

April 14, 2021

Will Seuffert
Executive Secretary
Minnesota Public Utilities Commission
121 7th Place East, Suite 350
St. Paul, Minnesota 55101

RE: **Comments of the Minnesota Department of Commerce, Division of Energy Resources**
Docket No. E015/M-20-830

Dear Mr. Seuffert:

Attached are the comments of the Minnesota Department of Commerce, Division of Energy Resources (Department) in the following matter:

In the Matter of Minnesota Power's Proposed Changes for Lighting Rates and Options.

The petition was filed on November 13, 2020 by:

David R. Moeller
Minnesota Power
30 West Superior Street
Duluth, MN 55802
(218) 723-3963

The Department recommends approval of the petition, pending further clarification by Minnesota Power. The Department is available to answer any questions that the Minnesota Public Utilities Commission may have.

Sincerely,

/s/ DANIELLE WINNER
Rates Analyst

DW/ja
Attachment



Before the Minnesota Public Utilities Commission

Comments of the Minnesota Department of Commerce Division of Energy Resources

Docket No. E015/M-20-830

I. INTRODUCTION

On November 13, 2020, Minnesota Power (MP or the Company) filed a *Petition* requesting that the Minnesota Public Utilities Commission (Commission):

- Approve MP's proposal to add Light Emitting Diode (LED) service options to the Company's Outdoor and Area Lighting Service (Rate Codes 76 and 77); and
- Approve MP's proposal to close all Mercury Vapor service options to new customers in its Outdoor and Area Lighting Service.

MP submitted redlined and clean tariff sheets of the proposed changes and provided a marginal cost analysis for the proposed fixture additions. The Department submits these Comments in response to the Company's proposal.

II. BACKGROUND

On November 1, 2019, Minnesota Power filed for a rate increase in Docket No. E015/GR-19-442 (2019 Rate Case). In this proceeding, the Company proposed rate changes for the entirety of its street lighting class, comprising both its Area and Outdoor Lighting tariff (Rate Codes 76 and 77) as well as its Street and Highway Lighting tariff (Rate Codes 80, 83, 84). The Company also proposed to add three additional LED lighting options solely to its Area and Outdoor Lighting tariff: LED71W, LED184W, LED316W.¹ Both the proposed rate changes and the proposed lighting additions were based on results of a marginal cost study provided by Minnesota Power during the 2019 rate case.²

With the advent of the COVID-19 pandemic, Minnesota Power proposed to modify its initial proposal and withdraw the rate case.³ The Company's modified proposal would recalculate and shift its asset-based margins credit from base rates to its Fuel Clause Adjustment (FCA), thereby increasing base rates and lowering the FCA.⁴ The removal of the credit from base rates and the addition of the credit to the FCA were accomplished using different allocation methodologies,

¹ See Attachment A to these Comments, page 1.

² See Attachment B to these Comments, pages 1-3, 6, and 15.

³ See Minnesota Power's April 23, 2020 comments in Docket Nos. E015/GR-19-442 and E015/M-20-429, as well as its April 30, 2020 supplemental comments in Docket No. E015/M-20-429.

⁴ See Attachment C, pages 2-4 to these Comments for Commission staff's explanation of this proposal.

which were detailed in Minnesota Power's supplemental filing.⁵ Through a preliminary *Order* and then a final *Order*, the Commission approved the Company's proposal with modifications.⁶

As a result of the 2019 Rate Case resolution, the rates from the street lighting class were impacted, but the three newly proposed LED options were removed from the Company's tariff entirely. Minnesota Power filed its compliance filings on July 6, 2020; these included both the redline and clean versions of the tariff pages, as well as the lighting class rate impact calculations.⁷

For ease of reference, the Department provides the following attachments of relevant documents from the 2019 Rate Case:

- Attachment A: MP's initially proposed lighting tariff pages, redlined;⁸
- Attachment B: MP's marginal cost study for lighting options ("Original Cost Study");⁹
- Attachment C: Commission Staff's Briefing Papers for the Commission's June 4, 2020 Meeting;¹⁰
- Attachment D: MP's final lighting tariff pages, redlined and clean;¹¹ and
- Attachment E: MP's final lighting rate calculations.¹²

Minnesota Power's instant filing proposed to add into the Company's tariff the three Area and Outdoor Lighting options that were removed as a result of the 2019 rate case resolution.

⁵ See Minnesota Power's April 30, 2020 supplemental comments in Docket No. E015/M-20-429, Attachments A and B.

⁶ See Commission's June 30, 2020 *Initial Order Approving Petition and Resolving Rate Case with Conditions* and August 7, 2020 *Order Approving Petition and Resolving Rate Case with Conditions* in Docket Nos. E015/GR-19-442 and E015/M-20-429.

⁷ See Attachments D and E to these Comments.

⁸ This document can be found in Minnesota Power's November 1, 2019 filing in Docket No. E015/GR-442 entitled "INITIAL FILING--VOLUME 3 - REQUIRED FILING SCHEDULES - PART 4 OF 4," pages 367-373 and 377-384.

⁹ This document can be found in Minnesota Power's January 16, 2020 filing in Docket No. E015/GR-19-442 entitled "INITIAL FILING--VOLUME 4 - WORKPAPERS - PART 12 OF 12 - TRADE SECRET DESIGNATIONS CORRECTED IN WORKPAPER OS-2 FROM NOVEMBER 1ST FILING REPLACING DOCUMENT ID 201911-157131-02."

¹⁰ This document can be found in Commission staff's May 28, 2020 filing in Docket Nos. E015/GR-19-442 and E015/M-20-429 entitled "BRIEFING PAPERS--JUNE 4, 2020 BRIEFING PAPERS."

¹¹ These documents can be found in Minnesota Power's July 6, 2020 filings in both Docket Nos. E015/GR-19-442 and E015/M-20-429 entitled "COMPLIANCE FILING--PT 3.A. UPDATED FINAL RATE TARIFF SHEETS."

¹² This document can be found in Minnesota Power's July 10, 2020 filings in Docket No. E015/M-20-429 entitled "COMPLIANCE FILING--," pages 21-26.

III. MP'S PROPOSAL

A. NEW LED SERVICE OPTIONS

In the instant docket, the Company re-proposed adding the three new lighting options into its Area and Outdoor Lighting tariff (Rate Codes 76 and 77). The following table shows the lighting options, with rates as they were originally proposed in the 2019 Rate Case versus the *Petition*.

Table 1. Minnesota Power's proposed LED lighting option additions in its Area and Outdoor Lighting Tariff (Rate Codes 76 and 77), with rates as originally proposed in the 2019 rate case versus currently proposed rates

Tariff	LED Lamp	Code	Originally Proposed Rate ¹³	Currently Proposed Rate ¹⁴
Area and Outdoor Lighting	10,000 Lumens (71 watts or less)	LED71W	\$13.06	\$12.02
Area and Outdoor Lighting	24,000 Lumens (184 watts or less)	LED184W	\$19.73	\$18.16
Area and Outdoor Lighting	43,000 Lumens (316 watts or less)	LED316W	\$28.36	\$26.12

Minnesota Power states that it derived the currently proposed rates in the following manner:

- First, MP determined the originally proposed rates from the 2019 Rate Case for each of the three LEDs. These originally proposed rates were calculated via the Original Cost Study in the 2019 Rate Case.¹⁵
- MP then found the three "similarly sized" LEDs from the Street and Highway Lighting tariff: LED118W, LED219W, and LED278W.
- MP then determined both the proposed versus final rates for those three similarly sized Street and Highway Lighting LEDs, from the 2019 Rate Case.
- MP then calculated the ratio of the final rate to the proposed rate for each of those three Street and Highway Lighting LEDs, then calculated an average adjustment ratio of 0.92.
- Finally, to derive the currently proposed rates, MP applied the average adjustment ratio to the originally proposed rates of the three Area and Outdoor Lighting LEDs.

¹³ See Attachment A, page 1.

¹⁴ See *Petition*, tariff page Attachment.

¹⁵ See Attachment B to these Comments.

The Department summarizes these calculations in the following table.

Table 2. Minnesota Power’s stated derivation of the currently proposed Area and Outdoor Lighting rates

	Street and Highway Lighting			Area and Outdoor Lighting		
	LED118W	LED219W	LED278W	LED71W	LED184W	LED316W
2019 Rate Case Proposed Rate [A]	\$19.56	\$24.60	\$24.43	\$13.06	\$19.73	\$28.36
2019 Rate Case Final Rate [B]	\$18.10	\$22.50	\$22.50			
Adjustment Ratio [C = B/A]	0.93	0.91	0.92			
Average Adjustment Ratio [D =C/3]	0.92					
Currently Proposed Rate [E=A*D]	n/a	n/a	n/a	\$12.02	\$18.16	\$26.12

Minnesota Power also submitted an updated and streamlined marginal cost study for each of these three proposed LED additions (“Updated Cost Study”).¹⁶ Unlike the Original Cost Study, which appears to include all lighting options within the lighting class, the Updated Cost Study only includes the three Area and Outdoor Lighting LEDs in question. The Company states that in the Updated Cost Study, Minnesota Power uses “the same Lighting revenue requirement calculation methodology that was originally utilized in the Company’s 2019 rate case.”¹⁷

¹⁶ See Attachment 1 to the *Petition*.

¹⁷ See *Petition*, page 6.

This revenue requirement calculation methodology is represented in the following figure:

Fixed Charges
+ Maintenance
+ Replacement (Fixture, Materials, Labor)
+ Billing and Collections
<i>Subtotal: Annual Costs Per Fixture</i>
+ A&G Expense
<i>Total Annual Costs Per Fixture</i>
+ Annual Energy Revenue Adjustment Factor per fixture
<i>Annual Revenue Requirement per fixture</i>
÷ 12 months
Monthly Revenue Requirement per fixture

The last components of the above calculation (Total cost per fixture, energy revenue adjustment per fixture, and annual/monthly revenues requirements) for the proposed LED additions in the Updated Cost Study are detailed the following table.

Table 3. Minnesota Power’s costs, energy revenue adjustments, and revenue requirements per proposed LED fixture, as reported in MP’s *Petition*

	LED71W	LED184W	LED316W
Annual Costs Per Fixture [A]	\$156.13	\$242.16	\$350.74
Annual Energy Adjustment Revenue per Fixture [B]	(\$11.88)	(\$24.22)	(\$37.35)
Annual Revenue Requirement per Fixture [C = A - B]	\$144.25	\$217.94	\$313.39
Monthly Revenue Requirement per Fixture [D = C/12 months]	\$12.02	\$18.16	\$26.12

B. CLOSING OF MERCURY VAPOR SERVICES

Minnesota Power also proposed to close its Mercury Vapor lighting options to new customers of its Outdoor and Area Lighting tariff. The redline tariff sheet of this can be found in an Attachment to the Company’s proposal.

Minnesota Power justified this proposal by stating that the Company is responding to growing concerns about the environmental impacts of mercury. Further, the Company stated that it no longer purchases Mercury Vapor lamps. This lighting option closure would affect the following lights:

Table 4. Minnesota Power’s mercury vapor lights proposed for closure to new customers

Tariff	Mercury Vapor Lamp	Code	Rate Option 1	Rate Option 2
Outdoor and Area Lighting Services	7000 Lumens (175 watts)	MV175W	\$11.77	\$8.23
Outdoor and Area Lighting Services	20,000 Lumens (400 watts)	MV200W	\$18.73	\$12.40
Outdoor and Area Lighting Services	55,000 Lumens (1,000 watts)	MV1000W	\$34.89	\$24.58

IV. DEPARTMENT ANALYSIS

A. MINNESOTA STATUTES AND RULES

Xcel filed its *Petition* pursuant to Minn. Rules 7829.0100, subpart 11, which states:

Miscellaneous filing.

"Miscellaneous filing" means a request or notice that does not require determination of a utility's revenue requirement.

A miscellaneous filing includes a filing involving a new service offering; a change in a utility's rates, services, terms, or conditions of service; a change in a utility's corporate structure, assigned service area, or capital structure, when conducted separately from a general rate proceeding; filings made under the rules governing automatic adjustment of charges in chapter 7825; or any related matter.

The inclusion of a particular type of filing in this list does not require a filing that would not otherwise be required or confer jurisdiction that would not otherwise be present.

The “Miscellaneous Filing” Rule’s statutory authority comes from Minn. Stat. § 216A.05: Commission Functions and Powers. The Department agrees that Minnesota Power’s proposal can be considered a request for “a change in a utility’s rates, services, terms, or conditions of service.”

As with all filings that include rate changes, Minn. Stat. § 216B.03 applies, which requires that rates must be just and reasonable, and that any doubt as to reasonableness should be resolved in favor of the consumer.

B. NEW LIGHTING OPTIONS

To evaluate the reasonableness of Minnesota Power’s proposed rates, the Department reviewed two components: the 0.92 adjustment factor proposed by the Company and the Updated Cost Study.

First, the Department reviewed the Company’s proposal to modify the rates initially proposed in the rate case by a factor of 0.92. For all lighting options except for the three LEDs at issue in this docket, the Department compared the final and proposed rates from the 2019 Rate Case.¹⁸ The Department found that the Company’s 0.92 ratio was fairly representative of final to proposed rate ratios for all lights, not simply the “similarly sized” LEDs examined by the Company. The results of this review can be found in Attachment F to these Comments, and are summarized in the following table.

Table 5. Ratios of final to proposed rates from Minnesota Power’s 2019 Rate Case for all lighting options

	Area and Outdoor	Street and Highway	Average
Mercury Vapor	96.7	97.4	97.05
Sodium Vapor	90.5	92.3	91.4
Metal Halide	96	100.9	98.45
LEDs	83.4	91.7	87.55
Average	91.65	95.575	93.6125

The Department also reviewed the Updated Cost Study and compared it to the Original Cost Study.

The Department observed that the Updated Cost Study appeared to correct for an error from the Original Cost Study: while the Original Cost Study calculated the annual energy usage of the LED184W to be 773 kWh/year, the energy input for that light is 701 kWh/year in the cost calculation.¹⁹ The Updated Cost Study appropriately updates the energy input to 773 kWh/year for that light.²⁰

The Department further noted a set of changes between the Original Cost Study and the Updated Cost Study: the energy charge rate and the annual energy revenue adjustment per fixture. These differences are shown in the following table:

¹⁸ See Attachments A and D to these Comments for MP’s proposed and final tariff sheets.

¹⁹ See Attachment B to these Comments, pages 2 and 3.

²⁰ See Attachment 1 to the *Petition*, pages 1 and 4.

Table 6. Minnesota Power’s energy charges and energy revenue adjustments per fixture for the proposed LEDs, as presented in the 2019 rate case versus the *Petition*

	Original Cost Study	Updated Cost Study ²¹
Energy Charge Rate (all lights)	\$0.008228/kWh ²²	-\$0.03134/kWh
Annual Energy Revenue Adjustment per Fixture (LED71W)	\$2.45 ²³	-\$11.88
Annual Energy Revenue Adjustment per Fixture (LED184W)	\$5.77 ²⁴	-\$24.22
Annual Energy Revenue Adjustment per Fixture (LED316W)	\$10.92 ²⁵	-\$37.35

The annual energy revenue adjustment figures for the Updated Cost Study are the same ones captured in Table 3 above. In its *Petition*, Minnesota Power notes next to each of these changes: “Adjustment factor to balance total allowed annual revenue requirements for Lighting class in 2019 rate case resolution.”²⁶ This is further explained on page 6 of the *Petition*, in which the Company states, “The current proposed rates shown in Table 2 [of the *Petition*] include a downward adjustment for each lamp, as described above, to reflect the lower Lighting class revenue requirements that were approved as part of the 2019 rate case resolution.”

From the Department’s understanding, these notes seem to indicate that in setting the proposed LED rates, Minnesota Power attempted to ensure that the final revenue requirements for each fixture would not result in a total class revenue requirement that exceeds the amount agreed upon in the 2019 Rate Case resolution. The Department agrees that this is an important consideration, but observes that the Company’s note seems to indicate that the 0.92 factor methodology was simply a reasonableness check, rather than the driving methodology by which MP calculated rates.

While the Department appreciates Minnesota Power’s attention to the terms of the 2019 Rate Case, the Department remains unclear about the -\$0.03134/kWh energy charge rate in the Updated Cost Study. This charge can only be traced back to one of the three Area and Outdoor Lighting LEDs; by contrast, the \$0.008228/kWh energy charge rate from the Original Cost Study can be traced back to all three. This is shown in the following table.

²¹ See Attachment 1 to the *Petition*, pages 1-3.

²² See Attachment B to these Comments, page 15.

²³ See Attachment B to these Comments, page 6.

²⁴ See Attachment B to these Comments, page 3.

²⁵ See Attachment B to these Comments, page 3.

²⁶ See *Petition*, Attachment 1.

