.	0.	0.	0.
Wyoming	6460	0	0	6460	0.	0.	0.	0.
PAD District V	20961	26639	18692	66292	224.	-100.	21.	145.
Alaska	4734	2844	3595	11173	0.	-60.	0.	-60.
Arizona	2353s	0	1433s	3786	17.	0.	0.	17.
California	3836s	1863s	5099	10798	62.	-26.	-21.	15.
Hawaii	2614s	0	2544s	5158	-48.	0.	0.	-48.
Nevada	2991	4707s	423w	8121	13.	0.	42.	55.
Oregon	1742w	17225s	3040	22007	87.	-14.	0.	73.
Washington	2691s	0	2558s	5249	93.	0.	0.	93.

Classical LP 4D Solid	Regular Fuel				Reformulated Fuel			
	DTW	Rack	Bulk	Total	<------- CTA			---------->
United States	55451	78002	75152	208605	57.	154.	-103.	108.
PAD District I	23326	20395	29683	73404	8.	127.	-78.	57.
Subdistrict IA	4657	4540	4311	13508	0.	59.	-28.	31.
Connecticut	0	0	0	0	0.	0.	0.	0.
Maine	0	1936s	4024s	5960	0.	0.	0.	0.
Massachusetts	0	0	0	0	0.	0.	0.	0.
New Hampshire	1210	0	0	1210	0.	0.	0.	0.
Rhode Island	0	593w	0	593w	0.	59.	0.	59.
Vermont	3447	2011s	287w	5745s	0.	0.	-28.	-28.
Subdistrict IB	11495	8117	12504	32116	-68.	68.	0.	0.
Delaware	4784	1364w	3940s	10088	-68.	68.	0.	0.
District of Colu	0	5070	7070	12140	0.	0.	0.	0.
Maryland	3311	0	0	3311	0.	0.	0.	0.
New Jersey	3400	0	144	3544	0.	0.	0.	0.
New York	0	648s	0	648s	0.	0.	0.	0.
Pennsylvania	0	1035s	1350s	2385s	0.	0.	0.	0.
Subdistrict IC	7174	7738	12868	27780	76.	0.	-50.	26.
Florida	0	3288s	1847	5135s	0.	0.	0.	0.
Georgia	5166s	0	0	5166s	0.	0.	0.	0.
North Carolina	1338s	0	1812s	3150s	43.	0.	0.	43.
South Carolina	0	2463	4720	7183	0.	0.	0.	0.
Virginia	0	0	3485	3485	0.	0.	0.	0.
West Virginia	670w	1987s	1004w	3661s	33.	0.	-50.	-17.
PAD District II	22018	27980	21377	71375	26.	-55.	12.	-17.
Illinois	0	0	0	0	0.	0.	0.	0.
Indiana	436	0	0	436	0.	0.	0.	0.
Iowa	965s	552w	0	1517s	0.	-55.	0.	-55.
Kansas	9020	3644s	248w	12912	-52.	0.	12.	-40.
Kentucky	0	645	2359	3004	0.	0.	0.	0.
Michigan	1074	0	2238	3312	0.	0.	0.	0.
Minnesota	5030	0	0	5030	0.	0.	0.	0.
Missouri	974s	3990	3552s	8516	0.	0.	0.	0.
Nebraska	0	7667	0	7667	0.	0.	0.	0.
North Dakota	1131	0	0	1131	0.	0.	0.	0.
Ohio	0	0	0	0	0.	0.	0.	0.
Oklahoma	870s	1864s	789s	3523	0.	0.	0.	0.
South Dakota	24	8973	5526	14523	0.	0.	0.	0.
Tennessee	1712s	645s	4635	6992	0.	0.	0.	0.
Wisconsin	782w	0	2030s	2812s	78.	0.	0.	78.
PAD District III	4950	6421	14434	25805	33.	44.	-37.	40.
Alabama	0	0	0	0	0.	0.	0.	0.
Arkansas	670w	1936s	3106s	5712	33.	0.	0.	33.
Louisiana	0	0	3262	3262	0.	0.	0.	0.
Mississippi	0	3587	1560w	5147s	0.	0.	-78.	-78.
New Mexico	4280s	0	5672s	9952	0.	0.	0.	0.
Texas	0	898w	834w	1732s	0.	44.	41.	85.
PAD District IV	1263	9582	5637	16482	0.	38.	0.	38.
Colorado	0	1680s	5637	7317s	0.	0.	0.	0.
Idaho	0	0	0	0	0.	0.	0.	0.
Montana	0	1860	0	1860	0.	0.	0.	0.
Utah	0	382w	0	382w	0.	38.	0.	38.
Wyoming	1263	5660	0	6923	0.	0.	0.	0.
PAD District V	3894	13624	4021	21539	-10.	0.	0.	-10.
Alaska	0	3102s	705s	3807s	0.	0.	0.	0.
Arizona	204w	828	1149s	2181s	-10.	0.	0.	-10.
California	3690s	3728s	0	7418s	0.	0.	0.	0.
Hawaii	0	0	327	327	0.	0.	0.	0.
Nevada	0	0	0	0	0.	0.	0.	0.
Oregon	0	5966s	0	5966s	0.	0.	0.	0.
Washington	0	0	1840	1840	0.	0.	0.	0.

Classical LP 4D Solid   Mid-grade Fuel   Reformulated Fuel

	DTW	Rack	Bulk	Total	<------- CTA			--------->
United States	59557	55911	74892	190360	80.	-101.	-20.	-41.
PAD District I	20358	13162	21617	55137	94.	-41.	-58.	-5.
Subdistrict IA	6122	3815	8074	18011	0.	-41.	0.	-41.
Connecticut	3290	0	0	3290	0.	0.	0.	0.
Maine	2832	410w	4260s	7502	0.	-41.	1.	-40.
Massachusetts	0	3405s	0	3405s	0.	0.	0.	0.
New Hampshire	0	0	3795	3795	0.	0.	0.	0.
Rhode Island	0	0	0	0	0.	0.	0.	0.
Vermont	0	0	19w	19w	0.	0.	-1.	-1.
Subdistrict IB	9540	2718	7410	19668	0.	0.	0.	0.
Delaware	0	0	0	0	0.	0.	0.	0.
District of Colu	4595s	2343	0	6938s	0.	0.	0.	0.
Maryland	0	0	3592s	3592s	0.	0.	0.	0.
New Jersey	0	375	440s	815s	0.	0.	0.	0.
New York	880s	0	705	1585s	0.	0.	0.	0.
Pennsylvania	4065	0	2673s	6738s	0.	0.	0.	0.
Subdistrict IC	4696	6629	6133	17458	94.	0.	-58.	36.
Florida	0	0	0	0	0.	0.	0.	0.
Georgia	0	0	1168w	1168w	0.	0.	-58.	-58.
North Carolina	0	0	0	0	0.	0.	0.	0.
South Carolina	0	6629	0	6629	0.	0.	0.	0.
Virginia	2808s	0	4965s	7773	0.	0.	0.	0.
West Virginia	1888w	0	0	1888w	94.	0.	0.	94.
PAD District II	15863	26297	17858	60018	-14.	-60.	86.	12.
Illinois	0	7970s	3750	11720s	0.	-60.	0.	-60.
Indiana	839w	1195	0	2034s	-83.	0.	0.	-83.
Iowa	1206s	4279	861w	6346	0.	0.	86.	86.
Kansas	1390w	3215	0	4605s	69.	0.	0.	69.
Kentucky	0	0	1158	1158	0.	0.	0.	0.
Michigan	0	0	0	0	0.	0.	0.	0.
Minnesota	0	2615	4386	7001	0.	0.	0.	0.
Missouri	0	1469	0	1469	0.	0.	0.	0.
Nebraska	3326s	676s	122	4124	0.	0.	0.	0.
North Dakota	5772	4878	3182	13832	0.	0.	0.	0.
Ohio	1176	0	0	1176	0.	0.	0.	0.
Oklahoma	0	0	0	0	0.	0.	0.	0.
South Dakota	0	0	4187	4187	0.	0.	0.	0.
Tennessee	0	0	0	0	0.	0.	0.	0.
Wisconsin	2154s	0	212s	2366s	0.	0.	0.	0.
PAD District III	11902	0	12255	24157	0.	0.	45.	45.
Alabama	0	0	458w	458w	0.	0.	45.	45.
Arkansas	0	0	978	978	0.	0.	0.	0.
Louisiana	5772s	0	2454s	8226s	0.	0.	0.	0.
Mississippi	1590s	0	0	1590s	0.	0.	0.	0.
New Mexico	0	0	6061	6061	0.	0.	0.	0.
Texas	4540s	0	2304s	6844	0.	0.	0.	0.
PAD District IV	11199	8296	12030	31525	0.	0.	0.	0.
Colorado	5217	1905s	3276	10398s	0.	0.	0.	0.
Idaho	0	6391s	3012s	9403	0.	0.	0.	0.
Montana	5982	0	3492	9474	0.	0.	0.	0.
Utah	0	0	2250s	2250s	0.	0.	0.	0.
Wyoming	0	0	0	0	0.	0.	0.	0.
PAD District V	235	8156	11132	19523	0.	0.	-93.	-93.
Alaska	0	0	735w	735w	0.	0.	-73.	-73.
Arizona	235	0	0	235	0.	0.	0.	0.
California	0	2015	6143	8158	0.	0.	0.	0.
Hawaii	0	0	2664s	2664s	0.	0.	0.	0.
Nevada	0	0	1590s	1590s	0.	0.	-20.	-20.
Oregon	0	2874s	0	2874s	0.	0.	0.	0.
Washington	0	3267s	0	3267s	0.	0.	0.	0.

Classical LP 4D Solid Premium Fuel Reformulated Fuel

	DTW	Rack	Bulk	Total	<------- CTA			---------->
United States	57500	63876	58104	179480	14.	-291.	131.	-146.
PAD District I	28936	23822	10397	63155	-43.	-294.	-11.	-348.
Subdistrict IA	11424	3520	9376	24320	0.	0.	-11.	-11.
Connecticut	2657s	1284	3080s	7021	0.	0.	0.	0.
Maine	3420	0	4584	8004	0.	0.	0.	0.
Massachusetts	1839s	0	1068w	2907s	0.	0.	53.	53.
New Hampshire	3508	2236	0	5744	0.	0.	0.	0.
Rhode Island	0	0	0	0	0.	0.	0.	0.
Vermont	0	0	644w	644w	0.	0.	-64.	-64.
Subdistrict IB	13270	9614	0	22884	0.	-108.	0.	-108.
Delaware	2632	0	0	2632	0.	0.	0.	0.
District of Colu	968	1230s	0	2198s	0.	0.	0.	0.
Maryland	0	852w	0	852w	0.	-42.	0.	-42.
New Jersey	6458s	0	0	6458s	0.	0.	0.	0.
New York	3212s	6200s	0	9412s	0.	0.	0.	0.
Pennsylvania	0	1332w	0	1332w	0.	-66.	0.	-66.
Subdistrict IC	4242	10688	1021	15951	-43.	-186.	0.	-229.
Florida	0	2283s	0	2283s	0.	0.	0.	0.
Georgia	0	883w	1021	1904s	0.	-88.	0.	-88.
North Carolina	866w	0	0	866w	-43.	0.	0.	-43.
South Carolina	0	3464	0	3464	0.	0.	0.	0.
Virginia	0	2088	0	2088	0.	0.	0.	0.
West Virginia	3376s	1970w	0	5346s	0.	-98.	0.	-98.
PAD District II	9326	16635	20726	46687	47.	3.	97.	147.
Illinois	0	1200w	0	1200w	0.	60.	0.	60.
Indiana	1950w	0	0	1950w	-97.	0.	0.	-97.
Iowa	0	500s	3700s	4200s	0.	0.	0.	0.
Kansas	637w	0	0	637w	63.	0.	0.	63.
Kentucky	0	2984s	2502s	5486	0.	0.	0.	0.
Michigan	0	0	0	0	0.	0.	0.	0.
Minnesota	0	4847	0	4847	0.	0.	0.	0.
Missouri	0	0	0	0	0.	0.	0.	0.
Nebraska	1224s	0	2730s	3954	0.	0.	0.	0.
North Dakota	0	0	0	0	0.	0.	0.	0.
Ohio	2511s	2550s	1905s	6966	0.	0.	0.	0.
Oklahoma	1368s	0	2664s	4032	0.	0.	0.	0.
South Dakota	0	504s	1958w	2462	0.	0.	97.	97.
Tennessee	0	1180	3956	5136	0.	0.	0.	0.
Wisconsin	1636w	2870	1311s	5817s	81.	-57.	0.	24.
PAD District III	9490	12054	4808	26352	0.	0.	0.	0.
Alabama	0	4674	411s	5085s	0.	0.	0.	0.
Arkansas	32s	2945s	0	2977	0.	0.	0.	0.
Louisiana	1730s	807s	0	2537s	0.	0.	0.	0.
Mississippi	543s	792	0	1335s	0.	0.	0.	0.
New Mexico	2592s	2836	4397s	9825	0.	0.	0.	0.
Texas	4593s	0	0	4593s	0.	0.	0.	0.
PAD District IV	4315	3260	14777	22352	0.	0.	0.	0.
Colorado	2751	0	6660	9411	0.	0.	0.	0.
Idaho	0	3260	0	3260	0.	0.	0.	0.
Montana	0	0	4825	4825	0.	0.	0.	0.
Utah	0	0	2523	2523	0.	0.	0.	0.
Wyoming	1564	0	769	2333	0.	0.	0.	0.
PAD District V	5433	8105	7396	20934	10.	0.	45.	55.
Alaska	19	4760s	0	4779s	-1.	0.	0.	-1.
Arizona	265s	0	0	265s	0.	0.	0.	0.
California	447s	0	0	447s	0.	0.	0.	0.
Hawaii	52w	2046	0	2098s	2.	0.	0.	2.
Nevada	0	1212s	910w	2122s	0.	0.	45.	45.
Oregon	1156w	0	5168	6324s	57.	0.	0.	57.
Washington	3494s	87s	1318s	4899s	-48.	0.	0.	-48.

Classical LP 4D Solid All Fuel Grades Reformulated Fuel

	DTW	Rack	Bulk	Total	<-------	CTA	----------	->
United States	172508	197789	208148	578445	151.	-238.	8.	-79.
PAD District I	72620	57379	61697	191696	59.	-208.	-147.	-296.
Subdistrict IA	22203	11875	21761	55839	0.	18.	-39.	-21.
Connecticut	5947s	1284	3080s	10311	0.	0.	0.	0.
Maine	6252	2346	12868	21466	0.	-41.	1.	-40.
Massachusetts	1839s	3405s	1068w	6312	0.	0.	53.	53.
New Hampshire	4718	2236	3795	10749	0.	0.	0.	0.
Rhode Island	0	593w	0	593w	0.	59.	0.	59.
Vermont	3447	2011s	950p	6408s	0.	0.	-93.	-93.
Subdistrict IB	34305	20449	19914	74668	-68.	-40.	0.	-108.
Delaware	7416	1364w	3940s	12720	-68.	68.	0.	0.
District of Colu	5563s	8643s	7070	21276	0.	0.	0.	0.
Maryland	3311	852w	3592s	7755	0.	-42.	0.	-42.
New Jersey	9858s	375	584s	10817	0.	0.	0.	0.
New York	4092	6848	705	11645	0.	0.	0.	0.
Pennsylvania	4065	2367s	4023s	10455	0.	-66.	0.	-66.
Subdistrict IC	16112	25055	20022	61189	127.	-186.	-108.	-167.
Florida	0	5571	1847	7418	0.	0.	0.	0.
Georgia	5166s	883w	2189s	8238	0.	-88.	-58.	-146.
North Carolina	2204s	0	1812s	4016	0.	0.	0.	0.
South Carolina	0	12556	4720	17276	0.	0.	0.	0.
Virginia	2808s	2088	8450s	13346	0.	0.	0.	0.
West Virginia	5934s	3957s	1004w	10895	127.	-98.	-50.	-21.
PAD District II	47207	70912	59961	178080	59.	-112.	195.	142.
Illinois	0	9170	3750	12920	0.	0.	0.	0.
Indiana	3225	1195	0	4420	-180.	0.	0.	-180.
Iowa	2171s	5331	4561s	12063	0.	-55.	86.	31.
Kansas	11047	6859s	248w	18154	80.	0.	12.	92.
Kentucky	0	3629s	6019s	9648	0.	0.	0.	0.
Michigan	1074	0	2238	3312	0.	0.	0.	0.
Minnesota	5030	7462	4386	16878	0.	0.	0.	0.
Missouri	974s	5459	3552s	9985	0.	0.	0.	0.
Nebraska	4550s	8343s	2852s	15745	0.	0.	0.	0.
North Dakota	6903	4878	3182	14963	0.	0.	0.	0.
Ohio	3687s	2550s	1905s	8142	0.	0.	0.	0.
Oklahoma	2238s	1864s	3453s	7555	0.	0.	0.	0.
South Dakota	24	9477s	11671s	21172	0.	0.	97.	97.
Tennessee	1712s	1825s	8591	12128	0.	0.	0.	0.
Wisconsin	4572s	2870	3553s	10995	159.	-57.	0.	102.
PAD District III	26342	18475	31497	76314	33.	44.	8.	85.
Alabama	0	4674	869s	5543s	0.	0.	45.	45.
Arkansas	702p	4881	4084s	9667	33.	0.	0.	33.
Louisiana	7502	807s	5716s	14025	0.	0.	0.	0.
Mississippi	2133s	4379	1560w	8072s	0.	0.	-78.	-78.
New Mexico	6872	2836	16130	25838	0.	0.	0.	0.
Texas	9133	898w	3138s	13169s	0.	44.	41.	85.
PAD District IV	16777	21138	32444	70359	0.	38.	0.	38.
Colorado	7968	3585	15573	27126	0.	0.	0.	0.
Idaho	0	9651s	3012s	12663	0.	0.	0.	0.
Montana	5982	1860	8317	16159	0.	0.	0.	0.
Utah	0	382w	4773s	5155	0.	38.	0.	38.
Wyoming	2827	5660	769	9256	0.	0.	0.	0.
PAD District V	9562	29885	22549	61996	0.	0.	-48.	-48.
Alaska	19	7862	1440	9321	-1.	0.	-73.	-74.
Arizona	704s	828	1149s	2681	-10.	0.	0.	-10.
California	4137s	5743s	6143	16023	0.	0.	0.	0.
Hawaii	52w	2046	2991s	5089	2.	0.	0.	2.
Nevada	0	1212s	2500s	3712	0.	0.	25.	25.
Oregon	1156w	8840s	5168	15164	57.	0.	0.	57.
Washington	3494s	3354	3158s	10006	-48.	0.	0.	-48.

Classical LP 4D Solid   Regular Fuel   All Fuel Formulations

	DTW	Rack	Bulk	Total	<------- CTA			--------->
United States	188668	218471	170021	577160	-78.	283.	60.	265.
PAD District I	64625	72994	65620	203239	-51.	330.	-93.	186.
Subdistrict IA	25314	28780	16952	71046	85.	59.	-50.	94.
Connecticut	6258	1494	1700	9452	0.	0.	0.	0.
Maine	3936	4719s	4429s	13084	0.	0.	0.	0.
Massachusetts	172w	3840s	0	4012	-8.	0.	0.	-8.
New Hampshire	7879	0	3188	11067	0.	0.	0.	0.
Rhode Island	1748	6224	3976	11948	0.	59.	-22.	37.
Vermont	5321s	12503	3659s	21483	93.	0.	-28.	65.
Subdistrict IB	19417	16493	22335	58245	11.	187.	7.	205.
Delaware	6978	2400s	4272s	13650	11.	119.	33.	163.
District of Colu	2253	5070	11338	18661	0.	0.	0.	0.
Maryland	3311	1836s	1079w	6226	0.	0.	13.	13.
New Jersey	6875	0	144	7019	0.	0.	0.	0.
New York	0	648s	784w	1432	0.	0.	-39.	-39.
Pennsylvania	0	6539	4718	11257	0.	68.	0.	68.
Subdistrict IC	19894	27721	26333	73948	-147.	84.	-50.	-113.
Florida	0	10857	1847	12704	0.	0.	0.	0.
Georgia	9961	0	0	9961	0.	0.	0.	0.
North Carolina	2268	7226s	8464s	17958	-3.	84.	0.	81.
South Carolina	1195	5887	7582	14664	0.	0.	0.	0.
Virginia	3560	0	3625	7185	-177.	0.	0.	-177.
West Virginia	2910	3751s	4815s	11476	33.	0.	-50.	-17.
PAD District II	76174	62147	54796	193117	0.	-46.	134.	88.
Illinois	4128	0	0	4128	0.	0.	0.	0.
Indiana	4613	0	3846	8459	64.	0.	84.	148.
Iowa	1149s	4196	4216s	9561	9.	-84.	0.	-75.
Kansas	11996	10330	1948	24274	-52.	0.	12.	-40.
Kentucky	5826	2787	6523	15136	0.	0.	0.	0.
Michigan	2022	0	6668	8690	0.	0.	0.	0.
Minnesota	6400s	3694s	1332s	11426	0.	0.	0.	0.
Missouri	5915	10385	3934	20234	0.	0.	38.	38.
Nebraska	2652	7667	942	11261	0.	0.	0.	0.
North Dakota	4671	8286	0	12957	-63.	38.	0.	-25.
Ohio	7197	0	3477	10674	0.	0.	0.	0.
Oklahoma	4030	1864s	4339s	10233	0.	0.	0.	0.
South Dakota	24	11013	5526	16563	0.	0.	0.	0.
Tennessee	2242	645s	8325s	11212	-26.	0.	0.	-26.
Wisconsin	13309s	1280	3720s	18309	68.	0.	0.	68.
PAD District III	15248	23726	26417	65391	33.	19.	-25.	27.
Alabama	3504s	259w	2856s	6619	0.	-25.	0.	-25.
Arkansas	1598s	5628s	6358s	13584	33.	0.	0.	33.
Louisiana	0	3088s	4667s	7755	0.	0.	0.	0.
Mississippi	666	8925	2980	12571	0.	0.	-7.	-7.
New Mexico	8410s	4928	6696s	20034	0.	0.	-51.	-51.
Texas	1070s	898w	2860s	4828	0.	44.	33.	77.
PAD District IV	13561	23112	8479	45152	-134.	-56.	44.	-146.
Colorado	0	8772s	5637	14409s	0.	0.	0.	0.
Idaho	925s	940w	890w	2755	0.	-94.	44.	-50.
Montana	514w	7358	0	7872s	-51.	0.	0.	-51.
Utah	5676	382w	0	6058s	0.	38.	0.	38.
Wyoming	6446	5660	1952s	14058s	-83.	0.	0.	-83.
PAD District V	19060	36492	14709	70261	74.	36.	0.	110.
Alaska	0	7948	4300s	12248s	0.	-60.	0.	-60.
Arizona	2721	828	2189s	5738s	-10.	0.	0.	-10.
California	3792s	3728s	2251	9771	5.	0.	0.	5.
Hawaii	1038	6141	327	7506	79.	-4.	0.	75.
Nevada	2555s	3522s	0	6077	0.	24.	0.	24.
Oregon	0	14325	3040	17365	0.	76.	0.	76.
Washington	8954	0	2602	11556	0.	0.	0.	0.

Classical LP 4D Solid   Mid-grade Fuel   All Fuel Formulations

	DTW	Rack	Bulk	Total	<-------	CTA	---------->	
United States	234099	170421	209941	614461	133.	-69.	-10.	54.
PAD District I	69006	60078	45675	174759	112.	13.	21.	146.
Subdistrict IA	23026	19648	17765	60439	32.	-59.	0.	-27.
Connecticut	3672s	10737s	1551s	15960	38.	0.	0.	38.
Maine	9886	2113s	7014s	19013	0.	-41.	1.	-40.
Massachusetts	1698w	3405s	0	5103s	84.	0.	0.	84.
New Hampshire	1456	1743s	8119s	11318	0.	-18.	0.	-18.
Rhode Island	5604s	755s	0	6359	-90.	0.	0.	-90.
Vermont	710	895	1081s	2686s	0.	0.	-1.	-1.
Subdistrict IB	33509	14578	12603	60690	0.	93.	-38.	55.
Delaware	1386	0	3617	5003	0.	0.	0.	0.
District of Colu	7460	4758	0	12218	0.	0.	0.	0.
Maryland	0	3902s	4390s	8292	0.	0.	0.	0.
New Jersey	4795s	375	440s	5610	0.	0.	0.	0.
New York	6434s	2063p	705	9202	0.	93.	0.	93.
Pennsylvania	13434	3480s	3451s	20365	0.	0.	-38.	-38.
Subdistrict IC	12471	25852	15307	53630	80.	-21.	59.	118.
Florida	3200s	5264	1001w	9465	0.	-34.	82.	48.
Georgia	0	2122s	2661s	4783	0.	0.	-58.	-58.
North Carolina	714w	272w	0	986	-35.	13.	0.	-22.
South Carolina	345	14094	0	14439	0.	0.	0.	0.
Virginia	4853	1724	8333	14910	0.	0.	51.	51.
West Virginia	3359s	2376s	3312s	9047	115.	0.	-16.	99.
PAD District II	74913	67732	78659	221304	1.	-91.	54.	-36.
Illinois	316w	14174s	3750	18240	15.	14.	0.	29.
Indiana	839w	14060	1905	16804s	-83.	0.	0.	-83.
Iowa	3319	4704	12645	20668	0.	0.	86.	86.
Kansas	1390w	7794	606w	9790s	69.	0.	-30.	39.
Kentucky	3364	612w	7962s	11938	0.	-61.	0.	-61.
Michigan	9941	1080w	0	11021s	0.	54.	0.	54.
Minnesota	6756s	3833s	22520	33109	0.	-60.	0.	-60.
Missouri	5075	1769	3330	10174	0.	0.	0.	0.
Nebraska	16463	1526	4481	22470	0.	0.	0.	0.
North Dakota	5772	5558	8154	19484	0.	-38.	0.	-38.
Ohio	10728	6112	5048	21888	0.	0.	0.	0.
Oklahoma	1480	3090	3276	7846	0.	0.	0.	0.
South Dakota	0	1153s	4227s	5380	0.	0.	-2.	-2.
Tennessee	0	1448s	543s	1991	0.	0.	0.	0.
Wisconsin	9470s	819s	212s	10501	0.	0.	0.	0.
PAD District III	33192	13706	35889	82787	0.	0.	111.	111.
Alabama	9144s	75s	9977s	19196	0.	0.	45.	45.
Arkansas	0	0	1448	1448	0.	0.	0.	0.
Louisiana	5772s	3596s	9797s	19165	0.	0.	0.	0.
Mississippi	5261	6399	2330	13990	0.	0.	66.	66.
New Mexico	8475	3636	10033	22144	0.	0.	0.	0.
Texas	4540s	0	2304s	6844	0.	0.	0.	0.
PAD District IV	26384	13793	33824	74001	0.	-44.	-164.	-208.
Colorado	9457	4440	8352	22249	0.	0.	0.	0.
Idaho	6351	9353	8846	24550	0.	-44.	0.	-44.
Montana	6344	0	11850	18194	0.	0.	-38.	-38.
Utah	4232	0	4776	9008	0.	0.	-126.	-126.
Wyoming	0	0	0	0	0.	0.	0.	0.
PAD District V	30604	15112	15894	61610	20.	53.	-32.	41.
Alaska	6939	0	3871s	10810s	0.	0.	-73.	-73.
Arizona	583s	0	363s	946s	17.	0.	0.	17.
California	5734s	3083s	6579s	15396	57.	53.	-21.	89.
Hawaii	9123s	147	2664s	11934	-83.	0.	0.	-83.
Nevada	582w	2606s	2013s	5201	29.	0.	22.	51.
Oregon	4585	6009	0	10594	0.	0.	0.	0.
Washington	3058	3267s	404w	6729	0.	0.	40.	40.

Classical LP 4D Solid   Premium Fuel   All Fuel Formulations

	DTW	Rack	Bulk	Total	<-------	CTA	--------	--->
United States	169122	166813	193519	529454	44.	-310.	-53.	-319.
PAD District I	69900	54199	57812	181911	7.	-231.	-154.	-378.
Subdistrict IA	28875	16615	24200	69690	0.	65.	-66.	-1.
Connecticut	6821s	1550s	5602s	13973	-13.	-13.	43.	17.
Maine	6874	0	4584	11458	0.	0.	0.	0.
Massachusetts	2151s	4280	4116	10547s	0.	78.	47.	125.
New Hampshire	7900	5311s	2128s	15339	0.	0.	0.	0.
Rhode Island	3065s	5474s	2588	11127	13.	0.	0.	13.
Vermont	2064s	0	5182s	7246s	0.	0.	-156.	-156.
Subdistrict IB	21910	12103	17624	51637	37.	-117.	-23.	-103.
Delaware	6632	804s	3168s	10604	0.	0.	0.	0.
District of Colu	4860	1540	4012	10412	0.	0.	0.	0.
Maryland	0	852w	996s	1848	0.	-42.	-23.	-65.
New Jersey	7186s	625s	3832	11643	36.	0.	0.	36.
New York	3232s	6328	4740s	14300	1.	6.	0.	7.
Pennsylvania	0	1954s	876s	2830	0.	-81.	0.	-81.
Subdistrict IC	19115	25481	15988	60584	-30.	-179.	-65.	-274.
Florida	3520s	5429	1571s	10520	0.	-47.	0.	-47.
Georgia	8613	2355	6603	17571	0.	-88.	0.	-88.
North Carolina	1126s	0	1306w	2432	-30.	0.	-65.	-95.
South Carolina	0	11093	0	11093	0.	0.	0.	0.
Virginia	2480	4088	0	6568	0.	0.	0.	0.
West Virginia	3376s	2516	6508s	12400	0.	-44.	0.	-44.
PAD District II	48832	45882	63611	158325	-102.	-57.	98.	-61.
Illinois	4053s	1200w	11969	17222	0.	60.	0.	60.
Indiana	1950w	0	0	1950w	-97.	0.	0.	-97.
Iowa	412s	5898	3872s	10182	0.	0.	0.	0.
Kansas	3393s	0	1632w	5025s	11.	0.	2.	13.
Kentucky	0	2984s	4635s	7619	0.	0.	0.	0.
Michigan	0	1905s	3830s	5735s	0.	-90.	0.	-90.
Minnesota	8071	5144s	2368s	15583	0.	29.	0.	29.
Missouri	4555	20	0	4575	0.	0.	0.	0.
Nebraska	6310	5357	12187	23854	-97.	0.	0.	-97.
North Dakota	0	8633	0	8633	0.	0.	0.	0.
Ohio	6693	4371	6707	17771	0.	0.	52.	52.
Oklahoma	11318	3617s	2664s	17599	0.	-56.	0.	-56.
South Dakota	0	504s	6908s	7412	0.	0.	97.	97.
Tennessee	0	2235	4466	6701	0.	0.	0.	0.
Wisconsin	2077s	4014s	2373s	8464	81.	0.	-53.	28.
PAD District III	21321	26517	17132	64970	-34.	0.	-1.	-35.
Alabama	2684s	4674	865s	8223	4.	0.	-45.	-41.
Arkansas	4400s	9815s	4856s	19071	0.	0.	0.	0.
Louisiana	1730s	5322	1150w	8202	0.	0.	-57.	-57.
Mississippi	1010	792	0	1802	46.	0.	0.	46.
New Mexico	5218s	4822	8455s	18495	0.	0.	11.	11.
Texas	6279s	1092s	1806w	9177	-84.	0.	90.	6.
PAD District IV	11355	9475	26290	47120	0.	67.	-1.	66.
Colorado	2751	1456s	9460	13667s	0.	45.	0.	45.
Idaho	0	3260	0	3260	0.	0.	0.	0.
Montana	0	1382w	10045	11427s	0.	-69.	0.	-69.
Utah	3720	1539s	6016	11275s	0.	0.	-1.	-1.
Wyoming	4884	1838w	769	7491s	0.	91.	0.	91.
PAD District V	17714	30740	28674	77128	173.	-89.	5.	89.
Alaska	19	6998	5252	12269	-1.	0.	0.	-1.
Arizona	1120s	0	30s	1150	0.	0.	0.	0.
California	3039s	902w	2412s	6353	0.	-89.	0.	-89.
Hawaii	3736s	2046	6026s	11808	8.	0.	0.	8.
Nevada	2337s	8188	6314s	16839	-16.	0.	45.	29.
Oregon	3038	12519	5168	20725	137.	0.	0.	137.
Washington	4425	87s	3472s	7984	45.	0.	-40.	5.

