

***Generation Interconnection
Feasibility Study Report***

for

***PJM Generation Interconnection Request Queue
Position Y2-095 (with Y2-116)***

Sullivan 765 kV

August / 2013

General

Interconnection Customer (IC) proposes to interconnect 1211 MW under PJM project queue Y2-095 and another 600 MW under Y2-116. Primary point of interconnection (POI) is at Sullivan 765 kV and secondary POI is at Breed 345 kV.

System Normal @ Energy Output

Listed below are violations at Energy output and system normal conditions.

Table 1: AEP – System Normal @ Energy Output

#	Branch Fix	Rating	Base	Y2-095	Y2-116	Req. Rating	Network Upgrade Cost	
		MVA	%	%	%	MVA	Y2-095	Y2-116
1	235428 WINDSOR 138 243131 05TILTON 138 1 Fix: Rebuild Windsor – Tiltonville. AEP-FE tie line.	205	112.7	115.2	116.5	238.8		\$6,285,000
2	242921 05CORNU 765 242934 05CORNU 345 1 Fix: Replace TX	1500	89.4	101.4	101.4	1506.0	\$15,000,000	
3	242983 05CHANDR 138 243074 05PHILO 138 1 Fix: Risers and bus at Philo	191	97.5	100.8	102.7	196.2	\$150,000	
4	243056 05NEWCOM 138 243094 05SCOSHC 138 1 Fix: Rebuild Newcomerstown - South Coshocton	138	106.1	109	110.8	152.9	\$21,750,000	
5	243070 05OHIOCT 138 243094 05SCOSHC 138 1 Fix: Rebuild Ohio Central - South Coshocton	185	111.8	114.2	115.6	213.9		\$24,165,000
6	243070 05OHIOCT 138 243145 05WCOSHC 138 1 Fix: Rebuild Ohio Central - West Coshocton	185	105.7	108	109.3	202.2		\$30,510,000
7	243105 05MILLB 138 243151 05WMILLS 138 1 Fix: Remote end South Millersburg equipment	159	104.2	106.9	108.5	172.5	\$150,000	
8	243208 05JEFRSO 765 243209 05ROCKPT 765 1 Fix: Wavetrap at Rockport and Jefferson	4055	92.6	107.4	111.3	4513.2	\$500,000	
9	243213 05BREED 345 346809 7CASEY 345 1 Fix: non-AEP conductor limited	1332	76	100.9	101.6	1353.3		
10	243225 05KEYSTN 345 243232 05SORENS 345 1 Fix: Tie in Desoto – Sorenson at Keystone 345 kV	897	115.9	121.5	123.4	1106.9	\$5,000,000	
11	243230 05REYNOL 345 243878 05MEADOW 345 1 Fix: Pioneer Project, refer to Appendix A	971	108.7	117.4	120.1	1166.2		
12	243313 05HUNT J 138 243367 05ROCKCR 138 1 Fix: Replace Rock Creek switch	138	106.7	112	114.3	157.7	\$150,000	
13	243313 05HUNT J 138 243377 05SORENS 138 1 Fix: Tie in Delaware – Sorenson at Huntington Junction	167	109.1	115.5	119	198.7	\$3,500,000	
14	246652 BRIGSDL 39.4 246665 MCOMBS 39.4 1 Fix: Replace Briggsdale risers	32	101.7	102.3	113.1	36.2		\$50,000

Category B @ Energy Output (DC Load Flow)

DC analysis was performed on contingencies that did not converge under AC analysis. Note that AC loadings are expected to be higher than DC loadings. Since, the fixes provided below are based on DC loadings, they should be considered preliminary. A more detailed AC analysis will be performed during impact study phase. Refer to Appendix B for contingency definitions.

Table 2: AEP - Category B @ Energy Output (DC Load Flow)

#	Branch Contingency Fix	Rating	Base	Y2-095	Y2-116	Req. Rating	Network Upgrade Cost	
		MVA	%	%	%	MVA	Y2-095	Y2-116
1	242931 05BEVERL 345 248101 NBURGER 345 1 41_B2_TOR544 Fix: Not required.	972	111.2	115.5	115.5	1123		

AEP DC Analysis

DC analysis was performed on contingencies that did not converge under AC analysis. Note that AC loadings are expected to be higher than DC loadings. Since, the fixes provided below are based on DC loadings, they should be considered preliminary. A more detailed AC analysis will be performed during impact study phase. Refer to Appendix B for contingency definitions.

Table 3: AEP – DC Analysis for non-convergent AC contingencies

#	Branch Contingency Fix	Rating	Base	Y2-095	Y2-116	Req.	Network Upgrade Cost	
		MVA	%	%	%	Rating MVA	Y2-095	Y2-116
1	242937 05KAMMER 345 242940 05MUSKNG 345 1 2942_C2_05KAMMER 765-PP Fix: Perform sag condition correction study	972	124	128	128	1244	\$340,000	
2	242973 05BUCKH8 138 243105 05SMILLB 138 1 2942_C2_05KAMMER 765-PP Fix: Perform sag condition correction study	184	107	109	110	202		\$10,000
3	242973 05BUCKH8 138 243145 05WCOSHC 138 1 2942_C2_05KAMMER 765-PP Fix: Perform sag condition correction study	185	109	111	111	205	\$52,000	
4	243014 05GRBLOP 138 243366 05ROB PK 138 1 2932_C2_05JEFRSO 765-A2 Fix: Perform sag condition correction study.	223	96	99	100	223		\$32,000
5	243045 05MUSKNG 138 243091 05SCALDW 138 2942_C2_05KAMMER 765-PP Fix: Perform sag condition correction study	205	111	114	114	234	\$54,000	
6	243056 05NEWCOM 138 243094 05SCOSHC 138 1 2942_C2_05KAMMER 765-PP Fix: Remote end equipment upgrade	179	99	102	102	183	\$500,000	
7	243105 05SMILLB 138 243151 05WMILLS 138 1 2942_C2_05KAMMER 765-PP Fix: Perform sag condition correction study	184	105	107	107	197	\$15,000	
8	243206 05DUMONT 765 907020 X1-020 TAP 765 1 2932_C2_05JEFRSO 765-A2 Fix: Pioneer project network upgrade	4094	96	102	103	4217		
9	243208 05JEFRSO 765 248000 06CLIFTY 345 1 1760_C2_05JEFRSO 765-A	1935	121	135	139	2690		

Table 3: AEP – DC Analysis for non-convergent AC contingencies

#	Branch Contingency Fix	Rating	Base	Y2-095	Y2-116	Req. Rating	Network Upgrade Cost	
		MVA	%	%	%	MVA	Y2-095	Y2-116
	Fix: Pioneer project network upgrade							
10	243210 05SULLVA 765 243213 05BREED 345 1 2929_C2 Fix: Pioneer project network upgrade	1875	105	126	126	2363		
11	243210 05SULLVA 765 243213 05BREED 345 2 3007_C2 Fix: Pioneer project network upgrade	1905	97	130	130	2477		
12	243210 05SULLVA 765 243213 05BREED 345 3 7336_C2_05SULLVA 765-A Fix: Pioneer project network upgrade	2608	85	114	110	2869		
13	243213 05BREED 345 243216 05DARWIN 345 1 2930_C2 Fix: Pioneer project network upgrade	1419	100	118	118	1674		
14	243218 05DESOTO 345 243232 05SORENS 345 2 2979_C2_X1-020_X2-052 Fix: Perform sag condition correction study	971	102	106	106	1029	\$100,000	
15	243229 05OLIVE 345 243353 05OLIVE 138 2 2979_C2_X1-020_X2-052 Fix: Upgrade relay thermal limits	818	101	101	102	834		\$50,000
16	243230 05REYNOL 345 243878 05MEADOW 345 1 4690_C2_05OLIVE 345-D_A Fix: Pioneer project network upgrade	1195	116	120	121	1446		
17	243237 05ADAM 138 243358 05PENNV 138 1 444 Fix: Perform sag condition correction study	205	101	106	106	217	\$52,400	
18	243242 05ALLEN 138 243334 05MAGLEY 138 1 444 Fix: Perform sag condition correction study	205	101	107	107	219	\$72,400	
19	243262 05COLLCO 138 250001 08COLINV 138 1 2932_C2_05JEFRSO 765-A2 Fix: Perform sag condition correction study	179	104	107	108	193	\$49,000	

Table 3: AEP – DC Analysis for non-convergent AC contingencies

#	Branch Contingency Fix	Rating	Base	Y2-095	Y2-116	Req. Rating	Network Upgrade Cost	
		MVA	%	%	%	MVA	Y2-095	Y2-116
20	243262 05COLLCO 138 250106 08TODHJT 138 1 2932_C2_05JEFRSO 765-A2 Fix: Non-AEP sag limited conductor	201	86	89	89	201		
21	243274 05DEERCR 138 243303 05GRNTTA 138 1 3132_C2_05GRNTWN 765-T1 Fix: Previously identified for U4-039. Rebuild line.	307	101	104	105	322	\$12,150,000	
22	243275 05DELAWR 138 243387 05VANBUR 138 1 444 Fix: Perform sag condition correction study	167	95	101	100	167	\$120,000	
23	243312 05HUMMEL 138 243367 05ROCKCR 138 1 2979_C2_X1-020_X2-052 Fix: Remote end ckt terminal elements upgrade	184	138	142	144	265	\$250,000	
24	243313 05HUNT J 138 243367 05ROCKCR 138 12979_C2_X1-020_X2-052 Fix: Tie in Delaware – Sorenson 138 kV line	167	146	151	153	256		
25	243313 05HUNT J 138 243377 05SORENS 138 1 2979_C2_X1-020_X2-052 Fix: Tie in Delaware – Sorenson 138 kV line	208	188	195	198	412		
26	243319 05JAY 138 243358 05PENNV 138 1 444 Fix: Perform a sag condition correction study	205	105	110	110	226	\$31,000	
27	243334 05MAGLEY 138 247500 R-003 C 138 1 444 Fix: Sag study and upgrade circuit terminal equipment	250	104	108	108	270	\$549,000	
28	243490 05CORNER 138 243533 05LAYMAN 138 1 37_B2_TOR12_WOMOP Fix: Sag study and upgrade circuit terminal equipment	284	123	128	128	364	\$529,000	
29	243533 05LAYMAN 138 243589 05WOLFCL 138 1 2942_C2_05KAMMER 765-PP Fix: Sag study and upgrade circuit terminal equipment	284	128	133	133	378	\$535,000	

Category C @ Energy Output (AC Load Flow)

Overloads listed below are based on AC loadings. For contingency definitions, refer to Appendix C.

Table 4: AEP Category C @ Energy Output (AC Load Flow)

#	Branch Contingency Fix	Rating	Base	Y2-095	Y2-116	Req. Rating	Network Upgrade Cost	
		MVA	%	%	%	MVA	Y2-095	Y2-116
1	1 CAIMAN 138 243026 05KAMMR1 138 1 476 Fix: AEP-FE tie line	205	133.7	137.2	139.2	285		
2	1 CAIMAN 138 246940 05BIGR2Z 138 1 476 Fix: AEP-Fix tie line	205	103.5	106.8	108.8	223		
3	235363 MAHANS LANE 138 243127 05TIDD 138 1 4743_C2_05TIDD 345-CC Fix: Non-AEP conductor limited	250	109.7	112.7	114.6	287		
4	242516 05MOUNTN 765 242920 05BELMON 765 1 7445_C2_05MARYSV 765-B Fix: Upgrade wavetrap at Mountaineer	4253	102.8	106.7	108.5	4615	\$500,000	
5	242528 05SPORN 345 248005 06KYGER 345 2 3019_C2_05SPORN 345-CC2 Fix: Perform sag condition correction study	1438	101.2	105.3	107.3	1543	\$51,000	
6	242542 05ATKINS 138 242780 05RURALR 138 1 7587_C2_05J.FERR 765-B Fix: Rebuild Line	307	122.8	131.9	135.2	415	\$9,025,000	
7	242566 05BROADF 138 242567 05BROADX 138 BP 7587_C2_05J.FERR 765-B Fix:	286	148.2	155.9	157.7	451		
8	242567 05BROADX 138 242803 05SMYTH 138 1 7587_C2_05J.FERR 765-B Fix: Rebuild line and upgrade remote end equipment	258	164.6	173	175	452	\$21,275,000	
9	242608 05CLYTR1 138 242791 05SCHRIS 138 1 2914_C2_05J.FERR 765-B2 Fix: Perform sag condition correction study	167	103.4	105.3	108.5	181		\$43,000
10	242609 05CLYTR2 138 242853 05WURNO 138 1 2914_C2_05J.FERR 765-B2	251	111.9	114.2	115.7	290		\$551,400

Table 4: AEP Category C @ Energy Output (AC Load Flow)

#	Branch Contingency Fix	Rating	Base	Y2-095	Y2-116	Req. Rating	Network Upgrade Cost	
		MVA	%	%	%	MVA	Y2-095	Y2-116
	Fix: Upgrade terminal equipment and perform sag study							
11	242685 05J.FERX 138 242745 05PEAKCK 138 1 2914_C2_05J.FERR 765-B2 Fix: Rebuild line	335	112.6	115	115.6	387		\$21,275,000
12	242725 05MTAIRY 138 242780 05RURALR 138 1 7587_C2_05J.FERR 765-B Fix: Rebuild Line	335	107.6	117	120.5	404	\$6,875,000	
13	242745 05PEAKCK 138 242841 05W GLOW 138 1 2914_C2_05J.FERR 765-B2 Fix: Rebuild line	319	110	112.5	113.2	361		\$1,530,000
14	242788 05SALTV1 138 242827 05TAZEWE 138 1 2916_C2_05J.FERR 765-A Fix: Perform sag condition correction study	296	99.8	101.8	102.4	303	\$84,000	
15	242841 05W GLOW 138 242853 05WURNO 138 1 2914_C2_05J.FERR 765-B2 Fix: Rebuild line	319	108.3	110.8	111.5	356		\$2,775,000
16	242858 05WYTHE1 138 242859 05WYTHE2 138 1 7587_C2_05J.FERR 765-B Fix: Upgrade relay thermal limits	305		104.4	104.2	318	\$50,000	
17	242932 05CANTNC 345 914080 Y2-050 TAP 345 1 4743 Fix: Perform sag condition correction study	1409	114.1	116.1	117.3	1653		\$210,000
18	242937 05KAMMER 345 242940 05MUSKNG 345 1 2937_C2_05KAMMER 345-CC Fix: Perform sag condition correction study	972	122.8	126.7	128.7	1251	\$210,000	
19	242938 05MARQUI 345 243034 05MARQUI 138 3 6775_C2_05MARQUI 345-D1 Fix: Upgrade transformer	564		99.4	100.4	566		\$5,000,000
20	242973 05BUCKH8 138 243145 05WCOSHC 138 1 5034_C2_05SCANTO 345-C2 Fix: Perform sag condition correction study	185	119.8	123.6	125.6	232	\$52,000	

Table 4: AEP Category C @ Energy Output (AC Load Flow)

#	Branch Contingency Fix	Rating	Base	Y2-095	Y2-116	Req. Rating	Network Upgrade Cost	
		MVA	%	%	%	MVA	Y2-095	Y2-116
21	242998 05EPOINT 138 243001 05EZANEV 138 1 6403_C1_05OHIOCT 138-1 Fix: Rebuild line	284	104	105.7	106.6	303		\$4,665,000
22	242998 05EPOINT 138 243070 05OHIOCT 138 1 6403_C1_05OHIOCT 138-1 Fix: Rebuild line and upgrade remote end equipment	255	119.7	121.5	122.5	312		\$15,125,000
23	243006 05FOSTOR 138 243137 05W.END 138 1 517_C2 Fix: Perform sag condition correction study	296		99.3	105.6	313		\$6,600
24	243014 05GRBLOP 138 243086 05S HICK 138 1 2906_C2_05MARYSV 765-A1 Fix: Perform sag condition correction study	223	105.3	110.3	113.2	252	\$55,000	
25	243014 05GRBLOP 138 243366 05ROB PK 138 1 2906_C2_05MARYSV 765-A1 Fix: Perform sag condition correction study	223	109	114	117	261	\$31,400	
26	243020 05HILLVI 138 243156 05WNPIL 138 1 1917_C2_05SCANTO 345-B2 Fix: Perform sag condition correction study	290	112	115.9	118.2	343	\$61,000	
27	243029 05LCKWRD 138 243086 05S HICK 138 1 6466_C2_05E LIMA 345-M2 Fix: Perform sag condition correction study	223		103.2	107	239	\$196,000	
28	243045 05MUSKNG 138 243091 05SCALDW 138 1 474 Fix: Upgrade terminal equipment and perform sag study	205	117.5	121.1	122.9	252	\$346,000	
29	243059 05NFINDL 138 243067 05NWOODC 138 1 724_C1_05E LIMA 345-2 Fix: Perform sag condition correction study	167	109.6	114.2	117	195	\$47,000	
30	243068 05NZANEV 138 243161 05ZANESV 138 1 6404_C1_05OHIOCT 138-2 Fix: Rebuild line and upgrade remote end equipment	255	111.4	112.9	113.8	290		\$519,000
31	243131 05TILTON 138 243143 05WBELLA 138 1	284	114.4	117.2	118.8	337	\$18,675,000	

Table 4: AEP Category C @ Energy Output (AC Load Flow)

#	Branch Contingency Fix	Rating	Base	Y2-095	Y2-116	Req. Rating	Network Upgrade Cost	
		MVA	%	%	%	MVA	Y2-095	Y2-116
	4743_C2_05TIDD 345-CC Fix: Rebuild line							
32	243217 05DEQUIN 345 243878 05MEADOW 345 1 6485_C2_05DEQUIN 345-C1 Fix: Pioneer Project	1304		102.9	105.6	1377		
33	243217 05DEQUIN 345 243878 05MEADOW 345 2 4704_C2_05DEQUIN 345-B1 Fix: Pioneer Project	1304	102.9	105.6	102.9	1377		
34	243218 05DESOTO 345 243232 05SORENS 345 2 4817_C2_05SORENS 345-B2 Fix: Perform sag condition correction study	971	121.5	128.7	131.1	1273	\$100,000	
35	243218 05DESOTO 345 247508 U2-090 C 345 2 3024_C2_05TANNER 345-Q1 Fix: Perform sag condition correction study	1166	104	106.3	106.8	1245		\$340,000
36	243229 05OLIVE 345 243230 05REYNOL 345 1 4690_C2_05OLIVE 345-D_B Fix: Pioneer Project	1195		101	103.4	1236		
37	243242 05ALLEN 138 243330 05LINCOL 138 2 7907_C2_05ROB PK 138-C Fix: Perform sag condition correction study	268		100.4	101.3	271	\$31,400	
38	243242 05ALLEN 138 243334 05MAGLEY 138 1 3006_C2_05SORENS 345-D Fix: Perform sag condition correction study	205		99.4	101.1	207		\$73,000
39	243312 05HUMMEL 138 243367 05ROCKCR 138 1 7456_C2_05SORENS 345-C Fix: Upgrade remote end equipment	184	101.5	105.2	106.8	197	\$250,000	
40	243348 05MULLIN 138 246771 05SELWDZ 138 1 6981_C2_05FISHER 138-A Fix: Upgrade remote end equipment	250	102.4	102.7	102.8	257	\$250,000	
41	243469 05BEATTY 138 243519 05HALLRD 138 1 5094	223	100.9	103	103.9	232		\$24,600

Table 4: AEP Category C @ Energy Output (AC Load Flow)

#	Branch Contingency Fix	Rating	Base	Y2-095	Y2-116	Req. Rating	Network Upgrade Cost	
		MVA	%	%	%	MVA	Y2-095	Y2-116
	Fix: Perform a sag condition correction study							

Category B @ Capacity Output (AC Load Flow)

Overloads listed below are based on AC loadings. For contingency definitions, refer to Appendix C.

Table 5: AEP Category B @ Capacity Output (AC Load Flow)

#	Branch Contingency Fix	Rating	Base	Y2-095	Y2-116	Req. Rating	Network Upgrade Cost	
		MVA	%	%	%	MVA	Y2-095	Y2-116
1	243213 05BREED 345 243216 05DARWIN 345 1 685_B2 Fix: Pioneer project network upgrade	971			111.6	1084		
2	243213 05BREED 345 243217 05DEQUIN 345 1 672_B2_TOR1713 Fix: Pioneer project network upgrade	971			104.6	1016		
3	243217 05DEQUIN 345 243221 05EUGENE 345 1 667_B2_TOR1697 Fix: Pioneer project network upgrade	971	104.5	114.9	120.2	1167		
4	243217 05DEQUIN 345 243878 05MEADOW 345 1 6490_B2_TOR16000 Fix: Pioneer project network upgrade	971	104.6	118.1	124.8	1212		
5	243217 05DEQUIN 345 243878 05MEADOW 345 2 6472_B2_TOR15258 Fix: Pioneer project network upgrade	971	104.6	118.1	124.8	1212		
6	243225 05KEYSTN 345 243232 05SORENS 345 1 4814_B2_TOR2543 Fix: Tie in Delaware – Sorenson at Huntington Junction	897		106.2	109.9	986		
7	243230 05REYNOL 345 243878 05MEADOW 345 1 4689_B2_TOR15257 Fix: Pioneer project network upgrade	971		106.7	112.1	1088		
8	242998 05EPOINT 138 243070 05OHIOCT 138 1 B3_05ZANESVILLE_138-1	255		99	102	260		\$50,000

Table 5: AEP Category B @ Capacity Output (AC Load Flow)

#	Branch Contingency Fix	Rating	Base	Y2-095	Y2-116	Req. Rating	Network Upgrade Cost	
		MVA	%	%	%	MVA	Y2-095	Y2-116
	Fix: Replace risers at Ohio Central							
9	243056 05NEWCOM 138 243094 05SCOSHC 138 1 B3_05MUSKINGUM_138-1 Fix: Replace risers at Newcomerstown	179		99.7	100.5	180		\$50,000
10	243207 05GRNTWN 765 249742 08GRTOWN 138 1 1733_C2_X1-020 Fix: Non-AEP transformer	789	105.4	110.8	112.9	891		
11	243313 05HUNT J 138 243367 05ROCKCR 138 1 1733_C2_X1-020 Fix: Tie in Delaware – Sorenson 138 kV line	167		105.6	110	184		
12	243313 05HUNT J 138 243377 05SORENS 138 1 360_B2_TOR1679_X1-020A Fix: Tie in Delaware – Sorenson 138 kV line	208	105.1	116.8	122.5	255		
13	246020 N PORTLN 69 246022 PORTLAND 69 1 5505_B2_TOR1728_woMOAB Fix: Upgrade relay trip settings	69	99	102	103.2	71	\$50,000	

Category B @ Capacity Output (DC Load Flow)

DC analysis was performed on contingencies that did not converge under AC analysis. Note that AC loadings are expected to be higher than DC loadings. Since, the fixes provided below are based on DC loadings, they should be considered preliminary. A more detailed AC analysis will be performed during impact study phase. Refer to Appendix B for contingency definitions.

Table 6: AEP Category B @ Capacity Output (DC Load Flow)

#	Branch Contingency Fix	Rating	Base	Y2-095	Y2-116	Req. Rating	Network Upgrade Cost	
		MVA	%	%	%	MVA	Y2-095	Y2-116
1	243210 05SULLVA 765 243213 05BREED 345 1 363_B2_TOR1682 Fix: Pioneer project network upgrade	1680	88	112	124	2083		
2	243210 05SULLVA 765 243213 05BREED 345 2 363_B2_TOR1682 Fix: Pioneer project network upgrade	1650	92	117	130	2145		
3	243213 05BREED 345 243216 05DARWIN 345 1 363_B2_TOR1682 Fix: Pioneer project network upgrade	971	119	145	158	1534		
4	243213 05BREED 345 243217 05DEQUIN 345 1 363_B2_TOR1682 Fix: Pioneer project network upgrade	971	104	120	127	1233		
5	243213 05BREED 345 254539 16WHEAT 345 1 363_B2_TOR1682 Fix: Pioneer project network upgrade	956	87	122	139	1329		
6	243213 05BREED 345 346809 7CASEY 345 1 363_B2_TOR1682 Fix: Pioneer project network upgrade	1332	105	140	157	2091		
7	243216 05DARWIN 345 243221 05EUGENE 345 1 363_B2_TOR1682 Fix: Pioneer project network upgrade	971	119	145	158	1534		
8	243230 05REYNOL 345 243878 05MEADOW 345 1 363_B2_TOR1682 Fix: Pioneer project network upgrade	971	92	101	105	1020		

Appendix B

Listed below are contingencies that did not converge under AC analysis. A more detailed voltage analysis will be performed on these contingencies during impact study phase which may result in new violations.

Contingency '41_B2_TOR544'

Open branch from bus 242925 to bus 242930 ckt 1 / 242925 05KAMMER 765 242930 05SCANTO 765

1

Open branch from bus 242930 to bus 242943 ckt 3 / 242930 05SCANTO 765 242943 05SCANTO 345

3

end

Contingency '3132_C2_05GRNTWN 765-T1'

Open branch from bus 243207 to bus 907020 ckt 1 / 243207 05GRNTWN 765 907020 X1-020 TAP 765

1

Open branch from bus 243207 to bus 249742 ckt 1 / 243207 05GRNTWN 765 249742 08GRTOWN

138 1

Open branch from bus 243312 to bus 249742 ckt 1 / 243312 05HUMMEL 138 249742 08GRTOWN

138 1

end

Contingency '2942_C2_05KAMMER 765-PP'

Open branch from bus 242920 to bus 242925 ckt 1 / 242920 05BELMON 765 242925 05KAMMER

765 1

Open branch from bus 242516 to bus 242920 ckt 1 / 242516 05MOUNTN 765 242920 05BELMON 765

1

Open branch from bus 235102 to bus 242920 ckt 1 / 235102 BELMONT 500 242920 05BELMON 765

1

Open branch from bus 242925 to bus 243188 ckt 1 / 242925 05KAMMER 765 243188 05MLG1 26.0 1

Remove unit 1 from bus 243188 / 243188 05MLG1 26.0

end

Contingency '1732_X1-020A'

Open branch from bus 243207 to bus 907020 ckt 1 / 243207 05GRNTWN 765 907020 X1-020 TAP 765

1

Open branch from bus 243207 to bus 243208 ckt 1 / 243207 05GRNTWN 765 243208 05JEFRSO 765 1

Open branch from bus 243207 to bus 249742 ckt 1 / 243207 05GRNTWN 765 249742 08GRTOWN

138 1

Open branch from bus 243207 to bus 252004 ckt 1 / 243207 05GRNTWN 765 252004 08GRNTWN

1.00 1

Open branch from bus 249619 to bus 252004 ckt 1 / 249619 08GRNTWN 230 252004 08GRNTWN

1.00 1

Open branch from bus 249741 to bus 252004 ckt 1 / 249741 08GRTOW2 138 252004 08GRNTWN 1.00

1

end

Contingency '7589_C2_05J.FERR 765-C2'

Open branch from bus 242514 to bus 242520 ckt 1 / 242514 05J.FERR 765 242520 05J.FERR 500 1

Open branch from bus 242514 to bus 242684 ckt 2 / 242514 05J.FERR 765 242684 05J.FERR 138 2

Open branch from bus 242520 to bus 306100 ckt 1 / 242520 05J.FERR 500 306100 8ANTIOCH 500 1

end

Contingency '2998_C2'

Open branch from bus 242508 to bus 242516 ckt 1 / 242508 05AMOS 765 242516 05MOUNTN 765 1

Open branch from bus 242516 to bus 242920 ckt 1 / 242516 05MOUNTN 765 242920 05BELMON 765

1

Open branch from bus 242516 to bus 242923 ckt 1 / 242516 05MOUNTN 765 242923 05GAVIN 765 1

end

Contingency '6189_C2_05HANG R 765-D1'

Open branch from bus 242921 to bus 242924 ckt 1 / 242921 05CORNU 765 242924 05HANG R 765 1

Open branch from bus 242924 to bus 243208 ckt 1 / 242924 05HANG R 765 243208 05JEFRSO 765 1

end

CONTINGENCY '2932_C2_05JEFRSO 765-A2'

OPEN BRANCH FROM BUS 242924 TO BUS 243208 CKT 1 / 242924 05HANG R 765 243208

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05JEFRSO 765 1
  OPEN BRANCH FROM BUS 243208 TO BUS 248000 CKT 1          / 243208 05JEFRSO 765 248000
06CLIFTY 345 1
  end
Contingency '1760_C2_05JEFRSO 765-A'
  Open branch from bus 243207 to bus 243208 ckt 1 / 243207 05GRNTWN 765 243208 05JEFRSO 765 1
  Open branch from bus 242924 to bus 243208 ckt 1 / 242924 05HANG R 765 243208 05JEFRSO 765 1
  end
CONTINGENCY '2929_C2'
  OPEN BRANCH FROM BUS 243207 TO BUS 243208 CKT 1          / 243207 05GRNTWN 765 243208
05JEFRSO 765 1
  OPEN BRANCH FROM BUS 243208 TO BUS 243209 CKT 1          / 243208 05JEFRSO 765 243209
05ROCKPT 765 1
  end
CONTINGENCY '3007_C2'
  OPEN BRANCH FROM BUS 243209 TO BUS 243210 CKT 1          / 243209 05ROCKPT 765 243210
05SULLVA 765 1
  OPEN BRANCH FROM BUS 243210 TO BUS 243213 CKT 1          / 243210 05SULLVA 765 243213
05BREED 345 1
  end
CONTINGENCY '7336_C2_05SULLVA 765-A'
  OPEN BRANCH FROM BUS 243210 TO BUS 243213 CKT 1          / 243210 05SULLVA 765 243213
05BREED 345 1
  OPEN BRANCH FROM BUS 243210 TO BUS 243213 CKT 2          / 243210 05SULLVA 765 243213
05BREED 345 2
  end
CONTINGENCY '2930_C2'
  OPEN BRANCH FROM BUS 243208 TO BUS 243209 CKT 1          / 243208 05JEFRSO 765 243209
05ROCKPT 765 1
  OPEN BRANCH FROM BUS 243208 TO BUS 248000 CKT 1          / 243208 05JEFRSO 765 248000
06CLIFTY 345 1
  end
Contingency '3002_C2_05ROCKPT 765-C2'
  Open branch from bus 243208 to bus 243209 ckt 1 / 243208 05JEFRSO 765 243209 05ROCKPT 765 1
  Open branch from bus 243209 to bus 243240 ckt 8 / 243209 05ROCKPT 765 243240 05AKSTL2 138 8
  Open branch from bus 243785 to bus 243240 ckt 1 / 243785 05AKSTL 138 243240 05AKSTL2 138 1
  end
CONTINGENCY '2979_C2_X1-020_X2-052'
  OPEN BRANCH FROM BUS 243206 TO BUS 907020 CKT 1          / 243206 05DUMONT 765 243207
05GRNTWN 765 1
  OPEN BRANCH FROM BUS 243206 TO BUS 243219 CKT 2          / 243206 05DUMONT 765 243219
05DUMONT 345 2
  OPEN BRANCH FROM BUS 243219 TO BUS 909180 CKT 2 / 243219 05DUMONT 345 243229 05OLIVE
345 2
  end
CONTINGENCY '4690_C2_05OLIVE 345-D_A'
  OPEN BRANCH FROM BUS 914010 TO BUS 243229 CKT 1 / 914010 Y2-010 TAP 345 243229 05OLIVE
345 1
  OPEN BRANCH FROM BUS 243229 TO BUS 274804 CKT 1 / 243229 05OLIVE 345 274804 UPNOR;RP
345 1
  end
Contingency '6527_C2_05MEADOW 345-B'
  Open branch from bus 243230 to bus 243878 ckt 1 / 243230 05REYNOL 345 243878 05MEADOW 345
1
  Open branch from bus 243229 to bus 243230 ckt 1 / 243229 05OLIVE 345 243230 05REYNOL 345 1
  Open branch from bus 243230 to bus 255173 ckt 1 / 243230 05REYNOL 345 255173 17RYNLDS 138
1
  end
Contingency '444'

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    Open branch from bus 243218 to bus 243225 ckt 1 / 243218 05DESOTO    345 243225 05KEYSTN    345 1
    Open branch from bus 243218 to bus 243232 ckt 2 / 243218 05DESOTO    345 243232 05SORENS    345 2
    Open branch from bus 243218 to bus 243233 ckt 1 / 243218 05DESOTO    345 243233 05TANNER    345
1
end
Contingency '37_B2_TOR12_woMOP'
    Open branch from bus 242920 to bus 242925 ckt 1 / 242920 05BELMON    765 242925 05KAMMER
765 1
    Open branch from bus 242516 to bus 242920 ckt 1 / 242516 05MOUNTN    765 242920 05BELMON    765
1
    Open branch from bus 235102 to bus 242920 ckt 1 / 235102 BELMONT    500 242920 05BELMON    765
1
end
Contingency '363_B2_TOR1682'
    Open branch from bus 243208 to bus 243209 ckt 1 / 243208 05JEFRSO    765 243209 05ROCKPT    765 1
end

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Appendix C

Listed below are all the other contingencies that resulted in violations.

Contingency '476'

Open branch from bus 242946 to bus 248101 ckt 1 / 242946 05TIDD 345 248101 NBURGER 345 1
Open branch from bus 242937 to bus 242948 ckt 1 / 242937 05KAMMER 345 242948 05WBELLA 345 1
Open branch from bus 242946 to bus 242948 ckt 1 / 242946 05TIDD 345 242948 05WBELLA 345 1
end

Contingency '4743_C2_05TIDD 345-CC'

Open branch from bus 235707 to bus 242946 ckt 1 / 235707 WYLIE RIDGE 345 242946 05TIDD 345 1
Open branch from bus 242946 to bus 253965 ckt 1 / 242946 05TIDD 345 253965 15COLLIE 345 1
end

Contingency '7445_C2_05MARYSV 765-B'

Open branch from bus 242922 to bus 242928 ckt 1 / 242922 05FLTLC 765 242928 05MARYSV 765 1
Open branch from bus 242928 to bus 299951 ckt 1 / 242928 05MARYSV 765 299951 05SOREN 765 1
end

Contingency '3019_C2_05SPORN 345-CC2'

Open branch from bus 242522 to bus 242528 ckt 1 / 242522 05AMOS 345 242528 05SPORN 345 1
Open branch from bus 242528 to bus 248005 ckt 1 / 242528 05SPORN 345 248005 06KYGER 345 1
Open branch from bus 242528 to bus 242808 ckt 4 / 242528 05SPORN 345 242808 05SPORNB 138 4
end

Contingency '7587_C2_05J.FERR 765-B'

Open branch from bus 242512 to bus 242514 ckt 1 / 242512 05CLOVRD 765 242514 05J.FERR 765 1
Open branch from bus 242514 to bus 242684 ckt 2 / 242514 05J.FERR 765 242684 05J.FERR 138 2
end

Contingency '2915_C2_05J.FERR 765-A1_A'

Open branch from bus 914140 to bus 242514 ckt 1 / 914140 y2-058 tap 765 242514 05j.ferr 765 1
Open branch from bus 242514 to bus 242684 ckt 2 / 242514 05j.ferr 765 242684 05j.ferr 138 2
end

Contingency '2914_C2_05J.FERR 765-B2'

Open branch from bus 242512 to bus 242514 ckt 1 / 242512 05CLOVRD 765 242514 05J.FERR 765 1
Open branch from bus 242514 to bus 242520 ckt 1 / 242514 05J.FERR 765 242520 05J.FERR 500 1
Open branch from bus 242520 to bus 306100 ckt 1 / 242520 05J.FERR 500 306100 8ANTIOCH 500 1
end

Contingency '2916_C2_05J.FERR 765-A'

Open branch from bus 242509 to bus 242514 ckt 1 / 242509 05AXTON 765 242514 05J.FERR 765 1
Open branch from bus 242514 to bus 914140 ckt 1 / 242514 05J.FERR 765 914140 Y2-058 TAP 765 1
Open branch from bus 242509 to bus 242545 ckt 1 / 242509 05AXTON 765 242545 05AXTONX 138 1
Open branch from bus 242544 to bus 242545 ckt SR / 242544 05AXTON 138 242545 05AXTONX 138 SR
end

CONTINGENCY '4743'

OPEN BRANCH FROM BUS 242946 TO BUS 253965 CKT 1 / 242946 05TIDD 345 253965 15COLLIE 345 1
OPEN BRANCH FROM BUS 242946 TO BUS 235707 CKT 1 / 242946 05TIDD 345 235707 WYLIE RIDGE 345 1
END

Contingency '2937_C2_05KAMMER 345-CC'

Open branch from bus 242925 to bus 242937 ckt 4 / 242925 05KAMMER 765 242937 05KAMMER 345 4
Open branch from bus 242937 to bus 243189 ckt 2 / 242937 05KAMMER 345 243189 05MLG2 26.0 2
Remove unit 2 from bus 243189 / 243189 05MLG2 26.0
end

Contingency '6775_C2_05MARQUI 345-D1'

Open branch from bus 242938 to bus 246888 ckt 1 / 242938 05MARQUI 345 246888 05NFORK 345 1
Open branch from bus 242938 to bus 248005 ckt 1 / 242938 05MARQUI 345 248005 06KYGER 345 1
Open branch from bus 242938 to bus 243034 ckt 2 / 242938 05MARQUI 345 243034 05MARQUI 138 2
end

Contingency '5034_C2_05SCANTO 345-C2'

Open branch from bus 242925 to bus 242930 ckt 1 / 242925 05KAMMER 765 242930 05SCANTO 765 1
Open branch from bus 242930 to bus 242943 ckt 3 / 242930 05SCANTO 765 242943 05SCANTO 345 3

Open branch from bus 242943 to bus 243092 ckt 4 / 242943 05SCANTO 345 243092 05SCANTE 138 4
 end
 Contingency '6403_C1_05OHIOCT 138-1'
 Open branch from bus 243070 to bus 243075 ckt 1 / 243070 05OHIOCT 138 243075 05POWELS 138 1
 Open branch from bus 243070 to bus 243160 ckt 1 / 243070 05OHIOCT 138 243160 05WTRNWY 138 1
 Open branch from bus 243070 to bus 245338 ckt 1 / 243070 05OHIOCT 138 245338 OHIO CTR 69.0 1
 Open branch from bus 245323 to bus 245338 ckt 1 / 245323 DRESDEN8 69.0 245338 OHIO CTR 69.0 1
 end
 Contingency '517_C2'
 Open branch from bus 242936 to bus 913440 ckt 1 / 242936 05FOSTOR 345 913440 Y1-069 TAP 345 1
 Open branch from bus 238889 to bus 242936 ckt 1 / 238889 02LEMOYN 345 242936 05FOSTOR 345 1
 end
 CONTINGENCY '2906_C2_05MARYSV 765-A1'
 OPEN BRANCH FROM BUS 242926 TO BUS 242928 CKT 1 / 242926 05MALIS 765 242928 05MARYSV 765 1
 OPEN BRANCH FROM BUS 242928 TO BUS 242939 CKT 1 / 242928 05MARYSV 765 242939 05MARYSV 345 1
 OPEN BRANCH FROM BUS 239133 TO BUS 242939 CKT 1 / 239133 02TANGY 345 242939 05MARYSV 345 1
 END
 Contingency '1917_C2_05SCANTO 345-B2'
 Open branch from bus 242925 to bus 242930 ckt 1 / 242925 05KAMMER 765 242930 05SCANTO 765 1
 Open branch from bus 242930 to bus 242943 ckt 3 / 242930 05SCANTO 765 242943 05SCANTO 345 3
 Open branch from bus 242932 to bus 242943 ckt 1 / 242932 05CANTNC 345 242943 05SCANTO 345 1
 Open branch from bus 242943 to bus 243092 ckt 4 / 242943 05SCANTO 345 243092 05SCANTE 138 4
 end
 Contingency '6466_C2_05E LIMA 345-M2'
 Open branch from bus 242935 to bus 242936 ckt 1 / 242935 05E LIMA 345 242936 05FOSTOR 345 1
 Open branch from bus 242935 to bus 247503 ckt 1 / 242935 05E LIMA 345 247503 T-130 C 345 1
 end
 Contingency '474'
 Open branch from bus 242931 to bus 248101 ckt 1 / 242931 05BEVERL 345 248101 NBURGER 345 1
 Open branch from bus 242937 to bus 242940 ckt 1 / 242937 05KAMMER 345 242940 05MUSKNG 345 1
 end
 Contingency '724_C1_05E LIMA 345-2_woMOP'
 Open branch from bus 242935 to bus 242936 ckt 1 / 242935 05E LIMA 345 242936 05FOSTOR 345 1
 end
 Contingency '6404_C1_05OHIOCT 138-2'
 Open branch from bus 242998 to bus 243070 ckt 1 / 242998 05EPOINT 138 243070 05OHIOCT 138 1
 Open branch from bus 243070 to bus 243094 ckt 1 / 243070 05OHIOCT 138 243094 05SCOSHC 138 1
 end
 Contingency '6485_C2_05DEQUIN 345-C1'
 Open branch from bus 243217 to bus 243878 ckt 2 / 243217 05DEQUIN 345 243878 05MEADOW 345 2
 Open branch from bus 243217 to bus 249525 ckt 1 / 243217 05DEQUIN 345 249525 08WESTWD 345 1
 Open branch from bus 249525 to bus 249874 ckt 1 / 249525 08WESTWD 345 249874 08WESTWD 138 1
 end
 Contingency '4704_C2_05DEQUIN 345-B1'
 Open branch from bus 243217 to bus 243878 ckt 1 / 243217 05DEQUIN 345 243878 05MEADOW 345 1
 Open branch from bus 243217 to bus 249525 ckt 1 / 243217 05DEQUIN 345 249525 08WESTWD 345 1
 Open branch from bus 249525 to bus 249874 ckt 1 / 249525 08WESTWD 345 249874 08WESTWD 138 1
 end
 Contingency '4817_C2_05SORENS 345-B2'
 Open branch from bus 243225 to bus 243232 ckt 1 / 243225 05KEYSTN 345 243232 05SORENS 345 1
 end
 Contingency '3024_C2_05TANNER 345-Q1'
 Open branch from bus 243218 to bus 243233 ckt 1 / 243218 05DESOTO 345 243233 05TANNER 345 1
 Open branch from bus 243233 to bus 248001 ckt 1 / 243233 05TANNER 345 248001 06DEARB1 345 1
 Open branch from bus 243233 to bus 249565 ckt 1 / 243233 05TANNER 345 249565 08EBEND 345 1
 Open branch from bus 248000 to bus 248001 ckt 1 / 248000 06CLIFTY 345 248001 06DEARB1 345 1

Open branch from bus 248001 to bus 248013 ckt 1 / 248001 06DEARB1 345 248013 06PIERCE 345 1
 end
 Contingency '4690_C2_05OLIVE 345-D_B'
 OPEN BRANCH FROM BUS 243878 TO BUS 914010 CKT 1 / 243878 05MEADOW 345 914010 Y2-010 TAP 345 1
 1
 OPEN BRANCH FROM BUS 243229 TO BUS 274804 CKT 1 / 243229 05OLIVE 345 274804 UPNOR;RP 345 1
 END
 Contingency '7907_C2_05ROB PK 138-C'
 Open branch from bus 243231 to bus 243366 ckt 5 / 243231 05ROB PK 345 243366 05ROB PK 138 5
 Open branch from bus 243397 to bus 243786 ckt 1 / 243397 05WILMGZ 138 243786 05APCI 138 1
 Open branch from bus 243247 to bus 243397 ckt 1 / 243247 05AUBURN 138 243397 05WILMGZ 138 1
 Open branch from bus 243366 to bus 243397 ckt 1 / 243366 05ROB PK 138 243397 05WILMGZ 138 1
 end
 Contingency '3006_C2_05SORENS 345-D'
 Open branch from bus 243211 to bus 243232 ckt 1 / 243211 05ALLEN 345 243232 05SORENS 345 1
 Open branch from bus 243218 to bus 243232 ckt 2 / 243218 05DESOTO 345 243232 05SORENS 345 2
 end
 Contingency '7456_C2_05SORENS 345-C'
 Open branch from bus 243232 to bus 243377 ckt 1 / 243232 05SORENS 345 243377 05SORENS 138 1
 Open branch from bus 243232 to bus 243377 ckt 2 / 243232 05SORENS 345 243377 05SORENS 138 2
 end
 Contingency '6981_C2_05FISHER 138-A_woMOAB'
 Open branch from bus 243274 to bus 243303 ckt 1 / 243274 05DEERCR 138 243303 05GRNTTA 138 1
 Open branch from bus 243293 to bus 243302 ckt 1 / 243293 05FISHER 138 243302 05GRANT 138 1
 Open branch from bus 243293 to bus 243303 ckt 1 / 243293 05FISHER 138 243303 05GRNTTA 138 1
 Open branch from bus 243303 to bus 891220 ckt 1 / 243303 05GRNTTA 138 891220 U4-038 TAP 138 1
 Open branch from bus 243293 to bus 246004 ckt 1 / 243293 05FISHER 138 246004 05FISHER 13.8 1
 Open branch from bus 246010 to bus 246763 ckt 1 / 246010 PIPE CKL 12.0 246763 05PIPECK 138 1
 end
 Contingency '5094'
 Open branch from bus 243453 to bus 243457 ckt 1 / 243453 05BEATTY 345 243457 05HAYDEN 345 1
 Open branch from bus 243457 to bus 243458 ckt 1 / 243457 05HAYDEN 345 243458 05HYATT 345 1
 Open branch from bus 243457 to bus 243461 ckt 2 / 243457 05HAYDEN 345 243461 05ROBRT1 345 2
 Open branch from bus 243457 to bus 243460 ckt 1 / 243457 05HAYDEN 345 243460 05ROBRT2 345 1
 end
 Contingency '685_B2'
 Open branch from bus 243213 to bus 346809 ckt 1 / 243213 05BREED 345 346809 7CASEY 345 1
 end
 Contingency '672_B2_TOR1713'
 Open branch from bus 243217 to bus 243221 ckt 1 / 243217 05DEQUIN 345 243221 05EUGENE 345 1
 end
 Contingency '667_B2_TOR1697'
 Open branch from bus 243213 to bus 243217 ckt 1 / 243213 05BREED 345 243217 05DEQUIN 345 1
 end
 Contingency '667_B2_TOR1697'
 Open branch from bus 243213 to bus 243217 ckt 1 / 243213 05BREED 345 243217 05DEQUIN 345 1
 end
 Contingency '6490_B2_TOR16000'
 Open branch from bus 243217 to bus 243878 ckt 2 / 243217 05DEQUIN 345 243878 05MEADOW 345 2
 end
 Contingency '6472_B2_TOR15258'
 Open branch from bus 243217 to bus 243878 ckt 1 / 243217 05DEQUIN 345 243878 05MEADOW 345 1
 end
 Contingency '4814_B2_TOR2543'
 Open branch from bus 243218 to bus 243232 ckt 2 / 243218 05DESOTO 345 243232 05SORENS 345 2
 end
 Contingency '4689_B2_TOR15257_Y2-010A'
 Open branch from bus 243878 to bus 914010 ckt 1 / 243878 05MEADOW 345 914010 Y2-010 TAP 345 1
 end

Contingency 'B3_05ZANESVILLE_138-1 & 2_WOMOAB'

Open branch from bus 243161 to bus 245423 ckt 1 / 243161 05ZANESV 138 245423 ZANESVIL 69.0 1
 Open branch from bus 243068 to bus 243161 ckt 1 / 243068 05NZANEV 138 243161 05ZANESV 138 1
 Open branch from bus 243025 to bus 243161 ckt 1 / 243025 05JUNCTN 138 243161 05ZANESV 138 1
 Open branch from bus 243161 to bus 245422 ckt 1 / 243161 05ZANESV 138 245422 ZANESVIL 12.0 1
 Open branch from bus 245399 to bus 245423 ckt 1 / 245399 LINDEN A 69.0 245423 ZANESVIL 69.0 1
 Open branch from bus 245416 to bus 245423 ckt 1 / 245416 SCHINICK 69.0 245423 ZANESVIL 69.0 1
 Open branch from bus 245386 to bus 245423 ckt 1 / 245386 BROCKWAY 69.0 245423 ZANESVIL 69.0 1

end

Contingency 'B3_05MUSKINGUM_138-1_WOMOAB'

Open branch from bus 243045 to bus 245429 ckt 1 / 243045 05MUSKNG 138 245429 MUSKINGU 69.0 1
 Open branch from bus 243045 to bus 243589 ckt 1 / 243045 05MUSKNG 138 243589 05WOLFCL 138 1
 Open branch from bus 243045 to bus 243091 ckt 1 / 243045 05MUSKNG 138 243091 05SCALDW 138 1
 Open branch from bus 242997 to bus 243045 ckt 1 / 242997 05ENCONC 138 243045 05MUSKNG 138 1
 Open branch from bus 242977 to bus 243045 ckt 1 / 242977 05CALDWE 138 243045 05MUSKNG 138 1

end

Contingency '1733_c2_x1-020'

Open branch from bus 243206 to bus 907020 ckt 1 / 243206 05dumont 765 243207 05grntwn 765 1
 Open branch from bus 243207 to bus 252004 ckt 1 / 243207 05grntwn 765 252004 08grntwn 1.00 1
 Open branch from bus 249619 to bus 252004 ckt 1 / 249619 08grntwn 230 252004 08grntwn 1.00 1
 Open branch from bus 249741 to bus 252004 ckt 1 / 249741 08grtow2 138 252004 08grntwn 1.00 1

end

Contingency '360_B2_TOR1679_X1-020A'

Open branch from bus 243206 to bus 907020 ckt 1 / 243206 05DUMONT 765 907020 X1-020 TAP 765 1

end

Contingency '5505_B2_TOR1728_woMOAB'

Open branch from bus 243237 to bus 246232 ckt 1 / 243237 05ADAM 138 246232 ADAMS1EQ 999 1
 Open branch from bus 246231 to bus 246232 ckt 1 / 246231 ADAMS- 69.0 246232 ADAMS1EQ 999 1
 Open branch from bus 246230 to bus 246232 ckt 1 / 246230 ADAMS 34.5 246232 ADAMS1EQ 999 1
 Open branch from bus 243237 to bus 247500 ckt 1 / 243237 05ADAM 138 247500 R-003 C 138 1
 Open branch from bus 243334 to bus 247500 ckt 1 / 243334 05MAGLEY 138 247500 R-003 C 138 1
 Open branch from bus 243237 to bus 243358 ckt 1 / 243237 05ADAM 138 243358 05PENNV I 138 1
 Open branch from bus 243319 to bus 243358 ckt 1 / 243319 05JAY 138 243358 05PENNV I 138 1
 Open branch from bus 243358 to bus 246021 ckt 1 / 243358 05PENNV I 138 246021 PENNV L 12.0 1

end

PJM Analysis - Network Impacts

The Queue Project #Y2-095 was studied as a 1211.0MW (Capacity 1211.0MW) injection at the Sullivan 765 kV substation in the AEP area. Project #Y2-095 was evaluated for compliance with reliability criteria for summer peak conditions in 2016. Potential network impacts were as follows:

Table 7: PJM Option 1- Connection to Sullivan 765 kV Substation

Contingency Name	Description
6484	CONTINGENCY '6484' OPEN BRANCH FROM BUS 243217 TO BUS 243878 CKT 1 / 243217 05DEQUIN 345 243878 05MEADOW 345 1 OPEN BRANCH FROM BUS 243217 TO BUS 243878 CKT 2 / 243217 05DEQUIN 345 243878 05MEADOW 345 2 END
01HATFLD _01RONCO _059	CONTINGENCY '01HATFLD _01RONCO _059' DISCONNECT BRANCH FROM BUS 235108 TO BUS 235774 CKT 1 /* 500/500KV, AREA 201/201. END
05BELMON _05KAMMER _108	CONTINGENCY '05BELMON _05KAMMER _108' DISCONNECT BRANCH FROM BUS 242920 TO BUS 242925 CKT 1 /* 765/765KV, AREA 205/205. END
05CLOVRD _05J.FERR _096	CONTINGENCY '05CLOVRD _05J.FERR _096' DISCONNECT BRANCH FROM BUS 242512 TO BUS 242514 CKT 1 /* 765/765KV, AREA 205/205. END
05DUMONT _05GRNTWN _120_A	CONTINGENCY '05DUMONT _05GRNTWN _120_A' DISCONNECT BRANCH FROM BUS 243206 TO BUS 907020 CKT 1 /* 765/765KV, AREA 205/205. END
05DUMONT _05GRNTWN _120_B	CONTINGENCY '05DUMONT _05GRNTWN _120_B' DISCONNECT BRANCH FROM BUS 907020 TO BUS 243207 CKT 1 /* 765/765KV, AREA 205/205. END
05HANG R _05JEFRSO _114	CONTINGENCY '05HANG R _05JEFRSO _114' DISCONNECT BRANCH FROM BUS 242924 TO BUS 243208 CKT 1 /* 765/765KV, AREA 205/205. END
05JEFRSO _05ROCKPT _122	CONTINGENCY '05JEFRSO _05ROCKPT _122' DISCONNECT BRANCH FROM BUS 243208 TO BUS 243209 CKT 1 /* 765/765KV, AREA 205/205. END
05MOUNTN _05BELMON _102	CONTINGENCY '05MOUNTN _05BELMON _102' DISCONNECT BRANCH FROM BUS 242516 TO BUS 242920 CKT 1 /* 765/765KV, AREA 205/205. END
1375_C1	CONTINGENCY '1375_C1' OPEN BRANCH FROM BUS 242511 TO BUS 242518 CKT 4 / 242511 05BROADF 765 242518 05BROADF 500 4 OPEN BRANCH FROM BUS 242518 TO BUS 360106 CKT 1 / 242518 05BROADF 500 360106 8SULLIVAN TN 500 1 END

Table 7: PJM Option 1- Connection to Sullivan 765 kV Substation

Contingency Name	Description
1589_B3_05CLOVRD 765-10_WOMOAB	CONTINGENCY '1589_B3_05CLOVRD 765-10_WOMOAB' OPEN BRANCH FROM BUS 242512 TO BUS 242514 CKT 1 / 242512 05CLOVRD 765 242514 05J.FERR 765 1 OPEN BRANCH FROM BUS 242512 TO BUS 242515 CKT 1 / 242512 05CLOVRD 765 242515 05JOSHUA 765 1 OPEN BRANCH FROM BUS 242512 TO BUS 242524 CKT 10 / 242512 05CLOVRD 765 242524 05CLOVRD 345 10 END
1733_C2_X1-020	CONTINGENCY '1733_C2_X1-020' OPEN BRANCH FROM BUS 243206 TO BUS 907020 CKT 1 / 243206 05DUMONT 765 243207 05GRNTWN 765 1 OPEN BRANCH FROM BUS 243207 TO BUS 252004 CKT 1 / 243207 05GRNTWN 765 252004 08GRNTWN 1.00 1 OPEN BRANCH FROM BUS 249619 TO BUS 252004 CKT 1 / 249619 08GRNTWN 230 252004 08GRNTWN 1.00 1 OPEN BRANCH FROM BUS 249741 TO BUS 252004 CKT 1 / 249741 08GRTOW2 138 252004 08GRNTWN 1.00 1 END
1760_C2_05JEFRSO 765-A	CONTINGENCY '1760_C2_05JEFRSO 765-A' OPEN BRANCH FROM BUS 243207 TO BUS 243208 CKT 1 / 243207 05GRNTWN 765 243208 05JEFRSO 765 1 OPEN BRANCH FROM BUS 242924 TO BUS 243208 CKT 1 / 242924 05HANG R 765 243208 05JEFRSO 765 1 END
2056&2058	CONTINGENCY '2056&2058' /* LN 2056 & 2058 OPEN BRANCH FROM BUS 314990 TO BUS 314591 CKT 1 /* 2056 HORNERTOWN OPEN BRANCH FROM BUS 314591 TO BUS 304222 CKT 1 /* 2056 OPEN BRANCH FROM BUS 314564 TO BUS 304222 CKT 1 /* 2058 ROCKY MT END
2856_C2	CONTINGENCY '2856_C2' OPEN BRANCH FROM BUS 242920 TO BUS 242925 CKT 1 / 242920 05BELMON 765 242925 05KAMMER 765 1 OPEN BRANCH FROM BUS 242920 TO BUS 242516 CKT 1 / 242920 05BELMON 765 242516 05MOUNTN 765 1 OPEN BRANCH FROM BUS 242923 TO BUS 242516 CKT 1 / 242923 05GAVIN 765 242516 05MOUNTN 765 1 OPEN BRANCH FROM BUS 242920 TO BUS 235102 CKT 1 / 242920 05BELMON 765 235102 BELMONT 500 1 END
2906_C2_05MARYSV 765-A1	CONTINGENCY '2906_C2_05MARYSV 765-A1' OPEN BRANCH FROM BUS 242926 TO BUS 242928 CKT 1 / 242926 05MALIS 765 242928 05MARYSV 765 1 OPEN BRANCH FROM BUS 242928 TO BUS 242939 CKT 1 / 242928 05MARYSV 765 242939 05MARYSV 345 1 OPEN BRANCH FROM BUS 239133 TO BUS 242939 CKT 1 / 239133 02TANGY 345 242939 05MARYSV 345 1 END