Table 7. Minnesota Power’s reported energy adjustments versus Department calculated energy adjustments for the proposed LEDs, as presented in the 2019 rate case versus the *Petition*

	Original Cost Study			Updated Cost Study		
	LED71W	LED184W	LED316W	LED71W	LED184W	LED316W
Annual Energy Usage (kWh) [A]	298	701	1327	298	773	1327
Energy Rate (\$/kWh) [B]	\$0.008228	\$0.008228	\$0.008228	-\$0.03134	-\$0.03134	-\$0.03134
Energy Adjustment, Calculated (\$) [C = A*B]	\$2.45	\$5.77	\$10.92	(\$9.34)	(\$24.23)	(\$41.59)
Energy Adjustment, Reported (\$) [D]	\$2.45	\$5.77	\$10.92	(\$11.88)	(\$24.22)	(\$37.35)
Difference [E=C-D]	-	-	-	\$2.54	(\$0.01)	(\$4.24)

This table shows that consistently applying the energy rate reported in MP’s *Petition* would yield a smaller energy adjustment for the LED71W and a greater energy adjustment for the LED316W; this would in turn result a rate of \$12.23 for the LED71W light (as opposed to the proposed \$12.02) and \$25.76 for the LED316W light (as opposed to the proposed \$26.12).

It is unclear to the Department, therefore, how the energy charge was calculated and how it ensures that class revenues will be in alignment with the rate case resolution. The Department concludes that while the Company’s proposal generally seems reasonable, as demonstrated through the 0.92 factor reasonableness check, the Company should address the Department’s concerns in Reply Comments.

C. CLOSED LIGHTING OPTIONS

The Department reviewed Minnesota Power’s proposal to close new Mercury Vapor lights to new customers. The Department agrees with the Company’s rationale for closing the rate to new customers to respond to the growing environmental concerns over mercury in the environment.

The Department also notes that the proposal to close the Area and Outdoor Lighting Mercury Vapor lights is consistent with the Street and Highway Lighting Mercury Vapor Lights, which are also closed. However, while the Street and Highway Lighting rates are “Closed to new installations” per MP’s tariff, the Company proposes to make the Area and Outdoor Lighting Mercury Vapor lights “Closed to new customers.” The Department is unclear if there is a meaningful difference between these two designations, but notes that the Company may wish to make this consistent between tariffs.

The Department also notes that closing a rate to new *customers* implies that there may be some existing Area and Outdoor Lighting customers who will continue to need Mercury Vapor lamps. Since the Company states it is no longer purchasing Mercury Vapor lamps, the Department assumes that there is still inventory to serve existing Mercury Vapor customers. The lack of new purchases also implies that the Company must have a longer term plan to transition these customers to different lighting options. The Department asks that in Reply Comments, the Company share whether it continues to have inventory for current Mercury Vapor lighting customers, and what its longer term plan for these customers is.

Although the Department continues to have questions regarding the Company’s plans to continue serving these customers, the Department concludes that the Company’s proposal is generally reasonable.

V. DEPARTMENT RECOMMENDATIONS

The Department concludes that Minnesota Power’s proposal is generally reasonable, although the Department has remaining questions regarding the energy charge reported in the Company’s lighting study as well as the immediate and future needs of any existing Mercury Vapor lighting customers. Pending resolution of these issues in Reply Comments, the Department recommends that the Commission:

- Approve MP’s proposal to add Light Emitting Diode service options to the Company’s Outdoor and Area Lighting Service (Rate Codes 76 and 77); and,
- Approve MP’s proposal to close all Mercury Vapor service options to new customers in its Outdoor and Area Lighting Service.

/ja

MINNESOTA POWER
ELECTRIC RATE BOOK - VOLUME I

SECTION V **PAGE NO.** 37.0
REVISION 1514

OUTDOOR AND AREA LIGHTING SERVICE

RATE CODES

Outdoor Lighting Service 76
 Area Lighting Service 77

APPLICATION

To all classes of retail customers for outdoor lighting purposes (Rate Codes 76) and to persons other than governmental subdivisions for the purpose of lighting streets, alleys, roads, driveways and parking lots (Rate Code 77) subject to any applicable Riders. Rate Code 76 is not available on a seasonal or temporary basis.

RATE

<u>Lamp Type & Size</u> Sub rate code	<u>CIS Code</u>	Rate Per Lamp Per Month			
		<u>Option 1</u> __A	<u>Option 2</u> __B	<u>Option 3</u> __C	<u>Option 4</u> __D
			(Option 2 Closed to New Installation)	(Option 3 Closed to New Installation)	
Mercury Vapor Lamps					
7,000 Lumens (175 watts)	MV175W	\$11.88	12.99	\$9.63	9.45
20,000 Lumens (400 watts)	MV400W	\$18.65	21.39	\$12.87	15.72
55,000 Lumens (1,000 watts)	MV1000W	\$34.89	41.63	\$24.90	31.82
Sodium Vapor Lamps					
8,500 Lumens (100 watts)	SV100W	\$12.05	10.98	\$6.97	6.65 \$6.97
14,000 Lumens (150 watts)	SV150W	\$13.91	12.92	\$8.89	8.63
23,000 Lumens (250 watts)	SV250W2	\$16.93	18.57	\$11.84	11.84 \$10.53
45,000 Lumens (400 watts)	SV400W	\$22.58	25.38	\$15.93	16.39 \$11.75
Metal Halide Lamps					
17,000 Lumens (250 watts)	MH250W	\$19.53	18.42		
28,800 Lumens (400 watts)	MH400W	\$20.73	23.15	\$12.11	14.87
88,000 Lumens (1,000 watts)	MH1000W	\$33.88	40.34	\$22.70	29.34
Light Emitting Diodes (LED)					
<u>5,000</u> 4,674 Lumens (48 watts or less)	LED48W	\$10.79	9.49		
<u>10,000</u> Lumens (71 watts or less)	LED71W	\$13.06			
<u>24,000</u> Lumens (184 watts or less)	LED184W	\$19.73			
<u>43,000</u> Lumens (316 watts or less)	LED316W	\$28.36			

Filing Date November 12, 2019 **MPUC Docket No.** E015/GR-19-44216-664
Effective Date December 1, 2018 **Order Date** May 29, 2018

Approved by: Marcia A. Podratz David R. Moeller
 Marcia A. Podratz David R. Moeller
Director - Rates Senior Attorney & Director of Regulatory Compliance

MINNESOTA POWER
ELECTRIC RATE BOOK - VOLUME I

SECTION V **PAGE NO.** 37.1
REVISION 1514

OUTDOOR AND AREA LIGHTING SERVICE

Pole Charge

Each pole used for service
 under this schedule only

MPPOLE\$~~11.00~~~~6.64~~ \$6.64\$~~11.00~~~~6.64~~

Monthly Service Charge
 \$~~3.34~~~~2.09~~

Included Included Included

Energy Charge - Per kWh
~~6.02~~~~7.14~~¢

Included Included Included

Plus any applicable adjustments

ADJUSTMENTS

1. There shall be added to or deducted from the monthly bill, as computed above, a fuel and purchased energy adjustment determined in accordance with the Rider for Fuel and Purchased Energy ~~Adjustment~~ Charge.

The monthly fuel and purchased energy adjustment per lamp shall be determined as the above fuel and purchased energy adjustment per kWh multiplied by the monthly kWh per lamp shown in the Energy Table below for the respective lamps.

2. There shall be added to the monthly bill, as computed above, a transmission investment adjustment determined in accordance with the Rider for Transmission Cost Recovery.

3. There shall be added to the monthly bill, as computed above, a renewable resources adjustment determined in accordance with the Rider for Renewable Resources.

4. There shall be added to the monthly bill, as computed above, a conservation program adjustment determined in accordance with the Rider for Conservation Program Adjustment.

5. There shall be added to the monthly bill, as computed above, an emissions-reduction adjustment determined in accordance with the Rider for Boswell Unit 4 Emission Reduction.

6. There shall be added to or deducted from the monthly billing, as computed above, a solar energy adjustment determined in accordance with the Rider for Solar Energy Adjustment.

7. Plus the applicable proportionate part of any taxes and assessments imposed by any governmental authority which are assessed on the basis of meters or customers, or the

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Approved by: ~~Marcia A. Podratz~~ David R. Moeller
~~Marcia A. Podratz~~ David R. Moeller
~~Director - Rates~~ Senior Attorney & Director of Regulatory Compliance

**MINNESOTA POWER
 ELECTRIC RATE BOOK - VOLUME I**

**SECTION V PAGE NO. 37.2
 REVISION 1514**

OUTDOOR AND AREA LIGHTING SERVICE

price of or revenues from electric energy or service sold, or the volume of energy generated, transmitted or purchased for sale or sold.

8. Bills for service within the corporate limits of the applicable city shall include an upward adjustment as specified in the applicable Rider for the city's Franchise Fee.

8.9. The combination of applicable Riders may be shown on Customer's bills as the Minnesota Policy Adjustment.

PAYMENT

Bills are due and payable 15 days following the date the bill is rendered or such later date as may be specified on the bill.

BURNING SCHEDULE

Burning schedule is from dusk until dawn each night for a total of approximately 4,200 hours per year.

ENERGY TABLE

Lamp CIS Code	Days Month	Total	31	28	31	30	31	30	31	31	30	31	30	31
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Burning Hours	Daily Estimates	4,200	462	379	367	302	264	233	252	294	336	401	435	475
Montly kWh usage per fixture by type														
MV175W	2	888	98	80	78	64	56	49	53	62	71	85	92	100
MV400W	5	1,932	213	174	169	139	121	107	116	135	155	184	200	219
MV1000W	13	4,620	508	417	404	332	290	256	277	323	370	441	479	523
SV100W	1	504	56	46	44	36	32	28	30	35	40	48	52	57
SV150W	2	756	83	68	66	54	48	42	45	53	60	72	78	87
SV250W	3	1,224	135	110	107	88	77	68	73	86	98	117	127	138
SV400W	6	2,016	222	182	176	145	127	112	121	141	161	192	209	228
MH250W	3	1,260	139	114	110	91	79	70	76	88	101	120	130	142
MH400W	5	1,932	213	174	169	139	121	107	116	135	155	184	200	219
MH1000W	12	4,410	485	398	385	317	277	245	264	309	353	421	457	499
LED48W	1	207	23	19	18	15	13	11	12	14	17	20	21	24

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**MINNESOTA POWER
 ELECTRIC RATE BOOK - VOLUME I**

**SECTION V PAGE NO. 37.3
 REVISION 1514**

OUTDOOR AND AREA LIGHTING SERVICE

Lamp CIS Code	Days Month		31	28	31	30	31	30	31	31	30	31	30	31
	Total	Daily Estimates	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Burning Hours	4,200		462	379	367	302	264	233	252	294	336	401	435	475
Monthly kWh usage per fixture by type														
MV175W	2	888	98	80	78	64	56	49	53	62	71	85	92	100
MV400W	5	1,932	213	174	169	139	121	107	116	135	155	184	200	219
MV1000W	13	4,620	508	417	404	332	290	256	277	323	370	441	479	523
SV100W	1	504	56	46	44	36	32	28	30	35	40	48	52	57
SV150W	2	756	83	68	66	54	48	42	45	53	60	72	78	87
SV250W	3	1,224	135	110	107	88	77	68	73	86	98	117	127	138
SV400W	6	2,016	222	182	176	145	127	112	121	141	161	192	209	228
MH250W	3	1,260	139	114	110	91	79	70	76	88	101	120	130	142
MH400W	5	1,932	213	174	169	139	121	107	116	135	155	184	200	219
MH1000W	12	4,410	485	398	385	317	277	245	264	309	353	421	457	499
LED48W	1	207	23	19	18	15	13	11	12	14	17	20	21	24
LED71W	1	298	33	27	26	21	19	17	18	21	24	28	31	34
LED184W	2	701	85	70	68	21	49	43	46	54	24	74	80	87
LED316W	4	1,327	146	120	116	95	83	74	80	93	106	127	137	150

Company shall furnish all electric energy required for service under this schedule.

EQUIPMENT OWNERSHIP, OPERATION AND MAINTENANCE

New Customer must select Option 1 or Option 4 only for each account served under this schedule.

Option 1

COMPANY TO OWN AND MAINTAIN:

1. The Company shall install, own, operate and provide normal maintenance to all equipment necessary for the above service including the Lighting Equipment beyond the point of attachment to Company's facilities consisting of, but not limited to, the fixture, lamp, ballast, photo-electric control and wiring.

Option 2

1. The Customer shall own all equipment for service under this schedule beyond the point of attachment with Company's pole or pad-mounted transformer. The equipment shall include, but not be limited to, the fixture, mounting bracket, lamp, ballast, photo-electric

Filing Date November 12, 2019 MPUC Docket No. E015/GR-19-44246-664
 Effective Date December 1, 2018 Order Date May 29, 2018

Approved by: Marcia A. Podratz David R. Moeller
Marcia A. Podratz David R. Moeller
Director - Rates Senior Attorney & Director of Regulatory Compliance

OUTDOOR AND AREA LIGHTING SERVICE

control and all minor materials. All customer-owned equipment must meet Company's specifications.

2. The Company shall install and operate all equipment necessary for service under this schedule and Company will own all equipment necessary for service under this Option, including poles, except for that equipment as specified in paragraph 1. All Customer owned Lighting Equipment will be installed at Customer's expense. The Company shall perform all normal maintenance on equipment necessary for service under this schedule and furnish and replace all burned out lamps and photo-electric controls Option 2 is closed to new installations.

Option 3

1. The Customer shall own, install and maintain all equipment necessary for service under this schedule beyond the point of attachment with Company's pole or pad-mounted transformer. The equipment shall include but not be limited to the poles, fixture, mounting bracket, lamp, ballast, photo-electric control and all minor materials. In addition, Customer must furnish and install a master disconnect switch at the point of attachment to isolate Customer's equipment from Company's electrical system. All Customer owned equipment must meet Company's specifications. Customer is responsible for providing lighting poles.

2. The Company shall own all equipment necessary for service under this Option except for that equipment as specified in paragraph 1. No maintenance will be provided by the Company on Customer owned equipment except as specified in a separate agreement. Option 3 is closed to new installations.

Option 4

CUSTOMER TO OWN AND MAINTAIN:

1. The Customer shall own, install and maintain all equipment necessary for service under this schedule beyond the point of attachment with Company's electrical system. The equipment shall include but not be limited to the poles, fixture, mounting bracket, lamp, ballast, photo-electric control and all minor materials. In addition, Customer must furnish and install a master disconnect switch at the point of attachment to isolate Customer's equipment from Company's electrical system. Customer's disconnect switch must meet Company's specifications. Company's point of delivery shall be on the Company's side of disconnect switch either at the weather head for overhead service or at the pad mount transformer for underground service.

2. Customer is responsible for all maintenance on all equipment beyond Company's

Filing Date November 12, 2019 **MPUC Docket No.** E015/GR-19-44216-664
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MINNESOTA POWER
ELECTRIC RATE BOOK - VOLUME I

SECTION V **PAGE NO.** 37.5
REVISION 1514

OUTDOOR AND AREA LIGHTING SERVICE

point of delivery. Standard safety procedures followed by the Company on Company-owned lighting facilities shall be followed by Customer when maintaining its lighting equipment. Company reserves the right to disconnect Customer equipment from Company's electrical system if in the Company's opinion Customer's lighting equipment is operated or maintained in an unsafe or improper condition.

CONTRACT PERIOD

Six months, automatically renewable for six month periods unless canceled by 30 days written notice by either party to the other.

SERVICE CONDITIONS

1. Lights shall be located at sites designated and authorized by Customer. Customer shall provide in writing suitable right-of-way and right-of-occupancy for the facilities which the Company deems necessary to render service under the option chosen. The location shall be readily accessible to Company's equipment used for servicing and/or supplying service under the option chosen.

2. Service will normally be from standard distribution facilities typical of those in the area surrounding the point of service. If it is necessary to provide non-standard distribution facilities, Customer shall pay Company for all costs in excess of standard facility costs.

3. Company will, at Customer's expense, relocate or change the position of any poles, circuits or lights owned by the Company as may be requested in writing and duly authorized by Customer.

4. For Area Lighting Service purposes, no more than four lights will be mounted on a single distribution pole used for other utility purposes. If more than one light is mounted on a single pole, Company's investment in additional facilities, over and above those which would be required for a single standard bracket mounting, shall not exceed \$15.00 per light. Additional required investment will be at Customer's expense.

5. Company shall provide as standard a service extension of up to the equivalent of one pole span to provide service under this schedule without cost to the Customer. No additional transformer capacity shall be provided as standard for Area Lighting Service. All necessary costs for providing service under this schedule in excess of standard costs shall be paid by Customer.

6. For lamps which satisfy the conditions as set forth in Options 1 or 2 under Equipment Ownership, Operation and Maintenance, Company will absorb the cost of replacing a lamp and photo-electric control devices damaged by a first act of vandalism at

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MINNESOTA POWER
ELECTRIC RATE BOOK - VOLUME I

SECTION V **PAGE NO.** 37.6
REVISION 1514

OUTDOOR AND AREA LIGHTING SERVICE

each location during each calendar year. In addition, Company will absorb the cost of replacing a lighting unit damaged by a first act of vandalism at each location during each calendar year if served under Option 1. All subsequent and other costs due to vandalism are at Customer's expense. For those locations served under Option 1 or 2, Company will repair equipment (not covered above) damaged by vandalism and will bill customer for appropriate costs.