Classical LP 4D Solid   All Fuel Grades   All Fuel Formulations

	DTW	Rack	Bulk	Total	<------- CTA ---------->			
United States	591889	555705	573481	1721075	99.	-96.	-3.	0.
PAD District I	203531	187271	169107	559909	68.	112.	-226.	-46.
Subdistrict IA	77215	65043	58917	201175	117.	65.	-116.	66.
Connecticut	16751	13781	8853	39385	25.	-13.	43.	55.
Maine	20696	6832	16027	43555	0.	-41.	1.	-40.
Massachusetts	4021	11525	4116	19662	76.	78.	47.	201.
New Hampshire	17235	7054	13435	37724	0.	-18.	0.	-18.
Rhode Island	10417	12453	6564	29434	-77.	59.	-22.	-40.
Vermont	8095	13398	9922	31415	93.	0.	-185.	-92.
Subdistrict IB	74836	43174	52562	170572	48.	163.	-54.	157.
Delaware	14996	3204	11057	29257	11.	119.	33.	163.
District of Colu	14573	11368	15350	41291	0.	0.	0.	0.
Maryland	3311	6590	6465	16366	0.	-42.	-10.	-52.
New Jersey	18856	1000s	4416s	24272	36.	0.	0.	36.
New York	9666	9039s	6229s	24934	1.	99.	-39.	61.
Pennsylvania	13434	11973	9045	34452	0.	-13.	-38.	-51.
Subdistrict IC	51480	79054	57628	188162	-97.	-116.	-56.	-269.
Florida	6720	21550	4419	32689	0.	-81.	82.	1.
Georgia	18574	4477s	9264s	32315	0.	-88.	-58.	-146.
North Carolina	4108	7498s	9770s	21376	-68.	97.	-65.	-36.
South Carolina	1540	31074	7582	40196	0.	0.	0.	0.
Virginia	10893	5812	11958	28663	-177.	0.	51.	-126.
West Virginia	9645	8643	14635	32923	148.	-44.	-66.	38.
PAD District II	199919	175761	197066	572746	-101.	-194.	286.	-9.
Illinois	8497	15374	15719	39590	15.	74.	0.	89.
Indiana	7402	14060	5751	27213	-116.	0.	84.	-32.
Iowa	4880	14798	20733	40411	9.	-84.	86.	11.
Kansas	16779	18124	4186	39089	28.	0.	-16.	12.
Kentucky	9190	6383	19120	34693	0.	-61.	0.	-61.
Michigan	11963	2985s	10498s	25446	0.	-36.	0.	-36.
Minnesota	21227	12671	26220	60118	0.	-31.	0.	-31.
Missouri	15545	12174	7264	34983	0.	0.	38.	38.
Nebraska	25425	14550	17610	57585	-97.	0.	0.	-97.
North Dakota	10443	22477	8154	41074	-63.	0.	0.	-63.
Ohio	24618	10483	15232	50333	0.	0.	52.	52.
Oklahoma	16828	8571	10279	35678	0.	-56.	0.	-56.
South Dakota	24	12670	16661	29355	0.	0.	95.	95.
Tennessee	2242	4328s	13334s	19904	-26.	0.	0.	-26.
Wisconsin	24856	6113	6305	37274	149.	0.	-53.	96.
PAD District III	69761	63949	79438	213148	-1.	19.	85.	103.
Alabama	15332	5008	13698	34038	4.	-25.	0.	-21.
Arkansas	5998	15443	12662	34103	33.	0.	0.	33.
Louisiana	7502	12006	15614	35122	0.	0.	-57.	-57.
Mississippi	6937	16116	5310	28363	46.	0.	59.	105.
New Mexico	22103	13386	25184	60673	0.	0.	-40.	-40.
Texas	11889	1990	6970	20849	-84.	44.	123.	83.
PAD District IV	51300	46380	68593	166273	-134.	-33.	-121.	-288.
Colorado	12208	14668	23449	50325	0.	45.	0.	45.
Idaho	7276s	13553s	9736s	30565	0.	-138.	44.	-94.
Montana	6858s	8740s	21895	37493	-51.	-69.	-38.	-158.
Utah	13628	1921	10792	26341	0.	38.	-127.	-89.
Wyoming	11330	7498s	2721s	21549	-83.	91.	0.	8.
PAD District V	67378	82344	59277	208999	267.	0.	-27.	240.
Alaska	6958	14946	13423	35327	-1.	-60.	-73.	-134.
Arizona	4424	828	2582	7834	7.	0.	0.	7.
California	12565	7713	11242	31520	62.	-36.	-21.	5.
Hawaii	13897	8334	9017	31248	4.	-4.	0.	0.
Nevada	5474	14316	8327	28117	13.	24.	67.	104.
Oregon	7623	32853	8208	48684	137.	76.	0.	213.
Washington	16437	3354	6478	26269	45.	0.	0.	45.

NETWORK FLOW MODEL AND NOISE ON FOUR DIMENSIONAL TABLE STRUCTURE

TO INCLUDE TWO-WAY INTERACTIONS BETWEEN FUEL GRADE AND FORMULATIONS

NETWORK Flow 4D Solid Regular Fuel Conventional Fuel

	DTW	Rack	Bulk	Total	<------- NOISE ------->			
United States	68018	78993	48652	195663	-227.	-356.	-481.	-1065.
PAD District I	21038	31461	20442	72941	-266.	-167.	-431.	-864.
Subdistrict IA	10849C	16320	5075C	32244	-275.	-115.	-141.	-531.
Connecticut	3032C	0	1700C	4732C	-38.	0.	-35.	-73.
Maine	0	1305C	0	1305C	0.	-26.	0.	-26.
Massachusetts	0	3840C	0	3840C	0.	-65.	0.	-65.
New Hampshire	6069C	0	0	6069C	-183.	0.	0.	-183.
Rhode Island	1748C	5631C	227P	7606	-53.	78.	-23.	1.
Vermont	0	5544C	3148C	8692	0.	-101.	-83.	-184.
Subdistrict IB	3453C	4236C	8089C	15778	177.	-174.	-283.	-280.
Delaware	798P	1036P	0	1834C	83.	-53.	0.	31.
District of Colu	0	0	3328C	3328C	0.	0.	-85.	-85.
Maryland	0	1836C	609P	2445	0.	-46.	-61.	-107.
New Jersey	2655C	0	0	2655C	94.	0.	0.	94.
New York	0	0	784P	784P	0.	0.	-41.	-41.
Pennsylvania	0	1364P	3368C	4732	0.	-75.	-96.	-172.
Subdistrict IC	6736	10905C	7278C	24919	-168.	122.	-7.	-53.
Florida	0	6636	0	6636	0.	-36.	0.	-36.
Georgia	1830C	0	0	1830C	-62.	0.	0.	-62.
North Carolina	930P	845P	3327C	5102C	47.	85.	-70.	62.
South Carolina	0	3424C	0	3424C	0.	73.	0.	73.
Virginia	1736P	0	140C	1876C	-93.	0.	3.	-90.
West Virginia	2240C	0	3811C	6051	-61.	0.	61.	0.
PAD District II	28805	16268	22105	67178	-108.	185.	-197.	-120.
Illinois	4128	0	0	4128	154.	0.	0.	154.
Indiana	1288P	0	1680P	2968C	67.	0.	-89.	-22.
Iowa	184P	588P	436C	1208C	9.	31.	11.	51.
Kansas	0	4100C	1700C	5800	0.	82.	34.	117.
Kentucky	0	0	4164C	4164C	0.	0.	-72.	-72.
Michigan	0	0	4430C	4430C	0.	0.	-81.	-81.
Minnesota	1215C	1210C	1332C	3757	-42.	25.	37.	20.
Missouri	1908C	3750C	0	5658C	-64.	-77.	0.	-142.
Nebraska	2652C	0	942C	3594C	-80.	0.	32.	-48.
North Dakota	1276P	5340C	0	6616C	-66.	89.	0.	23.
Ohio	5227C	0	2181C	7408C	-141.	0.	-73.	-214.
Oklahoma	1440C	0	3550C	4990	24.	0.	54.	79.
South Dakota	0	0	0	0	0.	0.	0.	0.
Tennessee	0	0	0	0	0.	0.	0.	0.
Wisconsin	9487	1280C	1690C	12457	31.	35.	-50.	17.
PAD District III	4574C	14977	3391C	22942	-116.	-145.	71.	-190.
Alabama	3504C	259P	0	3763C	-94.	-26.	0.	-120.
Arkansas	0	3692C	0	3692C	0.	-93.	0.	-93.
Louisiana	0	1575C	1405C	2980C	0.	-55.	35.	-20.
Mississippi	0	5338C	0	5338C	0.	-109.	0.	-109.
New Mexico	0	4113C	0	4113C	0.	138.	0.	138.
Texas	1070C	0	1986C	3056C	-22.	0.	37.	15.
PAD District IV	3670C	3886	1952C	9508	-20.	-3.	49.	27.
Colorado	0	2946C	0	2946C	0.	-103.	0.	-103.
Idaho	925C	940P	0	1865C	-19.	100.	0.	81.
Montana	514P	0	0	514P	53.	0.	0.	53.
Utah	1398C	0	0	1398C	32.	0.	0.	32.
Wyoming	833P	0	1952C	2785C	-86.	0.	49.	-37.
PAD District V	9931C	12401	762C	23094	283.	-226.	26.	82.
Alaska	0	4240C	0	4240C	0.	-85.	0.	-85.
Arizona	1367	0	0	1367	48.	0.	0.	48.
California	102P	0	0	102P	-6.	0.	0.	-6.
Hawaii	792P	6141C	0	6933	80.	-196.	0.	-116.
Nevada	476C	486P	0	962C	-12.	-25.	0.	-37.
Oregon	0	1534P	0	1534P	0.	80.	0.	80.
Washington	7194C	0	762C	7956C	172.	0.	26.	198.

NETWORK Flow 4D Solid Mid-grade Fuel Conventional Fuel

	DTW	Rack	Bulk	Total	<-------	NOISE		------->
United States	107895	64619	77070	249584	-883.	-74.	-487.	-1444.
PAD District I	26330	25496	11603	63429	-124.	-293.	-49.	-465.
Subdistrict IA	5552C	10072C	4821C	20445	-83.	-1.	-68.	-151.
Connecticut	382P	6345C	1551C	8278	-39.	-51.	-11.	-101.
Maine	1672C	1703C	0	3375C	-42.	66.	0.	23.
Massachusetts	1698P	0	0	1698P	92.	0.	0.	92.
New Hampshire	0	374P	2232C	2606C	0.	19.	-38.	-18.
Rhode Island	1800P	755C	0	2555C	-93.	-16.	0.	-110.
Vermont	0	895C	1038C	1933C	0.	-18.	-19.	-37.
Subdistrict IB	16318	3969C	1942C	22229	49.	-75.	36.	10.
Delaware	1386C	0	1144C	2530C	-49.	0.	63.	14.
District of Colu	0	0	0	0	0.	0.	0.	0.
Maryland	0	3902C	798C	4700C	0.	-82.	-27.	-109.
New Jersey	1878C	0	0	1878C	-64.	0.	0.	-64.
New York	3685C	67P	0	3752	74.	7.	0.	81.
Pennsylvania	9369C	0	0	9369C	88.	0.	0.	88.
Subdistrict IC	4460C	11455	4840C	20755	-90.	-217.	-17.	-324.
Florida	3200C	4920C	1001P	9121C	-65.	15.	-66.	-116.
Georgia	0	2122C	1493C	3615C	0.	-99.	8.	-91.
North Carolina	0	0	0	0	0.	0.	0.	0.
South Carolina	0	2037C	0	2037C	0.	-70.	0.	-70.
Virginia	0	0	2346C	2346C	0.	0.	41.	41.
West Virginia	1260C	2376C	0	3636C	-25.	-63.	0.	-88.
PAD District II	33222	26575	34578	94375	-167.	165.	-307.	-310.
Illinois	316P	5456C	0	5772	16.	109.	0.	125.
Indiana	0	5561C	0	5561C	0.	-11.	0.	-11.
Iowa	0	425C	9674C	10099	0.	-10.	81.	71.
Kansas	0	1744C	606P	2350C	0.	-77.	32.	-45.
Kentucky	0	612P	4117C	4729	0.	64.	-166.	-102.
Michigan	4351C	0	0	4351C	-2.	0.	0.	-2.
Minnesota	5448C	1218P	13484	20150	-165.	-61.	36.	-190.
Missouri	5075C	0	0	5075C	9.	0.	0.	9.
Nebraska	8852	0	3081	11933	-64.	0.	-168.	-231.
North Dakota	0	385P	1140C	1525C	0.	-43.	-40.	-83.
Ohio	5772C	6112C	2436C	14320	97.	160.	-85.	172.
Oklahoma	0	3090C	0	3090C	0.	-43.	0.	-43.
South Dakota	0	1153C	40P	1193C	0.	106.	2.	108.
Tennessee	0	0	0	0	0.	0.	0.	0.
Wisconsin	3408C	819C	0	4227C	-58.	-29.	0.	-87.
PAD District III	17649	7580C	15077C	40306	-132.	-66.	-258.	-456.
Alabama	9144C	75C	4819C	14038	65.	2.	-17.	49.
Arkansas	0	0	470C	470C	0.	0.	-9.	-9.
Louisiana	0	1106C	4490C	5596C	0.	-30.	-94.	-124.
Mississippi	2571C	6399C	1326P	10296C	-47.	-38.	-68.	-152.
New Mexico	5934C	0	3972C	9906	-150.	0.	-71.	-220.
Texas	0	0	0	0	0.	0.	0.	0.
PAD District IV	8893	2070C	12676C	23639	-169.	78.	46.	-46.
Colorado	4240C	0	5076C	9316C	-88.	0.	-62.	-150.
Idaho	4653C	2070C	0	6723C	-82.	78.	0.	-4.
Montana	0	0	6476C	6476C	0.	0.	51.	51.
Utah	0	0	1124P	1124P	0.	0.	57.	57.
Wyoming	0	0	0	0	0.	0.	0.	0.
PAD District V	21801	2898C	3136C	27835	-291.	42.	81.	-167.
Alaska	2205C	0	3136C	5341C	47.	0.	81.	128.
Arizona	0	0	0	0	0.	0.	0.	0.
California	4490C	0	0	4490C	-95.	0.	0.	-95.
Hawaii	7463C	147C	0	7610	-18.	5.	0.	-13.
Nevada	0	2606C	0	2606C	0.	52.	0.	52.
Oregon	4585C	145P	0	4730	-99.	-15.	0.	-113.
Washington	3058C	0	0	3058C	-125.	0.	0.	-125.

NETWORK Flow 4D Solid   Premium Fuel   Conventional Fuel

	DTW	Rack	Bulk	Total	<-------	NOISE	------->	
United States	57559	56898	63559	178016	-461.	-677.	-782.	-1920.
PAD District I	20830	13134	23799	57763	-443.	-2.	-243.	-688.
Subdistrict IA	2432C	6094C	6148	14674	-102.	-17.	-151.	-269.
Connecticut	1860C	266P	878P	3004C	-66.	13.	-45.	-98.
Maine	0	0	0	0	0.	0.	0.	0.
Massachusetts	312C	2708C	0	3020C	-23.	-68.	0.	-91.
New Hampshire	0	0	0	0	0.	0.	0.	0.
Rhode Island	260P	3120C	2588C	5968C	-13.	38.	-14.	11.
Vermont	0	0	2682C	2682C	0.	0.	-91.	-91.
Subdistrict IB	4640C	1745C	10078C	16463	-64.	-50.	-86.	-200.
Delaware	0	804C	660C	1464	0.	-21.	-12.	-33.
District of Colu	3892C	0	4012C	7904C	-103.	0.	20.	-82.
Maryland	0	0	534C	534C	0.	0.	-18.	-18.
New Jersey	728P	625C	0	1353C	38.	-13.	0.	25.
New York	20P	0	3996C	4016C	1.	0.	-106.	-105.
Pennsylvania	0	316P	876C	1192C	0.	-16.	30.	13.
Subdistrict IC	13758C	5295C	7573C	26626	-277.	64.	-6.	-219.
Florida	2665C	954P	612C	4231C	-55.	-52.	-16.	-123.
Georgia	8613C	0	4730C	13343	-158.	0.	100.	-58.
North Carolina	0	0	1306P	1306P	0.	0.	-69.	-69.
South Carolina	0	4341C	0	4341C	0.	116.	0.	116.
Virginia	2480C	0	0	2480C	-64.	0.	0.	-64.
West Virginia	0	0	925C	925C	0.	0.	-20.	-20.
PAD District II	19782	20369	16519	56670	34.	-366.	-265.	-596.
Illinois	2796C	0	2975C	5771	77.	0.	48.	125.
Indiana	0	0	0	0	0.	0.	0.	0.
Iowa	412C	3995	172C	4579C	-11.	-50.	4.	-56.
Kansas	2756C	0	824P	3580C	36.	0.	-87.	-50.
Kentucky	0	0	999C	999C	0.	0.	33.	33.
Michigan	0	1800P	3830C	5630C	0.	-101.	-79.	-180.
Minnesota	5239C	0	2368C	7607	29.	0.	-61.	-33.
Missouri	2710C	0	0	2710C	-60.	0.	0.	-60.
Nebraska	3136C	3233C	4317C	10686	43.	-44.	-61.	-62.
North Dakota	0	8018C	0	8018C	0.	-266.	0.	-266.
Ohio	0	0	524P	524P	0.	0.	-54.	-54.
Oklahoma	2292C	1124P	0	3416C	-64.	56.	0.	-8.
South Dakota	0	0	0	0	0.	0.	0.	0.
Tennessee	0	1055C	510C	1565C	0.	-22.	-9.	-31.
Wisconsin	441C	1144P	0	1585C	-15.	60.	0.	44.
PAD District III	10614C	8649C	4671C	23934	-112.	-44.	-201.	-357.
Alabama	2684C	0	454P	3138C	-68.	0.	-46.	-114.
Arkansas	4368C	4350C	2411C	11129	-81.	75.	-62.	-68.
Louisiana	0	2313C	0	2313C	0.	-82.	0.	-82.
Mississippi	0	0	0	0	0.	0.	0.	0.
New Mexico	1876C	1986C	0	3862C	-49.	-37.	0.	-87.
Texas	1686P	0	1806P	3492C	86.	0.	-93.	-7.
PAD District IV	1210C	4225C	4432C	9867	25.	-1.	-181.	-157.
Colorado	0	1005C	2800C	3805C	0.	-21.	-115.	-136.
Idaho	0	0	0	0	0.	0.	0.	0.
Montana	0	1382P	204C	1586	0.	-73.	7.	-66.
Utah	0	0	1428P	1428P	0.	0.	-73.	-73.
Wyoming	1210C	1838P	0	3048C	25.	93.	0.	118.
PAD District V	5123C	10521C	14138C	29782	34.	-264.	108.	-122.
Alaska	0	0	5252C	5252C	0.	0.	94.	94.
Arizona	0	0	0	0	0.	0.	0.	0.
California	0	107P	0	107P	0.	12.	0.	12.
Hawaii	2976C	0	3482C	6458	103.	0.	-3.	100.
Nevada	2007C	5305C	5404C	12716	-62.	-109.	16.	-155.
Oregon	140P	5109C	0	5249C	-7.	-166.	0.	-173.
Washington	0	0	0	0	0.	0.	0.	0.

NETWORK Flow 4D Solid   All Fuel Grades   Conventional Fuel

	DTW	Rack	Bulk	Total	<------- NOISE			------>
United States	233472	200510	189281	623263	-1571.	-1107.	-1750.	-4429.
PAD District I	68198	70091	55844	194133	-833.	-462.	-722.	-2017.
Subdistrict IA	18833	32486	16044	67363	-459.	-132.	-359.	-951.
Connecticut	5274C	6611	4129C	16014	-143.	-38.	-91.	-272.
Maine	1672C	3008C	0	4680	-42.	39.	0.	-3.
Massachusetts	2010	6548	0	8558	70.	-134.	0.	-64.
New Hampshire	6069C	374P	2232C	8675	-183.	19.	-38.	-202.
Rhode Island	3808C	9506	2815C	16129	-160.	100.	-37.	-97.
Vermont	0	6439	6868	13307	0.	-120.	-193.	-313.
Subdistrict IB	24411	9950	20109	54470	162.	-298.	-334.	-470.
Delaware	2184C	1840C	1804C	5828	34.	-73.	51.	12.
District of Colu	3892C	0	7340C	11232	-103.	0.	-64.	-167.
Maryland	0	5738C	1941C	7679C	0.	-128.	-106.	-234.
New Jersey	5261C	625C	0	5886	68.	-13.	0.	55.
New York	3705C	67P	4780C	8552C	75.	7.	-148.	-66.
Pennsylvania	9369C	1680C	4244	15293	88.	-91.	-67.	-71.
Subdistrict IC	24954	27655	19691	72300	-535.	-31.	-30.	-596.
Florida	5865C	12510	1613C	19988	-120.	-74.	-82.	-275.
Georgia	10443	2122C	6223C	18788	-220.	-99.	107.	-211.
North Carolina	930P	845P	4633C	6408	47.	85.	-139.	-8.
South Carolina	0	9802	0	9802	0.	120.	0.	120.
Virginia	4216C	0	2486C	6702	-157.	0.	44.	-113.
West Virginia	3500C	2376C	4736C	10612	-86.	-63.	41.	-109.
PAD District II	81809	63212	73202	218223	-242.	-16.	-768.	-1026.
Illinois	7240C	5456C	2975C	15671	246.	109.	48.	404.
Indiana	1288P	5561C	1680P	8529C	67.	-11.	-89.	-33.
Iowa	596C	5008C	10282	15886	-1.	-28.	96.	67.
Kansas	2756C	5844	3130C	11730	36.	5.	-20.	21.
Kentucky	0	612P	9280C	9892	0.	64.	-205.	-141.
Michigan	4351C	1800P	8260C	14411	-2.	-101.	-160.	-263.
Minnesota	11902C	2428C	17184	31514	-179.	-36.	12.	-203.
Missouri	9693C	3750C	0	13443	-116.	-77.	0.	-193.
Nebraska	14640	3233C	8340C	26213	-100.	-44.	-197.	-341.
North Dakota	1276P	13743	1140C	16159	-66.	-220.	-40.	-326.
Ohio	10999	6112C	5141C	22252	-44.	160.	-212.	-96.
Oklahoma	3732C	4214	3550C	11496	-40.	13.	54.	27.
South Dakota	0	1153C	40P	1193C	0.	106.	2.	108.
Tennessee	0	1055C	510C	1565C	0.	-22.	-9.	-31.
Wisconsin	13336	3243C	1690C	18269	-42.	67.	-50.	-25.
PAD District III	32837	31206	23139	87182	-359.	-256.	-388.	-1003.
Alabama	15332	334C	5273C	20939	-97.	-24.	-63.	-184.
Arkansas	4368C	8042	2881C	15291	-81.	-18.	-71.	-170.
Louisiana	0	4994C	5895C	10889	0.	-166.	-59.	-226.
Mississippi	2571C	11737	1326P	15634	-47.	-147.	-68.	-262.
New Mexico	7810	6099C	3972C	17881	-199.	100.	-71.	-169.
Texas	2756C	0	3792C	6548	65.	0.	-57.	8.
PAD District IV	13773	10181	19060	43014	-164.	74.	-86.	-176.
Colorado	4240C	3951C	7876	16067	-88.	-124.	-177.	-389.
Idaho	5578C	3010C	0	8588C	-100.	178.	0.	77.
Montana	514P	1382P	6680C	8576	53.	-73.	58.	38.
Utah	1398C	0	2552C	3950	32.	0.	-16.	16.
Wyoming	2043C	1838P	1952C	5833C	-61.	93.	49.	82.
PAD District V	36855	25820	18036	80711	26.	-448.	215.	-207.
Alaska	2205C	4240C	8388	14833	47.	-85.	175.	137.
Arizona	1367	0	0	1367	48.	0.	0.	48.
California	4592C	107P	0	4699	-101.	12.	0.	-90.
Hawaii	11231C	6288C	3482C	21001	165.	-191.	-3.	-29.
Nevada	2483C	8397	5404C	16284	-74.	-83.	16.	-140.
Oregon	4725	6788	0	11513	-106.	-101.	0.	-207.
Washington	10252C	0	762C	11014	47.	0.	26.	73.

NETWORK Flow 4D Solid Regular Fuel Oxygenated Fuel

	DTW	Rack	Bulk	Total	<-------	NOISE	------->	
United States	65199	61476	46217	172892	121.	110.	-28.	204.
PAD District I	20261	21138	15495	56894	16.	-19.	286.	283.
Subdistrict IA	9808	7920C	7566C	25294	128.	-127.	181.	182.
Connecticut	3226C	1494C	0	4720C	-123.	-26.	0.	-149.
Maine	3936C	1478C	405C	5819C	150.	7.	-8.	148.
Massachusetts	172P	0	0	172P	-9.	0.	0.	-9.
New Hampshire	600C	0	3188C	3788C	13.	0.	81.	93.
Rhode Island	0	0	3749C	3749C	0.	0.	102.	102.
Vermont	1874P	4948C	224C	7046C	98.	-107.	6.	-4.
Subdistrict IB	4469	4140C	1742C	10351	-105.	67.	-59.	-97.
Delaware	1396C	0	332P	1728C	-35.	0.	-34.	-69.
District of Colu	2253C	0	940C	3193C	-53.	0.	24.	-29.
Maryland	0	0	470P	470P	0.	0.	-49.	-49.
New Jersey	820C	0	0	820C	-17.	0.	0.	-17.
New York	0	0	0	0	0.	0.	0.	0.
Pennsylvania	0	4140C	0	4140C	0.	67.	0.	67.
Subdistrict IC	5984	9078C	6187C	21249	-7.	41.	164.	198.
Florida	0	933C	0	933C	0.	-33.	0.	-33.
Georgia	2965C	0	0	2965C	61.	0.	0.	61.
North Carolina	0	6381C	3325C	9706	0.	121.	68.	189.
South Carolina	1195C	0	2862C	4057C	25.	0.	96.	122.
Virginia	1824P	0	0	1824P	-94.	0.	0.	-94.
West Virginia	0	1764C	0	1764C	0.	-47.	0.	-47.
PAD District II	25351	17899	11314	54564	132.	45.	83.	260.
Illinois	0	0	0	0	0.	0.	0.	0.
Indiana	2889C	0	2166C	5055	102.	0.	-22.	80.
Iowa	0	3056C	3780C	6836	0.	-24.	49.	25.
Kansas	2976C	2586C	0	5562	-78.	-93.	0.	-171.
Kentucky	5826C	2142C	0	7968	106.	75.	0.	180.
Michigan	948C	0	0	948C	34.	0.	0.	34.
Minnesota	155C	2484C	0	2639C	3.	85.	0.	89.
Missouri	3033C	2645C	382P	6060	-79.	57.	-40.	-62.
Nebraska	0	0	0	0	0.	0.	0.	0.
North Dakota	2264C	2946C	0	5210C	57.	-108.	0.	-51.
Ohio	1970C	0	1296C	3266C	40.	0.	33.	73.
Oklahoma	1720C	0	0	1720C	37.	0.	0.	37.
South Dakota	0	2040C	0	2040C	0.	54.	0.	54.
Tennessee	530P	0	3690C	4220C	-27.	0.	63.	37.
Wisconsin	3040C	0	0	3040C	-64.	0.	0.	-64.
PAD District III	5724	2328C	8592C	16644	39.	17.	-223.	-166.
Alabama	0	0	2856C	2856C	0.	0.	-51.	-51.
Arkansas	928C	0	3252C	4180C	-24.	0.	-47.	-71.
Louisiana	0	1513C	0	1513C	0.	34.	0.	34.
Mississippi	666C	0	1420P	2086C	-23.	0.	-74.	-97.
New Mexico	4130C	815C	1024P	5969C	86.	-17.	-53.	16.
Texas	0	0	40P	40P	0.	0.	2.	2.
PAD District IV	8628	9644C	890P	19162	-43.	-143.	49.	-136.
Colorado	0	4146C	0	4146C	0.	-73.	0.	-73.
Idaho	0	0	890P	890P	0.	0.	49.	49.
Montana	0	5498C	0	5498C	0.	-70.	0.	-70.
Utah	4278C	0	0	4278C	-131.	0.	0.	-131.
Wyoming	4350C	0	0	4350C	89.	0.	0.	89.
PAD District V	5235	10467C	9926C	25628	-23.	210.	-223.	-36.
Alaska	0	606P	3595C	4201	0.	67.	-72.	-6.
Arizona	1150C	0	1040C	2190	24.	0.	-26.	-3.
California	0	0	2251C	2251C	0.	0.	-61.	-61.
Hawaii	246C	0	0	246C	-4.	0.	0.	-4.
Nevada	2079C	3036C	0	5115C	-7.	81.	0.	75.
Oregon	0	6825	3040C	9865C	0.	62.	-64.	-2.
Washington	1760C	0	0	1760C	-36.	0.	0.	-36.

NETWORK Flow 4D Solid Mid-grade Fuel Oxygenated Fuel

	DTW	Rack	Bulk	Total	<-------	NOISE		------->
United States	66647	49891	57979	174517	111.	98.	191.	401.
PAD District I	22318	21420	12455	56193	237.	-206.	-30.	2.
Subdistrict IA	11352C	5761	4870C	21983	106.	-115.	-30.	-39.
Connecticut	0	4392C	0	4392C	0.	-115.	0.	-115.
Maine	5382C	0	2754C	8136	-56.	0.	75.	20.
Massachusetts	0	0	0	0	0.	0.	0.	0.
New Hampshire	1456C	1369C	2092C	4917C	38.	0.	-106.	-69.
Rhode Island	3804C	0	0	3804C	110.	0.	0.	110.
Vermont	710C	0	24	734C	15.	0.	1.	15.
Subdistrict IB	7651C	7891	3251C	18793	124.	23.	31.	179.
Delaware	0	0	2473C	2473C	0.	0.	-8.	-8.
District of Colu	2865C	2415C	0	5280C	60.	41.	0.	101.
Maryland	0	0	0	0	0.	0.	0.	0.
New Jersey	2917C	0	0	2917C	-3.	0.	0.	-3.
New York	1869C	1996P	0	3865C	67.	-104.	0.	-37.
Pennsylvania	0	3480C	778P	4258C	0.	87.	39.	127.
Subdistrict IC	3315C	7768	4334C	15417	7.	-114.	-30.	-138.
Florida	0	344P	0	344P	0.	-37.	0.	-37.
Georgia	0	0	0	0	0.	0.	0.	0.
North Carolina	714P	272P	0	986C	38.	-14.	0.	24.
South Carolina	345C	5428C	0	5773C	-12.	-15.	0.	-27.
Virginia	2045C	1724C	1022P	4791C	-41.	-48.	53.	-36.
West Virginia	211P	0	3312C	3523C	21.	0.	-84.	-63.
PAD District II	25828	14860	26223	66911	-64.	335.	24.	296.
Illinois	0	748P	0	748P	0.	75.	0.	75.
Indiana	0	7304C	1905C	9209	0.	114.	-49.	64.
Iowa	2113C	0	2110C	4223C	-88.	0.	43.	-45.
Kansas	0	2835C	0	2835C	0.	57.	0.	57.
Kentucky	3364C	0	2687	6051C	-84.	0.	79.	-6.
Michigan	5590C	1080P	0	6670C	18.	55.	0.	73.
Minnesota	1308C	0	4650C	5958	-22.	0.	-94.	-116.
Missouri	0	300C	3330C	3630C	0.	8.	-41.	-33.
Nebraska	4285C	850C	1278C	6413	91.	-17.	32.	106.
North Dakota	0	295C	3832C	4127	0.	6.	98.	104.
Ohio	3780	0	2612C	6392C	98.	0.	42.	140.
Oklahoma	1480C	0	3276C	4756C	30.	0.	-85.	-55.
South Dakota	0	0	0	0	0.	0.	0.	0.
Tennessee	0	1448C	543C	1991C	0.	38.	0.	38.
Wisconsin	3908	0	0	3908	-107.	0.	0.	-107.
PAD District III	3641C	6126C	8557	18324	-111.	59.	-24.	-76.
Alabama	0	0	4700C	4700C	0.	0.	-96.	-96.
Arkansas	0	0	0	0	0.	0.	0.	0.
Louisiana	0	2490C	2853C	5343C	0.	51.	97.	148.
Mississippi	1100C	0	1004C	2104C	-23.	0.	-25.	-48.
New Mexico	2541C	3636C	0	6177C	-89.	8.	0.	-81.
Texas	0	0	0	0	0.	0.	0.	0.
PAD District IV	6292C	3427C	9118	18837	61.	-3.	98.	155.
Colorado	0	2535C	0	2535C	0.	-52.	0.	-52.
Idaho	1698C	892P	5834C	8424C	59.	48.	77.	185.
Montana	362C	0	1882P	2244C	9.	0.	95.	104.
Utah	4232C	0	1402P	5634C	-7.	0.	-75.	-82.
Wyoming	0	0	0	0	0.	0.	0.	0.
PAD District V	8568C	4058C	1626	14252	-11.	-87.	123.	24.
Alaska	4734C	0	0	4734C	-80.	0.	0.	-80.
Arizona	348P	0	363C	711C	18.	0.	13.	31.
California	1244P	1068P	436P	2748C	-66.	-57.	22.	-100.
Hawaii	1660P	0	0	1660P	87.	0.	0.	87.
Nevada	582P	0	423P	1005C	31.	0.	45.	75.
Oregon	0	2990C	0	2990C	0.	-31.	0.	-31.
Washington	0	0	404P	404P	0.	0.	43.	43.