Table 7: PJM Option 1- Connection to Sullivan 765 kV Substation

Contingency Name	Description
2929_C2	CONTINGENCY '2929_C2' OPEN BRANCH FROM BUS 243207 TO BUS 243208 CKT 1 / 243207 05GRNTWN 765 243208 05JEFRSO 765 1 OPEN BRANCH FROM BUS 243208 TO BUS 243209 CKT 1 / 243208 05JEFRSO 765 243209 05ROCKPT 765 1 END
2930_C2	CONTINGENCY '2930_C2' OPEN BRANCH FROM BUS 243208 TO BUS 243209 CKT 1 / 243208 05JEFRSO 765 243209 05ROCKPT 765 1 OPEN BRANCH FROM BUS 243208 TO BUS 248000 CKT 1 / 243208 05JEFRSO 765 248000 06CLIFTY 345 1 END
2932_C2_05JEFRSO 765-A2	CONTINGENCY '2932_C2_05JEFRSO 765-A2' OPEN BRANCH FROM BUS 242924 TO BUS 243208 CKT 1 / 242924 05HANG R 765 243208 05JEFRSO 765 1 OPEN BRANCH FROM BUS 243208 TO BUS 248000 CKT 1 / 243208 05JEFRSO 765 248000 06CLIFTY 345 1 END
2942_C2_05KAMMER 765-PP	CONTINGENCY '2942_C2_05KAMMER 765-PP' OPEN BRANCH FROM BUS 242920 TO BUS 242925 CKT 1 / 242920 05BELMON 765 242925 05KAMMER 765 1 OPEN BRANCH FROM BUS 242920 TO BUS 242516 CKT 1 / 242920 05BELMON 765 242516 05MOUNTN 765 1 OPEN BRANCH FROM BUS 242920 TO BUS 235102 CKT 1 / 242920 05BELMON 765 235102 BELMONT 500 1 OPEN BRANCH FROM BUS 242925 TO BUS 243188 CKT 1 / 242925 05KAMMER 765 243188 05MLG1 26.0 1 REMOVE UNIT 1 FROM BUS 243188 / 243188 05MLG1 26.0 END
2965_C2	CONTINGENCY '2965_C2' OPEN BRANCH FROM BUS 243218 TO BUS 243222 CKT 1 / 243218 05DESOTO 345 243222 05FALL C 345 1 OPEN BRANCH FROM BUS 243218 TO BUS 243278 CKT 1 / 243218 05DESOTO 345 243278 05DESOTO 138 1 END
2978_C2_X1-020	CONTINGENCY '2978_C2_X1-020' OPEN BRANCH FROM BUS 243206 TO BUS 907020 CKT 1 / 243206 05DUMONT 765 243207 05GRNTWN 765 1 OPEN BRANCH FROM BUS 243206 TO BUS 270644 CKT 1 / 243206 05DUMONT 765 270644 WILTO; 765 1 END
2979_C2_X1-020_X2-052	CONTINGENCY '2979_C2_X1-020_X2-052' OPEN BRANCH FROM BUS 243206 TO BUS 907020 CKT 1 / 243206 05DUMONT 765 243207 05GRNTWN 765 1 OPEN BRANCH FROM BUS 243206 TO BUS 243219 CKT 2 / 243206 05DUMONT 765 243219 05DUMONT 345 2 OPEN BRANCH FROM BUS 243219 TO BUS 909180 CKT 2 / 243219 05DUMONT 345 243229 05OLIVE 345 2 END

Table 7: PJM Option 1- Connection to Sullivan 765 kV Substation

Contingency Name	Description
3002_C2_05ROCKPT 765-C2	CONTINGENCY '3002_C2_05ROCKPT 765-C2' OPEN BRANCH FROM BUS 243208 TO BUS 243209 CKT 1 / 243208 05JEFRSO 765 243209 05ROCKPT 765 1 OPEN BRANCH FROM BUS 243209 TO BUS 243240 CKT 8 / 243209 05ROCKPT 765 243240 05AKSTL2 138 8 OPEN BRANCH FROM BUS 243785 TO BUS 243240 CKT 1 / 243785 05AKSTL 138 243240 05AKSTL2 138 1 END
3007_C2	CONTINGENCY '3007_C2' OPEN BRANCH FROM BUS 243209 TO BUS 243210 CKT 1 / 243209 05ROCKPT 765 243210 05SULLVA 765 1 OPEN BRANCH FROM BUS 243210 TO BUS 243213 CKT 1 / 243210 05SULLVA 765 243213 05BREED 345 1 END
3132_C2_05GRNTWN 765-T1_X1-020	CONTINGENCY '3132_C2_05GRNTWN 765-T1_X1-020' OPEN BRANCH FROM BUS 907020 TO BUS 243207 CKT 1 / 243206 05DUMONT 765 243207 05GRNTWN 765 1 OPEN BRANCH FROM BUS 243207 TO BUS 249742 CKT 1 / 243207 05GRNTWN 765 249742 08GRTOWN 138 1 OPEN BRANCH FROM BUS 243312 TO BUS 249742 CKT 1 / 243312 05HUMMEL 138 249742 08GRTOWN 138 1 END
3183_C2_05ROCKPT 765-C	CONTINGENCY '3183_C2_05ROCKPT 765-C' OPEN BRANCH FROM BUS 243208 TO BUS 243209 CKT 1 / 243208 05JEFRSO 765 243209 05ROCKPT 765 1 OPEN BRANCH FROM BUS 243209 TO BUS 243239 CKT 7 / 243209 05ROCKPT 765 243239 05AKSTL1 138 7 OPEN BRANCH FROM BUS 243785 TO BUS 243239 CKT 1 / 243785 05AKSTL 138 243239 05AKSTL1 138 1 END
345-L8001___-S	CONTINGENCY '345-L8001___-S' / CONTINGENCY # 734 TRIP BRANCH FROM BUS 270853 TO BUS 348847 CKT 1 / PONTI; R 345 7BROKAW T1 345 END
361_1_B2	CONTINGENCY '361_1_B2' OPEN BRANCH FROM BUS 243206 TO BUS 299951 CKT 1 /* 243206 05DUMONT 765 299951 05SORENS 765 1 END
37_B2_TOR12_WOM OP	CONTINGENCY '37_B2_TOR12_WOMOP' OPEN BRANCH FROM BUS 242920 TO BUS 242925 CKT 1 / 242920 05BELMON 765 242925 05KAMMER 765 1 OPEN BRANCH FROM BUS 242920 TO BUS 242516 CKT 1 / 242920 05BELMON 765 242516 05MOUNTN 765 1 OPEN BRANCH FROM BUS 242920 TO BUS 235102 CKT 1 / 242920 05BELMON 765 235102 BELMONT 500 1 END
4689_B2_TOR15257_A	CONTINGENCY '4689_B2_TOR15257_A' OPEN BRANCH FROM BUS 243878 TO BUS 914010 CKT 1 / 243878 05MEADOW 345 914010 Y2-010 TAP 345 1

Table 7: PJM Option 1- Connection to Sullivan 765 kV Substation

Contingency Name	Description
	END
4690_C2_05OLIVE 345-D	CONTINGENCY '4690_C2_05OLIVE 345-D' OPEN BRANCH FROM BUS 914010 TO BUS 243229 CKT 1 / 914010 Y2-010 TAP 345 243229 05OLIVE 345 1 OPEN BRANCH FROM BUS 243229 TO BUS 274804 CKT 1 / 243229 05OLIVE 345 274804 UPNOR;RP 345 1 END
474_A	CONTINGENCY '474_A' OPEN BRANCH FROM BUS 242931 TO BUS 248101 CKT 1 / 242931 05BEVERL 345 242946 05TIDD 345 1 OPEN BRANCH FROM BUS 242937 TO BUS 242940 CKT 1 / 242937 05KAMMER 345 242940 05MUSKNG 345 1 END
4831_C2_05KAMMER 765-NN	CONTINGENCY '4831_C2_05KAMMER 765-NN' OPEN BRANCH FROM BUS 242925 TO BUS 242930 CKT 1 / 242925 05KAMMER 765 242930 05SCANTO 765 1 OPEN BRANCH FROM BUS 242925 TO BUS 235117 CKT 1 / 242925 05KAMMER 765 235117 KAMMER 500 1 OPEN BRANCH FROM BUS 242930 TO BUS 242943 CKT 3 / 242930 05SCANTO 765 242943 05SCANTO 345 3 OPEN BRANCH FROM BUS 235111 TO BUS 235117 CKT 1 / 235111 502 JUNCTION 500 235117 KAMMER 500 1 OPEN BRANCH FROM BUS 242943 TO BUS 243092 CKT 4 / 242943 05SCANTO 345 243092 05SCANTE 138 4 END
5031_C2_05KAMMER 765-PP2	CONTINGENCY '5031_C2_05KAMMER 765-PP2' OPEN BRANCH FROM BUS 242920 TO BUS 242925 CKT 1 / 242920 05BELMON 765 242925 05KAMMER 765 1 OPEN BRANCH FROM BUS 242920 TO BUS 242516 CKT 1 / 242920 05BELMON 765 242516 05MOUNTN 765 1 OPEN BRANCH FROM BUS 242920 TO BUS 235102 CKT 1 / 242920 05BELMON 765 235102 BELMONT 500 1 OPEN BRANCH FROM BUS 242925 TO BUS 235117 CKT 1 / 242925 05KAMMER 765 235117 KAMMER 500 1 OPEN BRANCH FROM BUS 235111 TO BUS 235117 CKT 1 / 235111 502 JUNCTION 500 235117 KAMMER 500 1 END
6178_C2_05CLOVRD 345-P_WOMOAB	CONTINGENCY '6178_C2_05CLOVRD 345-P_WOMOAB' OPEN BRANCH FROM BUS 242512 TO BUS 242514 CKT 1 / 242512 05CLOVRD 765 242514 05J.FERR 765 1 OPEN BRANCH FROM BUS 242512 TO BUS 242515 CKT 1 / 242512 05CLOVRD 765 242515 05JOSHUA 765 1 OPEN BRANCH FROM BUS 242512 TO BUS 242524 CKT 10 / 242512 05CLOVRD 765 242524 05CLOVRD 345 10 OPEN BRANCH FROM BUS 242524 TO BUS 242527 CKT 1 / 242524 05CLOVRD 345 242527 05M FUNK 345 1 END

Table 7: PJM Option 1- Connection to Sullivan 765 kV Substation

Contingency Name	Description
6189_C2_05HANG R 765-D1	CONTINGENCY '6189_C2_05HANG R 765-D1' OPEN BRANCH FROM BUS 242921 TO BUS 242924 CKT 1 / 242921 05CORNU 765 242924 05HANG R 765 1 OPEN BRANCH FROM BUS 242924 TO BUS 243208 CKT 1 / 242924 05HANG R 765 243208 05JEFRSO 765 1 END
6430_B2_TOR22_WO MOAB	CONTINGENCY '6430_B2_TOR22_WOMOAB' OPEN BRANCH FROM BUS 242529 TO BUS 242528 CKT 1 / 242529 05TRISTA 345 248005 06KYGER 345 1 OPEN BRANCH FROM BUS 242528 TO BUS 248005 CKT 1 / 242529 05TRISTA 345 248005 06KYGER 345 1 OPEN BRANCH FROM BUS 242529 TO BUS 242835 CKT 1 / 242529 05TRISTA 345 242835 05TRISTA 138 1 END
6472_B2_TOR15258	CONTINGENCY '6472_B2_TOR15258' OPEN BRANCH FROM BUS 243217 TO BUS 243878 CKT 1 / 243217 05DEQUIN 345 243878 05MEADOW 345 1 END
6488_A	CONTINGENCY '6488_A' OPEN BRANCH FROM BUS 243878 TO BUS 914010 CKT 1 / 243878 05MEADOW 345 914010 Y2-010 TAP 345 1 OPEN BRANCH FROM BUS 243878 TO BUS 243230 CKT 1 / 243878 05MEADOW 345 243230 05REYNOL 345 1 OPEN BRANCH FROM BUS 243229 TO BUS 243230 CKT 1 / 243229 05OLIVE 345 243230 05REYNOL 345 1 OPEN BRANCH FROM BUS 243230 TO BUS 255173 CKT 1 / 243230 05REYNOL 345 255173 17RYNLDS 138 1 END
6490_B2_TOR3002545	CONTINGENCY '6490_B2_TOR3002545' OPEN BRANCH FROM BUS 243217 TO BUS 243878 CKT 2 / 243217 05DEQUIN 345 243878 05MEADOW 345 2 END
667_B2_TOR1697	CONTINGENCY '667_B2_TOR1697' OPEN BRANCH FROM BUS 243213 TO BUS 243217 CKT 1 / 243213 05BREED 345 243217 05DEQUIN 345 1 END
673_B2	CONTINGENCY '673_B2' OPEN BRANCH FROM BUS 243218 TO BUS 243222 CKT 1 / 243218 05DESOTO 345 243222 05FALL C 345 1 END
7336_C2_05SULLVA 765-A	CONTINGENCY '7336_C2_05SULLVA 765-A' OPEN BRANCH FROM BUS 243210 TO BUS 243213 CKT 1 / 243210 05SULLVA 765 243213 05BREED 345 1 OPEN BRANCH FROM BUS 243210 TO BUS 243213 CKT 2 / 243210 05SULLVA 765 243213 05BREED 345 2 END
8CARSON_8DBGEN_014_B	CONTINGENCY '8CARSON_8DBGEN_014_B' DISCONNECT BRANCH FROM BUS 909840 TO BUS 304183 CKT 1 /* 500/500KV, AREA 345/340. END
AP_C5_19	CONTINGENCY 'AP_C5_19' /BRIGHTON LOOP OPEN BRANCH FROM BUS 200003 TO BUS 235105 CKT 1 OPEN BRANCH FROM BUS 200003 TO BUS 200004 CKT 1

Table 7: PJM Option 1- Connection to Sullivan 765 kV Substation

Contingency Name	Description
	END
AP_SB_467	CONTINGENCY 'AP_SB_467' / HATFIELD500-RONCO500 STK BKR AT HATFIELD500 #8 OPEN BRANCH FROM BUS 235108 TO BUS 235774 CKT 1 OPEN BUS 235582 END
AP_SB_468	CONTINGENCY 'AP_SB_468' / HATFIELD500-RONCO500 STK BKR AT RONCO500 #1 OPEN BUS 235774 OPEN BUS 235755 OPEN BUS 235756 OPEN BUS 235757 END
APS_B_G402	CONTINGENCY 'APS_B_G402' / 235316 01COWEN 138 235318 01CRUPRN 138 1 OPEN BRANCH FROM BUS 235316 TO BUS 235318 CKT 1 END
APS_B_G425	CONTINGENCY 'APS_B_G425' / 235328 01ENONTP 138 235389 01POWELM 138 1 OPEN BRANCH FROM BUS 235328 TO BUS 235389 CKT 1 END
B_LINE_SY_064	CONTINGENCY 'B_LINE_SY_064' /* LINE 01CABOT 500 TO 02CRNBRY 500 CK 1 DISCONNECT BRANCH FROM BUS 235104 TO BUS 239280 CKT 1 /* CABOT 500.00 02CRNBRY 500.00 END
B_LINE_SY_065	CONTINGENCY 'B_LINE_SY_065' /* LINE 02CRNBRY 500 TO 01WYLIER 500 CK 1 DISCONNECT BRANCH FROM BUS 239280 TO BUS 235703 CKT 1 /* 02CRNBRY 500.00 WYLIE RIDGE 500.00 END
B_ME230-SX-#9	CONTINGENCY 'B_ME230-SX-#9' /* HUNTERSTOWN-JACKSON & HUNTERSTOWN 2 BANK DISCONNECT BRANCH FROM BUS 204575 TO BUS 204502 CKT 1 DISCONNECT BRANCH FROM BUS 204575 TO BUS 204539 CKT 4 END
B_PN230-SX-#11_B	CONTINGENCY 'B_PN230-SX-#11_B' /* X1-109 TAP - N MESHOPPEN (ETP) 230 KV & N MESHOPPEN BK 4 DISCONNECT BRANCH FROM BUS 907460 TO BUS 200924 CKT 1F DISCONNECT BRANCH FROM BUS 200924 TO BUS 200706 CKT 1F DISCONNECT BRANCH FROM BUS 200706 TO BUS 200677 CKT 4 END
B_PN230-SX-#8	CONTINGENCY 'B_PN230-SX-#8' /* EAST TOWANDA - HILLSIDE (ETH) 230 KV DISCONNECT BRANCH FROM BUS 200675 TO BUS 130763 CKT 1 END

Table 7: PJM Option 1- Connection to Sullivan 765 kV Substation

Contingency Name	Description
C1_PN230-BS-#5A	CONTINGENCY 'C1_PN230-BS-#5A' /* EAST TOWANDA #1 230 KV BUS FAULT DISCONNECT BRANCH FROM BUS 200701 TO BUS 200675 CKT 1 DISCONNECT BRANCH FROM BUS 200675 TO BUS 130763 CKT 1 DISCONNECT BRANCH FROM BUS 200674 TO BUS 200675 CKT 3 END
C2_PN230-SB-#3D	CONTINGENCY 'C2_PN230-SB-#3D' /* EAST TOWANDA 230 KV STUCK CB - (GROVER) DISCONNECT BRANCH FROM BUS 200675 TO BUS 130763 CKT 1 DISCONNECT BRANCH FROM BUS 200857 TO BUS 200701 CKT 1 DISCONNECT BRANCH FROM BUS 200701 TO BUS 200675 CKT 1 DISCONNECT BRANCH FROM BUS 200701 TO BUS 200702 CKT 1 DISCONNECT BUS 200701 DISCONNECT BRANCH FROM BUS 200674 TO BUS 200675 CKT 3 END
C2_PN230-SB-#3F	CONTINGENCY 'C2_PN230-SB-#3F' /* EAST TOWANDA 230 KV STUCK CB - (#3 XF) DISCONNECT BRANCH FROM BUS 200675 TO BUS 130763 CKT 1 DISCONNECT BRANCH FROM BUS 200701 TO BUS 200675 CKT 1 DISCONNECT BRANCH FROM BUS 200674 TO BUS 200675 CKT 3 END
C2-BRK-NR125	CONTINGENCY 'C2-BRK-NR125' /* BREAKER FAILURE ON S145 BREAKER AT AVON 345KV DISCONNECT BRANCH FROM BUS 238569 TO BUS 238551 CKT 1 /* 02BEAVER 345.00 02AVON 345.00 DISCONNECT BRANCH FROM BUS 238569 TO BUS 238551 CKT 2 /* 02BEAVER 345.00 02AVON 345.00 END
C5-TWL-CR040_A	CONTINGENCY 'C5-TWL-CR040_A' /* DAVIS BESSE-BEAVER + DAVIS BESSE-HAYES 345KV DISCONNECT BRANCH FROM BUS 238654 TO BUS 239289 CKT 1 /* 02DAV-BE 345.00 02HAYES 345.00 DISCONNECT BRANCH FROM BUS 238654 TO BUS 907040 CKT 1 /* 02DAV-BE 345.00 X1-027A TAP 345.00 END
C5-TWL-CR040_B	CONTINGENCY 'C5-TWL-CR040_B' /* DAVIS BESSE-BEAVER + DAVIS BESSE-HAYES 345KV DISCONNECT BRANCH FROM BUS 238654 TO BUS 239289 CKT 1 /* 02DAV-BE 345.00 02HAYES 345.00 DISCONNECT BRANCH FROM BUS 907040 TO BUS 238569 CKT 1 /* X1-027A TAP 345.00 02BEAVER 345.00 END
C5-TWL-CR041_B	CONTINGENCY 'C5-TWL-CR041_B' /* DAVIS BESSE-BEAVER + BEAVER-HAYES 345KV DISCONNECT BRANCH FROM BUS 238569 TO BUS 239289 CKT 1 /* 02BEAVER 345.00 02HAYES 345.00 DISCONNECT BRANCH FROM BUS 907040 TO BUS 238569 CKT 1 /* X1-027A TAP 345.00 02BEAVER 345.00 END
C5-TWL-NR054	CONTINGENCY 'C5-TWL-NR054' /* AVON-BEAVER #1 AND #2 345KV LINE OUTAGES DISCONNECT BRANCH FROM BUS 238551 TO BUS 238569 CKT 1 /* 02AVON 345.00 02BEAVER 345.00 DISCONNECT BRANCH FROM BUS 238551 TO BUS 238569 CKT 2 /* 02AVON 345.00 02BEAVER 345.00

Table 7: PJM Option 1- Connection to Sullivan 765 kV Substation

Contingency Name	Description
	END
LN 2056_A3	CONTINGENCY 'LN 2056_A3' /*BATTLEBORO - ROCKY MOUNT OPEN BRANCH FROM BUS 314990 TO BUS 314591 CKT 1 /* OPEN BRANCH FROM BUS 314591 TO BUS 304222 CKT 1 END
PEACH245	CONTINGENCY 'PEACH245' /* \$CHESCO \$PEACH245 \$STBK TRIP BRANCH FROM BUS 200013 TO BUS 200004 CKT 1 /* PEACHBTM 500.00 CONASTONE 500.00 \$CHESCO \$PEACH245 \$STBK DISCONNECT BUS 200122 /* \$CHESCO \$PEACH245 \$STBK DISCONNECT BUS 200192 /* \$CHESCO \$PEACH245 \$STBK DISCONNECT BUS 200193 /* \$CHESCO \$PEACH245 \$STBK DISCONNECT BUS 200194 /* \$CHESCO \$PEACH245 \$STBK DISCONNECT BUS 200195 /* \$CHESCO \$PEACH245 \$STBK END /* \$CHESCO \$PEACH245 \$STBK Please refer to Appendix 36 for a table containing the generators having contribution to this flowgate. 25. The 05CORNER-05DEGUSS 138 kV line (from bus 243490 to bus 243496 ckt 1) loads from 116.5% to 117.61% (DC power flow) of its emergency rating (148 MVA) for the line fault with failed breaker contingency outage of CONTINGENCY DESCRIPTION ('2942_C2_05KAMMER 765-PP'). This project contributes approximately 10.15 MW to the thermal violation. CONTINGENCY '2942_C2_05KAMMER 765-PP' OPEN BRANCH FROM BUS 242920 TO BUS 242925 CKT 1 / 242920 05BELMON 765 242925 05KAMMER 765 1 OPEN BRANCH FROM BUS 242920 TO BUS 242516 CKT 1 / 242920 05BELMON 765 242516 05MOUNTN 765 1 OPEN BRANCH FROM BUS 242920 TO BUS 235102 CKT 1 / 242920 05BELMON 765 235102 BELMONT 500 1 OPEN BRANCH FROM BUS 242925 TO BUS 243188 CKT 1 / 242925 05KAMMER 765 243188 05MLG1 26.0 1 REMOVE UNIT 1 FROM BUS 243188 / 243188 05MLG1 26.0 END
PJM17	CONTINGENCY 'PJM17' DISCONNECT BRANCH FROM BUS 200004 TO BUS 200013 CKT 1 /* CNASTONE PEACHBTM 500 500 END
PP1E_NO EMORYGROVE	CONTINGENCY 'PP1E_NO EMORYGROVE' / NO PATH OPEN BRANCH FROM BUS 200003 TO BUS 200004 CKT 1 / 200003 BRIGHTON 500 200004 CNASTONE 500 1 END

Generator Deliverability

(Single or N-1 contingencies for the Capacity portion only of the interconnection)

Table 8 below provides a summary of the impacts caused by Y2-095 on the AEP transmission system and other TO areas for generator deliverability:

Table 8: PJM Option 1- Connection to Sullivan 765 kV Substation												
Y2-095 Generator Deliverability												
	Contingency		Facility Description	Bus		Cir.	Loading		Rating		MW Cont.	FG App.
#	Type	Name		From	To		Initial	Final	Type	MVA		
1	N-1	01HATFLD_01RONCO_059	SHEPLER H J-SMITHTON 62 138 kV line	235247	235252	1	95.23	96.09	ER	297	15.76	2
2	N-1	673_B2	05DELCOR-05MADISO 138 kV line	243276	243333	1	98.3	99.25	ER	223	13.13	4
3	N-1	8CARSON_8DBGEN_014_B	6HALIFAX-6CLOVER 230 kV line	314697	314686	1	95.6	96.49	ER	797	44.13	14

Multiple Facility Contingency

(Double Circuit Tower Line(DCTL), Line with Failed Breaker(LFFB) and Bus Fault(Bus) contingencies for the full energy output.)

Table 9 below provides a summary of the impacts caused by Y2-095 on the AEP transmission system and other TO areas for multiple facility contingency:

Table 9: PJM Option 1- Connection to Sullivan 765 kV Substation												
Y2-095 Multiple Facility Contingency												
#	Contingency		Facility Description	Bus			Loading		Rating		MW Cont.	FG App.
	Type	Name		From	To	Cir.	Initial	Final	Type	MVA		
1	LFFB	1760_C2_05JEFRSO 765-A	06KYGER-05SPORN 345 kV line	248005	242528	1	97.27	97.96	ER	1438	61.56	1
2	LFFB	5031_C2_05KAMMER 765-PP2	05J.FERR-05CLOVRD 765 kV line	242514	242512	1	97.46	98	ER	4055	139.98	3
3	DCTL	6484	05REYNOL 345/138 kV transformer	255173	243230	1	99.58	100.92	ER	318	26.27	7
4	LFFB	2932_C2_05JEFRSO 765-A2	05JEFRSO-05GRNTWN 765 kV line	243208	243207	1	90.18	99.07	ER	4094	363.81	8
5	LFFB	AP_SB_468	SHEPLER H J-SMITHTON 62 138 kV line	235247	235252	1	98.53	99.4	ER	297	16	9
6	LFFB	6189_C2_05HANG R 765-D1	X1-020 TAP-05DUMONT 765 kV line	907020	243206	1	98.68	103.58	ER	4094	200.63	15
7	LFFB	7336_C2_05SULLVA 765-A	05SULLVA-05ROCKPT 765 kV line	243210	243209	1	82.28	110.75	ER	4253	1211	44

Contribution to Previously Identified Overloads

(This project contributes to the following contingency overloads, i.e. “Network Impacts”, identified for earlier generation or transmission interconnection projects in the PJM Queue)

Table 10 below provides a summary of the impacts caused by Y2-095 on the AEP transmission system and other TO areas for contribution to previously identified overloads:

Table 10: PJM Option 1- Connection to Sullivan 765 kV Substation												
Y2-095 Contribution to Previously Identified Overloads												
#	Type	Contingency		Bus			Loading		Rating		MW Cont.	FG App.
		Name	Facility Description	From	To	Cir.	Initial	Final	Type	MVA		
1	N-1	05DUMONT_05GRNTWN_120_B	05ROCKCR-05HUNT J 138 kV line	243367	243313	1	100.79	101.76	ER	167	9.95	10
2	N-1	673_B2	05CROSS-05HOGAN 138 kV line	243270	243311	1	100.67	101.56	ER	245	13.58	12
3	N-1	673_B2	05FALL C-05DELCOR 138 kV line	243292	243276	1	101.6	102.55	ER	223	13.13	13
4	LFFB	AP_SB_467	SMITHTON 62-YUKON 138 kV line	235252	235277	1	102.27	103.13	ER	297	15.76	16
5	N-1	673_B2	05MADISO-05CROSS 138 kV line X2-052 TAP-05DUMONT 345 kV line	243333	243270	1	105.74	106.63	ER	245	13.58	17
6	N-1	05JEFRSO_05ROCKPT_122		909180	243219	2	100.62	106.32	ER	1409	80.22	18
7	LFFB	AP_SB_467	SHEPLER H J-SMITHTON 62 138 kV line	235247	235252	1	107.58	108.44	ER	297	15.76	19
8	LFFB	6178_C2_05CLOVRD 345-P_WOMOAB	05BURLHT-05CLOVRD 138 kV line	242572	242607	1	106.81	107.86	ER	223	14.58	20
9	N-1	361_1_B2	05JEFRSO-05HANG R 765 kV line	243208	242924	1	102.62	108.62	ER	4055	282.07	21
10	N-1	37_B2_TOR12_WOMOP	05DEGUSS-05BELPRE 138 kV line	243496	243470	1	107.22	108.33	ER	148	10.15	22
11	N-1	345-L8001___-S	4LILLY-POWER;RT 138 kV line	348875	272285	1	112.06	112.88	ER	132	6.72	23
12	N-1	37_B2_TOR12_WOMOP	05J.FERR-05CLOVRD 765 kV line	242514	242512	1	109.72	110.36	ER	3176	124.43	24
13	N-1	37_B2_TOR12_WOMOP	05MUSKNG-05BEVERL 345 kV line	242940	242931	1	110.2	111.03	ER	971	49.41	25
14	N-1	05JEFRSO_05ROCKPT_122	7PANA-KINCA; R 345 kV line	347945	270797	1	102.83	108.69	ER	1195	70.06	26
15	N-1	37_B2_TOR12_WOMOP	05CORNER-05DEGUSS 138 kV line	243490	243496	1	110.52	111.62	ER	148	10.15	27
16	N-1	LN 2056_A3	3ROCKY M-3BTLEBRO 115 kV line	304223	314554	1	102.64	103.88	ER	94	7.23	28
17	DCTL	AP_C5_19	TANEYTOWN 1-GERMANTN 138 kV line	235463	204530	1	110.9	111.71	ER	214	10.73	29
18	DCTL	AP_C5_19	TANEYTOWN 1-GERMANTN 138 kV line	235463	204530	1	110.9	111.71	ER	214	10.73	30
19	LFFB	2942_C2_05KAMMER 765-PP	05DEGUSS-05BELPRE 138 kV line	243496	243470	1	113.14	114.24	ER	148	10.15	31
20	N-1	05JEFRSO_05ROCKPT_122	08NOBLSV-05FALL C 345 kV line	249515	243222	1	105.83	113.82	ER	956	76.45	32
21	BUS	1375_C1	05JEFRSO-05HANG R 765 kV line	243208	242924	1	108.52	114.96	ER	4253	274.13	33
22	N-1	PJM17	NOTTREAC-NOTTNGHM 230 kV line	213846	213844	1	113.19	113.97	ER	567	28.37	34
23	LFFB	2856_C2	05DEGUSS-05BELPRE 138 kV line	243496	243470	1	114.99	116.1	ER	148	10.15	35
24	LFFB	PEACH245	NOTTREAC-	213846	213844	1	114.14	114.92	ER	567	28.37	36

Table 10: PJM Option 1- Connection to Sullivan 765 kV Substation

Y2-095 Contribution to Previously Identified Overloads

#	Type	Contingency	Facility Description	Bus			Loading		Rating		MW Cont.	FG App.
		Name		From	To	Cir.	Initial	Final	Type	MVA		
			NOTTINGHAM 230 kV line									
25	LFFB	2942_C2_05KAMMER 765-PP	05CORNER-05DEGUSS 138 kV line	243490	243496	1	116.5	117.61	ER	148	10.15	37
26	N-1	673_B2	05HOGAN-05DELAWR 138 kV line	243311	243275	1	118.47	119.75	ER	167	13.16	38
27	N-1	05HANG R_05JEFRSO_114	05JEFRSO 765/345 kV transformer	243208	248000	1	103.02	116.47	ER	1935	260.56	39
28	LFFB	2932_C2_05JEFRSO 765-A2	X1-020 TAP-05DUMONT 765 kV line	907020	243206	1	111.14	118.74	ER	4094	310.92	40
29	LFFB	2856_C2	05CORNER-05DEGUSS 138 kV line	243490	243496	1	118.3	119.4	ER	148	10.15	41
30	LFFB	6178_C2_05CLOVRD 345-P_WOMOAB	05CATAWZ-05BURLHT 138 kV line	242584	242572	1	118.63	119.69	ER	223	14.58	42
31	LFFB	6178_C2_05CLOVRD 345-P_WOMOAB	05WSALEM-05CATAWZ 138 kV line	242852	242584	1	118.63	119.69	ER	223	14.58	43
32	N-1	05MOUNTN_05BELMON_102	05WATERF-05MUSKNG 345 kV line	242947	242940	2	123.59	124	ER	2572	65.3	45
33	DCTL	AP_C5_19	CARROLL-TANEYTOWN 1 138 kV line	235450	235463	1	119.8	120.61	ER	214	10.73	46
34	N-1	05CLOVRD_05J.FERR_096	05SCHRIS-05TECHDR 138 kV line	242791	243874	1	121.56	122.43	ER	167	8.97	47
35	N-1	PP1E_NO EMORYGROVE	STRABAN-LINCOLN 115 kV line	204538	204544	1	119.07	120.11	ER	153	10.11	48
36	LFFB	2978_C2_X1-020	05HUMMEL-05ROCKCR 138 kV line	243312	243367	1	127.91	128.79	ER	184	10.01	49
37	LFFB	6178_C2_05CLOVRD 345-P_WOMOAB	05M FUNK-05WSALEM 138 kV line	242708	242852	1	124.77	125.83	ER	223	14.58	50
38	LFFB	2979_C2_X1-020_X2-052	05HUMMEL-05ROCKCR 138 kV line	243312	243367	1	128.37	129.26	ER	184	10.12	51
39	N-1	APS_B_G402	SUTTON-HEATERS 138 kV line	235411	235348	1	125.3	126.17	ER	103	5.58	52
40	DCTL	474_A	05MOUNTN-05BELMON 765 kV line	242516	242920	1	128.38	129.01	ER	4253	170.98	53
41	N-1	1589_B3_05CLOVRD 765-10_WOMOAB	05MOUNTN-05BELMON 765 kV line	242516	242920	1	130.38	131.03	ER	4055	167.95	54
42	N-1	05CLOVRD_05J.FERR_096	05TECHDR-05M FUNK 138 kV line	243874	242708	1	128.45	129.41	ER	151	8.97	55
43	N-1	05JEFRSO_05ROCKPT_122	05REYNOL-05OLIVE 345 kV line	243230	243229	1	122.25	131.41	ER	972	88.98	56
44	LFFB	1733_C2_X1-020	05HUMMEL-05ROCKCR 138 kV line	243312	243367	1	135.92	136.8	ER	184	10.03	57
45	DCTL	2056&2058	3ROCKY M-3BTLEBRO 115 kV line	304223	314554	1	125.42	126.81	ER	94	8.11	58
46	Non	Non	05TILTON-WINDSOR 138 kV line	243131	235428	1	136.61	137.43	NR	205	10.33	59
47	LFFB	2965_C2	05HOGAN-05DELAWR 138 kV line	243311	243275	1	137.87	138.9	ER	167	10.68	60
48	LFFB	2978_C2_X1-020	05ROCKCR-05HUNT J 138 kV line	243367	243313	1	138.81	139.77	ER	167	10.01	61
49	N-1	667_B2_TOR1697	05ROCKPT-05JEFRSO 765 kV line	243209	243208	1	121.26	134.44	ER	4055	534.24	62
50	LFFB	2979_C2_X1-020_X2-052	05ROCKCR-05HUNT J 138 kV line	243367	243313	1	139.29	140.27	ER	167	10.12	63
51	N-1	05DUMONT_05GRNTWN_120_A	05HUNT J-05SORENS 138 kV line	243313	243377	1	139.28	140.84	ER	208	20.14	64
52	LFFB	2906_C2_05MARYSV 765-A1	05MOUNTN-05BELMON 765 kV line	242516	242920	1	139.51	140.19	ER	4253	186.07	65
53	LFFB	2929_C2	05BREED-05DEQUIN 345 kV line	243213	243217	1	123.75	136.56	ER	1272	162.96	66
54	N-1	05CLOVRD_05J.FERR_096	05CLYTR1-05SCHRIS 138 kV line	242608	242791	1	137.8	138.64	ER	167	8.69	67
55	DCTL	AP_C5_19	STRABAN-LINCOLN 115 kV line	204538	204544	1	133.65	134.75	ER	153	10.73	68
56	N-1	B_LINE_SY_064	SHANOR MANOR-BUTLER 138 kV line	235246	235152	1	138.66	139.71	ER	352	22.83	69

Table 10: PJM Option 1- Connection to Sullivan 765 kV Substation

Y2-095 Contribution to Previously Identified Overloads

#	Contingency		Facility Description	Bus			Loading		Rating		MW Cont.	FG App.
	Type	Name		From	To	Cir.	Initial	Final	Type	MVA		
57	N-1	6430_B2_TOR22_WOMOAB	06KYGER-05SPORN 345 kV line	248005	242528	2	141.51	142.32	ER	1438	72.83	70
58	LFFB	5031_C2_05KAMMER 765-PP2	05BELVA-JONES BRANCH 138 kV line	242551	235626	1	140.59	141.4	ER	278	14.07	71
59	N-1	B_LINE_SY_065	02HOYTDL-02CRNBRY 138 kV line	238813	239281	1	140.82	141.68	ER	309	16.38	72
60	LFFB	2930_C2	05BREED-05DEQUIN 345 kV line	243213	243217	1	125.02	138.06	ER	1272	165.85	73
61	DCTL	6488_A	05ROCKPT-05JEFRSO 765 kV line	243209	243208	1	127.26	139.73	ER	4253	530.04	74
62	N-1	B_LINE_SY_064	KRENDALE-SHANOR MANOR 138 kV line	235205	235246	1	141.72	142.77	ER	352	22.83	75
63	N-1	05JEFRSO_05ROCKPT_122	05EUGENE-08CAYSUB 345 kV line	243221	249504	1	122.76	138.66	ER	1386	236.33	76
64	N-1	B_PN230-SX-#11_B	N.MESHPN 230/115 kV transformer	200825	200706	3	142.58	143.43	ER	188	9.86	77
65	N-1	B_PN230-SX-#11_B	NO MESHO-MESH2REA 115 kV line	200677	200825	3	142.6	143.45	ER	188	9.86	78
66	N-1	8CARSON_8DBGEN_014_B	6PERSON-6HALIFAX 230 kV line	304070	314697	1	138.49	139.59	ER	608	41.25	79
67	LFFB	5031_C2_05KAMMER 765-PP2	GILBOA-ENON TAP 138 kV line	235333	235328	1	145.99	146.88	ER	256	14.07	80
68	LFFB	1733_C2_X1-020	05ROCKCR-05HUNT J 138 kV line	243367	243313	1	148.73	149.7	ER	167	10.03	81
69	N-1	05BELMON_05KAMMER_108	05BELMON 765/500 kV transformer	242920	235102	4	145.53	146.48	ER	2094	123.21	82
70	LFFB	3132_C2_05GRNTWN 765-T1_X1-020	08GRTOWN-05GRANT 138 kV line	249742	243302	1	152.76	153.63	ER	239	12.99	83
71	LFFB	5031_C2_05KAMMER 765-PP2	05DEGUSS-05BELPRE 138 kV line	243496	243470	1	147.37	148.8	ER	148	13.14	84
72	N-1	PP1E_NO EMORYGROVE	GERMANTN-STRABAN 115 kV line	204529	204538	4	143.85	144.99	ER	139	10.11	85
73	N-1	B_PN230-SX-#8	N.WAV115-E.SAYRE 115 kV line	130836	200676	4	150.85	151.85	ER	128	7.91	86
74	LFFB	6189_C2_05HANG R 765-D1	05JEFRSO 765/345 kV transformer	243208	248000	1	131.82	148.85	ER	1935	260.56	87
75	LFFB	5031_C2_05KAMMER 765-PP2	05CORNER-05DEGUSS 138 kV line	243490	243496	1	150.67	152.11	ER	148	13.14	88
76	N-1	APS_B_G425	NETTIE-CRUPPERNECK 138 kV line	235376	235318	4	154.05	154.95	ER	151	8.46	89
77	N-1	4689_B2_TOR15257_A	05MEADOW-05REYNOL 345 kV line	243878	243230	1	146.42	154.88	ER	971	82.14	90
78	DCTL	AP_C5_19	ROXBURY 138/115 kV transformer	200532	200520	1	152.04	152.93	ER	138	7.85	91
79	N-1	05JEFRSO_05ROCKPT_122	05FALL C-05DESOTO 345 kV line	243222	243218	1	141.65	152.8	ER	1016	113.35	92
80	LFFB	4690_C2_05OLIVE 345-D	05REYNOL-05OLIVE 345 kV line	243230	243229	1	158.76	159.98	ER	972	73.57	93
81	DCTL	C5-TWL-CR040_A	02CAMDEN-02HENRTA 138 kV line	239319	239318	1	160.27	161.1	ER	135	6.88	94
82	LFFB	4831_C2_05KAMMER 765-NN	05BELMON 765/500 kV transformer	242920	235102	4	158.79	159.83	ER	2094	156.4	95
83	DCTL	C5-TWL-CR040_A	02BRKSID-02TROY 138 kV line	238586	239216	1	164.99	165.82	ER	135	6.88	96
84	DCTL	AP_C5_19	GERMANTN-STRABAN 115 kV line	204529	204538	1	159.43	160.64	ER	139	10.73	97
85	N-1	667_B2_TOR1697	05EUGENE-05DEQUIN 345 kV line	243221	243217	1	158.28	165.86	ER	971	73.58	98
86	Non	Non	OXBOW-LACK 230 kV line	200708	208009	1	172.38	173.24	NR	488	26.17	99
87	N-1	05JEFRSO_05ROCKPT_122	05BREED-7CASEY 345 kV line	243213	346809	1	135.45	164.09	ER	1466	419.83	100
88	DCTL	C5-TWL-CR041_B	02GRNFLD-02NASA 138 kV line	238768	238981	1	174.61	175.42	ER	179	9.01	101
89	LFFB	2929_C2	05EUGENE-08CAYSUB	243221	249504	1	151.87	169.02	ER	1386	237.71	102

Table 10: PJM Option 1- Connection to Sullivan 765 kV Substation

Y2-095 Contribution to Previously Identified Overloads

#	Type	Contingency	Facility Description	Bus			Loading		Rating		MW Cont.	FG App.
		Name		From	To	Cir.	Initial	Final	Type	MVA		
			345 kV line									
90	N-1	B_LINE_SY_064	02MAPLE-02SENECA 138 kV line	238942	239099	1	173.56	174.63	ER	350	23.91	103
91	BUS	C1_PN230-BS-#5A	N.WAV115-E.SAYRE 115 kV line	130836	200676	1	175.68	176.73	ER	128	8.27	104
92	LFFB	C2_PN230-SB-#3F	N.WAV115-E.SAYRE 115 kV line	130836	200676	1	175.68	176.73	ER	128	8.27	105
93	Non	Non	N.MESHPN-OXBOW 230 kV line	200706	200708	1	176.75	177.62	NR	478	25.72	106
94	LFFB	7336_C2_05SULLVA 765-A	05ROCKPT-05JEFRSO 765 kV line	243209	243208	1	141.36	169.43	ER	4253	1193.72	107
95	LFFB	C2_PN230-SB-#3D	N.WAV115-E.SAYRE 115 kV line	130836	200676	1	177.45	178.5	ER	128	8.3	108
96	LFFB	2929_C2	05BREED-7CASEY 345 kV line	243213	346809	1	141.58	170.2	ER	1466	419.47	109
97	N-1	B_LINE_SY_065	02HOYTDL-02MAPLE 138 kV line	238813	238942	1	179.51	180.45	ER	309	17.92	110
98	LFFB	2930_C2	05BREED-7CASEY 345 kV line	243213	346809	1	143.03	171.74	ER	1466	420.88	111
99	N-1	6490_B2_TOR3002545	05DEQUIN- 05MEADOW 345 kV line	243217	243878	1	168.23	178.82	ER	971	102.83	112
100	N-1	6472_B2_TOR15258	05DEQUIN- 05MEADOW 345 kV line	243217	243878	2	168.23	178.82	ER	971	102.83	113
101	N-1	05JEFRSO_05ROCKPT _122	05BREED-05DEQUIN 345 kV line	243213	243217	1	160.77	177.74	ER	971	164.76	114
102	N-1	05MOUNTN_05BELMON _102	05MUSKNG- 05KAMMER 345 kV line	242940	242937	1	182.87	183.73	ER	972	51.82	115
103	DCTL	C5-TWL-NR054	02JONSON-02LRN Q2 138 kV line	238845	238915	1	184.09	184.9	ER	267	13.36	116
104	LFFB	C2-BRK-NR125	02JONSON-02LRN Q2 138 kV line	238845	238915	1	184.11	184.92	ER	267	13.36	117
105	N-1	37_B2_TOR12_WOMOP	05LAYMAN- 05CORNER 138 kV line	243533	243490	1	182.4	183.76	ER	284	23.94	118
106	LFFB	2979_C2_X1-020_X2-052	05HUNT J-05SORENS 138 kV line	243313	243377	1	186.57	188.16	ER	208	20.54	119
107	LFFB	2978_C2_X1-020	05HUNT J-05SORENS 138 kV line	243313	243377	1	186.69	188.26	ER	208	20.28	120
108	N-1	37_B2_TOR12_WOMOP	05WOLFCL- 05LAYMAN 138 kV line	243589	243533	1	184.13	185.49	ER	284	23.94	121
109	LFFB	2942_C2_05KAMMER 765- PP	05LAYMAN- 05CORNER 138 kV line	243533	243490	1	188.48	189.84	ER	284	23.94	122
110	LFFB	2942_C2_05KAMMER 765- PP	05WOLFCL- 05LAYMAN 138 kV line	243589	243533	1	190.2	191.56	ER	284	23.94	123
111	LFFB	1733_C2_X1-020	05HUNT J-05SORENS 138 kV line	243313	243377	1	193.61	195.14	ER	208	19.74	124
112	LFFB	1760_C2_05JEFRSO 765-A	05JEFRSO 765/345 kV transformer	243208	248000	1	171.05	190.84	ER	1935	391.04	125
113	LFFB	3002_C2_05ROCKPT 765- C2	05SULLVA 765/345 kV transformer	243210	243213	2	162.91	195.26	ER	1905	616.22	126
114	LFFB	3183_C2_05ROCKPT 765-C	05SULLVA 765/345 kV transformer	243210	243213	2	162.91	195.26	ER	1905	616.22	127
115	LFFB	2929_C2	05SULLVA 765/345 kV transformer	243210	243213	2	162.91	195.26	ER	1905	616.22	128
116	LFFB	2930_C2	05SULLVA 765/345 kV transformer	243210	243213	2	162.91	195.26	ER	1905	616.22	129
117	DCTL	C5-TWL-CR041_B	02AVERY-02SHNROK 138 kV line	238549	239108	1	220.45	221.25	ER	195	9.76	130
118	N-1	B_ME230-SX-#9	GERMANTN 138/115 kV transformer	204530	204529	1	214.85	215.88	ER	104	6.84	131
119	N-1	05JEFRSO_05ROCKPT _122	05BREED-05DARWIN 345 kV line	243213	243216	1	184.93	211.81	ER	971	261.01	132
120	N-1	05JEFRSO_05ROCKPT _122	05DARWIN-05EUGENE 345 kV line	243216	243221	1	184.93	211.81	ER	971	261.01	133
121	N-1	05JEFRSO_05ROCKPT _122	05SULLVA 765/345 kV transformer	243210	243213	1	176.28	211.28	ER	1650	577.5	134

Table 10: PJM Option 1- Connection to Sullivan 765 kV Substation**Y2-095 Contribution to Previously Identified Overloads**

#	Type	Contingency	Facility Description	Bus			Loading		Rating		MW Cont.	FG App.
		Name		From	To	Cir.	Initial	Final	Type	MVA		
122	N-1	05JEFRSO_05ROCKPT_122	05SULLVA 765/345 kV transformer	243210	243213	2	184.73	221.41	ER	1680	616.22	135
123	DCTL	AP_C5_19	GERMANTN 138/115 kV transformer	204530	204529	1	239.38	240.98	ER	104	10.73	136
124	LFFB	5031_C2_05KAMMER 765-PP2	05LAYMAN-05CORNER 138 kV line	243533	243490	1	251.64	253.35	ER	284	30.95	137
125	LFFB	5031_C2_05KAMMER 765-PP2	05WOLFCL-05LAYMAN 138 kV line	243589	243533	1	253.37	255.08	ER	284	30.95	138
126	N-1	05JEFRSO_05ROCKPT_122	05BREED-16WHEAT 345 kV line	243213	254539	1	209.63	245.57	ER	956	348.13	139
127	LFFB	2929_C2	05BREED-16WHEAT 345 kV line	243213	254539	1	222.63	257.3	ER	956	351.4	140
128	LFFB	3007_C2	05SULLVA 765/345 kV transformer	243210	243213	2	183.7	247.27	ER	1905	1211	141
129	DCTL	C5-TWL-CR040_B	02OTTAWA-02LAKVEW 138 kV line	239030	238874	1	313.29	314.33	ER	375	24.47	142

Energy Portion of Interconnection Request

PJM also studied the delivery of the energy portion of the surrounding generation. Any potential problems identified below are likely to result in operational restrictions to the project under study. The developer can proceed with network upgrades to eliminate the operational restriction at their discretion by submitting a Transmission Interconnection request.

Note: Only the most severely overloaded conditions are listed. There is no guarantee of full delivery of energy for this project by fixing only the conditions listed in this section. With a Transmission Interconnection Request, a subsequent analysis will be performed which analyzes all overload conditions associated with the overloaded element(s) identified.

As a result of the aggregate energy resources in the area, no violations were identified.

Short Circuit

(Summary of impacted circuit breakers)

PJM has completed the short circuit analysis of the **Y2-095** queue project Sullivan 765 kV. Two options were considered during this study: the first option was a direct connection to Sullivan 765 kV substation, while the second option was a direct connection to Breed 345 kV substation. Our analysis found **2 new breakers** for option 1 and **9 new breakers** for option 2, to be over-duty in the ComEd transmission area. **This is originally an AEP project but a ComEd bus is 3 or more buses away.** The new over-duty breakers are listed below.

Option 1: Sullivan 765 Summary of Breakers

Cost estimate: \$2.4M - Two 345 kV Circuit Breakers @ \$1.2M each

Table 11: PJM Option 1- Connection to Sullivan 765 kV Substation							
BUS_NO	BUS	BREAKER	Rating Type	Duty Percent With y2-095_AEP_opt1	Duty Percent Without y2-095_AEP_opt1	Duty Percent Difference	Note
0	05BREED 345.kV	C1	T	110.50%	85.80%	24.70%	New Over-duty
0	05BREED 345.kV	A2	T	106.80%	85.10%	21.70%	New Over-duty

Option 2: Breed 345 kV Summary of Breakers

Cost estimate: Estimates not provided for secondary point of interconnection

Table 12: PJM Option 2- Connection to Breed 345 kV Substation							
BUS_NO	BUS	BREAKER	Rating Type	Duty Percent With y2-095_AEP_opt2	Duty Percent Without y2-095_AEP_opt2	Duty Percent Difference	Note
0	05BREED 345.kV	C1	T	128.00%	85.80%	42.20%	New Over-duty
0	05BREED 345.kV	A2	T	122.10%	85.10%	37.00%	New Over-duty
0	05BREED 345.kV	A	T	115.70%	81.20%	34.50%	New Over-duty
0	05BREED 345.kV	A1	T	115.70%	81.20%	34.50%	New Over-duty
0	05BREED 345.kV	C	T	115.40%	81.20%	34.20%	New Over-duty
0	05BREED 345.kV	B	T	105.60%	Not Found	25.60%	New Over-duty
0	DES4638B 138.kV	46 BT3-4 B3	T	102.80%	99.20%	3.60%	New Over-duty
0	DES4638R 138.kV	46 4605	T	101.40%	99.30%	2.10%	New Over-duty
0	DES4638R 710 138.kV	46 11702	T	100.10%	98.40%	1.70%	New Over-duty

New System Reinforcements

(Upgrades required to mitigate reliability criteria violations, i.e. "Network Impacts", initially caused by the addition of this project generation)

Table 8B: PJM Option 1- Connection to Sullivan 765 kV Substation

#	Contingency Name	Facility Description	Description	Schedule	Cost
1	01HATFLD_01IRONCO_059	SHEPLER H J-SMITHTON 62 138 kV line	This is an existing baseline RTEP project b2170. The estimated upgrade cost and ISD in the PJM database is \$120,000 and 6-1-2017 respectively. Upgrade b2170 is presently scheduled to be complete prior to the ISD for the Y2-050 project (Q3 - 2017) and will eliminate the violations identified below. New Rating will be 376 MVA.	Q3 - 2017	b2170
2	673_B2	05DELCOR-05MADISO 138 kV line	The Delco Remy - Madison 138 kV line is sag limited. A sag study will be required to determine if the rating of this line can be improved with or without addition work. The cost of sag study will be \$10 k for this line. The potential cost of upgrades to improve the emergency rating can be anywhere from \$0 to \$2 million.		\$10,000
3	8CARSON_8DBGEN_014_B	6HALIFAX-6CLOVER 230 kV line	Increase emergency rating of 2068 Line (Halifax – Clover) to 867 MVA by replacing wave traps at Clover and Halifax with 3000a wave traps. Estimated cost is \$200,000 and would require 8-12 months to complete.		\$200,000

Table 9B: PJM Option 1- Connection to Sullivan 765 kV Substation

Y2-116 Multiple Facility Contingency Reinforcements

#	Contingency Name	Facility Description	Description	Schedule	Cost
1	1760_C2_05JEFRSO 765-A	06KYGER-05SPORN 345 kV line	Rebuild at an estimated cost of \$26,000,000		\$26,000,000
2	5031_C2_05KAMMER 765-PP2	05J.FERR-05CLOVRD 765 kV line	The Jacksons Ferry 2397 Amps RTHL Relay Thermal Limit and the Cloverdale Relay 2397 Amps Relay Thermal Limit are the limiting elements. An engineering study needs to be performed to determine if the relay settings at both stations can be adjusted to mitigate these overloads. Otherwise a new relay package would be needed at both stations for estimated cost (2013 Dollars): \$600,000.		\$600,000.
3	6484	05REYNOL 345/138 kV transformer	This violation occurs in NIPSCO; it will be further investigated during the System Impact and Facilities Study phases. No reinforcement or estimate is needed at this time.		tbd
4	2932_C2_05JEFRSO 765-A2	05JEFRSO-05GRNTWN 765 kV line	Upgrade terminal elements at remote ends at an estimated cost of \$1,500,000		\$1,500,000
5	AP_SB_468	SHEPLER H J-SMITHTON 62 138 kV line	This is an existing baseline RTEP project b2170. The estimated upgrade cost and ISD in the PJM database is \$120,000 and 6-1-2017 respectively. Upgrade b2170 is presently scheduled to be complete prior to the ISD for the Y2-050 project (Q3 - 2017) and will eliminate the violations identified below. New Rating will be 376 MVA.	Q3 - 2017	b2170
6	6189_C2_05HANG R 765-D1	X1-020 TAP-05DUMONT	Upgrade terminal elements at remote ends at an estimated cost of \$1,500,000		\$1,500,000

Table 9B: PJM Option 1- Connection to Sullivan 765 kV Substation

Y2-116 Multiple Facility Contingency Reinforcements

#	Contingency Name	Facility Description	Description	Schedule	Cost
		765 kV line			
7	7336_C2_05SULLVA 765-A	05SULLVA-05ROCKPT 765 kV line	Pioneer Project 1. Reynolds – Greentown 765 kV line and a 765/345 kV transformer at Reynolds Cost of Reynolds – Greentown 765 kV line: \$185,000,000 Cost of station work at Greentown: \$30,000,000 Cost of station work at Reynolds: \$55,000,000 Total = \$270,000,000 2. Reynolds – Sullivan 765 kV line Cost of Reynolds – Sullivan 765 kV line: \$300,000,000 Cost of station work at Sullivan: \$30,000,000 Total estimated cost for Pioneer project is \$600,000,000. Note: Reynolds – Greentown 765 kV segment and the 765/345 kV transformer at Reynolds is slated for an in-service date in 2018 by Midwest ISO. If Y2-095 in-service date is after Reynolds – Greentown segment energizes, and then Y2-095 will only be responsible for the cost the remaining Sullivan – Reynolds 765 kV segment and work at Sullivan station. This cost may be further reduced by allocation to other MTXs in PJM interconnection queue. Such allocation will be determined by PJM. Total = \$930,000,000		\$1,200,000,000

Table 10B: PJM Option 1- Connection to Sullivan 765 kV Substation

Y2-058 Contribution to Previously Identified Overloads

#	Name	Facility Description	Description	Schedule	Cost
1	05DUMONT_05GRNTWN _120_B	05ROCKCR-05HUNT J 138 kV line	Rebuild the line		\$7,650,000
2	673_B2	05CROSS-05HOGAN 138 kV line	Rebuild the line		\$7,650,000
3	673_B2	05FALL C-05DELCOR 138 kV line	Sag study. Estimated Min Cost: \$27,480; Estimated Max Cost: \$8.5875 M		\$8,587,500
4	AP_SB_467	SMITHTON 62-YUKON 138 kV line	This is an existing baseline RTEP project b2169. The estimated upgrade cost and ISD in the PJM database is \$60,000 and 6-1-2017 respectively. Upgrade b2169 is presently scheduled to be complete prior to the ISD for the Y2-050 project (Q3 - 2017) and will eliminate the violations identified below. New Rating will be 332 MVA.		b2169
5	673_B2	05MADISO-05CROSS 138 kV line	Rebuild the line. Estimated Cost: \$4.125 M		\$4,125,000
6	05JEFRSO_05ROCKPT _122	X2-052 TAP- 05DUMONT 345 kV line	The 345 kV line from which X2-052 is tapped off is a double circuit. Only one 345 kV line will be brought in to the X2-052 station as part of X2-052. This overload can be mitigated by bringing the other side of the 345 kV line in to the X2-052 station as will. Doing so will increase the number of 345 kV line exits from two to four that go out of the X2-052 station. Estimated cost is \$5,000,000.		\$5,000,000
7	AP_SB_467	SHEPLER H J- SMITHTON 62 138 kV line	This is an existing baseline RTEP project b2170. The estimated upgrade cost and ISD in the PJM database is \$120,000 and 6-1-2017 respectively. Upgrade b2170 is presently scheduled to be complete prior to the ISD for the		b2170