SCHEDULE OF CHARGES

Applicable in conjunction with Service Conditions paragraph 6.

Labor and vehicle charges per the applicable rate as stated in the Company's Accounting Manual at the time the charge was incurred. Materials charges per the Company's cost for lighting replacement equipment plus the then current Material Handling Expense and A&G expense per Company's Accounting Manual.

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**MINNESOTA POWER
 ELECTRIC RATE BOOK - VOLUME I**

SECTION V **PAGE NO.** 46.0
REVISION 1817

STREET AND HIGHWAY LIGHTING SERVICE

RATE CODES

Highway Lighting Service	80
Overhead Street Lighting Service	83
Ornamental Street Lighting Service	84

TERRITORY

Applicable in all territories served at retail by the Company. Highway Lighting Service is subject to individual review for each point of delivery.

APPLICATION

To any governmental subdivision taking all of its street or highway lighting requirements for service within the Company's service territory under the Company's standard contract for such service, subject to any applicable Riders. Highway Lighting Service is limited to the State of Minnesota, Department of Highways exclusively for public highway lighting.

RATE

Lamp Type & Size Sub rate code	CIS Code	Rate Per Fixture Per Month			
		Option 1 __A	Option 2 __B	Option 3 __C	Option 4 __D
			(Option 2 Closed to New Installation)	Option 3 Closed to New Installation)	
Mercury Vapor Lamps (Closed to New Installations)					
7,000 Lumens (175 watts)	MV175W	\$ 16.21 <u>17.33</u>	\$ 9.95 <u>9.72</u>	\$ 9.63 <u>9.45</u>	
10,000 Lumens (250 watts)	MV250W		\$ 10.94 <u>12.40</u>		
20,000 Lumens (400 watts)	MV400W	\$ 21.67 <u>24.36</u>	\$ 14.44 <u>17.26</u>	\$ 13.96 <u>16.79</u>	
55,000 Lumens (1,000 watts)	MV1000W2		\$ 25.56 <u>32.47</u>		
Sodium Vapor Lamps					
8,500 Lumens (100 watts)	SV100W	\$ 16.07 <u>14.44</u>	\$ 8.11 <u>7.62</u>	\$ 7.69 <u>7.27</u>	
14,000 Lumens (150 watts)	SV150W	\$ 18.60 <u>16.92</u>	\$ 10.23 <u>9.78</u>	\$ 9.93 <u>9.52</u>	
14,000 Lumens (150 watts)	SV150W-P		\$ 9.21 <u>9.06</u>		
20,500 Lumens (200 watts)	SV200W	\$ 19.65 <u>20.14</u>	\$ 12.06 <u>11.87</u>	\$ 11.90 <u>11.74</u>	
23,000 Lumens (250 watts)	SV250W	\$ 20.11 <u>21.69</u>	\$ 13.21 <u>12.97</u>	\$ 12.78 <u>12.67</u>	
45,000 Lumens (400 watts)	SV400W	\$ 24.62 <u>27.38</u>	\$ 17.70 <u>18.14</u>	\$ 14.30 <u>17.25</u>	
Metal Halide Lamps					
28,800 Lumens (400 watts)	MH400W	\$ 15.76 <u>16.14</u>			

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**MINNESOTA POWER
ELECTRIC RATE BOOK - VOLUME I**

SECTION V **PAGE NO.** 46.1
REVISION 1817

STREET AND HIGHWAY LIGHTING SERVICE

Light Emitting Diode (LED)				
4,000 Lumens (54 watts or less)	LED54W	\$ 14.98	13.10	
8,800 Lumens (118 watts or less, but more than 54 watts)	LED118W	\$ 19.56	17.39	
23,000 Lumens (219 watts or less, but more than 118 watts)	LED219W	\$ 24.60	22.55	
30,000 Lumens (278 watts or less)	LED278W	\$ 24.43		
Monthly Service Charge	Included	Included	Included	\$ 3.34
Energy Charge - Per kWh	Included	Included	Included	07.14
Plus any applicable adjustments				20¢

ADJUSTMENTS

1. There shall be added to or deducted from the monthly bill, as computed above, a fuel and purchased energy adjustment determined in accordance with the Rider for Fuel and Purchased Energy ~~Adjustment~~ Charge.

2. The monthly fuel and purchased energy adjustment per fixture shall be determined as the above fuel and purchased energy adjustment per kWh multiplied by the monthly kWh per fixture shown in the Energy Table below for the respective fixtures.

3. There shall be added to the monthly bill, as computed above, a transmission investment adjustment determined in accordance with the Rider for Transmission Cost Recovery.

4. There shall be added to the monthly bill, as computed above, a renewable resources adjustment determined in accordance with the Rider for Renewable Resources.

5. There shall be added to the monthly bill, as computed above, a conservation program adjustment determined in accordance with the Rider for Conservation Program Adjustment.

6. There shall be added to the monthly bill, as computed above, an emissions-reduction adjustment determined in accordance with the Rider for Boswell Unit 4 Emission Reduction.

7. There shall be added or deducted from the monthly billing, as computed above, a solar energy adjustment determined in accordance with the Rider for Solar Energy Adjustment.

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**MINNESOTA POWER
ELECTRIC RATE BOOK - VOLUME I**

SECTION V **PAGE NO.** 46.2
REVISION 1817

STREET AND HIGHWAY LIGHTING SERVICE

8. Plus the applicable proportionate part of any taxes and assessments imposed by any governmental authority which are assessed on the basis of meters or customers, or the price of or revenues from electric energy or service sold, or the volume of energy generated, transmitted or purchased for sale or sold.

9. Bills for service to parties within the corporate limits of the applicable city shall include an upward adjustment as specified in the applicable Rider for city's Franchise Fee.

9-10. The combination of applicable Riders may be shown on Customer's bills as the Minnesota Policy Adjustment.

PAYMENT

Bills are due and payable 15 days following the date the bill is rendered or such later date as may be specified on the bill.

BURNING SCHEDULE

Burning schedule is from dusk until dawn each night for a total of approximately 4,200 hours per year.

ENERGY TABLE

Filing Date November 12, 2019 **MPUC Docket No.** E015/GR-19-44216-664
Effective Date December 1, 2018 **Order Date** May 29, 2018

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**MINNESOTA POWER
 ELECTRIC RATE BOOK - VOLUME I**

**SECTION V PAGE NO. 46.3
 REVISION 1817**

STREET AND HIGHWAY LIGHTING SERVICE

Lamp CIS Code	Days Month		31	28	31	30	31	30	31	31	30	31	30	31
	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Burning Hours	Daily Estimates	4,200	462	379	367	302	264	233	252	294	336	401	435	475
Montly kWh usage per fixture by type														
MV175W	2	888	98	80	78	64	56	49	53	62	71	85	92	100
MV250W	3	1,224	135	110	107	88	77	68	73	86	98	117	127	138
MV400W	5	1,932	213	174	169	139	121	107	116	135	155	184	200	219
MV1000W2	13	4,620	508	417	404	332	290	256	277	323	370	441	479	523
SV100W	1	504	56	46	44	36	32	28	30	35	40	48	52	57
SV150W	2	756	83	68	66	54	48	42	45	53	60	72	78	87
SV150W-P	1	468	51	42	41	34	29	26	28	33	37	45	48	54
SV200W	3	1,140	125	103	100	82	72	63	68	80	91	109	118	129
SV250W	3	1,224	135	110	107	88	77	68	73	86	98	117	127	138
SV400W	6	2,016	222	182	176	145	127	112	121	141	161	192	209	228
MH400W	5	1,932	213	174	169	139	121	107	116	135	155	184	200	219
LED54W	1	226	25	20	20	16	14	13	14	16	18	22	23	25
LED118W	1	505	56	46	44	36	32	28	30	35	40	48	52	58
LED219W	3	945	104	85	83	68	59	52	57	66	76	90	98	107

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STREET AND HIGHWAY LIGHTING SERVICE

Lamp CIS Code	Days Month		31	28	31	30	31	30	31	31	30	31	30	31
	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Burning Hours	Daily Estimates	4,200	462	379	367	302	264	233	252	294	336	401	435	475
Monthly kWh usage per fixture by type														
MV175W	2	888	98	80	78	64	56	49	53	62	71	85	92	100
MV250W	3	1,224	135	110	107	88	77	68	73	86	98	117	127	138
MV400W	5	1,932	213	174	169	139	121	107	116	135	155	184	200	219
MV1000W2	13	4,620	508	417	404	332	290	256	277	323	370	441	479	523
SV100W	1	504	56	46	44	36	32	28	30	35	40	48	52	57
SV150W	2	756	83	68	66	54	48	42	45	53	60	72	78	87
SV150W-P	1	468	51	42	41	34	29	26	28	33	37	45	48	54
SV200W	3	1,140	125	103	100	82	72	63	68	80	91	109	118	129
SV250W	3	1,224	135	110	107	88	77	68	73	86	98	117	127	138
SV400W	6	2,016	222	182	176	145	127	112	121	141	161	192	209	228
MH400W	5	1,932	213	174	169	139	121	107	116	135	155	184	200	219
LED54W	1	227	25	20	20	16	14	13	14	16	18	22	23	25
LED118W	1	496	55	45	43	36	31	27	30	35	40	47	51	57
LED219W	3	920	101	83	80	66	58	51	55	64	74	88	95	104
LED278W	3	1,095	120	99	96	79	69	61	66	77	88	105	113	124

Company shall furnish all electric energy required for service under this schedule.

EQUIPMENT OWNERSHIP, OPERATION AND MAINTENANCE

New Customers with new installations must select Option 1 or Option 4 only for each account served under this schedule. Options 2 and 3 are closed to new installations. Options 1 or 4 are available for Overhead Lighting Service and for Highway or Ornamental Lighting Service.

Option 1

COMPANY TO OWN AND MAINTAIN.

1. The Company shall install, own, operate and provide normal maintenance to all equipment necessary for the above service including the Lighting Equipment beyond the point of attachment to Company's facilities consisting of, but not limited to, the fixture, standard brackets or mast arms not exceeding 14 feet in length, fixture, ballast, photo-electric control, driver, and wiring.

Option 2

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STREET AND HIGHWAY LIGHTING SERVICE

The Customer shall own all equipment for service under this schedule beyond the point of attachment with Company's facilities. The equipment shall include, but not be limited to, the fixture, standard brackets or mast arms not exceeding 14 feet in length, lamp, ballast, photo-electric control and all minor materials. All customer-owned equipment must meet Company's specifications. In all cases, poles are owned by Company.

The Company shall install and operate all equipment necessary for service under this schedule and Company will own all equipment necessary for service under this Option except for that equipment as specified in paragraph 1. All Customer owned Lighting Equipment will be installed at Customer's expense. The Company shall perform all normal maintenance on equipment necessary for service under this schedule and furnish and replace all burned out lamps and photo-electric controls. Option 2 is closed to new installations.

Option 3

The Customer shall own, install and maintain all equipment necessary for service under this schedule beyond the point of attachment with Company's lines used to deliver power to Customer's system. The equipment shall include, but not be limited to, the posts, fixture, mounting bracket, lamp, ballast and all minor materials. In addition, Customer must furnish and install a master disconnect switch at the point of attachment to isolate Customer's equipment from Company's electrical system. All Customer owned equipment must meet Company's specifications.

The Company shall own all equipment necessary for service under this Option except for that equipment as specified in paragraph 1. The Company will furnish and replace all burned out lamps and photo-electric controls and will clean or replace glassware at the time of lamp replacement. Customer shall be responsible for providing replacement glassware. No maintenance will be provided by the Company on customer owned equipment except as specified in a separate agreement. Option 3 is closed to new installations.

Option 4

CUSTOMERS TO OWN AND MAINTAIN:

1. The Customer shall own, install and maintain all equipment necessary for service under this schedule beyond the point of attachment with Company's lines used to deliver power to Customer's system. The equipment shall include but not be limited to the poles, fixture, mounting bracket, lamp, ballast, photo-electric control and all minor materials. In addition, Customer must furnish and install in master disconnect switch at the point of attachment to isolate Customer's equipment from Company's electrical system. Customer's disconnect switch must meet Company's specifications.

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STREET AND HIGHWAY LIGHTING SERVICE

2. Customer is responsible for all maintenance on all equipment beyond Company's point of attachment. Standard safety procedures followed by the Company on Company-owned lighting facilities shall be followed by Customer when maintaining its lighting equipment. Company reserves the right to disconnect Customer equipment from Company's electrical system if in the Company's opinion Customer's lighting equipment is operated or maintained in an unsafe or improper condition.

CONTRACT PERIOD

Six months, automatically renewable for six month periods unless canceled by 30 days written notice by either party to the other.

SERVICE CONDITIONS

1. Customers will contract for service under this schedule for the number of fixtures of each size installed at the time of the contract.

2. Lights shall be located at sites designated and authorized by Customer. Customer shall provide in writing suitable right-of-way and right-of-occupancy for the facilities which the Company deems necessary to render service under the option chosen. The location shall be readily accessible to Company's equipment used for servicing and/or supplying service under the option chosen. The Company shall have the right to use and occupy the street and highway rights-of-way for the purpose of performing any act of service in connection with service under this schedule.

3. Service will normally be from standard distribution facilities typical of those in the area surrounding the point of service. If it is necessary to provide non-standard distribution facilities, Customer shall pay Company for all costs in excess of standard facility costs.

4. Company will, at Customer's expense, relocate or change the position of any poles, circuits or lights owned by the Company as may be requested in writing and duly authorized by Customer.

5. Company will install at its expense such additional street lights served under Option 1 as may be requested in writing and duly authorized by Customer from time to time during the period of the contract. Company shall provide as standard a service extension of up to the equivalent of one pole span to provide service under this schedule without cost to the Customer. No additional transformer capacity shall be provided as standard for Option 4 Lighting Service. All necessary costs for providing service under this schedule in excess of standard costs shall be paid by Customer.

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 Marcia A. Podratz David R. Moeller
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STREET AND HIGHWAY LIGHTING SERVICE

6. For fixtures which satisfy the conditions as set forth in Options 1 or 2 under Equipment Ownership, Operation and Maintenance, Company will absorb the cost of replacing a lamp and photo-electric control devices damaged by a first act of vandalism at each location during each calendar year. In addition, Company will absorb the cost of replacing a lighting unit damaged by a first act of vandalism at each location during each calendar year if served under Option 1.

7. All subsequent and other costs due to vandalism are at Customer's expense. For those locations served under Option 1 or 2, Company will repair equipment (not covered above) damaged by vandalism and will bill customer for appropriate costs.

8. Existing Option 1 Customers who wish to replace Sodium Vapor fixtures that are less than ten years old and not in need of significant maintenance or repair with LED street lights will pay Company the remaining un-depreciated facility cost. Under Option 2, Customers who convert to LED street lights will be assessed a removal fee of \$50 if the mast arm is left up and reused or \$100 if the mast arm is removed and not reused. Under Option 3, the Company's Compatible Unit Estimator (CUE) will be used to estimate the removal fee with a true-up of actual costs once the work is completed.

SCHEDULE OF CHARGES

Applicable in conjunction with Service Conditions paragraph 6.

Labor and vehicle charges per the applicable rate as stated in the Company's Accounting Manual at the time the charge was incurred. Charges for materials used per the Company's cost for lighting replacement equipment plus the then current Materials Handling expense and A&G expense per Company's Accounting Manual.