NETWORK Flow 4D Solid Premium Fuel Oxygenated Fuel

	DTW	Rack	Bulk	Total	<-------	NOISE	------->	
United States	54063	46039	71856	171958	134.	83.	-225.	-8.
PAD District I	20134	17243	23616	60993	-102.	-21.	-95.	-218.
Subdistrict IA	15019C	7001C	8676	30696	-92.	-85.	-147.	-324.
Connecticut	2304C	0	1644C	3948C	-79.	0.	-29.	-108.
Maine	3454C	0	0	3454C	-120.	0.	0.	-120.
Massachusetts	0	1572P	3048C	4620C	0.	-81.	-78.	-159.
New Hampshire	4392C	3075C	2128C	9595	105.	-65.	56.	95.
Rhode Island	2805C	2354C	0	5159C	57.	61.	0.	118.
Vermont	2064C	0	1856P	3920C	-55.	0.	-95.	-150.
Subdistrict IB	4000C	744C	7546C	12290	-52.	-19.	-41.	-112.
Delaware	4000C	0	2508C	6508	-52.	0.	65.	12.
District of Colu	0	310C	0	310C	0.	6.	0.	6.
Maryland	0	0	462P	462P	0.	0.	-23.	-23.
New Jersey	0	0	3832C	3832C	0.	0.	-57.	-57.
New York	0	128P	744C	872C	0.	7.	-25.	-19.
Pennsylvania	0	306P	0	306P	0.	-32.	0.	-32.
Subdistrict IC	1115C	9498C	7394C	18007	42.	83.	93.	218.
Florida	855C	2192C	959C	4006	29.	57.	-31.	54.
Georgia	0	1472C	852C	2324C	0.	-41.	-22.	-63.
North Carolina	260P	0	0	260P	13.	0.	0.	13.
South Carolina	0	3288C	0	3288C	0.	83.	0.	83.
Virginia	0	2000C	0	2000C	0.	42.	0.	42.
West Virginia	0	546P	5583C	6129	0.	-57.	146.	89.
PAD District II	19724	8878	26366	54968	316.	-47.	-108.	161.
Illinois	1257C	0	8994	10251C	21.	0.	-1.	20.
Indiana	0	0	0	0	0.	0.	0.	0.
Iowa	0	1403C	0	1403C	0.	-79.	0.	-79.
Kansas	0	0	808P	808P	0.	0.	87.	87.
Kentucky	0	0	1134C	1134C	0.	0.	-19.	-19.
Michigan	0	105C	0	105C	0.	2.	0.	2.
Minnesota	2832C	297P	0	3129C	74.	-30.	0.	44.
Missouri	1845C	20	0	1865C	50.	1.	0.	50.
Nebraska	1950P	2124C	5140C	9214C	98.	-74.	-26.	-2.
North Dakota	0	615C	0	615C	0.	-13.	0.	-13.
Ohio	4182C	1821C	4278	10281	72.	62.	-100.	34.
Oklahoma	7658C	2493C	0	10151	1.	84.	0.	85.
South Dakota	0	0	4950C	4950C	0.	0.	-103.	-103.
Tennessee	0	0	0	0	0.	0.	0.	0.
Wisconsin	0	0	1062P	1062P	0.	0.	54.	54.
PAD District III	1217C	5814C	7653C	14684	-22.	49.	176.	203.
Alabama	0	0	0	0	0.	0.	0.	0.
Arkansas	0	2520C	2445C	4965C	0.	89.	81.	171.
Louisiana	0	2202C	1150P	3352C	0.	-78.	59.	-19.
Mississippi	467P	0	0	467P	-47.	0.	0.	-47.
New Mexico	750C	0	4058C	4808C	25.	0.	36.	61.
Texas	0	1092C	0	1092C	0.	37.	0.	37.
PAD District IV	5830C	1990C	7081C	14901	-34.	-7.	-43.	-84.
Colorado	0	451P	0	451P	0.	46.	0.	46.
Idaho	0	0	0	0	0.	0.	0.	0.
Montana	0	0	5016C	5016C	0.	0.	-86.	-86.
Utah	3720C	1539C	2065C	7324	-78.	-53.	43.	-89.
Wyoming	2110C	0	0	2110C	44.	0.	0.	44.
PAD District V	7158C	12114	7140C	26412	-24.	110.	-155.	-69.
Alaska	0	2238C	0	2238C	0.	78.	0.	78.
Arizona	855C	0	30C	885C	29.	0.	1.	29.
California	2592C	795P	2412C	5799	-66.	83.	-123.	-107.
Hawaii	708P	0	2544C	3252	36.	0.	-70.	-33.
Nevada	330P	1671C	0	2001C	-17.	58.	0.	41.
Oregon	1742P	7410C	0	9152	90.	-110.	0.	-21.
Washington	931P	0	2154C	3085	-95.	0.	37.	-58.

NETWORK Flow 4D Solid   All Fuel Grades   Oxygenated Fuel

	DTW	Rack	Bulk	Total	<-------	NOISE	------->	
United States	185909	157406	176052	519367	366.	291.	-61.	597.
PAD District I	62713	59801	51566	174080	151.	-246.	161.	67.
Subdistrict IA	36179	20682	21112	77973	143.	-327.	3.	-181.
Connecticut	5530C	5886C	1644C	13060	-202.	-141.	-29.	-372.
Maine	12772	1478C	3159C	17409	-25.	7.	67.	48.
Massachusetts	172P	1572P	3048C	4792C	-9.	-81.	-78.	-168.
New Hampshire	6448	4444	7408	18300	155.	-65.	30.	120.
Rhode Island	6609C	2354C	3749C	12712C	167.	61.	102.	331.
Vermont	4648C	4948C	2104C	11700	58.	-107.	-89.	-139.
Subdistrict IB	16120	12775	12539	41434	-33.	72.	-69.	-31.
Delaware	5396C	0	5313C	10709	-87.	0.	22.	-65.
District of Colu	5118C	2725C	940C	8783	7.	47.	24.	78.
Maryland	0	0	932C	932C	0.	0.	-72.	-72.
New Jersey	3737C	0	3832C	7569	-20.	0.	-57.	-77.
New York	1869C	2124C	744C	4737C	67.	-98.	-25.	-56.
Pennsylvania	0	7926C	778P	8704	0.	123.	39.	162.
Subdistrict IC	10414	26344	17915	54673	42.	9.	227.	278.
Florida	855C	3469C	959C	5283	29.	-13.	-31.	-16.
Georgia	2965C	1472C	852C	5289	61.	-41.	-22.	-2.
North Carolina	974	6653C	3325C	10952	52.	107.	68.	226.
South Carolina	1540C	8716C	2862C	13118	14.	68.	96.	177.
Virginia	3869	3724C	1022P	8615	-135.	-6.	53.	-88.
West Virginia	211P	2310C	8895	11416	21.	-104.	63.	-20.
PAD District II	70903	41637	63903	176443	383.	333.	0.	716.
Illinois	1257C	748P	8994	10999	21.	75.	-1.	95.
Indiana	2889C	7304C	4071C	14264	102.	114.	-72.	144.
Iowa	2113C	4459C	5890	12462	-88.	-103.	92.	-99.
Kansas	2976C	5421C	808P	9205	-78.	-36.	87.	-27.
Kentucky	9190	2142C	3821C	15153	21.	75.	59.	155.
Michigan	6538C	1185C	0	7723C	52.	57.	0.	109.
Minnesota	4295C	2781C	4650C	11726	55.	55.	-94.	17.
Missouri	4878	2965C	3712C	11555	-29.	65.	-81.	-45.
Nebraska	6235C	2974C	6418	15627	190.	-91.	6.	104.
North Dakota	2264C	3856C	3832C	9952	57.	-114.	98.	41.
Ohio	9932	1821C	8186C	19939	210.	62.	-25.	247.
Oklahoma	10858	2493C	3276C	16627	68.	84.	-85.	66.
South Dakota	0	2040C	4950C	6990C	0.	54.	-103.	-49.
Tennessee	530P	1448C	4233C	6211C	-27.	38.	63.	74.
Wisconsin	6948C	0	1062P	8010	-171.	0.	54.	-117.
PAD District III	10582	14268	24802	49652	-94.	125.	-70.	-39.
Alabama	0	0	7556C	7556C	0.	0.	-147.	-147.
Arkansas	928C	2520C	5697	9145	-24.	89.	34.	100.
Louisiana	0	6205C	4003C	10208	0.	7.	156.	163.
Mississippi	2233C	0	2424C	4657C	-92.	0.	-99.	-191.
New Mexico	7421C	4451C	5082C	16954	22.	-9.	-17.	-4.
Texas	0	1092C	40P	1132C	0.	37.	2.	39.
PAD District IV	20750	15061	17089	52900	-16.	-153.	104.	-65.
Colorado	0	7132	0	7132	0.	-78.	0.	-78.
Idaho	1698C	892P	6724C	9314C	59.	48.	127.	234.
Montana	362C	5498C	6898	12758	9.	-70.	10.	-52.
Utah	12230C	1539C	3467C	17236	-216.	-53.	-32.	-302.
Wyoming	6460C	0	0	6460C	133.	0.	0.	133.
PAD District V	20961	26639	18692	66292	-58.	232.	-256.	-81.
Alaska	4734C	2844	3595C	11173	-80.	145.	-72.	-7.
Arizona	2353C	0	1433C	3786	71.	0.	-13.	58.
California	3836C	1863C	5099C	10798	-132.	26.	-162.	-268.
Hawaii	2614C	0	2544C	5158	119.	0.	-70.	49.
Nevada	2991C	4707C	423P	8121	7.	140.	45.	191.
Oregon	1742P	17225	3040C	22007	90.	-79.	-64.	-53.
Washington	2691	0	2558	5249	-131.	0.	80.	-51.

NETWORK Flow 4D Solid   Regular Fuel   Reformulated Fuel

	DTW	Rack	Bulk	Total	<------- NOISE ------->			
United States	55451	78002	75152	208605	90.	604.	590.	1283.
PAD District I	23326	20395	29683	73404	106.	405.	92.	602.
Subdistrict IA	4657C	4540C	4311C	13508	-121.	126.	43.	49.
Connecticut	0	0	0	0	0.	0.	0.	0.
Maine	0	1936C	4024C	5960	0.	-49.	72.	23.
Massachusetts	0	0	0	0	0.	0.	0.	0.
New Hampshire	1210C	0	0	1210C	12.	0.	0.	12.
Rhode Island	0	593P	0	593P	0.	64.	0.	64.
Vermont	3447C	2011C	287P	5745C	-132.	111.	-29.	-50.
Subdistrict IB	11495C	8117C	12504C	32116	52.	158.	205.	415.
Delaware	4784C	1364P	3940C	10088	85.	72.	81.	238.
District of Colu	0	5070C	7070C	12140	0.	85.	147.	232.
Maryland	3311C	0	0	3311C	-120.	0.	0.	-120.
New Jersey	3400C	0	144C	3544	87.	0.	5.	91.
New York	0	648C	0	648C	0.	22.	0.	22.
Pennsylvania	0	1035C	1350C	2385C	0.	-21.	-28.	-49.
Subdistrict IC	7174C	7738C	12868	27780	175.	121.	-157.	139.
Florida	0	3288C	1847C	5135C	0.	85.	-15.	70.
Georgia	5166C	0	0	5166C	93.	0.	0.	93.
North Carolina	1338C	0	1812C	3150C	47.	0.	-47.	0.
South Carolina	0	2463C	4720C	7183	0.	-78.	69.	-9.
Virginia	0	0	3485C	3485C	0.	0.	-115.	-115.
West Virginia	670P	1987C	1004P	3661C	35.	114.	-50.	99.
PAD District II	22018	27980	21377	71375	-11.	-44.	136.	80.
Illinois	0	0	0	0	0.	0.	0.	0.
Indiana	436C	0	0	436C	-12.	0.	0.	-12.
Iowa	965C	552P	0	1517C	41.	-55.	0.	-15.
Kansas	9020C	3644C	248P	12912	16.	-145.	-13.	-142.
Kentucky	0	645C	2359C	3004C	0.	-14.	-1.	-14.
Michigan	1074C	0	2238C	3312C	39.	0.	-77.	-38.
Minnesota	5030C	0	0	5030C	-106.	0.	0.	-106.
Missouri	974C	3990C	3552C	8516C	-51.	67.	53.	68.
Nebraska	0	7667C	0	7667C	0.	148.	0.	148.
North Dakota	1131C	0	0	1131C	40.	0.	0.	40.
Ohio	0	0	0	0	0.	0.	0.	0.
Oklahoma	870C	1864C	789C	3523C	-15.	-52.	27.	-39.
South Dakota	24	8973C	5526C	14523C	1.	21.	94.	116.
Tennessee	1712C	645C	4635C	6992C	-43.	-14.	94.	36.
Wisconsin	782P	0	2030C	2812C	80.	0.	-42.	38.
PAD District III	4950C	6421C	14434	25805	107.	-105.	332.	334.
Alabama	0	0	0	0	0.	0.	0.	0.
Arkansas	670P	1936C	3106C	5712	35.	49.	127.	212.
Louisiana	0	0	3262C	3262C	0.	0.	80.	80.
Mississippi	0	3587C	1560P	5147C	0.	-109.	-81.	-190.
New Mexico	4280C	0	5672C	9952	72.	0.	164.	236.
Texas	0	898P	834P	1732C	0.	-46.	43.	-3.
PAD District IV	1263C	9582C	5637C	16482	-44.	13.	129.	99.
Colorado	0	1680C	5637C	7317	0.	59.	129.	189.
Idaho	0	0	0	0	0.	0.	0.	0.
Montana	0	1860C	0	1860C	0.	47.	0.	47.
Utah	0	382P	0	382P	0.	-39.	0.	-39.
Wyoming	1263C	5660C	0	6923	-44.	-54.	0.	-98.
PAD District V	3894C	13624C	4021C	21539	-68.	335.	-100.	167.
Alaska	0	3102C	705C	3807C	0.	54.	-14.	40.
Arizona	204P	828C	1149C	2181	10.	29.	-41.	-2.
California	3690C	3728C	0	7418C	-78.	97.	0.	18.
Hawaii	0	0	327C	327C	0.	0.	11.	11.
Nevada	0	0	0	0	0.	0.	0.	0.
Oregon	0	5966C	0	5966C	0.	155.	0.	155.
Washington	0	0	1840C	1840C	0.	0.	-56.	-56.

NETWORK Flow 4D Solid Mid-grade Fuel Reformulated Fuel

	DTW	Rack	Bulk	Total	<-------	NOISE	------->	
United States	59557	55911	74892	190360	-239.	-153.	933.	541.
PAD District I	20358	13162	21617	55137	143.	235.	353.	731.
Subdistrict IA	6122C	3815C	8074C	18011	8.	115.	160.	284.
Connecticut	3290C	0	0	3290C	-67.	0.	0.	-67.
Maine	2832C	410P	4260C	7502C	75.	45.	78.	199.
Massachusetts	0	3405C	0	3405C	0.	70.	0.	70.
New Hampshire	0	0	3795C	3795C	0.	0.	80.	80.
Rhode Island	0	0	0	0	0.	0.	0.	0.
Vermont	0	0	19P	19P	0.	0.	2.	2.
Subdistrict IB	9540C	2718C	7410C	19668	172.	-87.	151.	237.
Delaware	0	0	0	0	0.	0.	0.	0.
District of Colu	4595C	2343C	0	6938C	65.	-79.	0.	-15.
Maryland	0	0	3592C	3592C	0.	0.	90.	90.
New Jersey	0	375C	440C	815C	0.	-8.	-9.	-17.
New York	880C	0	705C	1585C	22.	0.	-24.	-1.
Pennsylvania	4065C	0	2673C	6738	85.	0.	94.	179.
Subdistrict IC	4696C	6629C	6133	17458	-38.	207.	41.	210.
Florida	0	0	0	0	0.	0.	0.	0.
Georgia	0	0	1168P	1168P	0.	0.	-62.	-62.
North Carolina	0	0	0	0	0.	0.	0.	0.
South Carolina	0	6629C	0	6629C	0.	207.	0.	207.
Virginia	2808C	0	4965C	7773	59.	0.	103.	162.
West Virginia	1888P	0	0	1888P	-97.	0.	0.	-97.
PAD District II	15863	26297	17858	60018	2.	-201.	328.	128.
Illinois	0	7970C	3750C	11720C	0.	1.	81.	82.
Indiana	839P	1195C	0	2034C	-88.	-26.	0.	-114.
Iowa	1206C	4279C	861P	6346C	-41.	-194.	89.	-146.
Kansas	1390P	3215C	0	4605C	-70.	66.	0.	-3.
Kentucky	0	0	1158C	1158C	0.	0.	20.	20.
Michigan	0	0	0	0	0.	0.	0.	0.
Minnesota	0	2615C	4386C	7001	0.	54.	71.	125.
Missouri	0	1469C	0	1469C	0.	-25.	0.	-25.
Nebraska	3326C	676C	122C	4124	22.	-36.	4.	-9.
North Dakota	5772C	4878C	3182C	13832C	101.	-42.	-82.	-23.
Ohio	1176C	0	0	1176C	41.	0.	0.	41.
Oklahoma	0	0	0	0	0.	0.	0.	0.
South Dakota	0	0	4187C	4187C	0.	0.	149.	149.
Tennessee	0	0	0	0	0.	0.	0.	0.
Wisconsin	2154C	0	212C	2366C	36.	0.	-5.	31.
PAD District III	11902C	0	12255C	24157	-176.	0.	-15.	-191.
Alabama	0	0	458P	458P	0.	0.	47.	47.
Arkansas	0	0	978C	978C	0.	0.	-33.	-33.
Louisiana	5772C	0	2454C	8226	-111.	0.	-87.	-198.
Mississippi	1590C	0	0	1590C	28.	0.	0.	28.
New Mexico	0	0	6061C	6061C	0.	0.	-24.	-24.
Texas	4540C	0	2304C	6844C	-93.	0.	83.	-10.
PAD District IV	11199C	8296C	12030C	31525	-213.	-251.	-12.	-475.
Colorado	5217C	1905C	3276C	10398	-105.	-66.	-83.	-254.
Idaho	0	6391C	3012C	9403C	0.	-185.	115.	-70.
Montana	5982	0	3492	9474	-108.	0.	-89.	-197.
Utah	0	0	2250C	2250C	0.	0.	45.	45.
Wyoming	0	0	0	0	0.	0.	0.	0.
PAD District V	235C	8156C	11132C	19523	5.	64.	280.	348.
Alaska	0	0	735P	735P	0.	0.	77.	77.
Arizona	235C	0	0	235C	5.	0.	0.	5.
California	0	2015C	6143C	8158	0.	-43.	143.	99.
Hawaii	0	0	2664C	2664C	0.	0.	92.	92.
Nevada	0	0	1590C	1590C	0.	0.	-33.	-33.
Oregon	0	2874C	0	2874C	0.	51.	0.	51.
Washington	0	3267C	0	3267C	0.	56.	0.	56.

NETWORK Flow 4D Solid Premium Fuel Reformulated Fuel

	DTW	Rack	Bulk	Total	<-------	NOISE	------->	
United States	57500	63876	58104	179480	113.	-55.	-201.	-143.
PAD District I	28936	23822	10397	63155	-32.	284.	-118.	135.
Subdistrict IA	11424	3520	9376	24320	-145.	152.	-108.	-101.
Connecticut	2657C	1284C	3080C	7021C	-70.	33.	37.	-1.
Maine	3420C	0	4584C	8004C	72.	0.	-156.	-85.
Massachusetts	1839C	0	1068P	2907C	-62.	0.	-54.	-116.
New Hampshire	3508C	2236C	0	5744	-84.	119.	0.	35.
Rhode Island	0	0	0	0	0.	0.	0.	0.
Vermont	0	0	644P	644P	0.	0.	66.	66.
Subdistrict IB	13270	9614	0	22884	-25.	15.	0.	-10.
Delaware	2632C	0	0	2632C	-23.	0.	0.	-23.
District of Colu	968C	1230C	0	2198C	25.	25.	0.	50.
Maryland	0	852P	0	852P	0.	43.	0.	43.
New Jersey	6458C	0	0	6458C	56.	0.	0.	56.
New York	3212C	6200C	0	9412C	-83.	-121.	0.	-204.
Pennsylvania	0	1332P	0	1332P	0.	68.	0.	68.
Subdistrict IC	4242	10688	1021	15951	138.	117.	-9.	246.
Florida	0	2283C	0	2283C	0.	64.	0.	64.
Georgia	0	883P	1021	1904C	0.	89.	-9.	80.
North Carolina	866P	0	0	866P	47.	0.	0.	47.
South Carolina	0	3464C	0	3464C	0.	-87.	0.	-87.
Virginia	0	2088C	0	2088C	0.	-54.	0.	-54.
West Virginia	3376C	1970P	0	5346C	91.	105.	0.	197.
PAD District II	9326	16635	20726	46687	207.	-62.	172.	317.
Illinois	0	1200P	0	1200P	0.	-62.	0.	-62.
Indiana	1950P	0	0	1950P	102.	0.	0.	102.
Iowa	0	500C	3700C	4200C	0.	13.	77.	90.
Kansas	637P	0	0	637P	-68.	0.	0.	-68.
Kentucky	0	2984C	2502C	5486	0.	78.	-86.	-8.
Michigan	0	0	0	0	0.	0.	0.	0.
Minnesota	0	4847C	0	4847C	0.	13.	0.	13.
Missouri	0	0	0	0	0.	0.	0.	0.
Nebraska	1224C	0	2730C	3954C	-45.	0.	-95.	-140.
North Dakota	0	0	0	0	0.	0.	0.	0.
Ohio	2511C	2550C	1905C	6966C	87.	-52.	-71.	-36.
Oklahoma	1368C	0	2664C	4032C	46.	0.	94.	140.
South Dakota	0	504C	1958P	2462C	0.	-17.	105.	88.
Tennessee	0	1180C	3956C	5136C	0.	24.	103.	127.
Wisconsin	1636P	2870C	1311C	5817	85.	-59.	46.	71.
PAD District III	9490C	12054C	4808C	26352	-81.	-261.	13.	-329.
Alabama	0	4674C	411C	5085C	0.	-83.	15.	-69.
Arkansas	32C	2945C	0	2977C	1.	-61.	0.	-60.
Louisiana	1730C	807C	0	2537C	-38.	-28.	0.	-66.
Mississippi	543C	792C	0	1335C	-19.	-13.	0.	-33.
New Mexico	2592C	2836C	4397C	9825C	-45.	-75.	-2.	-122.
Texas	4593C	0	0	4593C	21.	0.	0.	21.
PAD District IV	4315C	3260C	14777	22352	-73.	-90.	-51.	-214.
Colorado	2751C	0	6660C	9411	-41.	0.	49.	7.
Idaho	0	3260C	0	3260C	0.	-90.	0.	-90.
Montana	0	0	4825C	4825C	0.	0.	-75.	-75.
Utah	0	0	2523C	2523C	0.	0.	-88.	-88.
Wyoming	1564C	0	769C	2333	-31.	0.	63.	31.
PAD District V	5433C	8105C	7396C	20934	91.	73.	-217.	-53.
Alaska	19P	4760C	0	4779C	-2.	-9.	0.	-11.
Arizona	265C	0	0	265C	6.	0.	0.	6.
California	447C	0	0	447C	17.	0.	0.	17.
Hawaii	52P	2046C	0	2098	3.	36.	0.	39.
Nevada	0	1212C	910P	2122C	0.	49.	-47.	2.
Oregon	1156P	0	5168C	6324C	60.	0.	-93.	-33.
Washington	3494C	87C	1318C	4899	9.	-3.	-77.	-72.

NETWORK Flow 4D Solid   All Fuel Grades   Reformulated Fuel

	DTW	Rack	Bulk	Total	<-------	NOISE	------->	
United States	172508	197789	208148	578445	-37.	395.	1322.	1681.
PAD District I	72620	57379	61697	191696	217.	924.	327.	1468.
Subdistrict IA	22203	11875	21761	55839	-257.	394.	95.	232.
Connecticut	5947	1284C	3080C	10311	-137.	33.	37.	-68.
Maine	6252C	2346C	12868C	21466	147.	-4.	-6.	137.
Massachusetts	1839C	3405C	1068P	6312C	-62.	70.	-54.	-46.
New Hampshire	4718C	2236C	3795C	10749	-73.	119.	80.	126.
Rhode Island	0	593P	0	593P	0.	64.	0.	64.
Vermont	3447C	2011C	950P	6408	-132.	111.	39.	17.
Subdistrict IB	34305	20449	19914	74668	200.	85.	356.	641.
Delaware	7416	1364P	3940C	12720	62.	72.	81.	215.
District of Colu	5563C	8643C	7070C	21276	90.	30.	147.	267.
Maryland	3311C	852P	3592C	7755	-120.	43.	90.	13.
New Jersey	9858	375C	584C	10817	143.	-8.	-4.	131.
New York	4092C	6848	705C	11645	-60.	-99.	-24.	-183.
Pennsylvania	4065C	2367	4023C	10455	85.	47.	66.	198.
Subdistrict IC	16112	25055	20022	61189	275.	445.	-125.	595.
Florida	0	5571C	1847C	7418	0.	149.	-15.	134.
Georgia	5166C	883P	2189C	8238	93.	89.	-71.	111.
North Carolina	2204C	0	1812C	4016	93.	0.	-47.	47.
South Carolina	0	12556C	4720C	17276	0.	41.	69.	111.
Virginia	2808C	2088C	8450	13346	59.	-54.	-12.	-7.
West Virginia	5934	3957C	1004P	10895	29.	220.	-50.	199.
PAD District II	47207	70912	59961	178080	197.	-307.	636.	526.
Illinois	0	9170C	3750C	12920	0.	-61.	81.	20.
Indiana	3225C	1195C	0	4420C	2.	-26.	0.	-24.
Iowa	2171	5331	4561	12063	0.	-237.	165.	-71.
Kansas	11047	6859C	248P	18154	-121.	-79.	-13.	-213.
Kentucky	0	3629	6019	9648	0.	64.	-66.	-2.
Michigan	1074C	0	2238C	3312C	39.	0.	-77.	-38.
Minnesota	5030C	7462	4386C	16878	-106.	67.	71.	32.
Missouri	974C	5459	3552C	9985	-51.	42.	53.	44.
Nebraska	4550C	8343	2852C	15745	-23.	112.	-91.	-2.
North Dakota	6903	4878C	3182C	14963	141.	-42.	-82.	17.
Ohio	3687	2550C	1905C	8142	128.	-52.	-71.	6.
Oklahoma	2238C	1864C	3453	7555	31.	-52.	121.	101.
South Dakota	24	9477C	11671C	21172	1.	4.	349.	354.
Tennessee	1712C	1825C	8591	12128C	-43.	11.	197.	164.
Wisconsin	4572C	2870C	3553	10995	201.	-59.	-1.	140.
PAD District III	26342	18475	31497	76314	-150.	-365.	330.	-186.
Alabama	0	4674C	869C	5543C	0.	-83.	62.	-22.
Arkansas	702P	4881C	4084C	9667	36.	-11.	94.	118.
Louisiana	7502	807C	5716C	14025	-149.	-28.	-7.	-184.
Mississippi	2133C	4379	1560P	8072C	8.	-122.	-81.	-195.
New Mexico	6872C	2836C	16130	25838	27.	-75.	138.	89.
Texas	9133C	898P	3138C	13169C	-72.	-46.	125.	8.
PAD District IV	16777	21138	32444	70359	-329.	-328.	67.	-591.
Colorado	7968C	3585C	15573	27126	-146.	-7.	95.	-58.
Idaho	0	9651C	3012C	12663	0.	-275.	115.	-160.
Montana	5982	1860C	8317C	16159	-108.	47.	-163.	-224.
Utah	0	382P	4773C	5155	0.	-39.	-43.	-82.
Wyoming	2827C	5660C	769C	9256	-75.	-54.	63.	-67.
PAD District V	9562	29885	22549	61996	28.	472.	-37.	463.
Alaska	19P	7862C	1440C	9321	-2.	45.	63.	107.
Arizona	704C	828C	1149C	2681	21.	29.	-41.	8.
California	4137C	5743	6143C	16023	-62.	53.	143.	134.
Hawaii	52P	2046C	2991C	5089	3.	36.	104.	143.
Nevada	0	1212C	2500C	3712	0.	49.	-80.	-31.
Oregon	1156P	8840	5168C	15164	60.	206.	-93.	174.
Washington	3494C	3354C	3158	10006	9.	53.	-133.	-72.

NETWORK Flow 4D Solid   Regular Fuel   All Fuel Formulations

	DTW	Rack	Bulk	Total	<-------	NOISE	------->	
United States	188668	218471	170021	577160	-16.	357.	81.	422.
PAD District I	64625	72994	65620	203239	-144.	219.	-53.	22.
Subdistrict IA	25314	28780	16952	71046	-267.	-115.	83.	-300.
Connecticut	6258C	1494C	1700C	9452	-161.	-26.	-35.	-222.
Maine	3936C	4719C	4429	13084	150.	-69.	64.	145.
Massachusetts	172P	3840C	0	4012	-9.	-65.	0.	-74.
New Hampshire	7879C	0	3188C	11067	-159.	0.	81.	-78.
Rhode Island	1748C	6224	3976C	11948	-53.	143.	79.	168.
Vermont	5321	12503C	3659C	21483	-34.	-98.	-106.	-238.
Subdistrict IB	19417	16493	22335	58245	123.	51.	-137.	38.
Delaware	6978C	2400C	4272	13650	133.	19.	47.	200.
District of Colu	2253C	5070C	11338C	18661	-53.	85.	86.	118.
Maryland	3311C	1836C	1079P	6226	-120.	-46.	-110.	-275.
New Jersey	6875C	0	144C	7019	163.	0.	5.	168.
New York	0	648C	784P	1432	0.	22.	-41.	-19.
Pennsylvania	0	6539	4718	11257	0.	-30.	-124.	-154.
Subdistrict IC	19894	27721	26333	73948	0.	283.	1.	284.
Florida	0	10857C	1847C	12704	0.	15.	-15.	1.
Georgia	9961C	0	0	9961C	93.	0.	0.	93.
North Carolina	2268	7226C	8464C	17958	94.	205.	-49.	250.
South Carolina	1195C	5887C	7582	14664	25.	-5.	165.	186.
Virginia	3560C	0	3625	7185C	-187.	0.	-112.	-298.
West Virginia	2910C	3751C	4815	11476	-26.	68.	10.	52.
PAD District II	76174	62147	54796	193117	12.	186.	22.	220.
Illinois	4128	0	0	4128	154.	0.	0.	154.
Indiana	4613	0	3846C	8459C	158.	0.	-112.	46.
Iowa	1149C	4196C	4216C	9561	50.	-49.	60.	62.
Kansas	11996	10330	1948	24274	-62.	-156.	21.	-197.
Kentucky	5826C	2787C	6523C	15136	106.	61.	-73.	94.
Michigan	2022C	0	6668C	8690C	73.	0.	-158.	-85.
Minnesota	6400	3694C	1332C	11426	-145.	110.	37.	2.
Missouri	5915	10385C	3934C	20234	-195.	46.	13.	-136.
Nebraska	2652C	7667C	942C	11261	-80.	148.	32.	100.
North Dakota	4671C	8286C	0	12957	30.	-18.	0.	12.
Ohio	7197	0	3477C	10674	-101.	0.	-40.	-141.
Oklahoma	4030C	1864C	4339	10233	46.	-52.	82.	76.
South Dakota	24	11013C	5526C	16563	1.	75.	94.	170.
Tennessee	2242C	645C	8325	11212	-70.	-14.	157.	73.
Wisconsin	13309	1280C	3720C	18309	47.	35.	-91.	-9.
PAD District III	15248	23726	26417	65391	30.	-233.	181.	-22.
Alabama	3504C	259P	2856C	6619	-94.	-26.	-51.	-171.
Arkansas	1598C	5628C	6358	13584C	11.	-43.	80.	48.
Louisiana	0	3088C	4667C	7755	0.	-21.	115.	94.
Mississippi	666C	8925	2980C	12571	-23.	-218.	-155.	-396.
New Mexico	8410	4928	6696	20034	158.	121.	111.	389.
Texas	1070C	898P	2860	4828C	-22.	-46.	81.	14.
PAD District IV	13561	23112	8479	45152	-106.	-133.	228.	-11.
Colorado	0	8772C	5637C	14409	0.	-116.	129.	13.
Idaho	925C	940P	890P	2755C	-19.	100.	49.	131.
Montana	514P	7358C	0	7872	53.	-23.	0.	30.
Utah	5676C	382P	0	6058	-99.	-39.	0.	-138.
Wyoming	6446C	5660C	1952C	14058C	-41.	-54.	49.	-46.
PAD District V	19060	36492	14709	70261	192.	318.	-297.	213.
Alaska	0	7948C	4300C	12248	0.	36.	-87.	-51.
Arizona	2721	828C	2189C	5738	82.	29.	-67.	44.
California	3792	3728C	2251C	9771	-84.	97.	-61.	-48.
Hawaii	1038C	6141C	327C	7506	76.	-196.	11.	-108.
Nevada	2555C	3522C	0	6077	-19.	56.	0.	37.
Oregon	0	14325C	3040C	17365	0.	297.	-64.	233.
Washington	8954C	0	2602C	11556	136.	0.	-30.	106.