Table 10B: PJM Option 1- Connection to Sullivan 765 kV Substation

Y2-058 Contribution to Previously Identified Overloads

#	Name	Facility Description	Description	Schedule	Cost
			Y2-050 project (Q3 - 2017) and will eliminate the violations identified below. New Rating will be 376 MVA.		
8	6178_C2_05CLOVRD 345-P_WOMOAB	05BURLHT-05CLOVRD 138 kV line	The ACSR ~ 636 ~ 26/7 ~ GROSBEAK conductor Section 1 is a limiting element. A sag check will be required for the ACSR ~ 636 ~ 26/7 ~ GROSBEAK conductor Section 1 to determine if the line section can be operated above its emergency rating of 223 MVA. The results could prove that no additional upgrades are necessary, that some upgrades on the circuit are necessary, or that the entire 4.37 mile section of line would need to be rebuilt. Estimated Cost (2013 Dollars): \$17,480.		\$17,480
9	361_1_B2	05JEFRSO-05HANG R 765 kV line	Upgrade terminal elements at remote ends at an estimated cost of \$1,500,000.		\$1,500,000
10	37_B2_TOR12_WOMOP	05DEGUSS-05BELPRE 138 kV line	Rebuild the line. Estimated Cost: \$2.475 M		\$2,475,000
11	345-L8001____-S	4LILLY-POWER;RT 138 kV line	There is no ComEd work required for the Lilly to Powerton 138 kV violation (L1352_2). The SE rating of 132 MVA is associated with an AMEREN facility. No upgrade is required at this time; this violation will be further analyzed in the SIS phase.		tbd
12	37_B2_TOR12_WOMOP	05J.FERR-05CLOVRD 765 kV line	The Jacksons Ferry 2397 Amps RTHL Relay Thermal Limit and the Cloverdale Relay 2397 Amps Relay Thermal Limit are the limiting elements. An engineering study needs to be performed to determine if the relay settings at both stations can be adjusted to mitigate these overloads. Otherwise a new relay package would be needed at both stations for estimated cost (2013 Dollars): \$600,000.		\$600,000
13	37_B2_TOR12_WOMOP	05MUSKNG-05BEVERL 345 kV line	Sag study. Estimated Min Cost: \$7,440; Estimated Max Cost: \$4.65 M.		\$4,650,000
14	05JEFRSO_05ROCKPT_122	7PANA-KINCA; R 345 kV line	For the Powerton-to-Pana (L2105) violation, ComEd will need to mitigate sag limitations on ~28 miles of 2338 ACAR. There are also possible limitations associated with an AMEREN facility. No AMEREN upgrades are required at this time. The cost for the ComEd portion of the upgrade is \$8.3 M; this violation will be further analyzed in the SIS phase.		\$8,300,000
15	37_B2_TOR12_WOMOP	05CORNER-05DEGUSS 138 kV line	Rating on this line will increase to 282 MVA starting 6/1/17.	6/1/17	tbd
16	LN 2056_A3	3ROCKY M-3BTLEBRO 115 kV line	The limiting element is on the Progress side of the tie line. This violation will be further analyzed in the SIS phase.		tbd
17	AP_C5_19	TANEYTOWN 1-GERMANTN 138 kV line	This line is governed by an operating procedure, opening Carroll – Germantown 138 kV. This violation will be further analyzed in the SIS phase.		tbd
18	AP_C5_19	TANEYTOWN 1-GERMANTN 138 kV line	Same as #17		
19	2942_C2_05KAMMER 765-PP	05DEGUSS-05BELPRE 138 kV line	Same as #10		
20	05JEFRSO_05ROCKPT_122	08NOBLSV-05FALL C 345 kV line	Noblesville - Fall Creek 345 kV line is a tie line between Duke and AEP. The rating of this line is set by the Duke owned conductor. PJM should contact Duke to get an estimate for improving the capability of this facility.		tbd
21	1375_C1	05JEFRSO-05HANG R 765 kV line	Same as #9		
22	PJM17	NOTTREAC-NOTTNGHM 230 kV line	The actual summer emergency rating of the Line 220-08 reactor and by-pass circuit switcher at the Nottingham substation is 567 MVA. The reinforcement is to replace Line 220-08 reactor and by-pass circuit switcher at Nottingham substation to get a minimum summer emergency rating of 622 MVA. The estimated cost to perform this work is \$1.9M, and will require 24 months to complete.	24 months	\$1,900,000
23	2856_C2	05DEGUSS-05BELPRE 138 kV line	Same as #10		
24	PEACH245	NOTTREAC-NOTTNGHM 230 kV line	Same as #22		

Table 10B: PJM Option 1- Connection to Sullivan 765 kV Substation

Y2-058 Contribution to Previously Identified Overloads

#	Name	Facility Description	Description	Schedule	Cost
25	2942_C2_05KAMMER 765-PP	05CORNER-05DEGUSS 138 kV line	Same as #15		
26	673_B2	05HOGAN-05DELAWR 138 kV line	Sag study. Estimated Min Cost: \$20,720; Estimated Max Cost: \$6,475 M.		\$6,475,000
27	05HANG R _05JEFRSO _114	05JEFRSO 765/345 kV transformer	Replace subject transformer at an estimated cost of \$3,000,000.		\$3,000,000
28	2932_C2_05JEFRSO 765-A2	X1-020 TAP-05DUMONT 765 kV line	Upgrade terminal elements at remote ends at an estimated cost of \$1,500,000.		\$1,500,000
29	2856_C2	05CORNER-05DEGUSS 138 kV line	Same as #15		
30	6178_C2_05CLOVRD 345-P_WOMOAB	05CATAWZ-05BURLHT 138 kV line	The ACSR ~ 636 ~ 26/7 ~ GROSBEAK conductor Section 2, the ACSR ~ 795 ~ 45/7 ~ TERN conductor Section 1, Catawba Riser Sub cond 795 AAC 37 Str. and the Burlington Heights Riser Sub cond 795 AAC 37 Str. are the limiting elements. A sag check will be required for the ACSR ~ 636 ~ 26/7 ~ GROSBEAK conductor Section 2 to determine if the line section can be operated above its emergency rating of 223 MVA. The results could prove that no additional upgrades are necessary, that some upgrades on the circuit are necessary, or that the entire 3.74 mile section of line would need to be rebuilt. Estimated Cost (2013 Dollars): \$14,960. Replace the Catawba Riser for estimated cost based on 2013 Dollars: \$50,000. Replace the Burlington Heights Riser for estimated cost (2013 Dollars): \$50,000.		\$114,960
31	6178_C2_05CLOVRD 345-P_WOMOAB	05WSALEM-05CATAWZ 138 kV line	The ACSR ~ 636 ~ 26/7 ~ GROSBEAK conductor Section 1 and the Catawba Riser Sub cond 795 AAC 37 Str. are the limiting elements. Replace the Catawba Riser for estimated cost based on 2013 dollars: \$50,000 A sag check will be required for the ACSR ~ 636 ~ 26/7 ~ GROSBEAK conductor Section 1 to determine if the line section can be operated above its emergency rating of 223 MVA. The results could prove that no additional upgrades are necessary, that some upgrades on the circuit are necessary, or that the entire 6.21 mile section of line would need to be rebuilt. Estimated Cost (2013 Dollars): \$24,840.		\$74,840
32	05MOUNTN _05BELMON _102	05WATERF-05MUSKNG 345 kV line	Upgrade remote end equipment. Estimated Cost: \$1 M.		\$1,000,000
33	AP_C5_19	CARROLL-TANEYTOWN 1 138 kV line	There is an operating procedure that governs this line, opening Carroll – Germantown 138 kV. This violation will be further analyzed in the SIS phase.		tbd
34	05CLOVRD _05J.FERR _096	05SCHCHRIS-05TECHDR 138 kV line	Sag study. Estimated Min Cost: \$3,440; Estimated Max Cost: \$1.075 M.		\$1,075,000
35	PP1E_NO EMORYGROVE	STRABAN-LINCOLN 115 kV line	This line is governed by an operating procedure, opening Carroll – Germantown 138 kV. This violation will be further analyzed in the SIS phase.		tbd
36	2978_C2_X1-020	05HUMMEL-05ROCKCR 138 kV line	Sag study section 1 and rebuild section 2. Estimated Min Cost: \$14,424,640; Estimated Max Cost: \$25,575,000.		\$25,575,000
37	6178_C2_05CLOVRD 345-P_WOMOAB	05M FUNK-05WSALEM 138 kV line	Sag study. Estimated Min Cost: \$28,720; Estimated Max Cost: \$8.975 M.		\$8,975,000
38	2979_C2_X1-020_X2-052	05HUMMEL-05ROCKCR 138 kV line	Same as #36		
39	APS_B_G402	SUTTON-HEATERS 138 kV line	Rebuild and reconductor the 4 mile Sutton-Heaters Tap section of the French Creek-Sutton 138kV line with 336 kcmil ACSR conductor, replacing the existing 4/0 ACSR. Estimated Cost w tax: \$4,320,600; Estimated cost w/o tax: \$3,265,700; Estimated Time: 14 months At the Sutton SS, replace the French Creek 138kV wave trap with an 800A, 138kV wave trap. Estimated Cost w tax: \$35,800; Estimated cost w/o tax: \$27,000; Estimated Time: 12 months At the French Creek SS, revise the Sutton 138kV terminal relay settings. Estimated Cost w tax: \$19,900; Estimated cost w/o tax: \$15,000; Estimated Time: 8 months		\$7,642,000

Table 10B: PJM Option 1- Connection to Sullivan 765 kV Substation

Y2-058 Contribution to Previously Identified Overloads

#	Name	Facility Description	Description	Schedule	Cost
40	474_A	05MOUNTN-05BELMON 765 kV line	Upgrade remote end equipment. Estimated Cost: \$1.5 M		\$1,500,000
41	1589_B3_05CLOVRD 765-10_WOMOAB	05MOUNTN-05BELMON 765 kV line	Same as #40		
42	05CLOVRD_05J.FERR_096	05TECHDR-05M FUNK 138 kV line	Sag study. Estimated Cost: \$58,800.		\$58,800
43	05JEFRSO_05ROCKPT_122	05REYNOL-05OLIVE 345 kV line	Pioneer Project - Same as #7 from Table 9B (\$1.2B)		
44	1733_C2_X1-020	05HUMMEL-05ROCKCR 138 kV line	Same as #36		
45	2056&2058	3ROCKY M-3BTLEBRO 115 kV line	The limiting element of this tie line is on the Progress side. This violation will be further analyzed in the SIS phase.		tbd
46	Non	05TILTON-WINDSOR 138 kV line	The ACSR ~ 556.5 ~ 26/7 ~ DOVE Conductor Section 1 is a limiting element A sag check will be required for the ACSR ~ 556.5 ~ 26/7 ~ DOVE Conductor Section 1 to determine if the line section can be operated above its emergency rating of 284 MVA. A study scheduled to be completed by 12/31/2012 could prove that no additional upgrades are necessary, that some upgrades on the circuit are necessary, or that the entire 4.92 mile section of line would need to be rebuilt.		tbd
47	2965_C2	05HOGAN-05DELAWR 138 kV line	Same as #46		
48	2978_C2_X1-020	05ROCKCR-05HUNT J 138 kV line	Same as #1		
49	667_B2_TOR1697	05ROCKPT-05JEFRSO 765 kV line	Same as #7 from Table 9B (\$1.2B)		
50	2979_C2_X1-020_X2-052	05ROCKCR-05HUNT J 138 kV line	Same as #1		
51	05DUMONT_05GRNTWN_120_A	05HUNT J-05SORENS 138 kV line	Rebuild the line. Estimated Cost: \$9.1375 M.		\$9,137,500
52	2906_C2_05MARYSV 765-A1	05MOUNTN-05BELMON 765 kV line	Same as #40		
53	2929_C2	05BREED-05DEQUIN 345 kV line	Pioneer Project - Same as #7 from Table 9B (\$1.2B)		
54	05CLOVRD_05J.FERR_096	05CLYTR1-05SCHRS 138 kV line	Perform sag condition correction study. Estimated Cost: \$43,000.		\$43,000
55	AP_C5_19	STRABAN-LINCOLN 115 kV line	Opening the Carroll – Germantown 138 kV line will alleviate this overload. However, when the operating procedure is applied, the Carlisle – Gardners 115 kV line overloads; this violation will be addressed further in the SIS phase.		tbd
56	B_LINE_SY_064	SHANOR MANOR-BUTLER 138 kV line	Reconductor Shanor Manor-Butler with 954 ACSS conductor. Replace terminal equipment at Shanor Manor and Butler. Line: Butler-Krendale 138kV, Rebuild & Reconductor 4.4 Miles (Butler-Shanor Manor section). Rebuild the 4.4 mile Butler-Shanor Manor section of the Butler-Krendale 138kV line to reconductor with single 954 kcmil ACSS conductor, replacing the existing single 556 kcmil ACSR. Estimated cost with tax: \$9,954,900 ; Estimated cost without tax: \$7,681,200; Estimated Time: 18 months Shanor Manor SS: Replace 1-1200A, 138kV LB line switch with 1-2000A LB line switch and replace 2-1200A, 138kV line and bus tie switches with 2-2000A, 138kV switches, replace line risers with 3500AL conductor for required 520 MVA SE rating required for PJM Queue Y2-095 network upgrades. Estimated cost with tax: \$247,800; Estimated cost without tax: \$191,200; Estimated Time: 12 months		\$10,621,000

Table 10B: PJM Option 1- Connection to Sullivan 765 kV Substation

Y2-058 Contribution to Previously Identified Overloads

#	Name	Facility Description	Description	Schedule	Cost
			Butler SS: On the Krendale 138kV terminal, replace 1-138kV breaker with 1-3000A, 138kV breaker, replace 2-138kV disconnect switches with 2-2000A 138kV switches. Reconductor breaker risers and No. 2A 138kV bus with 3500AL conductor, for required 520MVA SE rating for PJM queue Y2-095 network upgrades. Estimated cost with tax: \$418,300; Estimated cost without tax: \$322,700; Estimated Time: 12 months		
57	6430_B2_TOR22_WOMOAB	06KYGER-05SPORN 345 kV line	There are internal AEP discussions going on as to what the final line ratings should be increased to. More information shall be shared during the SIS phase.		tbd
58	5031_C2_05KAMMER 765-PP2	05BELVA-JONES BRANCH 138 kV line	AEP has a baseline upgrade (b1962) to install additional 765 kV breakers at Kammer Substation which will eliminate this stuck breaker contingency and the associated violation. The proposed in-service date for upgrade b1962 is 6/1/2015. It is FE's recommendation that upgrade b1962 be advanced to meet the in-service date of the Y2-095 generation interconnection project. AEP: We believe the results shown reflect an old contingency definition, invalidated by the 765 kV breaker additions associated with baseline project b1962. In addition, AEP records of coordination of this tie line rating with AP (FE) show the Summer Emergency rating to be 376 MVA.	6/1/2015	b1962
59	B_LINE_SY_065	02HOYTDL-02CRNBRY 138 kV line	Reconductor the 21.2 mile Cranberry – Hoytdale 138 kV line with single 795 kcmil ACSS conductor, replacing the existing single 795 ACSR. Estimated Cost w/ tax: \$28,249,000; Estimated Cost w/o tax: \$22,601,000; Estimated Time: 40 months	40 months	\$28,249,000
60	2930_C2	05BREED-05DEQUIN 345 kV line	Same as #53		
61	6488_A	05ROCKPT-05JEFRSO 765 kV line	Same as #49		
62	B_LINE_SY_064	KRENDALE-SHANOR MANOR 138 kV line	Reconductor Krendale-Shanor Manor with 954 ACSS conductor. Replace terminal equipment at Shanor Manor and Krendale. Line: Butler-Krendale 138kV, Rebuild & Reconductor 3 Miles (Krendale-Shanor Manor section). Rebuild the 3 mile Krendale-Shanor Manor section of the Butler-Krendale 138kV line to reconductor with single 954 kcmil ACSS conductor, replacing the existing single 556 kcmil ACSR. Estimated cost with tax: \$7,415,100; Estimated cost without tax: \$5,721,500; Estimated Time: 18 months Shanor Manor SS: Replace 1-1200A, 138kV LB line switch with 1-2000A LB line switch and replace 2-1200A, 138kV line and bus tie switches with 2-2000A, 138kV switches, replace line risers with 3500AL conductor for required 520 MVA SE rating required for PJM Queue Y2-095 network upgrades. Estimated cost with tax: \$247,800; Estimated cost without tax: \$191,200; Estimated Time: 12 months Krendale SS: On the Butler 138kV line terminal, replace 1-138kV breaker with 1-3000A, 138kV breaker, replace 2-138kV disconnects with 2-2000A 138kV switches, replace breaker and line risers with 3500 AL, revise relay settings, required for 520MVA SE rating for PJM Queue Y2-095	12 to18 months	\$8,014,000

Table 10B: PJM Option 1- Connection to Sullivan 765 kV Substation**Y2-058 Contribution to Previously Identified Overloads**

#	Name	Facility Description	Description	Schedule	Cost
			network upgrades. Estimated cost with tax: \$351,100; Estimated cost without tax: \$270,900; Estimated Time: 12 months		
63	05JEFRSO_05ROCKPT_122	05EUGENE-08CAYSUB 345 kV line	Pioneer Project - Same as #7 from Table 9B (\$1.2B)		
64	B_PN230-SX-#11_B	N.MESHPN 230/115 kV transformer	Replace the North Meshoppen #3 transformer with a larger unit. Remove the reactor. Estimated Cost: \$9,216,400 including \$2,102,300 in tax; Estimated Time: 15 months.	15 months	\$9,216,400
65	B_PN230-SX-#11_B	NO MESHO-MESH2REA 115 kV line	Same as #64		
66	8CARSON_8DBGEN_014_B	6PERSON-6HALIFAX 230 kV line	Further 296 Line upgrade would be required beyond scope of s0471. The height of 29 structures would need to be raised to achieve a minimum STE rating of 1024 MVA. Estimated cost is \$3,400,000 and would require 18-24 months to complete.	18-24 months	\$3,400,000
67	5031_C2_05KAMMER 765-PP2	GILBOA-ENON TAP 138 kV line	Reconductor the 3.2 mile Gilboa to Enon Junction section of the Gilboa-Grassy Falls-Powell Mtn 138kV line with 954 kcmil ACSS, replacing the existing 954 kcmil ACSR conductor. Estimated Cost w tax: \$2,597,100; Estimated cost w/o tax: \$1,963,000; Estimated Time: 12 months At the Gilboa SS, replace 2-138kV breakers, foundations and cables, 2-138kV wave traps, and associated risers and connectors. Estimated Cost w tax: \$610,700; Estimated cost w/o tax: \$461,600; Estimated Time: 18 months	12 to 18 months	\$3,207,800
68	1733_C2_X1-020	05ROCKCR-05HUNT J 138 kV line	Same as #1		
69	05BELMON_05KAMMER_108	05BELMON 765/500 kV transformer	This violation is crossed out because the contingency is not valid.		
70	3132_C2_05GRNTWN 765-T1_X1-020	08GRTOWN-05GRANT 138 kV line	Rebuild the line. Estimated Cost: \$15.9 M.		\$15,900,000
71	5031_C2_05KAMMER 765-PP2	05DEGUSS-05BELPRE 138 kV line	Same as #10		
72	PP1E_NO EMORYGROVE	GERMANTN-STRABAN 115 kV line	This violation is crossed out because it can be alleviated by opening the Carroll – Germantown 138 kV line; when the operating procedure is applied, there are no new violations.		\$0
73	B_PN230-SX-#8	N.WAV115-E.SAYRE 115 kV line	This violation is crossed out because of the operating agreement between PJM and NYISO; if the loading on this line reaches 100%, it will be open. This violation and its subsequent reinforcements will be addressed during the System Impact Study phase.		tbd
74	6189_C2_05HANG R 765-D1	05JEFRSO 765/345 kV transformer	Replace subject transformer at an estimated cost of \$3,000,000.		\$3,000,000
75	5031_C2_05KAMMER 765-PP2	05CORNER-05DEGUSS 138 kV line	Same as #15		
76	APS_B_G425	NETTIE-CRUPPERNECK 138 kV line	This violation is crossed out because the contingency is not valid.		
77	4689_B2_TOR15257_A	05MEADOW-05REYNOL 345 kV line	Pioneer Project - Same as #7 from Table 9B (\$1.2B)		
78	AP_C5_19	ROXBURY 138/115 kV transformer	Install a standard 115kV Circuit Breaker with 3000A. Total Cost: \$717,300		\$717,300
79	05JEFRSO_05ROCKPT_122	05FALL C-05DESOTO 345 kV line	Perform sag study at an estimated cost of \$100,000. Sag study results would determine what level of remediation (if any) is required to operate subject line section at it maximum operating temperature.		\$100,000
80	4690_C2_05OLIVE 345-D	05REYNOL-05OLIVE 345 kV line	Same as #7 from Table 9B (\$1.2B)		
81	C5-TWL-CR040_A	02CAMDEN-02HENRTA 138 kV line	Brookside – Henrietta 138 kV, Increase operating temp to 212 F (Camden-Henrietta Section)		\$163,000

Table 10B: PJM Option 1- Connection to Sullivan 765 kV Substation

Y2-058 Contribution to Previously Identified Overloads

#	Name	Facility Description	Description	Schedule	Cost
82	4831_C2_05KAMMER 765-NN	05BELMON 765/500 kV transformer	This violation is crossed out because the contingency is not valid.		\$0
83	C5-TWL-CR040_A	02BRKSID-02TROY 138 kV line	Brookside – Henrietta 138 kV, Increase operating temp to 212 F (Camden-Troy Section)		\$238,900
84	AP_C5_19	GERMANTN-STRABAN 115 kV line	This line is governed by an operating procedure, opening Carroll – Germantown 138 kV. This violation will be further analyzed in the SIS phase.		tbd
85	667_B2_TOR1697	05EUGENE-05DEQUIN 345 kV line	Pioneer Project - Same as #7 from Table 9B (\$1.2B)		
86	Non	OXBOW-LACK 230 kV line	PENELEC: Reconductor 16.33 miles of 1033 ACSR with 1033 ACSS high temperature conductor from Oxbow to PPL's Lackawanna. Estimated cost: \$11,296,800 including \$2,576,800 in tax; Estimated time: 24 months At the Oxbow SS, replace the 1200A disconnect switch on the 230 kV Lackawanna line. Estimated cost: \$124,700 including \$28,500 in tax; Estimated time: 9 months PPL: Rebuild LACK 230kV bay to 3000 Amps: \$1,550,000 Rebuild 0.4 miles of LACK-OXBO (NMES) 230kV line to double-bundle 1590 (3200 Amps): \$3,150,000 Total of upgrade for PPL: \$4,700,000; Estimated Time: 18-24 months	9 to 24 months	\$12,846,800
87	05JEFRSO_05ROCKPT_122	05BREED-7CASEY 345 kV line	Pioneer Project - Same as #7 from Table 9B (\$1.2B)		
88	C5-TWL-CR041_B	02GRNFLD-02NASA 138 kV line	Rebuild the 4.6 miles of 336.4 ACSR with 636 ACSS high-temperature conductor. Estimated Cost w tax: \$12,225,800; Estimated Cost w/o tax: \$9,781,400; Estimated Time: 28 months At the Greenfield SS, replace the wave trap and relaying on the NASA 138 kV line. Estimated Cost w tax: \$245,500; Estimated Cost w/o tax: \$199,200; Estimated Time: 28 months At the NASA SS, replace the wave trap and relaying on the Greenfield 138 kV line exit. Estimated Cost w tax: \$246,300; Estimated Cost w/o tax: \$199,800; Estimated Time: 28 months	28 months	\$12,717,600
89	2929_C2	05EUGENE-08CAYSUB 345 kV line	Same as #63		
90	B_LINE_SY_064	02MAPLE-02SENECA 138 kV line	At Krendale, install new 138 kV line exit for new 138 kV Krendale – Maple line. Estimated Cost w/ tax: \$892,400; Estimated Cost w/o tax: \$713,900; Estimated Time: 12 months At Maple, install new 138 kV line exit for new 138 kV Krendale – Maple line. Estimated Cost w/ tax: \$922,700; Estimated Cost w/o tax: \$738,200; Estimated Time: 12 months Create a new second Krendale – Maple 138 kV line by rebuilding the existing single circuit H-frame line as a new double circuit line, utilizing 954 kcmil ACSR conductor for both circuits. Estimated Cost w/ tax: \$24,058,500; Estimated Cost w/o tax: \$19,248,300; Estimated Time: 18 months	12 to 18 months	\$25,873,600
91	C1_PN230-BS-#5A	N.WAV115-E.SAYRE 115 kV line	Same as #73		
92	C2_PN230-SB-#3F	N.WAV115-E.SAYRE 115 kV line	Same as #73		
93	Non	N.MESHNP-02OXBOW 230 kV line	Reconductor 10.58 miles of 1033 ACSR with 1033 ACSS high temperature conductor from North Meshoppen to Oxbow. At the North Meshoppen SS, replace the 1033 AAC conductor with 1033 ACSS high temperature conductor on the Oxbow terminal. Total w/taxes: \$7,757,800; total w/o taxes: \$5,988,200. Estimated time: 24 months	24 months	\$7,757,800
94	7336_C2_05SULLVA 765-A	05ROCKPT-05JEFRSO 765 kV line	Same as #49		

Table 10B: PJM Option 1- Connection to Sullivan 765 kV Substation

Y2-058 Contribution to Previously Identified Overloads

#	Name	Facility Description	Description	Schedule	Cost
95	C2_PN230-SB-#3D	N.WAV115-E.SAYRE 115 kV line	Same as #73		
96	2929_C2	05BREED-7CASEY 345 kV line	Same as #87		
97	B_LINE_SY_065	02HOYTDL-02MAPLE 138 kV line	At the Hoytdale SS, replace primary, backup and BFT relaying for the 138 kV Maple line exit. Estimated Cost w/ tax: \$208,700; Estimated Cost w/o tax: \$166,900; Estimated Time: 12 months At the Maple SS, replace primary, backup and BFT relaying for the 138 kV Hoytdale line exit. Estimated Cost w/ tax: \$208,700; Estimated Cost w/o tax: \$166,900; Estimated Time: 12 months	12 months	\$417,400
98	2930_C2	05BREED-7CASEY 345 kV line	Same as #87		
99	6490_B2_TOR3002545	05DEQUIN-05MEADOW 345 kV line	Same as #7 from Table 9B (\$1.2B)		
100	6472_B2_TOR15258	05DEQUIN-05MEADOW 345 kV line	Same as #99		
101	05JEFRSO_05ROCKPT _122	05BREED-05DEQUIN 345 kV line	Same as #53		
102	05MOUNTN_05BELMON _102	05MUSKNG- 05KAMMER 345 kV line	Rebuild the line. Estimated Min Cost: \$102.548 M; Estimated Max Cost: 105.5 M.		\$105,500,000
103	C5-TWL-NR054	02JONSON-02LRN Q2 138 kV line	Johnson – Lorain 138 kV, Reconductor 1.54 miles with 605 kcmil ACSS and 6-Wire 3.6 Mile Section. Reconductor approx. 1.54 miles with 605 kcmil ACSS conductor, replacing the the existing 636 kcmil ACSR conductor. Six-wire the 3.63 mile double-circuit section of 636 kcmil ACSR and de-energized 4/0 copper. Cost \$1,013,300.		\$1,168,400
			Johnson SS. Replace 600A wave trap on Lorain line terminal. Cost \$100,700		
			Lorain SS. Upgrade line drops and meter on 138 kV Johnson line terminal. Cost \$54,400		
104	C2-BRK-NR125	02JONSON-02LRN Q2 138 kV line	Same as #103		
105	37_B2_TOR12_WOMOP	05LAYMAN-05CORNER 138 kV line	Rebuild the line. Estimated Cost: \$10.62 M		\$10,620,000
106	2979_C2_X1-020_X2-052	05HUNT J-05SORENS 138 kV line	Same as #51		
107	2978_C2_X1-020	05HUNT J-05SORENS 138 kV line	Same as #51		
108	37_B2_TOR12_WOMOP	05WOLFCL- 05LAYMAN 138 kV line	Rebuild the line. Estimated Cost: \$11.025 M		\$11,025,000
109	2942_C2_05KAMMER 765- PP	05LAYMAN-05CORNER 138 kV line	Same as #105		
110	2942_C2_05KAMMER 765- PP	05WOLFCL- 05LAYMAN 138 kV line	Same as #108		
111	1733_C2_X1-020	05HUNT J-05SORENS 138 kV line	Same as #51		
112	1760_C2_05JEFRSO 765-A	05JEFRSO 765/345 kV transformer	Same as #74		
113	3002_C2_05ROCKPT 765- C2	05SULLVA 765/345 kV transformer	Pioneer Project - Same as #7 from Table 9B (\$1.2B)		
114	3183_C2_05ROCKPT 765-C	05SULLVA 765/345 kV transformer	Pioneer Project - Same as #7 from Table 9B (\$1.2B)		
115	2929_C2	05SULLVA 765/345 kV transformer	Pioneer Project - Same as #7 from Table 9B (\$1.2B)		
116	2930_C2	05SULLVA 765/345 kV transformer	Pioneer Project - Same as #7 from Table 9B (\$1.2B)		
117	C5-TWL-CR041_B	02AVERY-02SHNRK 138 kV line	Avery-Shinrock 138 kV, Upgrade Line Design Temperature from 150 F to 212 F from Avery Substation to Greenfield Substation by replacing (4) H-frame structures		\$248,700
118	B_ME230-SX-#9	GERMANTN 138/115 kV transformer	There is an operating procedure that can alleviate this overload, opening Carroll – Germantown 138 kV. This violation will be further analyzed in the SIS phase.		tbd
119	05JEFRSO_05ROCKPT _122	05BREED-05DARWIN 345 kV line	Pioneer Project - Same as #7 from Table 9B (\$1.2B)		

Table 10B: PJM Option 1- Connection to Sullivan 765 kV Substation

Y2-058 Contribution to Previously Identified Overloads

#	Name	Facility Description	Description	Schedule	Cost
120	05JEFRSO_05ROCKPT_122	05DARWIN-05EUGENE 345 kV line	Pioneer Project - Same as #7 from Table 9B (\$1.2B)		
121	05JEFRSO_05ROCKPT_122	05SULLVA 765/345 kV transformer	Pioneer Project - Same as #7 from Table 9B (\$1.2B)		
122	05JEFRSO_05ROCKPT_122	05SULLVA 765/345 kV transformer	Pioneer Project - Same as #7 from Table 9B (\$1.2B)		
123	AP_C5_19	GERMANTN 138/115 kV transformer	Opening the Carroll – Germantown 138 kV line will alleviate this overload. However, when the operating procedure is applied, the Roxbury – Greene 138 kV line overloads; this violation will be addressed further in the SIS phase. The overload on the Roxbury – Greene 138 kV circuit can be alleviated by replacing the Roxbury 138/115 kV transformer and associated terminal equipment (circuit breaker, substation conductor, CT circuits), which is estimated to cost approximately \$2,250,000 and require a lead time of at least 2 years.	2 years	\$2,250,000
124	5031_C2_05KAMMER 765-PP2	05LAYMAN-05CORNER 138 kV line	Same as #105		
125	5031_C2_05KAMMER 765-PP2	05WOLFCL-05LAYMAN 138 kV line	Same as #108		
126	05JEFRSO_05ROCKPT_122	05BREED-16WHEAT 345 kV line	Pioneer Project - Same as #7 from Table 9B (\$1.2B)		
127	2929_C2	05BREED-16WHEAT 345 kV line	Pioneer Project - Same as #7 from Table 9B (\$1.2B)		
128	3007_C2	05SULLVA 765/345 kV transformer	Pioneer Project - Same as #7 from Table 9B (\$1.2B)		
129	C5-TWL-CR040_B	02OTTAWA-02LAKVIEW 138 kV line	Add new Hayes-West Freemont No. 2 138 kV Line Position to the Hayes 138 kV substation @ Hayes SS.		\$8,127,400
			Hayes-West Freemont #2 138 kV, New 28 Mile Line		
			OPGW fiber for 28 miles		
			Create the West Freemont – Hayes 138 kV #2 line by installing a 138 kV power CB and associated equipment at West Freemont Substation. This exit assumes a new breaker string is constructed for the 1 st 138 kV exit to Hayes Substation @ West Freemont		

Energy Portion of Interconnection Request

PJM also studied the delivery of the energy portion of the surrounding generation. Any potential problems identified below are likely to result in operational restrictions to the project under study. The developer can proceed with network upgrades to eliminate the operational restriction at their discretion by submitting a Transmission Interconnection request.

Note: Only the most severely overloaded conditions are listed. There is no guarantee of full delivery of energy for this project by fixing only the conditions listed in this section. With a Transmission Interconnection Request, a subsequent analysis will be performed which analyzes all overload conditions associated with the overloaded element(s) identified. As a result of the aggregate energy resources in the area, the following violations were identified.

No problems identified.

Steady-State Voltage Requirements

(Results of the steady-state voltage studies should be inserted here)

To be determined

Stability and Reactive Power Requirement

(Results of the dynamic studies should be inserted here)

The analysis will be done in the Impact Study

Sensitivity Analysis for Secondary POI – Breed 345 kV Line

**Table 13: PJM Option 2- Connection to Breed 345 kV Substation
Contingencies**

Contingency Name	Description
6484	CONTINGENCY '6484' OPEN BRANCH FROM BUS 243217 TO BUS 243878 CKT 1 / 243217 05DEQUIN 345 243878 05MEADOW 345 1 OPEN BRANCH FROM BUS 243217 TO BUS 243878 CKT 2 / 243217 05DEQUIN 345 243878 05MEADOW 345 2 END
6488	CONTINGENCY '6488' OPEN BRANCH FROM BUS 243878 TO BUS 243229 CKT 1 / 243878 05MEADOW 345 243229 05OLIVE 345 1 OPEN BRANCH FROM BUS 243878 TO BUS 243230 CKT 1 / 243878 05MEADOW 345 243230 05REYNOL 345 1 OPEN BRANCH FROM BUS 243229 TO BUS 243230 CKT 1 / 243229 05OLIVE 345 243230 05REYNOL 345 1 OPEN BRANCH FROM BUS 243230 TO BUS 255173 CKT 1 / 243230 05REYNOL 345 255173 17RYNLDS 138 1 END
01HATFLD _01RONCO _059	CONTINGENCY '01HATFLD _01RONCO _059' DISCONNECT BRANCH FROM BUS 235108 TO BUS 235774 CKT 1 /* 500/500KV, AREA 201/201. END
05BELMON _05KAMMER _108	CONTINGENCY '05BELMON _05KAMMER _108' DISCONNECT BRANCH FROM BUS 242920 TO BUS 242925 CKT 1 /* 765/765KV, AREA 205/205. END
05CLOVRD _05J.FERR _096	CONTINGENCY '05CLOVRD _05J.FERR _096' DISCONNECT BRANCH FROM BUS 242512 TO BUS 242514 CKT 1 /* 765/765KV, AREA 205/205. END
05DUMONT _05GRNTWN _120_A	CONTINGENCY '05DUMONT _05GRNTWN _120_A' DISCONNECT BRANCH FROM BUS 243206 TO BUS 907020 CKT 1 /* 765/765KV, AREA 205/205. END
05DUMONT _05GRNTWN _120_B	CONTINGENCY '05DUMONT _05GRNTWN _120_B' DISCONNECT BRANCH FROM BUS 907020 TO BUS 243207 CKT 1 /* 765/765KV, AREA 205/205. END
05HANG R _05JEFRSO _114	CONTINGENCY '05HANG R _05JEFRSO _114' DISCONNECT BRANCH FROM BUS 242924 TO BUS 243208 CKT 1 /* 765/765KV, AREA 205/205. END

**Table 13: PJM Option 2- Connection to Breed 345 kV Substation
Contingencies**

Contingency Name	Description
05JEFRSO_05ROCKPT_122	CONTINGENCY '05JEFRSO_05ROCKPT_122' DISCONNECT BRANCH FROM BUS 243208 TO BUS 243209 CKT 1 /* 765/765KV, AREA 205/205. END
05MOUNTN_05BELMON_102	CONTINGENCY '05MOUNTN_05BELMON_102' DISCONNECT BRANCH FROM BUS 242516 TO BUS 242920 CKT 1 /* 765/765KV, AREA 205/205. END
1375_C1_A	CONTINGENCY '1375_C1_A' OPEN BRANCH FROM BUS 242511 TO BUS 242518 CKT 4 / 242511 05BROADF 765 242518 05BROADF 500 4 OPEN BRANCH FROM BUS 242518 TO BUS 914142 CKT 1 / 242518 05BROADF 500 360106 8SULLIVAN TN 500 1 END
1589_B3_05CLOVRD 765-10_WOMOAB	CONTINGENCY '1589_B3_05CLOVRD 765-10_WOMOAB' OPEN BRANCH FROM BUS 242512 TO BUS 242514 CKT 1 / 242512 05CLOVRD 765 242514 05J.FERR 765 1 OPEN BRANCH FROM BUS 242512 TO BUS 242515 CKT 1 / 242512 05CLOVRD 765 242515 05JOSHUA 765 1 OPEN BRANCH FROM BUS 242512 TO BUS 242524 CKT 10 / 242512 05CLOVRD 765 242524 05CLOVRD 345 10 END
1733_C2_X1-020	CONTINGENCY '1733_C2_X1-020' OPEN BRANCH FROM BUS 243206 TO BUS 907020 CKT 1 / 243206 05DUMONT 765 243207 05GRNTWN 765 1 OPEN BRANCH FROM BUS 243207 TO BUS 252004 CKT 1 / 243207 05GRNTWN 765 252004 08GRNTWN 1.00 1 OPEN BRANCH FROM BUS 249619 TO BUS 252004 CKT 1 / 249619 08GRNTWN 230 252004 08GRNTWN 1.00 1 OPEN BRANCH FROM BUS 249741 TO BUS 252004 CKT 1 / 249741 08GRNTWN 138 252004 08GRNTWN 1.00 1 END
1760_C2_05JEFRSO 765-A	CONTINGENCY '1760_C2_05JEFRSO 765-A' OPEN BRANCH FROM BUS 243207 TO BUS 243208 CKT 1 / 243207 05GRNTWN 765 243208 05JEFRSO 765 1 OPEN BRANCH FROM BUS 242924 TO BUS 243208 CKT 1 / 242924 05HANG R 765 243208 05JEFRSO 765 1 END
2056&2058	CONTINGENCY '2056&2058' /* LN 2056 & 2058 OPEN BRANCH FROM BUS 314990 TO BUS 314591 CKT 1 /* 2056 HORNERTOWN OPEN BRANCH FROM BUS 314591 TO BUS 304222 CKT 1 /* 2056 OPEN BRANCH FROM BUS 314564 TO BUS 304222 CKT 1 /* 2058 ROCKY MT END

**Table 13: PJM Option 2- Connection to Breed 345 kV Substation
Contingencies**

Contingency Name	Description
2856_C2	CONTINGENCY '2856_C2' OPEN BRANCH FROM BUS 242920 TO BUS 242925 CKT 1 / 242920 05BELMON 765 242925 05KAMMER 765 1 OPEN BRANCH FROM BUS 242920 TO BUS 242516 CKT 1 / 242920 05BELMON 765 242516 05MOUNTN 765 1 OPEN BRANCH FROM BUS 242923 TO BUS 242516 CKT 1 / 242923 05GAVIN 765 242516 05MOUNTN 765 1 OPEN BRANCH FROM BUS 242920 TO BUS 235102 CKT 1 / 242920 05BELMON 765 235102 BELMONT 500 1 END
2877_C2_05OLIVE 345-B1	CONTINGENCY '2877_C2_05OLIVE 345-B1' OPEN BRANCH FROM BUS 243215 TO BUS 243229 CKT 1 / 243215 05COOK 345 243229 05OLIVE 345 1 OPEN BRANCH FROM BUS 243229 TO BUS 243353 CKT 2 / 243229 05OLIVE 345 243353 05OLIVE 138 2 OPEN BRANCH FROM BUS 243327 TO BUS 243353 CKT 1 / 243327 05LAPORT 138 243353 05OLIVE 138 1 END
2906_C2_05MARYSV 765-A1	CONTINGENCY '2906_C2_05MARYSV 765-A1' OPEN BRANCH FROM BUS 242926 TO BUS 242928 CKT 1 / 242926 05MALIS 765 242928 05MARYSV 765 1 OPEN BRANCH FROM BUS 242928 TO BUS 242939 CKT 1 / 242928 05MARYSV 765 242939 05MARYSV 345 1 OPEN BRANCH FROM BUS 239133 TO BUS 242939 CKT 1 / 239133 02TANGY 345 242939 05MARYSV 345 1 END
2929_C2	CONTINGENCY '2929_C2' OPEN BRANCH FROM BUS 243207 TO BUS 243208 CKT 1 / 243207 05GRNTWN 765 243208 05JEFRSO 765 1 OPEN BRANCH FROM BUS 243208 TO BUS 243209 CKT 1 / 243208 05JEFRSO 765 243209 05ROCKPT 765 1 END
2930_C2	CONTINGENCY '2930_C2' OPEN BRANCH FROM BUS 243208 TO BUS 243209 CKT 1 / 243208 05JEFRSO 765 243209 05ROCKPT 765 1 OPEN BRANCH FROM BUS 243208 TO BUS 248000 CKT 1 / 243208 05JEFRSO 765 248000 06CLIFTY 345 1 END
2932_C2_05JEFRSO 765-A2	CONTINGENCY '2932_C2_05JEFRSO 765-A2' OPEN BRANCH FROM BUS 242924 TO BUS 243208 CKT 1 / 242924 05HANG R 765 243208 05JEFRSO 765 1 OPEN BRANCH FROM BUS 243208 TO BUS 248000 CKT 1 / 243208 05JEFRSO 765 248000 06CLIFTY 345 1 END

**Table 13: PJM Option 2- Connection to Breed 345 kV Substation
Contingencies**

Contingency Name	Description
2942_C2_05KAMMER 765-PP	CONTINGENCY '2942_C2_05KAMMER 765-PP' OPEN BRANCH FROM BUS 242920 TO BUS 242925 CKT 1 / 242920 05BELMON 765 242925 05KAMMER 765 1 OPEN BRANCH FROM BUS 242920 TO BUS 242516 CKT 1 / 242920 05BELMON 765 242516 05MOUNTN 765 1 OPEN BRANCH FROM BUS 242920 TO BUS 235102 CKT 1 / 242920 05BELMON 765 235102 BELMONT 500 1 OPEN BRANCH FROM BUS 242925 TO BUS 243188 CKT 1 / 242925 05KAMMER 765 243188 05MLG1 26.0 1 REMOVE UNIT 1 FROM BUS 243188 / 243188 05MLG1 26.0 END
2965_C2	CONTINGENCY '2965_C2' OPEN BRANCH FROM BUS 243218 TO BUS 243222 CKT 1 / 243218 05DESOTO 345 243222 05FALL C 345 1 OPEN BRANCH FROM BUS 243218 TO BUS 243278 CKT 1 / 243218 05DESOTO 345 243278 05DESOTO 138 1 END
2978_C2_X1-020	CONTINGENCY '2978_C2_X1-020' OPEN BRANCH FROM BUS 243206 TO BUS 907020 CKT 1 / 243206 05DUMONT 765 243207 05GRNTWN 765 1 OPEN BRANCH FROM BUS 243206 TO BUS 270644 CKT 1 / 243206 05DUMONT 765 270644 WILTO; 765 1 END
2979_C2_X1-020_X2-052	CONTINGENCY '2979_C2_X1-020_X2-052' OPEN BRANCH FROM BUS 243206 TO BUS 907020 CKT 1 / 243206 05DUMONT 765 243207 05GRNTWN 765 1 OPEN BRANCH FROM BUS 243206 TO BUS 243219 CKT 2 / 243206 05DUMONT 765 243219 05DUMONT 345 2 OPEN BRANCH FROM BUS 243219 TO BUS 909180 CKT 2 / 243219 05DUMONT 345 243229 05OLIVE 345 2 END
3027_C2	CONTINGENCY '3027_C2' OPEN BRANCH FROM BUS 243233 TO BUS 249568 CKT 1 / 243233 05TANNER 345 249568 08M.FTHS 345 1 OPEN BRANCH FROM BUS 243233 TO BUS 254524 CKT 1 / 243233 05TANNER 345 254524 16HANNA 345 1 OPEN BRANCH FROM BUS 243233 TO BUS 243382 CKT 1 / 243233 05TANNER 345 243382 05TANNER 138 1 OPEN BRANCH FROM BUS 249568 TO BUS 250057 CKT 10 / 249568 08M.FTHS 345 250057 08M.FORT 138 10 OPEN BRANCH FROM BUS 249568 TO BUS 250057 CKT 9 / 249568 08M.FTHS 345 250057 08M.FORT 138 9 END
345-L8001___-S	CONTINGENCY '345-L8001___-S' / CONTINGENCY # 734 TRIP BRANCH FROM BUS 270853 TO BUS 348847 CKT 1 / PONTI; R 345 7BROKAW T1 345

**Table 13: PJM Option 2- Connection to Breed 345 kV Substation
Contingencies**

Contingency Name	Description
	END
345-L8002___-S	CONTINGENCY '345-L8002___-S' / CONTINGENCY # 735 TRIP BRANCH FROM BUS 270852 TO BUS 270668 CKT 1 / PONTI; B 345 BLUEM; B 345 END
361_1_B2	CONTINGENCY '361_1_B2' OPEN BRANCH FROM BUS 243206 TO BUS 299951 CKT 1 /* 243206 05DUMONT 765 299951 05SORENS 765 1 END
37_B2_TOR12_WOMOP	CONTINGENCY '37_B2_TOR12_WOMOP' OPEN BRANCH FROM BUS 242920 TO BUS 242925 CKT 1 / 242920 05BELMON 765 242925 05KAMMER 765 1 OPEN BRANCH FROM BUS 242920 TO BUS 242516 CKT 1 / 242920 05BELMON 765 242516 05MOUNTN 765 1 OPEN BRANCH FROM BUS 242920 TO BUS 235102 CKT 1 / 242920 05BELMON 765 235102 BELMONT 500 1 END
4504MFTANNERS4512EB TANNERS	CONTINGENCY '4504MFTANNERS4512EBTANNERS' OPEN BRANCH FROM BUS 243233 TO BUS 249568 CKT 1 / 243233 05TANNER 345 249568 08M.FTHS 345 1 OPEN BRANCH FROM BUS 249568 TO BUS 250057 CKT 10 / 249568 08M.FTHS 345 250057 08M.FORT 138 10 OPEN BRANCH FROM BUS 249568 TO BUS 250057 CKT 9 / 249568 08M.FTHS 345 250057 08M.FORT 138 9 OPEN BRANCH FROM BUS 243233 TO BUS 249565 CKT 1 / 243233 05TANNER 345 249565 08EBEND 345 1 END
4689_B2_TOR15257	CONTINGENCY '4689_B2_TOR15257' OPEN BRANCH FROM BUS 243878 TO BUS 243229 CKT 1 / 243878 05MEADOW 345 243229 05OLIVE 345 1 END
4690_C2_05OLIVE 345-D	CONTINGENCY '4690_C2_05OLIVE 345-D' OPEN BRANCH FROM BUS 243878 TO BUS 243229 CKT 1 / 243878 05MEADOW 345 243229 05OLIVE 345 1 OPEN BRANCH FROM BUS 243229 TO BUS 274804 CKT 1 / 243229 05OLIVE 345 274804 UPNOR;RP 345 1 END
474_A	CONTINGENCY '474_A' OPEN BRANCH FROM BUS 242931 TO BUS 248101 CKT 1 / 242931 05BEVERL 345 242946 05TIDD 345 1 OPEN BRANCH FROM BUS 242937 TO BUS 242940 CKT 1 / 242937 05KAMMER 345 242940 05MUSKNG 345 1 END

**Table 13: PJM Option 2- Connection to Breed 345 kV Substation
Contingencies**

Contingency Name	Description
5031_C2_05KAMMER 765-PP2	CONTINGENCY '5031_C2_05KAMMER 765-PP2' OPEN BRANCH FROM BUS 242920 TO BUS 242925 CKT 1 / 242920 05BELMON 765 242925 05KAMMER 765 1 OPEN BRANCH FROM BUS 242920 TO BUS 242516 CKT 1 / 242920 05BELMON 765 242516 05MOUNTN 765 1 OPEN BRANCH FROM BUS 242920 TO BUS 235102 CKT 1 / 242920 05BELMON 765 235102 BELMONT 500 1 OPEN BRANCH FROM BUS 242925 TO BUS 235117 CKT 1 / 242925 05KAMMER 765 235117 KAMMER 500 1 OPEN BRANCH FROM BUS 235111 TO BUS 235117 CKT 1 / 235111 502 JUNCTION 500 235117 KAMMER 500 1 END
6178_C2_05CLOVRD 345-P_WOMOAB	CONTINGENCY '6178_C2_05CLOVRD 345-P_WOMOAB' OPEN BRANCH FROM BUS 242512 TO BUS 242514 CKT 1 / 242512 05CLOVRD 765 242514 05J.FERR 765 1 OPEN BRANCH FROM BUS 242512 TO BUS 242515 CKT 1 / 242512 05CLOVRD 765 242515 05JOSHUA 765 1 OPEN BRANCH FROM BUS 242512 TO BUS 242524 CKT 10 / 242512 05CLOVRD 765 242524 05CLOVRD 345 10 OPEN BRANCH FROM BUS 242524 TO BUS 242527 CKT 1 / 242524 05CLOVRD 345 242527 05M FUNK 345 1 END
6189_C2_05HANG R 765-D1	CONTINGENCY '6189_C2_05HANG R 765-D1' OPEN BRANCH FROM BUS 242921 TO BUS 242924 CKT 1 / 242921 05CORNU 765 242924 05HANG R 765 1 OPEN BRANCH FROM BUS 242924 TO BUS 243208 CKT 1 / 242924 05HANG R 765 243208 05JEFRSO 765 1 END
6372_B2_TOR12497	CONTINGENCY '6372_B2_TOR12497' OPEN BRANCH FROM BUS 243262 TO BUS 250106 CKT 1 / 243262 05COLLCO 138 250106 08TODHJT 138 1 OPEN BRANCH FROM BUS 250106 TO BUS 253057 CKT 1 / 250106 08TODHJT 138 253057 09OHH 138 1 END
6430_B2_TOR22_WOMO AB	CONTINGENCY '6430_B2_TOR22_WOMOAB' OPEN BRANCH FROM BUS 242529 TO BUS 242528 CKT 1 / 242529 05TRISTA 345 248005 06KYGER 345 1 OPEN BRANCH FROM BUS 242528 TO BUS 248005 CKT 1 / 242529 05TRISTA 345 248005 06KYGER 345 1 OPEN BRANCH FROM BUS 242529 TO BUS 242835 CKT 1 / 242529 05TRISTA 345 242835 05TRISTA 138 1 END
6472_B2_TOR15258	CONTINGENCY '6472_B2_TOR15258' OPEN BRANCH FROM BUS 243217 TO BUS 243878 CKT 1 / 243217 05DEQUIN 345 243878 05MEADOW 345 1 END

**Table 13: PJM Option 2- Connection to Breed 345 kV Substation
Contingencies**

Contingency Name	Description
6489_B2_TOR16002	CONTINGENCY '6489_B2_TOR16002' OPEN BRANCH FROM BUS 243878 TO BUS 243230 CKT 1 / 243878 05MEADOW 345 243230 05REYNOL 345 1 OPEN BRANCH FROM BUS 243229 TO BUS 243230 CKT 1 / 243229 05OLIVE 345 243230 05REYNOL 345 1 OPEN BRANCH FROM BUS 243230 TO BUS 255173 CKT 1 / 243230 05REYNOL 345 255173 17RYNLDS 138 1 END
6490_B2_TOR3002545	CONTINGENCY '6490_B2_TOR3002545' OPEN BRANCH FROM BUS 243217 TO BUS 243878 CKT 2 / 243217 05DEQUIN 345 243878 05MEADOW 345 2 END
664_B3	CONTINGENCY '664_B3' OPEN BRANCH FROM BUS 243210 TO BUS 243213 CKT 1 / 243210 05SULLVA 765 243213 05BREED 345 1 END
665_B3	CONTINGENCY '665_B3' OPEN BRANCH FROM BUS 243210 TO BUS 243213 CKT 2 / 243210 05SULLVA 765 243213 05BREED 345 2 END
667_B2_TOR1697	CONTINGENCY '667_B2_TOR1697' OPEN BRANCH FROM BUS 243213 TO BUS 243217 CKT 1 / 243213 05BREED 345 243217 05DEQUIN 345 1 END
673_B2	CONTINGENCY '673_B2' OPEN BRANCH FROM BUS 243218 TO BUS 243222 CKT 1 / 243218 05DESOTO 345 243222 05FALL C 345 1 END
8CARSON_8DBGEN_014_B	CONTINGENCY '8CARSON_8DBGEN_014_B' DISCONNECT BRANCH FROM BUS 909840 TO BUS 304183 CKT 1 /* 500/500KV, AREA 345/340. END
AP_C5_19	CONTINGENCY 'AP_C5_19' /BRIGHTON LOOP OPEN BRANCH FROM BUS 200003 TO BUS 235105 CKT 1 OPEN BRANCH FROM BUS 200003 TO BUS 200004 CKT 1 END
AP_SB_467	CONTINGENCY 'AP_SB_467' / HATFIELD500-RONCO500 STK BKR AT HATFIELD500 #8 OPEN BRANCH FROM BUS 235108 TO BUS 235774 CKT 1 OPEN BUS 235582 END

**Table 13: PJM Option 2- Connection to Breed 345 kV Substation
Contingencies**

Contingency Name	Description
AP_SB_468	CONTINGENCY 'AP_SB_468' / HATFIELD500-RONCO500 STK BKR AT RONCO500 #1 OPEN BUS 235774 OPEN BUS 235755 OPEN BUS 235756 OPEN BUS 235757 END
APS_B_G402	CONTINGENCY 'APS_B_G402' / 235316 01COWEN 138 235318 01CRUPRN 138 1 OPEN BRANCH FROM BUS 235316 TO BUS 235318 CKT 1 END
APS_B_G425	CONTINGENCY 'APS_B_G425' / 235328 01ENONTP 138 235389 01POWELM 138 1 OPEN BRANCH FROM BUS 235328 TO BUS 235389 CKT 1 END
B_LINE_SY_064	CONTINGENCY 'B_LINE_SY_064' /* LINE 01CABOT 500 TO 02CRNBRY 500 CK 1 DISCONNECT BRANCH FROM BUS 235104 TO BUS 239280 CKT 1 /* CABOT 500.00 02CRNBRY 500.00 END
B_LINE_SY_065	CONTINGENCY 'B_LINE_SY_065' /* LINE 02CRNBRY 500 TO 01WYLIER 500 CK 1 DISCONNECT BRANCH FROM BUS 239280 TO BUS 235703 CKT 1 /* 02CRNBRY 500.00 WYLIE RIDGE 500.00 END
B_ME230-SX-#9	CONTINGENCY 'B_ME230-SX-#9' /* HUNTERSTOWN-JACKSON & HUNTERSTOWN 2 BANK DISCONNECT BRANCH FROM BUS 204575 TO BUS 204502 CKT 1 DISCONNECT BRANCH FROM BUS 204575 TO BUS 204539 CKT 4 END
B_PN230-SX-#11_B	CONTINGENCY 'B_PN230-SX-#11_B' /* X1-109 TAP - N MESHOPPEN (ETP) 230 KV & N MESHOPPEN BK 4 DISCONNECT BRANCH FROM BUS 907460 TO BUS 200924 CKT 1F DISCONNECT BRANCH FROM BUS 200924 TO BUS 200706 CKT 1F DISCONNECT BRANCH FROM BUS 200706 TO BUS 200677 CKT 4 END
B_PN230-SX-#8	CONTINGENCY 'B_PN230-SX-#8' /* EAST TOWANDA - HILLSIDE (ETH) 230 KV DISCONNECT BRANCH FROM BUS 200675 TO BUS 130763 CKT 1 END
C1_PN230-BS-#5A	CONTINGENCY 'C1_PN230-BS-#5A' /* EAST TOWANDA #1 230 KV BUS FAULT DISCONNECT BRANCH FROM BUS 200701 TO BUS 200675 CKT 1 DISCONNECT BRANCH FROM BUS 200675 TO BUS 130763 CKT 1

**Table 13: PJM Option 2- Connection to Breed 345 kV Substation
Contingencies**

Contingency Name	Description
	DISCONNECT BRANCH FROM BUS 200674 TO BUS 200675 CKT 3 END
C2_PN230-SB-#3D	CONTINGENCY 'C2_PN230-SB-#3D' /* EAST TOWANDA 230 KV STUCK CB - (GROVER) DISCONNECT BRANCH FROM BUS 200675 TO BUS 130763 CKT 1 DISCONNECT BRANCH FROM BUS 200857 TO BUS 200701 CKT 1 DISCONNECT BRANCH FROM BUS 200701 TO BUS 200675 CKT 1 DISCONNECT BRANCH FROM BUS 200701 TO BUS 200702 CKT 1 DISCONNECT BUS 200701 DISCONNECT BRANCH FROM BUS 200674 TO BUS 200675 CKT 3 END
C2_PN230-SB-#3F	CONTINGENCY 'C2_PN230-SB-#3F' /* EAST TOWANDA 230 KV STUCK CB - (#3 XF) DISCONNECT BRANCH FROM BUS 200675 TO BUS 130763 CKT 1 DISCONNECT BRANCH FROM BUS 200701 TO BUS 200675 CKT 1 DISCONNECT BRANCH FROM BUS 200674 TO BUS 200675 CKT 3 END
C2-BRK-NR125	CONTINGENCY 'C2-BRK-NR125' /* BREAKER FAILURE ON S145 BREAKER AT AVON 345KV DISCONNECT BRANCH FROM BUS 238569 TO BUS 238551 CKT 1 /* 02BEAVER 345.00 02AVON 345.00 DISCONNECT BRANCH FROM BUS 238569 TO BUS 238551 CKT 2 /* 02BEAVER 345.00 02AVON 345.00 END
C5-TWL-CR040_A	CONTINGENCY 'C5-TWL-CR040_A' /* DAVIS BESSE-BEAVER + DAVIS BESSE-HAYES 345KV DISCONNECT BRANCH FROM BUS 238654 TO BUS 239289 CKT 1 /* 02DAV-BE 345.00 02HAYES 345.00 DISCONNECT BRANCH FROM BUS 238654 TO BUS 907040 CKT 1 /* 02DAV-BE 345.00 X1-027A TAP 345.00 END
C5-TWL-CR040_B	CONTINGENCY 'C5-TWL-CR040_B' /* DAVIS BESSE-BEAVER + DAVIS BESSE-HAYES 345KV DISCONNECT BRANCH FROM BUS 238654 TO BUS 239289 CKT 1 /* 02DAV-BE 345.00 02HAYES 345.00 DISCONNECT BRANCH FROM BUS 907040 TO BUS 238569 CKT 1 /* X1-027A TAP 345.00 02BEAVER 345.00 END
C5-TWL-CR041_B	CONTINGENCY 'C5-TWL-CR041_B' /* DAVIS BESSE-BEAVER + BEAVER-HAYES 345KV DISCONNECT BRANCH FROM BUS 238569 TO BUS 239289 CKT 1 /* 02BEAVER 345.00 02HAYES 345.00 DISCONNECT BRANCH FROM BUS 907040 TO BUS 238569 CKT 1 /* X1-027A TAP

**Table 13: PJM Option 2- Connection to Breed 345 kV Substation
Contingencies**

Contingency Name	Description
	345.00 02BEAVER 345.00 END
C5-TWL-NR054	CONTINGENCY 'C5-TWL-NR054' /* AVON-BEAVER #1 AND #2 345KV LINE OUTAGES DISCONNECT BRANCH FROM BUS 238551 TO BUS 238569 CKT 1 /* 02AVON 345.00 02BEAVER 345.00 DISCONNECT BRANCH FROM BUS 238551 TO BUS 238569 CKT 2 /* 02AVON 345.00 02BEAVER 345.00 END
DUKE-SB 925_MIAMIFORT	CONTINGENCY 'DUKE-SB 925_MIAMIFORT' OPEN BRANCH FROM BUS 250057 TO BUS 250060 CKT 1 / 250057 08M.FORT 138 250060 08MDWAY1 138 1 OPEN BRANCH FROM BUS 250057 TO BUS 250058 CKT 1 / 250057 08M.FORT 138 250058 08M.FTGT 138 1 OPEN BRANCH FROM BUS 250057 TO BUS 249568 CKT 10 OPEN BRANCH FROM BUS 248009 TO BUS 250057 CKT 1 / 248009 06CLIFTY 138 250057 08M.FORT 138 1 OPEN BRANCH FROM BUS 250057 TO BUS 250151 CKT 1 / 250057 08M.FORT 138 250151 08HEBRN3 138 1 OPEN BRANCH FROM BUS 250057 TO BUS 250071 CKT 1 / 250057 08M.FORT 138 250071 08MRGAN2 138 1 END
LN 2056_A3	CONTINGENCY 'LN 2056_A3' /*BATTLEBORO - ROCKY MOUNT OPEN BRANCH FROM BUS 314990 TO BUS 314591 CKT 1 /* OPEN BRANCH FROM BUS 314591 TO BUS 304222 CKT 1 END
PEACH245	CONTINGENCY 'PEACH245' /* \$CHESCO \$PEACH245 \$STBK TRIP BRANCH FROM BUS 200013 TO BUS 200004 CKT 1 /* PEACHBTM 500.00 CONASTONE 500.00 \$CHESCO \$PEACH245 \$STBK DISCONNECT BUS 200122 /* \$CHESCO \$PEACH245 \$STBK DISCONNECT BUS 200192 /* \$CHESCO \$PEACH245 \$STBK DISCONNECT BUS 200193 /* \$CHESCO \$PEACH245 \$STBK DISCONNECT BUS 200194 /* \$CHESCO \$PEACH245 \$STBK DISCONNECT BUS 200195 /* \$CHESCO \$PEACH245 \$STBK END /* \$CHESCO \$PEACH245 \$STBK Please refer to Appendix 44 for a table containing the generators having contribution to this flowgate. 33. The X1-020 TAP-05DUMONT 765 kV line (from bus 907020 to bus 243206 ckt 1) loads from 111.15% to 117.44% (DC power flow) of its emergency rating (4094 MVA) for the line fault with failed breaker contingency outage of CONTINGENCY DESCRIPTION ('2932_C2_05JEFRSO 765-A2'). This project contributes approximately 257.46 MW to the thermal violation.