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Monthly Revenue Requirements per fixture

	Old Code	Lamp Code	Current Rates			Adjusted without Base Cost of Fuel			Base Fuel	E8760
			Option 1	Option 2	Option 3	Option 1	Option 2	Option 3		
Outdoor and Area Lighting Service - 76, 77										
<u>Mercury Vapor Lamps</u>										
Lumens	Watts									
7,000	175 K	MV175W	Reddy (Area)	\$12.99	\$9.45		11.88	9.63		
20,000	400 M/P	MV400W / MV400W2	Flood	\$21.39	\$15.72		18.65	12.87		
55,000	1,000 Q	MV1000W	Flood	\$41.63	\$31.82		34.89	24.90		
<u>Sodium Vapor Lamps</u>										
Lumens	Watts									
8,500	100 I	SV100W	Reddy (Area)	\$10.98	\$6.65	\$6.65	12.05	6.97	6.97	
14,000	150 X	SV150W	Reddy (Area)	\$12.92	\$8.63		13.91	8.89		
23,000	250 J/G	SV250W2 / SV250W	Flood	\$18.57	\$11.81	\$11.88	16.93	11.84	11.75	
45,000	400 Z	SV400W	Flood	\$25.38	\$16.39	\$13.75	22.58	15.93	11.53	
<u>Metal Halide Lamps</u>										
Lumens	Watts									
17,000	250 R	MH250W	Flood	\$18.42			19.53			
28,800	400 S	MH400W	Flood	\$23.15		\$14.87	20.78		12.11	
88,000	1,000 U	MH1000W	Flood	\$40.31		\$29.34	33.88		22.70	
<u>Light Emitting Diode</u>										
Lumens	Watts									
5,000	≤ 48 -	LED48W	Reddy (Area)	\$9.49			10.79			
10,000	≤ 71	LED71W	Reddy (Area)	\$0.00			13.06			
<u>Light Emitting Diode</u>										
Lumens	Watts									
24,000	≤184	LED184W	Flood (Outdoor)				19.73			
43,500	≤316	LED316W	Flood (Outdoor)				28.36			
Street and Highway Lighting Service - 80, 83										
<u>Mercury Vapor Lamps</u>										
Lumens	Watts									
7,000	175 K	MV175W	Roadway	\$17.33	\$9.72	\$9.45	16.21	9.95	9.63	
10,000	250 L	MV250W	Roadway			\$12.10			10.94	
20,000	400 M	MV400W	Roadway	\$24.36	\$17.26	\$16.79	21.67	14.44	13.96	
55,000	1,000 O	MV1000W2	Roadway			\$32.47			25.56	
<u>Sodium Vapor Lamps</u>										
Lumens	Watts									
8,500	100 I	SV100W	Roadway	\$14.41	\$7.62	\$7.27	16.07	8.11	7.69	
14,000	150 X	SV150W	Roadway	\$16.92	\$9.78	\$9.52	18.60	10.23	9.93	
14,000	150 A	SV150W-P	Roadway			\$9.06			9.21	
20,500	200 F	SV200W	Roadway	\$20.11	\$11.87	\$11.74	19.65	12.06	11.90	
23,000	250 G	SV250W	Roadway	\$21.69	\$12.97	\$12.67	20.11	13.21	12.78	
45,000	400 Z	SV400W	Roadway	\$27.38	\$18.11	\$17.25	24.62	17.70	14.30	
<u>Metal Halide Lamps</u>										
Lumens	Watts									
28,800	400 S	MH400W	Roadway		\$16.14		-	15.76	-	
<u>Light Emitting Diode</u>										
Lumens	Watts									
4,000	≤ 54 W	LED54W	Roadway	\$13.10			14.98			
8,800	≤ 118 Y	LED118W	Roadway	\$17.39			19.56			
23,000	≤ 219 -	LED219W	Roadway	\$22.55			24.14			
30,000	≤278	LED278W	Roadway	\$0.00			24.43			

Option 4

Customer Charge										
Energy Charge (¢/kWh)				\$0.07142					\$3.34	\$0.06020
Pole Costs										
Pole Charge				\$6.64					\$11.00	

Minnesota Power
Docket No. E015/GR-19-442

Volume 4
RD-01, Lighting Cost Study
Page 3 of 15

**Flood Fixtures - Outdoor Lighting Service
Rate Code 76**

Bulb Type	Light Emitting Diode LED184W			Light Emitting Diode LED316W			Mercury Vapor MV400W / MV400W2		
	Option 1	Option 2	Option 3	Option 1	Option 2	Option 3	Option 1	Option 2	Option 3
Lumens	30,000			0			20,000	20,000	
Watt	≤278			0			400	400	
Number of fixtures	0	0	0	0	0	0	105	5	0
Annual kWh per fixture	701	701	701	1,327	1,327	1,327	1,932	1,932	1,932
Investment									
Conductor	49.50	49.50	49.50	49.50	49.50	49.50	\$49.50	\$49.50	\$49.50
Fixture - includes mast arm, ballast (non-LED), and lamp (LED)	\$436.67	\$436.67	\$436.67	\$809.45	\$809.45	\$809.45	\$0.00	\$0.00	\$0.00
Lamp - non-LED							\$8.21	\$8.21	\$8.21
Light Installation	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65
Photo Eye	\$14.20	\$14.20	\$14.20	\$14.20	\$14.20	\$14.20	\$4.85	\$4.85	\$4.85
<i>Subtotal</i>	<i>\$837.02</i>	<i>\$837.02</i>	<i>\$837.02</i>	<i>\$1,209.80</i>	<i>\$1,209.80</i>	<i>\$1,209.80</i>	<i>\$399.21</i>	<i>\$399.21</i>	<i>\$399.21</i>
A&G Expense	\$100.44	\$100.44	\$100.44	\$145.18	\$145.18	\$145.18	\$47.91	\$47.91	\$47.91
Material Handling Expense	\$83.70	\$83.70	\$83.70	\$120.98	\$120.98	\$120.98	\$39.92	\$39.92	\$39.92
Sales Tax	\$57.55	\$57.55	\$57.55	\$83.17	\$83.17	\$83.17	\$27.45	\$27.45	\$27.45
Total Investment	\$1,078.71	\$1,078.71	\$1,078.71	\$1,559.13	\$1,559.13	\$1,559.13	\$514.48	\$514.48	\$514.48
Annual Costs per fixture									
Fixed Charges	\$114.34	\$114.34	\$114.34	\$165.27	\$165.27	\$165.27	\$54.54	\$54.54	\$54.54
Maintenance	\$61.49	\$61.49	\$61.49	\$88.87	\$88.87	\$155.91	\$29.33	\$29.33	
Replacement - Fixture	\$21.83	\$21.83	\$21.83	\$40.47	\$40.47	\$40.47	\$0.00		
Replacement - Materials - Photo Eye, Driver (LED), and lamp (non-LED)	\$2.12	\$2.12	\$2.12	\$2.12	\$2.12	\$2.12	\$1.95	\$1.95	\$1.95
Replacement - Labor Costs	\$14.43	\$14.43	\$14.43	\$14.43	\$14.43	\$14.43	\$43.07	\$43.07	\$43.07
Billing and Collections	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00
<i>Subtotal</i>	<i>\$216.21</i>	<i>\$216.21</i>	<i>\$216.21</i>	<i>\$313.16</i>	<i>\$313.16</i>	<i>\$380.21</i>	<i>\$130.88</i>	<i>\$130.88</i>	<i>\$101.56</i>
A&G Expense	\$25.95	\$25.95	\$25.95	\$37.58	\$37.58	\$45.62	\$15.71	\$15.71	\$12.19
Total Annual Costs per fixture	\$242.16	\$242.16	\$242.16	\$350.74	\$350.74	\$425.83	\$146.59	\$146.59	\$113.74
Annual Energy Revenue per fixture									
	\$5.77	\$5.77	\$5.77	\$10.92	\$10.92	\$10.92	\$15.90	\$15.90	\$15.90
Annual Revenue Requirement per fixture									
	\$247.93	\$247.93	\$247.93	\$361.66	\$361.66	\$436.75	\$162.48	\$162.48	\$129.64
Total Annual Revenue									
	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$17,060.86	\$812.42	\$0.00
Annual Base Rate Fuel per fixture									
	\$2.24	\$2.24	\$2.24	\$4.25	\$4.25	\$4.25	\$6.18	\$6.18	\$6.18
Annual Revenue Requirement plus Base Rate Fuel per fixture									
	\$250.17	\$250.17	\$250.17	\$365.91	\$365.91	\$440.99	\$168.67	\$168.67	\$135.82
Total Annual Revenue plus Base Rate Fuel									
	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$17,710.01	\$843.33	\$0.00
Adjusted Annual Revenue per fixture									
	\$250.17	\$0.00	\$0.00	\$365.91	\$0.00	\$0.00	\$256.68	\$188.64	\$0.00
Adjusted Total Annual Revenue									
	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$26,951.40	\$943.20	\$0.00

Minnesota Power
 Docket No. E015/GR-19-442

Volume 4
 RD-01, Lighting Cost Study
 Page 4 of 15

**Flood Fixtures - Outdoor Lighting Service
 Rate Code 76**

Bulb Type	Mercury Vapor MV1000W			Metal Halide MH250W			Metal Halide MH400W		
	Option 1	Option 2	Option 3	Option 1	Option 2	Option 3	Option 1	Option 2	Option 3
Lumens	55,000	55,000		17,000			28,800		28,800
Watt	1,000	1,000		250			400		400
Number of fixtures	1	1	0	159	0	0	233	0	0
Annual kWh per fixture	4,620	4,620	4,620	1,260	1,260	1,260	1,932	1,932	1,932
Investment									
Conductor	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50
Fixture - includes mast arm, ballast (non-LED), and lamp (LED)	\$0.00	\$0.00	\$0.00	\$275.95	\$275.95	\$275.95	\$275.95	\$275.95	\$275.95
Lamp - non-LED	\$32.71	\$32.71	\$32.71	\$13.32	\$13.32	\$13.32	\$13.11	\$13.11	\$13.11
Light Installation	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65
Photo Eye	\$4.85	\$4.85	\$4.85	\$4.85	\$4.85	\$4.85	\$4.85	\$4.85	\$4.85
<i>Subtotal</i>	<i>\$423.71</i>	<i>\$423.71</i>	<i>\$423.71</i>	<i>\$680.27</i>	<i>\$680.27</i>	<i>\$680.27</i>	<i>\$680.06</i>	<i>\$680.06</i>	<i>\$680.06</i>
A&G Expense	\$50.85	\$50.85	\$50.85	\$81.63	\$81.63	\$81.63	\$81.61	\$81.61	\$81.61
Material Handling Expense	\$42.37	\$42.37	\$42.37	\$68.03	\$68.03	\$68.03	\$68.01	\$68.01	\$68.01
Sales Tax	\$29.13	\$29.13	\$29.13	\$46.77	\$46.77	\$46.77	\$46.75	\$46.75	\$46.75
Total Investment	\$546.06	\$546.06	\$546.06	\$876.70	\$876.70	\$876.70	\$876.43	\$876.43	\$876.43
Annual Costs per fixture									
Fixed Charges	\$57.88	\$57.88	\$57.88	\$92.93	\$92.93	\$92.93	\$92.90	\$92.90	\$92.90
Maintenance	\$31.13	\$31.13		\$49.97	\$49.97		\$49.96	\$49.96	
Replacement - Fixture	\$0.00			\$41.19			\$41.19		
Replacement - Materials - Photo Eye, Driver (LED), and lamp (non-LED)	\$5.61	\$5.61	\$5.61	\$2.71	\$2.71	\$2.71	\$2.68	\$2.68	\$2.68
Replacement - Labor Costs	\$43.07	\$43.07	\$43.07	\$43.07	\$43.07	\$43.07	\$43.07	\$43.07	\$43.07
Billing and Collections	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00
<i>Subtotal</i>	<i>\$139.69</i>	<i>\$139.69</i>	<i>\$108.56</i>	<i>\$231.87</i>	<i>\$190.69</i>	<i>\$140.71</i>	<i>\$231.80</i>	<i>\$190.61</i>	<i>\$140.65</i>
A&G Expense	\$16.76	\$16.76	\$13.03	\$27.82	\$22.88	\$16.89	\$27.82	\$22.87	\$16.88
Total Annual Costs per fixture	\$156.45	\$156.45	\$121.59	\$259.70	\$213.57	\$157.60	\$259.61	\$213.48	\$157.53
Annual Energy Revenue per fixture									
	\$38.01	\$38.01	\$38.01	\$10.37	\$10.37	\$10.37	\$15.90	\$15.90	\$15.90
Annual Revenue Requirement per fixture									
	\$194.46	\$194.46	\$159.60	\$270.06	\$223.94	\$167.97	\$275.51	\$229.38	\$173.43
Total Annual Revenue									
	\$194.46	\$194.46	\$0.00	\$42,940.29	\$0.00	\$0.00	\$64,193.65	\$0.00	\$0.00
Annual Base Rate Fuel per fixture									
	\$14.78	\$14.78	\$14.78	\$4.03	\$4.03	\$4.03	\$6.18	\$6.18	\$6.18
Annual Revenue Requirement plus Base Rate Fuel per fixture									
	\$209.24	\$209.24	\$174.38	\$274.10	\$227.97	\$172.00	\$281.69	\$235.56	\$179.61
Total Annual Revenue plus Base Rate Fuel									
	\$209.24	\$209.24	\$0.00	\$43,581.38	\$0.00	\$0.00	\$65,634.14	\$0.00	\$0.00
Adjusted Annual Revenue per fixture									
	\$499.56	\$381.84	\$0.00	\$254.20	\$0.00	\$0.00	\$281.69	\$0.00	\$179.61
Adjusted Total Annual Revenue									
	\$499.56	\$381.84	\$0.00	\$40,417.16	\$0.00	\$0.00	\$65,634.14	\$0.00	\$0.00

Minnesota Power
Docket No. E015/GR-19-442

Volume 4
RD-01, Lighting Cost Study
Page 5 of 15

**Flood Fixtures - Outdoor Lighting Service
Rate Code 76**

Bulb Type	Metal Halide MH1000W			Sodium Vapor SV250W2 / SV250W			Sodium Vapor SV400W		
	Option 1	Option 2	Option 3	Option 1	Option 2	Option 3	Option 1	Option 2	Option 3
Lumens	88,000		88,000	23,000	23,000	23,000	45,000	45,000	45,000
Watt	1,000		1,000	250	250	250	400	400	400
Number of fixtures	63	0	0	898	20	0	652	12	0
Annual kWh per fixture	4,410	4,410	4,410	1,224	1,224	1,224	2,016	2,016	2,016
Investment									
Conductor	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50
Fixture - includes mast arm, ballast (non-LED), and lamp (LED)	\$329.61	\$329.61	\$329.61	\$125.18	\$125.18	\$125.18	\$252.79	\$252.79	\$252.79
Lamp - non-LED	\$26.34	\$26.34	\$26.34	\$10.02	\$10.02	\$10.02	\$13.23	\$13.23	\$13.23
Light Installation	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65
Photo Eye	\$4.85	\$4.85	\$4.85	\$4.85	\$4.85	\$4.85	\$4.85	\$4.85	\$4.85
<i>Subtotal</i>	<i>\$746.95</i>	<i>\$746.95</i>	<i>\$746.95</i>	<i>\$526.20</i>	<i>\$526.20</i>	<i>\$526.20</i>	<i>\$657.02</i>	<i>\$657.02</i>	<i>\$657.02</i>
A&G Expense	\$89.63	\$89.63	\$89.63	\$63.14	\$63.14	\$63.14	\$78.84	\$78.84	\$78.84
Material Handling Expense	\$74.69	\$74.69	\$74.69	\$52.62	\$52.62	\$52.62	\$65.70	\$65.70	\$65.70
Sales Tax	\$51.35	\$51.35	\$51.35	\$36.18	\$36.18	\$36.18	\$45.17	\$45.17	\$45.17
Total Investment	\$962.63	\$962.63	\$962.63	\$678.14	\$678.14	\$678.14	\$846.73	\$846.73	\$846.73
Annual Costs per fixture									
Fixed Charges	\$102.04	\$102.04	\$102.04	\$71.88	\$71.88	\$71.88	\$89.75	\$89.75	\$89.75
Maintenance	\$54.87	\$54.87		\$38.65	\$38.65		\$48.26	\$48.26	
Replacement - Fixture	\$49.20			\$18.68			\$37.73		
Replacement - Materials - Photo Eye, Driver (LED), and lamp (non-LED)	\$4.66	\$4.66	\$4.66	\$2.22	\$2.22	\$2.22	\$2.70	\$2.70	\$2.70
Replacement - Labor Costs	\$43.07	\$43.07	\$43.07	\$43.07	\$43.07	\$43.07	\$43.07	\$43.07	\$43.07
Billing and Collections	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00
<i>Subtotal</i>	<i>\$255.83</i>	<i>\$206.64</i>	<i>\$151.77</i>	<i>\$176.51</i>	<i>\$157.83</i>	<i>\$119.18</i>	<i>\$223.52</i>	<i>\$185.79</i>	<i>\$137.53</i>
A&G Expense	\$30.70	\$24.80	\$18.21	\$21.18	\$18.94	\$14.30	\$26.82	\$22.29	\$16.50
Total Annual Costs per fixture	\$286.53	\$231.43	\$169.98	\$197.69	\$176.77	\$133.48	\$250.34	\$208.08	\$154.03
Annual Energy Revenue per fixture									
	\$36.28	\$36.28	\$36.28	\$10.07	\$10.07	\$10.07	\$16.59	\$16.59	\$16.59
Annual Revenue Requirement per fixture									
	\$322.82	\$267.72	\$206.26	\$207.76	\$186.84	\$143.55	\$266.93	\$224.67	\$170.62
Total Annual Revenue									
	\$20,337.44	\$0.00	\$0.00	\$186,572.81	\$3,736.78	\$0.00	\$174,037.16	\$2,696.05	\$0.00
Annual Base Rate Fuel per fixture									
	\$14.11	\$14.11	\$14.11	\$3.92	\$3.92	\$3.92	\$6.45	\$6.45	\$6.45
Annual Revenue Requirement plus Base Rate Fuel per fixture									
	\$336.93	\$281.83	\$220.38	\$211.68	\$190.76	\$147.46	\$273.38	\$231.12	\$177.07
Total Annual Revenue plus Base Rate Fuel									
	\$21,226.50	\$0.00	\$0.00	\$190,090.10	\$3,815.12	\$0.00	\$178,243.34	\$2,773.46	\$0.00
Adjusted Annual Revenue per fixture									
	\$483.72	\$0.00	\$352.08	\$222.84	\$162.98	\$147.46	\$304.56	\$226.18	\$177.07
Adjusted Total Annual Revenue									
	\$30,474.36	\$0.00	\$0.00	\$200,110.32	\$3,259.56	\$0.00	\$198,573.12	\$2,714.18	\$0.00