NETWORK Flow 4D Solid   Mid-grade Fuel   All Fuel Formulations

	DTW	Rack	Bulk	Total	<-------	NOISE	------->	
United States	234099	170421	209941	614461	-1011.	-129.	638.	-502.
PAD District I	69006	60078	45675	174759	256.	-263.	274.	267.
Subdistrict IA	23026	19648	17765	60439	32.	0.	62.	94.
Connecticut	3672C	10737	1551C	15960	-106.	-166.	-11.	-283.
Maine	9886	2113C	7014C	19013	-23.	111.	153.	241.
Massachusetts	1698P	3405C	0	5103	92.	70.	0.	163.
New Hampshire	1456C	1743C	8119	11318	38.	19.	-64.	-7.
Rhode Island	5604C	755C	0	6359	16.	-16.	0.	0.
Vermont	710C	895C	1081C	2686	15.	-18.	-16.	-20.
Subdistrict IB	33509	14578	12603	60690	346.	-138.	218.	426.
Delaware	1386C	0	3617C	5003	-49.	0.	55.	6.
District of Colu	7460C	4758C	0	12218	125.	-39.	0.	86.
Maryland	0	3902C	4390C	8292	0.	-82.	63.	-19.
New Jersey	4795C	375C	440C	5610	-67.	-8.	-9.	-84.
New York	6434C	2063P	705C	9202	164.	-97.	-24.	43.
Pennsylvania	13434	3480C	3451C	20365	173.	87.	133.	393.
Subdistrict IC	12471	25852	15307	53630	-121.	-124.	-6.	-252.
Florida	3200C	5264C	1001P	9465	-65.	-22.	-66.	-153.
Georgia	0	2122C	2661C	4783C	0.	-99.	-54.	-153.
North Carolina	714P	272P	0	986C	38.	-14.	0.	24.
South Carolina	345C	14094C	0	14439	-12.	122.	0.	110.
Virginia	4853C	1724C	8333	14910	18.	-48.	197.	167.
West Virginia	3359	2376C	3312C	9047	-101.	-63.	-84.	-248.
PAD District II	74913	67732	78659	221304	-230.	299.	45.	114.
Illinois	316P	14174C	3750C	18240	16.	184.	81.	282.
Indiana	839P	14060	1905C	16804	-88.	77.	-49.	-61.
Iowa	3319	4704	12645	20668	-129.	-204.	213.	-120.
Kansas	1390P	7794	606P	9790C	-70.	46.	32.	9.
Kentucky	3364C	612P	7962	11938	-84.	64.	-67.	-88.
Michigan	9941C	1080P	0	11021	16.	55.	0.	71.
Minnesota	6756	3833	22520	33109	-187.	-7.	13.	-181.
Missouri	5075C	1769C	3330C	10174	9.	-16.	-41.	-49.
Nebraska	16463	1526C	4481C	22470	50.	-53.	-131.	-134.
North Dakota	5772C	5558C	8154	19484	101.	-79.	-23.	-1.
Ohio	10728	6112C	5048C	21888	236.	160.	-43.	353.
Oklahoma	1480C	3090C	3276C	7846	30.	-43.	-85.	-98.
South Dakota	0	1153C	4227C	5380C	0.	106.	151.	257.
Tennessee	0	1448C	543C	1991C	0.	38.	0.	38.
Wisconsin	9470C	819C	212C	10501	-129.	-29.	-5.	-163.
PAD District III	33192	13706	35889	82787	-419.	-7.	-297.	-723.
Alabama	9144C	75C	9977C	19196	65.	2.	-66.	1.
Arkansas	0	0	1448C	1448C	0.	0.	-43.	-43.
Louisiana	5772C	3596C	9797	19165	-111.	21.	-84.	-173.
Mississippi	5261C	6399C	2330C	13990	-42.	-38.	-93.	-172.
New Mexico	8475C	3636C	10033	22144	-238.	8.	-95.	-325.
Texas	4540C	0	2304C	6844C	-93.	0.	83.	-10.
PAD District IV	26384	13793	33824	74001	-321.	-176.	132.	-366.
Colorado	9457C	4440	8352C	22249	-193.	-118.	-145.	-456.
Idaho	6351C	9353	8846C	24550	-23.	-59.	192.	111.
Montana	6344C	0	11850C	18194	-99.	0.	57.	-42.
Utah	4232C	0	4776C	9008	-7.	0.	27.	20.
Wyoming	0	0	0	0	0.	0.	0.	0.
PAD District V	30604	15112	15894	61610	-297.	19.	483.	205.
Alaska	6939C	0	3871C	10810	-33.	0.	158.	125.
Arizona	583C	0	363C	946	23.	0.	13.	36.
California	5734C	3083C	6579	15396	-161.	-100.	165.	-96.
Hawaii	9123	147C	2664C	11934	68.	5.	92.	166.
Nevada	582P	2606C	2013C	5201	31.	52.	12.	94.
Oregon	4585C	6009C	0	10594	-99.	6.	0.	-93.
Washington	3058C	3267C	404P	6729	-125.	56.	43.	-26.

NETWORK Flow 4D Solid Premium Fuel All Fuel Formulations

	DTW	Rack	Bulk	Total	<------- NOISE			------->
United States	169122	166813	193519	529454	-215.	-649.	-1207.	-2071.
PAD District I	69900	54199	57812	181911	-576.	261.	-455.	-771.
Subdistrict IA	28875	16615	24200	69690	-338.	50.	-406.	-694.
Connecticut	6821	1550C	5602C	13973	-216.	46.	-38.	-207.
Maine	6874C	0	4584C	11458	-48.	0.	-156.	-204.
Massachusetts	2151C	4280	4116C	10547	-84.	-150.	-132.	-366.
New Hampshire	7900C	5311C	2128C	15339	21.	54.	56.	130.
Rhode Island	3065C	5474C	2588C	11127	44.	100.	-14.	130.
Vermont	2064C	0	5182C	7246	-55.	0.	-121.	-176.
Subdistrict IB	21910	12103	17624	51637	-141.	-54.	-128.	-323.
Delaware	6632	804C	3168C	10604	-75.	-21.	53.	-43.
District of Colu	4860	1540C	4012C	10412	-78.	31.	20.	-26.
Maryland	0	852P	996C	1848	0.	43.	-41.	1.
New Jersey	7186	625C	3832C	11643	94.	-13.	-57.	24.
New York	3232	6328C	4740C	14300	-82.	-114.	-132.	-328.
Pennsylvania	0	1954C	876C	2830	0.	20.	30.	50.
Subdistrict IC	19115	25481	15988	60584	-97.	264.	78.	245.
Florida	3520C	5429	1571C	10520	-26.	69.	-48.	-5.
Georgia	8613C	2355C	6603C	17571C	-158.	47.	69.	-42.
North Carolina	1126C	0	1306P	2432C	60.	0.	-69.	-9.
South Carolina	0	11093	0	11093	0.	112.	0.	112.
Virginia	2480C	4088C	0	6568	-64.	-12.	0.	-76.
West Virginia	3376C	2516	6508C	12400	91.	48.	126.	266.
PAD District II	48832	45882	63611	158325	556.	-475.	-200.	-118.
Illinois	4053C	1200P	11969C	17222	97.	-62.	48.	83.
Indiana	1950P	0	0	1950P	102.	0.	0.	102.
Iowa	412C	5898	3872C	10182	-11.	-115.	81.	-45.
Kansas	3393C	0	1632P	5025C	-32.	0.	1.	-31.
Kentucky	0	2984C	4635C	7619	0.	78.	-72.	6.
Michigan	0	1905C	3830C	5735C	0.	-98.	-79.	-178.
Minnesota	8071	5144C	2368C	15583	103.	-17.	-61.	25.
Missouri	4555C	20	0	4575	-10.	1.	0.	-10.
Nebraska	6310C	5357C	12187	23854	97.	-118.	-183.	-204.
North Dakota	0	8633	0	8633	0.	-279.	0.	-279.
Ohio	6693	4371C	6707	17771	158.	10.	-224.	-56.
Oklahoma	11318	3617C	2664C	17599	-18.	140.	94.	216.
South Dakota	0	504C	6908C	7412C	0.	-17.	3.	-15.
Tennessee	0	2235	4466C	6701C	0.	3.	94.	97.
Wisconsin	2077C	4014	2373C	8464	70.	0.	99.	169.
PAD District III	21321	26517	17132	64970	-215.	-256.	-12.	-483.
Alabama	2684C	4674C	865C	8223	-68.	-83.	-31.	-183.
Arkansas	4400C	9815C	4856C	19071	-80.	103.	20.	43.
Louisiana	1730C	5322	1150P	8202	-38.	-188.	59.	-167.
Mississippi	1010C	792C	0	1802	-66.	-13.	0.	-80.
New Mexico	5218C	4822C	8455	18495	-69.	-112.	34.	-148.
Texas	6279	1092C	1806P	9177	107.	37.	-93.	51.
PAD District IV	11355	9475	26290	47120	-82.	-98.	-275.	-455.
Colorado	2751C	1456C	9460	13667	-41.	25.	-66.	-82.
Idaho	0	3260C	0	3260C	0.	-90.	0.	-90.
Montana	0	1382P	10045C	11427	0.	-73.	-153.	-227.
Utah	3720C	1539C	6016C	11275	-78.	-53.	-118.	-250.
Wyoming	4884C	1838P	769C	7491C	38.	93.	63.	194.
PAD District V	17714	30740	28674	77128	101.	-81.	-264.	-244.
Alaska	19P	6998C	5252C	12269	-2.	69.	94.	162.
Arizona	1120C	0	30C	1150	34.	0.	1.	35.
California	3039C	902P	2412C	6353	-50.	95.	-123.	-79.
Hawaii	3736C	2046C	6026	11808	142.	36.	-72.	106.
Nevada	2337C	8188	6314C	16839	-79.	-2.	-30.	-112.
Oregon	3038C	12519C	5168C	20725	142.	-276.	-93.	-227.
Washington	4425C	87C	3472C	7984	-87.	-3.	-40.	-130.

NETWORK Flow 4D Solid   All Fuel Grades   All Fuel Formulations

	DTW	Rack	Bulk	Total	<-------	NOISE	------->	
United States	591889	555705	573481	1721075	-1242.	-421.	-489.	-2152.
PAD District I	203531	187271	169107	559909	-464.	216.	-234.	-482.
Subdistrict IA	77215	65043	58917	201175	-573.	-65.	-261.	-900.
Connecticut	16751	13781	8853	39385	-483.	-146.	-84.	-713.
Maine	20696	6832	16027	43555	79.	42.	61.	182.
Massachusetts	4021C	11525	4116C	19662	-1.	-144.	-132.	-278.
New Hampshire	17235	7054	13435	37724	-101.	73.	72.	45.
Rhode Island	10417C	12453	6564C	29434	7.	226.	65.	298.
Vermont	8095	13398	9922	31415	-75.	-116.	-243.	-434.
Subdistrict IB	74836	43174	52562	170572	328.	-141.	-46.	141.
Delaware	14996	3204	11057	29257	9.	-2.	155.	162.
District of Colu	14573	11368	15350	41291	-6.	77.	107.	178.
Maryland	3311C	6590	6465C	16366	-120.	-85.	-88.	-293.
New Jersey	18856	1000	4416	24272	190.	-20.	-61.	108.
New York	9666C	9039	6229C	24934	82.	-189.	-197.	-304.
Pennsylvania	13434	11973	9045	34452	173.	78.	38.	290.
Subdistrict IC	51480	79054	57628	188162	-219.	423.	73.	277.
Florida	6720	21550	4419	32689	-91.	62.	-128.	-157.
Georgia	18574	4477	9264	32315	-65.	-52.	15.	-102.
North Carolina	4108C	7498	9770C	21376	192.	191.	-118.	265.
South Carolina	1540C	31074	7582C	40196	14.	229.	165.	408.
Virginia	10893	5812	11958	28663	-233.	-60.	86.	-207.
West Virginia	9645	8643	14635	32923	-35.	53.	53.	70.
PAD District II	199919	175761	197066	572746	339.	10.	-133.	216.
Illinois	8497	15374	15719	39590	267.	122.	129.	518.
Indiana	7402	14060	5751	27213	172.	77.	-161.	88.
Iowa	4880C	14798C	20733	40411	-90.	-368.	354.	-104.
Kansas	16779	18124	4186	39089	-163.	-110.	54.	-219.
Kentucky	9190	6383	19120	34693	21.	202.	-212.	12.
Michigan	11963	2985	10498	25446	89.	-43.	-237.	-192.
Minnesota	21227	12671	26220	60118	-230.	86.	-11.	-154.
Missouri	15545	12174	7264	34983	-196.	30.	-28.	-195.
Nebraska	25425	14550	17610	57585	66.	-23.	-282.	-239.
North Dakota	10443	22477	8154	41074	131.	-376.	-23.	-268.
Ohio	24618	10483	15232	50333	294.	170.	-307.	156.
Oklahoma	16828	8571	10279	35678	59.	46.	90.	194.
South Dakota	24	12670	16661	29355	1.	164.	248.	412.
Tennessee	2242C	4328C	13334	19904	-70.	27.	251.	208.
Wisconsin	24856	6113	6305	37274	-12.	7.	3.	-2.
PAD District III	69761	63949	79438	213148	-604.	-496.	-129.	-1228.
Alabama	15332	5008	13698	34038	-97.	-108.	-148.	-353.
Arkansas	5998	15443	12662	34103	-69.	60.	57.	48.
Louisiana	7502	12006	15614	35122	-149.	-187.	90.	-246.
Mississippi	6937	16116	5310	28363	-131.	-269.	-248.	-648.
New Mexico	22103	13386	25184	60673	-150.	17.	50.	-83.
Texas	11889	1990	6970	20849	-8.	-8.	71.	54.
PAD District IV	51300	46380	68593	166273	-509.	-407.	84.	-832.
Colorado	12208	14668	23449	50325	-234.	-209.	-82.	-525.
Idaho	7276	13553	9736	30565	-41.	-49.	242.	152.
Montana	6858	8740	21895	37493	-46.	-96.	-96.	-238.
Utah	13628	1921	10792	26341	-184.	-92.	-91.	-368.
Wyoming	11330	7498	2721	21549	-4.	39.	112.	147.
PAD District V	67378	82344	59277	208999	-4.	256.	-78.	175.
Alaska	6958C	14946	13423C	35327	-35.	105.	166.	236.
Arizona	4424C	828C	2582C	7834	140.	29.	-54.	115.
California	12565	7713	11242	31520	-295.	91.	-19.	-223.
Hawaii	13897	8334	9017	31248	286.	-155.	31.	163.
Nevada	5474	14316	8327	28117	-67.	106.	-19.	20.
Oregon	7623	32853	8208	48684	44.	26.	-157.	-87.
Washington	16437	3354C	6478C	26269	-76.	53.	-27.	-50.

Synthetic Tabular Data - A Better Alternative to Complementary Data Suppression - Original Manuscript Dated December 2001

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Abstract. Complementary cell suppression is often used for statistical disclosure limitation in tabular data, and in particular for magnitude data such as aggregate economic statistics. Cell suppression results in missing data, This can complicate and sometimes thwart thorough analysis. Suppressed entries could be replaced by interval estimates of their hidden values, but this too presents analytical challenges. Expected values, often close to original values, threaten disclosure. These approaches are also limited in the ability to preserve additive structure. We demonstrate the use of synthetic tables to prevent disclosure of sensitive information. Synthetic tables are relatively easy to generate and provide significantly more information, compared to conventional tables protected by complementary data suppression techniques. Relatively low computational burden associated with synthetic tables make them much more attractive relative to other methods of tabular data protection. The accuracies of synthetic tabular cells are easy to control, making them a useful tool for dissemination of statistical information. The primary criterion for a valid synthetic table is that the value presented for a disclosure cell lie outside the cell's disclosure interval. The secondary objective is to hold a maximum number of synthetic cells to their true values. This is accomplished via iterative refinement of synthetic tabular cells using a variation of classical gradient search in a manner analogous to partial cell suppression.

1. Introduction

Procedures used to protect sensitive cells in tabular data have slowly evolved over the last four decades. From the very beginning federal statistical agencies realized that just withholding the value for sensitive cells was not a good enough strategy to protect sensitive information in tables containing marginal entries. The concept of complementary data suppression was, therefore, introduced and practiced ever since to protect sensitive cells from disclosure. At first it was thought that suppressing at least two cells in any given row or column offered adequate protection from disclosure for sensitive cells. Over the years statistical offices realized that the minimum of two suppressed cells in a row or column strategy did not work as well for sparse and multi-dimensional tables. Procedures based on network flow as well as linear programming techniques were introduced to increase the reliability and the efficiency of complementary data suppression procedures. In recent years, it has become increasingly obvious that by using commonly practiced missing data analysis techniques, probabilistic estimates for the suppressed tabular cells can be derived with great accuracy, limiting the applicability of complementary cell suppression techniques for statistical disclosure prevention.   .

In this paper, we demonstrate an entirely different approach to the age-old objective of protecting sensitive data cells from disclosure in complex multi-dimensional link tables containing hierarchical structures. In our approach, we completely discard the notion of complementary data suppression and in its place advocate the use of synthetic tables to disseminate statistical information. Our proposed method completely eliminates the information loss associated with complementary data suppression procedures. Our proposed approach requires a fraction of the computational resources required by the complementary cell suppression methods, and offers multiple alternatives to produce synthetic data by appropriate selection of an objective function that satisfies a wide variety of requirements for different statistical offices.

2 Basic Concept

The basic concept of generating synthetic tabular data that closely mimics the overall characteristics of real tabular data is quite straightforward. In synthetic tables, values for all the sensitive cells are kept at a safe distance away from their true cell values. The remaining non-sensitive cell values in the table are then adjusted from their true values as little as possible by using some predetermined criteria to make the table contents additive in all the dimensions as in the original table. The optimal mathematical structure of a synthetic table is relatively easy to specify by using mixed integer linear programming formulation[1].

Minimize SUM [c_i ($y_i^+ + y_i^-$)]

Subject to

$M (y_i^+ - y_i^-) = 0$

$0 =< y_i^+ =< UB_i$

$0 =< y_i^- =< LB_i$

$y_{ik}^+ >= BOUND_{ik} * I_{ik}$

$y_{ik}^- >= BOUND_{ik} * (1 - I_{ik})$

where

I_{ik} is a binary zero/one variable

$BOUND_{ik}$ is confidentiality bound for sensitive cell ik

ik (k = 1, ... p) p sensitive cells

i = 1, ... n n non-zero table cells

y_i^+ = positive adjustment to cell value

y_i^- = negative adjustment to cell value

UB_i and LB_i Upper and lower cell bounds

c_i = cost function.

[1] Fischetti,Salazar naming conventions are used

Five different cost functions are commonly used. They are: 1) constant, 2)log(value), 3) value, 4) 1/value, and 5) log(value)/value, where 'value' denotes the cell value.

It is generally known that the mixed integer linear programming formulations are suitable only to solve small problems. We, therefore, propose using a simplified linear programming formulation, which could be used in practice to generate large complex synthetic tables containing linked hierarchical structures. In our simplified linear programming formulation, the binary integer variable is replaced by a binary constant. We assign the binary constant the value of zero or one prior to finding a linear programming solution by using the following simple heuristic:

- Arrange all the sensitive cells in the table, in an increasing order of magnitude of the cell values.
- Using an alternate sequence, assign the value of zero and one to the binary constant associated with each sensitive cell, except when the values of the sensitive cells are identical.
- When the values of the sensitive cells are identical, assign the same binary constant value to them all.
- To ensure that our select direction of adjustment is followed, we assign relatively high value to the cost coefficient associated with sensitive cell adjustment component in the opposite direction.

3. Illustrative Example

We use a hypothetical 3 dimensional table, containing 10 columns, 6 rows and 4 levels to demonstrate generation of a synthetic table to disseminate statistical information. Our table contains 191 non-zero cells, of which 24 cells are sensitive cells. The location of the sensitive cells, their cell values and required cell protection values are as follows:

SENSITIVE CELLS AND PROTECTION REQUIREMENT

Col	Row	Lev	Val	Prot	Col	Row	Lev	Val	Prot	Col	Row	Lev	Val	Prot
2	1	1	714	39	2	1	2	539	59	2	4	3	644	35
4	1	2	70	7	4	1	3	614	34	4	2	2	786	87
4	2	3	928	51	4	4	2	382	42	4	6	2	1238	17
5	1	1	140	7	6	2	2	1074	59	6	3	2	544	30
7	1	3	549	61	7	3	2	631	70	7	5	2	726	40
7	5	3	134	7	8	1	3	92	10	8	4	2	1050	58
8	5	1	664	36	8	5	4	664	36	9	2	1	1042	57
9	3	3	820	91	9	5	2	1598	88	9	5	4	1598	88

By using the traditional complementary cell suppression technique, our test example requires 39 complementary cell suppressions to adequately protect 24 sensitive cells. The entire table contents are displayed below. In the table, the complementary suppression cells are marked by a symbol c next to the cell value. The sensitive cells are identified by a symbol w next to the cell value. In addition, to the symbols w and c, we use gray shades to identify suppressed cells. The gray shades are to emphasize that the numeric values for these cells are prevented from a display to data users. The complementary cell suppression technique in this example results in a significant amount of information loss, rendering the table useless for many practical applications.

DATA SUPPRESSION -- (10x6x4) TABLE

6764	714w	3356	4067c	140w	--	3932	1478c	--	20451
1994c	--	5593	--	3022	3504c	--	3220	1042w	18375
3744c	--	3708	--	3678c	2502c	--	--	--	13632
2810c	10632c	--	2445c	--	--	2313	2978	7548c	28726
3682	--	--	--	4667	1988c	1748	664w	--	12749
18994	11346	12657	6512	11507	7994	7993	8340	8590	93933
--	539w	--	70w	--	7472	715c	3832	--	12628
2253c	--	4948	786w	472	1074w	1830	5030	--	16393
640c	--	986	--	--	544w	631w	48c	750c	3599
1334c	--	1016	382w	3175	3302c	3803	1050w	--	14062
1648	2814	--	--	--	2102c	726w	--	1598w	8888
5875	3353c	6950	1238w	3647	14494	7705	9960	2348	55570
--	3552c	3476	614w	1916c	1131	549w	92w	1772	13102
--	--	3222	928w	--	--	308c	429	87c	4974
4145	--	--	3692	2115c	4196	414c	3804c	820w	19186
5995	644w	--	--	2410	1677c	--	1912c	4134c	16772
2016	--	--	2212	2826	1627c	134w	--	--	8815
12156	4196c	6698	7446c	9267	8631	1405	6237	6813	62849
6764	4805	6832	4751	2056	8603	5196	5402	1772	46181
4247	--	13763	1714	3494	4578	2138c	8679	1129c	39742
8529	--	4694	3692	5793	7242	1045c	3852c	1570c	36417
10139	11276	1016	2827	5585	4979	6116	5940	11682	59560
7346	2814	--	2212	7493	5717	2608	664w	1598w	30452
37025	18895	26305	15196	24421	31119	17103	24537	17751	212352

To generate a synthetic table that retains most of the statistical characteristics of the original unsuppressed table above, we use the linear programming heuristic formulation specified earlier. We make use of a cost function, which is proportional to the cell value, to identify the required controlled adjustments to select few non-sensitive cell values. The cell value adjustments are such that resulting table is additive in all the dimensions and at the same time the published estimates for the sensitive cells are kept outside of their disclosure range. The table below summarizes the cell locations and magnitude of required controlled adjustments to the true cell values. We have highlighted sensitive cells, in addition to marking them with symbol w, so that readers can easily verify that all adjustments to sensitive cells are beyond their respective confidentiality bounds.

CONTROLLED ADJUSTMENTS (10x6x4) TABLE

--	39w	--	-41	-8w	--	--	10	--	--
--	--	--	--	9	22	--	26	-57w	--
--	--	--	--	8	-8	--	--	--	--
5	-35	--	-38	--	--	11	--	57	--
-5	--	--	--	--	-14	55	-36w	--	--
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
--	4	--	-79	9	--	66	--	--	--
--	-62w	--	7w	--	--	55	--	--	--
--	--	--	78w	-9	-59w	--	-10	--	--
--	--	--	--	--	30w	-70w	-48	88	--
-5	--	--	38w	--	-80	-11	58w	--	--
5	14	--	--	--	109	-40w	--	-88w	--
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
--	-48	--	123w	-9	--	-66	--	--	--
--	9	--	34w	8	--	-55w	-10w	14	--
--	--	--	51w	--	--	-161	-16	126	--
--	--	--	-41	-8	-22	70	84	-83w	--
--	35w	--	--	--	80	--	-58	-57	--
--	--	--	-88	--	-58	146w	--	--	--
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
--	44	--	-44	--	--	--	--	--	--
--	-14	--	--	--	--	--	--	14	--
--	--	--	129	--	-37	-161	--	69	--
--	--	--	-41	--	--	--	36	5	--
--	--	--	--	--	--	--	--	--	--
--	14	--	-88	--	37	161	-36w	-88w	--
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
--	--	--	--	--	--	--	--	--	--

After applying the linear programming-based control adjustments to the original table, our synthetic table will appear as shown below. Once again, in the following table we highlight all the sensitive cells for the ease of understanding of our readers. In a real application synthetic tables will be published in their entirety. Depending on the accuracy of the data a synthetic table represents, statistical offices as an option might decide to attach some kind of quality indicators to select a few cells where the published cell values are beyond some pre-determined tolerance level

SYNTHETIC(10x6x4) TABLE

6764	753	3356	4026	132	--	3932	1488	--	20451
1994	--	5593	--	3031	3526	--	3246	985	18375
3744	--	3708	--	3686	2494	--	--	--	13632
2815	10597	--	2407	--	--	2324	2978	7605	28726
3677	--	--	--	4667	1974	1803	628	--	12749
18994	11350	12657	6433	11516	7994	8059	8340	8590	93933
--	477	--	77	--	7472	770	3832	--	12628
2253	--	4948	864	463	1015	1830	5020	--	16393
640	--	986	--	--	574	561	0	838	3599
1329	--	1016	420	3175	3222	3792	1108	--	14062
1653	2828	--	--	--	2211	686	--	1510	8888
5875	3305	6950	1361	3638	14494	7639	9960	2348	55570
--	3561	3476	648	1924	1131	494	82	1786	13102
--	--	3222	979	--	--	147	413	213	4974
4145	--	--	3651	2107	4174	484	3888	737	19186
5995	679	--	--	2410	1757	--	1854	4077	16772
2016	--	--	2124	2826	1569	280	--	--	8815
12156	4240	6698	7402	9267	8631	1405	6237	6813	62849
6764	4791	6832	4751	2056	8603	5196	5402	1786	46181
4247	--	13763	1843	3494	4541	1977	8679	1198	39742
8529	--	4694	3651	5793	7242	1045	3888	1575	36417
10139	11276	1016	2827	5585	4979	6116	5940	11682	59560
7346	2828	--	2124	7493	5754	2769	628	1510	30452
37025	18895	26305	15196	24421	31119	17103	24537	17751	212352

In the synthetic table, true values are published for 103 cells. For the remaining 88 cells (including sensitive cells), the published cell values are altered slightly from their true values to protect the sensitive cell values from being disclosed within an allowable protection interval. Most of the cell values of the marginal cells are unaffected in the synthetic table. In addition, the table values are additive in all the dimensions.

4. Multi Dimensional Linked Tables

The linear programming heuristic identified above, to generate synthetic tabular data, is applicable to protect sensitive information in all the generic, multi-dimensional, linked tables containing hierarchical structure. We next provide the overall performance statistics for synthetic tables generated by using two different test examples of multi-dimensional linked tables. These two test cases were created by this author to enable testing of algorithm developed by Fischetti and Salazar, to generate optimum complementary cell suppression pattern.

The first test example consists of 2, five-dimensional linked sections of a six dimensional table (6x4x16x4x4x4). The table contains 1254 non-zero cells. Of this total, 1089 cells are non-sensitive and 165 cells are sensitive. Fischetti and Salazar determined that the optimum complementary cell suppression results in 419 suppressed cells, which is 34% of total non-zero cells.

The second example consists of 4, five-dimensional linked sections of a nine dimensional table (4*29*3*4*5*6*5*4*5). The table contains 1141 non-zero cells, of which 831 cells are non-sensitive and 310 cells are sensitive. Fischetti & Salazar determined that the optimum complementary cell suppression results in 491 suppressed cells, which is 43% of total non-zero cells.

The synthetic tables generated by using these two test examples provide additive tables containing cell values for all the non-zero cells in the original test examples. In the following two tables we summarize the overall performance statistics of change from the true value of nonzero synthetic cells by ten different percent change from true value categories. We use five different cost functions that are commonly used in tabular cell protection to demonstrate five different possible formulations for synthetic tables.

NUMBER OF CELLS BY PERCENT CHANGE CATEGORY[2]

2 Sections Of Six Dimensional Linked Table

Percent change from true value	cost function used for optimization				
	const	log(value)	value	1/value	log(value)/value
.00- .10	691{ 55.3%}	716{ 57.5%}	749{ 60.4%}	720{ 57.5%}	687{ 54.8%}
.10- .50	189{ 70.4%}	154{ 69.8%}	120{ 70.1%}	231{ 75.9%}	254{ 75.1%}
.50- 1.00	91{ 77.7%}	72{ 75.6%}	37{ 73.1%}	47{ 79.6%}	56{ 79.6%}
1.00- 1.50	38{ 80.7%}	27{ 77.8%}	41{ 76.4%}	22{ 81.4%}	28{ 81.8%}
1.50- 2.00	22{ 82.5%}	33{ 80.4%}	22{ 78.1%}	14{ 82.5%}	14{ 82.9%}
2.00- 5.00	52{ 86.6%}	52{ 84.6%}	63{ 83.2%}	47{ 86.3%}	42{ 86.3%}
5.00- 10.00	73{ 92.5%}	88{ 91.7%}	98{ 91.1%}	119{ 95.8%}	100{ 94.3%}
10.00- 15.00	58{ 97.1%}	56{ 96.1%}	51{ 95.2%}	51{ 99.8%}	69{ 99.8%}
15.00- 30.00	19{ 98.6%}	24{ 98.1%}	30{ 97.7%}	2{100.0%}	3{100.0%}
30.00-100.00	17{100.0%}	24{100.0%}	29{100.0%}	0{100.0%}	0{100.0%}
unchanged cells	390{ 31.2%}	422{ 33.9%}	651{ 52.5%}	319{ 25.5%}	257{ 20.5%}

4 Sections Of Nine Dimensional Linked Table

Percent change from true value	cost function used for optimization				
	const	log(value)	value	1/value	log(value)/value
.00- .10	431{ 38.1%}	397{ 35.1%}	494{ 44.0%}	320{ 29.3%}	333{ 29.9%}
.10- .50	96{ 46.6%}	134{ 46.9%}	33{ 46.9%}	46{ 33.5%}	69{ 36.1%}
.50- 1.00	59{ 51.8%}	48{ 51.2%}	27{ 49.3%}	23{ 35.6%}	46{ 40.3%}
1.00- 1.50	35{ 54.9%}	23{ 53.2%}	29{ 51.9%}	23{ 37.7%}	27{ 42.7%}
1.50- 2.00	33{ 57.8%}	29{ 55.8%}	13{ 53.0%}	25{ 40.0%}	15{ 44.0%}
2.00- 5.00	85{ 65.3%}	90{ 63.7%}	86{ 60.7%}	83{ 47.6%}	90{ 52.1%}
5.00- 10.00	256{ 87.9%}	259{ 86.6%}	212{ 79.5%}	242{ 69.7%}	266{ 76.0%}
10.00- 15.00	55{ 92.8%}	64{ 92.3%}	57{ 84.6%}	60{ 75.2%}	62{ 81.6%}
15.00- 30.00	32{ 95.6%}	45{ 96.3%}	58{ 89.8%}	81{ 82.6%}	59{ 86.9%}
30.00-100.00	50{100.0%}	42{100.0%}	115{100.0%}	190{100.0%}	146{100.0%}
unchanged cells	353{ 31.2%}	329{ 29.1%}	453{ 40.3%}	287{ 26.3%}	302{ 27.1%}

[2] The numbers in the parentheses are cumulative percentages associated with the cell count.