**Table 13: PJM Option 2- Connection to Breed 345 kV Substation
Contingencies**

Contingency Name	Description
	CONTINGENCY '2932_C2_05JEFRSO 765-A2' OPEN BRANCH FROM BUS 242924 TO BUS 243208 CKT 1 / 242924 05HANG R 765 243208 05JEFRSO 765 1 OPEN BRANCH FROM BUS 243208 TO BUS 248000 CKT 1 / 243208 05JEFRSO 765 248000 06CLIFTY 345 1 END
PJM17	CONTINGENCY 'PJM17' DISCONNECT BRANCH FROM BUS 200004 TO BUS 200013 CKT 1 /* CNASTONE PEACHBTM 500 500 END
PP1E_NO EMORYGROVE	CONTINGENCY 'PP1E_NO EMORYGROVE' / NO PATH OPEN BRANCH FROM BUS 200003 TO BUS 200004 CKT 1 / 200003 BRIGHTON 500 200004 CNASTONE 500 1 END

**Table 14: PJM Option 2- Connection to Breed 345 kV Substation
Y2-095 Generator Deliverability**

#	Type	Contingency	Facility Description	Bus			Loading		Rating		MW Cont.	FG App.
		Name		From	To	Cir.	Initial	Final	Type	MVA		
1	N-1	01HATFLD _01RONCO_059	SHEPLER H J-SMITHTON 62 138 kV line	235247	235252	1	95.19	96.04	ER	297	15.72	1
2	N-1	673_B2	05DELCOR-05MADISO 138 kV line	243276	243333	1	98.3	99.39	ER	223	15.03	5
3	N-1	664_B3	05SULLVA 765/345 kV transformer	243213	243210	2	64.97	87.91	ER	1680	385.32	7
4	N-1	665_B3	05SULLVA 765/345 kV transformer	243213	243210	1	65.45	88.56	ER	1650	381.25	8
5	N-1	8CARSON_8DBGEN _014_B	6HALIFAX-6CLOVER 230 kV line	314697	314686	1	95.6	96.5	ER	797	44.64	15

Table 15: PJM Option 2

Y2-095 Multiple Facility Contingency

#	Type	Contingency	Facility Description	Bus			Loading		Rating		MW Cont.	FG App.
		Name		From	To	Cir.	Initial	Final	Type	MVA		
1	LFFB	2932_C2_05JEFRSO 765-A2	05JEFRSO-05GRNTWN 765 kV line	243208	243207	1	90.18	97.04	ER	4094	280.86	2
2	LFFB	5031_C2_05KAMMER 765-PP2	05J.FERR-05CLOVRD 765 kV line	242514	242512	1	97.46	98	ER	4055	139.01	3

Table 15: PJM Option 2

Y2-095 Multiple Facility Contingency

Contingency				Bus			Loading		Rating		MW	FG
#	Type	Name	Facility Description	From	To	Cir.	Initial	Final	Type	MVA	Cont.	App.
3	LFFB	2965_C2	05FALL C-05MADISO 138 kV line	243292	243333	1	98.81	99.65	ER	251	13.08	4
4	LFFB	C2_PN230-SB-#3F	E.SAYRE-TOWANDA 115 kV line	200676	200674	1	97.17	98.04	ER	155	8.31	6
5	LFFB	AP_SB_468	SHEPLER H J-SMITHTON 62 138 kV line	235247	235252	1	98.48	99.35	ER	297	15.96	9
6	LFFB	C2_PN230-SB-#3D	E.SAYRE-TOWANDA 115 kV line	200676	200674	1	98.65	99.52	ER	155	8.33	11
7	LFFB	6189_C2_05HANG R 765-D1	X1-020 TAP-05DUMONT 765 kV line	907020	243206	1	98.69	102.85	ER	4094	170.17	16

Table 16: PJM Option 2

Y2-095 Contribution to Previously Identified Overloads

Contingency				Bus			Loading		Rating		MW	FG
#	Type	Name	Facility Description	From	To	Cir.	Initial	Final	Type	MVA	Cont.	App.
1	N-1	05DUMONT_05GRNTWN_120_B	05ROCKCR-05HUNT J 138 kV line	243367	243313	1	100.79	101.67	ER	167	9.05	10
2	N-1	673_B2	05CROSS-05HOGAN 138 kV line	243270	243311	1	100.67	101.68	ER	245	15.28	12
3	DCTL	4504MFTANNERS451 2EBTANNERS	08GRDALE-08M.FORT 138 kV line	249736	250057	1	100.65	101.52	ER	478	25.84	13
4	N-1	673_B2	05FALL C-05DELCOR 138 kV line	243292	243276	1	101.61	102.7	ER	223	15.03	14
5	LFFB	3027_C2	08GRDALE-08M.FORT 138 kV line	249736	250057	1	102.08	102.95	ER	478	25.83	17
6	LFFB	AP_SB_467	SMITHTON 62-YUKON 138 kV line	235252	235277	1	102.24	103.1	ER	297	15.72	18
7	DCTL	6484	05REYNOL 345/138 kV transformer	255173	243230	1	103.34	104.85	ER	318	29.79	19
8	N-1	6372_B2_TOR12497	05COLLCO-08COLINV 138 kV line	243262	250001	1	105.46	106.3	ER	179	9.25	20
9	N-1	673_B2	05MADISO-05CROSS 138 kV line	243333	243270	1	105.74	106.75	ER	245	15.28	21
10	N-1	05JEFRSO_05ROCKPT_122	X2-052 TAP-05DUMONT 345 kV line	909180	243219	2	100.61	106.3	ER	1409	80.24	22
11	LFFB	2965_C2	05DELCOR-05MADISO 138 kV line	243276	243333	1	106.76	107.68	ER	223	12.69	23
12	N-1	361_1_B2	05JEFRSO-05HANG R 765 kV line	243208	242924	1	102.52	107.94	ER	4055	255.33	24
13	LFFB	AP_SB_467	SHEPLER H J-SMITHTON 62 138 kV line	235247	235252	1	107.52	108.37	ER	297	15.72	25
14	LFFB	6178_C2_05CLOVRD 345-P_WOMOAB	05BURLHT-05CLOVRD 138 kV line	242572	242607	1	106.8	107.85	ER	223	14.42	26
15	LFFB	2965_C2	05FALL C-05DELCOR 138 kV line	243292	243276	1	110.07	110.99	ER	223	12.69	27
16	N-1	37_B2_TOR12_WOM OP	05DEGUSS-05BELPRE 138 kV line	243496	243470	1	107.22	108.32	ER	148	10.06	28
17	N-1	345-L8001_-S	4LILLY-POWER;RT 138 kV line	348875	272285	1	112.06	112.98	ER	132	7.52	29
18	N-1	37_B2_TOR12_WOM OP	05J.FERR-05CLOVRD 765 kV line	242514	242512	1	109.72	110.35	ER	3176	123.47	30
19	N-1	37_B2_TOR12_WOM OP	05MUSKNG-05BEVERL 345 kV line	242940	242931	1	110.2	111.01	ER	971	48.73	31
20	N-1	05JEFRSO_05ROCKPT_122	7PANA-KINCA; R 345 kV line	347945	270797	1	102.83	108.69	ER	1195	70.06	32
21	N-1	37_B2_TOR12_WOM OP	05CORNER-05DEGUSS 138 kV line	243490	243496	1	110.52	111.62	ER	148	10.06	33
22	N-1	LN 2056_A3	3ROCKY M-3BTLEBRO 115 kV line	304223	314554	1	102.64	103.9	ER	94	7.33	34
23	LFFB	2965_C2	05CROSS-05HOGAN 138 kV line	243270	243311	1	114.54	115.36	ER	245	12.39	35

Table 16: PJM Option 2

Y2-095 Contribution to Previously Identified Overloads

#	Type	Contingency	Facility Description	Bus		Cir.	Loading		Rating		MW Cont.	FG App.
		Name		From	To		Initial	Final	Type	MVA		
24	DCTL	AP_C5_19	TANEYTOWN 1-GERMANTN 138 kV line	235463	204530	1	110.91	111.72	ER	214	10.73	36
25	DCTL	AP_C5_19	TANEYTOWN 1-GERMANTN 138 kV line	235463	204530	1	110.91	111.72	ER	214	10.73	37
26	N-1	05HANG R _05JEFRSO _114	05JEFRSO 765/345 kV transformer	243208	248000	1	103.02	113.66	ER	1935	206.22	38
27	BUS	1375_C1_A	05JEFRSO-05HANG R 765 kV line	243208	242924	1	108.51	114.33	ER	4253	247.59	39
28	LFFB	2942_C2_05KAMMER 765-PP	05DEGUSS-05BELPRE 138 kV line	243496	243470	1	113.19	114.29	ER	148	10.06	40
29	N-1	05JEFRSO _05ROCKPT _122	08NOBLV-05FALL C 345 kV line	249515	243222	1	105.81	113.81	ER	956	76.46	41
30	N-1	PJM17	NOTTREAC-NOTTNGHM 230 kV line	213846	213844	1	113.19	113.97	ER	567	28.39	42
31	LFFB	2856_C2	05DEGUSS-05BELPRE 138 kV line	243496	243470	1	115.05	116.15	ER	148	10.06	43
32	LFFB	PEACH245	NOTTREAC-NOTTNGHM 230 kV line	213846	213844	1	114.14	114.92	ER	567	28.39	44
33	LFFB	2932_C2_05JEFRSO 765-A2	X1-020 TAP-05DUMONT 765 kV line	907020	243206	1	111.15	117.44	ER	4094	257.46	45
34	LFFB	2965_C2	05MADISO-05CROSSS 138 kV line	243333	243270	1	119.66	120.48	ER	245	12.39	46
35	LFFB	2942_C2_05KAMMER 765-PP	05CORNER-05DEGUSS 138 kV line	243490	243496	1	116.5	117.6	ER	148	10.06	47
36	N-1	673_B2	05HOGAN-05DELAWR 138 kV line	243311	243275	1	118.5	119.93	ER	167	14.8	48
37	LFFB	2856_C2	05CORNER-05DEGUSS 138 kV line	243490	243496	1	118.3	119.4	ER	148	10.06	49
38	LFFB	6178_C2_05CLOVRD 345-P_WOMOAB	05CATAWZ-05BURLHT 138 kV line	242584	242572	1	118.63	119.68	ER	223	14.42	50
39	LFFB	6178_C2_05CLOVRD 345-P_WOMOAB	05WSALEM-05CATAWZ 138 kV line	242852	242584	1	118.63	119.68	ER	223	14.42	51
40	LFFB	2979_C2_X1-020_X2- 052	05OLIVE-05COOK 345 kV line	243229	243215	1	123.31	124.08	ER	1409	71.53	52
41	N-1	05MOUNTN _05BELMON _102	05WATERF-05MUSKNG 345 kV line	242947	242940	2	123.59	123.99	ER	2572	62.89	53
42	DCTL	AP_C5_19	CARROLL-TANEYTOWN 1 138 kV line	235450	235463	1	119.8	120.61	ER	214	10.73	54
43	N-1	05CLOVRD _05J.FERR _096	05SCHRS-05TECHDR 138 kV line	242791	243874	1	121.56	122.43	ER	167	8.95	55
44	N-1	PP1E_NO EMORYGROVE	STRABAN-LINCOLN 115 kV line	204538	204544	1	119.07	120.11	ER	153	10.12	56
45	LFFB	6178_C2_05CLOVRD 345-P_WOMOAB	05M FUNK-05WSALEM 138 kV line	242708	242852	1	124.74	125.79	ER	223	14.42	57
46	LFFB	2979_C2_X1-020_X2- 052	05HUMMEL-05ROCKCR 138 kV line	243312	243367	1	128.37	129.18	ER	184	9.24	58
47	N-1	APS_B_G402	SUTTON-HEATERS 138 kV line	235411	235348	1	125.3	126.16	ER	103	5.51	59
48	DCTL	474_A	05MOUNTN-05BELMON 765 kV line	242516	242920	1	128.37	128.99	ER	4253	167.19	60
49	N-1	1589_B3_05CLOVRD 765-10_WOMOAB	05MOUNTN-05BELMON 765 kV line	242516	242920	1	130.38	131.01	ER	4055	164.32	61
50	N-1	05CLOVRD _05J.FERR _096	05TECHDR-05M FUNK 138 kV line	243874	242708	1	128.45	129.41	ER	151	8.95	62
51	N-1	667_B2_TOR1697	05ROCKPT-05JEFRSO 765 kV line	243209	243208	1	121.27	131.88	ER	4055	430.29	63
52	N-1	4689_B2_TOR15257	05REYNOL-05OLIVE 345 kV line	243230	243229	1	123.41	132.11	ER	972	84.58	64
53	DCTL	2056&2058	3ROCKY M-3BTLEBRO 115 kV line	304223	314554	1	125.42	126.83	ER	94	8.22	65
54	Non	Non	05TILTON-WINDSOR 138 kV line	243131	235428	1	136.62	137.43	NR	205	10.27	66
55	LFFB	2978_C2_X1-020	05ROCKCR-05HUNT J 138 kV line	243367	243313	1	138.81	139.69	ER	167	9.16	67
56	LFFB	2965_C2	05HOGAN-05DELAWR 138	243311	243275	1	137.91	139.08	ER	167	12.05	68

Table 16: PJM Option 2

Y2-095 Contribution to Previously Identified Overloads

#	Type	Contingency	Facility Description	Bus		Cir.	Loading		Rating		MW Cont.	FG App.
		Name		From	To		Initial	Final	Type	MVA		
			kV line									
57	LFFB	2979_C2_X1-020_X2-052	05ROCKCR-05HUNT J 138 kV line	243367	243313	1	139.35	140.24	ER	167	9.24	69
58	DCTL	6488	05ROCKPT-05JEFRSO 765 kV line	243209	243208	1	127.24	137.24	ER	4253	425.11	70
59	N-1	05DUMONT_05GRNTWN_120_A	05HUNT J-05SORENS 138 kV line	243313	243377	1	139.28	140.7	ER	208	18.24	71
60	LFFB	2906_C2_05MARYSV 765-A1	05MOUNTN-05BELMON 765 kV line	242516	242920	1	139.51	140.19	ER	4253	183.26	72
61	LFFB	2929_C2	05BREED-05DEQUIN 345 kV line	243213	243217	1	123.64	136.45	ER	1272	162.96	73
62	N-1	05CLOVRD_05J.FERR_096	05CLYTR1-05SCHRS 138 kV line	242608	242791	1	137.8	138.63	ER	167	8.67	74
63	DCTL	AP_C5_19	STRABAN-LINCOLN 115 kV line	204538	204544	1	133.66	134.75	ER	153	10.73	75
64	N-1	B_LINE_SY_064	SHANOR MANOR-BUTLER 138 kV line	235246	235152	1	138.84	139.88	ER	352	22.8	76
65	N-1	6430_B2_TOR22_WO MOAB	06KYGER-05SPORN 345 kV line	248005	242528	2	141.51	142.32	ER	1438	72.15	77
66	LFFB	5031_C2_05KAMMER 765-PP2	05BELVA-JONES BRANCH 138 kV line	242551	235626	1	140.58	141.39	ER	278	13.9	78
67	N-1	6489_B2_TOR16002	05MEADOW-05OLIVE 345 kV line	243878	243229	1	130.28	139.29	ER	971	87.48	79
68	LFFB	2930_C2	05BREED-05DEQUIN 345 kV line	243213	243217	1	124.91	137.95	ER	1272	165.85	80
69	N-1	B_LINE_SY_065	02HOYTDL-02CRNBRY 138 kV line	238813	239281	1	141.04	141.9	ER	309	16.37	81
70	N-1	B_LINE_SY_064	KRENDALE-SHANOR MANOR 138 kV line	235205	235246	1	141.9	142.94	ER	352	22.8	82
71	N-1	05JEFRSO_05ROCKPT_122	05EUGENE-08CAYSUB 345 kV line	243221	249504	1	122.76	138.67	ER	1386	236.36	83
72	N-1	B_PN230-SX-#11_B	N.MESHPN 230/115 kV transformer	200825	200706	3	142.58	143.43	ER	188	9.89	84
73	N-1	B_PN230-SX-#11_B	NO MESHO-MESH2REA 115 kV line	200677	200825	3	142.6	143.45	ER	188	9.89	85
74	N-1	8CARSON_8DBGEN_014_B	6PERSON-6HALIFAX 230 kV line	304070	314697	1	138.51	139.62	ER	608	41.84	86
75	LFFB	5031_C2_05KAMMER 765-PP2	GILBOA-ENON TAP 138 kV line	235333	235328	1	145.99	146.87	ER	256	13.9	87
76	LFFB	1733_C2_X1-020	05ROCKCR-05HUNT J 138 kV line	243367	243313	1	148.76	149.62	ER	167	8.88	88
77	N-1	05BELMON_05KAMMER_108	05BELMON 765/500 kV transformer	242920	235102	1	145.53	146.47	ER	2094	121.21	89
78	LFFB	6189_C2_05HANG R 765-D1	05JEFRSO 765/345 kV transformer	243208	248000	1	132.52	146.28	ER	1935	206.22	90
79	LFFB	5031_C2_05KAMMER 765-PP2	05DEGUSS-05BELPRE 138 kV line	243496	243470	1	147.38	148.8	ER	148	13.05	91
80	N-1	PP1E_NO EMORYGROVE	GERMANTN-STRABAN 115 kV line	204529	204538	1	143.85	144.99	ER	139	10.12	92
81	N-1	B_PN230-SX-#8	N.WAV115-E.SAYRE 115 kV line	130836	200676	1	151.66	152.67	ER	128	7.96	93
82	LFFB	5031_C2_05KAMMER 765-PP2	05CORNER-05DEGUSS 138 kV line	243490	243496	1	150.67	152.1	ER	148	13.05	94
83	LFFB	2877_C2_05OLIVE 345-B1	05OLIVE-X2-052 TAP 345 kV line	243229	909180	2	155.18	156.09	ER	1409	85.24	95
84	N-1	APS_B_G425	NETTIE-CRUPPERNECK 138 kV line	235376	235318	1	154.05	154.94	ER	151	8.37	96
85	DCTL	AP_C5_19	ROXBURY 138/115 kV transformer	200532	200520	1	152.04	152.93	ER	138	7.85	97
86	N-1	05JEFRSO_05ROCKPT_122	05FALL C-05DESOTO 345 kV line	243222	243218	1	141.65	152.81	ER	1016	113.36	98
87	N-1	4689_B2_TOR15257	05MEADOW-05REYNOL 345 kV line	243878	243230	1	146.21	155.89	ER	971	94.07	99
88	LFFB	4690_C2_05OLIVE 345-D	05REYNOL-05OLIVE 345 kV line	243230	243229	1	159.05	160.45	ER	972	84.16	100

Table 16: PJM Option 2

Y2-095 Contribution to Previously Identified Overloads

#	Type	Contingency	Facility Description	Bus		Cir.	Loading		Rating		MW Cont.	FG App.
		Name		From	To		Initial	Final	Type	MVA		
89	LFFB	DUKE-SB 925_MIAMIFORT	08M.FORT-08WILEY1 138 kV line	250057	250130	1	160.52	161.37	ER	201	10.66	101
90	DCTL	C5-TWL-CR040_A	02CAMDEN-02HENRTA 138 kV line	239319	239318	1	160.28	161.11	ER	135	6.89	102
91	DCTL	C5-TWL-CR040_A	02BRKSID-02TROY 138 kV line	238586	239216	1	164.99	165.82	ER	135	6.89	103
92	N-1	345-L8002___-S	7BROKAW T1-PONTI; R 345 kV line	348847	270853	1	161.31	165.75	ER	1441	63.99	104
93	DCTL	AP_C5_19	GERMANTN-STRABAN 115 kV line	204529	204538	1	159.43	160.64	ER	139	10.73	105
94	N-1	667_B2_TOR1697	05EUGENE-05DEQUIN 345 kV line	243221	243217	1	158.23	166.92	ER	971	84.39	106
95	Non	Non	OXBOW-LACK 230 kV line	200708	208009	1	172.38	173.24	NR	488	26.25	107
96	N-1	05JEFRSO _05ROCKPT_122	05BREED-7CASEY 345 kV line	243213	346809	1	135.45	164.09	ER	1466	419.79	108
97	DCTL	C5-TWL-CR041_B	02GRNFLD-02NASA 138 kV line	238768	238981	1	174.61	175.44	ER	179	9.2	109
98	LFFB	2929_C2	05EUGENE-08CAYSUB 345 kV line	243221	249504	1	151.77	168.92	ER	1386	237.74	110
99	BUS	C1_PN230-BS-#5A	N.WAV115-E.SAYRE 115 kV line	130836	200676	1	175.71	176.76	ER	128	8.31	111
100	LFFB	C2_PN230-SB-#3F	N.WAV115-E.SAYRE 115 kV line	130836	200676	1	175.71	176.76	ER	128	8.31	112
101	Non	Non	N.MESHPN-OXBOW 230 kV line	200706	200708	1	176.75	177.62	NR	478	25.81	113
102	LFFB	C2_PN230-SB-#3D	N.WAV115-E.SAYRE 115 kV line	130836	200676	1	177.48	178.53	ER	128	8.33	114
103	LFFB	2929_C2	05BREED-7CASEY 345 kV line	243213	346809	1	141.58	170.19	ER	1466	419.43	115
104	N-1	B_LINE_SY_065	02HOYTDL-02MAPLE 138 kV line	238813	238942	1	179.76	180.69	ER	309	17.91	116
105	LFFB	2930_C2	05BREED-7CASEY 345 kV line	243213	346809	1	143.03	171.74	ER	1466	420.85	117
106	N-1	05JEFRSO _05ROCKPT_122	05BREED-05DEQUIN 345 kV line	243213	243217	1	160.75	177.72	ER	971	164.77	118
107	N-1	05MOUNTN _05BELMON_102	05MUSKNG-05KAMMER 345 kV line	242940	242937	1	182.87	183.72	ER	972	51.02	119
108	LFFB	C2-BRK-NR125	02JONSON-02LRN Q2 138 kV line	238845	238915	1	184.09	184.91	ER	267	13.59	120
109	DCTL	C5-TWL-NR054	02JONSON-02LRN Q2 138 kV line	238845	238915	1	184.09	184.91	ER	267	13.59	121
110	N-1	6490_B2_TOR3002545	05DEQUIN-05MEADOW 345 kV line	243217	243878	1	168.21	180.31	ER	971	117.58	122
111	N-1	6472_B2_TOR15258	05DEQUIN-05MEADOW 345 kV line	243217	243878	2	168.21	180.31	ER	971	117.58	123
112	N-1	37_B2_TOR12_WOM OP	05LAYMAN-05CORNER 138 kV line	243533	243490	1	182.4	183.75	ER	284	23.74	124
113	LFFB	2877_C2_05OLIVE 345-B1	X2-052 TAP-05DUMONT 345 kV line	909180	243219	2	187.28	187.96	ER	1409	85.24	125
114	LFFB	2979_C2_X1-020_X2- 052	05HUNT J-05SORENS 138 kV line	243313	243377	1	186.57	188.03	ER	208	18.69	126
115	LFFB	2978_C2_X1-020	05HUNT J-05SORENS 138 kV line	243313	243377	1	186.72	188.16	ER	208	18.48	127
116	N-1	37_B2_TOR12_WOM OP	05WOLFCL-05LAYMAN 138 kV line	243589	243533	1	184.13	185.48	ER	284	23.74	128
117	LFFB	1760_C2_05JEFRSO 765-A	05JEFRSO 765/345 kV transformer	243208	248000	1	170.71	186.13	ER	1935	304.89	129
118	LFFB	2942_C2_05KAMMER 765-PP	05LAYMAN-05CORNER 138 kV line	243533	243490	1	188.49	189.84	ER	284	23.74	130
119	LFFB	2942_C2_05KAMMER 765-PP	05WOLFCL-05LAYMAN 138 kV line	243589	243533	1	190.22	191.57	ER	284	23.74	131
120	LFFB	1733_C2_X1-020	05HUNT J-05SORENS 138 kV line	243313	243377	1	193.61	195	ER	208	17.92	132
121	DCTL	C5-TWL-CR041_B	02AVERY-02SHNR0K 138 kV line	238549	239108	1	220.45	221.27	ER	195	9.98	133

Table 16: PJM Option 2

Y2-095 Contribution to Previously Identified Overloads

#	Type	Contingency	Facility Description	Bus			Loading		Rating		MW Cont.	FG App.
		Name		From	To	Cir.	Initial	Final	Type	MVA		
122	N-1	B_ME230-SX-#9	GERMANTN 138/115 kV transformer	204530	204529	1	214.85	215.88	ER	104	6.84	134
123	N-1	05JEFRSO_05ROCKPT_122	05DARWIN-05EUGENE 345 kV line	243216	243221	1	184.93	211.81	ER	971	261.02	135
124	N-1	05JEFRSO_05ROCKPT_122	05BREED-05DARWIN 345 kV line	243213	243216	1	184.93	211.81	ER	971	261.02	136
125	DCTL	AP_C5_19	GERMANTN 138/115 kV transformer	204530	204529	1	239.39	240.99	ER	104	10.73	137
126	LFFB	5031_C2_05KAMMER 765-PP2	05LAYMAN-05CORNER 138 kV line	243533	243490	1	251.64	253.34	ER	284	30.75	138
127	LFFB	5031_C2_05KAMMER 765-PP2	05WOLFCL-05LAYMAN 138 kV line	243589	243533	1	253.37	255.07	ER	284	30.75	139
128	N-1	05JEFRSO_05ROCKPT_122	05BREED-16WHEAT 345 kV line	243213	254539	1	209.63	245.57	ER	956	348.14	140
129	LFFB	2929_C2	05BREED-16WHEAT 345 kV line	243213	254539	1	222.62	257.3	ER	956	351.42	141
130	DCTL	C5-TWL-CR040_B	02OTTAWA-02LAKVIEW 138 kV line	239030	238874	1	313.29	314.35	ER	375	25.01	142

Flowgate Tables

Appendix 1

Bus Number	Bus Name	Full Contribution
242807	05SPORNA	-41.8
243382	05TANNER	18.61
251934	08BCKJD2	8.01
251935	08BCKJD3	10.9
251936	08BCKJD4	12.77
251937	08BCKJD5	20.28
251938	08BCKJD6	42.33
251939	08BECJD1	8.01
253188	09OHGEN1	2.91
253189	09OHGEN2	2.74
253191	09OHGEN4	3.27
341853	1JKCT 2G	5.08
341860	1JKCT 4G	3.89
341866	1JKCT 6G	3.89
244761	RACINE	-2.34
884780	S-058 C	17.8
884781	S-058 E	58.69
247508	U2-090 C	1.39
247915	U2-090 E	9.28
247543	V3-007 C	1.39
247919	V3-007 E	9.28
247544	V3-008 C	1.39
247920	V3-008 E	9.28
247545	V3-009 C	1.39
247921	V3-009 E	9.28
LTF	V3-012	18.59
900261	V4-033 C1	1.06
900271	V4-033 C2	1.06
900262	V4-033 E1	7.11
900272	V4-033 E2	7.11
904722	V4-073 E	.09
LTF	W2-033	53.93
902332	W2-040 E	.77
903942	W3-170 E	.61
905041	W4-004 C	.6
905042	W4-004 E	4.03
905081	W4-008 C	.6
905082	W4-008 E	4.03
905272	W4-036 E	.61
LTF	X2-042	35.02

LTF	X3-021	11.46
900404	X3-028 C	177.9
LTF	X3-096	18.64
LTF	X3-097	26.43
LTF	X3-098	25.05
LTF	X4-041	24.75
LTF	Y1-002	19.44
LTF	Y1-004	20.69
LTF	Y1-007	14.36
913342	Y1-054 E	1.52
LTF	Y2-004	12.23
LTF	Y2-005	12.23
LTF	Y2-006	17.76
LTF	Y2-007	24.47
LTF	Y2-008	33.9
LTF	Y2-030	11.76
LTF	Y2-031	11.76
LTF	Y2-032	11.76
LTF	Y2-033	10.87
LTF	Y2-040	11.46
LTF	Y2-049	9.41
LTF	Y2-056	16.36
LTF	Y2-068	132.62
LTF	Y2-082	33.61
914381	Y2-095 OP1	61.56

Appendix 2

Bus Number	Bus Name	Full Contribution
253969	15BI1	.06
253970	15BI2	.12
253971	15BI3	.07
253972	15BI4	.18
254063	15CHSWK1	.87
254007	15ELRMA1	8.49
254008	15ELRMA2	8.67
254009	15ELRMA3	11.24
254010	15ELRMA4	18.12
235573	MITCHELL 2	.25
235574	MITCHELL 3	.86
294155	P-034	.01
884780	S-058 C	9.32
884781	S-058 E	30.72
LTF	V3-012	8.98
LTF	W3-083	2.06
LTF	X2-042	10.49
LTF	X3-020	2.79
LTF	X3-021	10.92
900404	X3-028 C	45.53
LTF	X3-096	6.7
LTF	X3-097	9.5
LTF	X3-098	9.01
LTF	X4-029D	2.5
LTF	X4-041	8.9
912241	X4-042	.19
LTF	Y1-002	9.44
LTF	Y1-004	10.59
LTF	Y1-007	7.35
913091	Y1-015 C	20.27
913191	Y1-027 C OP1	.01
LTF	Y1-041	2.5
913461	Y1-070 OP1	19.22
LTF	Y2-004	4.51
LTF	Y2-005	4.51
LTF	Y2-006	4.69
LTF	Y2-007	9.02
LTF	Y2-008	9.34
LTF	Y2-030	2.58
LTF	Y2-031	2.58
LTF	Y2-032	2.58
LTF	Y2-033	4.94
LTF	Y2-034	3.5
LTF	Y2-035	1.88
LTF	Y2-036	1.88

LTF	Y2-040	10.92
LTF	Y2-049	8.97
LTF	Y2-056	7.49
LTF	Y2-068	47.67
LTF	Y2-069	2.71
LTF	Y2-070	2.71
LTF	Y2-071	2.71
LTF	Y2-072	2.71
LTF	Y2-082	19.93
914331	Y2-085 OP1	23.71
914361	Y2-088	1.28
914381	Y2-095 OP1	15.76

Appendix 3

Bus Number	Bus Name	Full Contribution
243764	05BSG1	39.06
242900	05CRG1L	.85
242902	05CRG2L	.85
242904	05CRG3L	36.17
243859	05FR11_E	8.61
243862	05FR12_E	8.46
243864	05FR21_E	9.04
247924	05FRCS22_E	8.66
247925	05FRCS-3_E	17.54
247926	05FRCS-4_E	13.19
246909	05MLCS1_E	17.44
247930	05MLCS-2_E	17.44
246759	05SOLIDA	24.6
243382	05TANNER	32.4
246895	05VACITY	2.28
242850	05WOLFH1	.59
242851	05WOLFH2	.38
251934	08BCKJD2	10.57
251935	08BCKJD3	14.41
251936	08BCKJD4	16.89
251937	08BCKJD5	26.76
251938	08BCKJD6	46.79
251939	08BECJD1	10.57
341853	1JKCT 2G	12.01
341860	1JKCT 4G	9.19
341866	1JKCT 6G	9.19
341936	1LAUR 1G	9.1
244159	BUCK	1.21
244160	BYLLESBY	3.23
244221	INDDRVL	.19
990901	L-005 E	13.05
296335	R-033 1	11.48
296336	R-033 2	11.48
296346	R-033 3	8.32
296348	R-033 4	8.32
244761	RACINE	4.93
292417	T-127 E	17.46
292735	T-183 C	4.37
292736	T-183 E	17.46
292741	T-184 C	4.37
292742	T-184 E	17.46
274853	TWING;U1	17.3
274854	TWING;U2	17.3
887741	U1-087 C	2.14
887742	U1-087 E	14.34

887751	U1-088 C	1.43
887752	U1-088 E	9.56
247538	U2-062 C	2.66
247912	U2-062 E	17.83
247508	U2-090 C	2.86
247915	U2-090 E	19.15
247931	U3-002 E	19.09
891021	U4-003 C	2.84
891022	U4-003 E	18.99
891211	U4-037 C	2.89
891212	U4-037 E	19.36
891221	U4-038 C	1.42
891222	U4-038 E	9.53
891231	U4-039 C1	2.54
891241	U4-039 C2	2.54
891251	U4-039 C3	2.54
891261	U4-039 C4	2.54
891232	U4-039 E1	16.98
891242	U4-039 E2	16.98
891252	U4-039 E3	16.98
891262	U4-039 E4	16.98
893031	V2-008	66.46
247543	V3-007 C	2.86
247919	V3-007 E	19.15
247544	V3-008 C	2.86
247920	V3-008 E	19.15
247545	V3-009 C	2.86
247921	V3-009 E	19.15
LTF	V3-012	89.98
894781	V3-053 C	2.12
894782	V3-053 E	14.22
900261	V4-033 C1	2.15
900271	V4-033 C2	2.15
900262	V4-033 E1	14.38
900272	V4-033 E2	14.38
902332	W2-040 E	1.35
902352	W2-048 E	6.92
903942	W3-170 E	1.31
905041	W4-004 C	1.3
905042	W4-004 E	8.67
905071	W4-005 C	5.
905072	W4-005 E	33.49
905081	W4-008 C	1.3
905082	W4-008 E	8.67
905272	W4-036 E	1.31
244873	WINFIELD	2.06
909001	X2-006 C1OP1	50.26

909002	X2-006 C2OP1	40.21
909062	X2-022 E OP1	20.92
LTF	X2-042	85.81
909222	X2-060 E	-8.47
LTF	X3-020	25.06
LTF	X3-021	67.97
900404	X3-028 C	404.56
910731	X3-046 1	1.75
910741	X3-046 2	1.75
910751	X3-051	77.26
LTF	X3-096	60.29
LTF	X3-097	85.49
LTF	X3-098	81.04
912161	X4-025	9.77
LTF	X4-041	80.06
LTF	Y1-002	75.08
LTF	Y1-004	111.56
913031	Y1-006 C	1.37
913032	Y1-006 E	9.18
LTF	Y1-007	77.47
913321	Y1-048 OP1	-2.19
913342	Y1-054 E	2.25
913432	Y1-068 E	-5.65
LTF	Y2-004	40.69
LTF	Y2-005	40.69
LTF	Y2-006	40.86
LTF	Y2-007	81.39
LTF	Y2-008	81.9
LTF	Y2-033	56.7
LTF	Y2-034	43.25
LTF	Y2-040	67.97
LTF	Y2-049	55.82
LTF	Y2-056	62.42
LTF	Y2-068	429.
LTF	Y2-082	146.07
914321	Y2-084 C OP1	.37
914322	Y2-084 E OP1	6.67
914341	Y2-086	8.74
914381	Y2-095 OP1	139.98

Appendix 4

Bus Number	Bus Name	Full Contribution
LTF	V3-012	4.05
LTF	X2-042	14.79
LTF	X3-020	1.59
900404	X3-028 C	37.94
LTF	X3-096	3.83
LTF	X3-097	5.43
LTF	X3-098	5.14
LTF	X4-041	5.08
LTF	Y1-004	4.55
LTF	Y1-007	3.16
LTF	Y2-004	2.67
LTF	Y2-005	2.67
LTF	Y2-006	10.17
LTF	Y2-007	5.34
LTF	Y2-008	14.88
LTF	Y2-030	1.5
LTF	Y2-031	1.5
LTF	Y2-032	1.5
LTF	Y2-033	2.39
LTF	Y2-068	27.24
914381	Y2-095 OP1	13.13

Appendix 5

Bus Number	Bus Name	Full Contribution
247528	05COVRT1	1.92
247529	05COVRT2	1.92
247530	05COVRT3	1.92
247531	05COVRT4	1.15
247532	05COVRT5	1.15
247533	05COVRT6	1.15
884780	S-058 C	5.25
884781	S-058 E	17.31
218360	SEWAREN1	-1.64
218361	SEWAREN2	-1.85
218362	SEWAREN3	-1.68
218363	SEWAREN4	-1.94
218364	SEWAREN6	-1.74
LTF	V3-012	4.69
LTF	W3-083	1.12
907021	X1-020 C	1.44
907022	X1-020 E	9.64
907991	X1-078	7.78
LTF	X2-042	5.4
LTF	X3-020	1.51
LTF	X3-021	9.66
900404	X3-028 C	23.9
LTF	X3-050	11.63
LTF	X3-096	3.63
LTF	X3-097	5.15
LTF	X3-098	4.88
LTF	X4-029D	1.4
LTF	X4-041	4.82
LTF	Y1-002	5.35
LTF	Y1-004	5.49
LTF	Y1-007	3.81
LTF	Y1-041	1.4
913441	Y1-069 OP1	8.34
LTF	Y2-004	2.45
LTF	Y2-005	2.45
LTF	Y2-006	2.46
LTF	Y2-007	4.91
LTF	Y2-008	4.92
LTF	Y2-030	1.3
LTF	Y2-031	1.3
LTF	Y2-032	1.3
LTF	Y2-033	2.62
LTF	Y2-034	2.02
LTF	Y2-035	1.08
LTF	Y2-036	1.08

LTF	Y2-040	9.66
LTF	Y2-044	18.83
LTF	Y2-049	7.93
LTF	Y2-056	4.21
LTF	Y2-068	25.85
LTF	Y2-069	2.24
LTF	Y2-070	2.24
LTF	Y2-071	2.24
LTF	Y2-072	2.24
LTF	Y2-082	13.
914381	Y2-095 OP1	8.27

Appendix 6

Bus Number	Bus Name	Full Contribution
247528	05COVRT1	1.92
247529	05COVRT2	1.92
247530	05COVRT3	1.92
247531	05COVRT4	1.15
247532	05COVRT5	1.15
247533	05COVRT6	1.15
884780	S-058 C	5.25
884781	S-058 E	17.31
218360	SEWAREN1	-1.64
218361	SEWAREN2	-1.85
218362	SEWAREN3	-1.68
218363	SEWAREN4	-1.94
218364	SEWAREN6	-1.74
LTF	V3-012	4.69
LTF	W3-083	1.12
907021	X1-020 C	1.44
907022	X1-020 E	9.64
907991	X1-078	7.78
LTF	X2-042	5.4
LTF	X3-020	1.51
LTF	X3-021	9.66
900404	X3-028 C	23.9
LTF	X3-050	11.63
LTF	X3-096	3.63
LTF	X3-097	5.15
LTF	X3-098	4.88
LTF	X4-029D	1.4
LTF	X4-041	4.82
LTF	Y1-002	5.35
LTF	Y1-004	5.49
LTF	Y1-007	3.81
LTF	Y1-041	1.4
913441	Y1-069 OP1	8.34
LTF	Y2-004	2.45
LTF	Y2-005	2.45
LTF	Y2-006	2.46
LTF	Y2-007	4.91
LTF	Y2-008	4.92
LTF	Y2-030	1.3
LTF	Y2-031	1.3
LTF	Y2-032	1.3
LTF	Y2-033	2.62
LTF	Y2-034	2.02
LTF	Y2-035	1.08
LTF	Y2-036	1.08

LTF	Y2-040	9.66
LTF	Y2-044	18.83
LTF	Y2-049	7.93
LTF	Y2-056	4.21
LTF	Y2-068	25.85
LTF	Y2-069	2.24
LTF	Y2-070	2.24
LTF	Y2-071	2.24
LTF	Y2-072	2.24
LTF	Y2-082	13.
914381	Y2-095 OP1	8.27

Appendix 7

Bus Number	Bus Name	Full Contribution
243859	05FR11_E	5.22
243862	05FR12_E	5.13
243864	05FR21_E	5.49
247924	05FRCS22_E	5.25
247925	05FRCS-3_E	10.64
247926	05FRCS-4_E	8.
887741	U1-087 C	1.3
887742	U1-087 E	8.7
887751	U1-088 C	.87
887752	U1-088 E	5.8
LTF	V3-012	5.71
LTF	W2-033	4.69
LTF	X2-042	17.
LTF	X3-020	2.9
900404	X3-028 C	75.91
LTF	X3-096	6.97
LTF	X3-097	9.89
LTF	X3-098	9.37
LTF	X4-041	9.26
LTF	Y1-004	6.55
LTF	Y1-007	4.55
LTF	Y2-004	4.78
LTF	Y2-005	4.78
LTF	Y2-006	6.66
LTF	Y2-007	9.56
LTF	Y2-008	16.95
LTF	Y2-033	3.43
LTF	Y2-034	1.95
LTF	Y2-068	49.61
914321	Y2-084 C OP1	.22
914322	Y2-084 E OP1	4.04
914381	Y2-095 OP1	26.27

Appendix 8

Bus Number	Bus Name	Full Contribution
243442	05RKG1	14.37
243443	05RKG2	14.16
LTF	V3-012	24.12
LTF	X2-042	45.01
900404	X3-028 C	1051.47
LTF	X3-096	32.7
LTF	X3-097	46.37
LTF	X3-098	43.95
LTF	X4-041	43.42
LTF	Y1-004	25.21
LTF	Y2-006	26.71
LTF	Y2-007	45.18
LTF	Y2-008	45.38
LTF	Y2-068	232.67
914381	Y2-095 OP1	363.81

Appendix 9

Bus Number	Bus Name	Full Contribution
254007	15ELRMA1	8.51
254008	15ELRMA2	8.69
254009	15ELRMA3	11.26
254010	15ELRMA4	18.15
235573	MITCHELL 2	.26
235574	MITCHELL 3	.86
884780	S-058 C	9.46
884781	S-058 E	31.2
LTF	V3-012	9.14
LTF	W3-083	2.09
907021	X1-020 C	2.66
907022	X1-020 E	17.79
LTF	X2-042	10.65
LTF	X3-020	2.83
LTF	X3-021	11.09
900404	X3-028 C	46.23
LTF	X3-096	6.81
LTF	X3-097	9.66
LTF	X3-098	9.15
LTF	X4-029D	2.54
LTF	X4-041	9.04
912241	X4-042	.19
LTF	Y1-002	9.59
LTF	Y1-004	10.78
LTF	Y1-007	7.49
913091	Y1-015 C	20.45
913092	Y1-015 E	3.06
913191	Y1-027 C OP1	.01
913192	Y1-027 E OP1	.02
LTF	Y1-041	2.54
913461	Y1-070 OP1	19.39
LTF	Y2-004	4.58
LTF	Y2-005	4.58
LTF	Y2-006	4.77
LTF	Y2-007	9.17
LTF	Y2-008	9.49
LTF	Y2-030	2.62
LTF	Y2-031	2.62
LTF	Y2-032	2.62
LTF	Y2-033	5.03
LTF	Y2-034	3.6
LTF	Y2-035	1.93
LTF	Y2-036	1.93
LTF	Y2-040	11.09
LTF	Y2-049	9.11

LTF	Y2-056	7.61
LTF	Y2-068	48.45
LTF	Y2-069	2.75
LTF	Y2-070	2.75
LTF	Y2-071	2.75
LTF	Y2-072	2.75
LTF	Y2-082	20.23
914331	Y2-085 OP1	23.93
914361	Y2-088	1.28
914381	Y2-095 OP1	16.

Appendix 10

Bus Number	Bus Name	Full Contribution
247510	U3-002 C	.04
891221	U4-038 C	1.12
LTF	V3-012	2.15
LTF	W2-033	3.52
LTF	X2-042	5.7
900404	X3-028 C	28.77
LTF	X3-096	1.04
LTF	X3-097	1.47
LTF	X3-098	1.39
LTF	X4-041	1.38
LTF	Y1-004	2.78
LTF	Y1-007	1.93
LTF	Y2-006	3.03
LTF	Y2-007	1.35
LTF	Y2-008	5.68
LTF	Y2-030	1.39
LTF	Y2-031	1.39
LTF	Y2-032	1.39
LTF	Y2-033	1.48
LTF	Y2-034	1.07
LTF	Y2-068	7.38
914381	Y2-095 OP1	9.95

Appendix 11

Bus Number	Bus Name	Full Contribution
247528	05COVRT1	1.92
247529	05COVRT2	1.92
247530	05COVRT3	1.92
247531	05COVRT4	1.15
247532	05COVRT5	1.15
247533	05COVRT6	1.15
884780	S-058 C	5.26
884781	S-058 E	17.33
218360	SEWAREN1	-1.65
218361	SEWAREN2	-1.87
218362	SEWAREN3	-1.69
218363	SEWAREN4	-1.96
218364	SEWAREN6	-1.75
LTF	V3-012	4.71
LTF	W3-083	1.12
907021	X1-020 C	1.44
907022	X1-020 E	9.66
907991	X1-078	7.83
LTF	X2-042	5.42
LTF	X3-020	1.51
LTF	X3-021	9.63
900404	X3-028 C	23.97
LTF	X3-050	11.47
LTF	X3-096	3.64
LTF	X3-097	5.16
LTF	X3-098	4.89
LTF	X4-029D	1.41
LTF	X4-041	4.84
LTF	Y1-002	5.36
LTF	Y1-004	5.51
LTF	Y1-007	3.83
LTF	Y1-041	1.41
913441	Y1-069 OP1	8.33
LTF	Y2-004	2.46
LTF	Y2-005	2.46
LTF	Y2-006	2.46
LTF	Y2-007	4.92
LTF	Y2-008	4.93
LTF	Y2-030	1.31
LTF	Y2-031	1.31
LTF	Y2-032	1.31
LTF	Y2-033	2.63
LTF	Y2-034	2.03
LTF	Y2-035	1.09
LTF	Y2-036	1.09

LTF	Y2-040	9.63
LTF	Y2-044	18.57
LTF	Y2-049	7.9
LTF	Y2-056	4.22
LTF	Y2-068	25.91
LTF	Y2-069	2.23
LTF	Y2-070	2.23
LTF	Y2-071	2.23
LTF	Y2-072	2.23
LTF	Y2-082	13.
914381	Y2-095 OP1	8.3

Appendix 12

Bus Number	Bus Name	Full Contribution
243243	05ANDCT	.24
LTF	V3-012	4.11
LTF	W2-033	1.6
905041	W4-004 C	1.46
905081	W4-008 C	1.46
LTF	X2-042	15.3
LTF	X3-020	1.6
900404	X3-028 C	39.24
LTF	X3-096	3.86
LTF	X3-097	5.47
LTF	X3-098	5.19
LTF	X4-041	5.12
LTF	Y1-004	4.64
LTF	Y1-007	3.22
LTF	Y2-004	2.68
LTF	Y2-005	2.68
LTF	Y2-006	9.79
LTF	Y2-007	5.37
LTF	Y2-008	15.4
LTF	Y2-030	1.61
LTF	Y2-031	1.61
LTF	Y2-032	1.61
LTF	Y2-033	2.45
LTF	Y2-068	27.45
914381	Y2-095 OP1	13.58

Appendix 13

Bus Number	Bus Name	Full Contribution
LTF	V3-012	4.05
LTF	X2-042	14.79
LTF	X3-020	1.59
900404	X3-028 C	37.94
LTF	X3-096	3.83
LTF	X3-097	5.43
LTF	X3-098	5.14
LTF	X4-041	5.08
LTF	Y1-004	4.55
LTF	Y1-007	3.16
LTF	Y2-004	2.67
LTF	Y2-005	2.67
LTF	Y2-006	10.17
LTF	Y2-007	5.34
LTF	Y2-008	14.88
LTF	Y2-030	1.5
LTF	Y2-031	1.5
LTF	Y2-032	1.5
LTF	Y2-033	2.39
LTF	Y2-068	27.24
914381	Y2-095 OP1	13.13

Appendix 14

Bus Number	Bus Name	Full Contribution
242701	05LEESVI	.14
242750	05PHILPO	.03
242802	05SMITHM	1.42
242851	05WOLF2	.12
315150	1BUGSIL1	.4
315151	1BUGSIL2	.4
315094	1CHESPK1	-8.62
315095	1CHESPK2	-8.62
315096	1CHESPK3	-11.54
315097	1CHESPK4	-16.26
315131	1EDGECEMA	.11
315132	1EDGECEMB	.11
315165	1HURT 1	.14
315166	1HURT 2	.14
315158	1KERR 1	.06
315159	1KERR 2	.18
315160	1KERR 3	.18
315161	1KERR 4	.18
315162	1KERR 5	.18
315163	1KERR 6	.18
315164	1KERR 7	.18
315090	1YORKTN1	-10.84
315091	1YORKTN2	-11.25
244221	INDDRVL	.06
315167	O06_DP01	.01
315446	Q-065	-85.81
315419	Q-070	.02
242889	REUSENS	.01
884780	S-058 C	23.65
884781	S-058 E	77.96
297087	V2-040	.04
LTF	V3-012	43.7
902361	W2-049	.39
903521	W3-066 C1OP1	-1.35
903531	W3-066 C2OP1	-1.35
LTF	W3-083	5.29
LTF	W4-049	9.14
LTF	W4-050	9.14
907341	X1-084	.21
LTF	X2-042	27.85
LTF	X3-020	9.14
LTF	X3-021	20.88
900404	X3-028 C	127.54
LTF	X3-096	21.99
LTF	X3-097	31.18

LTF	X3-098	29.56
LTF	X4-029D	7.06
LTF	X4-041	29.2
LTF	Y1-002	23.58
LTF	Y1-004	53.94
LTF	Y1-007	37.46
LTF	Y1-041	7.06
913321	Y1-048 OP1	-1.19
913411	Y1-066	-.16
LTF	Y1-090	5.33
LTF	Y2-004	14.92
LTF	Y2-005	14.92
LTF	Y2-006	13.09
LTF	Y2-007	29.84
LTF	Y2-008	26.57
LTF	Y2-030	7.57
LTF	Y2-031	7.57
LTF	Y2-032	7.57
LTF	Y2-033	27.55
LTF	Y2-034	47.19
LTF	Y2-035	25.31
LTF	Y2-036	25.31
LTF	Y2-040	20.88
LTF	Y2-049	17.14
LTF	Y2-056	21.18
LTF	Y2-068	156.47
LTF	Y2-069	5.57
LTF	Y2-070	5.57
LTF	Y2-071	5.57
LTF	Y2-072	5.57
LTF	Y2-082	44.59
914381	Y2-095 OP1	44.13

Appendix 15

Bus Number	Bus Name	Full Contribution
243243	05ANDCT	.43
243442	05RKG1	7.
243443	05RKG2	6.9
246427	BERRIENS	-.76
246431	BUCHANAN	-.43
274679	SLINE;3U	-19.7
246416	TWBRANCH	-.48
247510	U3-002 C	.12
247931	U3-002 E	34.85
891221	U4-038 C	2.93
891222	U4-038 E	19.59
891231	U4-039 C1	8.79
891241	U4-039 C2	8.79
891251	U4-039 C3	8.79
891261	U4-039 C4	8.79
891232	U4-039 E1	58.81
891242	U4-039 E2	58.81
891252	U4-039 E3	58.81
891262	U4-039 E4	58.81
LTF	V3-012	31.33
LTF	W2-033	52.1
905041	W4-004 C	1.2
905042	W4-004 E	8.06
905081	W4-008 C	1.2
905082	W4-008 E	8.06
907021	X1-020 C	127.18
907022	X1-020 E	851.16
LTF	X2-042	86.95
900404	X3-028 C	579.85
LTF	Y1-004	40.93
LTF	Y1-007	28.42
LTF	Y2-006	41.98
LTF	Y2-008	85.65
LTF	Y2-030	25.34
LTF	Y2-031	25.34
LTF	Y2-032	25.34
LTF	Y2-068	97.48
914381	Y2-095 OP1	200.63

Appendix 16

Bus Number	Bus Name	Full Contribution
254007	15ELRMA1	8.49
254008	15ELRMA2	8.67
254009	15ELRMA3	11.24
254010	15ELRMA4	18.12
235573	MITCHELL 2	.25
235574	MITCHELL 3	.86
884780	S-058 C	9.32
884781	S-058 E	30.72
LTF	V3-012	8.98
LTF	W3-083	2.06
907021	X1-020 C	2.62
907022	X1-020 E	17.51
LTF	X2-042	10.49
LTF	X3-020	2.79
LTF	X3-021	10.92
900404	X3-028 C	45.53
LTF	X3-096	6.7
LTF	X3-097	9.5
LTF	X3-098	9.01
LTF	X4-029D	2.5
LTF	X4-041	8.9
912241	X4-042	.19
LTF	Y1-002	9.44
LTF	Y1-004	10.59
LTF	Y1-007	7.35
913091	Y1-015 C	20.27
913092	Y1-015 E	3.03
913191	Y1-027 C OP1	.01
913192	Y1-027 E OP1	.02
LTF	Y1-041	2.5
913461	Y1-070 OP1	19.22
LTF	Y2-004	4.51
LTF	Y2-005	4.51
LTF	Y2-006	4.69
LTF	Y2-007	9.02
LTF	Y2-008	9.34
LTF	Y2-030	2.58
LTF	Y2-031	2.58
LTF	Y2-032	2.58
LTF	Y2-033	4.94
LTF	Y2-034	3.5
LTF	Y2-035	1.88
LTF	Y2-036	1.88
LTF	Y2-040	10.92
LTF	Y2-049	8.97

LTF	Y2-056	7.49
LTF	Y2-068	47.67
LTF	Y2-069	2.71
LTF	Y2-070	2.71
LTF	Y2-071	2.71
LTF	Y2-072	2.71
LTF	Y2-082	19.93
914331	Y2-085 OP1	23.71
914361	Y2-088	1.27
914381	Y2-095 OP1	15.76

Appendix 17

Bus Number	Bus Name	Full Contribution
243243	05ANDCT	.24
LTF	V3-012	4.11
LTF	W2-033	1.6
905041	W4-004 C	1.46
905081	W4-008 C	1.46
LTF	X2-042	15.3
LTF	X3-020	1.6
900404	X3-028 C	39.24
LTF	X3-096	3.86
LTF	X3-097	5.47
LTF	X3-098	5.19
LTF	X4-041	5.12
LTF	Y1-004	4.64
LTF	Y1-007	3.22
LTF	Y2-004	2.68
LTF	Y2-005	2.68
LTF	Y2-006	9.79
LTF	Y2-007	5.37
LTF	Y2-008	15.4
LTF	Y2-030	1.61
LTF	Y2-031	1.61
LTF	Y2-032	1.61
LTF	Y2-033	2.45
LTF	Y2-068	27.45
914381	Y2-095 OP1	13.58

Appendix 18

Bus Number	Bus Name	Full Contribution
243440	05CKG1	1.72
243858	05FR11_C	.08
243861	05FR12_C	.08
243863	05FR21_C	.08
243866	05FRCS22_C	.08
243870	05FRCS-3_C	.16
243873	05FRCS-4_C	.12
246908	05MLCS1_C	.19
246910	05MLCS-2_C	.19
243442	05RKG1	2.06
243443	05RKG2	2.03
274654	BRAID;1U	1.49
274655	BRAID;2U	1.46
274751	CRETE;1U	.13
274752	CRETE;2U	.13
274753	CRETE;3U	.13
274754	CRETE;4U	.13
246422	MAYFLOWER	.01
290294	S-036 C1	1.79
290298	S-037 C1	1.79
292416	T-127 C	.19
292735	T-183 C	7.86
292741	T-184 C	7.86
274802	U PAR;5U	.08
274803	U PAR;6U	.08
887641	U1-049 C	.66
887741	U1-087 C	3.29
887751	U1-088 C	2.2
891021	U4-003 C	5.11
891171	U4-033	.08
274814	UPNOR;0U	.1
274805	UPNOR;1U	.1
274806	UPNOR;2U	.1
274807	UPNOR;3U	.1
274808	UPNOR;4U	.1
274809	UPNOR;5U	.1
274810	UPNOR;6U	.1
274811	UPNOR;7U	.1
274812	UPNOR;8U	.1
274813	UPNOR;9U	.1
274815	UPNOR;XU	.1
274816	UPNOR;YU	.1
LTF	V3-012	11.17
900391	V4-048	.03
900401	V4-049	.03

907121	X1-042	.
LTF	X2-042	25.68
909181	X2-052	410.55
LTF	X3-020	9.09
900404	X3-028 C	231.84
LTF	X3-096	21.88
LTF	X3-097	31.02
LTF	X3-098	29.41
LTF	X4-041	29.05
LTF	Y1-002	35.68
LTF	Y1-004	9.52
LTF	Y2-004	15.22
LTF	Y2-005	15.22
LTF	Y2-006	10.41
LTF	Y2-007	30.44
LTF	Y2-008	26.2
LTF	Y2-056	22.03
LTF	Y2-068	155.67
LTF	Y2-082	57.9
914321	Y2-084 C OP1	.56
914381	Y2-095 OP1	80.22