Minnesota Power
 Docket No. E015/GR-19-442

Volume 4
 RD-01, Lighting Cost Study
 Page 6 of 15

**Reddy (Area) Fixtures - Area Lighting Service
 Rate Code 77**

Bulb Type	Light Emitting Diode LED48W			Light Emitting Diode LED71W			Mercury Vapor MV175W		
	Option 1	Option 2	Option 3	Option 1	Option 2	Option 3	Option 1	Option 2	Option 3
Lumens	4,674			9,479			7,000	7,000	
Watt	≤ 48			≤ 71			175	175	
Number of fixtures	0	0	0	0	0	0	977	107	0
Annual kWh per fixture	207	207	207	298	298	298	888	888	888
<u>Investment</u>									
Conductor	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50
Fixture - includes mast arm, ballast (non-LED), and lamp (LED)	\$156.69	\$156.69	\$156.69	\$146.74	\$146.74	\$146.74	\$0.00	\$0.00	\$0.00
Lamp - non-LED							\$8.83	\$8.83	\$8.83
Light Installation	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65
Photo Eye	\$14.20	\$14.20	\$14.20	\$14.20	\$14.20	\$14.20	\$4.85	\$4.85	\$4.85
<i>Subtotal</i>	<i>\$557.04</i>	<i>\$557.04</i>	<i>\$557.04</i>	<i>\$547.09</i>	<i>\$547.09</i>	<i>\$547.09</i>	<i>\$399.83</i>	<i>\$399.83</i>	<i>\$399.83</i>
A&G Expense	\$66.84	\$66.84	\$66.84	\$65.65	\$65.65	\$65.65	\$47.98	\$47.98	\$47.98
Material Handling Expense	\$55.70	\$55.70	\$55.70	\$54.71	\$54.71	\$54.71	\$39.98	\$39.98	\$39.98
Sales Tax	\$38.30	\$38.30	\$38.30	\$37.61	\$37.61	\$37.61	\$27.49	\$27.49	\$27.49
Total Investment	\$717.88	\$717.88	\$717.88	\$705.06	\$705.06	\$705.06	\$515.28	\$515.28	\$515.28
<u>Annual Costs per fixture</u>									
Fixed Charges	\$76.10	\$76.10	\$76.10	\$74.74	\$74.74	\$74.74	\$54.62	\$54.62	\$54.62
Maintenance	\$40.92	\$40.92		\$40.19	\$40.19	\$40.19	\$29.37	\$29.37	
Replacement - Fixture	\$7.83			\$7.34	\$7.34	\$7.34	\$0.00		
Replacement - Materials - Photo Eye, Driver (LED), and lamp (non-LED)	\$0.71	\$0.71	\$0.71	\$0.71	\$0.71	\$0.71	\$2.04	\$2.04	\$2.04
Replacement - Labor Costs	\$14.43	\$14.43	\$14.43	\$14.43	\$14.43	\$14.43	\$43.07	\$43.07	\$43.07
Billing and Collections	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00
<i>Subtotal</i>	<i>\$141.99</i>	<i>\$134.16</i>	<i>\$93.24</i>	<i>\$139.40</i>	<i>\$139.40</i>	<i>\$139.40</i>	<i>\$131.11</i>	<i>\$131.11</i>	<i>\$101.73</i>
A&G Expense	\$17.04	\$16.10	\$11.19	\$16.73	\$16.73	\$16.73	\$15.73	\$15.73	\$12.21
Total Annual Costs per fixture	\$159.03	\$150.26	\$104.43	\$156.13	\$156.13	\$156.13	\$146.84	\$146.84	\$113.94
<u>Annual Energy Revenue per fixture</u>									
	\$1.70	\$1.70	\$1.70	\$2.45	\$2.45	\$2.45	\$7.31	\$7.31	\$7.31
<u>Annual Revenue Requirement per fixture</u>									
	\$160.73	\$151.96	\$106.13	\$158.58	\$158.58	\$158.58	\$154.14	\$154.14	\$121.25
<u>Total Annual Revenue</u>									
	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$150,598.86	\$16,493.43	\$0.00
<u>Annual Base Rate Fuel per fixture</u>									
	\$0.66	\$0.66	\$0.66	\$0.95	\$0.95	\$0.95	\$2.84	\$2.84	\$2.84
<u>Annual Revenue Requirement plus Base Rate Fuel per fixture</u>									
	\$161.40	\$152.62	\$106.79	\$159.54	\$159.54	\$159.54	\$156.99	\$156.99	\$124.09
<u>Total Annual Revenue plus Base Rate Fuel</u>									
	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$153,375.11	\$16,797.48	\$0.00
<u>Adjusted Annual Revenue Requirement per fixture</u>									
	\$130.96	\$0.00	\$0.00	\$159.54	\$0.00	\$0.00	\$156.99	\$130.41	\$0.00
<u>Adjusted Total Annual Revenue</u>									
	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$153,375.11	\$13,953.87	\$0.00

Minnesota Power
Docket No. E015/GR-19-442

Volume 4
RD-01, Lighting Cost Study
Page 7 of 15

**Reddy (Area) Fixtures - Area Lighting Service
Rate Code 77**

Bulb Type	Sodium Vapor SV100W			Sodium Vapor SV150W		
	Option 1	Option 2	Option 3	Option 1	Option 2	Option 3
Lumens	8,500	8,500	8,500	14,000	14,000	
Watt	100	100	100	150	150	
Number of fixtures	2,522	40	1	336	2	0
Annual kWh per fixture	504	504	504	756	756	756
<u>Investment</u>						
Conductor	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50
Fixture - includes mast arm, ballast (non-LED), and lamp (LED)	\$90.74	\$90.74	\$90.74	\$95.10	\$95.10	\$95.10
Lamp - non-LED	\$10.17	\$10.17	\$10.17	\$10.03	\$10.03	\$10.03
Light Installation	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65
Photo Eye	\$4.85	\$4.85	\$4.85	\$4.85	\$4.85	\$4.85
<i>Subtotal</i>	<i>\$491.91</i>	<i>\$491.91</i>	<i>\$491.91</i>	<i>\$496.13</i>	<i>\$496.13</i>	<i>\$496.13</i>
A&G Expense	\$59.03	\$59.03	\$59.03	\$59.54	\$59.54	\$59.54
Material Handling Expense	\$49.19	\$49.19	\$49.19	\$49.61	\$49.61	\$49.61
Sales Tax	\$33.82	\$33.82	\$33.82	\$34.11	\$34.11	\$34.11
Total Investment	\$633.95	\$633.95	\$633.95	\$639.39	\$639.39	\$639.39
<u>Annual Costs per fixture</u>						
Fixed Charges	\$67.20	\$67.20	\$67.20	\$67.78	\$67.78	\$67.78
Maintenance	\$36.14	\$36.14		\$36.45	\$36.45	
Replacement - Fixture	\$13.54			\$14.19		
Replacement - Materials - Photo Eye, Driver (LED), and lamp (non-LED)	\$2.24	\$2.24	\$2.24	\$2.22	\$2.22	\$2.22
Replacement - Labor Costs	\$43.07	\$43.07	\$43.07	\$43.07	\$43.07	\$43.07
Billing and Collections	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00
<i>Subtotal</i>	<i>\$164.19</i>	<i>\$150.65</i>	<i>\$114.51</i>	<i>\$165.71</i>	<i>\$151.51</i>	<i>\$115.07</i>
A&G Expense	\$19.70	\$18.08	\$13.74	\$19.88	\$18.18	\$13.81
Total Annual Costs per fixture	\$183.89	\$168.73	\$128.25	\$185.59	\$169.70	\$128.88
<u>Annual Energy Revenue per fixture</u>						
	\$4.15	\$4.15	\$4.15	\$6.22	\$6.22	\$6.22
<u>Annual Revenue Requirement per fixture</u>						
	\$188.04	\$172.87	\$132.40	\$191.81	\$175.92	\$135.10
<u>Total Annual Revenue</u>						
	\$474,240.07	\$6,914.91	\$132.40	\$64,449.15	\$351.83	\$0.00
<u>Annual Base Rate Fuel per fixture</u>						
	\$1.61	\$1.61	\$1.61	\$2.42	\$2.42	\$2.42
<u>Annual Revenue Requirement plus Base Rate Fuel per fixture</u>						
	\$189.65	\$174.49	\$134.01	\$194.23	\$178.33	\$137.52
<u>Total Annual Revenue plus Base Rate Fuel</u>						
	\$478,307.55	\$6,979.42	\$134.01	\$65,262.00	\$356.67	\$0.00
<u>Adjusted Annual Revenue Requirement per fixture</u>						
	\$151.52	\$91.77	\$91.77	\$178.30	\$119.09	\$0.00
<u>Adjusted Total Annual Revenue</u>						
	\$382,143.53	\$3,670.80	\$91.77	\$59,907.46	\$238.19	\$0.00

Minnesota Power
 Docket No. E015/GR-19-442

Volume 4
 RD-01, Lighting Cost Study
 Page 8 of 15

**Roadway Fixtures -Street and Highway Lighting Service
 Rate Codes 80, 83, 84**

Bulb Type	Light Emitting Diode LED54W			Light Emitting Diode LED118W			Light Emitting Diode LED219W		
	Option 1	Option 2	Option 3	Option 1	Option 2	Option 3	Option 1	Option 2	Option 3
Lumens	4,000			8,800			23,000		
Watt	≤ 54			≤ 118			≤ 219		
Number of fixtures	119	0	0	516	0	0	0	0	0
Annual kWh per fixture	227	227	227	496	496	496	920	920	920
<u>Investment</u>									
Conductor	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50
Fixture - includes ballast (non-LED), and lamp (LED)	\$192.69	\$192.69	\$192.69	\$305.40	\$305.40	\$305.40	\$502.95	\$502.95	\$502.95
Lamp - non-LED									
Light Installation	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65
Mast Arm	\$159.42	\$159.42	\$159.42	\$159.42	\$159.42	\$159.42	\$159.42	\$159.42	\$159.42
Photo Eye	\$14.20	\$14.20	\$14.20	\$14.20	\$14.20	\$14.20	\$14.20	\$14.20	\$14.20
<i>Subtotal</i>	<i>\$752.46</i>	<i>\$752.46</i>	<i>\$752.46</i>	<i>\$865.17</i>	<i>\$865.17</i>	<i>\$865.17</i>	<i>\$1,062.72</i>	<i>\$1,062.72</i>	<i>\$1,062.72</i>
A&G Expense	\$90.30	\$90.30	\$90.30	\$103.82	\$103.82	\$103.82	\$127.53	\$127.53	\$127.53
Material Handling Expense	\$75.25	\$75.25	\$75.25	\$86.52	\$86.52	\$86.52	\$106.27	\$106.27	\$106.27
Sales Tax	\$51.73	\$51.73	\$51.73	\$59.48	\$59.48	\$59.48	\$73.06	\$73.06	\$73.06
Total Investment	\$969.73	\$969.73	\$969.73	\$1,114.99	\$1,114.99	\$1,114.99	\$1,369.58	\$1,369.58	\$1,369.58
<u>Annual Costs per fixture</u>									
Fixed Charges	\$102.79	\$102.79	\$102.79	\$118.19	\$118.19	\$118.19	\$145.18	\$145.18	\$145.18
Maintenance	\$55.27	\$55.27		\$63.55	\$63.55		\$78.07	\$78.07	
Replacement - Fixture	\$9.63			\$15.27			\$25.15		
Replacement - Materials - Photo Eye, Driver (LED), and lamp (non-LED)	\$0.71	\$0.71	\$0.71	\$0.71	\$0.71	\$0.71	\$0.71	\$0.71	\$0.71
Replacement - Labor Costs	\$14.43	\$14.43	\$14.43	\$14.43	\$14.43	\$14.43	\$14.43	\$14.43	\$14.43
Billing and Collections	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00
<i>Subtotal</i>	<i>\$184.84</i>	<i>\$175.21</i>	<i>\$119.93</i>	<i>\$214.16</i>	<i>\$198.89</i>	<i>\$135.33</i>	<i>\$265.53</i>	<i>\$240.38</i>	<i>\$162.32</i>
A&G Expense	\$22.18	\$21.03	\$14.39	\$25.70	\$23.87	\$16.24	\$31.86	\$28.85	\$19.48
Total Annual Costs per fixture	\$207.02	\$196.23	\$134.33	\$239.85	\$222.75	\$151.57	\$297.40	\$269.23	\$181.80
<u>Annual Energy Revenue per fixture</u>	\$1.87	\$1.87	\$1.87	\$4.08	\$4.08	\$4.08	\$7.57	\$7.57	\$7.57
<u>Annual Revenue Requirement per fixture</u>	\$208.89	\$198.10	\$136.19	\$243.93	\$226.83	\$155.65	\$304.96	\$276.80	\$189.36
<u>Total Annual Revenue</u>	\$24,857.98	\$0.00	\$0.00	\$125,868.78	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
<u>Annual Base Rate Fuel per fixture</u>	\$0.73	\$0.73	\$0.73	\$1.59	\$1.59	\$1.59	\$2.94	\$2.94	\$2.94
<u>Annual Revenue Requirement plus Base Rate Fuel per fixture</u>	\$209.62	\$198.83	\$136.92	\$245.52	\$228.42	\$157.23	\$307.91	\$279.74	\$192.31
<u>Total Annual Revenue plus Base Rate Fuel</u>	\$24,944.35	\$0.00	\$0.00	\$126,687.11	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
<u>Adjusted Annual Revenue Requirement per fixture</u>	\$180.78	\$0.00	\$0.00	\$239.98	\$0.00	\$0.00	\$307.91	\$0.00	\$0.00
<u>Adjusted Total Annual Revenue</u>	\$21,512.82	\$0.00	\$0.00	\$123,830.71	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00

Minnesota Power
 Docket No. E015/GR-19-442

Volume 4
 RD-01, Lighting Cost Study
 Page 9 of 15

**Roadway Fixtures -Street and Highway Lighting Service
 Rate Codes 80, 83, 84**

Bulb Type	Light Emitting Diode LED278W			Mercury Vapor MV175W			Mercury Vapor MV250W		
	Option 1	Option 2	Option 3	Option 1	Option 2	Option 3	Option 1	Option 2	Option 3
Lumens				7,000	7,000	7,000			10,000
Watt	≤278			175	175	175			250
Number of fixtures	0	0	0	972	1,375	7	0	0	8
Annual kWh per fixture	1,327	1,327	1,327	888	888	888	1,224	1,224	1,224
<u>Investment</u>									
Conductor	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50
Fixture - includes ballast (non-LED), and lamp (LED)	\$524.25	\$524.25	\$524.25	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Lamp - non-LED				\$8.83	\$8.83	\$8.83	\$8.83	\$8.83	\$8.83
Light Installation	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65
Mast Arm	\$159.42	\$159.42	\$159.42	\$159.42	\$159.42	\$159.42	\$159.42	\$159.42	\$159.42
Photo Eye	\$14.20	\$14.20	\$14.20	\$4.85	\$4.85	\$4.85	\$4.85	\$4.85	\$4.85
<i>Subtotal</i>	<i>\$1,084.02</i>	<i>\$1,084.02</i>	<i>\$1,084.02</i>	<i>\$559.25</i>	<i>\$559.25</i>	<i>\$559.25</i>	<i>\$559.25</i>	<i>\$559.25</i>	<i>\$559.25</i>
A&G Expense	\$130.08	\$130.08	\$130.08	\$67.11	\$67.11	\$67.11	\$67.11	\$67.11	\$67.11
Material Handling Expense	\$108.40	\$108.40	\$108.40	\$55.92	\$55.92	\$55.92	\$55.92	\$55.92	\$55.92
Sales Tax	\$74.53	\$74.53	\$74.53	\$38.45	\$38.45	\$38.45	\$38.45	\$38.45	\$38.45
Total Investment	\$1,397.03	\$1,397.03	\$1,397.03	\$720.73	\$720.73	\$720.73	\$720.73	\$720.73	\$720.73
<u>Annual Costs per fixture</u>									
Fixed Charges	\$148.09	\$148.09	\$148.09	\$76.40	\$76.40	\$76.40	\$76.40	\$76.40	\$76.40
Maintenance	\$79.63			\$41.08	\$41.08		\$41.08	\$41.08	
Replacement - Fixture	\$26.21			\$0.00			\$0.00		
Replacement - Materials - Photo Eye, Driver (LED), and lamp (non-LED)	\$0.71	\$0.71	\$0.71	\$2.04	\$2.04	\$2.04	\$2.04	\$2.04	\$2.04
Replacement - Labor Costs	\$14.43	\$14.43	\$14.43	\$43.07	\$43.07	\$43.07	\$43.07	\$43.07	\$43.07
Billing and Collections	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00
<i>Subtotal</i>	<i>\$271.07</i>	<i>\$165.23</i>	<i>\$165.23</i>	<i>\$164.59</i>	<i>\$164.59</i>	<i>\$123.51</i>	<i>\$164.59</i>	<i>\$164.59</i>	<i>\$123.51</i>
A&G Expense	\$32.53	\$19.83	\$19.83	\$19.75	\$19.75	\$14.82	\$19.75	\$19.75	\$14.82
Total Annual Costs per fixture	\$303.60	\$185.06	\$185.06	\$184.35	\$184.35	\$138.33	\$184.35	\$184.35	\$138.33
<u>Annual Energy Revenue per fixture</u>									
	\$10.92	\$10.92	\$10.92	\$7.31	\$7.31	\$7.31	\$10.07	\$10.07	\$10.07
<u>Annual Revenue Requirement per fixture</u>									
	\$314.52	\$195.97	\$195.97	\$191.65	\$191.65	\$145.64	\$194.42	\$194.42	\$148.40
<u>Total Annual Revenue</u>									
	\$0.00	\$0.00	\$0.00	\$186,285.35	\$263,520.94	\$1,019.48	\$0.00	\$0.00	\$1,187.24
<u>Annual Base Rate Fuel per fixture</u>									
	\$4.25	\$4.25	\$4.25	\$2.84	\$2.84	\$2.84	\$3.92	\$3.92	\$3.92
<u>Annual Revenue Requirement plus Base Rate Fuel per fixture</u>									
	\$318.76	\$200.22	\$200.22	\$194.49	\$194.49	\$148.48	\$198.33	\$198.33	\$152.32
<u>Total Annual Revenue plus Base Rate Fuel</u>									
	\$0.00	\$0.00	\$0.00	\$189,047.38	\$267,428.14	\$1,039.37	\$0.00	\$0.00	\$1,218.57
<u>Adjusted Annual Revenue Requirement per fixture</u>									
	\$318.76	\$0.00	\$0.00	\$207.96	\$134.14	\$130.41	\$0.00	\$0.00	\$152.32
<u>Adjusted Total Annual Revenue</u>									
	\$0.00	\$0.00	\$0.00	\$202,137.12	\$184,437.00	\$912.87	\$0.00	\$0.00	\$1,218.57