From the summary statistics above it is clear that, by proper selection of the appropriate cost function, the controlled adjustments could be targeted to specific non-sensitive cell categories. Irrespective of the choice of the cost function, approximately 75% of the nonzero cell values in the first test case and 50% of the nonzero cell values in the second test case are altered within less than 1% of their true cell value. The synthetic cells undergoing changes in excess of 5% of true cell value are typically sensitive cells, which are otherwise blocked from publication using the complementary cell suppression method.

The quality of cell level information from the synthetic table could be conveyed to data users by using different strategies. As an option, a quality indicator, such as g (good), f (fair), and p (poor) could be assigned to each synthetic cell to inform the data user of the level of accuracy of information contained in each synthetic cell. Other options include: (1) providing overall percent accuracy of the published information, or (2) dividing the cells in multiple size categories and providing overall percent accuracy for each size category separately.

We have used only five basic cost functions to demonstrate the synthetic data generation technique in the linear programming environment. We, however, believe that a much wider spectrum of cost functions is readily available to the potential practitioner of synthetic tables to get a wide variety of desired results.

5. Iterative Refinement of LP Solution

The primary objective of the synthetic table is to provide estimates for sensitive cells, which are outside the disclosure limits. The secondary objective is to hold a maximum number of synthetic cells to their true cell values. This could be accomplished via an iterative refinement of the linear programming solution as follows:

- Exclude all the synthetic cells that are at the true cell value from future LP formulation.
- For the remaining non-sensitive synthetic cells, replace the original cost function with the new cost function, which is an inverse proportion of change in the cell value in the previous LP solution.
- Find the revised linear programming solution to generate a new subset of synthetic cell values.

In theory, multiple iterations could be performed to successively increase the number of synthetic cells that are at their true cell values. However in practice, by increasing the number of iterations estimates for more and more sensitive cells fall within their respective disclosure limits.

The table below summarizes the overall statistics for the second test example, after single iterative refinement of the LP heuristic.

Second Test Example After Single Iterative Refinement

Percent change from true value	cost function used for optimization				
	const	log(value)	value	1/value	log(value)/value
.00- .10	669{ 58.6%}	649{ 57.0%}	625{ 55.1%}	603{ 53.4%}	567{ 50.0%}
.10- .50	89{ 66.4%}	94{ 65.3%}	73{ 61.6%}	100{ 62.3%}	83{ 57.4%}
.50- 1.00	38{ 69.8%}	44{ 69.2%}	45{ 65.5%}	32{ 65.1%}	46{ 61.4%}
1.00- 1.50	31{ 72.5%}	22{ 71.1%}	26{ 67.8%}	18{ 66.7%}	28{ 63.9%}
1.50- 2.00	29{ 75.0%}	15{ 72.4%}	10{ 68.7%}	15{ 68.0%}	24{ 66.0%}
2.00- 5.00	60{ 80.3%}	84{ 79.8%}	81{ 75.8%}	69{ 74.1%}	95{ 74.4%}
5.00- 10.00	103{ 89.3%}	100{ 88.6%}	156{ 89.6%}	139{ 86.4%}	166{ 89.1%}
10.00- 15.00	33{ 92.2%}	57{ 93.6%}	40{ 93.1%}	43{ 90.3%}	29{ 91.6%}
15.00- 30.00	61{ 97.5%}	27{ 96.0%}	38{ 96.5%}	38{ 93.6%}	35{ 94.7%}
30.00-100.00	28{100.0%}	46{100.0%}	40{100.0%}	72{100.0%}	60{100.0%}
unchanged cells	543{ 47.6%}	556{ 48.9%}	565{ 49.8%}	498{ 44.1%}	513{ 45.3%}

From the table above, it is clear that the number of synthetic cells at their true cell value increases dramatically

6. Conclusion

Synthetic tabular data offers a significantly more attractive option for dissemination of statistical data containing sensitive information than conventional complementary cell suppression. Conventional complementary cell suppression methods result in too significant an amount of information loss, irrespective of how close one attempts to get to the optimum cell suppression choice. The overall information generated by using the complementary cell suppression method fails to compare favorably in regard to the practical utility of information provided by synthetic tables. The computational resources required to generate a synthetic table is a very small fraction of the resources required to generate a table protected by the complementary cell suppression method.

In this paper we have demonstrated a simple heuristic to generate synthetic tabular data. The heuristic is based on the linear programming formulation. However, we believe that computational techniques, such as iterative proportional fitting and the EM algorithm, could also be used effectively to generate synthetic tabular data.

References

M. Fischetti, J. J. Salazar, "Models and Algorithms for Optimizing Cell Suppression Problem in Tabular Data with Linear Constraints", working paper, 1998..

Synthetic Tabular Data – An Alternative to Complementary Cell Suppression

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Abstract: Complementary cell suppression is used for statistical disclosure limitation in tabular data, especially for magnitude data such as aggregate economic statistics. Cell suppression results in missing data, which complicates and can thwart thorough analysis. Suppressed entries can be replaced by interval estimates of their hidden values, but this too presents analytical challenges and can distort additivity to totals. Complementary cell suppression is an NP-hard computational problem. Even under optimal suppression, a data intruder can estimate expected values of suppressed entries, and often these estimates are close to original values. We introduce a new concept, *synthetic tabular data*, for limiting disclosure of sensitive information presented in tabular form. Synthetic tabular data is relatively easy to generate and provides significantly more information and flexibility than tables subject to suppression. The accuracy of synthetic cells is easy to control, making them useful for dissemination of statistical information.
Keywords: statistical disclosure limitation, statistical confidentiality

1. INTRODUCTION

Statistical disclosure occurs when released statistical data permit close approximation of sensitive information pertaining to an individual respondent or unit of analysis. A tabulation cell whose value closely approximates sensitive individual data is a *sensitive cell*. A cell is sensitive if its value equals the total for some statistic of data for only one or two respondents. Furthermore, if two respondents *dominate* the cell total, viz., the total contribution of all but the two largest contributors represents only a small fraction of the largest contribution, then the second largest can subtract its contribution from the cell total to obtain a narrow estimate of the largest. Values of sensitive cells must be *protected*, viz., obscured to the point that estimates of this sort of sensitive individual data are sufficiently imprecise. Federal Committee on Statistical Methodology (1994) provides an overview of statistical disclosure and disclosure limitation methods.

Procedures to protect sensitive cells in tabular data have evolved over the last four decades. From the very beginning national statistical offices realized that simply withholding the value for sensitive cells was insufficient to protect sensitive information in tables containing marginal totals. *Complementary cell suppression* (Cox 1980, 1995) was introduced and practiced by statistical offices to protect sensitive cells from disclosure through manipulation of additive relationships in statistical tables. Complementary cell suppression is aimed at assuring that *exact interval estimates* (lower and upper bounds) of the value of each suppressed sensitive cell are at a safe distance from the actual cell value, viz., lie within an interval at least as broad as that defined by predetermined *protection limits* (Cox 2001). (A generalization, *range protection*, allows protection limits to vary while enforcing a minimum distance between them.) In the largest-second largest contributor scenario, these limits equal a few percent of the largest contribution below and above the cell value. Cox (1981) provides a theory and algorithms for computing protection limits.

Early approaches to complementary suppression were based on linear equations (Fellegi 1972) and later linear programming (Sande 1984). Several approaches exploited properties of two-dimensional tables, e.g., assuring at least two suppressions in each row or column containing suppressions (Cox 1980) and network models for complementary cell suppression (Cox 1987, 1995), but, although efficient, such approaches do not generalize from two-dimensional to multi-dimensional tables or from simple hierarchies to complex aggregation structures (Cox and George 1989). Complementary cell suppression has been shown to be an *NP-hard problem* (Kelly et al. 1992), even for one-dimensional tables, making the existence of a computationally efficient, optimal method unlikely. Recent approaches are based on integer linear programs and branch-and-cut methods from integer programming (Fischetti and Salazar 2000).

Tables with suppressions are difficult to analyze. In lieu of suppressing cell values, it has been suggested, e.g., by Gordon Sande, that suppressions be replaced by their exact *interval estimates*. This is a step in the right direction, but is still demanding computationally and does not go sufficiently far in assuring ease-of-use for disclosure-limited tabular data. By using commonly practiced missing data techniques, e.g., *iterative proportional fitting* (Bishop et al. 1975) and the *E-M algorithm* (Little and Rubin 1987), probabilistic estimates for suppressed tabular cells can be computed, sometimes with great accuracy, sharply reducing the effectiveness of complementary cell suppression for statistical disclosure limitation. A third approach, introducing multiplicative noise into the underlying microdata (Zayatz et al. 2000), has been offered but not pursued.

In this paper, we demonstrate a new and different approach to limiting disclosure from sensitive tabular data cells. The method applies equally to two-dimensional tables as to multi-dimensional or linked tables, and to hierarchical as well as to complex tabular structure. We completely discard notions of complementary suppression and interval data and in their place advocate the use of *synthetic tabular data* to disseminate statistical information presented in tabular form. The essence of this approach is to replace each sensitive value with a value at a sufficient distance from the true value, and to adjust nonsensitive cell values minimally to restore additivity to totals. This method completely eliminates information loss associated with complementary suppression procedures, restores analytical tractability, requires a fraction of the computational resources required by complementary cell suppression methods, and offers multiple alternative outputs through choice among several objective functions satisfying a wide variety of requirements meaningful to national statistical offices. This concept permits extension in various directions—theoretical, computational, and practical implementation. Examination of these opportunities is begun here.

Section 2 presents the underlying concept of synthetic tabular data and a precise mathematical formulation for the associated computational problem. This is a mixed integer linear programming problem involving binary variables. Because such problems are difficult to impossible to solve computationally, a heuristic is provided for assigning the binary variables, leaving only a linear program to be solved. Section 3 illustrates the method in three dimensions, and two examples based on complex linked tabular structure are presented in Section 4. Each of these examples is compared to an optimal or near-optimal suppression solution. The use and selection of heuristics is examined through extensive simulation in Section 5. The question of what it means to protect sensitive cells is reexamined in Section 6, leading potentially to less distortion of original data. Concluding comments are provided in Section 7.

2. SYNTHETIC TABULAR DATA: CONCEPT AND MATHEMATICAL FORMULATION

The objective in generating synthetic tabular data is to closely mimic the original tabular data, subject to obscuring sensitive cell values to a sufficient extent. The underlying concept is simple: The value of each sensitive cell is replaced by a synthetic value selected to be at a *safe distance* away from the true cell value. As a starting point, we set this distance to be either the sensitive cell's lower or its upper protection limit; alternatives are examined in Section 6. Some or all of the nonsensitive cell values are then adjusted from their true values by as small an amount as possible to restore additivity to totals within the tabular system.

Within our framework, adjustments to nonsensitive cell values can be controlled in various ways. Selected nonsensitive cells, e.g., zero cells, can be exempted from change. Adjustments can be confined to within meaningful limits such as sampling variability. One of several linear objective functions can be used to measure and assure minimum deviation.

Tabular data systems with marginal entries can be represented by their system of equations in matrix form: $\mathbf{MX = 0}$. Column vector $\mathbf{X}$ represents the tabulation cells of the system; $\mathbf{x^*}$ represents the original data. Matrix $\mathbf{M}$ is the *aggregation matrix* representing the tabular structure among the cells. The entries of $\mathbf{M}$ are -1, 0 or +1: each row of the $\mathbf{M}$ corresponds to one *aggregation* (tabular equation) in which "+1" denotes a contributing internal cell and "-1" a marginal cell. With this notation, the mathematical structure of optimal synthetic tabular data is specified below by a mixed integer linear programming (MILP) formulation, analogous to that introduced in Cox (2000).

Notation

i = 1, …, p: denote the p sensitive cells
i = p+1,…, n: denotes the n-p nonsensitive cells
I_i = binary (zero/one) variable denoting selection of the lower/upper limit for sensitive cell i = 1,…,p
$LPROTECT_i$ = lower deviation required to protect sensitive cell i = 1,…,p
$UPROTECT_i$ = upper deviation required to protect sensitive cell i = 1,…,p
y_i^+ = positive adjustment to cell value i
y_i^- = negative adjustment to cell value i
UB_i, LB_i = upper/lower cell bounds on change to cell i
c_i = cost per unit change in cell i

MILP for Optimal Construction of Synthetic Tabular Data

$$\text{Min} \sum c_i \left(y_i^+ + y_i^- \right)$$

Subject to:

For i = 1,…, n:

$$\mathbf{M} \left(\mathbf{y}^+ - \mathbf{y}^- \right) = 0$$
$$0 \le y_i^+ \le UB_i$$
$$0 \le y_i^- \le LB_i$$

For i = 1,…, p:

$$y_i^+ \ge LPROTECT_i * I_i$$
$$y_i^- \ge UPROTECT_i * (1 - I_i)$$

After solution of the MILP, the synthetic tabular data $\mathbf{t} = (t_i)$ is given by: $t_i = x^*_i + y_i^+ - y_i^-$. Except as noted below, costs c_i are nonnegative, which implies that $y_i^+ y_i^- = 0$, viz., adjustment in a specific direction is indicated.

Five different cost functions are commonly used. They are: (1) constant, (2)log(1 + value), (3) value, (4) 1/(1+value), and (5) log(1+value)/(1+value), where 'value' denotes the cell value.
In general, mixed integer linear programming formulations are suitable only to solve small problems. We introduce a simple heuristic for selecting the binary I-variables, thereby reducing the problem to a linear programming formulation, which in practice can be efficiently solved for large and complex tabular structures.

The heuristic choice of assignment of sensitive cells to their lower/upper bound can be made in several ways. To illustrate our method, we introduce the following simple heuristic.

- Arrange all the sensitive cells in the table in an increasing order of magnitude of the cell values.
- Using an alternating sequence, assign value zero or one to the binary constant associated with each sensitive cell.
- When the marginal cell is sensitive and there are multiple internal sensitive cells, the direction of change of the marginal cell is reset to the net direction of change among the internal sensitive cells (when such exist).
- Any heuristic choice runs the risk of creating an infeasible problem. To ensure feasibility, we assign very high cost to adjustment of the sensitive cell in the opposite direction.

Other possible variations on the heuristic include: assign all sensitive cells to their lower (or upper bound), and, assign directions of change randomly. More complicated heuristics are also possible. In Section 5 we conduct a sensitivity analysis on the outputs based on these variations. As illustrated in Section 5, choice of heuristic appears to have minimal effect on quality and usefulness of the results.

3. ILLUSTRATION: THREE-DIMENSIONAL TABLE

We illustrate the method for a hypothetical three-dimensional table, containing 10 columns, 6 rows and 4 levels. Our table contains 191 non-zero cells, of which 24 cells are sensitive cells. It is customary, but not in all cases necessary, to exempt zero cells from change as, e.g., some zero cells are structural zeroes. We do so here. For simplicity, we assume *symmetric protection*, viz., $LPROTECT_i = UPROTECT_i = PROT_i$. This is also customary.

The location of the sensitive cells, their cell values and required cell protection limits are illustrated in Table 1.

Table 1: Sensitive Cells and Protection Limits

Col	Row	Lev	Val	Prot	Col	Row	Lev	Val	Prot	Col	Row	Lev	Val	Prot
2	1	1	714	39	2	1	2	539	59	2	4	3	644	35
4	1	2	70	7	4	1	3	614	34	4	2	2	786	87
4	2	3	928	51	4	4	2	382	42	4	6	2	1238	17
5	1	1	140	7	6	2	2	1074	59	6	3	2	544	30
7	1	3	549	61	7	3	2	631	70	7	5	2	726	40
7	5	3	134	7	8	1	3	92	10	8	4	2	1050	58
8	5	1	664	36	8	5	4	664	36	9	2	1	1042	57
9	3	3	820	91	9	5	2	1598	88	9	5	4	1598	88

Using traditional complementary cell suppression techniques, following Kelly et al. (1992) and Zayatz (1992), our test example requires 39 complementary suppressions to protect 24 sensitive cells, displayed in Table 2. The complementary cells are marked by a symbol *c* next to the cell value, and the sensitive cells are marked by symbol *w*. In addition, gray shades identify suppressed cells to emphasize the numeric values hidden from display. The complementary cell suppression in this example results in significant information loss, reducing the usefulness and usability of the table useless for many practical applications.

To generate a synthetic table that mimics Table 2 while limiting disclosure as specified in Table 1, we use the procedure described in Section 2. We choose costs equal to the cell value (3), which has the effect of targeting smaller nonsensitive cells for adjustment. This choice is arbitrary but in keeping with, e.g., past practice for U.S. Economic Censuses (Cox 1980, 1995). The cell value adjustments are such that resulting table is additive in all the dimensions and at the same time the published estimates for the sensitive cells are at one of the outer limits of their protection range.

Table 2: Cell Suppression—(10x6x4)Table

6764	714w	3356	4067c	140w	--	3932	1478c	--	20451
1994c	--	5593	--	3022	3504c	--	3220	1042w	18375
3744c	--	3708	--	3678c	2502c	--	--	--	13632
2810c	10632c	--	2445c	--	--	2313	2978	7548c	28726
3682	--	--	--	4667	1988c	1748	664w	--	12749
18994	**11346**	**12657**	**6512**	**11507**	**7994**	**7993**	**8340**	**8590**	**93933**

--	539w	--	70w	--	7472	715c	3832	--	12628
2253c	--	4948	786w	472	1074w	1830	5030	--	16393
640c	--	986	--	--	544w	631w	48c	750c	3599
1334c	--	1016	382w	3175	3302c	3803	1050w	--	14062
1648	2814	--	--	--	2102c	726w	--	1598w	8888
5875	**3353c**	**6950**	**1238w**	**3647**	**14494**	**7705**	**9960**	**2348**	**55570**

--	3552c	3476	614w	1916c	1131	549w	92w	1772	13102
--	--	3222	928w	--	--	308c	429	87c	4974
4145	--	--	3692	2115c	4196	414c	3804c	820w	19186
5995	644w	--	--	2410	1677c	--	1912c	4134c	16772
2016	--	--	2212	2826	1627c	134w	--	--	8815
12156	**4196c**	**6698**	**7446c**	**9267**	**8631**	**1405**	**6237**	**6813**	**62849**

6764	4805	6832	4751	2056	8603	5196	5402	1772	46181
4247	--	13763	1714	3494	4578	2138c	8679	1129c	39742
8529	--	4694	3692	5793	7242	1045c	3852c	1570c	36417
10139	11276	1016	2827	5585	4979	6116	5940	11682	59560
7346	2814	--	2212	7493	5717	2608	664w	1598w	30452
37025	**18895**	**26305**	**15196**	**24421**	**31119**	**17103**	**24537**	**17751**	**212352**

Table 3 summarizes the cell locations and magnitude of the *controlled adjustments* to true cell values. We have highlighted sensitive cells, in addition to marking them with symbol *w*, so that readers can easily verify that adjustments to sensitive cells are at either of their respective protection limits.

Table 3: Controlled Adjustments to (10x6x4)Table

--	39w	--	-41	-8w	--	--	10	--	--
--	--	--	--	18	13	--	26	-57w	--
--	--	--	--	8	-8	--	--	--	--
--	-35	--	-42	--	--	20	--	57	--
--	--	--	--	--	-5	41	-36w	--	--
--	4	--	-83	18	--	61	--	--	--
--	-68w	--	7w	--	--	61	--	--	--
--	--	--	87w	-18	-59w	--	-10	--	--
--	--	--	--	--	30w	-70w	-48	88	--
--	--	--	42w	--	-80	-20	58w	--	--
--	19	--	--	--	109	-40w	--	-88w	--
--	-49	--	136w	-18	--	-69	--	--	--
--	10	--	34w	8	--	-61w	-10w	19	--
--	--	--	51w	--	--	-164	-16	129	--
--	--	--	-33	-8	-22	70	84	-91w	--
--	35w	--	--	--	80	--	-58	-57	--
--	--	--	-105	--	-58	163w	--	--	--
--	45	--	-53	--	--	8	--	--	--
--	-19	--	--	--	--	--	--	19	--
--	--	--	138	--	-46	-164	--	72	--
--	--	--	-33	--	--	--	36	-3	--
--	--	--	--	--	--	--	--	--	--
--	19	--	-105	--	46	164	-36w	-88w	--
--	--	--	--	--	--	--	--	--	--

After applying the linear programming controlled adjustments to the original table, synthetic Table 4 results. Once again, we highlight the sensitive cells for ease of understanding. In a real application only the synthetic values are published. Depending on the accuracy of the data, statistical offices might attach to the cost function quality indicators designed to select cells of lower quality for adjustment, or for larger adjustment. Alternatively, the LB and UB could be based on sampling or measurement error. This is discussed further in Section 5.

In synthetic Table 4, true values are published for 106 cells. For the remaining 85 cells, published cell values are adjusted sufficiently from their true values to protect the sensitive cell values from disclosure within their protection interval. Most of the cell values of the marginal cells are unaffected in the synthetic table, and the table is additive in all dimensions.

Table 4: Synthetic (10x6x4)Table

6764	753	3356	4026	132	--	3932	1488	--	20451
1994	--	5593	--	3040	3517	--	3246	985	18375
3744	--	3708	--	3686	2494	--	--	--	13632
2810	10597	--	2403	--	--	2333	2978	7605	28726
3682	--	--	--	4667	1983	1789	628	--	12749
18994	11350	12657	6429	11525	7994	8054	8340	8590	93933
--	471	--	77	--	7472	776	3832	--	12628
2253	--	4948	873	454	1015	1830	5020	--	16393
640	--	986	--	--	574	561	0	838	3599
1334	--	1016	424	3175	3222	3783	1108	--	14062
1648	2833	--	--	--	2211	686	--	1510	8888
5875	3304	6950	1374	3629	14494	7636	9960	2348	55570
--	3562	3476	648	1924	1131	488	82	1791	13102
--	--	3222	979	--	--	144	413	216	4974
4145	--	--	3659	2107	4174	484	3888	729	19186
5995	679	--	--	2410	1757	--	1854	4077	16772
2016	--	--	2107	2826	1569	297	--	--	8815
12156	4241	6698	7393	9267	8631	1413	6237	6813	62849
6764	4786	6832	4751	2056	8603	5196	5402	1791	46181
4247	--	13763	1852	3494	4532	1974	8679	1201	39742
8529	--	4694	3659	5793	7242	1045	3888	1567	36417
10139	11276	1016	2827	5585	4979	6116	5940	11682	59560
7346	2833	--	2107	7493	5763	2772	628	1510	30452
37025	18895	26305	15196	24421	31119	17103	24537	17751	212352

4. ILLUSTRATION: MULTI-DIMENSIONAL LINKED TABLES

The procedure of Section 2 for generating synthetic tabular data is applicable to all multi-dimensional or multi-dimensional linked tables. We next provide the overall performance statistics for synthetic tables based on two test examples of multi-dimensional linked tables.

The first test example consists of two five-dimensional linked sections of a six-dimensional table (6x4x16x4x4x4). The table contains 1254 non-zero cells. Of these, 1089 cells are nonsensitive and 165 cells are sensitive. Fischetti and Salazar (2000) determined that the optimum complementary cell suppression results in 419 suppressed cells, amounting to 34% of total non-zero cells.

The second example consists of four five-dimensional linked sections of a nine-dimensional table (4*29*3*4*5*6*5*4*5). The table contains 1141 non-zero cells, of which 831 cells are nonsensitive and 310 cells are sensitive. Fischetti and Salazar (2000) determined that the optimum complementary cell suppression results in 491 suppressed cells, which is 43% of total non-zero cells.

The synthetic tables generated by using these two test examples provide additive tables containing cell values for all the non-zero cells in the original test examples. In Table 5 we summarize the overall performance statistics of change from nonzero true value by ten different percent change from true value categories. We use five different cost functions that are commonly used in tabular cell protection to demonstrate five different possible formulations for synthetic tables.

From Table 5 it is clear that, by proper selection of the cost function, controlled adjustments could be targeted to specific nonsensitive cell categories. Irrespective of the choice of the cost function, approximately 75% of the nonzero cell values in the first test case and 50% of the nonzero cell values in the second test case are altered within less than 1% of their true cell value. The synthetic cells undergoing changes in excess of 5% of true cell value are typically sensitive cells, which are otherwise blocked from publication using the complementary cell suppression method.

The quality of cell-level information from the synthetic table could be conveyed to data users by using different strategies. As an option, a quality indicator, such as g (good), f (fair), and p (poor) could be assigned to each synthetic cell to inform the data user of the level of accuracy of information contained in each synthetic cell. Other options include: (1) providing overall percent accuracy of the published information, or (2) dividing the cells in multiple size categories and providing overall percent accuracy for each size category separately.

We have used only five basic cost functions to demonstrate the synthetic data generation technique in the linear programming environment. There is of course a wide spectrum of cost functions available to potential practitioner of synthetic tables. An advantage of the synthetic tabular framework is that with modest effort several approaches could be tried and the “best” selected.

Table 5: Number of Cells by Percent Change[1]

2 Sections Of Six-Dimensional Linked Table

Percent change from true value	Cost Function Used In Optimization				
	constant	log(value)	value	1/value	log(value)/value
.00- .10	691{ 55.3%}	716{ 57.5%}	749{ 60.4%}	720{ 57.5%}	687{ 54.8%}
.10- .50	189{ 70.4%}	154{ 69.8%}	120{ 70.1%}	231{ 75.9%}	254{ 75.1%}
.50- 1.00	91{ 77.7%}	72{ 75.6%}	37{ 73.1%}	47{ 79.6%}	56{ 79.6%}
1.00- 1.50	38{ 80.7%}	27{ 77.8%}	41{ 76.4%}	22{ 81.4%}	28{ 81.8%}
1.50- 2.00	22{ 82.5%}	33{ 80.4%}	22{ 78.1%}	14{ 82.5%}	14{ 82.9%}
2.00- 5.00	52{ 86.6%}	52{ 84.6%}	63{ 83.2%}	47{ 86.3%}	42{ 86.3%}
5.00- 10.00	73{ 92.5%}	88{ 91.7%}	98{ 91.1%}	119{ 95.8%}	100{ 94.3%}
10.00- 15.00	58{ 97.1%}	56{ 96.1%}	51{ 95.2%}	51{ 99.8%}	69{ 99.8%}
15.00- 30.00	19{ 98.6%}	24{ 98.1%}	30{ 97.7%}	2{100.0%}	3{100.0%}
30.00-100.00	17{100.0%}	24{100.0%}	29{100.0%}	0{100.0%}	0{100.0%}
Unchanged cells	390{ 31.2%}	422{ 33.9%}	651{ 52.5%}	319{ 25.5%}	257{ 20.5%}

4 Sections Of Nine-Dimensional Linked Table

Percent change from true value	cost function used for optimization				
	const	log(value)	value	1/value	log(value)/value
.00- .10	431{ 38.1%}	397{ 35.1%}	494{ 44.0%}	320{ 29.3%}	333{ 29.9%}
.10- .50	96{ 46.6%}	134{ 46.9%}	33{ 46.9%}	46{ 33.5%}	69{ 36.1%}
.50- 1.00	59{ 51.8%}	48{ 51.2%}	27{ 49.3%}	23{ 35.6%}	46{ 40.3%}
1.00- 1.50	35{ 54.9%}	23{ 53.2%}	29{ 51.9%}	23{ 37.7%}	27{ 42.7%}
1.50- 2.00	33{ 57.8%}	29{ 55.8%}	13{ 53.0%}	25{ 40.0%}	15{ 44.0%}
2.00- 5.00	85{ 65.3%}	90{ 63.7%}	86{ 60.7%}	83{ 47.6%}	90{ 52.1%}
5.00- 10.00	256{ 87.9%}	259{ 86.6%}	212{ 79.5%}	242{ 69.7%}	266{ 76.0%}
10.00- 15.00	55{ 92.8%}	64{ 92.3%}	57{ 84.6%}	60{ 75.2%}	62{ 81.6%}
15.00- 30.00	32{ 95.6%}	45{ 96.3%}	58{ 89.8%}	81{ 82.6%}	59{ 86.9%}
30.00-100.00	50{100.0%}	42{100.0%}	115{100.0%}	190{100.0%}	146{100.0%}
unchanged cells	353{ 31.2%}	329{ 29.1%}	453{ 40.3%}	287{ 26.3%}	302{ 27.1%}

[1] The numbers in the parentheses are cumulative percentages associated with the cell count.

5. USE AND SELECTION OF A HEURISTIC

A precise mathematical formulation for generating synthetic tabular data, as a mixed integer linear program, was provided in Section 2. Also in Section 2, we proposed replacing optimal selection of direction for change of sensitive cells (the integer portion of the MILP) by a simple heuristic, thus reducing the computational problem to a linear program. It is appropriate to examine two questions:

- Is optimal selection of direction for change of sensitive cells necessary, or, can a heuristic be used?

- How does this heuristic compare with other potential heuristics?

5.1 Optimal Vs. Heuristic Selection of Direction for Change

If a mathematical optimization is computable, the optimization will produce one or more solutions that are provably "best" with respect to the constraints and objective function(s) specified in the mathematical formulation. The purpose of constructing an optimal solution is not, however, necessarily its actual use. Mathematical constraints typically only approximate real-world conditions. Mathematical formulations typically incorporate only a subset of actual conditions and criteria, and often are only approximations, with the result that optimal solutions only approximate fully "best" solutions. Likewise, two solutions that differ in objective function value for practical purposes are often indistinguishable. In many situations, therefore, demonstration of an optimal solution is valuable primarily from the standpoint of establishing a "gold standard" against which other solutions or outcomes can be compared.

This is true in the synthetic data framework. An optimal solution to the MILP of Section 2 does not necessarily exhibit distributional properties identical to those of the original data, and therefore is not guaranteed to produce equivalent results for every conceivable statistical analysis. (This, incidentally, is equally, if not more, true for cell suppression or interval data.) Conversely, a synthetic data set that, say, is within measurement error of original data is arguable equivalent to the original, regardless of objective function value. The mathematical constraints and objective function specified in Section 2 are designed to produce a synthetic result close to original data, but at some point there is no practical distinction between two similar solutions. Consequently, a fully optimal solution is not required to generate useable synthetic tabular data.

How then to proceed? Based on sampling and other measurement error, an estimated standard error can be computed for each tabulation cell. Within our linear programming model, it is a simple matter to further constraint the controlled adjustments (y-variables) to within, say, two standard errors of original data. Any two such solutions differing by no more than two standard errors are for all practical purposes equivalent. Using an appropriate heuristic to select direction of change, run the linear program. If at least one feasible solution exists, then an acceptable synthetic tabular data set has been found. In general, the relatively large number of nonsensitive cells will ensure feasibility. In the next subsection, we examine and compare different possible choices of heuristic.

5.2 Effect of Choice of Heuristic

A simple heuristic for selecting directions of change for sensitive cells was presented in Section 2, based on sorting the sensitive cells and assigning lower/upper protection to each in an alternating manner. Other heuristics are possible. In this subsection we illustrate and compare selection heuristics.

There are several obvious choices, including: the alternating heuristic of Section 2, referred to as "Plus/Minus"; for each sensitive cell, selecting the lower bound direction (viz., **I** = **0**), referred to as "Minus"; for each sensitive cell, selecting the upper bound direction (viz., **I** = **1**), referred to as "Plus"; and, for each sensitive cell, selecting the direction randomly, simulated 100 times. The evaluation statistics are: total *change* (controlled adjustments); total of original cell values affected by change; average change by value; number of cell values changed; average percent change in cell value; and, total percent change in cell value. The results, based on Table 3, are presented in Table 6.