Appendix 19

Bus Number	Bus Name	Full Contribution
254007	15ELRMA1	8.49
254008	15ELRMA2	8.67
254009	15ELRMA3	11.24
254010	15ELRMA4	18.12
235573	MITCHELL 2	.25
235574	MITCHELL 3	.86
884780	S-058 C	9.32
884781	S-058 E	30.72
LTF	V3-012	8.98
LTF	W3-083	2.06
907021	X1-020 C	2.62
907022	X1-020 E	17.51
LTF	X2-042	10.49
LTF	X3-020	2.79
LTF	X3-021	10.92
900404	X3-028 C	45.53
LTF	X3-096	6.7
LTF	X3-097	9.5
LTF	X3-098	9.01
LTF	X4-029D	2.5
LTF	X4-041	8.9
912241	X4-042	.19
LTF	Y1-002	9.44
LTF	Y1-004	10.59
LTF	Y1-007	7.35
913091	Y1-015 C	20.27
913092	Y1-015 E	3.03
913191	Y1-027 C OP1	.01
913192	Y1-027 E OP1	.02
LTF	Y1-041	2.5
913461	Y1-070 OP1	19.22
LTF	Y2-004	4.51
LTF	Y2-005	4.51
LTF	Y2-006	4.69
LTF	Y2-007	9.02
LTF	Y2-008	9.34
LTF	Y2-030	2.58
LTF	Y2-031	2.58
LTF	Y2-032	2.58
LTF	Y2-033	4.94
LTF	Y2-034	3.5
LTF	Y2-035	1.88
LTF	Y2-036	1.88
LTF	Y2-040	10.92
LTF	Y2-049	8.97

LTF	Y2-056	7.49
LTF	Y2-068	47.67
LTF	Y2-069	2.71
LTF	Y2-070	2.71
LTF	Y2-071	2.71
LTF	Y2-072	2.71
LTF	Y2-082	19.93
914331	Y2-085 OP1	23.71
914361	Y2-088	1.27
914381	Y2-095 OP1	15.76

Appendix 20

Bus Number	Bus Name	Full Contribution
242651	05GLENL2	11.87
242896	05KRG1L	6.59
242898	05KRG2L	6.59
315446	Q-065	-22.99
884780	S-058 C	7.86
884781	S-058 E	25.92
LTF	V3-012	7.81
LTF	W3-083	1.67
907021	X1-020 C	2.25
907022	X1-020 E	15.09
LTF	X2-042	9.
LTF	X3-020	2.49
LTF	X3-021	7.7
900404	X3-028 C	42.14
LTF	X3-096	6.
LTF	X3-097	8.5
LTF	X3-098	8.06
LTF	X4-029D	2.14
LTF	X4-041	7.96
LTF	Y1-002	7.96
LTF	Y1-004	9.48
LTF	Y1-007	6.58
LTF	Y1-041	2.14
913331	Y1-049	.37
LTF	Y1-090	1.45
LTF	Y2-004	4.04
LTF	Y2-005	4.04
LTF	Y2-006	4.28
LTF	Y2-007	8.07
LTF	Y2-008	8.52
LTF	Y2-030	2.47
LTF	Y2-031	2.47
LTF	Y2-032	2.47
LTF	Y2-033	4.76
LTF	Y2-034	2.18
LTF	Y2-040	7.7
LTF	Y2-049	6.32
LTF	Y2-056	6.43
LTF	Y2-068	42.68
LTF	Y2-069	2.02
LTF	Y2-070	2.02
LTF	Y2-071	2.02
LTF	Y2-072	2.02
LTF	Y2-082	15.87
914381	Y2-095 OP1	14.58

Appendix 21

Bus Number	Bus Name	Full Contribution
243441	05CKG2	4.05
243858	05FR11_C	.08
243861	05FR12_C	.08
243863	05FR21_C	.08
243866	05FRCS22_C	.08
243870	05FRCS-3_C	.16
243873	05FRCS-4_C	.12
246908	05MLCS1_C	.16
246910	05MLCS-2_C	.16
243442	05RKG1	8.88
243443	05RKG2	8.74
274654	BRAID;1U	4.3
274655	BRAID;2U	4.2
274865	CAYUG;1U C1	4.68
274863	CAYUG;1U E1	18.71
274866	CAYUG;2U C2	4.68
274670	CRAWF;7G	1.37
274671	CRAWF;7Y	1.38
274672	CRAWF;8U	48.97
274658	DRESD;2U	3.41
274659	DRESD;3U	3.41
274757	ELWOO;1P	2.18
274758	ELWOO;2P	2.73
274837	EQUIS; B	.15
274836	EQUIS; R	.24
274673	FISK ;9U	50.04
274708	KENDA;3C	.62
274709	KENDA;3S	.42
274710	KENDA;4C	.62
274711	KENDA;4S	.42
274650	KINCA;1U	2.12
274651	KINCA;2U	2.12
274660	LASCO;1U	4.09
274661	LASCO;2U	4.09
274770	LINC G1	.27
274771	LINC G2	.27
274772	LINC G3	.27
274773	LINC G4	.27
274774	LINC G5	.27
274775	LINC G6	.27
274776	LINC G7	.27
274777	LINC G8	.27
274847	N-015 C	.11
293664	O-024 C	.07
293666	O-024 C	.15

294391	P-010 C	.14
882311	Q-066	.32
296308	R-030 C1	5.17
296271	R-030 C2	5.17
296125	R-030 C3	5.23
274839	R-035	.18
290261	S-027 C	.15
290265	S-028 C	.15
290294	S-036 C1	5.38
290298	S-037 C1	5.38
884780	S-058 C	111.29
884781	S-058 E	366.93
884891	S-062 C1	5.14
884901	S-062 C2	5.11
884911	S-062 C3	5.14
886001	T-105 C	10.91
292416	T-127 C	.16
292735	T-183 C	6.74
292741	T-184 C	6.74
274802	U PAR;5U	.18
274803	U PAR;6U	.18
887641	U1-049 C	2.
887741	U1-087 C	3.34
887751	U1-088 C	2.23
890570	U3-026 C1	39.11
890571	U3-026 C2	39.11
890561	U3-031	.15
891021	U4-003 C	4.38
891211	U4-037 C	4.04
891221	U4-038 C	2.04
891231	U4-039 C1	4.48
891241	U4-039 C2	4.48
891251	U4-039 C3	4.48
891261	U4-039 C4	4.48
892051	V1-022 1	29.3
892061	V1-022 2	29.3
292068	V1-024	.07
292069	V1-025	.07
893031	V2-008	92.79
LTF	V3-012	46.73
900391	V4-048	.07
900401	V4-049	.07
903811	W3-135	.04
905071	W4-005 C	7.1
905251	W4-033 C1	.01
905491	W4-086	.32
905501	W4-087	.57

907021	X1-020 C	38.53
907141	X1-045	.46
LTF	X2-042	113.46
910541	X3-005 C	.58
LTF	X3-020	31.38
LTF	X3-021	56.97
900404	X3-028 C	815.22
910711	X3-045 1	2.46
910721	X3-045 2	2.46
LTF	X3-096	75.48
LTF	X3-097	107.03
LTF	X3-098	101.46
LTF	X4-029D	27.33
LTF	X4-041	100.24
LTF	Y1-002	104.35
LTF	Y1-004	42.4
913011	Y1-005 1	26.94
913021	Y1-005 2	26.94
LTF	Y1-007	29.45
LTF	Y1-041	27.33
LTF	Y2-004	51.62
LTF	Y2-005	51.62
LTF	Y2-006	55.55
LTF	Y2-007	103.24
LTF	Y2-008	112.46
LTF	Y2-030	27.83
LTF	Y2-031	27.83
LTF	Y2-032	27.83
LTF	Y2-040	56.97
LTF	Y2-049	46.78
LTF	Y2-056	82.
LTF	Y2-068	537.09
LTF	Y2-082	180.64
914321	Y2-084 C OP1	.57
914381	Y2-095 OP1	282.07

Appendix 22

Bus Number	Bus Name	Full Contribution
247528	05COVRT1	1.65
247529	05COVRT2	1.65
247530	05COVRT3	1.65
247531	05COVRT4	.99
247532	05COVRT5	.99
247533	05COVRT6	.99
243045	05MUSKNG	15.16
884780	S-058 C	5.61
884781	S-058 E	18.51
LTF	V3-012	5.05
LTF	W2-033	1.15
LTF	W3-083	1.17
903761	W3-128	10.77
235577	WILLOW I 1	-2.94
235578	WILLOW I 2	-9.11
LTF	X2-042	6.28
LTF	X3-020	1.73
LTF	X3-021	5.46
900404	X3-028 C	29.33
LTF	X3-096	4.17
LTF	X3-097	5.91
LTF	X3-098	5.6
LTF	X4-029D	1.52
LTF	X4-041	5.53
LTF	Y1-002	5.7
LTF	Y1-004	5.95
LTF	Y1-007	4.13
LTF	Y1-041	1.52
LTF	Y1-090	1.01
LTF	Y2-004	2.8
LTF	Y2-005	2.8
LTF	Y2-006	3.03
LTF	Y2-007	5.59
LTF	Y2-008	6.
LTF	Y2-030	1.72
LTF	Y2-031	1.72
LTF	Y2-032	1.72
LTF	Y2-033	3.02
LTF	Y2-034	1.84
LTF	Y2-035	.98
LTF	Y2-036	.98
LTF	Y2-040	5.46
LTF	Y2-049	4.48
LTF	Y2-056	4.55
LTF	Y2-068	29.65

LTF	Y2-069	1.44
LTF	Y2-070	1.44
LTF	Y2-071	1.44
LTF	Y2-072	1.44
LTF	Y2-082	11.39
914381	Y2-095 OP1	10.15

Appendix 23

Bus Number	Bus Name	Full Contribution
893031	V2-008	16.86
LTF	V3-012	1.27
LTF	X2-042	3.38
LTF	X3-020	1.13
900404	X3-028 C	19.42
LTF	X3-096	2.71
LTF	X3-097	3.84
LTF	X3-098	3.64
LTF	X4-041	3.6
LTF	Y1-004	1.74
LTF	Y1-007	1.21
LTF	Y2-004	1.86
LTF	Y2-005	1.86
LTF	Y2-006	1.48
LTF	Y2-007	3.72
LTF	Y2-008	3.31
LTF	Y2-033	.87
LTF	Y2-068	19.29
914381	Y2-095 OP1	6.72

Appendix 24

Bus Number	Bus Name	Full Contribution
243764	05BSG1	35.84
243763	05BSG2	2.5
242570	05BUCHAN	.26
242900	05CRG1L	.81
242902	05CRG2L	.81
242904	05CRG3L	34.23
246759	05SOLIDA	22.41
246895	05VACITY	2.16
242850	05WOLF1H	.56
242851	05WOLF2H	.36
341853	1JKCT 2G	10.82
341860	1JKCT 4G	8.28
341866	1JKCT 6G	8.28
341936	1LAUR 1G	8.34
270000	20FOOTHL	1.05
270001	20ZELDA	1.56
244221	INDDRVL	.18
884780	S-058 C	64.93
884781	S-058 E	214.09
LTF	V3-012	82.64
903931	W3-162	.06
909001	X2-006 C1OP1	46.26
909002	X2-006 C2OP1	37.
LTF	X2-042	75.88
LTF	X3-020	22.35
LTF	X3-021	57.4
900404	X3-028 C	359.63
910751	X3-051	69.12
LTF	X3-096	53.76
LTF	X3-097	76.23
LTF	X3-098	72.25
912161	X4-025	8.76
LTF	X4-041	71.39
LTF	Y1-002	65.32
LTF	Y1-004	103.13
913031	Y1-006 C	1.31
LTF	Y1-007	71.62
913321	Y1-048 OP1	-2.02
LTF	Y2-004	36.3
LTF	Y2-005	36.3
LTF	Y2-006	36.2
LTF	Y2-007	72.6
LTF	Y2-008	72.65
LTF	Y2-030	21.22
LTF	Y2-031	21.22

LTF	Y2-032	21.22
LTF	Y2-033	52.59
LTF	Y2-034	41.42
LTF	Y2-035	22.21
LTF	Y2-036	22.21
LTF	Y2-040	57.4
LTF	Y2-049	47.14
LTF	Y2-056	54.84
LTF	Y2-068	382.5
LTF	Y2-082	125.69
914341	Y2-086	8.12
914381	Y2-095 OP1	124.43

Appendix 25

Bus Number	Bus Name	Full Contribution
238995	02NCUNTD	-.32
239006	02NILEG1	-5.93
239007	02NILEG2	-5.87
239022	02NWCAG3	-4.91
239023	02NWCAG4	-4.9
239024	02NWCAG5	-7.52
243764	05BSG1	14.94
242896	05KRG1L	10.05
242898	05KRG2L	10.05
242940	05MUSKNG	44.02
243045	05MUSKNG	34.2
243084	05RUTLAN	.07
246759	05SOLIDA	10.09
242807	05SPORNA	41.1
242947	05WATERF	2.01
254007	15ELRMA1	-5.29
254008	15ELRMA2	-5.4
254009	15ELRMA3	-5.68
254010	15ELRMA4	-9.15
292067	FDNS	.1
884780	S-058 C	24.68
884781	S-058 E	81.36
892311	V1-035	2.66
LTF	V3-012	25.94
LTF	W2-033	12.27
903691	W3-111 C	.46
903701	W3-112 C	.46
903711	W3-113 C	.46
903761	W3-128	62.96
909001	X2-006 C1OP1	18.46
909002	X2-006 C2OP1	14.77
LTF	X2-042	28.47
LTF	X3-020	8.37
LTF	X3-021	13.32
900404	X3-028 C	142.8
910751	X3-051	30.94
LTF	X3-096	20.14
LTF	X3-097	28.56
LTF	X3-098	27.08
912161	X4-025	4.46
LTF	X4-029D	6.87
LTF	X4-041	26.75
LTF	Y1-002	24.9
LTF	Y1-004	31.3
LTF	Y1-007	21.74

913111	Y1-018	.25
913121	Y1-019	.25
LTF	Y1-041	6.87
LTF	Y2-004	13.52
LTF	Y2-005	13.52
LTF	Y2-006	14.61
LTF	Y2-007	27.03
LTF	Y2-008	28.98
LTF	Y2-030	8.66
LTF	Y2-031	8.66
LTF	Y2-032	8.66
LTF	Y2-033	17.08
LTF	Y2-034	13.76
LTF	Y2-035	7.38
LTF	Y2-036	7.38
LTF	Y2-040	13.32
LTF	Y2-049	10.94
LTF	Y2-056	20.6
LTF	Y2-068	143.34
LTF	Y2-082	43.68
914381	Y2-095 OP1	49.41

Appendix 26

Bus Number	Bus Name	Full Contribution
243442	05RKG1	1.8
243443	05RKG2	1.78
274865	CAYUG;1U C1	-3.26
274866	CAYUG;2U C2	-3.26
LTF	V3-012	34.82
LTF	X2-042	19.41
LTF	X3-020	12.16
900404	X3-028 C	202.48
LTF	X3-096	29.26
LTF	X3-097	41.48
LTF	X3-098	39.32
LTF	X4-041	38.85
LTF	Y1-004	35.64
LTF	Y1-007	24.75
LTF	Y1-090	7.09
LTF	Y2-004	20.18
LTF	Y2-005	20.18
LTF	Y2-006	10.15
LTF	Y2-007	40.35
LTF	Y2-008	19.05
LTF	Y2-033	18.35
LTF	Y2-034	9.68
LTF	Y2-068	208.17
914381	Y2-095 OP1	70.06

Appendix 27

Bus Number	Bus Name	Full Contribution
247528	05COVRT1	1.65
247529	05COVRT2	1.65
247530	05COVRT3	1.65
247531	05COVRT4	.99
247532	05COVRT5	.99
247533	05COVRT6	.99
243045	05MUSKNG	15.16
884780	S-058 C	5.61
884781	S-058 E	18.51
LTF	V3-012	5.05
LTF	W2-033	1.15
LTF	W3-083	1.17
903761	W3-128	10.77
235577	WILLOW I 1	-2.94
235578	WILLOW I 2	-9.11
LTF	X2-042	6.28
LTF	X3-020	1.73
LTF	X3-021	5.46
900404	X3-028 C	29.33
LTF	X3-096	4.17
LTF	X3-097	5.91
LTF	X3-098	5.6
LTF	X4-029D	1.52
LTF	X4-041	5.53
LTF	Y1-002	5.7
LTF	Y1-004	5.95
LTF	Y1-007	4.13
LTF	Y1-041	1.52
LTF	Y1-090	1.01
LTF	Y2-004	2.8
LTF	Y2-005	2.8
LTF	Y2-006	3.03
LTF	Y2-007	5.59
LTF	Y2-008	6.
LTF	Y2-030	1.72
LTF	Y2-031	1.72
LTF	Y2-032	1.72
LTF	Y2-033	3.02
LTF	Y2-034	1.84
LTF	Y2-035	.98
LTF	Y2-036	.98
LTF	Y2-040	5.46
LTF	Y2-049	4.48
LTF	Y2-056	4.55
LTF	Y2-068	29.65

LTF	Y2-069	1.44
LTF	Y2-070	1.44
LTF	Y2-071	1.44
LTF	Y2-072	1.44
LTF	Y2-082	11.39
914381	Y2-095 OP1	10.15

Appendix 28

Bus Number	Bus Name	Full Contribution
247528	05COVRT1	1.07
247529	05COVRT2	1.07
247530	05COVRT3	1.07
247531	05COVRT4	.64
247532	05COVRT5	.64
247533	05COVRT6	.64
315094	1CHESPK1	-1.72
315095	1CHESPK2	-1.72
315096	1CHESPK3	-2.31
315097	1CHESPK4	-3.25
315131	1EDGECSMA	.13
315132	1EDGECSMB	.13
315446	Q-065	-10.97
884780	S-058 C	3.9
884781	S-058 E	12.86
LTF	V2-031	.57
LTF	V2-032	.56
LTF	V3-012	7.41
LTF	W3-083	.88
LTF	W4-049	1.76
LTF	W4-050	1.76
LTF	X2-042	4.58
LTF	X3-020	1.52
LTF	X3-021	3.48
900404	X3-028 C	20.89
LTF	X3-096	3.65
LTF	X3-097	5.18
LTF	X3-098	4.91
LTF	X4-029D	1.17
LTF	X4-041	4.85
LTF	Y1-002	3.88
LTF	Y1-004	9.13
LTF	Y1-007	6.34
LTF	Y1-041	1.17
LTF	Y1-090	.89
LTF	Y2-004	2.48
LTF	Y2-005	2.48
LTF	Y2-006	2.15
LTF	Y2-007	4.96
LTF	Y2-008	4.37
LTF	Y2-030	1.24
LTF	Y2-031	1.24
LTF	Y2-032	1.24
LTF	Y2-033	4.66
LTF	Y2-034	7.97

LTF	Y2-035	4.27
LTF	Y2-036	4.27
LTF	Y2-040	3.48
LTF	Y2-049	2.86
LTF	Y2-056	3.51
LTF	Y2-068	26.
LTF	Y2-069	.92
LTF	Y2-070	.92
LTF	Y2-071	.92
LTF	Y2-072	.92
LTF	Y2-082	7.35
914381	Y2-095 OP1	7.23

Appendix 29

Bus Number	Bus Name	Full Contribution
315446	Q-065	28.92
884780	S-058 C	5.94
884781	S-058 E	19.57
218360	SEWAREN1	-2.46
218361	SEWAREN2	-2.8
218362	SEWAREN3	-2.54
218363	SEWAREN4	-2.94
218364	SEWAREN6	-2.63
LTF	V3-012	7.68
901451	W1-116 C	.01
901452	W1-116 E	.96
LTF	W3-083	1.29
907021	X1-020 C	1.65
907022	X1-020 E	11.05
907991	X1-078	12.45
LTF	X2-042	6.75
LTF	X3-020	2.
LTF	X3-021	5.52
900404	X3-028 C	31.01
910941	X3-087 C OP1	10.93
910942	X3-087 E OP1	2.5
LTF	X3-096	4.82
LTF	X3-097	6.83
LTF	X3-098	6.48
LTF	X4-029D	1.66
912211	X4-035 OP1	10.9
912221	X4-039	17.31
LTF	X4-041	6.4
LTF	Y1-002	5.96
LTF	Y1-004	9.35
LTF	Y1-007	6.49
LTF	Y1-041	1.66
LTF	Y2-004	3.25
LTF	Y2-005	3.25
LTF	Y2-006	3.17
LTF	Y2-007	6.51
LTF	Y2-008	6.37
LTF	Y2-030	1.81
LTF	Y2-031	1.81
LTF	Y2-032	1.81
LTF	Y2-033	4.71
LTF	Y2-034	5.56
LTF	Y2-035	2.98
LTF	Y2-036	2.98
LTF	Y2-040	5.52

LTF	Y2-049	4.54
LTF	Y2-056	4.99
LTF	Y2-068	34.28
LTF	Y2-069	1.46
LTF	Y2-070	1.46
LTF	Y2-071	1.46
LTF	Y2-072	1.46
LTF	Y2-082	11.67
914381	Y2-095 OP1	10.73

Appendix 30

Bus Number	Bus Name	Full Contribution
315446	Q-065	28.92
884780	S-058 C	5.94
884781	S-058 E	19.57
218360	SEWAREN1	-2.46
218361	SEWAREN2	-2.8
218362	SEWAREN3	-2.54
218363	SEWAREN4	-2.94
218364	SEWAREN6	-2.63
LTF	V3-012	7.68
901451	W1-116 C	.01
901452	W1-116 E	.96
LTF	W3-083	1.28
907021	X1-020 C	1.65
907022	X1-020 E	11.05
907991	X1-078	12.45
LTF	X2-042	6.75
LTF	X3-020	2.
LTF	X3-021	5.52
900404	X3-028 C	31.01
910941	X3-087 C OP1	10.93
910942	X3-087 E OP1	2.5
LTF	X3-096	4.82
LTF	X3-097	6.83
LTF	X3-098	6.48
LTF	X4-029D	1.66
912211	X4-035 OP1	10.9
912221	X4-039	17.31
LTF	X4-041	6.4
LTF	Y1-002	5.96
LTF	Y1-004	9.35
LTF	Y1-007	6.49
LTF	Y1-041	1.66
LTF	Y2-004	3.25
LTF	Y2-005	3.25
LTF	Y2-006	3.17
LTF	Y2-007	6.51
LTF	Y2-008	6.37
LTF	Y2-030	1.81
LTF	Y2-031	1.81
LTF	Y2-032	1.81
LTF	Y2-033	4.71
LTF	Y2-034	5.56
LTF	Y2-035	2.98
LTF	Y2-036	2.98
LTF	Y2-040	5.52

LTF	Y2-049	4.54
LTF	Y2-056	4.99
LTF	Y2-068	34.28
LTF	Y2-069	1.46
LTF	Y2-070	1.46
LTF	Y2-071	1.46
LTF	Y2-072	1.46
LTF	Y2-082	11.67
914381	Y2-095 OP1	10.73

Appendix 31

Bus Number	Bus Name	Full Contribution
247528	05COVRT1	1.65
247529	05COVRT2	1.65
247530	05COVRT3	1.65
247531	05COVRT4	.99
247532	05COVRT5	.99
247533	05COVRT6	.99
243045	05MUSKNG	15.16
884780	S-058 C	5.61
884781	S-058 E	18.51
LTF	V3-012	5.05
LTF	W2-033	1.15
LTF	W3-083	1.17
903761	W3-128	10.77
235577	WILLOW I 1	-2.94
235578	WILLOW I 2	-9.11
907021	X1-020 C	1.61
907022	X1-020 E	10.75
LTF	X2-042	6.28
LTF	X3-020	1.73
LTF	X3-021	5.46
900404	X3-028 C	29.33
LTF	X3-096	4.17
LTF	X3-097	5.91
LTF	X3-098	5.6
LTF	X4-029D	1.52
LTF	X4-041	5.53
LTF	Y1-002	5.7
LTF	Y1-004	5.95
LTF	Y1-007	4.13
LTF	Y1-041	1.52
LTF	Y1-090	1.01
LTF	Y2-004	2.8
LTF	Y2-005	2.8
LTF	Y2-006	3.03
LTF	Y2-007	5.59
LTF	Y2-008	6.
LTF	Y2-030	1.72
LTF	Y2-031	1.72
LTF	Y2-032	1.72
LTF	Y2-033	3.02
LTF	Y2-034	1.84
LTF	Y2-035	.98
LTF	Y2-036	.98
LTF	Y2-040	5.46
LTF	Y2-049	4.48

LTF	Y2-056	4.55
LTF	Y2-068	29.65
LTF	Y2-069	1.44
LTF	Y2-070	1.44
LTF	Y2-071	1.44
LTF	Y2-072	1.44
LTF	Y2-082	11.39
914381	Y2-095 OP1	10.15

Appendix 32

Bus Number	Bus Name	Full Contribution
243243	05ANDCT	.26
243858	05FR11_C	.03
243861	05FR12_C	.02
243863	05FR21_C	.03
243866	05FRCS22_C	.03
243870	05FRCS-3_C	.05
243873	05FRCS-4_C	.04
243442	05RKG1	1.97
243443	05RKG2	1.94
887741	U1-087 C	1.05
887751	U1-088 C	.7
LTF	V3-012	13.67
LTF	X2-042	55.45
LTF	X3-020	7.48
900404	X3-028 C	220.96
LTF	X3-096	18.
LTF	X3-097	25.53
LTF	X3-098	24.2
LTF	X4-041	23.91
LTF	Y1-002	5.82
LTF	Y1-004	14.07
LTF	Y1-007	9.77
LTF	Y2-004	12.6
LTF	Y2-005	12.6
LTF	Y2-006	24.77
LTF	Y2-007	25.19
LTF	Y2-008	55.93
LTF	Y2-033	7.43
LTF	Y2-056	7.89
LTF	Y2-068	128.09
914321	Y2-084 C OP1	.18
914381	Y2-095 OP1	76.45

Appendix 33

Bus Number	Bus Name	Full Contribution
243243	05ANDCT	.49
243858	05FR11_C	.07
243859	05FR11_E	12.4
243861	05FR12_C	.07
243862	05FR12_E	12.2
243863	05FR21_C	.08
243864	05FR21_E	13.04
243866	05FRCS22_C	.07
247924	05FRCS22_E	12.48
243870	05FRCS-3_C	.15
247925	05FRCS-3_E	25.28
243873	05FRCS-4_C	.11
247926	05FRCS-4_E	19.01
246908	05MLCS1_C	.15
246909	05MLCS1_E	24.6
246910	05MLCS-2_C	.15
247930	05MLCS-2_E	24.6
243442	05RKG1	8.66
243443	05RKG2	8.53
274848	CAMPG;RU	.09
274865	CAYUG;1U C1	4.05
274863	CAYUG;1U E1	16.21
274866	CAYUG;2U C2	4.05
274864	CAYUG;2U E2	16.21
274849	CRESC;1U	7.14
294702	CRESC;2U	6.3
274659	DRESD;3U	2.91
274650	KINCA;1U	1.93
274651	KINCA;2U	1.93
990901	L-005 E	15.77
274770	LINC G1	.22
274771	LINC G2	.22
274772	LINC G3	.22
274773	LINC G4	.22
274774	LINC G5	.22
274775	LINC G6	.22
274776	LINC G7	.22
274777	LINC G8	.22
293664	O-024 C	.06
293666	O-024 C	.13
293665	O-024 E	10.97
293667	O-024 E	21.74
274851	O-035 C	.05
293771	O-035 E	7.87
294700	P-040 C	.52

294701	P-040 E	2.1
274678	POWER;6U	2.38
296308	R-030 C1	4.52
296271	R-030 C2	4.52
296125	R-030 C3	4.57
296309	R-030 E1	18.06
296272	R-030 E2	18.06
296128	R-030 E3	18.28
290261	S-027 C	.13
290265	S-028 C	.13
884780	S-058 C	91.9
884781	S-058 E	302.99
886001	T-105 C	9.45
886002	T-105 E	37.81
292416	T-127 C	.15
292417	T-127 E	24.63
886211	T-143 C1	3.29
886221	T-143 C2	3.29
886212	T-143 E1	13.16
886222	T-143 E2	13.16
292735	T-183 C	6.16
292736	T-183 E	24.63
292741	T-184 C	6.16
292742	T-184 E	24.63
274853	TWING;U1	21.8
274854	TWING;U2	21.8
887741	U1-087 C	3.09
887742	U1-087 E	20.67
887751	U1-088 C	2.06
887752	U1-088 E	13.78
247510	U3-002 C	.09
247931	U3-002 E	25.55
890570	U3-026 C1	32.29
890571	U3-026 C2	32.29
890561	U3-031	.12
891021	U4-003 C	4.
891022	U4-003 E	26.79
891211	U4-037 C	3.67
891212	U4-037 E	24.59
891221	U4-038 C	1.96
891222	U4-038 E	13.12
891231	U4-039 C1	4.13
891241	U4-039 C2	4.13
891251	U4-039 C3	4.13
891261	U4-039 C4	4.13
891232	U4-039 E1	27.62
891242	U4-039 E2	27.62

891252	U4-039 E3	27.62
891262	U4-039 E4	27.62
893031	V2-008	84.44
LTF	V3-012	55.57
902352	W2-048 E	8.79
905071	W4-005 C	6.33
905072	W4-005 E	42.4
907021	X1-020 C	32.99
907022	X1-020 E	220.75
909062	X2-022 E OP1	26.57
LTF	X2-042	111.94
LTF	X3-020	29.84
LTF	X3-021	52.2
900404	X3-028 C	792.3
910721	X3-045 2	2.11
LTF	X3-096	71.79
LTF	X3-097	101.79
LTF	X3-098	96.49
LTF	X4-041	95.33
LTF	Y1-002	89.57
LTF	Y1-004	57.62
LTF	Y1-007	40.01
LTF	Y2-004	49.02
LTF	Y2-005	49.02
LTF	Y2-006	55.09
LTF	Y2-007	98.03
LTF	Y2-008	110.68
LTF	Y2-030	28.63
LTF	Y2-031	28.63
LTF	Y2-032	28.63
LTF	Y2-033	29.96
LTF	Y2-040	52.2
LTF	Y2-049	42.87
LTF	Y2-056	71.57
LTF	Y2-068	510.79
LTF	Y2-082	156.05
914321	Y2-084 C OP1	.53
914322	Y2-084 E OP1	9.61
914381	Y2-095 OP1	274.13

Appendix 34

Bus Number	Bus Name	Full Contribution
224024	BENN U15	14.51
224025	BENN U16	14.28
217006	BERGN26A	-1.51
220901	BRANDNG1	1.07
220902	BRANDNG2	1.07
220932	BRESCOG1	.1
219103	BURLNGT8	-1.98
219124	BURLNGT9	-17.38
224094	BUZZE1-4	3.23
224095	BUZZE5-8	3.23
224096	BUZZW1-4	3.23
224097	BUZZW5-8	3.23
228000	CEDR#1CT	-3.95
228001	CEDR#2CT	-1.9
220903	CRANE G1	.33
220904	CRANE G2	.34
220905	CRANE GT	.02
228301	D/W 1 ST	-7.36
228302	D/W 6 ST	-7.55
231904	DC1 NUG	-3.15
231905	DC2 NUG	-3.15
217078	ESSEX 12	-13.22
99210	G07_NEW	8.05
231903	GEN4	-8.94
206331	GG A1&2	-2.67
206332	GG A3&4	-2.67
206333	GG B5&6	-2.67
206334	GG B7&8	-2.67
220906	GOULD G3	.17
208907	HOLT 697	8.7
209027	LOR2_Q27 E	-4.39
219134	MERCER 3	-10.97
227807	MO AV B	-1.82
220907	N.C G1-4	.11
220908	N.C G5-8	.11
219137	NAT PARK	-2.03
94130	O66_NONFIRM	25.36
221846	PENWD 1G	.01
221845	PENWD 2G	.01
221844	PENWD 3G	.01
221843	PENWD 4G	.01
220909	PERRYG12	.2
220910	PERRYG34	.21
220911	PERRYG51	.31
220913	PHIL G12	.05

220912	PHIL G34	.05
204652	PORT1GEN	-10.18
204653	PORT2GEN	-15.67
295125	Q-020 2	.21
291429	Q-031	.02
315446	Q-065	61.38
220914	RVRSDEG4	.13
220915	RVRSDEG6	8.59
220916	RVRSDG78	.07
290285	S-032	.45
884780	S-058 C	15.99
884781	S-058 E	52.71
213941	SCHYLABC	-.25
213945	SCHYLKL1	-18.03
218360	SEWAREN1	-7.76
218361	SEWAREN2	-8.83
218362	SEWAREN3	-8.01
218363	SEWAREN4	-9.31
218364	SEWAREN6	-8.33
292451	T-133	11.77
292457	T-134	17.
885600	T20SOLAR E	-.21
292077	V1-033	9.25
292078	V1-034	.22
LTF	V3-012	19.52
292630	V3-017	37.07
904371	V4-038	.
209019	VIKI IPP	-.86
228700	VNLD 10	-2.15
901111	W1-033	1.75
208850	W1-046 C	.38
902211	W2-019 C	-.2
LTF	W3-083	3.47
905211	W4-025 C	-.22
905291	W4-038 OP1	-1.72
905321	W4-044	37.07
220917	WAGNERG1	.21
220918	WAGNERG2	.22
220919	WAGNERG3	.54
220920	WAGNERG4	.66
220921	WAGNR GT	.02
220922	WSPT G5	.2
907241	X1-068	-.77
907991	X1-078	40.7
907381	X1-094 C	-.43
LTF	X2-042	18.07
910531	X3-004	-2.51

LTF	X3-020	5.25
LTF	X3-021	16.36
900404	X3-028 C	82.
910831	X3-068 OP1	71.4
910931	X3-085 C	-.2
910941	X3-087 C OP1	36.78
LTF	X3-096	12.64
LTF	X3-097	17.92
LTF	X3-098	16.98
912091	X4-012 C OP1	-.15
912101	X4-015 C	-.16
LTF	X4-029D	4.44
912211	X4-035 OP1	35.82
912221	X4-039	31.79
LTF	X4-041	16.78
LTF	Y1-002	16.1
LTF	Y1-004	23.63
LTF	Y1-007	16.41
913141	Y1-022 C	.7
LTF	Y1-041	4.44
LTF	Y2-004	8.53
LTF	Y2-005	8.53
LTF	Y2-006	8.4
LTF	Y2-007	17.06
LTF	Y2-008	16.84
LTF	Y2-030	4.74
LTF	Y2-031	4.74
LTF	Y2-032	4.74
LTF	Y2-033	11.76
LTF	Y2-034	13.12
LTF	Y2-035	7.04
LTF	Y2-036	7.04
LTF	Y2-040	16.36
LTF	Y2-049	13.43
LTF	Y2-056	13.32
LTF	Y2-068	89.91
LTF	Y2-069	4.21
LTF	Y2-070	4.21
LTF	Y2-071	4.21
LTF	Y2-072	4.21
LTF	Y2-082	32.36
914381	Y2-095 OP1	28.37

Appendix 35

Bus Number	Bus Name	Full Contribution
247528	05COVRT1	1.64
247529	05COVRT2	1.64
247530	05COVRT3	1.64
247531	05COVRT4	.98
247532	05COVRT5	.98
247533	05COVRT6	.98
243045	05MUSKNG	15.22
242807	05SPORNA	7.51
884780	S-058 C	5.57
884781	S-058 E	18.37
LTF	V3-012	5.05
LTF	W2-033	1.21
LTF	W3-083	1.16
903761	W3-128	10.93
235577	WILLOW I 1	-2.94
235578	WILLOW I 2	-9.1
907021	X1-020 C	1.6
907022	X1-020 E	10.69
LTF	X2-042	6.27
LTF	X3-020	1.73
LTF	X3-021	5.42
900404	X3-028 C	29.33
LTF	X3-096	4.16
LTF	X3-097	5.89
LTF	X3-098	5.59
LTF	X4-029D	1.51
LTF	X4-041	5.52
LTF	Y1-002	5.66
LTF	Y1-004	5.95
LTF	Y1-007	4.13
LTF	Y1-041	1.51
LTF	Y1-090	1.01
LTF	Y2-004	2.79
LTF	Y2-005	2.79
LTF	Y2-006	3.03
LTF	Y2-007	5.58
LTF	Y2-008	6.
LTF	Y2-030	1.72
LTF	Y2-031	1.72
LTF	Y2-032	1.72
LTF	Y2-033	3.02
LTF	Y2-034	1.84
LTF	Y2-035	.99
LTF	Y2-036	.99
LTF	Y2-040	5.42

LTF	Y2-049	4.45
LTF	Y2-056	4.52
LTF	Y2-068	29.58
LTF	Y2-069	1.43
LTF	Y2-070	1.43
LTF	Y2-071	1.43
LTF	Y2-072	1.43
LTF	Y2-082	11.32
914381	Y2-095 OP1	10.15

Appendix 36

Bus Number	Bus Name	Full Contribution
224024	BENN U15	14.51
224025	BENN U16	14.28
217006	BERGN26A	-1.51
219103	BURLNGT8	-1.98
219124	BURLNGT9	-17.38
224094	BUZZE1-4	3.23
224095	BUZZE5-8	3.23
224096	BUZZW1-4	3.23
224097	BUZZW5-8	3.23
228000	CEDR#1CT	-3.95
228001	CEDR#2CT	-1.9
228301	D/W 1 ST	-7.36
228302	D/W 6 ST	-7.55
231904	DC1 NUG	-3.15
231905	DC2 NUG	-3.15
217078	ESSEX 12	-13.22
206617	EXXON	-.48
99210	G07_NEW	8.05
231903	GEN4	-8.94
206331	GG A1&2	-2.67
206332	GG A3&4	-2.67
206333	GG B5&6	-2.67
206334	GG B7&8	-2.67
208907	HOLT 697	8.7
209027	LOR2_Q27 E	-4.39
206679	M&M S721	-.69
210888	MACRTR10	-.31
219134	MERCER 3	-10.97
227807	MO AV B	-1.82
214194	N WALES4	-.18
219137	NAT PARK	-2.03
94130	O66_NONFIRM	25.36
206638	PEAPACK	-.28
204652	PORT1GEN	-10.18
204653	PORT2GEN	-15.67
290092	Q-041 E	-2.07
315446	Q-065	61.38
220915	RVRSDEG6	8.59
213941	SCHYLABC	-.25
213945	SCHYLKL1	-18.03
218360	SEWAREN1	-7.76
218361	SEWAREN2	-8.83
218362	SEWAREN3	-8.01
218363	SEWAREN4	-9.31
218364	SEWAREN6	-8.33

208769	SISO	.13
292451	T-133	11.77
292457	T-134	17.
885600	T20SOLAR E	-.21
292063	V1-021 E	-.03
292077	V1-033	9.25
292078	V1-034	.22
LTF	V3-012	19.52
292630	V3-017	37.07
904262	V4-027 E	.2
209019	VIKI IPP	-.86
228700	VNLD 10	-2.15
901111	W1-033	1.75
208850	W1-046 C	.38
208851	W1-046 E	.61
901602	W1-111 E	1.12
902211	W2-019 C	-.2
LTF	W3-083	3.47
905102	W4-010 E	1.6
905211	W4-025 C	-.22
905291	W4-038 OP1	-1.72
905321	W4-044	37.07
905482	W4-085 E	.22
907241	X1-068	-.77
907991	X1-078	40.7
907381	X1-094 C	-.43
909032	X2-013 E	.19
LTF	X2-042	18.07
910531	X3-004	-2.51
LTF	X3-020	5.25
LTF	X3-021	16.36
900404	X3-028 C	82.
910612	X3-029 E	-.73
910762	X3-052 E	-.22
910831	X3-068 OP1	71.4
910902	X3-081 E	-.05
910931	X3-085 C	-.2
910941	X3-087 C OP1	36.78
910942	X3-087 E OP1	8.41
LTF	X3-096	12.64
LTF	X3-097	17.92
LTF	X3-098	16.98
912032	X4-004 E	-.48
912052	X4-006 E	3.07
912091	X4-012 C OP1	-.15
912101	X4-015 C	-.16
LTF	X4-029D	4.44

912211	X4-035 OP1	35.82
912221	X4-039	31.79
LTF	X4-041	16.78
912271	X4-045 E	.05
912282	X4-046 E	.81
LTF	Y1-002	16.1
LTF	Y1-004	23.63
LTF	Y1-007	16.41
913141	Y1-022 C	.7
913142	Y1-022 E	1.14
LTF	Y1-041	4.44
913362	Y1-057 E	.21
LTF	Y2-004	8.53
LTF	Y2-005	8.53
LTF	Y2-006	8.4
LTF	Y2-007	17.06
LTF	Y2-008	16.84
LTF	Y2-030	4.74
LTF	Y2-031	4.74
LTF	Y2-032	4.74
LTF	Y2-033	11.76
LTF	Y2-034	13.12
LTF	Y2-035	7.04
LTF	Y2-036	7.04
LTF	Y2-040	16.36
LTF	Y2-049	13.43
LTF	Y2-056	13.32
LTF	Y2-068	89.91
LTF	Y2-069	4.21
LTF	Y2-070	4.21
LTF	Y2-071	4.21
LTF	Y2-072	4.21
LTF	Y2-082	32.36
914381	Y2-095 OP1	28.37

Appendix 37

Bus Number	Bus Name	Full Contribution
247528	05COVRT1	1.65
247529	05COVRT2	1.65
247530	05COVRT3	1.65
247531	05COVRT4	.99
247532	05COVRT5	.99
247533	05COVRT6	.99
243045	05MUSKNG	15.16
884780	S-058 C	5.61
884781	S-058 E	18.51
LTF	V3-012	5.05
LTF	W2-033	1.15
LTF	W3-083	1.17
903761	W3-128	10.77
235577	WILLOW I 1	-2.94
235578	WILLOW I 2	-9.11
907021	X1-020 C	1.61
907022	X1-020 E	10.75
LTF	X2-042	6.28
LTF	X3-020	1.73
LTF	X3-021	5.46
900404	X3-028 C	29.33
LTF	X3-096	4.17
LTF	X3-097	5.91
LTF	X3-098	5.6
LTF	X4-029D	1.52
LTF	X4-041	5.53
LTF	Y1-002	5.7
LTF	Y1-004	5.95
LTF	Y1-007	4.13
LTF	Y1-041	1.52
LTF	Y1-090	1.01
LTF	Y2-004	2.8
LTF	Y2-005	2.8
LTF	Y2-006	3.03
LTF	Y2-007	5.59
LTF	Y2-008	6.
LTF	Y2-030	1.72
LTF	Y2-031	1.72
LTF	Y2-032	1.72
LTF	Y2-033	3.02
LTF	Y2-034	1.84
LTF	Y2-035	.98
LTF	Y2-036	.98
LTF	Y2-040	5.46
LTF	Y2-049	4.48

LTF	Y2-056	4.55
LTF	Y2-068	29.65
LTF	Y2-069	1.44
LTF	Y2-070	1.44
LTF	Y2-071	1.44
LTF	Y2-072	1.44
LTF	Y2-082	11.39
914381	Y2-095 OP1	10.15

Appendix 38

Bus Number	Bus Name	Full Contribution
243243	05ANDCT	.23
LTF	V3-012	3.97
LTF	W2-033	1.51
905041	W4-004 C	1.39
905081	W4-008 C	1.39
LTF	X2-042	14.74
LTF	X3-020	1.56
900404	X3-028 C	38.05
LTF	X3-096	3.75
LTF	X3-097	5.32
LTF	X3-098	5.04
LTF	X4-041	4.98
LTF	Y1-004	4.46
LTF	Y1-007	3.1
LTF	Y2-004	2.61
LTF	Y2-005	2.61
LTF	Y2-006	9.42
LTF	Y2-007	5.22
LTF	Y2-008	14.84
LTF	Y2-030	1.54
LTF	Y2-031	1.54
LTF	Y2-032	1.54
LTF	Y2-033	2.35
LTF	Y2-034	1.
LTF	Y2-056	1.05
LTF	Y2-068	26.69
914381	Y2-095 OP1	13.16

Appendix 39

Bus Number	Bus Name	Full Contribution
243441	05CKG2	2.77
243858	05FR11_C	.05
243861	05FR12_C	.05
243863	05FR21_C	.05
243866	05FRCS22_C	.05
243870	05FRCS-3_C	.1
243873	05FRCS-4_C	.08
246908	05MLCS1_C	.1
246910	05MLCS-2_C	.1
243442	05RKG1	9.99
243443	05RKG2	9.84
251935	08BCKJD3	-3.42
251936	08BCKJD4	-.4
251938	08BCKJD6	-54.62
274654	BRAID;1U	2.81
274655	BRAID;2U	2.75
274751	CRETE;1U	.18
274752	CRETE;2U	.18
274753	CRETE;3U	.18
274754	CRETE;4U	.18
274673	FISK ;9U	32.7
274826	FISK ;BP	.24
274827	FISK ;RP	.17
274708	KENDA;3C	.41
274709	KENDA;3S	.27
274710	KENDA;4C	.41
274711	KENDA;4S	.27
274660	LASCO;1U	2.67
274661	LASCO;2U	2.67
274770	LINC G1	.18
274771	LINC G2	.18
274772	LINC G3	.18
274773	LINC G4	.18
274774	LINC G5	.18
274775	LINC G6	.18
274776	LINC G7	.18
274777	LINC G8	.18
293540	O-012 C	.05
882311	Q-066	.21
274839	R-035	.12
293968	RIVER_G1	.36
293969	RIVER_G2	.36
290294	S-036 C1	3.52
290298	S-037 C1	3.52
884780	S-058 C	73.81

884781	S-058 E	243.36
884891	S-062 C1	3.36
884901	S-062 C2	3.34
884911	S-062 C3	3.36
274793	SECHI;0U	.09
274794	SECHI;1U	.09
274795	SECHI;2U	.09
274788	SECHI;5U	.09
274789	SECHI;6U	.09
274790	SECHI;7U	.09
274791	SECHI;8U	.09
274792	SECHI;9U	.09
274679	SLINE;3U	19.85
274680	SLINE;4U	32.04
292416	T-127 C	.1
292735	T-183 C	4.34
292741	T-184 C	4.34
274798	U PAR;1U	.12
274799	U PAR;2U	.12
274800	U PAR;3U	.12
274801	U PAR;4U	.12
274802	U PAR;5U	.12
274803	U PAR;6U	.12
887641	U1-049 C	1.31
293964	U1-054 1	.03
293965	U1-054 2	.04
887741	U1-087 C	2.14
887751	U1-088 C	1.43
890570	U3-026 C1	25.94
890571	U3-026 C2	25.94
890561	U3-031	.1
891021	U4-003 C	2.82
891171	U4-033	.09
891231	U4-039 C1	3.74
891241	U4-039 C2	3.74
891251	U4-039 C3	3.74
891261	U4-039 C4	3.74
274814	UPNOR;0U	.1
274805	UPNOR;1U	.1
274806	UPNOR;2U	.1
274807	UPNOR;3U	.1
274808	UPNOR;4U	.1
274809	UPNOR;5U	.1
274810	UPNOR;6U	.1
274811	UPNOR;7U	.1
274812	UPNOR;8U	.1
274813	UPNOR;9U	.1

274815	UPNOR;XU	.1
274816	UPNOR;YU	.1
892051	V1-022 1	19.12
892061	V1-022 2	19.12
292068	V1-024	.05
292069	V1-025	.05
900391	V4-048	.05
900401	V4-049	.05
LTF	W3-083	12.69
905501	W4-087	.37
907021	X1-020 C	32.98
LTF	X2-042	12.24
909181	X2-052	69.17
910541	X3-005 C	.38
LTF	X3-020	16.43
LTF	X3-021	32.04
900404	X3-028 C	753.06
LTF	X3-096	39.53
LTF	X3-097	56.06
LTF	X3-098	53.14
LTF	X4-029D	15.96
LTF	X4-041	52.5
LTF	Y1-002	65.36
913011	Y1-005 1	17.6
913021	Y1-005 2	17.6
LTF	Y1-041	15.96
LTF	Y2-004	28.32
LTF	Y2-005	28.32
LTF	Y2-007	56.63
LTF	Y2-008	14.42
LTF	Y2-040	32.04
LTF	Y2-049	26.31
LTF	Y2-056	47.87
LTF	Y2-068	281.3
LTF	Y2-082	112.18
914321	Y2-084 C OP1	.37
914381	Y2-095 OP1	260.56

Appendix 40

Bus Number	Bus Name	Full Contribution
243243	05ANDCT	.45
243442	05RKG1	11.23
243443	05RKG2	11.06
247510	U3-002 C	.14
247931	U3-002 E	39.82
891221	U4-038 C	3.39
891222	U4-038 E	22.69
891231	U4-039 C1	10.37
891241	U4-039 C2	10.37
891251	U4-039 C3	10.37
891261	U4-039 C4	10.37
891232	U4-039 E1	69.4
891242	U4-039 E2	69.4
891252	U4-039 E3	69.4
891262	U4-039 E4	69.4
LTF	V3-012	30.92
907021	X1-020 C	141.15
907022	X1-020 E	944.6
LTF	X2-042	92.13
900404	X3-028 C	898.63
LTF	X3-096	30.43
LTF	X3-097	43.16
LTF	X3-098	40.91
LTF	X4-041	40.42
LTF	Y1-004	35.58
LTF	Y1-007	24.71
LTF	Y2-006	45.31
LTF	Y2-007	41.46
LTF	Y2-008	91.76
LTF	Y2-068	216.55
914381	Y2-095 OP1	310.92

Appendix 41

Bus Number	Bus Name	Full Contribution
247528	05COVRT1	1.64
247529	05COVRT2	1.64
247530	05COVRT3	1.64
247531	05COVRT4	.98
247532	05COVRT5	.98
247533	05COVRT6	.98
243045	05MUSKNG	15.22
242807	05SPORNA	7.51
884780	S-058 C	5.57
884781	S-058 E	18.37
LTF	V3-012	5.05
LTF	W2-033	1.21
LTF	W3-083	1.16
903761	W3-128	10.93
235577	WILLOW I 1	-2.94
235578	WILLOW I 2	-9.1
907021	X1-020 C	1.6
907022	X1-020 E	10.69
LTF	X2-042	6.27
LTF	X3-020	1.73
LTF	X3-021	5.42
900404	X3-028 C	29.33
LTF	X3-096	4.16
LTF	X3-097	5.89
LTF	X3-098	5.59
LTF	X4-029D	1.51
LTF	X4-041	5.52
LTF	Y1-002	5.66
LTF	Y1-004	5.95
LTF	Y1-007	4.13
LTF	Y1-041	1.51
LTF	Y1-090	1.01
LTF	Y2-004	2.79
LTF	Y2-005	2.79
LTF	Y2-006	3.03
LTF	Y2-007	5.58
LTF	Y2-008	6.
LTF	Y2-030	1.72
LTF	Y2-031	1.72
LTF	Y2-032	1.72
LTF	Y2-033	3.02
LTF	Y2-034	1.84
LTF	Y2-035	.99
LTF	Y2-036	.99
LTF	Y2-040	5.42

LTF	Y2-049	4.45
LTF	Y2-056	4.52
LTF	Y2-068	29.58
LTF	Y2-069	1.43
LTF	Y2-070	1.43
LTF	Y2-071	1.43
LTF	Y2-072	1.43
LTF	Y2-082	11.32
914381	Y2-095 OP1	10.15

Appendix 42

Bus Number	Bus Name	Full Contribution
242651	05GLENL2	11.87
242896	05KRG1L	6.59
242898	05KRG2L	6.59
315446	Q-065	-22.99
884780	S-058 C	7.86
884781	S-058 E	25.92
LTF	V3-012	7.81
LTF	W3-083	1.67
907021	X1-020 C	2.25
907022	X1-020 E	15.09
LTF	X2-042	9.
LTF	X3-020	2.49
LTF	X3-021	7.7
900404	X3-028 C	42.14
LTF	X3-096	6.
LTF	X3-097	8.5
LTF	X3-098	8.06
LTF	X4-029D	2.14
LTF	X4-041	7.96
LTF	Y1-002	7.96
LTF	Y1-004	9.48
LTF	Y1-007	6.58
LTF	Y1-041	2.14
913331	Y1-049	.37
LTF	Y1-090	1.45
LTF	Y2-004	4.04
LTF	Y2-005	4.04
LTF	Y2-006	4.28
LTF	Y2-007	8.07
LTF	Y2-008	8.52
LTF	Y2-030	2.47
LTF	Y2-031	2.47
LTF	Y2-032	2.47
LTF	Y2-033	4.76
LTF	Y2-034	2.18
LTF	Y2-040	7.7
LTF	Y2-049	6.32
LTF	Y2-056	6.43
LTF	Y2-068	42.68
LTF	Y2-069	2.02
LTF	Y2-070	2.02
LTF	Y2-071	2.02
LTF	Y2-072	2.02
LTF	Y2-082	15.87
914381	Y2-095 OP1	14.58

Appendix 43

Bus Number	Bus Name	Full Contribution
242651	05GLENL2	11.87
242896	05KRG1L	6.59
242898	05KRG2L	6.59
315446	Q-065	-22.99
884780	S-058 C	7.86
884781	S-058 E	25.92
LTF	V3-012	7.81
LTF	W3-083	1.67
907021	X1-020 C	2.25
907022	X1-020 E	15.09
LTF	X2-042	9.
LTF	X3-020	2.49
LTF	X3-021	7.7
900404	X3-028 C	42.14
LTF	X3-096	6.
LTF	X3-097	8.5
LTF	X3-098	8.06
LTF	X4-029D	2.14
LTF	X4-041	7.96
LTF	Y1-002	7.96
LTF	Y1-004	9.48
LTF	Y1-007	6.58
LTF	Y1-041	2.14
913331	Y1-049	.37
LTF	Y1-090	1.45
LTF	Y2-004	4.04
LTF	Y2-005	4.04
LTF	Y2-006	4.28
LTF	Y2-007	8.07
LTF	Y2-008	8.52
LTF	Y2-030	2.47
LTF	Y2-031	2.47
LTF	Y2-032	2.47
LTF	Y2-033	4.76
LTF	Y2-034	2.18
LTF	Y2-040	7.7
LTF	Y2-049	6.32
LTF	Y2-056	6.43
LTF	Y2-068	42.68
LTF	Y2-069	2.02
LTF	Y2-070	2.02
LTF	Y2-071	2.02
LTF	Y2-072	2.02
LTF	Y2-082	15.87
914381	Y2-095 OP1	14.58

Appendix 44

Bus Number	Bus Name	Full Contribution
900404	X3-028 C	3500.
914381	Y2-095 OP1	1211.