Minnesota Power
 Docket No. E015/GR-19-442

Volume 4
 RD-01, Lighting Cost Study
 Page 11 of 15

**Roadway Fixtures -Street and Highway Lighting Service
 Rate Codes 80, 83, 84**

Bulb Type	Sodium Vapor SV100W			Sodium Vapor SV150W			Sodium Vapor SV150W-P		
	Option 1	Option 2	Option 3	Option 1	Option 2	Option 3	Option 1	Option 2	Option 3
Lumens	8,500	8,500	8,500	14,000	14,000	14,000			14,000
Watt	100	100	100	150	150	150			150
Number of fixtures	1,158	3,101	47	1,188	1,188	102	0	0	0
Annual kWh per fixture	504	504	504	756	756	756	468	468	468
<u>Investment</u>									
Conductor	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50
Fixture - includes ballast (non-LED), and lamp (LED)	\$111.19	\$111.19	\$111.19	\$111.19	\$111.19	\$111.19			\$111.19
Lamp - non-LED	\$10.17	\$10.17	\$10.17	\$10.03	\$10.03	\$10.03			
Light Installation	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65
Mast Arm	\$159.42	\$159.42	\$159.42	\$159.42	\$159.42	\$159.42	\$159.42	\$159.42	\$159.42
Photo Eye	\$4.85	\$4.85	\$4.85	\$4.85	\$4.85	\$4.85	\$4.85	\$4.85	\$4.85
<i>Subtotal</i>	<i>\$671.78</i>	<i>\$671.78</i>	<i>\$671.78</i>	<i>\$671.64</i>	<i>\$671.64</i>	<i>\$671.64</i>	<i>\$550.42</i>	<i>\$550.42</i>	<i>\$661.61</i>
A&G Expense	\$80.61	\$80.61	\$80.61	\$80.60	\$80.60	\$80.60	\$66.05	\$66.05	\$79.39
Material Handling Expense	\$67.18	\$67.18	\$67.18	\$67.16	\$67.16	\$67.16	\$55.04	\$55.04	\$66.16
Sales Tax	\$46.18	\$46.18	\$46.18	\$46.18	\$46.18	\$46.18	\$37.84	\$37.84	\$45.49
Total Investment	\$865.76	\$865.76	\$865.76	\$865.58	\$865.58	\$865.58	\$709.35	\$709.35	\$852.65
<u>Annual Costs per fixture</u>									
Fixed Charges	\$91.77	\$91.77	\$91.77	\$91.75	\$91.75	\$91.75	\$75.19	\$75.19	\$90.38
Maintenance	\$49.35	\$49.35		\$49.34	\$49.34		\$40.43	\$40.43	
Replacement - Fixture	\$16.60			\$16.60			\$0.00		
Replacement - Materials - Photo Eye, Driver (LED), and lamp (non-LED)	\$2.24	\$2.24	\$2.24	\$2.22	\$2.22	\$2.22	\$0.72	\$0.72	\$0.72
Replacement - Labor Costs	\$43.07	\$43.07	\$43.07	\$43.07	\$43.07	\$43.07	\$43.07	\$43.07	\$43.07
Billing and Collections	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00
<i>Subtotal</i>	<i>\$205.03</i>	<i>\$188.43</i>	<i>\$139.08</i>	<i>\$204.98</i>	<i>\$188.38</i>	<i>\$139.04</i>	<i>\$161.42</i>	<i>\$161.42</i>	<i>\$136.18</i>
A&G Expense	\$24.60	\$22.61	\$16.69	\$24.60	\$22.61	\$16.69	\$19.37	\$19.37	\$16.34
Total Annual Costs per fixture	\$229.63	\$211.04	\$155.77	\$229.58	\$210.99	\$155.73	\$180.79	\$180.79	\$152.52
<u>Annual Energy Revenue per fixture</u>									
	\$4.15	\$4.15	\$4.15	\$6.22	\$6.22	\$6.22	\$3.85	\$3.85	\$3.85
<u>Annual Revenue Requirement per fixture</u>									
	\$233.78	\$215.19	\$159.92	\$235.80	\$217.21	\$161.95	\$184.64	\$184.64	\$156.37
<u>Total Annual Revenue</u>									
	\$270,715.55	\$667,309.02	\$7,516.32	\$280,125.15	\$258,043.82	\$16,518.93	\$0.00	\$0.00	\$0.00
<u>Annual Base Rate Fuel per fixture</u>									
	\$1.61	\$1.61	\$1.61	\$2.42	\$2.42	\$2.42	\$1.50	\$1.50	\$1.50
<u>Annual Revenue Requirement plus Base Rate Fuel per fixture</u>									
	\$235.39	\$216.80	\$161.53	\$238.21	\$219.63	\$164.37	\$186.14	\$186.14	\$157.87
<u>Total Annual Revenue plus Base Rate Fuel</u>									
	\$272,583.18	\$672,310.32	\$7,592.12	\$282,999.16	\$260,917.82	\$16,765.68	\$0.00	\$0.00	\$0.00
<u>Adjusted Annual Revenue Requirement per fixture</u>									
	\$198.86	\$105.16	\$100.33	\$233.50	\$134.96	\$131.38	\$0.00	\$0.00	\$125.03
<u>Adjusted Total Annual Revenue</u>									
	\$230,277.56	\$326,088.76	\$4,715.32	\$277,393.25	\$160,337.23	\$13,400.35	\$0.00	\$0.00	\$0.00

Minnesota Power
 Docket No. E015/GR-19-442

Volume 4
 RD-01, Lighting Cost Study
 Page 12 of 15

**Roadway Fixtures -Street and Highway Lighting Service
 Rate Codes 80, 83, 84**

Bulb Type	Sodium Vapor SV200W			Sodium Vapor SV250W			Sodium Vapor SV400W		
	Option 1	Option 2	Option 3	Option 1	Option 2	Option 3	Option 1	Option 2	Option 3
Lumens	20,500	20,500	20,500	23,000	23,000	23,000	45,000	45,000	45,000
Watt	200	200	200	250	250	250	400	400	400
Number of fixtures	1	4	63	501	987	210	24	34	107
Annual kWh per fixture	1,140	1,140	1,140	1,224	1,224	1,224	2,016	2,016	2,016
<u>Investment</u>									
Conductor	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50	\$49.50
Fixture - includes ballast (non-LED), and lamp (LED)	\$138.62	\$138.62	\$138.62	\$138.62	\$138.62	\$138.62	\$161.43	\$161.43	\$161.43
Lamp - non-LED	\$8.95	\$8.95	\$8.95	\$10.02	\$10.02	\$10.02	\$13.23	\$13.23	\$13.23
Light Installation	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65	\$336.65
Mast Arm	\$159.42	\$159.42	\$159.42	\$159.42	\$159.42	\$159.42	\$159.42	\$159.42	\$159.42
Photo Eye	\$4.85	\$4.85	\$4.85	\$4.85	\$4.85	\$4.85	\$4.85	\$4.85	\$4.85
<i>Subtotal</i>	<i>\$697.99</i>	<i>\$697.99</i>	<i>\$697.99</i>	<i>\$699.06</i>	<i>\$699.06</i>	<i>\$699.06</i>	<i>\$725.08</i>	<i>\$725.08</i>	<i>\$725.08</i>
A&G Expense	\$83.76	\$83.76	\$83.76	\$83.89	\$83.89	\$83.89	\$87.01	\$87.01	\$87.01
Material Handling Expense	\$69.80	\$69.80	\$69.80	\$69.91	\$69.91	\$69.91	\$72.51	\$72.51	\$72.51
Sales Tax	\$47.99	\$47.99	\$47.99	\$48.06	\$48.06	\$48.06	\$49.85	\$49.85	\$49.85
Total Investment	\$899.53	\$899.53	\$899.53	\$900.91	\$900.91	\$900.91	\$934.45	\$934.45	\$934.45
<u>Annual Costs per fixture</u>									
Fixed Charges	\$95.35	\$95.35	\$95.35	\$95.50	\$95.50	\$95.50	\$99.05	\$99.05	\$99.05
Maintenance	\$51.27	\$51.27		\$51.35	\$51.35		\$53.26	\$53.26	
Replacement - Fixture	\$20.69			\$20.69			\$24.09		
Replacement - Materials - Photo Eye, Driver (LED), and lamp (non-LED)	\$2.06	\$2.06	\$2.06	\$2.22	\$2.22	\$2.22	\$2.70	\$2.70	\$2.70
Replacement - Labor Costs	\$43.07	\$43.07	\$43.07	\$43.07	\$43.07	\$43.07	\$43.07	\$43.07	\$43.07
Billing and Collections	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00
<i>Subtotal</i>	<i>\$214.45</i>	<i>\$193.76</i>	<i>\$142.48</i>	<i>\$214.83</i>	<i>\$194.14</i>	<i>\$142.79</i>	<i>\$224.18</i>	<i>\$200.09</i>	<i>\$146.82</i>
A&G Expense	\$25.73	\$23.25	\$17.10	\$25.78	\$23.30	\$17.13	\$26.90	\$24.01	\$17.62
Total Annual Costs per fixture	\$240.18	\$217.01	\$159.58	\$240.61	\$217.44	\$159.92	\$251.08	\$224.10	\$164.44
<u>Annual Energy Revenue per fixture</u>	\$9.38	\$9.38	\$9.38	\$10.07	\$10.07	\$10.07	\$16.59	\$16.59	\$16.59
<u>Annual Revenue Requirement per fixture</u>	\$249.56	\$226.39	\$168.96	\$250.68	\$227.51	\$169.99	\$267.67	\$240.68	\$181.03
<u>Total Annual Revenue</u>	\$249.56	\$905.55	\$10,644.53	\$125,591.19	\$224,551.10	\$35,698.83	\$6,424.05	\$8,183.24	\$19,370.04
<u>Annual Base Rate Fuel per fixture</u>	\$3.65	\$3.65	\$3.65	\$3.92	\$3.92	\$3.92	\$6.45	\$6.45	\$6.45
<u>Annual Revenue Requirement plus Base Rate Fuel per fixture</u>	\$253.21	\$230.03	\$172.61	\$254.60	\$231.43	\$173.91	\$274.12	\$247.13	\$187.48
<u>Total Annual Revenue plus Base Rate Fuel</u>	\$253.21	\$920.14	\$10,874.35	\$127,553.50	\$228,416.98	\$36,521.36	\$6,578.88	\$8,402.58	\$20,060.32
<u>Adjusted Annual Revenue Requirement per fixture</u>	\$253.21	\$163.81	\$162.01	\$260.28	\$178.99	\$173.91	\$328.56	\$247.13	\$207.00
<u>Adjusted Total Annual Revenue</u>	\$253.21	\$655.22	\$10,206.76	\$130,400.28	\$176,659.18	\$36,521.36	\$7,885.44	\$8,402.58	\$22,149.00

Minnesota Power
 Docket No. E015/GR-19-442

**Street and Highway Lighting Service and Outdoor and Area Lighting Service
 Rate Codes 76, 77, 80, 83, 84**

Volume 4
 RD-01, Lighting Cost Study
 Page 13 of 15

	Option 4
Number of Customers	301
Annual kWh per customer	16,348
<u>Investment</u>	
Meter Costs	\$90.00
<i>Subtotal</i>	<u>\$90.00</u>
A&G Expense	\$10.80
Material Handling Expense	\$9.00
Sales Tax	\$6.19
Pre Cap Fee	<u>\$80.00</u>
Total Investment per customer	\$195.99
<u>Annual Costs per customer</u>	
Fixed Charges	\$20.77
Billing and Collections	<u>\$2.00</u>
Total Annual Costs per customer	\$22.78
<u>Annual Energy Revenue per customer</u>	\$134.50
<u>Total Annual Revenue</u>	\$47,342.43
<u>Annual Base Rate Fuel per customer</u>	\$1,342.64
<u>Total Annual Revenue plus Base Rate Fuel</u>	\$410,991.54
<u>Adjusted Annual Energy Revenue per customer</u>	\$1,342.69
<u>Adjusted Total Annual Revenue</u>	\$411,006.30

Minnesota Power
 Docket No. E015/GR-19-442

**Street and Highway Lighting Service and Outdoor and Area Lighting Service
 Rate Codes 76, 77, 80, 83, 84**

Volume 4
 RD-01, Lighting Cost Study
 Page 14 of 15

	Pole Costs
Number of MP-owned lighting-only poles	1,566
<u>Investment</u>	
Pole Cost	\$350.00
<i>Subtotal</i>	<u>\$350.00</u>
A&G Expense	\$42.00
Installation Labor	\$283.52
Local Tax	\$7.00
Material Handling Expense	\$35.00
Sales Tax	\$24.06
Vehicle Expense	<u>\$60.00</u>
Total Investment	\$741.58
<u>Annual Costs per pole</u>	
Fixed Charges	\$76.90
Maintenance Expense	<u>\$42.27</u>
<i>Subtotal</i>	\$119.17
A&G Expense	<u>\$14.30</u>
Total Annual Costs per pole	\$133.47
<u>Annual Revenue Requirement per pole</u>	\$133.47
<u>Total Annual Revenue</u>	\$209,018.69
<u>Adjusted Annual Revenue per pole</u>	\$132.00
<u>Adjusted Total Annual Revenue</u>	\$206,712.00

Minnesota Power
 Docket No. E015/GR-19-442

Volume 4
 RD-01, Lighting Cost Study
 Page 15 of 15

Inputs and Cost Allocations

A&G expense	12.000%
Area lighting only poles (MP owned)	1,566
Customer accounts revenue requirements per COS	\$40,851
Conductor (feet)	150
Conductor (\$ per foot)	\$0.33
Distribution pole cost	\$350.00
Energy charge rate (\$/kWh)	\$0.008228
Fixed charge rate - fixtures	10.60%
Fixed charge rate - distribution poles	10.37%
Hourly labor	\$70.88
Local Tax	2.000%
Maintenance expense	5.70%
Mast arm (Street Light)	\$159.42
Mart arm (Area Light)	\$25.21
Material handling expense	10.00%
Meter cost	\$90.00
Number of customers (Service Agreements) on Option 4	301
Number of hours to install light (LED and non-LED)	3.5
Number of hours to install pole	4.0
Number of hours for replacement	3.0
Photo eye for all LED	\$14.20
Photo eye for all non-LED	\$4.85
Pre Cap Fee	\$80.00
Replacement - LED	20.0
Replacement - non-LED	6.7
Revenue requirements - Lighting	\$4,035,709
Sales tax	6.875%
Street lighting only poles (MP owned)	3,715
Total distribution poles (MP owned)	134,918
Total number of fixtures	20,378
Vehicle expense	\$15.00
Average customer accounts Revenue Requirements per fixture	\$2.00
Conductor costs	\$49.50

Light Installation - LED & non-LED

Vehicle Expense	\$52.50
Labor Cost	\$248.08
<i>Subtotal</i>	<u>\$300.58</u>
A&G Expense	\$36.07
Total Light Installation	<u>\$336.65</u>

Replacement - Labor Costs

Vehicle Expense	\$45.00
Labor	\$212.64
<i>Subtotal</i>	<u>\$257.64</u>
A&G Expense	\$30.92
Total Replacement - LED & non-LED	<u>\$288.56</u>

On April 28, 2020, the Commission issued a Notice of Shortened Comment Period (Notice) with several topics open for comment related to Minnesota Power's Petition and the Resolution Proposal.