Table 6 : Comparison of Heuristics for Table 3
("Change" measured by absolute value)

Comparison of Plus/Minus, Minus and Plus Heuristics

	Quantity Changed (1)	Affected Quantity (2)	Average Change	Number of Cells	Average % Change	Tot.%Chng. (=(1)÷(2))
Plus/Minus	**4364.**	**221980.**	**51.34118**	**85**	**8.63305**	**1.96594**
Minus	**4460.**	**177172.**	**58.68421**	**76**	**8.76424**	**2.51733**
Plus	**4370.**	**210424.**	**52.65060**	**83**	**7.61722**	**2.07676**

Random Selection of Direction—Statistics for 100 Simulations

	Quantity Changed (1)	Affected Quantity (2)	Average Change	Number of Cells	Average % Change	Tot.%Chng. (=(1)÷(2))
Mean	**4046.**	**217252.**	**47.92028**	**85**	**6.95427**	**1.87373**
Std. Dev.	**431.**	**18767.**	**4.94445**	**4**	**1.35592**	**.23795**
Min.	**3058.**	**168143.**	**38.02299**	**73**	**3.76409**	**1.36656**
Max.	**5336.**	**264115.**	**62.77647**	**93**	**10.68496**	**2.55154**

The first half of Table 6 reveals that the base heuristic works slightly better than the two extreme choices. The second half of the table provides statistics on 100 simulations in which the magnitude of protection level for sensitive cells was exactly the same as the base case, but the direction of adjustment to sensitive cells was selected randomly. Based the mean and standard deviation over the 100 trials, it does not appear that random selection offers measurable improvement over the base case. Moreover, minimum values associated with all six "statistical change" measures were associated with six different simulations. Furthermore, none of the 100 offered convincing improvement.

From these modest analyses, we conclude that it is unlikely that a "best" heuristic can be found. Indeed, this actually is a strength of the synthetic tabular framework, because the relatively low computational cost associated with producing one or more sets of synthetic tabulations with respect to a single heuristic facilitates experimentation with multiple heuristics. The "best" simulated data set can then be selected from an array of candidates based on appropriate criteria including expert judgment.

6. INTERPRETING CONFIDENTIALITY PROTECTION IN THE SYNTHETIC DATA CONTEXT

Synthetic tabular data alters original data. The degree of distortion is determined by the number of sensitive cells and required changes to sensitive cell values. Based on the cell suppression paradigm, in the model of Section 2 these changes are set equal to the protection deviations $PROT_i$, viz., each sensitive value is forced to one of its protection limits. This is necessary under cell suppression because allowing estimation of the cell value within a narrower range is by definition not permissible. However, a more flexible interpretation of protection is possible in the synthetic data framework, as follows.

If a tabulation cell represents data from only one respondent, then the cell value is a point estimate of the contribution of the respondent. It would be unwise to select a synthetic value too close to the true value, and therefore use of $PROT_i$ is appropriate. Similarly, if the cell contains data for precisely two respondents, then either can subtract its value from the published cell value and use the result as a point estimate of the contribution of the other. Therefore, full protection makes sense in this situation as well.

However, when a small number of respondents (but more than two) dominate the cell value, the disclosure problem for synthetic tabular data is less clear, as illustrated by the following example.

Assume that disclosure is defined as allowing the second largest to estimate the contribution *c* of the largest to within k-percent of its value. Given a sensitive cell with largest contribution *c* and second largest contribution *d,* assume that the total contribution *e* of the remaining respondents (respondents 3, 4, … etc.) equals q-percent of the largest contribution, viz., $e = c(q/100)$ with $q < k$. Then, from Cox (1981), $PROT_i = c(k - q)/100$. A synthetic value *s* is published in lieu of the true cell value $c + d + e$. The second largest contributor (the *intruder*) subtracts its contribution *d* from synthetic value *s*, obtaining a point estimate $s - d$ of the contribution of the largest. This estimate is imprecise, for two reasons. First, the intruder cannot account precisely for the total contribution *e* of the remaining respondents. Second, the intruder does not know whether the synthetic value *s* lies below or above the true cell value, or how close. Even assuming that the intruder can estimate *e* to within 100-perecent of its value, viz., within the interval [0, 2e], the intruder still only has a range of point estimates [s – d – 2e, s – d] of *c* that may not even contain the actual contribution *c*.

This makes it reasonable to consider relaxing the requirement to force each synthetic sensitive value all the way to one of its protection limits. This clearly is a policy decision, requiring further analysis based on actual sensitive data. To illustrate the effects of this relaxation, we simulated going only “half-way” in Table 3. Namely, having selected the direction of change for a sensitive cell value using the Minus/Plus heuristic, we randomly select the adjustment to sensitive cell *i* within the range [$Prot_i/2$, $Prot_i$] using a uniform distribution, simulated 100 times. The results are presented in Table 7.

Table 7: Smaller Protection Level Selected Randomly—100 Simulations ($NewProt_i$ = Uniform [$Prot_i/2$, $Prot_i$]); Direction Random as in Table 3)

	Quantity Changed	Affected Quantity	Average Change	Number of Cells	Average % Change	Tot.%Chng. (=(1)÷(2))
Mean	**3429.**	**214193.**	**40.71679**	**84**	**6.82568**	**1.60473**
Std. Dev	**236.**	**10677.**	**3.29047**	**3**	**.73915**	**.13342**
Min.	**2866.**	**186637.**	**33.71765**	**77**	**5.17424**	**1.33369**
Max.	**3952.**	**237620.**	**51.32468**	**91**	**8.61083**	**1.97567**

Comparing Table 7 with the first row of Table 6, it is clear that less distortion results, with protection still assured.

7. CONCLUDING COMMENTS

Synthetic tabular data offers a more attractive option for disseminating tabular data containing sensitive information than conventional complementary cell suppression. Complementary cell suppression results in a significant amount of information loss, irrespective of how close one gets to optimum suppression. The overall information generated by complementary cell suppression fails to compare favorably to synthetic tabular data both in completeness and usability. Complementary cell suppression is a computationally demanding, and optimal suppression is an NP-hard problem, whereas the computational effort required to generate synthetic tables is minimal. This allows the statistical office to generate multiple synthetic data scenarios and select the most favorable based, among other criteria, on expert judgment.

In this paper we introduced the concept of synthetic tabular data and provided a simple heuristic combined with linear programming methods for generating synthetic tabular data. Illustrations for multi-dimensional and linked tables were provided. Alternatives for selecting direction for change were examined and compared. A more flexible interpretation of confidentiality protection in tabular data was examined.

Computational techniques, such as iterative proportional fitting and the EM algorithm, could also be used to generate synthetic tabular data. Such methods are useful, e.g., when all internal cells are suppressed or unavailable and must be estimated from marginal totals. However, in actual practice, not all marginal totals are fixed and such methods are likely to provide estimates unacceptably close to sensitive cell values.

Heuristics presented in this paper could be extended or replaced. In general, and for actual purposes, however, the methods presented here will result in practical, usable tabular data, and provide a basis for specialized approaches tailored to particular data. We compared several reasonable computational heuristics and found that they produced essentially equivalent results.

Having established a conceptual, practical and computational basis for synthetic tabular data, we examined the question of what constitutes adequate protection for a sensitive cell. In the synthetic data setting, a more flexible, data-enhancing interpretation emerged. This will require further practical simulation and examination from a policy standpoint by statistical offices.

In summary, synthetic tabular data reproduces original data as closely as possible, subject to confidentiality requirements, and offers considerable flexibility for preserving original values and for providing disclosure protection at less cost in terms of computational requirements and distortion of true values. The synthetic tabular framework offers advantages both to data producers and data users not possible under the more restrictive complementary cell suppression regimen.

DISCLAIMER

The material presented herein has been reviewed and approved by the Centers for Disease Control and Prevention for publication. It is solely the work of the authors and should not be interpreted as representing the policies or practices of the Centers for Disease Control and Prevention, the Energy Information Administration, or any other organization.

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February 27, 2002

Table 43. Refiner Motor Gasoline Volumes by Grade, Sales Type, PAD District, and State
(Thousand Gallons per Day)

Geographic Area Month	Regular						Midgrade					
	Sales to End Users		Sales for Resale				Sales to End Users		Sales for Resale			
	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total
United States												
November 2006	45,109.5	46,307.2	34,984.4	195,329.6	31,904.2	262,218.1	6,049.4	6,116.4	2,351.5	11,172.9	–	13,524.4
October 2006	46,308.9	47,471.1	33,856.4	194,761.3	35,954.4	264,572.0	6,174.4	6,245.6	2,244.1	11,318.4	–	13,562.4
November 2005	47,001.6	48,145.3	34,836.8	190,758.1	45,057.6	270,652.6	5,602.7	5,678.0	2,779.3	12,955.6	–	15,734.9
PAD District I												
November 2006	14,048.1	14,434.0	11,924.3	63,239.3	7,476.9	82,640.5	1,685.3	1,720.6	773.0	2,271.4	–	3,044.4
October 2006	14,396.5	14,801.1	11,648.8	63,748.9	8,667.3	84,065.0	1,690.8	1,727.0	779.7	2,230.6	–	3,010.4
November 2005	13,904.5	14,329.8	11,775.0	63,721.1	13,445.4	88,941.5	1,759.6	1,801.0	1,027.8	2,576.6	–	3,604.5
Subdistrict IA												
November 2006	1,543.7	1,552.0	2,300.7	W	W	8,336.7	159.2	159.6	W	W	–	224.7
October 2006	1,691.1	1,700.5	W	6,146.9	W	8,553.9	162.1	162.4	W	W	–	233.2
November 2005	1,532.1	1,540.5	W	6,529.2	W	9,059.1	146.7	147.1	144.9	134.6	–	279.5
Connecticut												
November 2006	W	W	737.4	W	W	3,138.0	W	W	W	W	–	90.1
October 2006	W	W	742.1	W	W	3,134.8	W	W	52.6	46.2	–	98.8
November 2005	W	W	778.2	W	W	3,170.4	W	W	W	W	–	120.7
Maine												
November 2006	W	W	W	W	–	923.9	W	W	–	14.8	–	14.8
October 2006	W	W	W	W	W	1,036.4	W	W	–	17.4	–	17.4
November 2005	W	W	–	W	W	1,083.7	W	W	–	17.5	–	17.5
Massachusetts												
November 2006	989.1	995.3	1,223.7	1,753.8	–	2,977.4	103.6	103.9	W	W	–	89.5
October 2006	1,082.9	1,089.6	1,184.9	1,857.4	–	3,042.3	105.7	106.0	45.6	39.6	–	85.2
November 2005	917.1	922.8	1,069.1	W	W	3,188.5	91.8	92.2	W	W	–	102.4
New Hampshire												
November 2006	203.1	203.1	W	W	–	329.6	12.8	12.8	W	W	–	4.2
October 2006	224.3	224.3	W	W	–	345.7	13.4	13.4	W	W	–	W
November 2005	209.9	209.9	98.9	493.3	–	592.2	12.6	12.6	W	W	–	11.2
Rhode Island												
November 2006	234.5	234.5	180.1	W	W	576.5	26.1	26.1	W	W	–	17.0
October 2006	262.5	262.5	177.0	W	W	556.1	26.9	26.9	W	W	–	16.7
November 2005	261.4	261.4	191.2	W	W	658.0	26.7	26.7	W	W	–	18.3
Vermont												
November 2006	–	–	W	W	–	391.2	–	–	–	9.1	–	9.1
October 2006	–	–	W	W	–	438.5	–	–	–	W	–	W
November 2005	–	–	W	W	–	366.4	–	–	–	9.5	–	9.5
Subdistrict IB												
November 2006	5,408.0	5,532.9	7,383.2	W	W	32,680.0	617.8	626.5	W	W	–	798.4
October 2006	5,358.7	5,480.7	W	19,811.4	W	33,752.5	616.9	626.1	W	W	–	806.5
November 2005	5,109.2	5,233.3	W	19,226.3	W	37,995.4	651.9	662.5	572.4	412.3	–	984.7
Delaware												
November 2006	43.5	52.2	W	W	–	882.9	6.0	6.0	W	W	–	W
October 2006	49.0	57.2	W	W	–	849.5	6.7	6.8	W	W	–	W
November 2005	41.6	47.9	W	W	–	1,026.2	6.0	6.0	W	W	–	41.6
District of Columbia												
November 2006	–	W	79.6	–	–	79.6	–	W	W	–	–	W
October 2006	–	W	76.0	–	–	76.0	–	W	W	–	–	W
November 2005	–	W	119.7	–	–	119.7	–	W	28.7	–	–	28.7
Maryland												
November 2006	–	W	W	W	W	4,578.6	–	W	W	W	–	329.7
October 2006	–	W	1,446.5	W	W	4,623.5	–	W	W	W	–	333.2
November 2005	–	W	1,589.6	W	W	4,605.2	–	W	W	W	–	373.0
New Jersey												
November 2006	1,228.8	1,250.4	2,008.4	3,789.6	3,926.0	9,724.0	165.9	167.8	81.5	42.4	–	123.9
October 2006	1,148.7	1,171.1	2,021.5	3,939.4	5,402.9	11,363.8	160.4	162.4	80.5	44.6	–	125.1
November 2005	1,104.7	1,129.0	1,911.5	3,850.7	9,465.8	15,228.0	170.6	172.7	102.5	45.7	–	148.2
New York												
November 2006	2,459.1	2,484.7	2,237.9	W	W	7,978.8	279.3	280.3	128.6	52.0	–	180.5
October 2006	2,436.9	2,463.0	W	5,690.7	W	7,909.5	279.6	280.6	134.2	50.4	–	184.5
November 2005	2,204.9	2,237.1	W	5,212.1	W	7,704.4	285.0	287.5	W	W	–	261.2
Pennsylvania												
November 2006	1,676.6	1,710.2	1,447.2	W	W	9,436.1	166.7	168.4	W	W	–	115.8
October 2006	1,724.1	1,756.1	1,371.4	W	W	8,930.1	170.2	171.7	W	W	–	117.4
November 2005	1,758.0	1,785.4	W	6,250.4	W	9,311.9	190.3	191.7	7.2	124.6	–	131.9

See footnotes at end of table.

Table 43. Refiner Motor Gasoline Volumes by Grade, Sales Type, PAD District, and State

(Thousand Gallons per Day) — Continued

Geographic Area Month	Premium						All Grades					
	Sales to End Users		Sales for Resale				Sales to End Users		Sales for Resale			
	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total
United States												
November 2006	5,014.9	5,154.0	7,381.6	20,803.2	2,722.2	30,907.0	56,173.8	57,577.5	44,717.5	227,305.7	34,626.3	306,649.5
October 2006	5,118.0	5,256.2	7,236.7	20,719.1	2,945.0	30,900.7	57,601.3	58,972.9	43,337.2	226,798.7	38,899.3	309,035.2
November 2005	5,123.1	5,271.3	7,469.8	20,249.6	2,177.3	29,896.7	57,727.4	59,094.7	45,085.9	223,963.3	47,234.9	316,284.1
PAD District I												
November 2006	1,934.5	1,986.5	2,559.5	8,020.3	947.8	11,527.6	17,667.9	18,141.2	15,256.8	73,531.0	8,424.7	97,212.5
October 2006	1,955.2	2,005.5	2,516.6	8,026.2	1,532.6	12,075.4	18,042.5	18,533.6	14,945.1	74,005.7	10,199.9	99,150.7
November 2005	1,952.7	2,002.0	2,708.6	8,070.2	665.3	11,444.1	17,616.7	18,132.8	15,511.5	74,367.9	14,110.7	103,990.1
Subdistrict IA												
November 2006	187.7	188.0	379.6	611.8	–	991.4	1,890.6	1,899.6	W	6,555.0	W	9,552.8
October 2006	193.9	194.2	378.8	W	W	1,050.9	2,047.1	2,057.2	W	6,917.4	W	9,837.9
November 2005	189.3	189.6	W	678.9	W	1,072.3	1,868.1	1,877.2	2,706.7	7,342.7	361.6	10,411.0
Connecticut												
November 2006	W	W	144.0	298.1	–	442.1	W	W	W	2,644.8	W	3,670.3
October 2006	W	W	W	W	–	440.5	W	W	W	2,663.7	W	3,674.2
November 2005	W	W	151.9	294.5	–	446.4	W	W	W	2,640.5	W	3,737.5
Maine												
November 2006	W	W	–	49.8	–	49.8	W	W	W	W	–	988.5
October 2006	W	W	–	W	W	85.4	W	W	W	1,085.8	W	1,139.2
November 2005	W	W	–	W	W	54.4	W	W	–	W	W	1,155.6
Massachusetts												
November 2006	120.0	120.3	W	W	–	376.2	1,212.6	1,219.5	1,465.8	1,977.4	–	3,443.2
October 2006	124.8	125.2	192.8	194.0	–	386.7	1,313.5	1,320.8	1,423.3	2,091.0	–	3,514.3
November 2005	113.9	114.1	190.5	213.0	–	403.5	1,122.9	1,129.2	W	2,286.3	W	3,694.3
New Hampshire												
November 2006	15.8	15.8	W	W	–	32.4	231.7	231.7	W	W	–	366.2
October 2006	16.8	16.8	12.9	W	–	W	254.5	254.5	W	W	–	386.3
November 2005	18.4	18.4	W	W	–	54.0	240.8	240.8	W	W	–	657.4
Rhode Island												
November 2006	26.6	26.6	27.7	33.0	–	60.7	287.3	287.3	W	323.9	W	654.1
October 2006	28.6	28.6	27.4	37.9	–	65.4	318.1	318.1	W	383.8	W	638.2
November 2005	29.4	29.4	W	48.3	W	84.6	317.4	317.4	W	466.3	W	760.9
Vermont												
November 2006	–	–	W	W	–	30.1	–	–	W	W	–	430.5
October 2006	–	–	W	34.5	–	W	–	–	W	W	–	485.8
November 2005	–	–	W	W	–	29.4	–	–	W	W	–	405.3
Subdistrict IB												
November 2006	818.6	831.4	1,641.2	2,193.0	719.8	4,554.0	6,844.5	6,990.8	W	21,985.2	W	38,032.4
October 2006	826.7	839.0	1,590.8	W	W	5,292.5	6,802.4	6,945.8	W	22,492.8	W	39,851.5
November 2005	815.6	828.1	W	2,185.3	W	4,489.0	6,576.7	6,724.0	9,688.6	21,824.0	11,956.5	43,469.1
Delaware												
November 2006	7.2	7.7	W	W	–	W	56.7	65.9	W	W	–	1,009.7
October 2006	7.9	8.5	W	72.3	–	W	63.6	72.5	W	W	–	967.3
November 2005	6.2	7.1	W	W	–	111.1	53.8	61.0	W	W	–	1,178.9
District of Columbia												
November 2006	–	W	W	–	–	W	–	W	124.2	–	–	124.2
October 2006	–	W	W	–	–	W	–	W	120.8	–	–	120.8
November 2005	–	W	50.3	–	–	50.3	–	W	198.8	–	–	198.8
Maryland												
November 2006	–	W	308.5	504.2	–	812.7	–	W	1,934.5	W	W	5,720.9
October 2006	–	W	W	W	–	832.9	–	W	1,907.3	W	W	5,789.6
November 2005	–	W	W	W	W	840.2	–	W	2,172.0	W	W	5,818.4
New Jersey												
November 2006	254.3	257.0	431.2	497.4	645.3	1,573.9	1,648.9	1,675.2	2,521.1	4,329.5	4,571.3	11,421.9
October 2006	246.2	248.9	424.8	518.5	1,303.8	2,247.1	1,555.3	1,582.5	2,526.8	4,502.5	6,706.7	13,736.0
November 2005	249.6	251.8	441.3	530.8	450.6	1,422.7	1,524.9	1,553.6	2,455.3	4,427.2	9,916.4	16,798.9
New York												
November 2006	405.4	407.7	672.1	W	W	1,197.2	3,143.8	3,172.8	3,038.6	6,093.2	224.7	9,356.5
October 2006	413.1	415.4	W	529.2	W	1,199.7	3,129.6	3,159.0	W	6,270.3	W	9,293.8
November 2005	413.5	416.0	719.6	W	W	1,240.3	2,903.4	2,940.7	W	5,771.4	W	9,205.9
Pennsylvania												
November 2006	151.7	153.9	W	598.3	W	847.3	1,995.1	2,032.5	1,648.2	6,943.2	1,807.7	10,399.2
October 2006	159.5	160.9	W	635.8	W	896.6	2,053.9	2,088.7	1,560.8	7,042.6	1,340.6	9,944.0
November 2005	146.3	148.2	W	583.3	W	824.4	2,094.6	2,125.3	W	6,958.4	W	10,268.2

See footnotes at end of table.

Table 43. Refiner Motor Gasoline Volumes by Grade, Sales Type, PAD District, and State

(Thousand Gallons per Day) — Continued

Geographic Area Month	Regular						Midgrade					
	Sales to End Users		Sales for Resale				Sales to End Users		Sales for Resale			
	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total
Subdistrict IC												
November 2006	7,096.4	7,349.1	2,240.4	38,008.9	1,374.5	41,623.8	908.3	934.6	254.9	1,766.4	–	2,021.3
October 2006	7,346.7	7,619.8	2,186.0	37,790.5	1,782.1	41,758.6	911.7	938.5	261.7	1,709.1	–	1,970.8
November 2005	7,263.2	7,555.9	2,240.3	37,965.6	1,681.2	41,887.0	961.0	991.4	310.5	2,029.7	–	2,340.3
Florida												
November 2006	4,236.2	4,295.5	W	9,979.8	W	12,096.1	589.7	595.2	141.5	609.0	–	750.4
October 2006	4,350.5	4,409.9	W	10,036.5	W	12,708.3	590.6	595.3	147.9	604.7	–	752.6
November 2005	4,317.7	4,382.9	1,291.3	10,573.9	1,470.9	13,336.2	619.5	624.8	172.1	725.1	–	897.2
Georgia												
November 2006	W	985.5	W	W	W	7,612.8	W	122.8	W	W	–	352.5
October 2006	W	1,056.9	W	7,466.5	W	7,682.1	W	126.5	W	W	–	340.2
November 2005	1,038.3	1,105.2	W	7,354.9	W	7,515.8	136.9	144.4	W	W	–	356.7
North Carolina												
November 2006	W	473.9	W	W	W	9,196.2	W	40.6	W	W	–	342.8
October 2006	W	499.7	W	9,105.8	W	9,146.6	W	40.6	–	330.3	–	330.3
November 2005	372.6	465.2	W	W	W	9,010.0	28.8	36.8	–	418.7	–	418.7
South Carolina												
November 2006	571.7	599.4	W	4,287.1	W	4,412.5	56.1	60.8	W	W	–	159.8
October 2006	597.2	629.1	W	W	W	4,338.6	56.5	61.5	W	W	–	153.5
November 2005	525.5	564.0	W	W	W	4,060.7	52.1	58.0	W	W	–	170.6
Virginia												
November 2006	493.8	516.9	831.5	W	W	7,343.7	84.7	87.8	91.0	291.6	–	382.5
October 2006	500.9	531.3	841.1	W	W	6,960.2	83.3	87.2	92.4	271.3	–	363.7
November 2005	545.7	575.3	800.3	6,243.9	–	7,044.2	93.4	97.2	114.3	347.8	–	462.1
West Virginia												
November 2006	478.0	478.0	–	962.5	–	962.5	27.3	27.3	–	33.2	–	33.2
October 2006	492.8	492.8	W	W	–	922.8	27.5	27.5	–	30.5	–	30.5
November 2005	463.4	463.4	–	920.2	–	920.2	30.3	30.3	–	35.0	–	35.0
PAD District II												
November 2006	12,761.7	12,981.2	1,385.3	65,710.0	4,975.3	72,070.6	2,030.8	2,035.2	211.0	6,808.0	–	7,019.1
October 2006	13,305.1	13,545.7	1,223.6	65,150.6	5,487.6	71,861.8	2,102.9	2,107.7	117.1	7,042.1	–	7,159.2
November 2005	14,597.2	14,809.7	2,276.8	63,894.6	5,175.3	71,346.6	1,372.3	1,376.5	222.0	8,055.7	–	8,277.7
Illinois												
November 2006	1,940.1	1,962.1	1,000.1	6,969.8	492.9	8,462.8	816.3	817.0	112.7	819.4	–	932.1
October 2006	1,996.7	2,020.2	842.5	7,014.2	738.9	8,595.5	870.2	871.5	104.4	804.6	–	909.0
November 2005	2,458.6	2,472.4	820.3	6,643.8	806.2	8,270.3	358.2	359.2	145.9	1,078.7	–	1,224.6
Indiana												
November 2006	1,422.6	1,433.8	W	5,060.9	W	5,232.2	211.7	211.7	W	W	–	457.0
October 2006	1,477.2	1,490.7	W	4,789.5	W	5,102.7	214.4	214.4	W	W	–	505.8
November 2005	1,754.4	1,772.2	W	4,523.6	W	4,853.2	129.2	129.2	W	W	–	467.3
Iowa												
November 2006	W	W	W	W	–	1,409.2	W	W	W	W	–	1,599.8
October 2006	W	W	W	W	–	1,500.9	W	W	W	W	–	1,501.7
November 2005	W	W	–	1,884.1	–	1,884.1	W	W	–	1,724.7	–	1,724.7
Kansas												
November 2006	NA	NA	–	2,836.7	1,346.9	4,183.6	NA	NA	–	99.4	–	99.4
October 2006	174.0	177.5	–	W	W	4,095.1	11.5	11.5	–	145.6	–	145.6
November 2005	168.6	171.2	–	W	W	4,735.0	13.4	13.4	–	189.3	–	189.3
Kentucky												
November 2006	821.3	853.5	W	3,615.3	W	3,907.4	49.7	50.1	–	90.0	–	90.0
October 2006	851.1	881.6	W	3,774.5	W	4,003.0	49.9	50.3	–	89.6	–	89.6
November 2005	838.3	871.6	W	W	–	3,915.3	54.6	55.0	W	W	–	113.1
Michigan												
November 2006	W	W	–	W	W	9,642.5	W	W	–	677.5	–	677.5
October 2006	W	1,979.4	–	W	W	9,882.5	W	W	–	627.7	–	627.7
November 2005	W	W	W	9,064.1	W	9,300.5	W	W	W	W	–	691.7
Minnesota												
November 2006	928.1	937.8	–	W	W	4,645.9	W	W	–	716.1	–	716.1
October 2006	953.0	963.7	–	W	W	4,674.9	W	W	–	764.8	–	764.8
November 2005	970.2	985.0	W	4,240.1	W	4,857.1	W	W	W	W	–	714.0
Missouri												
November 2006	728.8	756.1	W	W	–	4,862.5	38.2	38.8	W	W	–	NA
October 2006	762.9	788.9	4.4	4,742.1	–	4,746.5	36.5	37.2	W	W	–	126.4
November 2005	898.7	919.4	W	W	–	4,554.8	61.1	61.1	W	W	–	204.8

See footnotes at end of table.

Table 43. Refiner Motor Gasoline Volumes by Grade, Sales Type, PAD District, and State

(Thousand Gallons per Day) — Continued

Geographic Area Month	Premium						All Grades					
	Sales to End Users		Sales for Resale				Sales to End Users		Sales for Resale			
	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total
Subdistrict IC												
November 2006	928.2	967.1	538.7	5,215.5	228.1	5,982.2	8,932.9	9,250.8	3,034.0	44,990.7	1,602.6	49,627.3
October 2006	934.6	972.3	547.0	5,095.9	89.0	5,731.9	9,193.0	9,530.6	2,994.7	44,595.5	1,871.1	49,461.3
November 2005	947.8	984.3	565.4	5,206.0	111.5	5,882.8	9,171.9	9,531.6	3,116.2	45,201.3	1,792.6	50,110.1
Florida												
November 2006	623.6	629.9	W	1,609.9	W	2,118.7	5,449.5	5,520.6	1,696.8	12,198.7	1,069.7	14,965.2
October 2006	622.5	628.7	W	1,611.3	W	1,984.9	5,563.6	5,634.0	1,646.1	12,252.5	1,547.2	15,445.8
November 2005	624.5	630.3	308.1	1,707.1	111.5	2,126.6	5,561.7	5,638.0	1,771.6	13,006.0	1,582.4	16,360.0
Georgia												
November 2006	W	126.4	W	1,034.7	W	1,062.8	W	1,234.7	W	8,785.3	W	9,028.2
October 2006	W	131.9	W	W	W	1,037.1	W	1,315.4	W	8,797.5	W	9,059.4
November 2005	134.9	142.8	W	W	–	1,008.4	1,310.1	1,392.4	W	8,675.7	W	8,880.8
North Carolina												
November 2006	W	40.1	–	1,099.3	–	1,099.3	W	554.6	W	10,375.4	W	10,638.3
October 2006	W	38.7	–	1,100.9	–	1,100.9	W	579.0	W	10,537.0	W	10,577.9
November 2005	28.3	39.8	W	W	–	1,093.5	429.7	541.8	W	10,423.0	W	10,522.2
South Carolina												
November 2006	43.2	48.6	W	W	–	523.2	671.0	708.8	W	4,957.8	W	5,095.5
October 2006	44.1	49.9	W	W	–	504.1	697.8	740.5	W	W	W	4,996.2
November 2005	37.6	43.8	W	W	–	480.0	615.2	665.8	W	4,602.4	W	4,711.3
Virginia												
November 2006	102.2	106.6	W	W	–	1,109.5	680.7	711.3	W	7,609.2	W	8,835.7
October 2006	101.6	106.8	225.1	W	W	1,038.7	685.8	725.3	1,158.5	7,124.9	79.2	8,362.6
November 2005	107.1	112.0	227.1	879.0	–	1,106.2	746.2	784.5	1,141.7	7,470.8	–	8,612.5
West Virginia												
November 2006	15.4	15.4	–	68.7	–	68.7	520.7	520.7	–	1,064.4	–	1,064.4
October 2006	16.3	16.3	W	W	–	66.2	536.5	536.5	W	W	–	1,019.5
November 2005	15.4	15.4	–	68.1	–	68.1	509.1	509.1	–	1,023.3	–	1,023.3
PAD District II												
November 2006	880.4	907.1	280.9	4,774.4	356.1	5,411.3	15,672.9	15,923.5	1,877.2	77,292.4	5,331.4	84,501.0
October 2006	918.7	949.4	251.1	4,833.2	100.0	5,184.3	16,326.7	16,602.8	1,591.8	77,025.9	5,587.6	84,205.3
November 2005	1,021.2	1,053.6	371.0	4,801.5	229.0	5,401.5	16,990.7	17,239.7	2,869.7	76,751.9	5,404.2	85,025.8
Illinois												
November 2006	333.9	335.3	231.2	648.6	–	879.8	3,090.3	3,114.5	1,344.0	8,437.8	492.9	10,274.7
October 2006	347.7	349.3	207.1	657.9	–	865.1	3,214.6	3,240.9	1,154.0	8,476.8	738.9	10,369.6
November 2005	352.0	353.2	215.5	652.2	–	867.7	3,168.8	3,184.8	1,181.7	8,374.7	806.2	10,362.6
Indiana												
November 2006	80.0	80.2	W	W	–	361.3	1,714.3	1,725.7	W	5,856.6	W	6,050.5
October 2006	85.6	85.7	W	W	–	356.3	1,777.1	1,790.8	W	5,629.4	W	5,964.8
November 2005	110.2	110.2	W	W	–	352.0	1,993.8	2,011.6	W	5,292.3	W	5,672.5
Iowa												
November 2006	W	W	W	W	–	107.1	W	W	W	W	–	3,116.0
October 2006	W	W	W	W	–	101.9	W	W	W	W	–	3,104.5
November 2005	W	W	–	104.0	–	104.0	W	W	–	3,712.9	–	3,712.9
Kansas												
November 2006	NA	NA	–	161.3	114.2	275.6	NA	NA	–	3,097.5	1,461.1	4,558.6
October 2006	13.2	13.2	–	W	W	171.0	198.7	202.3	–	2,982.1	1,429.6	4,411.7
November 2005	13.4	13.4	–	W	W	244.3	195.4	198.0	–	3,259.2	1,909.5	5,168.6
Kentucky												
November 2006	36.8	38.9	W	268.8	W	297.3	907.8	942.5	W	3,974.2	W	4,294.8
October 2006	37.7	39.8	W	277.3	W	295.1	938.7	971.6	W	4,141.4	W	4,387.7
November 2005	36.9	39.8	W	W	–	289.4	929.9	966.4	W	W	–	4,317.8
Michigan												
November 2006	W	69.5	–	590.6	–	590.6	W	W	–	W	W	10,910.6
October 2006	W	W	–	616.2	–	616.2	W	2,120.1	–	W	W	11,126.4
November 2005	W	75.5	W	W	W	596.3	W	W	W	10,337.8	W	10,588.4
Minnesota												
November 2006	W	W	–	W	W	294.4	W	1,035.0	–	W	W	5,656.4
October 2006	W	W	–	W	W	273.1	1,052.1	1,063.7	–	W	W	5,712.8
November 2005	W	W	W	W	W	277.2	1,080.7	1,095.8	W	5,154.5	W	5,848.2
Missouri												
November 2006	36.4	37.7	W	W	–	311.0	803.5	832.6	6.9	5,296.6	–	5,303.5
October 2006	37.4	38.5	W	W	–	310.0	836.8	864.6	4.9	5,177.9	–	5,182.8
November 2005	53.1	54.7	W	W	–	308.8	1,012.8	1,035.2	W	W	–	5,068.4

See footnotes at end of table.