Appendix 45

Bus Number	Bus Name	Full Contribution
238545	02ASHTG5	-14.04
238554	02AVONG7	-5.14
238555	02AVONG9	-32.96
238995	02NCUNTD	-.39
239006	02NILEG1	-7.22
239007	02NILEG2	-7.16
239022	02NWCAG3	-5.93
239023	02NWCAG4	-5.91
239024	02NWCAG5	-9.04
242892	05AMG2	2.42
243764	05BSG1	31.78
242904	05CRG3L	18.4
243654	05CVG3	-13.23
242650	05GLENL1	7.3
242651	05GLENL2	19.06
242896	05KRG1L	23.35
242898	05KRG2L	23.35
242894	05MTG1	3.68
243045	05MUSKNG	-84.72
243084	05RUTLAN	.14
246759	05SOLIDA	21.4
242807	05SPORNA	107.33
243382	05TANNER	15.2
242838	05TWELVE	1.29
242947	05WATERF	12.58
251934	08BCKJD2	5.79
251935	08BCKJD3	7.92
251936	08BCKJD4	9.28
251937	08BCKJD5	14.66
251938	08BCKJD6	29.58
251939	08BECJD1	5.79
254007	15ELRMA1	-6.17
254008	15ELRMA2	-6.3
254009	15ELRMA3	-6.83
254010	15ELRMA4	-11.
341853	1JKCT 2G	5.86
341860	1JKCT 4G	4.48
341866	1JKCT 6G	4.48
341936	1LAUR 1G	4.38
292067	FDNS	.24
247535	R-076	.28
892311	V1-035	6.19
LTF	V3-012	38.45
LTF	W2-033	36.08
903761	W3-128	372.01

235577	WILLOW I 1	-3.86
235578	WILLOW I 2	-11.93
909001	X2-006 C1OP1	39.22
909002	X2-006 C2OP1	31.37
LTF	X2-042	35.1
900404	X3-028 C	188.72
910751	X3-051	58.56
LTF	X3-096	24.56
LTF	X3-097	34.82
LTF	X3-098	33.01
912161	X4-025	8.6
LTF	X4-041	32.61
LTF	Y1-002	23.17
LTF	Y1-004	48.3
913031	Y1-006 C	.74
LTF	Y1-007	33.54
913331	Y1-049	.46
LTF	Y2-004	16.51
LTF	Y2-005	16.51
LTF	Y2-006	18.19
LTF	Y2-007	33.02
LTF	Y2-008	36.15
LTF	Y2-033	26.3
LTF	Y2-034	24.51
LTF	Y2-056	21.25
LTF	Y2-068	174.75
LTF	Y2-082	30.86
914341	Y2-086	4.74
914381	Y2-095 OP1	65.3

Appendix 46

Bus Number	Bus Name	Full Contribution
315446	Q-065	28.92
884780	S-058 C	5.94
884781	S-058 E	19.57
218360	SEWAREN1	-2.46
218361	SEWAREN2	-2.8
218362	SEWAREN3	-2.54
218363	SEWAREN4	-2.94
218364	SEWAREN6	-2.63
LTF	V3-012	7.68
901451	W1-116 C	.01
901452	W1-116 E	.96
LTF	W3-083	1.28
907021	X1-020 C	1.65
907022	X1-020 E	11.05
907991	X1-078	12.45
LTF	X2-042	6.75
LTF	X3-020	2.
LTF	X3-021	5.52
900404	X3-028 C	31.01
910941	X3-087 C OP1	10.93
910942	X3-087 E OP1	2.5
LTF	X3-096	4.82
LTF	X3-097	6.83
LTF	X3-098	6.48
LTF	X4-029D	1.66
912211	X4-035 OP1	10.9
912221	X4-039	17.31
LTF	X4-041	6.4
LTF	Y1-002	5.96
LTF	Y1-004	9.35
LTF	Y1-007	6.49
LTF	Y1-041	1.66
LTF	Y2-004	3.25
LTF	Y2-005	3.25
LTF	Y2-006	3.17
LTF	Y2-007	6.51
LTF	Y2-008	6.37
LTF	Y2-030	1.81
LTF	Y2-031	1.81
LTF	Y2-032	1.81
LTF	Y2-033	4.71
LTF	Y2-034	5.56
LTF	Y2-035	2.98
LTF	Y2-036	2.98
LTF	Y2-040	5.52

LTF	Y2-049	4.54
LTF	Y2-056	4.99
LTF	Y2-068	34.28
LTF	Y2-069	1.46
LTF	Y2-070	1.46
LTF	Y2-071	1.46
LTF	Y2-072	1.46
LTF	Y2-082	11.67
914381	Y2-095 OP1	10.73

Appendix 47

Bus Number	Bus Name	Full Contribution
242906	05CLAY-1	.2
242907	05CLAY-2	.2
242650	05GLENL1	7.04
242651	05GLENL2	18.41
293730	O-031	.01
315446	Q-065	-12.5
884780	S-058 C	4.7
884781	S-058 E	15.49
LTF	V3-012	6.52
LTF	W3-083	1.02
LTF	X2-042	5.56
LTF	X3-020	1.66
LTF	X3-021	4.21
900404	X3-028 C	25.93
LTF	X3-096	4.
LTF	X3-097	5.67
LTF	X3-098	5.37
LTF	X4-029D	1.34
LTF	X4-041	5.31
LTF	Y1-002	4.72
LTF	Y1-004	8.24
913031	Y1-006 C	.47
LTF	Y1-007	5.72
LTF	Y1-041	1.34
913331	Y1-049	.91
LTF	Y2-004	2.7
LTF	Y2-005	2.7
LTF	Y2-006	2.64
LTF	Y2-007	5.41
LTF	Y2-008	5.31
LTF	Y2-030	1.57
LTF	Y2-031	1.57
LTF	Y2-032	1.57
LTF	Y2-033	4.2
LTF	Y2-034	3.37
LTF	Y2-035	1.81
LTF	Y2-036	1.81
LTF	Y2-040	4.21
LTF	Y2-049	3.46
LTF	Y2-056	4.02
LTF	Y2-068	28.45
LTF	Y2-069	1.13
LTF	Y2-070	1.13
LTF	Y2-071	1.13
LTF	Y2-072	1.13

LTF	Y2-082	9.08
914381	Y2-095 OP1	8.97

Appendix 48

Bus Number	Bus Name	Full Contribution
315094	1CHESPK1	1.78
315095	1CHESPK2	1.78
315096	1CHESPK3	2.38
315097	1CHESPK4	3.35
224026	C U1	1.46
224027	C U2	1.46
224028	C U3	1.69
224029	C U4	1.69
224030	C U5	1.69
315446	Q-065	28.34
884780	S-058 C	5.58
884781	S-058 E	18.39
218360	SEWAREN1	-2.39
218361	SEWAREN2	-2.72
218362	SEWAREN3	-2.46
218363	SEWAREN4	-2.85
218364	SEWAREN6	-2.55
294970	U1-048	.
LTF	V3-012	7.29
292630	V3-017	11.48
901451	W1-116 C	.01
902601	W2-094 C	.84
LTF	W3-083	1.21
905321	W4-044	11.48
907991	X1-078	12.09
LTF	X2-042	6.36
LTF	X3-020	1.89
LTF	X3-021	5.15
900404	X3-028 C	29.22
910871	X3-076 OP1	7.74
910941	X3-087 C OP1	12.28
LTF	X3-096	4.55
LTF	X3-097	6.45
LTF	X3-098	6.12
LTF	X4-029D	1.57
912211	X4-035 OP1	12.3
912221	X4-039	16.96
LTF	X4-041	6.04
LTF	Y1-002	5.61
LTF	Y1-004	8.88
LTF	Y1-007	6.17
LTF	Y1-041	1.57
LTF	Y1-090	1.1
LTF	Y2-004	3.07
LTF	Y2-005	3.07

LTF	Y2-006	2.99
LTF	Y2-007	6.15
LTF	Y2-008	6.
LTF	Y2-030	1.7
LTF	Y2-031	1.7
LTF	Y2-032	1.7
LTF	Y2-033	4.48
LTF	Y2-034	5.34
LTF	Y2-035	2.86
LTF	Y2-036	2.86
LTF	Y2-040	5.15
LTF	Y2-049	4.23
LTF	Y2-056	4.7
LTF	Y2-068	32.37
LTF	Y2-069	1.36
LTF	Y2-070	1.36
LTF	Y2-071	1.36
LTF	Y2-072	1.36
LTF	Y2-082	10.95
914381	Y2-095 OP1	10.11

Appendix 49

Bus Number	Bus Name	Full Contribution
247931	U3-002 E	12.52
891221	U4-038 C	1.11
891222	U4-038 E	7.45
891231	U4-039 C1	1.07
891241	U4-039 C2	1.07
891251	U4-039 C3	1.07
891261	U4-039 C4	1.07
891232	U4-039 E1	7.18
891242	U4-039 E2	7.18
891252	U4-039 E3	7.18
891262	U4-039 E4	7.18
LTF	V3-012	2.28
LTF	W2-033	3.58
907021	X1-020 C	4.97
907022	X1-020 E	33.24
LTF	X2-042	5.67
900404	X3-028 C	28.95
LTF	X3-096	1.39
LTF	X3-097	1.97
LTF	X3-098	1.87
LTF	X4-041	1.85
LTF	Y1-004	2.86
LTF	Y1-007	1.98
LTF	Y2-006	3.01
LTF	Y2-007	1.85
LTF	Y2-008	5.67
LTF	Y2-030	1.37
LTF	Y2-031	1.37
LTF	Y2-032	1.37
LTF	Y2-033	1.53
LTF	Y2-068	9.9
914381	Y2-095 OP1	10.01

Appendix 50

Bus Number	Bus Name	Full Contribution
242651	05GLENL2	11.87
242896	05KRG1L	6.59
242898	05KRG2L	6.59
315446	Q-065	-22.99
884780	S-058 C	7.86
884781	S-058 E	25.92
LTF	V3-012	7.81
LTF	W3-083	1.67
907021	X1-020 C	2.25
907022	X1-020 E	15.09
LTF	X2-042	9.
LTF	X3-020	2.49
LTF	X3-021	7.7
900404	X3-028 C	42.14
LTF	X3-096	6.
LTF	X3-097	8.5
LTF	X3-098	8.06
LTF	X4-029D	2.14
LTF	X4-041	7.96
LTF	Y1-002	7.96
LTF	Y1-004	9.48
LTF	Y1-007	6.58
LTF	Y1-041	2.14
913331	Y1-049	.37
LTF	Y1-090	1.45
LTF	Y2-004	4.04
LTF	Y2-005	4.04
LTF	Y2-006	4.28
LTF	Y2-007	8.07
LTF	Y2-008	8.52
LTF	Y2-030	2.47
LTF	Y2-031	2.47
LTF	Y2-032	2.47
LTF	Y2-033	4.76
LTF	Y2-034	2.18
LTF	Y2-040	7.7
LTF	Y2-049	6.32
LTF	Y2-056	6.43
LTF	Y2-068	42.68
LTF	Y2-069	2.02
LTF	Y2-070	2.02
LTF	Y2-071	2.02
LTF	Y2-072	2.02
LTF	Y2-082	15.87
914381	Y2-095 OP1	14.58

Appendix 51

Bus Number	Bus Name	Full Contribution
247931	U3-002 E	12.56
891221	U4-038 C	1.12
891222	U4-038 E	7.47
891231	U4-039 C1	1.08
891241	U4-039 C2	1.08
891251	U4-039 C3	1.08
891261	U4-039 C4	1.08
891232	U4-039 E1	7.21
891242	U4-039 E2	7.21
891252	U4-039 E3	7.21
891262	U4-039 E4	7.21
LTF	V3-012	2.18
LTF	W2-033	3.52
907021	X1-020 C	5.
907022	X1-020 E	33.49
LTF	X2-042	5.79
900404	X3-028 C	29.26
LTF	X3-096	1.09
LTF	X3-097	1.55
LTF	X3-098	1.47
LTF	X4-041	1.45
LTF	Y1-004	2.82
LTF	Y1-007	1.96
LTF	Y2-006	3.06
LTF	Y2-007	1.43
LTF	Y2-008	5.77
LTF	Y2-030	1.4
LTF	Y2-031	1.4
LTF	Y2-032	1.4
LTF	Y2-033	1.5
LTF	Y2-068	7.78
914381	Y2-095 OP1	10.12

Appendix 52

Bus Number	Bus Name	Full Contribution
242896	05KRG1L	5.33
242898	05KRG2L	5.33
292860	M-024 C	.15
884780	S-058 C	2.84
884781	S-058 E	9.37
292846	U1-075	5.09
LTF	V3-012	3.39
LTF	W2-033	.76
LTF	X2-042	3.34
LTF	X3-020	.97
LTF	X3-021	2.26
900404	X3-028 C	16.14
LTF	X3-096	2.34
LTF	X3-097	3.32
LTF	X3-098	3.15
LTF	X4-029D	.8
LTF	X4-041	3.11
LTF	Y1-002	2.87
LTF	Y1-004	4.17
LTF	Y1-007	2.89
LTF	Y1-041	.8
LTF	Y2-004	1.58
LTF	Y2-005	1.58
LTF	Y2-006	1.63
LTF	Y2-007	3.16
LTF	Y2-008	3.25
LTF	Y2-030	.96
LTF	Y2-031	.96
LTF	Y2-032	.96
LTF	Y2-033	2.16
LTF	Y2-034	1.79
LTF	Y2-035	.96
LTF	Y2-036	.96
LTF	Y2-040	2.26
LTF	Y2-049	1.85
LTF	Y2-056	2.39
LTF	Y2-068	16.67
LTF	Y2-069	.63
LTF	Y2-070	.63
LTF	Y2-071	.63
LTF	Y2-072	.63
LTF	Y2-082	5.38
914381	Y2-095 OP1	5.58

Appendix 53

Bus Number	Bus Name	Full Contribution
243764	05BSG1	60.46
242904	05CRG3L	38.21
243859	05FR11_E	3.11
243862	05FR12_E	3.06
243864	05FR21_E	3.27
247924	05FRCS22_E	3.13
247925	05FRCS-3_E	6.34
247926	05FRCS-4_E	4.77
242650	05GLENL1	13.59
242651	05GLENL2	35.48
243186	05GVG1	8.76
243187	05GVG2	8.76
242896	05KRG1L	36.96
242898	05KRG2L	36.96
242894	05MTG1	9.58
246759	05SOLIDA	39.81
242807	05SPORNA	116.23
243382	05TANNER	39.72
251934	08BCKJD2	13.63
251935	08BCKJD3	18.59
251936	08BCKJD4	21.78
251937	08BCKJD5	34.5
251938	08BCKJD6	62.37
251939	08BECJD1	13.63
253188	09OHGEN1	6.8
253189	09OHGEN2	6.42
253191	09OHGEN4	7.56
341853	1JKCT 2G	14.34
341860	1JKCT 4G	10.97
341866	1JKCT 6G	10.97
341936	1LAUR 1G	10.24
235564	ALBRIGHT 1	-9.38
235565	ALBRIGHT 2	-9.38
235566	ALBRIGHT 3	-17.61
244159	BUCK	1.43
244160	BYLLESBY	3.81
292067	FDNS	.41
244891	LONDONHY	3.14
244861	MARMETHY	3.45
244761	RACINE	8.91
235575	RIVESVILLE 5	-5.07
235576	RIVESVILLE 6	-12.45
244467	SUMMERVL	11.91
887741	U1-087 C	2.43
887742	U1-087 E	16.29

887751	U1-088 C	1.62
887752	U1-088 E	10.86
247538	U2-062 C	3.09
247912	U2-062 E	20.73
247508	U2-090 C	3.38
247915	U2-090 E	22.63
247931	U3-002 E	22.06
891221	U4-038 C	1.64
891222	U4-038 E	10.97
891231	U4-039 C1	2.93
891241	U4-039 C2	2.93
891251	U4-039 C3	2.93
891261	U4-039 C4	2.93
891232	U4-039 E1	19.61
891242	U4-039 E2	19.61
891252	U4-039 E3	19.61
891262	U4-039 E4	19.61
892311	V1-035	9.79
247543	V3-007 C	3.38
247919	V3-007 E	22.63
247544	V3-008 C	3.38
247920	V3-008 E	22.63
247545	V3-009 C	3.38
247921	V3-009 E	22.63
LTF	V3-012	93.9
894781	V3-053 C	2.44
894782	V3-053 E	16.36
900261	V4-033 C1	2.55
900271	V4-033 C2	2.55
900262	V4-033 E1	17.07
900272	V4-033 E2	17.07
904722	V4-073 E	.2
LTF	W2-033	34.89
902332	W2-040 E	1.65
903761	W3-128	105.94
903942	W3-170 E	1.7
905041	W4-004 C	1.53
905042	W4-004 E	10.26
905081	W4-008 C	1.53
905082	W4-008 E	10.26
905272	W4-036 E	1.7
235577	WILLOW I 1	-12.82
235578	WILLOW I 2	-39.66
244873	WINFIELD	4.
909001	X2-006 C1OP1	76.95
909002	X2-006 C2OP1	61.56
LTF	X2-042	96.97

LTF	X3-020	28.31
LTF	X3-021	48.38
900404	X3-028 C	494.17
910751	X3-051	157.35
LTF	X3-096	68.1
LTF	X3-097	96.57
LTF	X3-098	91.54
912161	X4-025	15.21
LTF	X4-041	90.44
LTF	Y1-002	81.04
LTF	Y1-004	114.69
913031	Y1-006 C	1.48
913032	Y1-006 E	9.9
LTF	Y1-007	79.65
913331	Y1-049	.88
913342	Y1-054 E	2.84
LTF	Y2-004	45.84
LTF	Y2-005	45.84
LTF	Y2-006	48.57
LTF	Y2-007	91.68
LTF	Y2-008	96.78
LTF	Y2-030	28.95
LTF	Y2-031	28.95
LTF	Y2-032	28.95
LTF	Y2-033	60.97
LTF	Y2-034	49.79
LTF	Y2-035	26.7
LTF	Y2-036	26.7
LTF	Y2-040	48.38
LTF	Y2-049	39.73
LTF	Y2-056	68.02
LTF	Y2-068	484.59
LTF	Y2-082	143.47
914321	Y2-084 C OP1	.42
914322	Y2-084 E OP1	7.57
914341	Y2-086	10.19
914381	Y2-095 OP1	170.98

Appendix 54

Bus Number	Bus Name	Full Contribution
242893	05AMG3	7.59
243764	05BSG1	59.39
242904	05CRG3L	39.51
242922	05FLTLCK	5.05
242650	05GLENL1	11.81
242651	05GLENL2	30.84
243186	05GVG1	8.69
243187	05GVG2	8.69
242896	05KRG1L	34.01
242898	05KRG2L	34.01
242894	05MTG1	9.49
246759	05SOLIDA	38.74
242807	05SPORNA	103.43
243382	05TANNER	38.25
251934	08BCKJD2	12.95
251935	08BCKJD3	17.68
251936	08BCKJD4	20.72
251937	08BCKJD5	32.8
251938	08BCKJD6	59.13
251939	08BECJD1	12.95
253188	09OHGEN1	6.42
253189	09OHGEN2	6.06
253191	09OHGEN4	7.15
341853	1JKCT 2G	14.02
341860	1JKCT 4G	10.73
341866	1JKCT 6G	10.73
341936	1LAUR 1G	10.22
235564	ALBRIGHT 1	-8.77
235565	ALBRIGHT 2	-8.77
235566	ALBRIGHT 3	-16.47
274865	CAYUG;1U C1	3.51
274863	CAYUG;1U E1	14.04
274866	CAYUG;2U C2	3.51
292535	CE23CL12	.46
292536	CE23EL12	1.85
292067	FDNS	.39
293120	N-021 C	.14
293130	N-022 C	.25
293140	N-023 C	.25
293150	N-024 C	.25
293160	N-025 C	.25
293190	O-003 C	.21
293513	O-009 C1	2.4
293514	O-009 C2	1.22
293515	O-009 C3	1.34

294500	P-020 C	4.91
295103	P-024 C	.47
295106	P-025 C	.47
294670	P-037 C	3.28
294700	P-040 C	.47
290089	Q-039 C	3.45
882331	Q-067B	.4
295990	R-016 C1	1.46
295992	R-016 C2	1.46
296308	R-030 C1	3.91
296271	R-030 C2	3.91
296125	R-030 C3	3.96
296335	R-033 1	20.38
296336	R-033 2	20.38
296346	R-033 3	14.76
296348	R-033 4	14.76
296827	R-079 C1	3.45
296741	R-079 C2	3.45
235575	RIVESVILLE 5	-4.79
235576	RIVESVILLE 6	-11.76
247536	S-071 C	2.9
885861	T-074 1	.92
885862	T-074 2	.92
885961	T-099 C	2.32
886001	T-105 C	8.19
886211	T-143 C1	2.92
886221	T-143 C2	2.92
886261	T-148 C	2.32
292735	T-183 C	4.84
292741	T-184 C	4.84
887741	U1-087 C	2.39
887751	U1-088 C	1.6
247538	U2-062 C	3.
247508	U2-090 C	3.28
890511	U3-021 1	5.77
890521	U3-021 2	5.77
891021	U4-003 C	3.14
891131	U4-027	11.72
891211	U4-037 C	3.18
891221	U4-038 C	1.6
891231	U4-039 C1	2.87
891241	U4-039 C2	2.87
891251	U4-039 C3	2.87
891261	U4-039 C4	2.87
892051	V1-022 1	12.58
892061	V1-022 2	12.58
892311	V1-035	9.01

893031	V2-008	73.32
247543	V3-007 C	3.28
247544	V3-008 C	3.28
247545	V3-009 C	3.28
LTF	V3-012	95.54
894581	V3-015 C	4.46
894781	V3-053 C	2.38
900261	V4-033 C1	2.47
900271	V4-033 C2	2.47
900371	V4-046	2.32
900381	V4-047	2.32
LTF	W2-033	30.47
902491	W2-079 C	.85
903432	W3-046	6.2
903442	W3-046	5.74
903452	W3-046	6.2
903462	W3-046	5.74
903761	W3-128	77.24
903791	W3-132 C	.86
905041	W4-004 C	1.49
905071	W4-005 C	5.47
905081	W4-008 C	1.49
905471	W4-084	.46
905491	W4-086	.24
235577	WILLOW I 1	-12.53
235578	WILLOW I 2	-38.77
907021	X1-020 C	23.37
907141	X1-045	.34
907361	X1-087	2.2
909001	X2-006 C1OP1	76.05
909002	X2-006 C2OP1	60.84
909041	X2-019 C	20.72
LTF	X2-042	95.69
LTF	X3-020	28.03
LTF	X3-021	50.38
900404	X3-028 C	485.41
910711	X3-045 1	1.83
910721	X3-045 2	1.84
910731	X3-046 1	1.89
910741	X3-046 2	1.89
910751	X3-051	155.93
LTF	X3-096	67.42
LTF	X3-097	95.61
LTF	X3-098	90.62
912161	X4-025	14.44
LTF	X4-041	89.53
LTF	Y1-002	79.87

LTF	Y1-004	117.29
913031	Y1-006 C	1.54
LTF	Y1-007	81.45
913331	Y1-049	.8
LTF	Y2-004	45.43
LTF	Y2-005	45.43
LTF	Y2-006	47.5
LTF	Y2-007	90.86
LTF	Y2-008	94.83
LTF	Y2-030	28.26
LTF	Y2-031	28.26
LTF	Y2-032	28.26
LTF	Y2-033	61.83
LTF	Y2-034	50.92
LTF	Y2-035	27.3
LTF	Y2-036	27.3
LTF	Y2-040	50.38
LTF	Y2-049	41.37
LTF	Y2-056	67.25
LTF	Y2-068	479.75
LTF	Y2-082	142.65
914321	Y2-084 C OP1	.41
914341	Y2-086	10.27
914381	Y2-095 OP1	167.95

Appendix 55

Bus Number	Bus Name	Full Contribution
242906	05CLAY-1	.2
242907	05CLAY-2	.2
242650	05GLENL1	7.04
242651	05GLENL2	18.41
293730	O-031	.01
315446	Q-065	-12.5
884780	S-058 C	4.7
884781	S-058 E	15.49
LTF	V3-012	6.52
LTF	W3-083	1.02
LTF	X2-042	5.56
LTF	X3-020	1.66
LTF	X3-021	4.21
900404	X3-028 C	25.93
LTF	X3-096	4.
LTF	X3-097	5.67
LTF	X3-098	5.37
LTF	X4-029D	1.34
LTF	X4-041	5.31
LTF	Y1-002	4.72
LTF	Y1-004	8.24
913031	Y1-006 C	.47
LTF	Y1-007	5.72
LTF	Y1-041	1.34
913331	Y1-049	.91
LTF	Y1-090	.97
LTF	Y2-004	2.7
LTF	Y2-005	2.7
LTF	Y2-006	2.64
LTF	Y2-007	5.41
LTF	Y2-008	5.31
LTF	Y2-030	1.57
LTF	Y2-031	1.57
LTF	Y2-032	1.57
LTF	Y2-033	4.2
LTF	Y2-034	3.37
LTF	Y2-035	1.81
LTF	Y2-036	1.81
LTF	Y2-040	4.21
LTF	Y2-049	3.46
LTF	Y2-056	4.02
LTF	Y2-068	28.45
LTF	Y2-069	1.13
LTF	Y2-070	1.13
LTF	Y2-071	1.13

LTF	Y2-072	1.13
LTF	Y2-082	9.08
914381	Y2-095 OP1	8.97

Appendix 56

Bus Number	Bus Name	Full Contribution
243858	05FR11_C	.09
243861	05FR12_C	.09
243863	05FR21_C	.09
243866	05FRCS22_C	.09
243870	05FRCS-3_C	.18
243873	05FRCS-4_C	.14
246908	05MLCS1_C	.21
246910	05MLCS-2_C	.21
243442	05RKG1	2.29
243443	05RKG2	2.26
292416	T-127 C	.21
292735	T-183 C	8.85
292741	T-184 C	8.85
887741	U1-087 C	3.73
887751	U1-088 C	2.48
891021	U4-003 C	5.75
LTF	V3-012	11.64
LTF	W2-033	6.92
LTF	X2-042	34.75
LTF	X3-020	5.86
900404	X3-028 C	257.18
LTF	X3-096	14.09
LTF	X3-097	19.98
LTF	X3-098	18.94
LTF	X4-041	18.71
LTF	Y1-004	12.88
LTF	Y1-007	8.95
LTF	Y2-004	9.69
LTF	Y2-005	9.69
LTF	Y2-006	14.7
LTF	Y2-007	19.38
LTF	Y2-008	34.75
LTF	Y2-033	6.76
LTF	Y2-068	100.26
914321	Y2-084 C OP1	.64
914381	Y2-095 OP1	88.98

Appendix 57

Bus Number	Bus Name	Full Contribution
247931	U3-002 E	13.65
891221	U4-038 C	1.22
891222	U4-038 E	8.13
891231	U4-039 C1	1.42
891241	U4-039 C2	1.42
891251	U4-039 C3	1.42
891261	U4-039 C4	1.42
891232	U4-039 E1	9.48
891242	U4-039 E2	9.48
891252	U4-039 E3	9.48
891262	U4-039 E4	9.48
LTF	V3-012	2.11
LTF	W2-033	3.8
907021	X1-020 C	5.56
907022	X1-020 E	37.22
LTF	X2-042	5.44
900404	X3-028 C	28.98
LTF	X3-097	1.13
LTF	Y1-004	2.8
LTF	Y1-007	1.95
LTF	Y2-006	3.01
LTF	Y2-008	5.41
LTF	Y2-030	1.47
LTF	Y2-031	1.47
LTF	Y2-032	1.47
LTF	Y2-033	1.49
LTF	Y2-034	1.14
LTF	Y2-068	5.69
914381	Y2-095 OP1	10.03

Appendix 58

Bus Number	Bus Name	Full Contribution
247528	05COVRT1	1.2
247529	05COVRT2	1.2
247530	05COVRT3	1.2
247531	05COVRT4	.72
247532	05COVRT5	.72
247533	05COVRT6	.72
315094	1CHESPK1	-2.06
315095	1CHESPK2	-2.06
315096	1CHESPK3	-2.75
315097	1CHESPK4	-3.88
315090	1YORKTN1	-2.43
315091	1YORKTN2	-2.52
314572	3EMPORIA	-.25
314704	3LAWRENC	-.89
314541	3WATKINS	-.28
315446	Q-065	-12.26
884780	S-058 C	4.38
884781	S-058 E	14.43
LTF	V2-031	.64
LTF	V2-032	.63
LTF	V3-012	8.28
LTF	W3-083	.98
LTF	W4-049	1.94
LTF	W4-050	1.94
907021	X1-020 C	1.17
907022	X1-020 E	7.82
907092	X1-038 E	-2.14
LTF	X2-042	5.15
LTF	X3-020	1.7
LTF	X3-021	3.92
900404	X3-028 C	23.45
LTF	X3-096	4.1
LTF	X3-097	5.81
LTF	X3-098	5.51
LTF	X4-029D	1.31
LTF	X4-041	5.44
LTF	Y1-002	4.36
LTF	Y1-004	10.19
LTF	Y1-007	7.08
LTF	Y1-041	1.31
LTF	Y1-089	.58
LTF	Y1-090	.99
LTF	Y2-004	2.78
LTF	Y2-005	2.78
LTF	Y2-006	2.41

LTF	Y2-007	5.56
LTF	Y2-008	4.9
LTF	Y2-030	1.39
LTF	Y2-031	1.39
LTF	Y2-032	1.39
LTF	Y2-033	5.2
LTF	Y2-034	8.89
LTF	Y2-035	4.77
LTF	Y2-036	4.77
LTF	Y2-040	3.92
LTF	Y2-049	3.22
LTF	Y2-056	3.94
LTF	Y2-068	29.14
LTF	Y2-069	1.04
LTF	Y2-070	1.04
LTF	Y2-071	1.04
LTF	Y2-072	1.04
LTF	Y2-082	8.27
914381	Y2-095 OP1	8.11

Appendix 59

Bus Number	Bus Name	Full Contribution
254009	15ELRMA3	-4.13
254010	15ELRMA4	-6.67
884780	S-058 C	5.89
884781	S-058 E	19.43
LTF	V3-012	5.22
LTF	X2-042	6.25
LTF	X3-020	1.8
LTF	X3-021	5.22
900404	X3-028 C	29.86
LTF	X3-096	4.32
LTF	X3-097	6.13
LTF	X3-098	5.81
LTF	X4-029D	1.58
LTF	X4-041	5.74
LTF	Y1-002	5.94
LTF	Y1-004	6.16
LTF	Y1-007	4.28
LTF	Y1-041	1.58
LTF	Y2-004	2.91
LTF	Y2-005	2.91
LTF	Y2-006	3.08
LTF	Y2-007	5.81
LTF	Y2-008	6.11
LTF	Y2-030	1.72
LTF	Y2-031	1.72
LTF	Y2-032	1.72
LTF	Y2-033	3.21
LTF	Y2-034	2.22
LTF	Y2-040	5.22
LTF	Y2-049	4.29
LTF	Y2-056	4.75
LTF	Y2-068	30.76
LTF	Y2-069	1.41
LTF	Y2-070	1.41
LTF	Y2-071	1.41
LTF	Y2-072	1.41
LTF	Y2-082	11.66
914381	Y2-095 OP1	10.33

Appendix 60

Bus Number	Bus Name	Full Contribution
LTF	V3-012	3.29
LTF	W2-033	1.39
905041	W4-004 C	1.17
905042	W4-004 E	7.8
905081	W4-008 C	1.17
905082	W4-008 E	7.8
LTF	X2-042	12.09
LTF	X3-020	1.26
900404	X3-028 C	30.87
LTF	X3-096	3.04
LTF	X3-097	4.31
LTF	X3-098	4.08
LTF	X4-041	4.03
LTF	Y1-004	3.72
LTF	Y1-007	2.58
LTF	Y2-004	2.11
LTF	Y2-005	2.11
LTF	Y2-006	7.87
LTF	Y2-007	4.22
LTF	Y2-008	12.16
LTF	Y2-030	1.33
LTF	Y2-031	1.33
LTF	Y2-032	1.33
LTF	Y2-033	1.96
LTF	Y2-068	21.61
914381	Y2-095 OP1	10.68

Appendix 61

Bus Number	Bus Name	Full Contribution
247931	U3-002 E	12.52
891221	U4-038 C	1.11
891222	U4-038 E	7.45
891231	U4-039 C1	1.07
891241	U4-039 C2	1.07
891251	U4-039 C3	1.07
891261	U4-039 C4	1.07
891232	U4-039 E1	7.18
891242	U4-039 E2	7.18
891252	U4-039 E3	7.18
891262	U4-039 E4	7.18
LTF	V3-012	2.28
LTF	W2-033	3.58
907021	X1-020 C	4.97
907022	X1-020 E	33.24
LTF	X2-042	5.67
900404	X3-028 C	28.95
LTF	X3-096	1.39
LTF	X3-097	1.97
LTF	X3-098	1.87
LTF	X4-041	1.85
LTF	Y1-004	2.86
LTF	Y1-007	1.98
LTF	Y2-006	3.01
LTF	Y2-007	1.85
LTF	Y2-008	5.67
LTF	Y2-030	1.37
LTF	Y2-031	1.37
LTF	Y2-032	1.37
LTF	Y2-033	1.53
LTF	Y2-034	1.02
LTF	Y2-068	9.9
914381	Y2-095 OP1	10.01

Appendix 62

Bus Number	Bus Name	Full Contribution
243858	05FR11_C	.04
243861	05FR12_C	.04
243863	05FR21_C	.04
243866	05FRCS22_C	.04
243870	05FRCS-3_C	.08
243873	05FRCS-4_C	.06
246908	05MLCS1_C	.07
246910	05MLCS-2_C	.07
243442	05RKG1	20.03
243443	05RKG2	19.73
274848	CAMPG;RU	.04
274865	CAYUG;1U C1	1.69
274863	CAYUG;1U E1	6.76
274866	CAYUG;2U C2	1.69
274699	CORDO;1C	.2
274701	CORDO;1S	.22
274700	CORDO;2C	.2
274650	KINCA;1U	1.39
274651	KINCA;2U	1.39
293664	O-024 C	.03
293666	O-024 C	.06
274851	O-035 C	.02
294400	P-011 C1	.03
294409	P-011 C2	.03
294700	P-040 C	.21
290089	Q-039 C	1.56
274662	QUAD ;1U	1.18
274663	QUAD ;2U	1.18
296308	R-030 C1	2.11
296271	R-030 C2	2.11
296125	R-030 C3	2.13
290261	S-027 C	.07
290265	S-028 C	.07
886001	T-105 C	3.94
292416	T-127 C	.07
886211	T-143 C1	1.28
886221	T-143 C2	1.28
292735	T-183 C	2.87
292741	T-184 C	2.87
887741	U1-087 C	1.58
887751	U1-088 C	1.06
891021	U4-003 C	1.87
891131	U4-027	5.19
891211	U4-037 C	2.6
893031	V2-008	60.83

LTF	V3-012	33.32
905071	W4-005 C	3.78
LTF	X2-042	69.22
LTF	X3-020	25.55
900404	X3-028 C	1544.06
910731	X3-046 1	.83
910741	X3-046 2	.83
LTF	X3-096	61.47
LTF	X3-097	87.16
LTF	X3-098	82.62
LTF	X4-041	81.62
LTF	Y1-004	29.68
LTF	Y2-004	42.73
LTF	Y2-005	42.73
LTF	Y2-006	40.79
LTF	Y2-007	85.47
LTF	Y2-008	70.19
LTF	Y2-068	437.37
914321	Y2-084 C OP1	.27
914381	Y2-095 OP1	534.24

Appendix 63

Bus Number	Bus Name	Full Contribution
247931	U3-002 E	12.56
891221	U4-038 C	1.12
891222	U4-038 E	7.47
891231	U4-039 C1	1.08
891241	U4-039 C2	1.08
891251	U4-039 C3	1.08
891261	U4-039 C4	1.08
891232	U4-039 E1	7.21
891242	U4-039 E2	7.21
891252	U4-039 E3	7.21
891262	U4-039 E4	7.21
LTF	V3-012	2.18
LTF	W2-033	3.52
907021	X1-020 C	5.
907022	X1-020 E	33.49
LTF	X2-042	5.79
900404	X3-028 C	29.26
LTF	X3-096	1.09
LTF	X3-097	1.55
LTF	X3-098	1.47
LTF	X4-041	1.45
LTF	Y1-004	2.82
LTF	Y1-007	1.96
LTF	Y2-006	3.06
LTF	Y2-007	1.43
LTF	Y2-008	5.77
LTF	Y2-030	1.4
LTF	Y2-031	1.4
LTF	Y2-032	1.4
LTF	Y2-033	1.5
LTF	Y2-034	1.08
LTF	Y2-068	7.78
914381	Y2-095 OP1	10.12

Appendix 64

Bus Number	Bus Name	Full Contribution
247510	U3-002 C	.05
891221	U4-038 C	1.25
891231	U4-039 C1	2.17
891241	U4-039 C2	2.17
891251	U4-039 C3	2.17
891261	U4-039 C4	2.17
LTF	V3-012	4.11
LTF	W2-033	6.31
907021	X1-020 C	10.83
LTF	X2-042	12.76
900404	X3-028 C	58.2
LTF	X3-096	2.54
LTF	X3-097	3.6
LTF	X3-098	3.41
LTF	X4-041	3.37
LTF	Y1-004	5.18
LTF	Y1-007	3.6
LTF	Y2-004	1.7
LTF	Y2-005	1.7
LTF	Y2-006	5.01
LTF	Y2-007	3.39
LTF	Y2-008	12.78
LTF	Y2-030	2.44
LTF	Y2-031	2.44
LTF	Y2-032	2.44
LTF	Y2-033	2.77
LTF	Y2-034	1.92
LTF	Y2-068	18.05
914381	Y2-095 OP1	20.14

Appendix 65

Bus Number	Bus Name	Full Contribution
243764	05BSG1	58.48
242904	05CRG3L	37.72
242650	05GLENL1	13.22
242651	05GLENL2	34.53
243186	05GVG1	9.12
243187	05GVG2	9.12
242896	05KRG1L	34.83
242898	05KRG2L	34.83
242894	05MTG1	9.69
246759	05SOLIDA	38.07
242807	05SPORNA	97.16
244159	BUCK	1.4
244160	BYLLESBY	3.74
292067	FDNS	.4
244891	LONDONHY	2.97
244861	MARMETHY	3.28
244761	RACINE	7.7
235575	RIVESVILLE 5	-5.31
235576	RIVESVILLE 6	-13.05
884780	S-058 C	103.43
884781	S-058 E	341.03
886001	T-105 C	4.62
886002	T-105 E	18.47
890570	U3-026 C1	36.35
890571	U3-026 C2	36.35
891231	U4-039 C1	3.48
891241	U4-039 C2	3.48
891251	U4-039 C3	3.48
891261	U4-039 C4	3.48
891232	U4-039 E1	23.33
891242	U4-039 E2	23.33
891252	U4-039 E3	23.33
891262	U4-039 E4	23.33
892311	V1-035	9.23
LTF	V3-012	98.08
LTF	W2-033	28.42
235577	WILLOW I 1	-13.61
235578	WILLOW I 2	-42.13
244873	WINFIELD	3.85
907021	X1-020 C	29.85
907022	X1-020 E	199.74
909001	X2-006 C1OP1	75.11
909002	X2-006 C2OP1	60.09
LTF	X2-042	104.45
LTF	X3-020	31.92

LTF	X3-021	53.88
900404	X3-028 C	537.77
910751	X3-051	173.52
LTF	X3-096	76.78
LTF	X3-097	108.87
LTF	X3-098	103.2
912161	X4-025	13.68
LTF	X4-029D	27.54
LTF	X4-041	101.95
LTF	Y1-002	101.47
LTF	Y1-004	117.9
913031	Y1-006 C	1.46
913032	Y1-006 E	9.74
LTF	Y1-007	81.88
LTF	Y1-041	27.54
LTF	Y2-004	52.
LTF	Y2-005	52.
LTF	Y2-006	52.19
LTF	Y2-007	103.99
LTF	Y2-008	104.65
LTF	Y2-030	28.87
LTF	Y2-031	28.87
LTF	Y2-032	28.87
LTF	Y2-033	62.69
LTF	Y2-034	49.37
LTF	Y2-035	26.47
LTF	Y2-036	26.47
LTF	Y2-040	53.88
LTF	Y2-049	44.25
LTF	Y2-056	82.63
LTF	Y2-068	546.3
LTF	Y2-082	179.23
914341	Y2-086	9.94
914381	Y2-095 OP1	186.07

Appendix 66

Bus Number	Bus Name	Full Contribution
243442	05RKG1	4.2
243443	05RKG2	4.13
LTF	V3-012	12.07
LTF	X2-042	11.94
900404	X3-028 C	471.
LTF	X3-096	15.29
LTF	X3-097	21.69
LTF	X3-098	20.55
LTF	X4-041	20.31
LTF	Y1-004	12.73
LTF	Y1-007	8.84
LTF	Y2-004	10.56
LTF	Y2-005	10.56
LTF	Y2-006	11.94
LTF	Y2-007	21.13
LTF	Y2-008	12.05
LTF	Y2-068	108.81
914321	Y2-084 C OP1	.5
914322	Y2-084 E OP1	9.11
914381	Y2-095 OP1	162.96

Appendix 67

Bus Number	Bus Name	Full Contribution
242906	05CLAY-1	.2
242907	05CLAY-2	.2
242650	05GLENL1	6.57
242651	05GLENL2	17.14
315446	Q-065	-12.08
884780	S-058 C	4.55
884781	S-058 E	15.
LTF	V3-012	6.35
LTF	W3-083	.99
LTF	X2-042	5.39
LTF	X3-020	1.61
LTF	X3-021	4.07
900404	X3-028 C	25.13
LTF	X3-096	3.88
LTF	X3-097	5.5
LTF	X3-098	5.22
LTF	X4-029D	1.3
LTF	X4-041	5.15
LTF	Y1-002	4.58
LTF	Y1-004	8.02
LTF	Y1-007	5.57
LTF	Y1-041	1.3
913331	Y1-049	.91
LTF	Y2-004	2.62
LTF	Y2-005	2.62
LTF	Y2-006	2.55
LTF	Y2-007	5.25
LTF	Y2-008	5.15
LTF	Y2-030	1.52
LTF	Y2-031	1.52
LTF	Y2-032	1.52
LTF	Y2-033	4.09
LTF	Y2-034	3.33
LTF	Y2-035	1.79
LTF	Y2-036	1.79
LTF	Y2-040	4.07
LTF	Y2-049	3.34
LTF	Y2-056	3.9
LTF	Y2-068	27.61
LTF	Y2-069	1.09
LTF	Y2-070	1.09
LTF	Y2-071	1.09
LTF	Y2-072	1.09
LTF	Y2-082	8.79
914381	Y2-095 OP1	8.69

Appendix 68

Bus Number	Bus Name	Full Contribution
315094	1CHESPK1	1.82
315095	1CHESPK2	1.82
315096	1CHESPK3	2.44
315097	1CHESPK4	3.43
315446	Q-065	28.92
884780	S-058 C	5.94
884781	S-058 E	19.57
218360	SEWAREN1	-2.46
218361	SEWAREN2	-2.8
218362	SEWAREN3	-2.54
218363	SEWAREN4	-2.94
218364	SEWAREN6	-2.63
LTF	V3-012	7.68
292630	V3-017	9.96
901451	W1-116 C	.01
901452	W1-116 E	.96
902601	W2-094 C	.84
902602	W2-094 E	1.45
LTF	W3-083	1.29
905321	W4-044	9.96
LTF	W4-049	.91
LTF	W4-050	.91
907991	X1-078	12.45
LTF	X2-042	6.75
LTF	X3-020	2.
LTF	X3-021	5.52
900404	X3-028 C	31.01
910871	X3-076 OP1	8.04
910941	X3-087 C OP1	10.93
910942	X3-087 E OP1	2.5
LTF	X3-096	4.82
LTF	X3-097	6.83
LTF	X3-098	6.48
LTF	X4-029D	1.66
912211	X4-035 OP1	10.9
912221	X4-039	17.31
LTF	X4-041	6.4
LTF	Y1-002	5.96
LTF	Y1-004	9.35
LTF	Y1-007	6.49
LTF	Y1-041	1.66
LTF	Y1-090	1.17
LTF	Y2-004	3.25
LTF	Y2-005	3.25
LTF	Y2-006	3.17

LTF	Y2-007	6.51
LTF	Y2-008	6.37
LTF	Y2-030	1.81
LTF	Y2-031	1.81
LTF	Y2-032	1.81
LTF	Y2-033	4.71
LTF	Y2-034	5.56
LTF	Y2-035	2.98
LTF	Y2-036	2.98
LTF	Y2-040	5.52
LTF	Y2-049	4.54
LTF	Y2-056	4.99
LTF	Y2-068	34.28
LTF	Y2-069	1.46
LTF	Y2-070	1.46
LTF	Y2-071	1.46
LTF	Y2-072	1.46
LTF	Y2-082	11.67
914381	Y2-095 OP1	10.73

Appendix 69

Bus Number	Bus Name	Full Contribution
238555	02AVONG9	20.31
238995	02NCUNTD	.58
239214	02NILE-A	.03
239006	02NILEG1	5.89
239007	02NILEG2	5.83
239022	02NWCAG3	10.16
239023	02NWCAG4	9.01
239024	02NWCAG5	13.87
247528	05COVRT1	4.35
247529	05COVRT2	4.35
247530	05COVRT3	4.35
247531	05COVRT4	2.61
247532	05COVRT5	2.61
247533	05COVRT6	2.61
884780	S-058 C	13.63
884781	S-058 E	44.94
LTF	V3-012	13.39
901381	W1-107 C	.
LTF	W3-083	3.05
905031	W4-001A_AT9	.26
905051	W4-004A_AT10	1.55
LTF	X2-042	15.45
LTF	X3-020	4.06
LTF	X3-021	16.97
900404	X3-028 C	65.98
LTF	X3-096	9.77
LTF	X3-097	13.86
LTF	X3-098	13.13
LTF	X4-029D	3.65
LTF	X4-041	12.98
LTF	Y1-002	13.82
LTF	Y1-004	15.79
LTF	Y1-007	10.96
913091	Y1-015 C	57.25
LTF	Y1-041	3.65
913441	Y1-069 OP1	19.11
913461	Y1-070 OP1	54.29
LTF	Y1-090	2.37
LTF	Y2-004	6.58
LTF	Y2-005	6.58
LTF	Y2-006	6.81
LTF	Y2-007	13.16
LTF	Y2-008	13.55
LTF	Y2-030	3.72
LTF	Y2-031	3.72

LTF	Y2-032	3.72
LTF	Y2-033	7.23
LTF	Y2-034	5.34
LTF	Y2-035	2.86
LTF	Y2-036	2.86
LTF	Y2-040	16.97
LTF	Y2-049	13.94
LTF	Y2-056	10.96
LTF	Y2-068	69.53
LTF	Y2-069	4.14
LTF	Y2-070	4.14
LTF	Y2-071	4.14
LTF	Y2-072	4.14
LTF	Y2-082	29.69
914331	Y2-085 OP1	37.79
914381	Y2-095 OP1	22.83

Appendix 70

Bus Number	Bus Name	Full Contribution
243045	05MUSKNG	-30.49
242807	05SPORNA	-73.58
243382	05TANNER	28.25
251934	08BCKJD2	12.61
251935	08BCKJD3	17.15
251936	08BCKJD4	20.1
251937	08BCKJD5	31.93
251938	08BCKJD6	67.13
251939	08BECJD1	12.61
251940	08BKJGT1	.15
251941	08BKJGT2	.15
251942	08BKJGT3	.15
251943	08BKJGT4	.15
251957	08MADSN6	.23
251958	08MADSN7	.23
251959	08MADSN8	.23
251968	08ZIMRHP	2.22
251969	08ZIMRLP	1.22
253166	09KN GEN	1.97
253188	09OHGEN1	4.61
253189	09OHGEN2	4.35
253191	09OHGEN4	5.19
341853	1JKCT 2G	7.84
341860	1JKCT 4G	6.
341866	1JKCT 6G	6.
341936	1LAUR 1G	4.1
247500	R-003 C	1.36
884780	S-058 C	28.57
884781	S-058 E	94.21
247536	S-071 C	1.66
292735	T-183 C	2.02
292741	T-184 C	2.02
887741	U1-087 C	1.02
887751	U1-088 C	.68
247538	U2-062 C	1.81
247508	U2-090 C	2.1
891021	U4-003 C	1.31
891221	U4-038 C	.78
891231	U4-039 C1	1.2
891241	U4-039 C2	1.2
891251	U4-039 C3	1.2
891261	U4-039 C4	1.2
247543	V3-007 C	2.1
247544	V3-008 C	2.1
247545	V3-009 C	2.1

LTF	V3-012	27.89
894581	V3-015 C	2.15
894781	V3-053 C	1.33
900261	V4-033 C1	1.61
900271	V4-033 C2	1.61
LTF	W2-033	87.57
905041	W4-004 C	.91
905081	W4-008 C	.91
LTF	X2-042	49.67
LTF	X3-020	11.08
LTF	X3-021	18.04
900404	X3-028 C	210.49
LTF	X3-096	26.64
LTF	X3-097	37.78
LTF	X3-098	35.81
LTF	X4-029D	8.47
LTF	X4-041	35.38
LTF	Y1-002	30.91
LTF	Y1-004	31.51
LTF	Y1-007	21.88
LTF	Y1-041	8.47
LTF	Y2-004	17.39
LTF	Y2-005	17.39
LTF	Y2-006	25.12
LTF	Y2-007	34.79
LTF	Y2-008	47.98
LTF	Y2-030	16.6
LTF	Y2-031	16.6
LTF	Y2-032	16.6
LTF	Y2-033	16.6
LTF	Y2-040	18.04
LTF	Y2-049	14.82
LTF	Y2-056	25.4
LTF	Y2-068	189.59
LTF	Y2-082	54.15
914321	Y2-084 C OP1	.17
914381	Y2-095 OP1	72.83

Appendix 71

Bus Number	Bus Name	Full Contribution
242896	05KRG1L	11.6
242898	05KRG2L	11.6
244891	LONDONHY	1.34
244861	MARMETHY	.95
884780	S-058 C	7.36
884781	S-058 E	24.26
892311	V1-035	3.08
LTF	V3-012	7.89
LTF	W2-033	1.74
902402	W2-057 E	2.53
907021	X1-020 C	2.12
907022	X1-020 E	14.17
LTF	X2-042	8.43
LTF	X3-020	2.42
LTF	X3-021	6.12
900404	X3-028 C	40.67
LTF	X3-096	5.82
LTF	X3-097	8.25
LTF	X3-098	7.82
LTF	X4-029D	2.03
LTF	X4-041	7.72
LTF	Y1-002	7.42
LTF	Y1-004	9.55
LTF	Y1-007	6.64
LTF	Y1-041	2.03
LTF	Y2-004	3.92
LTF	Y2-005	3.92
LTF	Y2-006	4.09
LTF	Y2-007	7.83
LTF	Y2-008	8.16
LTF	Y2-030	2.37
LTF	Y2-031	2.37
LTF	Y2-032	2.37
LTF	Y2-033	4.92
LTF	Y2-034	3.76
LTF	Y2-035	2.02
LTF	Y2-036	2.02
LTF	Y2-040	6.12
LTF	Y2-049	5.02
LTF	Y2-056	6.09
LTF	Y2-068	41.38
LTF	Y2-069	1.69
LTF	Y2-070	1.69
LTF	Y2-071	1.69
LTF	Y2-072	1.69

LTF	Y2-082	14.17
914381	Y2-095 OP1	14.07

Appendix 72

Bus Number	Bus Name	Full Contribution
238555	02AVONG9	16.36
238995	02NCUNTD	.46
239022	02NWCAG3	7.55
239023	02NWCAG4	7.31
239024	02NWCAG5	14.85
884780	S-058 C	9.86
884781	S-058 E	32.5
LTF	V3-012	9.66
LTF	W3-083	2.23
905031	W4-001A_AT9	.2
905051	W4-004A_AT10	1.22
LTF	X2-042	11.25
LTF	X3-020	2.92
LTF	X3-021	12.66
900404	X3-028 C	47.35
LTF	X3-096	7.02
LTF	X3-097	9.95
LTF	X3-098	9.43
LTF	X4-029D	2.64
LTF	X4-041	9.32
LTF	Y1-002	10.01
LTF	Y1-004	11.37
LTF	Y1-007	7.89
913091	Y1-015 C	59.81
LTF	Y1-041	2.64
913461	Y1-070 OP1	56.72
LTF	Y2-004	4.73
LTF	Y2-005	4.73
LTF	Y2-006	4.89
LTF	Y2-007	9.45
LTF	Y2-008	9.74
LTF	Y2-030	2.67
LTF	Y2-031	2.67
LTF	Y2-032	2.67
LTF	Y2-033	5.11
LTF	Y2-034	3.67
LTF	Y2-035	1.97
LTF	Y2-036	1.97
LTF	Y2-040	12.66
LTF	Y2-049	10.4
LTF	Y2-056	7.91
LTF	Y2-068	49.92
LTF	Y2-069	3.06
LTF	Y2-070	3.06
LTF	Y2-071	3.06

LTF	Y2-072	3.06
LTF	Y2-082	21.71
914331	Y2-085 OP1	27.78
914381	Y2-095 OP1	16.39

Appendix 73

Bus Number	Bus Name	Full Contribution
243442	05RKG1	4.27
243443	05RKG2	4.21
LTF	V3-012	12.68
LTF	X2-042	13.66
900404	X3-028 C	479.33
LTF	X3-096	16.41
LTF	X3-097	23.27
LTF	X3-098	22.06
LTF	X4-041	21.79
LTF	Y1-004	13.25
LTF	Y1-007	9.2
LTF	Y2-004	11.33
LTF	Y2-005	11.33
LTF	Y2-006	12.76
LTF	Y2-007	22.66
LTF	Y2-008	13.74
LTF	Y2-068	116.76
914321	Y2-084 C OP1	.49
914322	Y2-084 E OP1	8.95
914381	Y2-095 OP1	165.85

Appendix 74

Bus Number	Bus Name	Full Contribution
243858	05FR11_C	.09
243859	05FR11_E	16.01
243861	05FR12_C	.09
243862	05FR12_E	15.74
243863	05FR21_C	.1
243864	05FR21_E	16.82
243866	05FRCS22_C	.1
247924	05FRCS22_E	16.11
243870	05FRCS-3_C	.19
247925	05FRCS-3_E	32.63
243873	05FRCS-4_C	.14
247926	05FRCS-4_E	24.53
246908	05MLCS1_C	.19
246909	05MLCS1_E	32.67
246910	05MLCS-2_C	.19
247930	05MLCS-2_E	32.67
243442	05RKG1	19.98
243443	05RKG2	19.68
274650	KINCA;1U	1.42
274651	KINCA;2U	1.42
292416	T-127 C	.19
292417	T-127 E	32.71
292735	T-183 C	8.18
292736	T-183 E	32.71
292741	T-184 C	8.18
292742	T-184 E	32.71
887741	U1-087 C	3.99
887742	U1-087 E	26.68
887751	U1-088 C	2.66
887752	U1-088 E	17.78
891021	U4-003 C	5.31
891022	U4-003 E	35.57
891211	U4-037 C	2.66
891212	U4-037 E	17.82
893031	V2-008	62.15
LTF	V3-012	34.87
902352	W2-048 E	6.37
909062	X2-022 E OP1	19.26
LTF	X2-042	80.21
LTF	X3-020	26.18
900404	X3-028 C	1531.92
LTF	X3-096	62.98
LTF	X3-097	89.3
LTF	X3-098	84.65
LTF	X4-041	83.63

LTF	Y1-004	31.58
LTF	Y2-004	43.76
LTF	Y2-005	43.76
LTF	Y2-006	43.67
LTF	Y2-007	87.52
LTF	Y2-008	81.16
LTF	Y2-068	448.12
914321	Y2-084 C OP1	.68
914322	Y2-084 E OP1	12.4
914381	Y2-095 OP1	530.04

Appendix 75

Bus Number	Bus Name	Full Contribution
238555	02AVONG9	20.31
238995	02NCUNTD	.58
239214	02NILE-A	.03
239006	02NILEG1	5.89
239007	02NILEG2	5.83
239022	02NWCAG3	10.16
239023	02NWCAG4	9.01
239024	02NWCAG5	13.87
247528	05COVRT1	4.35
247529	05COVRT2	4.35
247530	05COVRT3	4.35
247531	05COVRT4	2.61
247532	05COVRT5	2.61
247533	05COVRT6	2.61
884780	S-058 C	13.63
884781	S-058 E	44.94
LTF	V3-012	13.39
901381	W1-107 C	.
LTF	W3-083	3.05
905031	W4-001A_AT9	.26
905051	W4-004A_AT10	1.55
LTF	X2-042	15.45
LTF	X3-020	4.06
LTF	X3-021	16.97
900404	X3-028 C	65.98
LTF	X3-096	9.77
LTF	X3-097	13.86
LTF	X3-098	13.13
LTF	X4-029D	3.65
LTF	X4-041	12.98
LTF	Y1-002	13.82
LTF	Y1-004	15.79
LTF	Y1-007	10.96
913091	Y1-015 C	57.25
LTF	Y1-041	3.65
913441	Y1-069 OP1	19.11
913461	Y1-070 OP1	54.29
LTF	Y1-090	2.37
LTF	Y2-004	6.58
LTF	Y2-005	6.58
LTF	Y2-006	6.81
LTF	Y2-007	13.16
LTF	Y2-008	13.55
LTF	Y2-030	3.72
LTF	Y2-031	3.72

LTF	Y2-032	3.72
LTF	Y2-033	7.23
LTF	Y2-034	5.34
LTF	Y2-035	2.86
LTF	Y2-036	2.86
LTF	Y2-040	16.97
LTF	Y2-049	13.94
LTF	Y2-056	10.96
LTF	Y2-068	69.53
LTF	Y2-069	4.14
LTF	Y2-070	4.14
LTF	Y2-071	4.14
LTF	Y2-072	4.14
LTF	Y2-082	29.69
914331	Y2-085 OP1	37.79
914381	Y2-095 OP1	22.83

Appendix 76

Bus Number	Bus Name	Full Contribution
243858	05FR11_C	.09
243861	05FR12_C	.09
243863	05FR21_C	.09
243866	05FRCS22_C	.09
243870	05FRCS-3_C	.18
243873	05FRCS-4_C	.13
246908	05MLCS1_C	.15
246910	05MLCS-2_C	.15
243442	05RKG1	6.08
243443	05RKG2	5.99
274848	CAMPG;RU	.05
274865	CAYUG;1U C1	2.1
274863	CAYUG;1U E1	8.42
274866	CAYUG;2U C2	2.1
274699	CORDO;1C	.2
274701	CORDO;1S	.22
274700	CORDO;2C	.2
274659	DRESD;3U	1.12
274650	KINCA;1U	1.48
274651	KINCA;2U	1.48
293513	O-009 C1	1.11
293514	O-009 C2	.56
293515	O-009 C3	.62
293664	O-024 C	.04
293666	O-024 C	.07
293712	O-029 C	.03
293713	O-029 C	.02
293714	O-029 C	.01
274851	O-035 C	.02
294400	P-011 C1	.03
294409	P-011 C2	.03
294670	P-037 C	1.56
294700	P-040 C	.24
274677	POWER;5U	.94
274678	POWER;6U	.94
290089	Q-039 C	1.8
274662	QUAD ;1U	1.19
274663	QUAD ;2U	1.19
296308	R-030 C1	2.6
296271	R-030 C2	2.6
296125	R-030 C3	2.63
296335	R-033 1	8.71
296336	R-033 2	8.71
296346	R-033 3	6.31
296348	R-033 4	6.31

290261	S-027 C	.08
290265	S-028 C	.08
884780	S-058 C	22.8
884781	S-058 E	75.17
886001	T-105 C	4.91
292416	T-127 C	.15
886211	T-143 C1	1.52
886221	T-143 C2	1.52
292735	T-183 C	6.53
292741	T-184 C	6.53
887741	U1-087 C	3.69
887751	U1-088 C	2.46
891021	U4-003 C	4.25
891131	U4-027	5.91
891211	U4-037 C	2.81
893031	V2-008	65.06
LTF	V2-031	8.36
LTF	V2-032	8.23
LTF	V3-012	16.41
905071	W4-005 C	4.47
905471	W4-084	.2
LTF	X3-020	22.93
900404	X3-028 C	683.03
910721	X3-045 2	.81
910731	X3-046 1	.84
910741	X3-046 2	.84
LTF	X3-096	55.16
LTF	X3-097	78.21
LTF	X3-098	74.14
LTF	X4-029D	8.39
LTF	X4-041	73.24
LTF	Y1-002	20.94
LTF	Y1-004	10.59
LTF	Y1-041	8.39
LTF	Y1-090	13.38
LTF	Y2-004	38.51
LTF	Y2-005	38.51
LTF	Y2-007	77.03
LTF	Y2-056	25.16
LTF	Y2-068	392.46
LTF	Y2-082	16.34
914321	Y2-084 C OP1	.63
914381	Y2-095 OP1	236.33

Appendix 77

Bus Number	Bus Name	Full Contribution
247528	05COVRT1	2.21
247529	05COVRT2	2.21
247530	05COVRT3	2.21
247531	05COVRT4	1.33
247532	05COVRT5	1.33
247533	05COVRT6	1.33
200887	ARMNA MT P47	.05
203261	BLOSSBCT	.04
203283	MANOR	.01
200851	MEHOOP3	.54
293270	N-036 C	.7
293942	O-052 C	.64
203125	OAKLAND	.36
294572	P-028 C	.27
884780	S-058 C	6.18
884781	S-058 E	20.38
886091	T-121 C	.96
LTF	V3-012	5.64
894731	V3-042 C	2.48
LTF	W3-083	1.33
203102	WEST TAN	.06
907991	X1-078	10.45
907461	X1-109 C	100.84
909071	X2-023 C	2.56
LTF	X2-042	6.45
LTF	X3-020	1.79
LTF	X3-021	10.74
900404	X3-028 C	28.49
LTF	X3-050	11.55
LTF	X3-096	4.32
LTF	X3-097	6.12
LTF	X3-098	5.8
LTF	X4-029D	1.66
LTF	X4-041	5.73
LTF	Y1-002	6.3
LTF	Y1-004	6.62
LTF	Y1-007	4.6
913081	Y1-012	.01
913231	Y1-032 C	.82
LTF	Y1-041	1.66
913311	Y1-047 OP1	5.95
913441	Y1-069 OP1	9.56
LTF	Y2-004	2.91
LTF	Y2-005	2.91
LTF	Y2-006	2.93