On April 30, 2020, Minnesota Power filed a supplement (April 30 Supplement) to its Petition with additional details about the Resolution Proposal.

On May 11, 2020, the Minnesota Department of Commerce, Division of Energy Resources (Department), the Office of the Attorney General—Residential Utilities Division (OAG), Large Power Intervenors (LPI),² the Citizens Utility Board of Minnesota (CUB) and the Energy CENTS Coalition (Energy CENTS), the Clean Energy Organizations (CEOs), i.e. Fresh Energy, Minnesota Center for Environmental Advocacy, Sierra Club, and Clean Grid Alliance, and Walmart Inc. (Walmart), filed comments pursuant to the Commission's Notice.

On May 14, 2020, the Minnesota Forest Industries (MFI) and on May 18, 2020 the Iron Mining Association of Minnesota (IMA)³ submitted public comment letters.

On May 18, 2020, Minnesota Power, OAG, and LPI filed reply comments.

On May 21, 2020, the OAG, at staff's request, filed an illustration of how the class rate increases would be calculated under the OAG's recommendation to "reallot[e] the EITE discount's impact among all classes according to the existing base-rate revenue apportionment before applying the proposed 5.75 increase to base rates."

III. Minnesota Power's Petition

In its Petition, Minnesota Power proposed to continue to charge its ratepayers final base rates set in its last completed rate case, Docket No. E-015/GR-16-664 (the 2016 Rate Case) for the first four months of 2020. Beginning May 1, the Company proposes to shift recovery of its energy and capacity asset-based wholesale sales margins (asset-based margins) from base rates to its fuel adjustment clause.

Asset-based margins are margins, or profits, earned from sales of energy and capacity supported by Minnesota Power's generating assets in rate base. Because those assets are included in rate base, ratepayers pay for them. To reflect the fact that the margins are generated using assets paid for by ratepayers, asset-based margins are included in rates as a credit, or decrease, to the Company's overall revenue requirement. Asset-based margins are derived in part from Minnesota Power's uncontracted sales of energy into the Midcontinent

² LPI is an ad hoc consortium of large industrial customers of Minnesota Power – consisting of ArcelorMittal USA (Minorca Mine); Blandin Paper Company; Boise Paper, a Packaging Corporation of America company, formerly known as Boise, Inc.; Enbridge Energy Limited Partnership; Gerdau Ameristeel US Inc.; Hibbing Taconite Company; Northern Foundry, LLC; Sappi Cloquet, LLC; USG Interiors, Inc.; United States Steel Corporation (Keetac and Minntac Mines); United Taconite, LLC; and Verso Corporation

³ IMA represents six taconite mines and 200 supplier vendor member businesses.

Independent System Operator (MISO) Day 2 energy market and, in part, from bilateral wholesale contracts the Company enters into, such as the LMC, to sell energy and/or capacity to specific counter parties. Final rates determined in the 2016 Rate Case include a revenue credit of \$35.8 million (MN Jurisdictional) resulting from Minnesota Power's expected (at that time) asset-based margins.⁴

A large percentage of the \$35.8 million asset-based margin credit included in the final rates set in the 2016 Rate Case resulted from the LMC, which, as noted above, expired on April 30, 2020. In its Petition, Minnesota Power stated that the expiration of this contract was a key impetus for its 2019 Rate Case, and aligns with the proposed May 1, 2020 start date for the changes to base rates and fuel clause rates the Company has proposed.

The LMC had a term of multiple years, but the Company also has other contracts with much shorter terms, often a year or less. Minnesota Power regularly cycles through these contracts, such that the mix of contracts reflected in the Company's estimate of asset-based margins in its 2019 Rate Case is significantly different from the mix of contracts reflected in the 2016 Rate Case.

In its Resolution Proposal, Minnesota Power proposes to adjust the size of the asset-based margin credit from \$35.8 million down to \$10 million. The \$10 million estimate is based on the asset-based margin credit the Company proposed in its 2019 Rate Case, which reflects the Company's expectations about wholesale margins at the time it filed the 2019 Rate Case. The \$25.8 million difference is due largely, but not completely, to the expiration of the LMC. The updated estimate also reflects the Company's expected level of uncontracted sales into the MISO Day 2 market as well as margins expected from bilateral wholesale contracts that the Company expects to be in place during 2020 (the test year of the 2019 Rate Case).

The total base rate revenue requirement determined in the 2016 Rate Case was \$623.1 million. Removal of the \$35.8 million asset-based margin credit from base rates increases the total base rate revenue requirement to \$658.9 million, an increase of 5.75 percent. To effect this increase, Minnesota Power proposes to increase the base energy rate for each customer class such that total revenue from each class would increase by 5.75 percent. In other words, Minnesota Power proposes to allocate the \$35.8 million increase in base rates across its customer classes using each class's share of total revenue responsibility to calculate each class's share of the increase.⁵

To reflect asset-based margins in its fuel adjustment clause rates, Minnesota Power added its expected margins (reduction in net costs of approximately \$10 million) to the fuel cost forecast approved in Docket No. E-015/AA-19-302 to derive updated monthly FAC rates. The Company

⁴ Petition at 10.

⁵ This process is described in Attachment E of the Company's April 30 Supplement, and the resulting increases to each customer class' base energy rates are shown in Attachment A of the April 30 Supplement.

then adjusts the monthly rates for each customer class using the E8760⁶ energy allocator to derive the applicable monthly rates for each class.⁷

A. Stay Out Provision

Minnesota Power states that if the Commission approves its Petition, it will agree to not file another rate case before November 1, 2021, unless one of its Energy-Intensive Trade-Exposed (EITE) customers shuts down or idles at least 50 megawatts (MW) below their actual load as of April 20, 2020 for a period of three months. However, under no circumstance will Minnesota Power file a rate case prior to March 1, 2021. The Company states that this exception is “necessary in the event Minnesota Power has no choice but to seek rate relief due to extenuating circumstances beyond its control.”⁸ The Company also stated that if a loss of EITE load prompts it to file a rate case prior to November 1, 2021, it will provide at least 90 days written notice to the Commission before filing.

B. Energy Intensive Trade Exposed Rate

In its Order dated December 21, 2016 in Docket No. E-015/M-16-564 (2016 EITE Order), the Commission approved an EITE Rate Rider that provides an Energy Charge Credit (EITE Rate Discount) to Minnesota Power’s eligible EITE customers. The 2016 EITE Order limited the EITE Rate Discount to a four-year term. Minnesota Power implemented the EITE Rate Discount on February 1, 2017, and thus per the EITE Order, the EITE Rate Discount was originally scheduled to expire on February 1, 2021.

In its Order dated March 17, 2020 in Docket No. E-015/M-16-564 (2020 EITE Order), the Commission extended the term of the EITE Rate Discount to last until implementation of final rates in the 2019 Rate Case, with the condition that Minnesota Power is prohibited from recovering any EITE-related costs through a surcharge on non-exempt, non-EITE customers after February 1, 2021.

As noted above, if the Commission approves the Resolution Proposal, Minnesota Power will withdraw its rate case, and no final rates will be determined or take effect in the 19-442 docket. Therefore, the Company proposes in its Petition to reinstate the original expiration date of the EITE Rate Discount of February 1, 2021. Minnesota Power states in its Petition that its intention is to maintain the status quo with respect to the EITE Rate Discount. The Company also states that its Petition is not intended to change any party’s opportunity to propose in other (or new) dockets to extend or modify the EITE rate beyond February 1, 2021.

⁶ There are 8760 hours in a 365 day year.

⁷ Minnesota Power’s April 30 Supplement at Attachment B.

⁸ Petition at 17.

**MINNESOTA POWER
 ELECTRIC RATE BOOK - VOLUME I**

**SECTION V PAGE NO. 37.0
 REVISION 1417**

OUTDOOR AND AREA LIGHTING SERVICE

RATE CODES

Outdoor Lighting Service 76
 Area Lighting Service 77

APPLICATION

To all classes of retail customers for outdoor lighting purposes (Rate Codes 76) and to persons other than governmental subdivisions for the purpose of lighting streets, alleys, roads, driveways and parking lots (Rate Code 77) subject to any applicable Riders. Rate Code 76 is not available on a seasonal or temporary basis.

RATE

<u>Lamp Type & Size</u> Sub rate code	<u>CIS Code</u>	<u>Rate Per Lamp Per Month</u>			
		<u>Option 1</u> __A	<u>Option 2</u> __B	<u>Option 3</u> __C	<u>Option 4</u> __D
			(Option 2 Closed to New Installation)	(Option 3 Closed to New Installation)	
Mercury Vapor Lamps					
7,000 Lumens (175 watts)	MV175W	\$11.77	12.99	\$8.23	9.45
20,000 Lumens (400 watts)	MV400W	\$18.73	21.39	\$12.40	15.72
55,000 Lumens (1,000 watts)	MV1000W	\$34.89	41.63	\$24.58	31.82
Sodium Vapor Lamps					
8,500 Lumens (100 watts)	SV100W	\$10.32	10.98	\$5.96	6.65
14,000 Lumens (150 watts)	SV150W	\$11.90	12.92	\$7.60	8.63
23,000 Lumens (250 watts)	SV250W	\$16.88	18.57	\$10.12	11.84
45,000 Lumens (400 watts)	SV400W	\$22.60	25.38	\$14.89	16.39
Metal Halide Lamps					
17,000 Lumens (250 watts)	MH250W	\$16.69	18.42		
28,800 Lumens (400 watts)	MH400W	\$20.33	23.15	\$12.05	14.87
88,000 Lumens (1,000 watts)	MH1000W	\$33.87	40.34	\$22.00	29.34
Light Emitting Diodes (LED)					
4,674 Lumens (48 watts or less)	LED48W	\$9.00	9.49		

Filing Date ~~November 2, 2016~~ April 23, 2020 MPUC Docket No. E015/GR-16-664/E015/M-20-429
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MINNESOTA POWER
ELECTRIC RATE BOOK - VOLUME I

SECTION V **PAGE NO.** 37.1
REVISION 4417

OUTDOOR AND AREA LIGHTING SERVICE

Pole Charge

Each pole used for service
under this schedule only

MPPOLE\$~~10.506.64~~\$~~10.506.64~~\$~~10.506.64~~

Monthly Service Charge

\$~~3.342.09~~

Included Included Included

Energy Charge - Per kWh

~~5.9907.1420¢~~

Included Included Included

Plus any applicable adjustments

ADJUSTMENTS

1. There shall be added to or deducted from the monthly bill, as computed above, a fuel and purchased energy adjustment determined in accordance with the Rider for Fuel and Purchased Energy Adjustment.

The monthly fuel and purchased energy adjustment per lamp shall be determined as the above fuel and purchased energy adjustment per kWh multiplied by the monthly kWh per lamp shown in the Energy Table below for the respective lamps.

2. There shall be added to the monthly bill, as computed above, a transmission investment adjustment determined in accordance with the Rider for Transmission Cost Recovery.

3. There shall be added to the monthly bill, as computed above, a renewable resources adjustment determined in accordance with the Rider for Renewable Resources.

4. There shall be added to the monthly bill, as computed above, a conservation program adjustment determined in accordance with the Rider for Conservation Program Adjustment.

5. There shall be added to the monthly bill, as computed above, an emissions-reduction adjustment determined in accordance with the Rider for Boswell Unit 4 Emission Reduction.

6. There shall be added to or deducted from the monthly billing, as computed above, a solar energy adjustment determined in accordance with the Rider for Solar Energy Adjustment.

7. Plus the applicable proportionate part of any taxes and assessments imposed by any governmental authority which are assessed on the basis of meters or customers, or the

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**MINNESOTA POWER
 ELECTRIC RATE BOOK - VOLUME I**

**SECTION V PAGE NO. 37.2
 REVISION 4417**

OUTDOOR AND AREA LIGHTING SERVICE

price of or revenues from electric energy or service sold, or the volume of energy generated, transmitted or purchased for sale or sold.

8. Bills for service within the corporate limits of the applicable city shall include an upward adjustment as specified in the applicable Rider for the city's Franchise Fee.

PAYMENT

Bills are due and payable 15 days following the date the bill is rendered or such later date as may be specified on the bill.

BURNING SCHEDULE

Burning schedule is from dusk until dawn each night for a total of approximately 4,200 hours per year.

ENERGY TABLE

Lamp CIS Code	Days Month		31	28	31	30	31	30	31	31	30	31	30	31
	Daily Estimates	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Burning Hours		4,200	462	379	367	302	264	233	252	294	336	401	435	475
Montly kWh usage per fixture by type														
MV175W	2	888	98	80	78	64	56	49	53	62	71	85	92	100
MV400W	5	1,932	213	174	169	139	121	107	116	135	155	184	200	219
MV1000W	13	4,620	508	417	404	332	290	256	277	323	370	441	479	523
SV100W	1	504	56	46	44	36	32	28	30	35	40	48	52	57
SV150W	2	756	83	68	66	54	48	42	45	53	60	72	78	87
SV250W	3	1,224	135	110	107	88	77	68	73	86	98	117	127	138
SV400W	6	2,016	222	182	176	145	127	112	121	141	161	192	209	228
MH250W	3	1,260	139	114	110	91	79	70	76	88	101	120	130	142
MH400W	5	1,932	213	174	169	139	121	107	116	135	155	184	200	219
MH1000W	12	4,410	485	398	385	317	277	245	264	309	353	421	457	499
LED48W	1	207	23	19	18	15	13	11	12	14	17	20	21	24

Filing Date ~~November 2, 2016~~ April 23, 2020 MPUC Docket No. E015/GR-16-664/E015/M-20-429
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**MINNESOTA POWER
 ELECTRIC RATE BOOK - VOLUME I**

**SECTION V PAGE NO. 37.3
 REVISION 4417**

OUTDOOR AND AREA LIGHTING SERVICE

Lamp CIS Code	Days Month		31	28	31	30	31	30	31	31	30	31	30	31
	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Burning Hours	Daily Estimates	4,200	462	379	367	302	264	233	252	294	336	401	435	475
Monthly kWh usage per fixture by type														
MV175W	2	888	98	80	78	64	56	49	53	62	71	85	92	100
MV400W	5	1,932	213	174	169	139	121	107	116	135	155	184	200	219
MV1000W	13	4,620	508	417	404	332	290	256	277	323	370	441	479	523
SV100W	1	504	56	46	44	36	32	28	30	35	40	48	52	57
SV150W	2	756	83	68	66	54	48	42	45	53	60	72	78	87
SV250W	3	1,224	135	110	107	88	77	68	73	86	98	117	127	138
SV400W	6	2,016	222	182	176	145	127	112	121	141	161	192	209	228
MH250W	3	1,260	139	114	110	91	79	70	76	88	101	120	130	142
MH400W	5	1,932	213	174	169	139	121	107	116	135	155	184	200	219
MH1000W	12	4,410	485	398	385	317	277	245	264	309	353	421	457	499
LED48W	1	207	23	19	18	15	13	11	12	14	17	20	21	24
LED71W	1	298	33	27	26	21	19	17	18	21	24	28	31	34
LED184W	2	701	85	70	68	21	49	43	46	54	24	74	80	87
LED316W	4	1,327	146	120	116	95	83	74	80	93	106	127	137	150

Company shall furnish all electric energy required for service under this schedule.

EQUIPMENT OWNERSHIP, OPERATION AND MAINTENANCE

New Customer must select Option 1 or Option 4 only for each account served under this schedule.

Option 1

COMPANY TO OWN AND MAINTAIN:

1. The Company shall install, own, operate and provide normal maintenance to all equipment necessary for the above service including the Lighting Equipment beyond the point of attachment to Company's facilities consisting of, but not limited to, the fixture, lamp, ballast, photo-electric control and wiring.

Option 2

1. The Customer shall own all equipment for service under this schedule beyond the point of attachment with Company's pole or pad-mounted transformer. The equipment shall include, but not be limited to, the fixture, mounting bracket, lamp, ballast, photo-electric

Filing Date ~~November 2, 2016~~ April 23, 2020 MPUC Docket No. E015/GR-16-664/E015/M-20-429
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OUTDOOR AND AREA LIGHTING SERVICE

control and all minor materials. All customer-owned equipment must meet Company's specifications.

2. The Company shall install and operate all equipment necessary for service under this schedule and Company will own all equipment necessary for service under this Option, including poles, except for that equipment as specified in paragraph 1. All Customer owned Lighting Equipment will be installed at Customer's expense. The Company shall perform all normal maintenance on equipment necessary for service under this schedule and furnish and replace all burned out lamps and photo-electric controls Option 2 is closed to new installations.

Option 3

1. The Customer shall own, install and maintain all equipment necessary for service under this schedule beyond the point of attachment with Company's pole or pad-mounted transformer. The equipment shall include but not be limited to the poles, fixture, mounting bracket, lamp, ballast, photo-electric control and all minor materials. In addition, Customer must furnish and install a master disconnect switch at the point of attachment to isolate Customer's equipment from Company's electrical system. All Customer owned equipment must meet Company's specifications. Customer is responsible for providing lighting poles.