Table 43. Refiner Motor Gasoline Volumes by Grade, Sales Type, PAD District, and State
(Thousand Gallons per Day) — Continued

Geographic Area Month	Regular						Midgrade					
	Sales to End Users		Sales for Resale				Sales to End Users		Sales for Resale			
	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total
Nebraska												
November 2006	W	W	W	W	–	1,217.5	W	W	W	W	–	726.4
October 2006	W	14.2	–	1,123.6	–	1,123.6	W	W	–	711.5	–	711.5
November 2005	W	W	–	1,246.6	–	1,246.6	W	W	–	745.0	–	745.0
North Dakota												
November 2006	–	–	–	650.3	–	650.3	–	–	–	197.7	–	197.7
October 2006	–	W	–	600.3	–	600.3	–	–	–	201.0	–	201.0
November 2005	–	–	–	667.2	–	667.2	–	–	–	211.2	–	211.2
Ohio												
November 2006	3,579.4	3,616.5	W	8,002.5	W	8,514.8	233.3	234.6	NA	289.9	–	301.3
October 2006	3,843.2	3,882.4	W	7,895.0	W	8,555.8	237.9	238.8	W	W	–	466.8
November 2005	3,978.9	4,005.3	W	7,165.5	W	8,345.7	290.3	291.9	W	W	–	834.6
Oklahoma												
November 2006	W	W	W	3,757.1	W	5,631.2	14.2	14.4	–	14.0	–	14.0
October 2006	W	W	W	3,565.6	W	5,226.5	13.8	13.9	–	13.5	–	13.5
November 2005	378.8	380.4	W	4,269.5	W	5,434.6	15.0	15.1	–	19.0	–	19.0
South Dakota												
November 2006	W	7.3	–	818.2	–	818.2	W	W	–	246.8	–	246.8
October 2006	W	8.0	–	803.4	–	803.4	W	W	–	239.4	–	239.4
November 2005	W	7.3	W	W	–	749.3	W	W	W	W	–	264.6
Tennessee												
November 2006	774.1	791.9	–	W	W	7,331.4	84.9	85.6	–	316.3	–	316.3
October 2006	784.3	802.4	–	W	W	7,485.5	82.8	82.8	–	313.4	–	313.4
November 2005	855.1	872.0	W	6,661.6	W	6,956.5	111.3	111.7	W	W	–	326.4
Wisconsin												
November 2006	110.7	114.9	W	W	–	5,561.2	W	W	W	W	–	514.7
October 2006	110.0	115.4	–	5,465.6	–	5,465.6	W	W	–	543.1	–	543.1
November 2005	W	W	–	5,576.5	–	5,576.5	W	W	–	547.4	–	547.4
PAD District III												
November 2006	8,366.2	8,561.2	W	38,382.3	W	55,624.4	762.3	770.5	W	W	–	1,152.2
October 2006	8,273.5	8,452.5	W	W	19,094.3	57,721.0	752.8	760.5	W	W	–	1,112.7
November 2005	8,003.1	8,182.1	560.9	37,196.7	23,937.4	61,695.0	759.7	773.9	55.5	1,278.0	–	1,333.5
Alabama												
November 2006	W	W	W	W	–	4,646.0	W	W	W	W	–	191.4
October 2006	W	W	W	W	–	4,627.9	W	W	W	W	–	199.5
November 2005	W	410.1	W	W	–	4,573.5	W	31.8	W	W	–	217.8
Arkansas												
November 2006	W	W	W	W	W	2,843.4	W	W	–	56.2	–	56.2
October 2006	W	W	W	2,702.5	W	2,807.9	W	W	–	54.8	–	54.8
November 2005	W	W	W	2,724.3	W	2,799.9	W	W	–	60.9	–	60.9
Louisiana												
November 2006	941.6	970.4	W	W	1,814.2	6,415.1	84.2	85.7	W	W	–	144.2
October 2006	893.4	921.6	W	4,508.4	W	7,970.4	82.7	83.5	W	W	–	142.2
November 2005	NA	919.4	W	W	2,367.4	6,878.6	NA	94.2	W	W	–	171.7
Mississippi												
November 2006	W	368.8	–	3,267.9	509.4	3,777.3	25.3	W	–	134.7	–	134.7
October 2006	W	372.1	–	W	W	3,809.4	24.7	W	–	134.8	–	134.8
November 2005	340.4	W	–	W	W	3,427.9	26.4	W	–	172.0	–	172.0
New Mexico												
November 2006	387.2	394.4	58.8	1,677.0	–	1,735.8	40.0	40.3	W	W	–	31.2
October 2006	375.2	382.7	57.8	1,651.5	–	1,709.4	40.2	40.4	W	W	–	28.2
November 2005	345.2	355.3	71.0	1,718.2	–	1,789.3	36.4	36.6	W	W	–	31.2
Texas												
November 2006	5,887.8	5,996.9	504.3	21,537.5	14,164.9	36,206.7	570.2	574.5	W	W	–	594.6
October 2006	5,853.0	5,946.5	481.4	21,342.3	14,972.5	36,796.1	563.5	567.8	W	W	–	553.2
November 2005	5,635.5	5,733.9	335.1	20,535.6	21,355.3	42,226.0	559.8	566.8	36.5	643.5	–	679.9
PAD District IV												
November 2006	1,519.8	1,551.4	W	8,341.8	W	9,254.1	304.8	306.2	W	W	–	349.2
October 2006	1,428.0	1,457.1	W	W	W	9,137.8	316.3	319.4	W	W	–	352.3
November 2005	1,547.1	1,572.9	W	7,641.9	W	8,580.3	397.8	400.7	34.2	361.0	–	395.2
Colorado												
November 2006	1,262.9	1,264.3	W	W	–	3,360.8	249.7	249.7	W	W	–	181.4
October 2006	1,158.1	1,159.2	14.5	3,425.5	–	3,440.0	256.8	256.8	W	W	–	193.2
November 2005	1,191.4	1,192.6	W	2,957.4	W	3,116.9	323.4	323.7	W	W	–	193.8

See footnotes at end of table.

Table 43. Refiner Motor Gasoline Volumes by Grade, Sales Type, PAD District, and State
(Thousand Gallons per Day) — Continued

Geographic Area Month	Premium						All Grades					
	Sales to End Users		Sales for Resale				Sales to End Users		Sales for Resale			
	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total
Nebraska												
November 2006	W	W	W	W	–	76.4	W	W	W	W	–	2,020.3
October 2006	W	W	–	71.0	–	71.0	W	26.7	–	1,906.1	–	1,906.1
November 2005	W	W	–	79.0	–	79.0	W	W	–	2,070.5	–	2,070.5
North Dakota												
November 2006	–	–	–	27.8	–	27.8	–	–	–	875.8	–	875.8
October 2006	–	–	–	27.8	–	27.8	–	W	–	829.1	–	829.1
November 2005	–	–	–	27.2	–	27.2	–	–	–	905.5	–	905.5
Ohio												
November 2006	178.5	180.9	W	542.4	W	582.3	3,991.2	4,031.9	W	8,834.8	W	9,398.3
October 2006	187.3	190.7	W	W	W	602.6	4,268.3	4,311.9	W	8,921.2	W	9,625.2
November 2005	218.5	225.7	W	W	W	597.9	4,487.6	4,522.9	W	8,486.9	W	9,778.2
Oklahoma												
November 2006	13.4	13.4	W	270.6	W	389.7	W	W	W	4,041.6	W	6,034.9
October 2006	13.3	13.3	W	W	W	266.5	W	W	W	W	1,666.5	5,506.4
November 2005	14.1	14.2	W	383.0	W	488.2	407.9	409.7	W	4,671.5	W	5,941.7
South Dakota												
November 2006	W	W	–	47.4	–	47.4	W	14.9	–	1,112.3	–	1,112.3
October 2006	W	W	–	48.3	–	48.3	W	15.9	–	1,091.0	–	1,091.0
November 2005	W	W	W	W	–	35.9	W	15.2	W	W	–	1,049.8
Tennessee												
November 2006	67.1	67.8	–	W	W	843.3	926.1	945.3	–	W	W	8,491.0
October 2006	66.4	67.0	–	W	W	834.5	933.5	952.1	–	W	W	8,633.5
November 2005	95.1	95.9	W	W	W	802.0	1,061.5	1,079.6	W	7,750.0	W	8,085.0
Wisconsin												
November 2006	W	W	W	W	–	327.3	W	W	W	W	–	6,403.2
October 2006	W	W	–	345.0	–	345.0	W	W	–	6,353.8	–	6,353.8
November 2005	W	W	–	331.6	–	331.6	W	W	–	6,455.5	–	6,455.5
PAD District III												
November 2006	627.1	645.7	84.7	W	W	5,231.3	9,755.5	9,977.3	803.3	43,537.4	17,667.2	62,007.9
October 2006	623.5	645.6	87.5	3,871.9	834.5	4,793.9	9,649.8	9,858.6	782.2	42,916.6	19,928.8	63,627.6
November 2005	617.5	640.7	103.7	3,894.8	1,018.5	5,017.0	9,380.3	9,596.7	720.1	42,369.6	24,955.9	68,045.6
Alabama												
November 2006	W	23.5	W	W	–	505.5	W	W	W	W	–	5,342.9
October 2006	W	24.8	W	W	–	510.8	W	W	W	W	–	5,338.3
November 2005	W	29.2	W	W	–	511.7	W	471.1	W	W	–	5,303.0
Arkansas												
November 2006	W	W	W	W	–	254.2	W	W	W	3,077.9	W	3,153.8
October 2006	W	W	W	252.1	W	286.6	W	W	W	3,009.4	W	3,149.3
November 2005	W	W	W	242.8	W	411.3	W	W	W	3,028.0	W	3,272.1
Louisiana												
November 2006	69.6	72.4	W	414.0	W	534.4	1,095.4	1,128.5	W	5,052.6	W	7,093.7
October 2006	68.5	71.4	W	W	169.6	595.2	1,044.6	1,076.4	W	5,046.7	W	8,707.8
November 2005	NA	78.0	W	421.8	W	517.7	1,056.7	1,091.5	W	4,987.4	W	7,568.0
Mississippi												
November 2006	W	W	–	W	W	534.2	397.4	412.5	–	W	W	4,446.2
October 2006	17.4	W	–	W	W	408.7	W	415.2	–	W	W	4,352.8
November 2005	18.9	W	–	W	W	347.1	385.7	W	–	W	W	3,947.0
New Mexico												
November 2006	29.7	30.0	W	W	–	206.3	456.9	464.7	70.0	1,903.3	–	1,973.3
October 2006	28.6	28.9	W	W	–	206.4	444.0	451.9	69.0	1,875.0	–	1,944.0
November 2005	23.3	23.7	W	W	–	199.3	404.9	415.7	84.5	1,935.2	–	2,019.7
Texas												
November 2006	479.4	487.1	W	W	819.9	3,196.7	6,937.5	7,058.4	581.4	24,431.8	14,984.8	39,998.0
October 2006	477.3	487.7	W	W	560.6	2,786.1	6,893.8	7,002.0	562.4	24,040.0	15,533.0	40,135.4
November 2005	466.1	474.9	64.7	2,198.4	766.8	3,029.9	6,661.3	6,775.6	436.2	23,377.5	22,122.1	45,935.8
PAD District IV												
November 2006	199.3	204.5	W	W	W	1,359.7	2,023.9	2,062.2	W	9,916.7	W	10,963.0
October 2006	188.1	193.3	W	1,231.2	W	1,340.9	1,932.4	1,969.9	W	9,804.4	W	10,831.0
November 2005	194.5	199.7	W	1,063.9	W	1,157.7	2,139.5	2,173.3	W	9,066.7	W	10,133.2
Colorado												
November 2006	172.5	172.5	W	W	–	484.8	1,685.2	1,686.5	W	W	–	4,027.1
October 2006	161.1	161.4	W	W	–	481.9	1,576.0	1,577.4	17.9	4,097.2	–	4,115.1
November 2005	165.1	165.1	W	W	W	415.8	1,679.9	1,681.4	W	3,534.7	W	3,726.6

See footnotes at end of table.

Table 43. Refiner Motor Gasoline Volumes by Grade, Sales Type, PAD District, and State

(Thousand Gallons per Day) — Continued

Geographic Area Month	Regular						Midgrade					
	Sales to End Users		Sales for Resale				Sales to End Users		Sales for Resale			
	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total
Idaho												
November 2006	W	55.8	W	W	–	1,502.7	W	W	W	W	–	29.8
October 2006	W	56.4	W	W	–	1,455.9	W	W	W	26.2	–	W
November 2005	W	W	W	W	–	1,395.2	W	W	W	W	–	W
Montana												
November 2006	W	6.5	–	W	W	1,165.9	W	W	–	W	–	W
October 2006	W	W	–	1,186.7	W	W	W	W	–	W	–	W
November 2005	W	W	–	W	–	W	W	W	–	W	–	W
Utah												
November 2006	175.1	196.1	W	W	–	2,606.1	46.0	47.4	W	W	–	115.0
October 2006	184.9	205.5	W	W	–	2,445.3	49.5	52.6	W	W	–	110.3
November 2005	247.8	264.3	W	W	–	2,336.8	62.3	65.0	W	W	–	139.9
Wyoming												
November 2006	21.7	28.7	–	618.5	–	618.5	3.8	3.8	–	W	–	W
October 2006	23.6	W	–	W	–	W	4.1	4.1	–	–	–	–
November 2005	20.9	27.8	–	W	–	W	3.6	3.6	–	–	–	–
PAD District V												
November 2006	8,413.7	8,779.4	20,086.8	19,656.1	2,885.6	42,628.5	1,266.2	1,283.8	1,303.9	655.7	–	1,959.6
October 2006	8,905.9	9,214.6	W	19,646.0	W	41,786.5	1,311.6	1,331.0	1,284.2	643.5	–	1,927.7
November 2005	8,949.7	9,250.9	W	18,303.9	W	40,089.1	1,313.3	1,326.0	1,439.8	684.2	–	2,124.0
Alaska												
November 2006	W	129.2	W	350.2	W	506.1	W	W	W	W	–	37.8
October 2006	W	120.5	W	344.5	W	504.9	W	W	W	W	–	33.3
November 2005	94.9	100.3	94.7	W	W	507.5	W	W	W	W	–	26.7
Arizona												
November 2006	926.1	1,158.0	1,356.6	2,238.6	831.8	4,426.9	72.1	73.5	17.0	62.2	–	79.2
October 2006	914.2	1,126.3	W	2,170.6	W	4,113.4	70.4	71.9	17.9	61.8	–	79.7
November 2005	875.5	1,069.3	W	2,010.2	W	3,645.8	NA	NA	W	W	–	85.2
California												
November 2006	5,869.5	5,887.0	14,965.1	10,492.8	1,475.1	26,933.0	989.3	989.5	1,029.4	387.2	–	1,416.6
October 2006	6,267.9	6,279.0	14,738.2	10,425.5	1,485.7	26,649.5	1,027.0	1,027.5	1,013.6	377.0	–	1,390.6
November 2005	6,251.6	6,259.2	14,396.6	9,560.9	1,199.8	25,157.3	1,028.8	1,029.5	1,119.9	416.8	–	1,536.6
Hawaii												
November 2006	W	220.3	W	W	W	469.2	W	44.6	W	W	–	46.2
October 2006	136.8	192.9	W	W	W	494.5	32.1	45.8	W	W	–	46.5
November 2005	116.9	208.3	W	W	W	700.6	27.2	35.9	W	W	–	54.6
Nevada												
November 2006	NA	41.8	W	W	–	1,641.0	NA	W	W	W	–	115.0
October 2006	W	35.5	940.4	W	W	1,635.2	W	W	81.3	32.0	–	113.3
November 2005	52.1	54.6	938.7	607.8	–	1,546.4	W	W	85.7	40.0	–	125.7
Oregon												
November 2006	455.4	456.6	1,022.5	W	W	3,536.9	43.8	43.8	W	W	–	69.9
October 2006	473.6	473.6	W	2,158.4	W	2,872.0	44.8	44.8	W	W	–	63.2
November 2005	530.8	530.8	898.6	W	W	3,123.3	49.5	49.5	W	W	–	71.0
Washington												
November 2006	886.3	886.4	W	3,452.7	W	5,115.3	118.2	118.2	95.6	99.2	–	194.8
October 2006	986.6	986.8	W	3,710.8	W	5,516.9	129.1	129.1	98.1	103.0	–	201.1
November 2005	1,028.0	1,028.4	W	3,521.9	W	5,408.2	130.6	130.6	W	W	–	224.0

See footnotes at end of table.

Table 43. Refiner Motor Gasoline Volumes by Grade, Sales Type, PAD District, and State

(Thousand Gallons per Day) — Continued

Geographic Area Month	Premium						All Grades					
	Sales to End Users		Sales for Resale				Sales to End Users		Sales for Resale			
	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total
Idaho												
November 2006	W	W	W	W	–	163.7	W	63.2	W	W	–	1,696.3
October 2006	W	W	W	144.0	–	W	W	64.1	W	W	–	1,654.6
November 2005	W	W	W	W	–	W	W	W	W	W	–	1,571.0
Montana												
November 2006	W	W	–	W	W	W	W	8.1	–	1,339.8	NA	1,348.3
October 2006	W	W	–	W	W	W	W	W	–	W	W	1,367.6
November 2005	W	W	–	W	–	W	W	W	–	1,307.1	–	1,307.1
Utah												
November 2006	21.1	25.1	W	386.5	W	467.2	242.2	268.6	W	2,429.8	W	3,188.2
October 2006	21.5	25.4	W	367.4	W	450.2	255.9	283.5	W	2,264.2	W	3,005.7
November 2005	23.1	27.1	W	W	–	396.0	333.2	356.4	W	W	–	2,872.6
Wyoming												
November 2006	2.1	3.2	–	W	–	W	27.6	35.7	–	703.1	–	703.1
October 2006	2.2	3.2	–	W	–	W	29.9	W	–	687.9	–	687.9
November 2005	2.0	3.1	–	W	–	W	26.5	34.5	–	655.9	–	655.9
PAD District V												
November 2006	1,373.6	1,410.1	W	2,716.3	W	7,377.0	11,053.5	11,473.3	W	23,028.1	W	51,965.1
October 2006	1,432.5	1,462.3	W	2,756.5	W	7,506.3	11,649.9	12,008.0	W	23,046.1	W	51,220.5
November 2005	1,337.1	1,375.3	W	2,419.1	W	6,876.4	11,600.1	11,952.2	W	21,407.2	W	49,089.4
Alaska												
November 2006	W	W	W	W	–	14.1	W	143.4	110.0	W	W	558.0
October 2006	W	W	W	W	–	14.1	W	132.5	106.8	W	W	552.2
November 2005	W	W	W	W	–	14.9	104.9	110.5	110.4	W	W	549.0
Arizona												
November 2006	74.1	94.3	213.3	302.5	50.7	566.5	1,072.3	1,325.8	1,586.9	2,603.3	882.5	5,072.7
October 2006	72.9	93.5	W	298.0	W	553.0	1,057.6	1,291.7	1,502.9	2,530.5	712.8	4,746.1
November 2005	81.7	98.7	196.0	W	W	446.3	1,023.1	1,235.9	W	2,311.6	W	4,177.3
California												
November 2006	1,099.4	1,099.6	3,544.8	1,661.9	188.1	5,394.8	7,958.1	7,976.1	19,539.3	12,541.9	1,663.2	33,744.4
October 2006	1,141.5	1,141.9	3,493.6	1,656.9	341.8	5,492.3	8,436.4	8,448.4	19,245.5	12,459.5	1,827.5	33,532.5
November 2005	1,057.5	1,057.7	3,406.1	1,458.7	151.8	5,016.6	8,337.9	8,346.3	18,922.6	11,436.3	1,351.5	31,710.5
Hawaii												
November 2006	W	50.2	W	W	W	119.2	205.3	315.2	W	W	W	634.6
October 2006	33.0	41.7	W	W	W	110.1	201.8	280.5	W	W	W	651.2
November 2005	24.7	45.3	W	W	W	168.8	168.7	289.5	W	W	W	924.1
Nevada												
November 2006	W	W	197.6	W	W	337.9	W	52.4	1,256.4	W	W	2,093.9
October 2006	W	W	193.0	W	W	345.0	W	44.9	1,214.7	W	W	2,093.5
November 2005	W	W	185.6	151.1	–	336.8	63.4	67.5	1,210.0	798.9	–	2,008.9
Oregon												
November 2006	44.4	44.4	101.1	200.9	NA	310.1	543.6	544.8	W	2,552.0	W	3,916.9
October 2006	50.5	50.5	76.1	W	W	285.2	568.9	568.9	W	2,396.1	W	3,220.4
November 2005	49.3	49.3	89.2	176.8	–	265.9	629.6	629.6	W	2,347.8	W	3,460.3
Washington												
November 2006	111.0	111.0	W	390.3	W	634.6	1,115.5	1,115.6	W	3,942.2	W	5,944.7
October 2006	125.2	125.2	W	432.0	W	706.6	1,240.9	1,241.2	1,935.3	4,245.8	243.4	6,424.6
November 2005	113.9	114.0	242.5	W	W	627.1	1,272.5	1,273.0	W	4,000.8	W	6,259.3

Dash (–) = No data reported.
NA = Not available.
W = Withheld to avoid disclosure of individual company data.
[a] Includes sales through retail outlets as well as all direct sales to end users that were not made through company-operated retail outlets, e.g., sales to agricultural customers, commercial sales, and industrial sales.
Notes: Motor gasoline averages and totals prior to October 1993 include leaded gasoline.
Notes: Values shown for the current month are preliminary. Values shown for previous months are revised. Data are final upon publication in the *Petroleum Marketing Annual.*
Source: Energy Information Administration Form EIA-782A, "Refiners'/Gas Plant Operators' Monthly Petroleum Product Sales Report."

Table 44. Refiner Motor Gasoline Volumes by Formulation, Sales Type, PAD District, and State

(Thousand Gallons per Day)

Geographic Area / Month	Conventional						Oxygenated					
	Sales to End Users		Sales for Resale				Sales to End Users		Sales for Resale			
	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total
United States												
November 2006	31,587.1	32,542.6	7,582.5	164,118.7	32,289.1	203,990.3	2,356.3	2,456.6	1,987.9	9,707.9	–	11,695.8
October 2006	32,839.1	33,779.2	7,805.6	164,138.6	35,224.7	207,168.9	1,849.7	1,947.0	1,330.7	9,054.5	–	10,385.2
November 2005	32,562.5	33,530.7	8,923.5	162,294.3	38,193.8	209,411.6	2,752.0	2,842.1	1,933.7	8,512.0	–	10,445.7
PAD District I												
November 2006	11,338.2	11,653.2	3,084.9	53,263.1	7,660.0	64,008.0	–	–	–	–	–	–
October 2006	11,632.4	11,957.7	3,067.1	53,428.1	8,221.5	64,716.7	–	–	–	–	–	–
November 2005	11,446.2	11,799.2	3,613.0	52,644.8	7,044.1	63,301.9	–	–	–	–	–	–
Subdistrict IA												
November 2006	W	W	W	W	–	1,479.3	–	–	–	–	–	–
October 2006	W	W	W	1,593.4	W	1,696.8	–	–	–	–	–	–
November 2005	W	W	W	1,556.9	W	1,712.0	–	–	–	–	–	–
Connecticut												
November 2006	–	–	–	–	–	–	–	–	–	–	–	–
October 2006	–	–	–	–	–	–	–	–	–	–	–	–
November 2005	–	–	–	–	–	–	–	–	–	–	–	–
Maine												
November 2006	W	W	W	W	–	988.5	–	–	–	–	–	–
October 2006	W	W	W	1,085.8	W	1,139.2	–	–	–	–	–	–
November 2005	W	W	–	W	W	1,155.6	–	–	–	–	–	–
Massachusetts												
November 2006	–	–	–	–	–	–	–	–	–	–	–	–
October 2006	–	–	–	–	–	–	–	–	–	–	–	–
November 2005	–	–	–	–	–	–	–	–	–	–	–	–
New Hampshire												
November 2006	–	–	W	W	–	W	–	–	–	–	–	–
October 2006	–	–	W	W	–	W	–	–	–	–	–	–
November 2005	–	–	–	151.1	–	151.1	–	–	–	–	–	–
Rhode Island												
November 2006	–	–	–	–	–	–	–	–	–	–	–	–
October 2006	–	–	–	–	–	–	–	–	–	–	–	–
November 2005	–	–	–	–	–	–	–	–	–	–	–	–
Vermont												
November 2006	–	–	W	W	–	W	–	–	–	–	–	–
October 2006	–	–	W	W	–	W	–	–	–	–	–	–
November 2005	–	–	W	W	–	405.3	–	–	–	–	–	–
Subdistrict IB												
November 2006	W	W	W	W	6,057.4	17,592.8	–	–	–	–	–	–
October 2006	W	W	W	10,533.5	W	18,053.3	–	–	–	–	–	–
November 2005	W	W	W	9,712.9	W	16,427.4	–	–	–	–	–	–
Delaware												
November 2006	–	–	–	–	–	–	–	–	–	–	–	–
October 2006	–	–	–	–	–	–	–	–	–	–	–	–
November 2005	–	–	–	–	–	–	–	–	–	–	–	–
District of Columbia												
November 2006	–	–	–	–	–	–	–	–	–	–	–	–
October 2006	–	–	–	–	–	–	–	–	–	–	–	–
November 2005	–	–	–	–	–	–	–	–	–	–	–	–
Maryland												
November 2006	–	–	W	W	W	668.5	–	–	–	–	–	–
October 2006	–	W	W	W	W	627.9	–	–	–	–	–	–
November 2005	–	W	31.1	W	W	697.6	–	–	–	–	–	–
New Jersey												
November 2006	–	–	–	–	4,284.5	4,284.5	–	–	–	–	–	–
October 2006	–	–	–	–	5,216.7	5,216.7	–	–	–	–	–	–
November 2005	–	–	–	–	3,482.5	3,482.5	–	–	–	–	–	–
New York												
November 2006	1,546.3	1,568.5	W	4,244.2	W	4,770.4	–	–	–	–	–	–
October 2006	1,526.5	1,549.4	W	W	W	4,845.5	–	–	–	–	–	–
November 2005	1,406.6	1,434.5	W	W	W	4,555.5	–	–	–	–	–	–
Pennsylvania												
November 2006	W	W	W	5,528.6	W	7,869.5	–	–	–	–	–	–
October 2006	W	1,535.9	W	5,553.5	W	7,363.3	–	–	–	–	–	–
November 2005	W	1,547.7	W	5,309.7	W	7,691.8	–	–	–	–	–	–

See footnotes at end of table.

Table 44. Refiner Motor Gasoline Volumes by Formulation, Sales Type, PAD District, and State

(Thousand Gallons per Day) — Continued

Geographic Area Month	Reformulated						All Formulations					
	Sales to End Users		Sales for Resale				Sales to End Users		Sales for Resale			
	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total
United States												
November 2006	22,230.5	22,578.3	35,147.2	53,479.1	2,337.2	90,963.5	56,173.8	57,577.5	44,717.5	227,305.7	34,626.3	306,649.5
October 2006	22,912.6	23,246.7	34,200.9	53,605.6	3,674.6	91,481.1	57,601.3	58,972.9	43,337.2	226,798.7	38,899.3	309,035.2
November 2005	22,412.9	22,721.9	34,228.7	53,157.0	9,041.1	96,426.8	57,727.4	59,094.7	45,085.9	223,963.3	47,234.9	316,284.1
PAD District I												
November 2006	6,329.8	6,487.9	12,171.9	20,267.9	764.7	33,204.5	17,667.9	18,141.2	15,256.8	73,531.0	8,424.7	97,212.5
October 2006	6,410.1	6,575.9	11,878.0	20,577.6	1,978.4	34,434.0	18,042.5	18,533.6	14,945.1	74,005.7	10,199.9	99,150.7
November 2005	6,170.6	6,333.5	11,898.5	21,723.2	7,066.6	40,688.3	17,616.7	18,132.8	15,511.5	74,367.9	14,110.7	103,990.1
Subdistrict IA												
November 2006	W	W	2,744.9	W	W	8,073.5	1,890.6	1,899.6	W	6,555.0	W	9,552.8
October 2006	W	W	W	5,324.0	W	8,141.2	2,047.1	2,057.2	W	6,917.4	W	9,837.9
November 2005	W	W	W	5,785.7	W	8,699.0	1,868.1	1,877.2	2,706.7	7,342.7	361.6	10,411.0
Connecticut												
November 2006	W	W	W	2,644.8	W	3,670.3	W	W	W	2,644.8	W	3,670.3
October 2006	W	W	W	2,663.7	W	3,674.2	W	W	W	2,663.7	W	3,674.2
November 2005	W	W	W	2,640.5	W	3,737.5	W	W	W	2,640.5	W	3,737.5
Maine												
November 2006	–	–	–	–	–	–	W	W	W	W	–	988.5
October 2006	–	–	–	–	–	–	W	W	W	1,085.8	W	1,139.2
November 2005	–	–	–	–	–	–	W	W	–	W	W	1,155.6
Massachusetts												
November 2006	1,212.6	1,219.5	1,465.8	1,977.4	–	3,443.2	1,212.6	1,219.5	1,465.8	1,977.4	–	3,443.2
October 2006	1,313.5	1,320.8	1,423.3	2,091.0	–	3,514.3	1,313.5	1,320.8	1,423.3	2,091.0	–	3,514.3
November 2005	1,122.9	1,129.2	W	2,286.3	W	3,694.3	1,122.9	1,129.2	W	2,286.3	W	3,694.3
New Hampshire												
November 2006	231.7	231.7	W	W	–	W	231.7	231.7	W	W	–	366.2
October 2006	254.5	254.5	W	W	–	W	254.5	254.5	W	W	–	386.3
November 2005	240.8	240.8	W	W	–	506.2	240.8	240.8	W	W	–	657.4
Rhode Island												
November 2006	287.3	287.3	W	323.9	W	W	287.3	287.3	W	323.9	W	654.1
October 2006	318.1	318.1	W	W	W	W	318.1	318.1	W	383.8	W	638.2
November 2005	317.4	317.4	W	W	W	760.9	317.4	317.4	W	466.3	W	760.9
Vermont												
November 2006	–	–	–	–	–	–	–	–	W	W	–	430.5
October 2006	–	–	–	–	–	–	–	–	W	W	–	485.8
November 2005	–	–	–	–	–	–	–	–	W	W	–	405.3
Subdistrict IB												
November 2006	W	W	8,301.8	W	W	20,439.6	6,844.5	6,990.8	W	21,985.2	W	38,032.4
October 2006	W	W	8,038.5	11,959.4	1,800.3	21,798.1	6,802.4	6,945.8	W	22,492.8	W	39,851.5
November 2005	W	W	W	12,111.1	W	27,041.7	6,576.7	6,724.0	9,688.6	21,824.0	11,956.5	43,469.1
Delaware												
November 2006	56.7	65.9	W	W	–	1,009.7	56.7	65.9	W	W	–	1,009.7
October 2006	63.6	72.5	W	W	–	967.3	63.6	72.5	W	W	–	967.3
November 2005	53.8	61.0	W	W	–	1,178.9	53.8	61.0	W	W	–	1,178.9
District of Columbia												
November 2006	–	W	124.2	–	–	124.2	–	W	124.2	–	–	124.2
October 2006	–	W	120.8	–	–	120.8	–	W	120.8	–	–	120.8
November 2005	–	W	198.8	–	–	198.8	–	W	198.8	–	–	198.8
Maryland												
November 2006	–	W	W	W	–	5,052.4	–	W	1,934.5	W	W	5,720.9
October 2006	–	34.3	W	W	–	5,161.7	–	W	1,907.3	W	W	5,789.6
November 2005	–	34.5	2,140.9	W	W	5,120.8	–	W	2,172.0	W	W	5,818.4
New Jersey												
November 2006	1,648.9	1,675.2	2,521.1	4,329.5	286.8	7,137.4	1,648.9	1,675.2	2,521.1	4,329.5	4,571.3	11,421.9
October 2006	1,555.3	1,582.5	2,526.8	4,502.5	1,490.0	8,519.3	1,555.3	1,582.5	2,526.8	4,502.5	6,706.7	13,736.0
November 2005	1,524.9	1,553.6	2,455.3	4,427.2	6,433.9	13,316.5	1,524.9	1,553.6	2,455.3	4,427.2	9,916.4	16,798.9
New York												
November 2006	1,597.5	1,604.3	W	1,849.0	W	4,586.1	3,143.8	3,172.8	3,038.6	6,093.2	224.7	9,356.5
October 2006	1,603.2	1,609.6	2,506.9	W	W	4,448.3	3,129.6	3,159.0	W	6,270.3	W	9,293.8
November 2005	1,496.8	1,506.2	2,517.2	W	W	4,650.3	2,903.4	2,940.7	W	5,771.4	W	9,205.9
Pennsylvania												
November 2006	W	W	W	1,414.6	W	2,529.7	1,995.1	2,032.5	1,648.2	6,943.2	1,807.7	10,399.2
October 2006	W	552.9	W	1,489.1	W	2,580.8	2,053.9	2,088.7	1,560.8	7,042.6	1,340.6	9,944.0
November 2005	W	577.6	W	1,648.6	W	2,576.4	2,094.6	2,125.3	W	6,958.4	W	10,268.2

See footnotes at end of table.