LTF	Y2-007	5.83
LTF	Y2-008	5.86
LTF	Y2-030	1.56
LTF	Y2-031	1.56
LTF	Y2-032	1.56
LTF	Y2-033	3.16
LTF	Y2-034	2.46
LTF	Y2-035	1.32
LTF	Y2-036	1.32
LTF	Y2-040	10.74
LTF	Y2-044	18.7
LTF	Y2-049	8.82
LTF	Y2-056	4.97
LTF	Y2-068	30.72
LTF	Y2-069	2.5
LTF	Y2-070	2.5
LTF	Y2-071	2.5
LTF	Y2-072	2.5
LTF	Y2-082	14.99
914381	Y2-095 OP1	9.86

Appendix 78

Bus Number	Bus Name	Full Contribution
247528	05COVRT1	2.21
247529	05COVRT2	2.21
247530	05COVRT3	2.21
247531	05COVRT4	1.33
247532	05COVRT5	1.33
247533	05COVRT6	1.33
200887	ARMNA MT P47	.05
203261	BLOSSBCT	.04
203283	MANOR	.01
200851	MEHOOP3	.54
293270	N-036 C	.7
293942	O-052 C	.64
203125	OAKLAND	.36
294572	P-028 C	.27
884780	S-058 C	6.18
884781	S-058 E	20.38
886091	T-121 C	.96
LTF	V3-012	5.64
894731	V3-042 C	2.48
LTF	W3-083	1.33
203102	WEST TAN	.06
907991	X1-078	10.45
907461	X1-109 C	100.84
909071	X2-023 C	2.56
LTF	X2-042	6.45
LTF	X3-020	1.79
LTF	X3-021	10.74
900404	X3-028 C	28.49
LTF	X3-050	11.55
LTF	X3-096	4.32
LTF	X3-097	6.12
LTF	X3-098	5.8
LTF	X4-029D	1.66
LTF	X4-041	5.73
LTF	Y1-002	6.3
LTF	Y1-004	6.62
LTF	Y1-007	4.6
913081	Y1-012	.01
913231	Y1-032 C	.82
LTF	Y1-041	1.66
913311	Y1-047 OP1	5.95
913441	Y1-069 OP1	9.56
LTF	Y2-004	2.91
LTF	Y2-005	2.91
LTF	Y2-006	2.93

LTF	Y2-007	5.83
LTF	Y2-008	5.86
LTF	Y2-030	1.56
LTF	Y2-031	1.56
LTF	Y2-032	1.56
LTF	Y2-033	3.16
LTF	Y2-034	2.46
LTF	Y2-035	1.32
LTF	Y2-036	1.32
LTF	Y2-040	10.74
LTF	Y2-044	18.7
LTF	Y2-049	8.82
LTF	Y2-056	4.97
LTF	Y2-068	30.72
LTF	Y2-069	2.5
LTF	Y2-070	2.5
LTF	Y2-071	2.5
LTF	Y2-072	2.5
LTF	Y2-082	14.99
914381	Y2-095 OP1	9.86

Appendix 79

Bus Number	Bus Name	Full Contribution
242750	05PHILPO	.03
315094	1CHESPK1	-7.39
315095	1CHESPK2	-7.39
315096	1CHESPK3	-9.9
315097	1CHESPK4	-13.95
315131	1EDGECSMA	.1
315132	1EDGECSMB	.1
315090	1YORKTN1	-9.34
315091	1YORKTN2	-9.7
244221	INDDRVL	.06
315446	Q-065	-72.43
884780	S-058 C	22.13
884781	S-058 E	72.96
LTF	V3-012	43.2
903521	W3-066 C1OP1	-1.18
903531	W3-066 C2OP1	-1.18
LTF	W3-083	4.98
LTF	W4-049	9.83
LTF	W4-050	9.83
LTF	X2-042	26.12
LTF	X3-020	8.74
LTF	X3-021	19.35
900404	X3-028 C	119.21
LTF	X3-096	21.01
LTF	X3-097	29.8
LTF	X3-098	28.24
LTF	X4-029D	6.67
LTF	X4-041	27.9
LTF	Y1-002	22.02
LTF	Y1-004	53.32
LTF	Y1-007	37.03
LTF	Y1-041	6.67
913321	Y1-048 OP1	-1.02
913411	Y1-066	-.14
LTF	Y1-090	5.1
LTF	Y2-004	14.27
LTF	Y2-005	14.27
LTF	Y2-006	12.26
LTF	Y2-007	28.54
LTF	Y2-008	24.94
LTF	Y2-030	7.08
LTF	Y2-031	7.08
LTF	Y2-032	7.08
LTF	Y2-033	27.25
LTF	Y2-034	49.38

LTF	Y2-035	26.48
LTF	Y2-036	26.48
LTF	Y2-040	19.35
LTF	Y2-049	15.89
LTF	Y2-056	20.02
LTF	Y2-068	149.52
LTF	Y2-069	5.16
LTF	Y2-070	5.16
LTF	Y2-071	5.16
LTF	Y2-072	5.16
LTF	Y2-082	41.41
914381	Y2-095 OP1	41.25

Appendix 80

Bus Number	Bus Name	Full Contribution
242896	05KRG1L	11.6
242898	05KRG2L	11.6
244891	LONDONHY	1.34
244861	MARMETHY	.95
884780	S-058 C	7.36
884781	S-058 E	24.26
892311	V1-035	3.08
LTF	V3-012	7.89
LTF	W2-033	1.74
902402	W2-057 E	2.53
LTF	W3-083	1.54
907021	X1-020 C	2.12
907022	X1-020 E	14.17
LTF	X2-042	8.43
LTF	X3-020	2.42
LTF	X3-021	6.12
900404	X3-028 C	40.67
LTF	X3-096	5.82
LTF	X3-097	8.25
LTF	X3-098	7.82
LTF	X4-029D	2.03
LTF	X4-041	7.72
LTF	Y1-002	7.42
LTF	Y1-004	9.55
LTF	Y1-007	6.64
LTF	Y1-041	2.03
LTF	Y2-004	3.92
LTF	Y2-005	3.92
LTF	Y2-006	4.09
LTF	Y2-007	7.83
LTF	Y2-008	8.16
LTF	Y2-030	2.37
LTF	Y2-031	2.37
LTF	Y2-032	2.37
LTF	Y2-033	4.92
LTF	Y2-034	3.76
LTF	Y2-035	2.02
LTF	Y2-036	2.02
LTF	Y2-040	6.12
LTF	Y2-049	5.02
LTF	Y2-056	6.09
LTF	Y2-068	41.38
LTF	Y2-069	1.69
LTF	Y2-070	1.69
LTF	Y2-071	1.69

LTF	Y2-072	1.69
LTF	Y2-082	14.17
914381	Y2-095 OP1	14.07

Appendix 81

Bus Number	Bus Name	Full Contribution
247931	U3-002 E	13.65
891221	U4-038 C	1.22
891222	U4-038 E	8.13
891231	U4-039 C1	1.42
891241	U4-039 C2	1.42
891251	U4-039 C3	1.42
891261	U4-039 C4	1.42
891232	U4-039 E1	9.48
891242	U4-039 E2	9.48
891252	U4-039 E3	9.48
891262	U4-039 E4	9.48
LTF	V3-012	2.11
LTF	W2-033	3.8
907021	X1-020 C	5.56
907022	X1-020 E	37.22
LTF	X2-042	5.44
900404	X3-028 C	28.98
LTF	X3-097	1.13
LTF	X3-098	1.07
LTF	X4-041	1.06
LTF	Y1-004	2.8
LTF	Y1-007	1.95
LTF	Y2-006	3.01
LTF	Y2-007	1.01
LTF	Y2-008	5.41
LTF	Y2-030	1.47
LTF	Y2-031	1.47
LTF	Y2-032	1.47
LTF	Y2-033	1.49
LTF	Y2-034	1.14
LTF	Y2-068	5.69
914381	Y2-095 OP1	10.03

Appendix 82

Bus Number	Bus Name	Full Contribution
242893	05AMG3	4.86
243764	05BSG1	38.44
242904	05CRG3L	24.18
242922	05FLTLCK	3.34
243186	05GVG1	5.62
243187	05GVG2	5.62
242896	05KRG1L	21.94
242898	05KRG2L	21.94
242894	05MTG1	6.07
246759	05SOLIDA	25.35
242807	05SPORNA	71.05
251934	08BCKJD2	9.66
251935	08BCKJD3	13.17
251936	08BCKJD4	15.43
251937	08BCKJD5	24.46
251938	08BCKJD6	43.52
251939	08BECJD1	9.66
341853	1JKCT 2G	9.94
341860	1JKCT 4G	7.61
341866	1JKCT 6G	7.61
235564	ALBRIGHT 1	-7.92
235565	ALBRIGHT 2	-7.92
235566	ALBRIGHT 3	-14.86
292067	FDNS	.25
235575	RIVESVILLE 5	-4.76
235576	RIVESVILLE 6	-11.7
884780	S-058 C	63.74
884781	S-058 E	210.14
892311	V1-035	5.81
LTF	V3-012	65.48
LTF	W2-033	16.09
LTF	W3-083	13.17
235577	WILLOW I 1	-19.72
235578	WILLOW I 2	-61.02
909001	X2-006 C1OP1	48.93
909002	X2-006 C2OP1	39.15
LTF	X2-042	72.33
LTF	X3-020	20.76
LTF	X3-021	49.9
900404	X3-028 C	356.09
910751	X3-051	103.23
LTF	X3-096	49.95
LTF	X3-097	70.83
LTF	X3-098	67.14
912161	X4-025	9.86

LTF	X4-029D	17.47
LTF	X4-041	66.33
LTF	Y1-002	64.12
LTF	Y1-004	78.8
LTF	Y1-007	54.72
LTF	Y1-041	17.47
LTF	Y2-004	33.64
LTF	Y2-005	33.64
LTF	Y2-006	35.4
LTF	Y2-007	67.28
LTF	Y2-008	70.53
LTF	Y2-030	20.37
LTF	Y2-031	20.37
LTF	Y2-032	20.37
LTF	Y2-033	40.9
LTF	Y2-034	30.36
LTF	Y2-035	16.28
LTF	Y2-036	16.28
LTF	Y2-040	49.9
LTF	Y2-049	40.98
LTF	Y2-056	52.42
LTF	Y2-068	355.42
LTF	Y2-069	14.07
LTF	Y2-070	14.07
LTF	Y2-071	14.07
LTF	Y2-072	14.07
LTF	Y2-082	121.04
914341	Y2-086	6.64
914381	Y2-095 OP1	123.21

Appendix 83

Bus Number	Bus Name	Full Contribution
891231	U4-039 C1	3.64
891241	U4-039 C2	3.64
891251	U4-039 C3	3.64
891261	U4-039 C4	3.64
891232	U4-039 E1	24.35
891242	U4-039 E2	24.35
891252	U4-039 E3	24.35
891262	U4-039 E4	24.35
LTF	V3-012	1.43
LTF	W2-033	2.18
LTF	X2-042	2.52
900404	X3-028 C	37.56
LTF	X3-096	1.63
LTF	X3-097	2.31
LTF	X3-098	2.19
LTF	X4-041	2.16
LTF	Y1-004	1.63
LTF	Y2-007	2.34
LTF	Y2-008	2.67
LTF	Y2-068	11.57
914381	Y2-095 OP1	12.99

Appendix 84

Bus Number	Bus Name	Full Contribution
247528	05COVRT1	2.22
247529	05COVRT2	2.22
247530	05COVRT3	2.22
247531	05COVRT4	1.34
247532	05COVRT5	1.34
247533	05COVRT6	1.34
243045	05MUSKNG	16.14
242807	05SPORNA	8.78
315446	Q-065	-9.64
884780	S-058 C	7.48
884781	S-058 E	24.65
891231	U4-039 C1	.25
891241	U4-039 C2	.25
891251	U4-039 C3	.25
891261	U4-039 C4	.25
891232	U4-039 E1	1.7
891242	U4-039 E2	1.7
891252	U4-039 E3	1.7
891262	U4-039 E4	1.7
LTF	V3-012	6.46
LTF	W2-033	1.16
LTF	W3-083	1.55
903761	W3-128	12.52
235577	WILLOW I 1	-3.05
235578	WILLOW I 2	-9.45
907021	X1-020 C	2.13
907022	X1-020 E	14.25
LTF	X2-042	8.19
LTF	X3-020	2.25
LTF	X3-021	7.49
900404	X3-028 C	37.98
LTF	X3-096	5.42
LTF	X3-097	7.69
LTF	X3-098	7.29
LTF	X4-029D	2.
LTF	X4-041	7.2
LTF	Y1-002	7.58
LTF	Y1-004	7.57
LTF	Y1-007	5.26
LTF	Y1-041	2.
LTF	Y1-090	1.32
LTF	Y2-004	3.64
LTF	Y2-005	3.64
LTF	Y2-006	3.93
LTF	Y2-007	7.28

LTF	Y2-008	7.78
LTF	Y2-030	2.2
LTF	Y2-031	2.2
LTF	Y2-032	2.2
LTF	Y2-033	3.81
LTF	Y2-034	2.19
LTF	Y2-035	1.17
LTF	Y2-036	1.17
LTF	Y2-040	7.49
LTF	Y2-049	6.15
LTF	Y2-056	6.01
LTF	Y2-068	38.6
LTF	Y2-069	1.96
LTF	Y2-070	1.96
LTF	Y2-071	1.96
LTF	Y2-072	1.96
LTF	Y2-082	15.31
914381	Y2-095 OP1	13.14

Appendix 85

Bus Number	Bus Name	Full Contribution
315094	1CHESPK1	1.78
315095	1CHESPK2	1.78
315096	1CHESPK3	2.38
315097	1CHESPK4	3.35
224026	C U1	1.46
224027	C U2	1.46
224028	C U3	1.69
224029	C U4	1.69
224030	C U5	1.69
315446	Q-065	28.34
884780	S-058 C	5.58
884781	S-058 E	18.39
218360	SEWAREN1	-2.39
218361	SEWAREN2	-2.72
218362	SEWAREN3	-2.46
218363	SEWAREN4	-2.85
218364	SEWAREN6	-2.55
204656	TITUS 1G	-2.41
204657	TITUS 2G	-2.41
204658	TITUS 3G	-2.41
294970	U1-048	.
LTF	V3-012	7.29
292630	V3-017	11.48
901451	W1-116 C	.01
LTF	W3-083	1.21
905321	W4-044	11.48
LTF	W4-049	.88
LTF	W4-050	.88
907991	X1-078	12.09
LTF	X2-042	6.36
LTF	X3-020	1.89
LTF	X3-021	5.15
900404	X3-028 C	29.22
910871	X3-076 OP1	7.74
910941	X3-087 C OP1	12.28
LTF	X3-096	4.55
LTF	X3-097	6.45
LTF	X3-098	6.12
LTF	X4-029D	1.57
912211	X4-035 OP1	12.3
912221	X4-039	16.96
LTF	X4-041	6.04
LTF	Y1-002	5.61
LTF	Y1-004	8.88
LTF	Y1-007	6.17

LTF	Y1-041	1.57
LTF	Y1-090	1.1
LTF	Y2-004	3.07
LTF	Y2-005	3.07
LTF	Y2-006	2.99
LTF	Y2-007	6.15
LTF	Y2-008	6.
LTF	Y2-030	1.7
LTF	Y2-031	1.7
LTF	Y2-032	1.7
LTF	Y2-033	4.48
LTF	Y2-034	5.34
LTF	Y2-035	2.86
LTF	Y2-036	2.86
LTF	Y2-040	5.15
LTF	Y2-049	4.23
LTF	Y2-056	4.7
LTF	Y2-068	32.37
LTF	Y2-069	1.36
LTF	Y2-070	1.36
LTF	Y2-071	1.36
LTF	Y2-072	1.36
LTF	Y2-082	10.95
914381	Y2-095 OP1	10.11

Appendix 86

Bus Number	Bus Name	Full Contribution
247528	05COVRT1	1.9
247529	05COVRT2	1.9
247530	05COVRT3	1.9
247531	05COVRT4	1.14
247532	05COVRT5	1.14
247533	05COVRT6	1.14
251934	08BCKJD2	.59
251935	08BCKJD3	.8
251936	08BCKJD4	.94
251937	08BCKJD5	1.49
251938	08BCKJD6	2.58
884780	S-058 C	5.08
884781	S-058 E	16.73
218360	SEWAREN1	-1.48
218361	SEWAREN2	-1.68
218362	SEWAREN3	-1.52
218363	SEWAREN4	-1.76
218364	SEWAREN6	-1.57
LTF	V3-012	4.43
LTF	W3-083	1.08
907991	X1-078	7.07
LTF	X2-042	5.16
LTF	X3-020	1.45
LTF	X3-021	9.8
900404	X3-028 C	22.85
LTF	X3-050	13.13
LTF	X3-096	3.48
LTF	X3-097	4.94
LTF	X3-098	4.68
LTF	X4-029D	1.36
LTF	X4-041	4.62
LTF	Y1-002	5.18
LTF	Y1-004	5.17
LTF	Y1-007	3.59
913081	Y1-012	.01
LTF	Y1-041	1.36
913441	Y1-069 OP1	8.29
LTF	Y1-090	.84
LTF	Y2-004	2.35
LTF	Y2-005	2.35
LTF	Y2-006	2.35
LTF	Y2-007	4.7
LTF	Y2-008	4.7
LTF	Y2-030	1.24
LTF	Y2-031	1.24

LTF	Y2-032	1.24
LTF	Y2-033	2.47
LTF	Y2-034	1.86
LTF	Y2-035	.99
LTF	Y2-036	.99
LTF	Y2-040	9.8
LTF	Y2-044	21.25
LTF	Y2-049	8.05
LTF	Y2-056	4.07
LTF	Y2-068	24.77
LTF	Y2-069	2.26
LTF	Y2-070	2.26
LTF	Y2-071	2.26
LTF	Y2-072	2.26
LTF	Y2-082	12.82
914381	Y2-095 OP1	7.91

Appendix 87

Bus Number	Bus Name	Full Contribution
243441	05CKG2	2.77
243858	05FR11_C	.05
243859	05FR11_E	8.6
243861	05FR12_C	.05
243862	05FR12_E	8.45
243863	05FR21_C	.05
243864	05FR21_E	9.04
243866	05FRCS22_C	.05
247924	05FRCS22_E	8.65
243870	05FRCS-3_C	.1
247925	05FRCS-3_E	17.52
243873	05FRCS-4_C	.08
247926	05FRCS-4_E	13.18
246908	05MLCS1_C	.1
246909	05MLCS1_E	17.33
246910	05MLCS-2_C	.1
247930	05MLCS-2_E	17.33
243442	05RKG1	9.99
243443	05RKG2	9.84
251938	08BCKJD6	228.76
274770	LINC G1	.18
274771	LINC G2	.18
274772	LINC G3	.18
274773	LINC G4	.18
274774	LINC G5	.18
274775	LINC G6	.18
274776	LINC G7	.18
274777	LINC G8	.18
293969	RIVER_G2	.36
884780	S-058 C	73.81
884781	S-058 E	243.36
274793	SECHI;0U	.09
274794	SECHI;1U	.09
274795	SECHI;2U	.09
274788	SECHI;5U	.09
274789	SECHI;6U	.09
274790	SECHI;7U	.09
274791	SECHI;8U	.09
274792	SECHI;9U	.09
274679	SLINE;3U	19.85
274680	SLINE;4U	32.04
292416	T-127 C	.1
292417	T-127 E	17.35
292735	T-183 C	4.34
292736	T-183 E	17.35

292741	T-184 C	4.34
292742	T-184 E	17.35
293965	U1-054 2	.04
887741	U1-087 C	2.14
887742	U1-087 E	14.33
887751	U1-088 C	1.43
887752	U1-088 E	9.55
890570	U3-026 C1	25.94
890571	U3-026 C2	25.94
890561	U3-031	.1
891021	U4-003 C	2.82
891022	U4-003 E	18.87
891231	U4-039 C1	3.74
891241	U4-039 C2	3.74
891251	U4-039 C3	3.74
891261	U4-039 C4	3.74
891232	U4-039 E1	25.01
891242	U4-039 E2	25.01
891252	U4-039 E3	25.01
891262	U4-039 E4	25.01
LTF	W3-083	12.69
905501	W4-087	.37
907021	X1-020 C	32.98
907022	X1-020 E	220.71
LTF	X2-042	12.24
909181	X2-052	69.17
910541	X3-005 C	.38
910542	X3-005 E	.62
LTF	X3-020	16.43
LTF	X3-021	32.04
900404	X3-028 C	753.06
LTF	X3-096	39.53
LTF	X3-097	56.06
LTF	X3-098	53.14
LTF	X4-029D	15.96
LTF	X4-041	52.5
LTF	Y1-002	65.36
LTF	Y1-041	15.96
LTF	Y2-004	28.32
LTF	Y2-005	28.32
LTF	Y2-007	56.63
LTF	Y2-008	14.42
LTF	Y2-040	32.04
LTF	Y2-049	26.31
LTF	Y2-056	47.87
LTF	Y2-068	281.3
LTF	Y2-082	112.18

914321	Y2-084 C OP1	.37
914322	Y2-084 E OP1	6.66
914381	Y2-095 OP1	260.56

Appendix 88

Bus Number	Bus Name	Full Contribution
247528	05COVRT1	2.22
247529	05COVRT2	2.22
247530	05COVRT3	2.22
247531	05COVRT4	1.34
247532	05COVRT5	1.34
247533	05COVRT6	1.34
243045	05MUSKNG	16.14
242807	05SPORNA	8.78
315446	Q-065	-9.64
884780	S-058 C	7.48
884781	S-058 E	24.65
891231	U4-039 C1	.25
891241	U4-039 C2	.25
891251	U4-039 C3	.25
891261	U4-039 C4	.25
891232	U4-039 E1	1.7
891242	U4-039 E2	1.7
891252	U4-039 E3	1.7
891262	U4-039 E4	1.7
LTF	V3-012	6.46
LTF	W2-033	1.16
LTF	W3-083	1.55
903761	W3-128	12.52
235577	WILLOW I 1	-3.05
235578	WILLOW I 2	-9.45
907021	X1-020 C	2.13
907022	X1-020 E	14.25
LTF	X2-042	8.19
LTF	X3-020	2.25
LTF	X3-021	7.49
900404	X3-028 C	37.98
LTF	X3-096	5.42
LTF	X3-097	7.69
LTF	X3-098	7.29
LTF	X4-029D	2.
LTF	X4-041	7.2
LTF	Y1-002	7.58
LTF	Y1-004	7.57
LTF	Y1-007	5.26
LTF	Y1-041	2.
LTF	Y1-090	1.32
LTF	Y2-004	3.64
LTF	Y2-005	3.64
LTF	Y2-006	3.93
LTF	Y2-007	7.28

LTF	Y2-008	7.78
LTF	Y2-030	2.2
LTF	Y2-031	2.2
LTF	Y2-032	2.2
LTF	Y2-033	3.81
LTF	Y2-034	2.19
LTF	Y2-035	1.17
LTF	Y2-036	1.17
LTF	Y2-040	7.49
LTF	Y2-049	6.15
LTF	Y2-056	6.01
LTF	Y2-068	38.6
LTF	Y2-069	1.96
LTF	Y2-070	1.96
LTF	Y2-071	1.96
LTF	Y2-072	1.96
LTF	Y2-082	15.31
914381	Y2-095 OP1	13.14

Appendix 89

Bus Number	Bus Name	Full Contribution
242896	05KRG1L	9.9
242898	05KRG2L	9.9
292860	M-024 C	.38
884780	S-058 C	4.16
884781	S-058 E	13.71
LTF	V3-012	5.51
LTF	W2-033	1.29
LTF	X2-042	5.03
LTF	X3-020	1.49
LTF	X3-021	3.03
900404	X3-028 C	24.47
LTF	X3-096	3.59
LTF	X3-097	5.09
LTF	X3-098	4.82
LTF	X4-029D	1.19
LTF	X4-041	4.76
LTF	Y1-002	4.19
LTF	Y1-004	6.84
LTF	Y1-007	4.75
LTF	Y1-041	1.19
LTF	Y2-004	2.42
LTF	Y2-005	2.42
LTF	Y2-006	2.46
LTF	Y2-007	4.84
LTF	Y2-008	4.92
LTF	Y2-030	1.48
LTF	Y2-031	1.48
LTF	Y2-032	1.48
LTF	Y2-033	3.56
LTF	Y2-034	3.18
LTF	Y2-035	1.71
LTF	Y2-036	1.71
LTF	Y2-040	3.03
LTF	Y2-049	2.49
LTF	Y2-056	3.56
LTF	Y2-068	25.53
LTF	Y2-082	7.68
914381	Y2-095 OP1	8.47

Appendix 90

Bus Number	Bus Name	Full Contribution
243858	05FR11_C	.15
243861	05FR12_C	.14
243863	05FR21_C	.15
243866	05FRCS22_C	.15
243870	05FRCS-3_C	.3
243873	05FRCS-4_C	.22
246908	05MLCS1_C	.36
246910	05MLCS-2_C	.36
292416	T-127 C	.36
292735	T-183 C	15.41
292741	T-184 C	15.41
887741	U1-087 C	6.13
887751	U1-088 C	4.09
891021	U4-003 C	10.02
LTF	V3-012	13.1
LTF	W2-033	10.8
LTF	X2-042	42.77
900404	X3-028 C	237.41
LTF	X3-096	12.24
LTF	X3-097	17.36
LTF	X3-098	16.46
LTF	X4-041	16.26
LTF	Y1-004	15.35
LTF	Y1-007	10.66
LTF	Y2-004	8.36
LTF	Y2-005	8.36
LTF	Y2-006	17.31
LTF	Y2-007	16.73
LTF	Y2-008	42.66
LTF	Y2-033	8.03
LTF	Y2-068	87.12
914321	Y2-084 C OP1	1.05
914381	Y2-095 OP1	82.14

Appendix 91

Bus Number	Bus Name	Full Contribution
237577	01ROUTE 16	.
315094	1CHESPK1	1.55
315095	1CHESPK2	1.55
315096	1CHESPK3	2.07
315097	1CHESPK4	2.92
235723	GUILFORD 1	.18
235724	GUILFORD 2	.18
290890	I-012	.16
204652	PORT1GEN	-3.02
204653	PORT2GEN	-4.64
315446	Q-065	24.88
235579	R PAUL SMITH	4.53
884780	S-058 C	4.24
884781	S-058 E	13.96
218360	SEWAREN1	-1.95
218361	SEWAREN2	-2.21
218362	SEWAREN3	-2.
218363	SEWAREN4	-2.32
218364	SEWAREN6	-2.07
200715	SHAWVL 1	-3.72
200722	SHAWVL 2	-3.82
LTF	V3-012	5.82
292630	V3-017	8.77
901181	W1-064	.01
901452	W1-116 E	.44
237901	W3-008 GEN	2.6
237903	W3-072 GEN	2.97
LTF	W3-083	.92
237904	W4-042 GEN	-.25
905321	W4-044	8.77
905552	W4-102 E	.55
907021	X1-020 C	1.18
907022	X1-020 E	7.91
907991	X1-078	9.76
909152	X2-038 E	.13
LTF	X2-042	4.88
LTF	X3-020	1.47
LTF	X3-021	3.32
900404	X3-028 C	22.68
237906	X3-062 GEN	2.3
910871	X3-076 OP1	7.02
910941	X3-087 C OP1	9.56
910942	X3-087 E OP1	2.19
LTF	X3-096	3.54
LTF	X3-097	5.02

LTF	X3-098	4.76
237908	X4-001 GEN	2.89
237910	X4-002 GEN	2.8
237912	X4-011 GEN	2.3
LTF	X4-029D	1.2
912211	X4-035 OP1	9.55
912221	X4-039	14.47
LTF	X4-041	4.7
LTF	Y1-002	4.25
LTF	Y1-004	7.12
LTF	Y1-007	4.94
LTF	Y1-041	1.2
LTF	Y1-090	.86
LTF	Y2-004	2.39
LTF	Y2-005	2.39
LTF	Y2-006	2.32
LTF	Y2-007	4.79
LTF	Y2-008	4.65
LTF	Y2-030	1.33
LTF	Y2-031	1.33
LTF	Y2-032	1.33
LTF	Y2-033	3.62
LTF	Y2-034	4.47
LTF	Y2-035	2.4
LTF	Y2-036	2.4
LTF	Y2-040	3.32
LTF	Y2-049	2.73
LTF	Y2-056	3.6
LTF	Y2-068	25.21
LTF	Y2-069	.92
LTF	Y2-070	.92
LTF	Y2-071	.92
LTF	Y2-072	.92
LTF	Y2-082	7.97
914381	Y2-095 OP1	7.85

Appendix 92

Bus Number	Bus Name	Full Contribution
243243	05ANDCT	.69
243858	05FR11_C	.03
243861	05FR12_C	.03
243863	05FR21_C	.03
243866	05FRCS22_C	.03
243870	05FRCS-3_C	.06
243873	05FRCS-4_C	.04
246908	05MLCS1_C	.05
246910	05MLCS-2_C	.05
243442	05RKG1	2.92
243443	05RKG2	2.87
292416	T-127 C	.05
292735	T-183 C	2.12
292741	T-184 C	2.12
887741	U1-087 C	1.21
887751	U1-088 C	.81
247510	U3-002 C	.04
891021	U4-003 C	1.38
LTF	V3-012	23.53
905041	W4-004 C	1.52
905081	W4-008 C	1.52
LTF	X2-042	83.05
LTF	X3-020	10.36
900404	X3-028 C	327.6
LTF	X3-096	24.91
LTF	X3-097	35.32
LTF	X3-098	33.48
LTF	X4-041	33.08
LTF	Y1-004	25.76
LTF	Y1-007	17.89
LTF	Y1-090	6.04
LTF	Y2-004	17.32
LTF	Y2-005	17.32
LTF	Y2-006	55.03
LTF	Y2-007	34.64
LTF	Y2-008	83.56
LTF	Y2-030	7.45
LTF	Y2-031	7.45
LTF	Y2-032	7.45
LTF	Y2-033	13.59
LTF	Y2-056	7.08
LTF	Y2-068	177.26
914321	Y2-084 C OP1	.21
914381	Y2-095 OP1	113.35

Appendix 93

Bus Number	Bus Name	Full Contribution
243858	05FR11_C	.12
243859	05FR11_E	19.8
243861	05FR12_C	.12
243862	05FR12_E	19.47
243863	05FR21_C	.12
243864	05FR21_E	20.81
243866	05FRCS22_C	.12
247924	05FRCS22_E	19.93
243870	05FRCS-3_C	.24
247925	05FRCS-3_E	40.36
243873	05FRCS-4_C	.18
247926	05FRCS-4_E	30.35
246908	05MLCS1_C	.28
246909	05MLCS1_E	47.43
246910	05MLCS-2_C	.28
247930	05MLCS-2_E	47.43
246427	BERRIENS	-.36
246431	BUCHANAN	-.22
292416	T-127 C	.28
292417	T-127 E	47.49
292735	T-183 C	11.87
292736	T-183 E	47.49
292741	T-184 C	11.87
292742	T-184 E	47.49
887741	U1-087 C	4.93
887742	U1-087 E	33.
887751	U1-088 C	3.29
887752	U1-088 E	22.
891021	U4-003 C	7.72
891022	U4-003 E	51.65
LTF	V3-012	13.24
LTF	W2-033	11.09
LTF	X2-042	41.
LTF	X3-020	6.01
900404	X3-028 C	212.62
LTF	X3-096	14.46
LTF	X3-097	20.5
LTF	X3-098	19.44
LTF	X4-041	19.2
LTF	Y1-004	15.16
LTF	Y1-007	10.53
LTF	Y2-004	9.91
LTF	Y2-005	9.91
LTF	Y2-006	16.37
LTF	Y2-007	19.82

LTF	Y2-008	40.96
LTF	Y2-033	7.96
LTF	Y2-068	102.89
914321	Y2-084 C OP1	.84
914322	Y2-084 E OP1	15.34
914381	Y2-095 OP1	73.57

Appendix 94

Bus Number	Bus Name	Full Contribution
238554	02AVONG7	-4.78
238555	02AVONG9	-35.45
884780	S-058 C	4.19
884781	S-058 E	13.82
247542	U4-001 C	1.34
247918	U4-001 E	8.97
833193	V2-042AC1OP1	1.25
833194	V2-042AE1OP1	8.34
LTF	V3-012	3.01
903231	W3-005 C	1.33
903232	W3-005 E	8.92
903611	W3-085 C	.95
903612	W3-085 E	6.4
907021	X1-020 C	1.17
907022	X1-020 E	7.82
LTF	X2-042	3.82
LTF	X3-020	1.23
LTF	X3-021	5.
900404	X3-028 C	19.88
LTF	X3-096	2.96
LTF	X3-097	4.2
LTF	X3-098	3.98
LTF	X4-029D	1.12
LTF	X4-041	3.93
LTF	Y1-002	4.27
LTF	Y1-004	3.49
LTF	Y1-007	2.42
LTF	Y1-041	1.12
LTF	Y2-004	1.99
LTF	Y2-005	1.99
LTF	Y2-006	2.09
LTF	Y2-007	3.98
LTF	Y2-008	4.15
LTF	Y2-030	1.14
LTF	Y2-031	1.14
LTF	Y2-032	1.14
LTF	Y2-033	2.09
LTF	Y2-034	1.45
LTF	Y2-040	5.
LTF	Y2-049	4.1
LTF	Y2-056	3.36
LTF	Y2-068	21.07
LTF	Y2-069	1.23
LTF	Y2-070	1.23
LTF	Y2-071	1.23

LTF	Y2-072	1.23
LTF	Y2-082	9.09
914381	Y2-095 OP1	6.88

Appendix 95

Bus Number	Bus Name	Full Contribution
243764	05BSG1	40.13
243186	05GVG1	5.48
243187	05GVG2	5.48
243188	05MLG1	4.06
242894	05MTG1	5.71
243655	05PCG5	12.99
246759	05SOLIDA	26.76
242807	05SPORNA	81.17
243382	05TANNER	38.16
251934	08BCKJD2	12.52
251935	08BCKJD3	17.04
251936	08BCKJD4	19.97
251937	08BCKJD5	31.7
251938	08BCKJD6	55.4
251939	08BECJD1	12.52
253188	09OHGEN1	7.07
253189	09OHGEN2	6.67
253191	09OHGEN4	7.74
235564	ALBRIGHT 1	-10.46
235565	ALBRIGHT 2	-10.46
235566	ALBRIGHT 3	-19.63
247500	R-003 C	3.36
247900	R-003 E	13.43
296454	R-052 C1	2.75
296479	R-052 C2	2.75
296455	R-052 E1	10.98
296480	R-052 E2	10.98
290286	R-052AC	2.72
290287	R-052AE	10.88
244761	RACINE	6.19
235575	RIVESVILLE 5	-6.23
235576	RIVESVILLE 6	-15.32
247536	S-071 C	3.13
247903	S-071 E	12.52
247504	T-142 C	8.28
247908	T-142 E	33.11
247911	U2-041 E	35.12
247538	U2-062 C	3.19
247912	U2-062 E	21.38
247540	U2-072 C	5.25
247914	U2-072 E	35.12
247508	U2-090 C	3.41
247915	U2-090 E	22.79
247931	U3-002 E	22.68
891221	U4-038 C	1.7

891222	U4-038 E	11.35
891231	U4-039 C1	3.01
891241	U4-039 C2	3.01
891251	U4-039 C3	3.01
891261	U4-039 C4	3.01
891232	U4-039 E1	20.17
891242	U4-039 E2	20.17
891252	U4-039 E3	20.17
891262	U4-039 E4	20.17
247543	V3-007 C	3.41
247919	V3-007 E	22.79
247544	V3-008 C	3.41
247920	V3-008 E	22.79
247545	V3-009 C	3.41
247921	V3-009 E	22.79
LTF	V3-012	78.19
894581	V3-015 C	5.1
894582	V3-015 E	34.13
894641	V3-028 C	1.02
894642	V3-028 E	1.67
894781	V3-053 C	2.54
894782	V3-053 E	17.02
900261	V4-033 C1	2.56
900271	V4-033 C2	2.56
900262	V4-033 E1	17.1
900272	V4-033 E2	17.1
904722	V4-073 E	.21
902332	W2-040 E	1.65
902402	W2-057 E	4.95
903281	W3-024 C	2.51
903282	W3-024 E	16.83
LTF	W3-083	18.29
903942	W3-170 E	1.63
905041	W4-004 C	1.53
905042	W4-004 E	10.21
905081	W4-008 C	1.53
905082	W4-008 E	10.21
905272	W4-036 E	1.63
235577	WILLOW I 1	-22.46
235578	WILLOW I 2	-69.49
244873	WINFIELD	2.56
907021	X1-020 C	25.52
907022	X1-020 E	170.76
909001	X2-006 C1OP1	50.56
909002	X2-006 C2OP1	40.45
LTF	X2-042	95.02
910512	X3-002 E	.28

LTF	X3-020	26.93
LTF	X3-021	79.76
910621	X3-030 C	4.13
910622	X3-030 E	27.61
910751	X3-051	105.71
LTF	X3-096	64.78
LTF	X3-097	91.85
LTF	X3-098	87.07
912161	X4-025	11.23
LTF	X4-029D	23.87
LTF	X4-041	86.02
LTF	Y1-002	89.96
LTF	Y1-004	92.11
LTF	Y1-007	63.96
LTF	Y1-041	23.87
913342	Y1-054 E	2.65
913382	Y1-063 E	.55
913392	Y1-064 E	.55
LTF	Y1-090	15.71
LTF	Y2-004	43.6
LTF	Y2-005	43.6
LTF	Y2-006	45.98
LTF	Y2-007	87.2
LTF	Y2-008	91.42
LTF	Y2-030	25.5
LTF	Y2-031	25.5
LTF	Y2-032	25.5
LTF	Y2-033	47.07
LTF	Y2-034	29.64
LTF	Y2-035	15.89
LTF	Y2-036	15.89
LTF	Y2-040	79.76
LTF	Y2-049	65.5
LTF	Y2-056	71.6
LTF	Y2-068	460.91
LTF	Y2-069	21.59
LTF	Y2-070	21.59
LTF	Y2-071	21.59
LTF	Y2-072	21.59
LTF	Y2-082	176.99
914381	Y2-095 OP1	137.95

Appendix 96

Bus Number	Bus Name	Full Contribution
238554	02AVONG7	-4.78
238555	02AVONG9	-35.45
884780	S-058 C	4.19
884781	S-058 E	13.82
247542	U4-001 C	1.34
247918	U4-001 E	8.97
833193	V2-042AC1OP1	1.25
833194	V2-042AE1OP1	8.34
LTF	V3-012	3.01
903231	W3-005 C	1.33
903232	W3-005 E	8.92
903611	W3-085 C	.95
903612	W3-085 E	6.4
907021	X1-020 C	1.17
907022	X1-020 E	7.82
LTF	X2-042	3.82
LTF	X3-020	1.23
LTF	X3-021	5.
900404	X3-028 C	19.88
LTF	X3-096	2.96
LTF	X3-097	4.2
LTF	X3-098	3.98
LTF	X4-029D	1.12
LTF	X4-041	3.93
LTF	Y1-002	4.27
LTF	Y1-004	3.49
LTF	Y1-007	2.42
LTF	Y1-041	1.12
LTF	Y2-004	1.99
LTF	Y2-005	1.99
LTF	Y2-006	2.09
LTF	Y2-007	3.98
LTF	Y2-008	4.15
LTF	Y2-030	1.14
LTF	Y2-031	1.14
LTF	Y2-032	1.14
LTF	Y2-033	2.09
LTF	Y2-034	1.45
LTF	Y2-040	5.
LTF	Y2-049	4.1
LTF	Y2-056	3.36
LTF	Y2-068	21.07
LTF	Y2-069	1.23
LTF	Y2-070	1.23
LTF	Y2-071	1.23

LTF	Y2-072	1.23
LTF	Y2-082	9.09
914381	Y2-095 OP1	6.88

Appendix 97

Bus Number	Bus Name	Full Contribution
315094	1CHESPK1	1.82
315095	1CHESPK2	1.82
315096	1CHESPK3	2.44
315097	1CHESPK4	3.43
224026	C U1	1.3
224027	C U2	1.3
224028	C U3	1.5
224029	C U4	1.5
224030	C U5	1.5
315446	Q-065	28.92
884780	S-058 C	5.94
884781	S-058 E	19.57
218360	SEWAREN1	-2.46
218361	SEWAREN2	-2.8
218362	SEWAREN3	-2.54
218363	SEWAREN4	-2.94
218364	SEWAREN6	-2.63
204656	TITUS 1G	-2.47
204657	TITUS 2G	-2.47
204658	TITUS 3G	-2.47
LTF	V3-012	7.68
292630	V3-017	9.96
901451	W1-116 C	.01
901452	W1-116 E	.96
LTF	W3-083	1.29
905321	W4-044	9.96
LTF	W4-049	.91
LTF	W4-050	.91
907991	X1-078	12.45
LTF	X2-042	6.75
LTF	X3-020	2.
LTF	X3-021	5.52
900404	X3-028 C	31.01
910871	X3-076 OP1	8.04
910941	X3-087 C OP1	10.93
910942	X3-087 E OP1	2.5
LTF	X3-096	4.82
LTF	X3-097	6.83
LTF	X3-098	6.48
LTF	X4-029D	1.66
912211	X4-035 OP1	10.9
912221	X4-039	17.31
LTF	X4-041	6.4
LTF	Y1-002	5.96
LTF	Y1-004	9.35

LTF	Y1-007	6.49
LTF	Y1-041	1.66
LTF	Y1-090	1.17
LTF	Y2-004	3.25
LTF	Y2-005	3.25
LTF	Y2-006	3.17
LTF	Y2-007	6.51
LTF	Y2-008	6.37
LTF	Y2-030	1.81
LTF	Y2-031	1.81
LTF	Y2-032	1.81
LTF	Y2-033	4.71
LTF	Y2-034	5.56
LTF	Y2-035	2.98
LTF	Y2-036	2.98
LTF	Y2-040	5.52
LTF	Y2-049	4.54
LTF	Y2-056	4.99
LTF	Y2-068	34.28
LTF	Y2-069	1.46
LTF	Y2-070	1.46
LTF	Y2-071	1.46
LTF	Y2-072	1.46
LTF	Y2-082	11.67
914381	Y2-095 OP1	10.73

Appendix 98

Bus Number	Bus Name	Full Contribution
LTF	V3-012	15.39
LTF	W2-033	10.57
LTF	X2-042	52.12
LTF	X3-020	6.63
900404	X3-028 C	212.66
LTF	X3-096	15.94
LTF	X3-097	22.61
LTF	X3-098	21.43
LTF	X4-041	21.17
LTF	Y1-004	17.74
LTF	Y1-007	12.32
LTF	Y2-004	10.92
LTF	Y2-005	10.92
LTF	Y2-006	19.11
LTF	Y2-007	21.83
LTF	Y2-008	51.96
LTF	Y2-033	9.25
LTF	Y2-068	113.43
914321	Y2-084 C OP1	1.2
914381	Y2-095 OP1	73.58

Appendix 99

Bus Number	Bus Name	Full Contribution
247528	05COVRT1	5.82
247529	05COVRT2	5.82
247530	05COVRT3	5.82
247531	05COVRT4	3.49
247532	05COVRT5	3.49
247533	05COVRT6	3.49
200887	ARMNA MT P47	.13
217006	BERGN26A	-1.24
203261	BLOSSBCT	.12
217078	ESSEX 12	-10.83
99210	G07_NEW	5.68
206331	GG A1&2	-2.33
206332	GG A3&4	-2.33
206333	GG B5&6	-2.33
206334	GG B7&8	-2.33
200828	HNSMLK 1	.08
200829	HNSMLK 2	.08
200830	HNSMLK 3	.08
200831	HNSMLK 4	.08
200832	HNSMLK 5	.08
200838	HOMER C2	.95
200839	HOMER C3	1.01
200849	LAKVU GN	.01
209027	LOR2_Q27 E	-5.7
203283	MANOR	.01
200851	MEHOOP3	.69
293270	N-036 C	1.84
293942	O-052 C	1.68
94130	O66_NONFIRM	20.78
203125	OAKLAND	.56
294271	P-001 C	.89
294572	P-028 C	.35
200649	PENNTECH	.1
200608	PINEY #1	.03
200657	PINEY CK	.04
204652	PORT1GEN	-9.89
204653	PORT2GEN	-15.62
290085	Q-036 C	.02
295247	Q-046	.02
200882	Q-053 C	.01
290113	Q-063 C	.04
296914	R-092 C	1.36
200846	RINGGOLD	.78
884780	S-058 C	16.35
884781	S-058 E	53.91

291011	S-103	.14
200662	SCRUB GR	.12
200642	SENECA#1	.49
200643	SENECA#2	.46
200644	SENECA#3	.07
218360	SEWAREN1	-5.83
218361	SEWAREN2	-6.6
218362	SEWAREN3	-5.98
218363	SEWAREN4	-6.91
218364	SEWAREN6	-6.18
200715	SHAWVL 1	12.17
200722	SHAWVL 2	12.39
200665	SHAWVL 3	18.49
200666	SHAWVL 4	18.31
886091	T-121 C	2.51
889061	U2-055 C	1.18
292078	V1-034	.18
LTF	V3-012	15.04
894731	V3-042 C	3.97
209019	VIKI IPP	-1.15
LTF	W3-083	3.52
903641	W3-099 C OP1	1.19
905291	W4-038 OP1	-1.41
203102	WEST TAN	.15
907241	X1-068	-.54
907991	X1-078	27.55
907381	X1-094 C	-.39
907461	X1-109 C	336.04
909051	X2-021 C OP1	1.94
909071	X2-023 C	3.26
LTF	X2-042	17.13
910531	X3-004	-2.06
LTF	X3-020	4.76
LTF	X3-021	28.01
900404	X3-028 C	75.63
910661	X3-039	6.15
LTF	X3-050	28.39
910931	X3-085 C	-.18
LTF	X3-096	11.45
LTF	X3-097	16.24
LTF	X3-098	15.4
912091	X4-012 C OP1	-.14
LTF	X4-029D	4.38
LTF	X4-041	15.21
LTF	Y1-002	16.65
LTF	Y1-004	17.66
LTF	Y1-007	12.27

913081	Y1-012	.03
913231	Y1-032 C	2.16
LTF	Y1-041	4.38
913311	Y1-047 OP1	7.58
913441	Y1-069 OP1	25.08
913471	Y1-071	.34
LTF	Y2-004	7.73
LTF	Y2-005	7.73
LTF	Y2-006	7.78
LTF	Y2-007	15.46
LTF	Y2-008	15.55
LTF	Y2-030	4.16
LTF	Y2-031	4.16
LTF	Y2-032	4.16
LTF	Y2-033	8.42
LTF	Y2-034	6.62
LTF	Y2-035	3.55
LTF	Y2-036	3.55
LTF	Y2-040	28.01
LTF	Y2-044	45.97
LTF	Y2-049	23.
LTF	Y2-056	13.15
LTF	Y2-068	81.51
LTF	Y2-069	6.54
LTF	Y2-070	6.54
LTF	Y2-071	6.54
LTF	Y2-072	6.54
LTF	Y2-082	39.44
914381	Y2-095 OP1	26.17

Appendix 100

Bus Number	Bus Name	Full Contribution
243858	05FR11_C	.04
243861	05FR12_C	.04
243863	05FR21_C	.04
243866	05FRCS22_C	.04
243870	05FRCS-3_C	.07
243873	05FRCS-4_C	.06
246908	05MLCS1_C	.06
246910	05MLCS-2_C	.06
243442	05RKG1	10.81
243443	05RKG2	10.65
274865	CAYUG;1U C1	-1.73
274866	CAYUG;2U C2	-1.73
292416	T-127 C	.06
292735	T-183 C	2.69
292741	T-184 C	2.69
887741	U1-087 C	1.55
887751	U1-088 C	1.03
891021	U4-003 C	1.75
LTF	V4-050	40.66
LTF	X2-042	38.59
900404	X3-028 C	1213.38
LTF	Y2-006	31.44
LTF	Y2-008	38.2
914321	Y2-084 C OP1	.26
914381	Y2-095 OP1	419.83

Appendix 101

Bus Number	Bus Name	Full Contribution
238555	02AVONG9	-25.35
238565	02BAYSG2	5.88
238566	02BAYSG3	6.05
238567	02BAYSG4	9.17
247528	05COVRT1	3.21
247529	05COVRT2	3.21
247530	05COVRT3	3.21
247531	05COVRT4	1.92
247532	05COVRT5	1.92
247533	05COVRT6	1.92
884780	S-058 C	6.96
884781	S-058 E	22.94
LTF	V3-012	3.92
903231	W3-005 C	1.29
903232	W3-005 E	8.63
903511	W3-059A_AT6	1.31
903512	W3-059A_AT6	8.72
LTF	W3-083	1.35
907021	X1-020 C	1.83
907022	X1-020 E	12.27
907041	X1-027A C1	.74
907044	X1-027A C2	.74
907046	X1-027A C3	.74
907048	X1-027A C4	.74
907042	X1-027A E1	4.98
907045	X1-027A E2	4.98
907047	X1-027A E3	4.98
907049	X1-027A E4	4.98
LTF	X2-042	5.6
LTF	X3-020	1.73
LTF	X3-021	19.63
900404	X3-028 C	26.04
LTF	X3-096	4.16
LTF	X3-097	5.9
LTF	X3-098	5.59
LTF	X4-029D	1.8
LTF	X4-041	5.52
LTF	Y1-002	7.24
LTF	Y1-004	4.29
LTF	Y1-007	2.98
LTF	Y1-041	1.8
913441	Y1-069 OP1	28.16
LTF	Y2-004	2.82
LTF	Y2-005	2.82
LTF	Y2-006	2.72

LTF	Y2-007	5.64
LTF	Y2-008	5.45
LTF	Y2-030	1.26
LTF	Y2-031	1.26
LTF	Y2-032	1.26
LTF	Y2-033	2.21
LTF	Y2-040	19.63
LTF	Y2-049	16.12
LTF	Y2-056	5.4
LTF	Y2-068	29.58
LTF	Y2-069	4.06
LTF	Y2-070	4.06
LTF	Y2-071	4.06
LTF	Y2-072	4.06
LTF	Y2-082	21.38
914381	Y2-095 OP1	9.01

Appendix 102

Bus Number	Bus Name	Full Contribution
243858	05FR11_C	.09
243859	05FR11_E	14.95
243861	05FR12_C	.09
243862	05FR12_E	14.7
243863	05FR21_C	.09
243864	05FR21_E	15.72
243866	05FRCS22_C	.09
247924	05FRCS22_E	15.05
243870	05FRCS-3_C	.18
247925	05FRCS-3_E	30.48
243873	05FRCS-4_C	.14
247926	05FRCS-4_E	22.91
246908	05MLCS1_C	.16
246909	05MLCS1_E	26.42
246910	05MLCS-2_C	.16
247930	05MLCS-2_E	26.42
243442	05RKG1	6.12
243443	05RKG2	6.03
274865	CAYUG;1U C1	2.17
274863	CAYUG;1U E1	8.7
274866	CAYUG;2U C2	2.17
274864	CAYUG;2U E2	8.7
274849	CRESC;1U	3.44
294702	CRESC;2U	3.03
274650	KINCA;1U	1.51
274651	KINCA;2U	1.51
990901	L-005 E	8.03
293665	O-024 E	6.5
293667	O-024 E	12.88
293771	O-035 E	3.79
294401	P-011 E1	5.07
294410	P-011 E2	5.07
294700	P-040 C	.25
294701	P-040 E	1.01
290089	Q-039 C	1.86
290090	Q-039 E	4.79
296308	R-030 C1	2.67
296271	R-030 C2	2.67
296125	R-030 C3	2.71
296309	R-030 E1	10.7
296272	R-030 E2	10.7
296128	R-030 E3	10.83
886001	T-105 C	5.07
886002	T-105 E	20.29
292416	T-127 C	.16

292417	T-127 E	26.46
886211	T-143 C1	1.57
886221	T-143 C2	1.57
886212	T-143 E1	6.3
886222	T-143 E2	6.3
292735	T-183 C	6.61
292736	T-183 E	26.46
292741	T-184 C	6.61
292742	T-184 E	26.46
274853	TWING;U1	14.52
274854	TWING;U2	14.52
887741	U1-087 C	3.72
887742	U1-087 E	24.92
887751	U1-088 C	2.48
887752	U1-088 E	16.61
891021	U4-003 C	4.3
891022	U4-003 E	28.77
891211	U4-037 C	2.86
891212	U4-037 E	19.18
893031	V2-008	66.14
LTF	V2-031	8.46
LTF	V2-032	8.33
LTF	V3-012	16.44
902352	W2-048 E	6.85
905071	W4-005 C	4.56
905072	W4-005 E	30.56
909062	X2-022 E OP1	20.73
LTF	X3-020	23.2
900404	X3-028 C	687.02
LTF	X3-096	55.81
LTF	X3-097	79.14
LTF	X3-098	75.02
LTF	X4-029D	8.79
LTF	X4-041	74.11
LTF	Y1-002	22.68
LTF	Y1-004	10.42
LTF	Y1-041	8.79
LTF	Y1-090	13.53
LTF	Y2-004	38.97
LTF	Y2-005	38.97
LTF	Y2-007	77.95
LTF	Y2-056	26.36
LTF	Y2-068	397.12
LTF	Y2-082	19.55
914321	Y2-084 C OP1	.64
914322	Y2-084 E OP1	11.58
914381	Y2-095 OP1	237.71

Appendix 103

Bus Number	Bus Name	Full Contribution
238555	02AVONG9	20.24
238995	02NCUNTD	.61
239214	02NILE-A	.03
239006	02NILEG1	6.01
239007	02NILEG2	5.95
239022	02NWCAG3	10.99
239023	02NWCAG4	9.38
239024	02NWCAG5	14.86
239085	02SAMMG1	.22
239086	02SAMMG2	.22
239093	02SAMMIS	.02
247528	05COVRT1	4.47
247529	05COVRT2	4.47
247530	05COVRT3	4.47
247531	05COVRT4	2.68
247532	05COVRT5	2.68
247533	05COVRT6	2.68
251934	08BCKJD2	1.93
251935	08BCKJD3	2.62
251936	08BCKJD4	3.07
251937	08BCKJD5	4.87
251938	08BCKJD6	8.46
235567	ARMSTRONG 1	-12.62
235569	ARMSTRONG 2	-12.54
884780	S-058 C	14.18
884781	S-058 E	46.76
LTF	V3-012	14.09
LTF	W3-083	3.18
905031	W4-001A_AT9	.27
905051	W4-004A_AT10	1.59
LTF	X2-042	16.15
LTF	X3-020	4.25
LTF	X3-021	16.98
900404	X3-028 C	69.09
LTF	X3-096	10.23
LTF	X3-097	14.5
LTF	X3-098	13.75
LTF	X4-029D	3.81
LTF	X4-041	13.58
LTF	Y1-002	14.37
LTF	Y1-004	16.63
LTF	Y1-007	11.55
913091	Y1-015 C	59.87
LTF	Y1-041	3.81
913441	Y1-069 OP1	19.26

913461	Y1-070 OP1	56.78
LTF	Y1-090	2.48
LTF	Y2-004	6.89
LTF	Y2-005	6.89
LTF	Y2-006	7.13
LTF	Y2-007	13.78
LTF	Y2-008	14.19
LTF	Y2-030	3.91
LTF	Y2-031	3.91
LTF	Y2-032	3.91
LTF	Y2-033	7.65
LTF	Y2-034	5.74
LTF	Y2-035	3.08
LTF	Y2-036	3.08
LTF	Y2-040	16.98
LTF	Y2-049	13.94
LTF	Y2-056	11.42
LTF	Y2-068	72.78
LTF	Y2-069	4.17
LTF	Y2-070	4.17
LTF	Y2-071	4.17
LTF	Y2-072	4.17
LTF	Y2-082	30.52
914331	Y2-085 OP1	39.78
914381	Y2-095 OP1	23.91

Appendix 104

Bus Number	Bus Name	Full Contribution
238554	02AVONG7	.88
238555	02AVONG9	5.93
247528	05COVRT1	1.92
247529	05COVRT2	1.92
247530	05COVRT3	1.92
247531	05COVRT4	1.15
247532	05COVRT5	1.15
247533	05COVRT6	1.15
884780	S-058 C	5.25
884781	S-058 E	17.31
218360	SEWAREN1	-1.64
218361	SEWAREN2	-1.85
218362	SEWAREN3	-1.68
218363	SEWAREN4	-1.94
218364	SEWAREN6	-1.74
LTF	V3-012	4.69
LTF	W3-083	1.12
907021	X1-020 C	1.44
907022	X1-020 E	9.64
907991	X1-078	7.78
LTF	X2-042	5.4
LTF	X3-020	1.51
LTF	X3-021	9.66
900404	X3-028 C	23.9
LTF	X3-050	11.63
LTF	X3-096	3.63
LTF	X3-097	5.15
LTF	X3-098	4.88
LTF	X4-029D	1.4
LTF	X4-041	4.82
LTF	Y1-002	5.35
LTF	Y1-004	5.49
LTF	Y1-007	3.81
913091	Y1-015 C	5.87
913092	Y1-015 E	.88
LTF	Y1-041	1.4
913441	Y1-069 OP1	8.34
LTF	Y1-090	.88
LTF	Y2-004	2.45
LTF	Y2-005	2.45
LTF	Y2-006	2.46
LTF	Y2-007	4.91
LTF	Y2-008	4.92
LTF	Y2-030	1.3
LTF	Y2-031	1.3

LTF	Y2-032	1.3
LTF	Y2-033	2.62
LTF	Y2-034	2.02
LTF	Y2-035	1.08
LTF	Y2-036	1.08
LTF	Y2-040	9.66
LTF	Y2-044	18.83
LTF	Y2-049	7.93
LTF	Y2-056	4.21
LTF	Y2-068	25.85
LTF	Y2-069	2.24
LTF	Y2-070	2.24
LTF	Y2-071	2.24
LTF	Y2-072	2.24
LTF	Y2-082	13.
914331	Y2-085 OP1	6.88
914381	Y2-095 OP1	8.27

Appendix 105

Bus Number	Bus Name	Full Contribution
238554	02AVONG7	.88
238555	02AVONG9	5.93
247528	05COVRT1	1.92
247529	05COVRT2	1.92
247530	05COVRT3	1.92
247531	05COVRT4	1.15
247532	05COVRT5	1.15
247533	05COVRT6	1.15
884780	S-058 C	5.25
884781	S-058 E	17.31
218360	SEWAREN1	-1.64
218361	SEWAREN2	-1.85
218362	SEWAREN3	-1.68
218363	SEWAREN4	-1.94
218364	SEWAREN6	-1.74
LTF	V3-012	4.69
LTF	W3-083	1.12
907021	X1-020 C	1.44
907022	X1-020 E	9.64
907991	X1-078	7.78
LTF	X2-042	5.4
LTF	X3-020	1.51
LTF	X3-021	9.66
900404	X3-028 C	23.9
LTF	X3-050	11.63
LTF	X3-096	3.63
LTF	X3-097	5.15
LTF	X3-098	4.88
LTF	X4-029D	1.4
LTF	X4-041	4.82
LTF	Y1-002	5.35
LTF	Y1-004	5.49
LTF	Y1-007	3.81
913091	Y1-015 C	5.87
913092	Y1-015 E	.88
LTF	Y1-041	1.4
913441	Y1-069 OP1	8.34
LTF	Y1-090	.88
LTF	Y2-004	2.45
LTF	Y2-005	2.45
LTF	Y2-006	2.46
LTF	Y2-007	4.91
LTF	Y2-008	4.92
LTF	Y2-030	1.3
LTF	Y2-031	1.3

LTF	Y2-032	1.3
LTF	Y2-033	2.62
LTF	Y2-034	2.02
LTF	Y2-035	1.08
LTF	Y2-036	1.08
LTF	Y2-040	9.66
LTF	Y2-044	18.83
LTF	Y2-049	7.93
LTF	Y2-056	4.21
LTF	Y2-068	25.85
LTF	Y2-069	2.24
LTF	Y2-070	2.24
LTF	Y2-071	2.24
LTF	Y2-072	2.24
LTF	Y2-082	13.
914331	Y2-085 OP1	6.88
914381	Y2-095 OP1	8.27

Appendix 106

Bus Number	Bus Name	Full Contribution
247528	05COVRT1	5.72
247529	05COVRT2	5.72
247530	05COVRT3	5.72
247531	05COVRT4	3.43
247532	05COVRT5	3.43
247533	05COVRT6	3.43
200887	ARMNA MT P47	.13
217006	BERGN26A	-1.22
203261	BLOSSBCT	.12
217078	ESSEX 12	-10.65
99210	G07_NEW	5.58
206331	GG A1&2	-2.29
206332	GG A3&4	-2.29
206333	GG B5&6	-2.29
206334	GG B7&8	-2.29
200828	HNSMLK 1	.08
200829	HNSMLK 2	.08
200830	HNSMLK 3	.08
200831	HNSMLK 4	.08
200832	HNSMLK 5	.08
200838	HOMER C2	.94
200839	HOMER C3	.99
200849	LAKVU GN	.01
209027	LOR2_Q27 E	-5.6
203283	MANOR	.01
200851	MEHOOP3	.66
293270	N-036 C	1.8
293942	O-052 C	1.65
94130	O66_NONFIRM	20.43
203125	OAKLAND	.54
294271	P-001 C	.88
294572	P-028 C	.33
200649	PENNTECH	.1
200608	PINEY #1	.03
200657	PINEY CK	.04
204652	PORT1GEN	-9.72
204653	PORT2GEN	-15.35
290085	Q-036 C	.02
295247	Q-046	.02
290113	Q-063 C	.04
296914	R-092 C	1.34
200846	RINGGOLD	.77
884780	S-058 C	16.08
884781	S-058 E	53.01
291011	S-103	.13

200662	SCRUB GR	.12
200642	SENECA#1	.49
200643	SENECA#2	.45
200644	SENECA#3	.07
218360	SEWAREN1	-5.74
218361	SEWAREN2	-6.49
218362	SEWAREN3	-5.88
218363	SEWAREN4	-6.8
218364	SEWAREN6	-6.08
200715	SHAWVL 1	12.
200722	SHAWVL 2	12.22
200665	SHAWVL 3	18.23
200666	SHAWVL 4	18.06
886091	T-121 C	2.47
889061	U2-055 C	1.16
292078	V1-034	.17
LTF	V3-012	14.79
894731	V3-042 C	3.85
209019	VIKI IPP	-1.13
LTF	W3-083	3.46
903641	W3-099 C OP1	1.17
905291	W4-038 OP1	-1.39
203102	WEST TAN	.15
907241	X1-068	-.53
907991	X1-078	27.08
907381	X1-094 C	-.38
907461	X1-109 C	332.41
909051	X2-021 C OP1	1.91
909071	X2-023 C	3.12
LTF	X2-042	16.84
910531	X3-004	-2.03
LTF	X3-020	4.68
LTF	X3-021	27.52
900404	X3-028 C	74.34
910661	X3-039	6.05
LTF	X3-050	27.86
910931	X3-085 C	-.18
LTF	X3-096	11.26
LTF	X3-097	15.97
LTF	X3-098	15.14
912091	X4-012 C OP1	-.14
LTF	X4-029D	4.31
LTF	X4-041	14.95
LTF	Y1-002	16.37
LTF	Y1-004	17.37
LTF	Y1-007	12.06
913081	Y1-012	.03

913231	Y1-032 C	2.12
LTF	Y1-041	4.31
913311	Y1-047 OP1	7.26
913441	Y1-069 OP1	24.65
913471	Y1-071	.34
LTF	Y2-004	7.6
LTF	Y2-005	7.6
LTF	Y2-006	7.65
LTF	Y2-007	15.2
LTF	Y2-008	15.28
LTF	Y2-030	4.09
LTF	Y2-031	4.09
LTF	Y2-032	4.09
LTF	Y2-033	8.28
LTF	Y2-034	6.51
LTF	Y2-035	3.49
LTF	Y2-036	3.49
LTF	Y2-040	27.52
LTF	Y2-044	45.1
LTF	Y2-049	22.6
LTF	Y2-056	12.92
LTF	Y2-068	80.12
LTF	Y2-069	6.43
LTF	Y2-070	6.43
LTF	Y2-071	6.43
LTF	Y2-072	6.43
LTF	Y2-082	38.77
914381	Y2-095 OP1	25.72

Appendix 107

Bus Number	Bus Name	Full Contribution
243442	05RKG1	30.74
243443	05RKG2	30.28
900404	X3-028 C	3450.06
914381	Y2-095 OP1	1193.72

Appendix 108

Bus Number	Bus Name	Full Contribution
238554	02AVONG7	.88
238555	02AVONG9	5.95
247528	05COVRT1	1.92
247529	05COVRT2	1.92
247530	05COVRT3	1.92
247531	05COVRT4	1.15
247532	05COVRT5	1.15
247533	05COVRT6	1.15
884780	S-058 C	5.26
884781	S-058 E	17.33
218360	SEWAREN1	-1.65
218361	SEWAREN2	-1.87
218362	SEWAREN3	-1.69
218363	SEWAREN4	-1.96
218364	SEWAREN6	-1.75
LTF	V3-012	4.71
LTF	W3-083	1.12
907021	X1-020 C	1.44
907022	X1-020 E	9.66
907991	X1-078	7.83
LTF	X2-042	5.42
LTF	X3-020	1.51
LTF	X3-021	9.63
900404	X3-028 C	23.97
LTF	X3-050	11.47
LTF	X3-096	3.64
LTF	X3-097	5.16
LTF	X3-098	4.89
LTF	X4-029D	1.41
LTF	X4-041	4.84
LTF	Y1-002	5.36
LTF	Y1-004	5.51
LTF	Y1-007	3.83
913091	Y1-015 C	5.92
913092	Y1-015 E	.88
LTF	Y1-041	1.41
913441	Y1-069 OP1	8.33
LTF	Y1-090	.88
LTF	Y2-004	2.46
LTF	Y2-005	2.46
LTF	Y2-006	2.46
LTF	Y2-007	4.92
LTF	Y2-008	4.93
LTF	Y2-030	1.31
LTF	Y2-031	1.31

LTF	Y2-032	1.31
LTF	Y2-033	2.63
LTF	Y2-034	2.03
LTF	Y2-035	1.09
LTF	Y2-036	1.09
LTF	Y2-040	9.63
LTF	Y2-044	18.57
LTF	Y2-049	7.9
LTF	Y2-056	4.22
LTF	Y2-068	25.91
LTF	Y2-069	2.23
LTF	Y2-070	2.23
LTF	Y2-071	2.23
LTF	Y2-072	2.23
LTF	Y2-082	13.
914331	Y2-085 OP1	6.92
914381	Y2-095 OP1	8.3

Appendix 109

Bus Number	Bus Name	Full Contribution
243859	05FR11_E	6.18
243862	05FR12_E	6.07
243864	05FR21_E	6.49
247924	05FRCS22_E	6.21
247925	05FRCS-3_E	12.59
247926	05FRCS-4_E	9.46
246909	05MLCS1_E	10.67
247930	05MLCS-2_E	10.67
243442	05RKG1	10.81
243443	05RKG2	10.64
274865	CAYUG;1U C1	-1.74
274866	CAYUG;2U C2	-1.74
292417	T-127 E	10.69
292735	T-183 C	2.67
292736	T-183 E	10.69
292741	T-184 C	2.67
292742	T-184 E	10.69
887741	U1-087 C	1.54
887742	U1-087 E	10.29
887751	U1-088 C	1.03
887752	U1-088 E	6.86
891021	U4-003 C	1.74
891022	U4-003 E	11.62
LTF	V4-050	40.75
LTF	X2-042	38.47
900404	X3-028 C	1212.33
LTF	Y2-006	31.39
LTF	Y2-008	38.08
914321	Y2-084 C OP1	.26
914322	Y2-084 E OP1	4.79
914381	Y2-095 OP1	419.47

Appendix 110

Bus Number	Bus Name	Full Contribution
238555	02AVONG9	17.86
238995	02NCUNTD	.38
239214	02NILE-A	.03
239006	02NILEG1	5.59
239007	02NILEG2	5.54
239022	02NWCAG3	5.41
239023	02NWCAG4	6.25
239024	02NWCAG5	15.85
247528	05COVRT1	3.47
247529	05COVRT2	3.47
247530	05COVRT3	3.47
247531	05COVRT4	2.08
247532	05COVRT5	2.08
247533	05COVRT6	2.08
884780	S-058 C	10.77
884781	S-058 E	35.52
LTF	V3-012	10.58
LTF	W3-083	2.44
905031	W4-001A_AT9	.18
905051	W4-004A_AT10	1.07
LTF	X2-042	12.32
LTF	X3-020	3.19
LTF	X3-021	13.74
900404	X3-028 C	51.8
LTF	X3-096	7.67
LTF	X3-097	10.88
LTF	X3-098	10.31
LTF	X4-029D	2.88
LTF	X4-041	10.19
LTF	Y1-002	10.93
LTF	Y1-004	12.45
LTF	Y1-007	8.65
913091	Y1-015 C	67.63
LTF	Y1-041	2.88
913441	Y1-069 OP1	15.86
913461	Y1-070 OP1	64.13
LTF	Y1-090	1.86
LTF	Y2-004	5.17
LTF	Y2-005	5.17
LTF	Y2-006	5.35
LTF	Y2-007	10.33
LTF	Y2-008	10.65
LTF	Y2-030	2.92
LTF	Y2-031	2.92
LTF	Y2-032	2.92

LTF	Y2-033	5.6
LTF	Y2-034	4.03
LTF	Y2-035	2.16
LTF	Y2-036	2.16
LTF	Y2-040	13.74
LTF	Y2-049	11.29
LTF	Y2-056	8.64
LTF	Y2-068	54.59
LTF	Y2-069	3.33
LTF	Y2-070	3.33
LTF	Y2-071	3.33
LTF	Y2-072	3.33
LTF	Y2-082	23.67
914331	Y2-085 OP1	30.58
914381	Y2-095 OP1	17.92

Appendix 111

Bus Number	Bus Name	Full Contribution
243859	05FR11_E	6.23
243862	05FR12_E	6.13
243864	05FR21_E	6.55
247924	05FRCS22_E	6.27
247925	05FRCS-3_E	12.7
247926	05FRCS-4_E	9.55
246909	05MLCS1_E	10.78
247930	05MLCS-2_E	10.78
243442	05RKG1	10.84
243443	05RKG2	10.68
274865	CAYUG;1U C1	-1.73
274866	CAYUG;2U C2	-1.73
292417	T-127 E	10.79
292735	T-183 C	2.7
292736	T-183 E	10.79
292741	T-184 C	2.7
292742	T-184 E	10.79
887741	U1-087 C	1.55
887742	U1-087 E	10.39
887751	U1-088 C	1.03
887752	U1-088 E	6.92
891021	U4-003 C	1.75
891022	U4-003 E	11.73
LTF	V4-050	40.53
LTF	X2-042	39.69
900404	X3-028 C	1216.43
LTF	Y2-006	31.99
LTF	Y2-008	39.27
914321	Y2-084 C OP1	.27
914322	Y2-084 E OP1	4.83
914381	Y2-095 OP1	420.88

Appendix 112

Bus Number	Bus Name	Full Contribution
243858	05FR11_C	.18
243861	05FR12_C	.17
243863	05FR21_C	.19
243866	05FRCS22_C	.18
243870	05FRCS-3_C	.36
243873	05FRCS-4_C	.27
243442	05RKG1	1.76
243443	05RKG2	1.73
887741	U1-087 C	7.45
887751	U1-088 C	4.97
LTF	V3-012	17.15
LTF	W2-033	13.77
LTF	X2-042	54.54
LTF	X3-020	6.8
900404	X3-028 C	297.19
LTF	X3-096	16.37
LTF	X3-097	23.21
LTF	X3-098	22.
LTF	X4-041	21.74
LTF	Y1-004	20.06
LTF	Y1-007	13.93
LTF	Y2-004	11.18
LTF	Y2-005	11.18
LTF	Y2-006	22.04
LTF	Y2-007	22.37
LTF	Y2-008	54.36
LTF	Y2-030	5.98
LTF	Y2-031	5.98
LTF	Y2-032	5.98
LTF	Y2-033	10.48
LTF	Y2-034	6.15
LTF	Y2-068	116.47
914321	Y2-084 C OP1	1.27
914381	Y2-095 OP1	102.83

Appendix 113

Bus Number	Bus Name	Full Contribution
243858	05FR11_C	.18
243861	05FR12_C	.17
243863	05FR21_C	.19
243866	05FRCS22_C	.18
243870	05FRCS-3_C	.36
243873	05FRCS-4_C	.27
243442	05RKG1	1.76
243443	05RKG2	1.73
887741	U1-087 C	7.45
887751	U1-088 C	4.97
LTF	V3-012	17.15
LTF	W2-033	13.77
LTF	X2-042	54.54
LTF	X3-020	6.8
900404	X3-028 C	297.19
LTF	X3-096	16.37
LTF	X3-097	23.21
LTF	X3-098	22.
LTF	X4-041	21.74
LTF	Y1-004	20.06
LTF	Y1-007	13.93
LTF	Y2-004	11.18
LTF	Y2-005	11.18
LTF	Y2-006	22.04
LTF	Y2-007	22.37
LTF	Y2-008	54.36
LTF	Y2-030	5.98
LTF	Y2-031	5.98
LTF	Y2-032	5.98
LTF	Y2-033	10.48
LTF	Y2-034	6.15
LTF	Y2-068	116.47
914321	Y2-084 C OP1	1.27
914381	Y2-095 OP1	102.83

Appendix 114

Bus Number	Bus Name	Full Contribution
243442	05RKG1	4.24
243443	05RKG2	4.18
LTF	V3-012	12.11
LTF	X2-042	12.52
LTF	X3-020	6.71
900404	X3-028 C	476.18
LTF	X3-096	16.14
LTF	X3-097	22.89
LTF	X3-098	21.7
LTF	X4-041	21.44
LTF	Y1-004	12.52
LTF	Y1-007	8.69
LTF	Y2-004	11.16
LTF	Y2-005	11.16
LTF	Y2-006	12.19
LTF	Y2-007	22.33
LTF	Y2-008	12.65
LTF	Y2-033	6.59
LTF	Y2-068	114.87
914321	Y2-084 C OP1	.49
914381	Y2-095 OP1	164.76

Appendix 115

Bus Number	Bus Name	Full Contribution
242931	05BEVERL	1.84
243764	05BSG1	16.18
243654	05CVG3	9.01
242896	05KRG1L	10.7
242898	05KRG2L	10.7
242940	05MUSKNG	53.32
243045	05MUSKNG	38.24
243655	05PCG5	4.91
243084	05RUTLAN	.08
246759	05SOLIDA	10.99
242807	05SPORNA	47.06
242947	05WATERF	2.41
251934	08BCKJD2	4.74
251935	08BCKJD3	6.46
251936	08BCKJD4	7.57
251937	08BCKJD5	12.
251938	08BCKJD6	21.66
251939	08BECJD1	4.74
292067	FDNS	.11
884780	S-058 C	25.33
884781	S-058 E	83.53
892311	V1-035	2.83
LTF	V3-012	26.97
LTF	W2-033	12.21
903761	W3-128	75.32
909001	X2-006 C1OP1	19.93
909002	X2-006 C2OP1	15.95
LTF	X2-042	30.47
LTF	X3-020	8.67
LTF	X3-021	18.1
900404	X3-028 C	149.76
910751	X3-051	32.24
LTF	X3-096	20.85
LTF	X3-097	29.57
LTF	X3-098	28.02
912161	X4-025	4.9
LTF	X4-029D	7.09
LTF	X4-041	27.69
LTF	Y1-002	25.78
LTF	Y1-004	32.49
LTF	Y1-007	22.57
913111	Y1-018	.29
913121	Y1-019	.29
LTF	Y1-041	7.09
LTF	Y2-004	13.97

LTF	Y2-005	13.97
LTF	Y2-006	15.33
LTF	Y2-007	27.95
LTF	Y2-008	30.35
LTF	Y2-030	9.14
LTF	Y2-031	9.14
LTF	Y2-032	9.14
LTF	Y2-033	17.35
LTF	Y2-034	12.98
LTF	Y2-035	6.96
LTF	Y2-036	6.96
LTF	Y2-040	18.1
LTF	Y2-049	14.86
LTF	Y2-056	21.28
LTF	Y2-068	148.36
LTF	Y2-082	47.39
914381	Y2-095 OP1	51.82

Appendix 116

Bus Number	Bus Name	Full Contribution
238545	02ASHTG5	-12.71
238554	02AVONG7	-14.54
238555	02AVONG9	-73.84
238565	02BAYSG2	6.71
238566	02BAYSG3	6.91
238567	02BAYSG4	10.46
238571	02BEAVGA	.19
238572	02BEAVGB	.19
239175	02WLORG-6	.28
247528	05COVRT1	4.23
247529	05COVRT2	4.23
247530	05COVRT3	4.23
247531	05COVRT4	2.54
247532	05COVRT5	2.54
247533	05COVRT6	2.54
884780	S-058 C	9.79
884781	S-058 E	32.29
LTF	V3-012	6.17
903231	W3-005 C	1.96
903232	W3-005 E	13.1
903511	W3-059A_AT6	1.21
903512	W3-059A_AT6	8.08
LTF	W3-083	1.95
907021	X1-020 C	2.61
907022	X1-020 E	17.47
907041	X1-027A C1	1.16
907044	X1-027A C2	1.16
907046	X1-027A C3	1.16
907048	X1-027A C4	1.16
907042	X1-027A E1	7.78
907045	X1-027A E2	7.78
907047	X1-027A E3	7.78
907049	X1-027A E4	7.78
LTF	X2-042	8.44
LTF	X3-020	2.52
LTF	X3-021	24.48
900404	X3-028 C	38.6
LTF	X3-096	6.06
LTF	X3-097	8.59
LTF	X3-098	8.15
LTF	X4-029D	2.55
LTF	X4-041	8.05
LTF	Y1-002	10.14
LTF	Y1-004	6.88
LTF	Y1-007	4.78

LTF	Y1-041	2.55
913441	Y1-069 OP1	35.04
LTF	Y2-004	4.1
LTF	Y2-005	4.1
LTF	Y2-006	4.03
LTF	Y2-007	8.2
LTF	Y2-008	8.07
LTF	Y2-030	1.95
LTF	Y2-031	1.95
LTF	Y2-032	1.95
LTF	Y2-033	3.46
LTF	Y2-034	1.81
LTF	Y2-040	24.48
LTF	Y2-049	20.11
LTF	Y2-056	7.65
LTF	Y2-068	43.13
LTF	Y2-069	5.15
LTF	Y2-070	5.15
LTF	Y2-071	5.15
LTF	Y2-072	5.15
LTF	Y2-082	28.35
914381	Y2-095 OP1	13.36

Appendix 117

Bus Number	Bus Name	Full Contribution
238545	02ASHTG5	-12.71
238554	02AVONG7	-14.54
238555	02AVONG9	-73.84
238565	02BAYSG2	6.71
238566	02BAYSG3	6.91
238567	02BAYSG4	10.46
238571	02BEAVGA	.19
238572	02BEAVGB	.19
239175	02WLORG-6	.28
247528	05COVRT1	4.23
247529	05COVRT2	4.23
247530	05COVRT3	4.23
247531	05COVRT4	2.54
247532	05COVRT5	2.54
247533	05COVRT6	2.54
884780	S-058 C	9.79
884781	S-058 E	32.29
LTF	V3-012	6.17
903231	W3-005 C	1.96
903232	W3-005 E	13.1
903511	W3-059A_AT6	1.21
903512	W3-059A_AT6	8.08
LTF	W3-083	1.95
907021	X1-020 C	2.61
907022	X1-020 E	17.47
907041	X1-027A C1	1.16
907044	X1-027A C2	1.16
907046	X1-027A C3	1.16
907048	X1-027A C4	1.16
907042	X1-027A E1	7.78
907045	X1-027A E2	7.78
907047	X1-027A E3	7.78
907049	X1-027A E4	7.78
LTF	X2-042	8.44
LTF	X3-020	2.52
LTF	X3-021	24.48
900404	X3-028 C	38.6
LTF	X3-096	6.06
LTF	X3-097	8.59
LTF	X3-098	8.15
LTF	X4-029D	2.55
LTF	X4-041	8.05
LTF	Y1-002	10.14
LTF	Y1-004	6.88
LTF	Y1-007	4.78

LTF	Y1-041	2.55
913441	Y1-069 OP1	35.04
LTF	Y2-004	4.1
LTF	Y2-005	4.1
LTF	Y2-006	4.03
LTF	Y2-007	8.2
LTF	Y2-008	8.07
LTF	Y2-030	1.95
LTF	Y2-031	1.95
LTF	Y2-032	1.95
LTF	Y2-033	3.46
LTF	Y2-034	1.81
LTF	Y2-040	24.48
LTF	Y2-049	20.11
LTF	Y2-056	7.65
LTF	Y2-068	43.13
LTF	Y2-069	5.15
LTF	Y2-070	5.15
LTF	Y2-071	5.15
LTF	Y2-072	5.15
LTF	Y2-082	28.35
914381	Y2-095 OP1	13.36

Appendix 118

Bus Number	Bus Name	Full Contribution
247528	05COVRT1	3.89
247529	05COVRT2	3.89
247530	05COVRT3	3.89
247531	05COVRT4	2.33
247532	05COVRT5	2.33
247533	05COVRT6	2.33
243045	05MUSKNG	36.12
242807	05SPORNA	17.31
315446	Q-065	-15.65
884780	S-058 C	13.23
884781	S-058 E	43.62
LTF	V3-012	11.9
LTF	W2-033	2.73
LTF	W3-083	2.75
903691	W3-111 C	.52
903701	W3-112 C	.52
903711	W3-113 C	.52
903761	W3-128	25.53
235577	WILLOW I 1	-8.3
235578	WILLOW I 2	-25.67
LTF	X2-042	14.8
LTF	X3-020	4.08
LTF	X3-021	12.86
900404	X3-028 C	69.19
LTF	X3-096	9.82
LTF	X3-097	13.93
LTF	X3-098	13.2
LTF	X4-029D	3.57
LTF	X4-041	13.04
LTF	Y1-002	13.44
LTF	Y1-004	14.01
LTF	Y1-007	9.73
LTF	Y1-041	3.57
LTF	Y1-090	2.38
LTF	Y2-004	6.59
LTF	Y2-005	6.59
LTF	Y2-006	7.14
LTF	Y2-007	13.19
LTF	Y2-008	14.15
LTF	Y2-030	4.05
LTF	Y2-031	4.05
LTF	Y2-032	4.05
LTF	Y2-033	7.12
LTF	Y2-034	4.32
LTF	Y2-035	2.32

LTF	Y2-036	2.32
LTF	Y2-040	12.86
LTF	Y2-049	10.56
LTF	Y2-056	10.72
LTF	Y2-068	69.9
LTF	Y2-069	3.39
LTF	Y2-070	3.39
LTF	Y2-071	3.39
LTF	Y2-072	3.39
LTF	Y2-082	26.86
914381	Y2-095 OP1	23.94

Appendix 119

Bus Number	Bus Name	Full Contribution
247931	U3-002 E	14.
891221	U4-038 C	1.25
891222	U4-038 E	8.37
891231	U4-039 C1	2.17
891241	U4-039 C2	2.17
891251	U4-039 C3	2.17
891261	U4-039 C4	2.17
891232	U4-039 E1	14.53
891242	U4-039 E2	14.53
891252	U4-039 E3	14.53
891262	U4-039 E4	14.53
LTF	V3-012	4.2
LTF	W2-033	6.32
907021	X1-020 C	10.86
907022	X1-020 E	72.65
LTF	X2-042	12.96
900404	X3-028 C	59.36
LTF	X3-096	2.66
LTF	X3-097	3.78
LTF	X3-098	3.58
LTF	X4-041	3.54
LTF	Y1-004	5.26
LTF	Y1-007	3.65
LTF	Y2-004	1.78
LTF	Y2-005	1.78
LTF	Y2-006	5.08
LTF	Y2-007	3.57
LTF	Y2-008	12.98
LTF	Y2-030	2.46
LTF	Y2-031	2.46
LTF	Y2-032	2.46
LTF	Y2-033	2.81
LTF	Y2-034	1.93
LTF	Y2-068	18.95
914381	Y2-095 OP1	20.54

Appendix 120

Bus Number	Bus Name	Full Contribution
247931	U3-002 E	13.91
891221	U4-038 C	1.24
891222	U4-038 E	8.32
891231	U4-039 C1	2.16
891241	U4-039 C2	2.16
891251	U4-039 C3	2.16
891261	U4-039 C4	2.16
891232	U4-039 E1	14.46
891242	U4-039 E2	14.46
891252	U4-039 E3	14.46
891262	U4-039 E4	14.46
LTF	V3-012	4.41
LTF	W2-033	6.45
907021	X1-020 C	10.77
907022	X1-020 E	72.09
LTF	X2-042	12.7
LTF	X3-020	1.39
900404	X3-028 C	58.63
LTF	X3-096	3.34
LTF	X3-097	4.74
LTF	X3-098	4.49
LTF	X4-041	4.44
LTF	Y1-004	5.34
LTF	Y1-007	3.71
LTF	Y2-004	2.26
LTF	Y2-005	2.26
LTF	Y2-006	4.97
LTF	Y2-007	4.52
LTF	Y2-008	12.76
LTF	Y2-030	2.39
LTF	Y2-031	2.39
LTF	Y2-032	2.39
LTF	Y2-033	2.87
LTF	Y2-034	1.81
LTF	Y2-068	23.78
914381	Y2-095 OP1	20.28

Appendix 121

Bus Number	Bus Name	Full Contribution
247528	05COVRT1	3.89
247529	05COVRT2	3.89
247530	05COVRT3	3.89
247531	05COVRT4	2.33
247532	05COVRT5	2.33
247533	05COVRT6	2.33
243045	05MUSKNG	36.12
242807	05SPORNA	17.31
315446	Q-065	-15.65
884780	S-058 C	13.23
884781	S-058 E	43.62
LTF	V3-012	11.9
LTF	W2-033	2.73
LTF	W3-083	2.75
903691	W3-111 C	.52
903701	W3-112 C	.52
903711	W3-113 C	.52
903761	W3-128	25.53
235577	WILLOW I 1	-8.3
235578	WILLOW I 2	-25.67
LTF	X2-042	14.8
LTF	X3-020	4.08
LTF	X3-021	12.86
900404	X3-028 C	69.19
LTF	X3-096	9.82
LTF	X3-097	13.93
LTF	X3-098	13.2
LTF	X4-029D	3.57
LTF	X4-041	13.04
LTF	Y1-002	13.44
LTF	Y1-004	14.01
LTF	Y1-007	9.73
LTF	Y1-041	3.57
LTF	Y1-090	2.38
LTF	Y2-004	6.59
LTF	Y2-005	6.59
LTF	Y2-006	7.14
LTF	Y2-007	13.19
LTF	Y2-008	14.15
LTF	Y2-030	4.05
LTF	Y2-031	4.05
LTF	Y2-032	4.05
LTF	Y2-033	7.12
LTF	Y2-034	4.32
LTF	Y2-035	2.32

LTF	Y2-036	2.32
LTF	Y2-040	12.86
LTF	Y2-049	10.56
LTF	Y2-056	10.72
LTF	Y2-068	69.9
LTF	Y2-069	3.39
LTF	Y2-070	3.39
LTF	Y2-071	3.39
LTF	Y2-072	3.39
LTF	Y2-082	26.86
914381	Y2-095 OP1	23.94

Appendix 122

Bus Number	Bus Name	Full Contribution
247528	05COVRT1	3.89
247529	05COVRT2	3.89
247530	05COVRT3	3.89
247531	05COVRT4	2.33
247532	05COVRT5	2.33
247533	05COVRT6	2.33
243045	05MUSKNG	36.12
242807	05SPORNA	17.31
315446	Q-065	-15.65
884780	S-058 C	13.23
884781	S-058 E	43.62
LTF	V3-012	11.9
LTF	W2-033	2.73
LTF	W3-083	2.75
903691	W3-111 C	.52
903692	W3-111 E	.85
903701	W3-112 C	.52
903702	W3-112 E	.85
903711	W3-113 C	.52
903712	W3-113 E	.85
903761	W3-128	25.53
235577	WILLOW I 1	-8.3
235578	WILLOW I 2	-25.67
907021	X1-020 C	3.79
907022	X1-020 E	25.34
LTF	X2-042	14.8
LTF	X3-020	4.08
LTF	X3-021	12.86
900404	X3-028 C	69.19
LTF	X3-096	9.82
LTF	X3-097	13.93
LTF	X3-098	13.2
LTF	X4-029D	3.57
LTF	X4-041	13.04
LTF	Y1-002	13.44
LTF	Y1-004	14.01
LTF	Y1-007	9.73
LTF	Y1-041	3.57
LTF	Y1-090	2.38
LTF	Y2-004	6.59
LTF	Y2-005	6.59
LTF	Y2-006	7.14
LTF	Y2-007	13.19
LTF	Y2-008	14.15
LTF	Y2-030	4.05

LTF	Y2-031	4.05
LTF	Y2-032	4.05
LTF	Y2-033	7.12
LTF	Y2-034	4.32
LTF	Y2-035	2.32
LTF	Y2-036	2.32
LTF	Y2-040	12.86
LTF	Y2-049	10.56
LTF	Y2-056	10.72
LTF	Y2-068	69.9
LTF	Y2-069	3.39
LTF	Y2-070	3.39
LTF	Y2-071	3.39
LTF	Y2-072	3.39
LTF	Y2-082	26.86
914381	Y2-095 OP1	23.94

Appendix 123

Bus Number	Bus Name	Full Contribution
247528	05COVRT1	3.89
247529	05COVRT2	3.89
247530	05COVRT3	3.89
247531	05COVRT4	2.33
247532	05COVRT5	2.33
247533	05COVRT6	2.33
243045	05MUSKNG	36.12
242807	05SPORNA	17.31
315446	Q-065	-15.65
884780	S-058 C	13.23
884781	S-058 E	43.62
LTF	V3-012	11.9
LTF	W2-033	2.73
LTF	W3-083	2.75
903691	W3-111 C	.52
903692	W3-111 E	.85
903701	W3-112 C	.52
903702	W3-112 E	.85
903711	W3-113 C	.52
903712	W3-113 E	.85
903761	W3-128	25.53
235577	WILLOW I 1	-8.3
235578	WILLOW I 2	-25.67
907021	X1-020 C	3.79
907022	X1-020 E	25.34
LTF	X2-042	14.8
LTF	X3-020	4.08
LTF	X3-021	12.86
900404	X3-028 C	69.19
LTF	X3-096	9.82
LTF	X3-097	13.93
LTF	X3-098	13.2
LTF	X4-029D	3.57
LTF	X4-041	13.04
LTF	Y1-002	13.44
LTF	Y1-004	14.01
LTF	Y1-007	9.73
LTF	Y1-041	3.57
LTF	Y1-090	2.38
LTF	Y2-004	6.59
LTF	Y2-005	6.59
LTF	Y2-006	7.14
LTF	Y2-007	13.19
LTF	Y2-008	14.15
LTF	Y2-030	4.05

LTF	Y2-031	4.05
LTF	Y2-032	4.05
LTF	Y2-033	7.12
LTF	Y2-034	4.32
LTF	Y2-035	2.32
LTF	Y2-036	2.32
LTF	Y2-040	12.86
LTF	Y2-049	10.56
LTF	Y2-056	10.72
LTF	Y2-068	69.9
LTF	Y2-069	3.39
LTF	Y2-070	3.39
LTF	Y2-071	3.39
LTF	Y2-072	3.39
LTF	Y2-082	26.86
914381	Y2-095 OP1	23.94

Appendix 124

Bus Number	Bus Name	Full Contribution
247931	U3-002 E	15.71
891221	U4-038 C	1.4
891222	U4-038 E	9.39
891231	U4-039 C1	2.68
891241	U4-039 C2	2.68
891251	U4-039 C3	2.68
891261	U4-039 C4	2.68
891232	U4-039 E1	17.93
891242	U4-039 E2	17.93
891252	U4-039 E3	17.93
891262	U4-039 E4	17.93
LTF	V3-012	4.09
LTF	W2-033	6.28
907021	X1-020 C	10.4
907022	X1-020 E	69.62
LTF	X2-042	12.92
900404	X3-028 C	57.05
LTF	X3-096	2.46
LTF	X3-097	3.49
LTF	X3-098	3.31
LTF	X4-041	3.27
LTF	Y1-004	5.17
LTF	Y1-007	3.59
LTF	Y2-004	1.64
LTF	Y2-005	1.64
LTF	Y2-006	5.14
LTF	Y2-007	3.28
LTF	Y2-008	12.93
LTF	Y2-030	2.45
LTF	Y2-031	2.45
LTF	Y2-032	2.45
LTF	Y2-033	2.76
LTF	Y2-034	1.92
LTF	Y2-068	17.5
914381	Y2-095 OP1	19.74

Appendix 125

Bus Number	Bus Name	Full Contribution
243858	05FR11_C	.05
243859	05FR11_E	8.08
243861	05FR12_C	.05
243862	05FR12_E	7.94
243863	05FR21_C	.05
243864	05FR21_E	8.49
243866	05FRCS22_C	.05
247924	05FRCS22_E	8.13
243870	05FRCS-3_C	.1
247925	05FRCS-3_E	16.46
243873	05FRCS-4_C	.07
247926	05FRCS-4_E	12.38
243442	05RKG1	15.27
243443	05RKG2	15.04
884780	S-058 C	27.96
884781	S-058 E	92.18
887741	U1-087 C	2.01
887742	U1-087 E	13.46
887751	U1-088 C	1.34
887752	U1-088 E	8.97
LTF	V3-012	15.09
LTF	X2-042	36.5
LTF	X3-020	18.59
900404	X3-028 C	1130.19
LTF	X3-096	44.72
LTF	X3-097	63.41
LTF	X3-098	60.11
LTF	X4-041	59.39
LTF	Y1-002	25.43
LTF	Y2-004	31.49
LTF	Y2-005	31.49
LTF	Y2-006	22.01
LTF	Y2-007	62.98
LTF	Y2-008	38.04
LTF	Y2-056	24.93
LTF	Y2-068	318.21
LTF	Y2-082	31.15
914321	Y2-084 C OP1	.34
914322	Y2-084 E OP1	6.26
914381	Y2-095 OP1	391.04

Appendix 126

Bus Number	Bus Name	Full Contribution
243442	05RKG1	15.87
243443	05RKG2	15.63
900404	X3-028 C	1780.97
914381	Y2-095 OP1	616.22

Appendix 127

Bus Number	Bus Name	Full Contribution
243442	05RKG1	15.87
243443	05RKG2	15.63
900404	X3-028 C	1780.97
914381	Y2-095 OP1	616.22

Appendix 128

Bus Number	Bus Name	Full Contribution
243442	05RKG1	15.87
243443	05RKG2	15.63
900404	X3-028 C	1780.97
914381	Y2-095 OP1	616.22

Appendix 129

Bus Number	Bus Name	Full Contribution
243442	05RKG1	15.87
243443	05RKG2	15.63
900404	X3-028 C	1780.97
914381	Y2-095 OP1	616.22

Appendix 130

Bus Number	Bus Name	Full Contribution
238555	02AVONG9	-22.49
238565	02BAYSG2	6.15
238566	02BAYSG3	6.33
238567	02BAYSG4	9.58
247528	05COVRT1	3.49
247529	05COVRT2	3.49
247530	05COVRT3	3.49
247531	05COVRT4	2.1
247532	05COVRT5	2.1
247533	05COVRT6	2.1
884780	S-058 C	7.55
884781	S-058 E	24.9
LTF	V3-012	4.27
903231	W3-005 C	1.41
903232	W3-005 E	9.46
903511	W3-059A_AT6	2.35
903512	W3-059A_AT6	15.67
LTF	W3-083	1.48
907021	X1-020 C	1.99
907022	X1-020 E	13.31
907041	X1-027A C1	.85
907044	X1-027A C2	.85
907046	X1-027A C3	.85
907048	X1-027A C4	.85
907042	X1-027A E1	5.71
907045	X1-027A E2	5.71
907047	X1-027A E3	5.71
907049	X1-027A E4	5.71
LTF	X2-042	6.11
LTF	X3-020	1.87
LTF	X3-021	21.49
900404	X3-028 C	28.21
LTF	X3-096	4.5
LTF	X3-097	6.39
LTF	X3-098	6.05
LTF	X4-029D	1.96
LTF	X4-041	5.98
LTF	Y1-002	7.86
LTF	Y1-004	4.68
LTF	Y1-007	3.25
LTF	Y1-041	1.96
913441	Y1-069 OP1	31.01
LTF	Y2-004	3.05
LTF	Y2-005	3.05
LTF	Y2-006	2.94

LTF	Y2-007	6.11
LTF	Y2-008	5.91
LTF	Y2-030	1.37
LTF	Y2-031	1.37
LTF	Y2-032	1.37
LTF	Y2-033	2.38
LTF	Y2-040	21.49
LTF	Y2-049	17.64
LTF	Y2-056	5.87
LTF	Y2-068	32.05
LTF	Y2-069	4.44
LTF	Y2-070	4.44
LTF	Y2-071	4.44
LTF	Y2-072	4.44
LTF	Y2-082	23.31
914381	Y2-095 OP1	9.76

Appendix 131

Bus Number	Bus Name	Full Contribution
315094	1CHESPK1	1.13
315095	1CHESPK2	1.13
315096	1CHESPK3	1.52
315097	1CHESPK4	2.14
315446	Q-065	17.98
884780	S-058 C	3.79
884781	S-058 E	12.49
204656	TITUS 1G	-1.97
204657	TITUS 2G	-1.97
204658	TITUS 3G	-1.97
294970	U1-048	.
LTF	V3-012	4.87
292630	V3-017	6.29
901451	W1-116 C	.01
LTF	W3-083	.82
905321	W4-044	6.29
907991	X1-078	7.6
LTF	X2-042	4.31
LTF	X3-020	1.27
LTF	X3-021	3.53
900404	X3-028 C	19.78
910941	X3-087 C OP1	6.87
LTF	X3-096	3.07
LTF	X3-097	4.35
LTF	X3-098	4.12
LTF	X4-029D	1.06
912211	X4-035 OP1	6.77
912221	X4-039	11.1
LTF	X4-041	4.07
LTF	Y1-002	3.81
LTF	Y1-004	5.93
LTF	Y1-007	4.12
LTF	Y1-041	1.06
LTF	Y1-090	.74
LTF	Y2-004	2.07
LTF	Y2-005	2.07
LTF	Y2-006	2.02
LTF	Y2-007	4.14
LTF	Y2-008	4.06
LTF	Y2-030	1.15
LTF	Y2-031	1.15
LTF	Y2-032	1.15
LTF	Y2-033	2.98
LTF	Y2-034	3.5
LTF	Y2-035	1.88

LTF	Y2-036	1.88
LTF	Y2-040	3.53
LTF	Y2-049	2.9
LTF	Y2-056	3.18
LTF	Y2-068	21.82
LTF	Y2-069	.93
LTF	Y2-070	.93
LTF	Y2-071	.93
LTF	Y2-072	.93
LTF	Y2-082	7.45
914381	Y2-095 OP1	6.84

Appendix 132

Bus Number	Bus Name	Full Contribution
243442	05RKG1	6.72
243443	05RKG2	6.62
LTF	V3-012	11.07
LTF	X3-020	7.15
900404	X3-028 C	754.36
LTF	X3-096	17.19
LTF	X3-097	24.38
LTF	X3-098	23.11
LTF	X4-041	22.83
LTF	Y1-004	10.3
LTF	Y1-007	7.15
LTF	Y2-004	11.97
LTF	Y2-005	11.97
LTF	Y2-006	7.38
LTF	Y2-007	23.93
LTF	Y2-068	122.34
914381	Y2-095 OP1	261.01

Appendix 133

Bus Number	Bus Name	Full Contribution
243442	05RKG1	6.72
243443	05RKG2	6.62
LTF	V3-012	11.07
LTF	X3-020	7.15
900404	X3-028 C	754.36
LTF	X3-096	17.19
LTF	X3-097	24.38
LTF	X3-098	23.11
LTF	X4-041	22.83
LTF	Y1-004	10.3
LTF	Y1-007	7.15
LTF	Y2-004	11.97
LTF	Y2-005	11.97
LTF	Y2-006	7.38
LTF	Y2-007	23.93
LTF	Y2-068	122.34
914381	Y2-095 OP1	261.01

Appendix 134

Bus Number	Bus Name	Full Contribution
243442	05RKG1	14.87
243443	05RKG2	14.65
900404	X3-028 C	1669.08
914381	Y2-095 OP1	577.5

Appendix 135

Bus Number	Bus Name	Full Contribution
243442	05RKG1	15.87
243443	05RKG2	15.63
900404	X3-028 C	1780.97
914381	Y2-095 OP1	616.22

Appendix 136

Bus Number	Bus Name	Full Contribution
315094	1CHESPK1	1.82
315095	1CHESPK2	1.82
315096	1CHESPK3	2.44
315097	1CHESPK4	3.43
315090	1YORKTN1	2.67
315091	1YORKTN2	2.77
224026	C U1	1.3
224027	C U2	1.3
224028	C U3	1.5
224029	C U4	1.5
224030	C U5	1.5
204653	PORT2GEN	-5.78
315446	Q-065	28.92
296335	R-033 1	.38
296336	R-033 2	.38
296346	R-033 3	.28
296348	R-033 4	.28
218360	SEWAREN1	-2.46
218361	SEWAREN2	-2.8
218362	SEWAREN3	-2.54
218363	SEWAREN4	-2.94
218364	SEWAREN6	-2.63
204656	TITUS 1G	-2.47
204657	TITUS 2G	-2.47
204658	TITUS 3G	-2.47
893031	V2-008	5.29
LTF	V2-031	.76
LTF	V2-032	.75
LTF	V3-012	7.68
292630	V3-017	9.96
901451	W1-116 C	.01
901452	W1-116 E	.96
LTF	W2-033	.64
LTF	W3-083	1.29
905321	W4-044	9.96
LTF	W4-049	.91
LTF	W4-050	.91
907991	X1-078	12.45
909001	X2-006 C1OP1	3.26
909002	X2-006 C2OP1	2.61
LTF	X2-042	6.75
LTF	X3-020	2.
LTF	X3-021	5.52
900404	X3-028 C	31.01
910751	X3-051	5.43

910871	X3-076 OP1	8.04
910941	X3-087 C OP1	10.93
910942	X3-087 E OP1	2.5
LTF	X3-096	4.82
LTF	X3-097	6.83
LTF	X3-098	6.48
LTF	X4-029D	1.66
912211	X4-035 OP1	10.9
912221	X4-039	17.31
LTF	X4-041	6.4
LTF	Y1-002	5.96
LTF	Y1-004	9.35
LTF	Y1-007	6.49
LTF	Y1-041	1.66
LTF	Y1-089	.68
LTF	Y1-090	1.17
LTF	Y1-091	.63
LTF	Y2-004	3.25
LTF	Y2-005	3.25
LTF	Y2-006	3.17
LTF	Y2-007	6.51
LTF	Y2-008	6.37
LTF	Y2-030	1.81
LTF	Y2-031	1.81
LTF	Y2-032	1.81
LTF	Y2-033	4.71
LTF	Y2-034	5.56
LTF	Y2-035	2.98
LTF	Y2-036	2.98
LTF	Y2-040	5.52
LTF	Y2-049	4.54
LTF	Y2-056	4.99
LTF	Y2-068	34.28
LTF	Y2-069	1.46
LTF	Y2-070	1.46
LTF	Y2-071	1.46
LTF	Y2-072	1.46
LTF	Y2-082	11.67
914381	Y2-095 OP1	10.73

Appendix 137

Bus Number	Bus Name	Full Contribution
243859	05FR11_E	1.98
243862	05FR12_E	1.95
243864	05FR21_E	2.09
247924	05FRCS22_E	2.
247925	05FRCS-3_E	4.04
247926	05FRCS-4_E	3.04
243045	05MUSKNG	38.43
242807	05SPORNA	20.71
251934	08BCKJD2	2.68
251935	08BCKJD3	3.64
251936	08BCKJD4	4.27
251937	08BCKJD5	6.78
884780	S-058 C	17.6
884781	S-058 E	58.02
891231	U4-039 C1	.6
891241	U4-039 C2	.6
891251	U4-039 C3	.6
891261	U4-039 C4	.6
891232	U4-039 E1	3.99
891242	U4-039 E2	3.99
891252	U4-039 E3	3.99
891262	U4-039 E4	3.99
893031	V2-008	13.32
LTF	V2-031	1.99
LTF	V2-032	1.96
LTF	V3-012	15.21
LTF	W2-033	2.74
LTF	W3-083	3.65
903691	W3-111 C	.57
903692	W3-111 E	.93
903701	W3-112 C	.57
903702	W3-112 E	.93
903711	W3-113 C	.57
903712	W3-113 E	.93
903761	W3-128	29.63
235577	WILLOW I 1	-8.55
235578	WILLOW I 2	-26.47
907021	X1-020 C	5.02
907022	X1-020 E	33.56
909001	X2-006 C1OP1	9.48
909002	X2-006 C2OP1	7.58
LTF	X2-042	19.28
909181	X2-052	17.05
LTF	X3-020	5.31
LTF	X3-021	17.63

900404	X3-028 C	89.46
910751	X3-051	17.22
LTF	X3-096	12.77
LTF	X3-097	18.11
LTF	X3-098	17.17
LTF	X4-029D	4.71
LTF	X4-041	16.96
LTF	Y1-002	17.84
LTF	Y1-004	17.81
LTF	Y1-007	12.37
LTF	Y1-041	4.71
LTF	Y1-089	1.8
LTF	Y1-090	3.1
LTF	Y1-091	1.68
LTF	Y2-004	8.58
LTF	Y2-005	8.58
LTF	Y2-006	9.25
LTF	Y2-007	17.15
LTF	Y2-008	18.32
LTF	Y2-030	5.18
LTF	Y2-031	5.18
LTF	Y2-032	5.18
LTF	Y2-033	8.97
LTF	Y2-034	5.15
LTF	Y2-035	2.76
LTF	Y2-036	2.76
LTF	Y2-040	17.63
LTF	Y2-049	14.48
LTF	Y2-056	14.14
LTF	Y2-068	90.87
LTF	Y2-069	4.6
LTF	Y2-070	4.6
LTF	Y2-071	4.6
LTF	Y2-072	4.6
LTF	Y2-082	36.05
914381	Y2-095 OP1	30.95

Appendix 138

Bus Number	Bus Name	Full Contribution
243859	05FR11_E	1.98
243862	05FR12_E	1.95
243864	05FR21_E	2.09
247924	05FRCS22_E	2.
247925	05FRCS-3_E	4.04
247926	05FRCS-4_E	3.04
243045	05MUSKNG	38.43
242807	05SPORNA	20.71
251934	08BCKJD2	2.68
251935	08BCKJD3	3.64
251936	08BCKJD4	4.27
251937	08BCKJD5	6.78
884780	S-058 C	17.6
884781	S-058 E	58.02
891231	U4-039 C1	.6
891241	U4-039 C2	.6
891251	U4-039 C3	.6
891261	U4-039 C4	.6
891232	U4-039 E1	3.99
891242	U4-039 E2	3.99
891252	U4-039 E3	3.99
891262	U4-039 E4	3.99
893031	V2-008	13.32
LTF	V2-031	1.99
LTF	V2-032	1.96
LTF	V3-012	15.21
LTF	W2-033	2.74
LTF	W3-083	3.65
903691	W3-111 C	.57
903692	W3-111 E	.93
903701	W3-112 C	.57
903702	W3-112 E	.93
903711	W3-113 C	.57
903712	W3-113 E	.93
903761	W3-128	29.63
235577	WILLOW I 1	-8.55
235578	WILLOW I 2	-26.47
907021	X1-020 C	5.02
907022	X1-020 E	33.56
909001	X2-006 C1OP1	9.48
909002	X2-006 C2OP1	7.58
LTF	X2-042	19.28
909181	X2-052	17.05
LTF	X3-020	5.31
LTF	X3-021	17.63

900404	X3-028 C	89.46
910751	X3-051	17.22
LTF	X3-096	12.77
LTF	X3-097	18.11
LTF	X3-098	17.17
LTF	X4-029D	4.71
LTF	X4-041	16.96
LTF	Y1-002	17.84
LTF	Y1-004	17.81
LTF	Y1-007	12.37
LTF	Y1-041	4.71
LTF	Y1-089	1.8
LTF	Y1-090	3.1
LTF	Y1-091	1.68
LTF	Y2-004	8.58
LTF	Y2-005	8.58
LTF	Y2-006	9.25
LTF	Y2-007	17.15
LTF	Y2-008	18.32
LTF	Y2-030	5.18
LTF	Y2-031	5.18
LTF	Y2-032	5.18
LTF	Y2-033	8.97
LTF	Y2-034	5.15
LTF	Y2-035	2.76
LTF	Y2-036	2.76
LTF	Y2-040	17.63
LTF	Y2-049	14.48
LTF	Y2-056	14.14
LTF	Y2-068	90.87
LTF	Y2-069	4.6
LTF	Y2-070	4.6
LTF	Y2-071	4.6
LTF	Y2-072	4.6
LTF	Y2-082	36.05
914381	Y2-095 OP1	30.95

Appendix 139

Bus Number	Bus Name	Full Contribution
243858	05FR11_C	.04
243861	05FR12_C	.04
243863	05FR21_C	.04
243866	05FRCS22_C	.04
243870	05FRCS-3_C	.08
243873	05FRCS-4_C	.06
246908	05MLCS1_C	.07
246910	05MLCS-2_C	.07
243442	05RKG1	8.96
243443	05RKG2	8.83
274650	KINCA;1U	.92
274651	KINCA;2U	.92
290261	S-027 C	.05
290265	S-028 C	.05
884780	S-058 C	14.85
884781	S-058 E	48.95
292416	T-127 C	.07
292735	T-183 C	2.93
292741	T-184 C	2.93
887741	U1-087 C	1.62
887751	U1-088 C	1.08
891021	U4-003 C	1.91
891211	U4-037 C	1.73
LTF	V1-016	9.42
893031	V2-008	40.5
LTF	V2-031	5.66
LTF	V3-012	6.71
905071	W4-005 C	2.57
LTF	X3-020	15.55
900404	X3-028 C	1006.15
LTF	X3-096	37.41
LTF	X3-097	53.04
LTF	X3-098	50.28
LTF	X4-041	49.68
LTF	Y1-002	13.47
LTF	Y1-090	9.07
LTF	Y2-004	26.15
LTF	Y2-005	26.15
LTF	Y2-007	52.31
LTF	Y2-056	15.76
LTF	Y2-068	266.17
LTF	Y2-082	11.16
914321	Y2-084 C OP1	.28
914381	Y2-095 OP1	348.13

Appendix 140

Bus Number	Bus Name	Full Contribution
243859	05FR11_E	6.88
243862	05FR12_E	6.76
243864	05FR21_E	7.23
247924	05FRCS22_E	6.92
247925	05FRCS-3_E	14.02
247926	05FRCS-4_E	10.54
246909	05MLCS1_E	12.5
247930	05MLCS-2_E	12.5
243442	05RKG1	9.05
243443	05RKG2	8.91
293665	O-024 E	4.04
293667	O-024 E	8.01
296308	R-030 C1	1.66
296271	R-030 C2	1.66
296125	R-030 C3	1.68
296309	R-030 E1	6.65
296272	R-030 E2	6.65
296128	R-030 E3	6.73
884780	S-058 C	19.37
884781	S-058 E	63.86
292417	T-127 E	12.52
292735	T-183 C	3.13
292736	T-183 E	12.52
292741	T-184 C	3.13
292742	T-184 E	12.52
274853	TWING;U1	8.93
274854	TWING;U2	8.93
887741	U1-087 C	1.71
887742	U1-087 E	11.46
887751	U1-088 C	1.14
887752	U1-088 E	7.64
891021	U4-003 C	2.03
891022	U4-003 E	13.61
891211	U4-037 C	1.85
891212	U4-037 E	12.38
LTF	V1-016	9.35
893031	V2-008	43.06
LTF	V2-031	5.9
LTF	V2-032	5.81
LTF	V3-012	6.78
902352	W2-048 E	4.42
905071	W4-005 C	2.79
905072	W4-005 E	18.67
909062	X2-022 E OP1	13.38
LTF	X3-020	16.2

900404	X3-028 C	1015.6
LTF	X3-096	38.96
LTF	X3-097	55.25
LTF	X3-098	52.37
LTF	X4-029D	6.2
LTF	X4-041	51.74
LTF	Y1-002	17.6
LTF	Y1-041	6.2
LTF	Y1-090	9.45
LTF	Y2-004	27.25
LTF	Y2-005	27.25
LTF	Y2-007	54.5
LTF	Y2-056	18.6
LTF	Y2-068	277.24
LTF	Y2-082	18.8
914321	Y2-084 C OP1	.29
914322	Y2-084 E OP1	5.33
914381	Y2-095 OP1	351.4

Appendix 141

Bus Number	Bus Name	Full Contribution
900404	X3-028 C	3500.
914381	Y2-095 OP1	1211.

Appendix 142

Bus Number	Bus Name	Full Contribution
238545	02ASHTG5	-13.56
238554	02AVONG7	-9.21
238555	02AVONG9	-68.97
238564	02BAYSG1	.43
238565	02BAYSG2	18.51
238566	02BAYSG3	19.05
238567	02BAYSG4	28.84
238568	02BAYSHO	.05
238601	02FRMENG 1	.96
238602	02FRMENG 2	.96
238603	02FRMENG 3	1.73
247528	05COVRT1	8.58
247529	05COVRT2	8.58
247530	05COVRT3	8.58
247531	05COVRT4	5.15
247532	05COVRT5	5.15
247533	05COVRT6	5.15
240950	BG5	.06
884780	S-058 C	18.81
884781	S-058 E	62.02
247522	U1-059 C	.33
247909	U1-059 E	2.23
889031	U2-028A_AT1	18.01
891141	U4-028 C	1.29
891142	U4-028 E	8.65
891151	U4-029 C	1.29
891152	U4-029 E	8.65
893001	V2-001 C	.58
893002	V2-001 E	4.1
893021	V2-006 C	1.16
893022	V2-006 E	7.77
LTF	V3-012	10.8
247548	V4-010 C	3.11
247932	V4-010 E	20.79
900041	V4-011	.24
247546	V4-015 C	.75
247922	V4-015 E	4.97
901221	W1-072A_AT5	3.88
902141	W2-001 C	.74
902142	W2-001 E	4.98
902151	W2-007 C	.77
902152	W2-007 E	5.18
903231	W3-005 C	3.53
903232	W3-005 E	23.65
LTF	W3-083	3.69

903611	W3-085 C	1.66
903612	W3-085 E	11.16
907021	X1-020 C	4.96
907022	X1-020 E	33.21
907041	X1-027A C1	1.57
907044	X1-027A C2	1.57
907046	X1-027A C3	1.57
907048	X1-027A C4	1.57
907042	X1-027A E1	10.48
907045	X1-027A E2	10.48
907047	X1-027A E3	10.48
907049	X1-027A E4	10.48
LTF	X2-042	15.39
909181	X2-052	19.78
909201	X2-058 C	1.69
909202	X2-058 E	11.34
910501	X3-001 C	.05
910502	X3-001 E	.08
LTF	X3-020	4.68
LTF	X3-021	51.89
910601	X3-023 C OP1	.52
910602	X3-023 E OP1	3.51
900404	X3-028 C	70.73
LTF	X3-096	11.27
LTF	X3-097	15.98
LTF	X3-098	15.15
LTF	X4-029D	4.87
LTF	X4-041	14.96
LTF	Y1-002	19.56
LTF	Y1-004	11.85
LTF	Y1-007	8.23
913211	Y1-030 C OP1	.73
913212	Y1-030 E OP1	4.87
LTF	Y1-041	4.87
913441	Y1-069 OP1	72.76
LTF	Y1-090	2.73
LTF	Y2-004	7.63
LTF	Y2-005	7.63
LTF	Y2-006	7.39
LTF	Y2-007	15.27
LTF	Y2-008	14.83
LTF	Y2-030	3.45
LTF	Y2-031	3.45
LTF	Y2-032	3.45
LTF	Y2-033	6.01
LTF	Y2-034	2.77
LTF	Y2-040	51.89

LTF	Y2-049	42.61
LTF	Y2-056	14.61
LTF	Y2-068	80.19
LTF	Y2-069	10.78
LTF	Y2-070	10.78
LTF	Y2-071	10.78
LTF	Y2-072	10.78
LTF	Y2-082	57.27
914381	Y2-095 OP1	24.47