Table 44. Refiner Motor Gasoline Volumes by Formulation, Sales Type, PAD District, and State

(Thousand Gallons per Day) — Continued

Geographic Area Month	Conventional						Oxygenated					
	Sales to End Users		Sales for Resale				Sales to End Users		Sales for Resale			
	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total
Subdistrict IC												
November 2006	8,309.3	8,597.3	1,908.8	41,424.5	1,602.6	44,935.9	–	–	–	–	–	–
October 2006	8,564.5	8,863.4	W	41,301.3	W	44,966.6	–	–	–	–	–	–
November 2005	8,487.9	8,809.4	1,994.9	41,374.9	1,792.6	45,162.5	–	–	–	–	–	–
Florida												
November 2006	5,449.5	5,520.6	1,696.8	12,198.7	1,069.7	14,965.2	–	–	–	–	–	–
October 2006	5,563.6	5,634.0	1,646.1	12,252.5	1,547.2	15,445.8	–	–	–	–	–	–
November 2005	5,561.7	5,638.0	1,771.6	13,006.0	1,582.4	16,360.0	–	–	–	–	–	–
Georgia												
November 2006	W	1,234.7	W	8,785.3	W	9,028.2	–	–	–	–	–	–
October 2006	W	1,315.4	W	8,797.5	W	9,059.4	–	–	–	–	–	–
November 2005	1,310.1	1,392.4	W	8,675.7	W	8,880.8	–	–	–	–	–	–
North Carolina												
November 2006	W	554.6	W	10,375.4	W	10,638.3	–	–	–	–	–	–
October 2006	W	579.0	W	10,537.0	W	10,577.9	–	–	–	–	–	–
November 2005	429.7	541.8	W	10,423.0	W	10,522.2	–	–	–	–	–	–
South Carolina												
November 2006	671.0	708.8	W	4,957.8	W	5,095.5	–	–	–	–	–	–
October 2006	697.8	740.5	W	W	W	4,996.2	–	–	–	–	–	–
November 2005	615.2	665.8	W	4,602.4	W	4,711.3	–	–	–	–	–	–
Virginia												
November 2006	W	57.8	W	4,042.9	W	4,144.3	–	–	–	–	–	–
October 2006	W	58.1	W	W	W	3,867.9	–	–	–	–	–	–
November 2005	62.2	62.2	W	W	–	3,664.8	–	–	–	–	–	–
West Virginia												
November 2006	520.7	520.7	–	1,064.4	–	1,064.4	–	–	–	–	–	–
October 2006	536.5	536.5	W	W	–	1,019.5	–	–	–	–	–	–
November 2005	509.1	509.1	–	W	–	1,023.3	–	–	–	–	–	–
PAD District II												
November 2006	10,702.7	10,933.1	W	62,214.2	W	67,759.2	W	1,034.9	–	5,164.4	–	5,164.4
October 2006	11,198.8	11,453.8	365.6	W	W	67,271.5	1,052.1	1,063.6	–	5,126.1	–	5,126.1
November 2005	11,805.6	12,024.7	W	W	5,404.2	69,035.6	1,080.7	1,095.7	W	W	–	4,923.3
Illinois												
November 2006	431.7	454.8	W	W	492.9	4,382.9	–	–	–	–	–	–
October 2006	451.7	476.8	W	3,763.6	W	4,115.5	–	–	–	–	–	–
November 2005	541.6	556.4	W	W	806.2	4,602.5	–	–	–	–	–	–
Indiana												
November 2006	1,462.2	1,472.2	W	W	W	4,944.5	–	–	–	–	–	–
October 2006	1,519.3	1,531.0	W	W	W	4,923.8	–	–	–	–	–	–
November 2005	W	W	W	W	W	4,672.6	–	–	–	–	–	–
Iowa												
November 2006	W	W	W	W	–	3,116.0	–	–	–	–	–	–
October 2006	W	W	W	W	–	3,104.5	–	–	–	–	–	–
November 2005	W	W	–	3,712.9	–	3,712.9	–	–	–	–	–	–
Kansas												
November 2006	NA	NA	–	3,097.5	1,461.1	4,558.6	–	–	–	–	–	–
October 2006	198.7	202.3	–	2,982.1	1,429.6	4,411.7	–	–	–	–	–	–
November 2005	195.4	198.0	–	3,259.2	1,909.5	5,168.6	–	–	–	–	–	–
Kentucky												
November 2006	W	647.6	W	W	W	3,207.5	–	–	–	–	–	–
October 2006	643.4	675.3	W	W	W	3,386.2	–	–	–	–	–	–
November 2005	W	W	W	W	–	3,275.1	–	–	–	–	–	–
Michigan												
November 2006	W	W	–	W	W	10,910.6	–	–	–	–	–	–
October 2006	W	2,120.1	–	W	W	11,126.4	–	–	–	–	–	–
November 2005	W	W	W	10,337.8	W	10,588.4	–	–	–	–	–	–
Minnesota												
November 2006	–	NA	–	W	W	W	W	1,034.9	–	W	–	W
October 2006	–	W	–	W	W	W	1,052.1	W	–	W	–	W
November 2005	–	W	W	572.1	W	W	1,080.7	W	W	4,582.4	–	W
Missouri												
November 2006	368.1	W	W	W	–	3,592.5	–	–	–	–	–	–
October 2006	W	W	W	W	–	3,422.7	–	–	–	–	–	–
November 2005	372.3	394.7	W	W	–	3,615.3	–	–	–	–	–	–

See footnotes at end of table.

Table 44. Refiner Motor Gasoline Volumes by Formulation, Sales Type, PAD District, and State

(Thousand Gallons per Day) — Continued

Geographic Area Month	Reformulated						All Formulations					
	Sales to End Users		Sales for Resale				Sales to End Users		Sales for Resale			
	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total
Subdistrict IC												
November 2006	623.5	653.5	1,125.2	3,566.2	–	4,691.4	8,932.9	9,250.8	3,034.0	44,990.7	1,602.6	49,627.3
October 2006	628.6	667.3	W	3,294.2	W	4,494.7	9,193.0	9,530.6	2,994.7	44,595.5	1,871.1	49,461.3
November 2005	684.0	722.3	1,121.3	3,826.4	–	4,947.6	9,171.9	9,531.6	3,116.2	45,201.3	1,792.6	50,110.1
Florida												
November 2006	–	–	–	–	–	–	5,449.5	5,520.6	1,696.8	12,198.7	1,069.7	14,965.2
October 2006	–	–	–	–	–	–	5,563.6	5,634.0	1,646.1	12,252.5	1,547.2	15,445.8
November 2005	–	–	–	–	–	–	5,561.7	5,638.0	1,771.6	13,006.0	1,582.4	16,360.0
Georgia												
November 2006	–	–	–	–	–	–	W	1,234.7	W	8,785.3	W	9,028.2
October 2006	–	–	–	–	–	–	W	1,315.4	W	8,797.5	W	9,059.4
November 2005	–	–	–	–	–	–	1,310.1	1,392.4	W	8,675.7	W	8,880.8
North Carolina												
November 2006	–	–	–	–	–	–	W	554.6	W	10,375.4	W	10,638.3
October 2006	–	–	–	–	–	–	W	579.0	W	10,537.0	W	10,577.9
November 2005	–	–	–	–	–	–	429.7	541.8	W	10,423.0	W	10,522.2
South Carolina												
November 2006	–	–	–	–	–	–	671.0	708.8	W	4,957.8	W	5,095.5
October 2006	–	–	–	–	–	–	697.8	740.5	W	W	W	4,996.2
November 2005	–	–	–	–	–	–	615.2	665.8	W	4,602.4	W	4,711.3
Virginia												
November 2006	W	653.5	1,125.2	3,566.2	–	4,691.4	680.7	711.3	W	7,609.2	W	8,835.7
October 2006	W	667.3	W	W	W	4,494.7	685.8	725.3	1,158.5	7,124.9	79.2	8,362.6
November 2005	684.0	722.3	W	W	–	4,947.6	746.2	784.5	1,141.7	7,470.8	–	8,612.5
West Virginia												
November 2006	–	–	–	–	–	–	520.7	520.7	–	1,064.4	–	1,064.4
October 2006	–	–	–	–	–	–	536.5	536.5	W	W	–	1,019.5
November 2005	–	–	–	–	–	–	509.1	509.1	–	1,023.3	–	1,023.3
PAD District II												
November 2006	W	3,955.5	W	9,913.9	W	11,577.4	15,672.9	15,923.5	1,877.2	77,292.4	5,331.4	84,501.0
October 2006	4,075.8	4,085.4	1,226.3	W	W	11,807.8	16,326.7	16,602.8	1,591.8	77,025.9	5,587.6	84,205.3
November 2005	4,104.4	4,119.4	1,405.7	9,661.3	–	11,066.9	16,990.7	17,239.7	2,869.7	76,751.9	5,404.2	85,025.8
Illinois												
November 2006	2,658.6	2,659.7	W	W	–	5,891.8	3,090.3	3,114.5	1,344.0	8,437.8	492.9	10,274.7
October 2006	2,762.9	2,764.2	W	4,713.2	W	6,254.1	3,214.6	3,240.9	1,154.0	8,476.8	738.9	10,369.6
November 2005	2,627.2	2,628.4	W	W	–	5,760.1	3,168.8	3,184.8	1,181.7	8,374.7	806.2	10,362.6
Indiana												
November 2006	252.1	253.5	W	W	–	1,106.1	1,714.3	1,725.7	W	5,856.6	W	6,050.5
October 2006	257.8	259.8	W	W	–	1,041.0	1,777.1	1,790.8	W	5,629.4	W	5,964.8
November 2005	W	W	W	W	–	999.9	1,993.8	2,011.6	W	5,292.3	W	5,672.5
Iowa												
November 2006	–	–	–	–	–	–	W	W	W	W	–	3,116.0
October 2006	–	–	–	–	–	–	W	W	W	W	–	3,104.5
November 2005	–	–	–	–	–	–	W	W	–	3,712.9	–	3,712.9
Kansas												
November 2006	–	–	–	–	–	–	NA	NA	–	3,097.5	1,461.1	4,558.6
October 2006	–	–	–	–	–	–	198.7	202.3	–	2,982.1	1,429.6	4,411.7
November 2005	–	–	–	–	–	–	195.4	198.0	–	3,259.2	1,909.5	5,168.6
Kentucky												
November 2006	W	294.9	–	W	W	1,087.3	907.8	942.5	W	3,974.2	W	4,294.8
October 2006	295.3	296.3	W	W	W	1,001.5	938.7	971.6	W	4,141.4	W	4,387.7
November 2005	W	W	W	W	–	1,042.7	929.9	966.4	W	W	–	4,317.8
Michigan												
November 2006	–	–	–	–	–	–	W	W	–	W	W	10,910.6
October 2006	–	–	–	–	–	–	W	2,120.1	–	W	W	11,126.4
November 2005	–	–	–	–	–	–	W	W	W	10,337.8	W	10,588.4
Minnesota												
November 2006	–	–	–	–	–	–	W	1,035.0	–	W	W	5,656.4
October 2006	–	–	–	–	–	–	1,052.1	1,063.7	–	W	W	5,712.8
November 2005	–	–	–	–	–	–	1,080.7	1,095.8	W	5,154.5	W	5,848.2
Missouri												
November 2006	435.4	W	W	W	–	1,711.0	803.5	832.6	6.9	5,296.6	–	5,303.5
October 2006	W	W	W	W	–	1,760.1	836.8	864.6	4.9	5,177.9	–	5,182.8
November 2005	640.5	640.5	W	W	–	1,453.2	1,012.8	1,035.2	W	W	–	5,068.4

See footnotes at end of table.

Table 44. Refiner Motor Gasoline Volumes by Formulation, Sales Type, PAD District, and State

(Thousand Gallons per Day) — Continued

Geographic Area Month	Conventional						Oxygenated					
	Sales to End Users		Sales for Resale				Sales to End Users		Sales for Resale			
	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total
Nebraska												
November 2006	W	W	W	W	–	2,020.3	–	–	–	–	–	–
October 2006	W	26.7	–	1,906.1	–	1,906.1	–	–	–	–	–	–
November 2005	W	W	–	2,070.5	–	2,070.5	–	–	–	–	–	–
North Dakota												
November 2006	–	–	–	875.8	–	875.8	–	–	–	–	–	–
October 2006	–	W	–	829.1	–	829.1	–	–	–	–	–	–
November 2005	–	–	–	905.5	–	905.5	–	–	–	–	–	–
Ohio												
November 2006	3,991.2	4,031.9	W	8,834.8	W	9,398.3	–	–	–	–	–	–
October 2006	4,268.3	4,311.9	W	8,921.2	W	9,625.2	–	–	–	–	–	–
November 2005	4,487.6	4,522.9	W	8,486.9	W	9,778.2	–	–	–	–	–	–
Oklahoma												
November 2006	W	W	W	4,041.6	W	6,034.9	–	–	–	–	–	–
October 2006	W	W	W	W	1,666.5	5,506.4	–	–	–	–	–	–
November 2005	407.9	409.7	W	4,671.5	W	5,941.7	–	–	–	–	–	–
South Dakota												
November 2006	W	14.9	–	1,112.3	–	1,112.3	–	–	–	–	–	–
October 2006	W	15.9	–	1,091.0	–	1,091.0	–	–	–	–	–	–
November 2005	W	15.2	W	W	–	1,049.8	–	–	–	–	–	–
Tennessee												
November 2006	926.1	945.3	–	W	W	8,491.0	–	–	–	–	–	–
October 2006	933.5	952.1	–	W	W	8,633.5	–	–	–	–	–	–
November 2005	1,061.5	1,079.6	W	7,750.0	W	8,085.0	–	–	–	–	–	–
Wisconsin												
November 2006	W	100.9	–	W	–	W	–	–	–	W	–	W
October 2006	W	101.1	–	W	–	W	–	–	–	W	–	W
November 2005	W	96.9	–	W	–	W	–	–	–	W	–	W
PAD District III												
November 2006	6,241.7	W	NA	W	W	51,147.8	W	W	W	W	–	879.8
October 2006	W	W	NA	32,935.8	19,610.3	52,935.8	W	W	W	W	–	671.9
November 2005	W	6,179.4	W	32,141.0	W	56,100.3	W	202.5	W	W	–	979.4
Alabama												
November 2006	W	W	W	W	–	5,342.9	–	–	–	–	–	–
October 2006	W	W	W	W	–	5,338.3	–	–	–	–	–	–
November 2005	W	471.1	W	W	–	5,303.0	–	–	–	–	–	–
Arkansas												
November 2006	W	W	W	3,077.9	W	3,153.8	–	–	–	–	–	–
October 2006	W	W	W	3,009.4	W	3,149.3	–	–	–	–	–	–
November 2005	W	W	W	3,028.0	W	3,272.1	–	–	–	–	–	–
Louisiana												
November 2006	1,095.4	1,128.5	W	5,052.6	W	7,093.7	–	–	–	–	–	–
October 2006	1,044.6	1,076.4	W	5,046.7	W	8,707.8	–	–	–	–	–	–
November 2005	1,056.7	1,091.5	W	4,987.4	W	7,568.0	–	–	–	–	–	–
Mississippi												
November 2006	397.4	412.5	–	W	W	4,446.2	–	–	–	–	–	–
October 2006	W	415.2	–	W	W	4,352.8	–	–	–	–	–	–
November 2005	385.7	W	–	W	W	3,947.0	–	–	–	–	–	–
New Mexico												
November 2006	W	W	W	W	–	1,599.0	W	W	W	W	–	374.3
October 2006	W	W	W	W	–	1,773.9	W	W	W	W	–	170.1
November 2005	W	W	W	W	–	1,535.8	W	W	W	W	–	483.9
Texas												
November 2006	W	W	W	14,516.9	W	29,512.2	–	W	–	505.4	–	505.4
October 2006	3,527.3	W	W	W	W	29,613.6	–	W	–	W	–	501.8
November 2005	3,449.9	W	18.1	W	W	34,474.4	–	W	–	W	–	495.5
PAD District IV												
November 2006	1,311.8	W	W	W	W	8,454.4	NA	W	W	W	–	2,508.6
October 2006	W	W	W	W	W	8,404.4	W	W	W	W	–	2,426.6
November 2005	W	1,279.0	W	W	W	7,829.8	W	894.3	W	W	–	2,303.4
Colorado												
November 2006	973.1	974.4	3.1	W	–	W	NA	NA	W	2,440.3	–	W
October 2006	W	W	W	1,702.2	–	W	W	W	W	2,395.0	–	W
November 2005	W	W	12.8	W	W	1,514.3	W	W	W	W	–	2,212.3

See footnotes at end of table.

Table 44. Refiner Motor Gasoline Volumes by Formulation, Sales Type, PAD District, and State

(Thousand Gallons per Day) — Continued

Geographic Area Month	Reformulated						All Formulations					
	Sales to End Users		Sales for Resale				Sales to End Users		Sales for Resale			
	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total
Nebraska												
November 2006	–	–	–	–	–	–	W	W	W	W	–	2,020.3
October 2006	–	–	–	–	–	–	W	26.7	–	1,906.1	–	1,906.1
November 2005	–	–	–	–	–	–	W	W	–	2,070.5	–	2,070.5
North Dakota												
November 2006	–	–	–	–	–	–	–	–	–	875.8	–	875.8
October 2006	–	–	–	–	–	–	–	W	–	829.1	–	829.1
November 2005	–	–	–	–	–	–	–	–	–	905.5	–	905.5
Ohio												
November 2006	–	–	–	–	–	–	3,991.2	4,031.9	W	8,834.8	W	9,398.3
October 2006	–	–	–	–	–	–	4,268.3	4,311.9	W	8,921.2	W	9,625.2
November 2005	–	–	–	–	–	–	4,487.6	4,522.9	W	8,486.9	W	9,778.2
Oklahoma												
November 2006	–	–	–	–	–	–	W	W	W	4,041.6	W	6,034.9
October 2006	–	–	–	–	–	–	W	W	W	W	1,666.5	5,506.4
November 2005	–	–	–	–	–	–	407.9	409.7	W	4,671.5	W	5,941.7
South Dakota												
November 2006	–	–	–	–	–	–	W	14.9	–	1,112.3	–	1,112.3
October 2006	–	–	–	–	–	–	W	15.9	–	1,091.0	–	1,091.0
November 2005	–	–	–	–	–	–	W	15.2	W	W	–	1,049.8
Tennessee												
November 2006	–	–	–	–	–	–	926.1	945.3	–	W	W	8,491.0
October 2006	–	–	–	–	–	–	933.5	952.1	–	W	W	8,633.5
November 2005	–	–	–	–	–	–	1,061.5	1,079.6	W	7,750.0	W	8,085.0
Wisconsin												
November 2006	W	W	W	W	–	1,781.3	W	W	W	W	–	6,403.2
October 2006	W	W	–	1,751.0	–	1,751.0	W	W	–	6,353.8	–	6,353.8
November 2005	W	W	–	1,811.1	–	1,811.1	W	W	–	6,455.5	–	6,455.5
PAD District III												
November 2006	W	3,367.4	W	9,409.5	W	9,980.3	9,755.5	9,977.3	803.3	43,537.4	17,667.2	62,007.9
October 2006	3,366.5	3,371.5	W	W	318.5	10,019.9	9,649.8	9,858.6	782.2	42,916.6	19,928.8	63,627.6
November 2005	3,211.5	3,214.8	418.1	W	W	10,965.9	9,380.3	9,596.7	720.1	42,369.6	24,955.9	68,045.6
Alabama												
November 2006	–	–	–	–	–	–	W	W	W	W	–	5,342.9
October 2006	–	–	–	–	–	–	W	W	W	W	–	5,338.3
November 2005	–	–	–	–	–	–	W	471.1	W	W	–	5,303.0
Arkansas												
November 2006	–	–	–	–	–	–	W	W	W	3,077.9	W	3,153.8
October 2006	–	–	–	–	–	–	W	W	W	3,009.4	W	3,149.3
November 2005	–	–	–	–	–	–	W	W	W	3,028.0	W	3,272.1
Louisiana												
November 2006	–	–	–	–	–	–	1,095.4	1,128.5	W	5,052.6	W	7,093.7
October 2006	–	–	–	–	–	–	1,044.6	1,076.4	W	5,046.7	W	8,707.8
November 2005	–	–	–	–	–	–	1,056.7	1,091.5	W	4,987.4	W	7,568.0
Mississippi												
November 2006	–	–	–	–	–	–	397.4	412.5	–	W	W	4,446.2
October 2006	–	–	–	–	–	–	W	415.2	–	W	W	4,352.8
November 2005	–	–	–	–	–	–	385.7	W	–	W	W	3,947.0
New Mexico												
November 2006	–	–	–	–	–	–	456.9	464.7	70.0	1,903.3	–	1,973.3
October 2006	–	–	–	–	–	–	444.0	451.9	69.0	1,875.0	–	1,944.0
November 2005	–	–	–	–	–	–	404.9	415.7	84.5	1,935.2	–	2,019.7
Texas												
November 2006	W	3,367.4	W	9,409.5	W	9,980.3	6,937.5	7,058.4	581.4	24,431.8	14,984.8	39,998.0
October 2006	3,366.5	3,371.5	W	W	W	10,019.9	6,893.8	7,002.0	562.4	24,040.0	15,533.0	40,135.4
November 2005	3,211.5	3,214.8	418.1	W	W	10,965.9	6,661.3	6,775.6	436.2	23,377.5	22,122.1	45,935.8
PAD District IV												
November 2006	–	–	–	–	–	–	2,023.9	2,062.2	W	9,916.7	W	10,963.0
October 2006	–	–	–	–	–	–	1,932.4	1,969.9	W	9,804.4	W	10,831.0
November 2005	–	–	–	–	–	–	2,139.5	2,173.3	W	9,066.7	W	10,133.2
Colorado												
November 2006	–	–	–	–	–	–	1,685.2	1,686.5	W	W	–	4,027.1
October 2006	–	–	–	–	–	–	1,576.0	1,577.4	17.9	4,097.2	–	4,115.1
November 2005	–	–	–	–	–	–	1,679.9	1,681.4	W	3,534.7	W	3,726.6

See footnotes at end of table.

Table 44. Refiner Motor Gasoline Volumes by Formulation, Sales Type, PAD District, and State

(Thousand Gallons per Day) — Continued

Geographic Area Month	Conventional						Oxygenated					
	Sales to End Users		Sales for Resale				Sales to End Users		Sales for Resale			
	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total
Idaho												
November 2006	W	63.2	W	W	–	1,696.3	–	–	–	–	–	–
October 2006	W	64.1	W	W	–	1,654.6	–	–	–	–	–	–
November 2005	W	W	W	W	–	1,571.0	–	–	–	–	–	–
Montana												
November 2006	W	W	–	W	NA	W	–	W	–	W	–	W
October 2006	W	W	–	W	W	W	–	–	–	W	–	W
November 2005	W	W	–	1,216.0	–	1,216.0	–	–	–	91.1	–	91.1
Utah												
November 2006	242.2	268.6	W	2,429.8	W	3,188.2	–	–	–	–	–	–
October 2006	255.9	283.5	W	2,264.2	W	3,005.7	–	–	–	–	–	–
November 2005	333.2	356.4	W	W	–	2,872.6	–	–	–	–	–	–
Wyoming												
November 2006	27.6	35.7	–	703.1	–	703.1	–	–	–	–	–	–
October 2006	29.9	W	–	687.9	–	687.9	–	–	–	–	–	–
November 2005	26.5	34.5	–	655.9	–	655.9	–	–	–	–	–	–
PAD District V												
November 2006	1,992.7	2,175.2	W	7,928.2	W	12,620.8	466.8	530.6	1,931.0	1,212.1	–	3,143.1
October 2006	2,272.8	2,418.4	W	8,482.4	W	13,840.6	316.9	375.6	1,283.3	877.2	–	2,160.5
November 2005	2,063.5	2,248.4	W	W	W	13,144.1	610.2	649.7	1,581.0	658.6	–	2,239.6
Alaska												
November 2006	W	143.4	110.0	W	W	558.0	–	–	–	–	–	–
October 2006	W	132.5	106.8	W	W	552.2	–	–	–	–	–	–
November 2005	104.9	110.5	110.4	W	W	549.0	–	–	–	–	–	–
Arizona												
November 2006	W	370.7	173.5	971.9	882.5	2,027.9	W	163.7	232.4	217.0	–	449.4
October 2006	W	374.8	212.2	W	W	1,951.6	W	151.4	231.9	181.6	–	413.5
November 2005	W	W	W	1,115.7	W	1,664.9	W	163.4	W	W	–	370.2
California												
November 2006	–	–	–	W	W	719.0	–	–	–	–	–	–
October 2006	–	–	–	205.6	1,050.5	1,256.2	–	–	–	–	–	–
November 2005	–	–	–	W	W	822.9	–	–	–	–	–	–
Hawaii												
November 2006	205.3	315.2	W	W	W	634.6	–	–	–	–	–	–
October 2006	201.8	280.5	W	W	W	651.2	–	–	–	–	–	–
November 2005	168.7	289.5	W	W	W	924.1	–	–	–	–	–	–
Nevada												
November 2006	W	18.8	W	W	W	319.5	NA	NA	715.2	478.7	–	1,193.9
October 2006	W	20.7	W	W	W	399.8	W	24.2	695.8	435.8	–	1,131.6
November 2005	W	W	W	W	–	301.3	W	W	W	W	–	1,031.7
Oregon												
November 2006	W	211.6	W	2,035.6	W	2,417.1	W	333.3	983.4	NA	–	1,499.8
October 2006	368.8	368.8	W	2,136.2	W	2,604.9	200.1	200.1	355.6	259.8	–	615.5
November 2005	150.3	W	W	2,235.3	W	2,622.6	479.3	W	725.2	112.5	–	837.7
Washington												
November 2006	1,115.5	1,115.6	W	3,942.2	W	5,944.7	–	–	–	–	–	–
October 2006	1,240.9	1,241.2	1,935.3	4,245.8	243.4	6,424.6	–	–	–	–	–	–
November 2005	1,272.5	1,273.0	W	4,000.8	W	6,259.3	–	–	–	–	–	–

See footnotes at end of table.

Table 44. Refiner Motor Gasoline Volumes by Formulation, Sales Type, PAD District, and State

(Thousand Gallons per Day) — Continued

Geographic Area Month	Reformulated						All Formulations					
	Sales to End Users		Sales for Resale				Sales to End Users		Sales for Resale			
	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total	Through Retail Outlets	Total[a]	DTW	Rack	Bulk	Total
Idaho												
November 2006	–	–	–	–	–	–	W	63.2	W	W	–	1,696.3
October 2006	–	–	–	–	–	–	W	64.1	W	W	–	1,654.6
November 2005	–	–	–	–	–	–	W	W	W	W	–	1,571.0
Montana												
November 2006	–	–	–	–	–	–	W	8.1	–	1,339.8	NA	1,348.3
October 2006	–	–	–	–	–	–	W	W	–	W	W	1,367.6
November 2005	–	–	–	–	–	–	W	W	–	1,307.1	–	1,307.1
Utah												
November 2006	–	–	–	–	–	–	242.2	268.6	W	2,429.8	W	3,188.2
October 2006	–	–	–	–	–	–	255.9	283.5	W	2,264.2	W	3,005.7
November 2005	–	–	–	–	–	–	333.2	356.4	W	W	–	2,872.6
Wyoming												
November 2006	–	–	–	–	–	–	27.6	35.7	–	703.1	–	703.1
October 2006	–	–	–	–	–	–	29.9	W	–	687.9	–	687.9
November 2005	–	–	–	–	–	–	26.5	34.5	–	655.9	–	655.9
PAD District V												
November 2006	8,594.0	8,767.5	W	13,887.8	W	36,201.2	11,053.5	11,473.3	W	23,028.1	W	51,965.1
October 2006	9,060.2	9,213.9	W	13,686.4	W	35,219.4	11,649.9	12,008.0	W	23,046.1	W	51,220.5
November 2005	8,926.4	9,054.1	20,506.5	W	W	33,705.7	11,600.1	11,952.2	W	21,407.2	W	49,089.4
Alaska												
November 2006	–	–	–	–	–	–	W	143.4	110.0	W	W	558.0
October 2006	–	–	–	–	–	–	W	132.5	106.8	W	W	552.2
November 2005	–	–	–	–	–	–	104.9	110.5	110.4	W	W	549.0
Arizona												
November 2006	635.9	791.4	1,181.1	1,414.4	–	2,595.4	1,072.3	1,325.8	1,586.9	2,603.3	882.5	5,072.7
October 2006	623.7	765.5	1,058.8	W	W	2,381.0	1,057.6	1,291.7	1,502.9	2,530.5	712.8	4,746.1
November 2005	W	W	W	W	–	2,142.1	1,023.1	1,235.9	W	2,311.6	W	4,177.3
California												
November 2006	7,958.1	7,976.1	19,539.3	W	W	33,025.4	7,958.1	7,976.1	19,539.3	12,541.9	1,663.2	33,744.4
October 2006	8,436.4	8,448.4	19,245.5	12,253.8	777.0	32,276.3	8,436.4	8,448.4	19,245.5	12,459.5	1,827.5	33,532.5
November 2005	8,337.9	8,346.3	18,922.6	W	W	30,887.6	8,337.9	8,346.3	18,922.6	11,436.3	1,351.5	31,710.5
Hawaii												
November 2006	–	–	–	–	–	–	205.3	315.2	W	W	W	634.6
October 2006	–	–	–	–	–	–	201.8	280.5	W	W	W	651.2
November 2005	–	–	–	–	–	–	168.7	289.5	W	W	W	924.1
Nevada												
November 2006	–	–	W	W	–	580.4	W	52.4	1,256.4	W	W	2,093.9
October 2006	–	–	W	W	–	562.1	W	44.9	1,214.7	W	W	2,093.5
November 2005	W	W	W	W	–	676.0	63.4	67.5	1,210.0	798.9	–	2,008.9
Oregon												
November 2006	–	–	–	–	–	–	543.6	544.8	W	2,552.0	W	3,916.9
October 2006	–	–	–	–	–	–	568.9	568.9	W	2,396.1	W	3,220.4
November 2005	–	–	–	–	–	–	629.6	629.6	W	2,347.8	W	3,460.3
Washington												
November 2006	–	–	–	–	–	–	1,115.5	1,115.6	W	3,942.2	W	5,944.7
October 2006	–	–	–	–	–	–	1,240.9	1,241.2	1,935.3	4,245.8	243.4	6,424.6
November 2005	–	–	–	–	–	–	1,272.5	1,273.0	W	4,000.8	W	6,259.3

Dash (–) = No data reported.
NA = Not available.
W = Withheld to avoid disclosure of individual company data.
[a] Includes sales through retail outlets as well as all direct sales to end users that were not made through company-operated retail outlets, e.g., sales to agricultural customers, commercial sales, and industrial sales.
Notes: Motor gasoline averages and totals prior to October 1993 include leaded gasoline.
Notes: Values shown for the current month are preliminary. Values shown for previous months are revised. Data are final upon publication in the *Petroleum Marketing Annual.*
Source: Energy Information Administration Form EIA-782A, "Refiners'/Gas Plant Operators' Monthly Petroleum Product Sales Report."