2. The Company shall own all equipment necessary for service under this Option except for that equipment as specified in paragraph 1. No maintenance will be provided by the Company on Customer owned equipment except as specified in a separate agreement. Option 3 is closed to new installations.

Option 4
CUSTOMER TO OWN AND MAINTAIN:

1. The Customer shall own, install and maintain all equipment necessary for service under this schedule beyond the point of attachment with Company's electrical system. The equipment shall include but not be limited to the poles, fixture, mounting bracket, lamp, ballast, photo-electric control and all minor materials. In addition, Customer must furnish and install a master disconnect switch at the point of attachment to isolate Customer's equipment from Company's electrical system. Customer's disconnect switch must meet Company's specifications. Company's point of delivery shall be on the Company's side of disconnect switch either at the weather head for overhead service or at the pad mount transformer for underground service.

2. Customer is responsible for all maintenance on all equipment beyond Company's

Filing Date ~~November 2, 2016~~ April 23, 2020 MPUC Docket No. E015/GR-16-664/E015/M-20-429
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**MINNESOTA POWER
ELECTRIC RATE BOOK - VOLUME I**

SECTION V **PAGE NO.** 37.5
REVISION 4417

OUTDOOR AND AREA LIGHTING SERVICE

point of delivery. Standard safety procedures followed by the Company on Company-owned lighting facilities shall be followed by Customer when maintaining its lighting equipment. Company reserves the right to disconnect Customer equipment from Company's electrical system if in the Company's opinion Customer's lighting equipment is operated or maintained in an unsafe or improper condition.

CONTRACT PERIOD

Six months, automatically renewable for six month periods unless canceled by 30 days written notice by either party to the other.

SERVICE CONDITIONS

1. Lights shall be located at sites designated and authorized by Customer. Customer shall provide in writing suitable right-of-way and right-of-occupancy for the facilities which the Company deems necessary to render service under the option chosen. The location shall be readily accessible to Company's equipment used for servicing and/or supplying service under the option chosen.

2. Service will normally be from standard distribution facilities typical of those in the area surrounding the point of service. If it is necessary to provide non-standard distribution facilities, Customer shall pay Company for all costs in excess of standard facility costs.

3. Company will, at Customer's expense, relocate or change the position of any poles, circuits or lights owned by the Company as may be requested in writing and duly authorized by Customer.

4. For Area Lighting Service purposes, no more than four lights will be mounted on a single distribution pole used for other utility purposes. If more than one light is mounted on a single pole, Company's investment in additional facilities, over and above those which would be required for a single standard bracket mounting, shall not exceed \$15.00 per light. Additional required investment will be at Customer's expense.

5. Company shall provide as standard a service extension of up to the equivalent of one pole span to provide service under this schedule without cost to the Customer. No additional transformer capacity shall be provided as standard for Area Lighting Service. All necessary costs for providing service under this schedule in excess of standard costs shall be paid by Customer.

6. For lamps which satisfy the conditions as set forth in Options 1 or 2 under Equipment Ownership, Operation and Maintenance, Company will absorb the cost of replacing a lamp and photo-electric control devices damaged by a first act of vandalism at

Filing Date ~~November 2, 2016~~ April 23, 2020 **MPUC Docket No.** E015/GR-16-664/E015/M-20-429
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 ~~Marcia A. Podratz~~ David R. Moeller
 ~~Director - Rates~~ Senior Attorney & Director of Regulatory Compliance

MINNESOTA POWER
ELECTRIC RATE BOOK - VOLUME I

SECTION V **PAGE NO.** 37.6
REVISION 4417

OUTDOOR AND AREA LIGHTING SERVICE

each location during each calendar year. In addition, Company will absorb the cost of replacing a lighting unit damaged by a first act of vandalism at each location during each calendar year if served under Option 1. All subsequent and other costs due to vandalism are at Customer's expense. For those locations served under Option 1 or 2, Company will repair equipment (not covered above) damaged by vandalism and will bill customer for appropriate costs.

SCHEDULE OF CHARGES

Applicable in conjunction with Service Conditions paragraph 6.

Labor and vehicle charges per the applicable rate as stated in the Company's Accounting Manual at the time the charge was incurred. Materials charges per the Company's cost for lighting replacement equipment plus the then current Material Handling Expense and A&G expense per Company's Accounting Manual.

Filing Date ~~November 2, 2016~~ April 23, 2020 **MPUC Docket No.** E015/GR-16-664/E015/M-20-429
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**MINNESOTA POWER
ELECTRIC RATE BOOK - VOLUME I**
**SECTION V PAGE NO. 46.0
REVISION 1719**
STREET AND HIGHWAY LIGHTING SERVICE
RATE CODES

Highway Lighting Service	80
Overhead Street Lighting Service	83
Ornamental Street Lighting Service	84

TERRITORY

Applicable in all territories served at retail by the Company. Highway Lighting Service is subject to individual review for each point of delivery.

APPLICATION

To any governmental subdivision taking all of its street or highway lighting requirements for service within the Company's service territory under the Company's standard contract for such service, subject to any applicable Riders. Highway Lighting Service is limited to the State of Minnesota, Department of Highways exclusively for public highway lighting.

RATE

Lamp Type & Size Sub rate code	CIS Code	Rate Per Fixture Per Month			
		Option 1 __A	Option 2 __B	Option 3 __C	Option 4 __D
Mercury Vapor Lamps (Closed to New Installations)					
7,000 Lumens (175 watts)	MV175W	\$ 16.25 17.33	\$ 9.70 9.72	\$ 8.10 9.45	
10,000 Lumens (250 watts)	MV250W		\$ 10.29 12.40		
20,000 Lumens (400 watts)	MV400W	\$ 22.10 24.36	\$ 15.00 17.26	\$ 13.90 16.79	
55,000 Lumens (1,000 watts)	MV1000W2		\$ 25.00 32.47		
Sodium Vapor Lamps					
8,500 Lumens (100 watts)	SV100W	\$ 14.35 14.44		\$7.62	\$ 6.50 7.27
14,000 Lumens (150 watts)	SV150W	\$ 15.88 16.92		\$ 8.92 9.78	\$ 9.15 9.52
14,000 Lumens (150 watts)	SV150W-P			\$ 8.30 9.06	
20,500 Lumens (200 watts)	SV200W	\$ 19.65 20.11	\$ 12.06 11.87		\$ 10.00 11.74
23,000 Lumens (250 watts)	SV250W	\$ 19.78 21.69	\$ 12.70 12.97		\$ 10.80 12.67
45,000 Lumens (400 watts)	SV400W	\$ 24.30 27.38	\$ 17.98 18.11		\$ 13.00 17.25
Metal Halide Lamps					
28,800 Lumens (400 watts)	MH400W		\$ 15.90 16.14		

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**MINNESOTA POWER
ELECTRIC RATE BOOK - VOLUME I**
**SECTION V PAGE NO. 46.1
REVISION 1719**

STREET AND HIGHWAY LIGHTING SERVICE

Light Emitting Diode (LED)

 4,000 Lumens (54 watts or less) LED54W \$~~13.60~~13.10

 8,800 Lumens (118 watts or less,
but more than 54 watts) LED118W \$~~18.10~~17.39

 23,000 Lumens (219 watts or less,
but more than 118 watts) LED219W \$~~22.55~~22.50

 30,000 Lumens (278 watts or less) LED278W \$22.50

Monthly Service Charge	Included	Included	Included	\$ 3.34 <u>2.09</u>
Energy Charge - Per kWh	Included	Included	Included	<u>5.990</u> 7.1420
Plus any applicable adjustments				

ADJUSTMENTS

1. There shall be added to or deducted from the monthly bill, as computed above, a fuel and purchased energy adjustment determined in accordance with the Rider for Fuel and Purchased Energy Adjustment.

2. The monthly fuel and purchased energy adjustment per fixture shall be determined as the above fuel and purchased energy adjustment per kWh multiplied by the monthly kWh per fixture shown in the Energy Table below for the respective fixtures.

3. There shall be added to the monthly bill, as computed above, a transmission investment adjustment determined in accordance with the Rider for Transmission Cost Recovery.

4. There shall be added to the monthly bill, as computed above, a renewable resources adjustment determined in accordance with the Rider for Renewable Resources.

5. There shall be added to the monthly bill, as computed above, a conservation program adjustment determined in accordance with the Rider for Conservation Program Adjustment.

6. There shall be added to the monthly bill, as computed above, an emissions-reduction adjustment determined in accordance with the Rider for Boswell Unit 4 Emission Reduction.

7. There shall be added or deducted from the monthly billing, as computed above, a solar energy adjustment determined in accordance with the Rider for Solar Energy Adjustment.

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**MINNESOTA POWER
ELECTRIC RATE BOOK - VOLUME I**

SECTION V **PAGE NO.** 46.2
REVISION 1719

STREET AND HIGHWAY LIGHTING SERVICE

8. Plus the applicable proportionate part of any taxes and assessments imposed by any governmental authority which are assessed on the basis of meters or customers, or the price of or revenues from electric energy or service sold, or the volume of energy generated, transmitted or purchased for sale or sold.

9. Bills for service to parties within the corporate limits of the applicable city shall include an upward adjustment as specified in the applicable Rider for city's Franchise Fee.

PAYMENT

Bills are due and payable 15 days following the date the bill is rendered or such later date as may be specified on the bill.

BURNING SCHEDULE

Burning schedule is from dusk until dawn each night for a total of approximately 4,200 hours per year.

ENERGY TABLE

Filing Date ~~November 2, 2016~~ April 23, 2020 **MPUC Docket No.** E015/GR-16-664/E015/M-20-429
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**MINNESOTA POWER
 ELECTRIC RATE BOOK - VOLUME I**

**SECTION V PAGE NO. 46.3
 REVISION 1719**

STREET AND HIGHWAY LIGHTING SERVICE

Lamp CIS Code	Days Month		31	28	31	30	31	30	31	31	30	31	30	31
	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Burning Hours	Daily Estimates	4,200	462	379	367	302	264	233	252	294	336	401	435	475
Montly kWh usage per fixture by type														
MV175W	2	888	98	80	78	64	56	49	53	62	71	85	92	100
MV250W	3	1,224	135	110	107	88	77	68	73	86	98	117	127	138
MV400W	5	1,932	213	174	169	139	121	107	116	135	155	184	200	219
MV1000W2	13	4,620	508	417	404	332	290	256	277	323	370	441	479	523
SV100W	1	504	56	46	44	36	32	28	30	35	40	48	52	57
SV150W	2	756	83	68	66	54	48	42	45	53	60	72	78	87
SV150W-P	1	468	51	42	41	34	29	26	28	33	37	45	48	54
SV200W	3	1,140	125	103	100	82	72	63	68	80	91	109	118	129
SV250W	3	1,224	135	110	107	88	77	68	73	86	98	117	127	138
SV400W	6	2,016	222	182	176	145	127	112	121	141	161	192	209	228
MH400W	5	1,932	213	174	169	139	121	107	116	135	155	184	200	219
LED54W	1	226	25	20	20	16	14	13	14	16	18	22	23	25
LED118W	1	505	56	46	44	36	32	28	30	35	40	48	52	58
LED219W	3	945	104	85	83	68	59	52	57	66	76	90	98	107

Company shall furnish all electric energy required for service under this schedule.

EQUIPMENT OWNERSHIP, OPERATION AND MAINTENANCE

New Customers with new installations must select Option 1 or Option 4 only for each account served under this schedule. Options 2 and 3 are closed to new installations. Options 1 or 4 are available for Overhead Lighting Service and for Highway or Ornamental Lighting Service.

Option 1

COMPANY TO OWN AND MAINTAIN.

1. The Company shall install, own, operate and provide normal maintenance to all equipment necessary for the above service including the Lighting Equipment beyond the point of attachment to Company's facilities consisting of, but not limited to, the fixture, standard brackets or mast arms not exceeding 14 feet in length, fixture, ballast, photo-electric control, driver, and wiring.

Filing Date ~~November 2, 2016~~ April 23, 2020 MPUC Docket No. E015/GR-16-664/E015/M-20-429
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~~Director - Rates~~ Senior Attorney & Director of Regulatory Compliance

STREET AND HIGHWAY LIGHTING SERVICE

Option 2

The Customer shall own all equipment for service under this schedule beyond the point of attachment with Company's facilities. The equipment shall include, but not be limited to, the fixture, standard brackets or mast arms not exceeding 14 feet in length, lamp, ballast, photo-electric control and all minor materials. All customer-owned equipment must meet Company's specifications. In all cases, poles are owned by Company.

The Company shall install and operate all equipment necessary for service under this schedule and Company will own all equipment necessary for service under this Option except for that equipment as specified in paragraph 1. All Customer owned Lighting Equipment will be installed at Customer's expense. The Company shall perform all normal maintenance on equipment necessary for service under this schedule and furnish and replace all burned out lamps and photo-electric controls. Option 2 is closed to new installations.

Option 3

The Customer shall own, install and maintain all equipment necessary for service under this schedule beyond the point of attachment with Company's lines used to deliver power to Customer's system. The equipment shall include, but not be limited to, the posts, fixture, mounting bracket, lamp, ballast and all minor materials. In addition, Customer must furnish and install a master disconnect switch at the point of attachment to isolate Customer's equipment from Company's electrical system. All Customer owned equipment must meet Company's specifications.

The Company shall own all equipment necessary for service under this Option except for that equipment as specified in paragraph 1. The Company will furnish and replace all burned out lamps and photo-electric controls and will clean or replace glassware at the time of lamp replacement. Customer shall be responsible for providing replacement glassware. No maintenance will be provided by the Company on customer owned equipment except as specified in a separate agreement. Option 3 is closed to new installations.

Option 4

CUSTOMERS TO OWN AND MAINTAIN:

1. The Customer shall own, install and maintain all equipment necessary for service under this schedule beyond the point of attachment with Company's lines used to deliver power to Customer's system. The equipment shall include but not be limited to the poles, fixture, mounting bracket, lamp, ballast, photo-electric control and all minor materials. In addition, Customer must furnish and install in master disconnect switch at the point of attachment to isolate Customer's equipment from Company's electrical system. Customer's disconnect switch must meet Company's specifications.

Filing Date ~~November 2, 2016~~ April 23, 2020 MPUC Docket No. E015/GR-16-664/E015/M-20-429
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STREET AND HIGHWAY LIGHTING SERVICE

2. Customer is responsible for all maintenance on all equipment beyond Company's point of attachment. Standard safety procedures followed by the Company on Company-owned lighting facilities shall be followed by Customer when maintaining its lighting equipment. Company reserves the right to disconnect Customer equipment from Company's electrical system if in the Company's opinion Customer's lighting equipment is operated or maintained in an unsafe or improper condition.

CONTRACT PERIOD

Six months, automatically renewable for six month periods unless canceled by 30 days written notice by either party to the other.

SERVICE CONDITIONS

1. Customers will contract for service under this schedule for the number of fixtures of each size installed at the time of the contract.

2. Lights shall be located at sites designated and authorized by Customer. Customer shall provide in writing suitable right-of-way and right-of-occupancy for the facilities which the Company deems necessary to render service under the option chosen. The location shall be readily accessible to Company's equipment used for servicing and/or supplying service under the option chosen. The Company shall have the right to use and occupy the street and highway rights-of-way for the purpose of performing any act of service in connection with service under this schedule.

3. Service will normally be from standard distribution facilities typical of those in the area surrounding the point of service. If it is necessary to provide non-standard distribution facilities, Customer shall pay Company for all costs in excess of standard facility costs.

4. Company will, at Customer's expense, relocate or change the position of any poles, circuits or lights owned by the Company as may be requested in writing and duly authorized by Customer.

5. Company will install at its expense such additional street lights served under Option 1 as may be requested in writing and duly authorized by Customer from time to time during the period of the contract. Company shall provide as standard a service extension of up to the equivalent of one pole span to provide service under this schedule without cost to the Customer. No additional transformer capacity shall be provided as standard for Option 4 Lighting Service. All necessary costs for providing service under this schedule in excess of standard costs shall be paid by Customer.

Filing Date ~~November 2, 2016~~ April 23, 2020 MPUC Docket No. E015/GR-16-664/E015/M-20-429
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STREET AND HIGHWAY LIGHTING SERVICE

6. For fixtures which satisfy the conditions as set forth in Options 1 or 2 under Equipment Ownership, Operation and Maintenance, Company will absorb the cost of replacing a lamp and photo-electric control devices damaged by a first act of vandalism at each location during each calendar year. In addition, Company will absorb the cost of replacing a lighting unit damaged by a first act of vandalism at each location during each calendar year if served under Option 1.

7. All subsequent and other costs due to vandalism are at Customer's expense. For those locations served under Option 1 or 2, Company will repair equipment (not covered above) damaged by vandalism and will bill customer for appropriate costs.

8. Existing Option 1 Customers who wish to replace Sodium Vapor fixtures that are less than ten years old and not in need of significant maintenance or repair with LED street lights will pay Company the remaining un-depreciated facility cost. Under Option 2, Customers who convert to LED street lights will be assessed a removal fee of \$50 if the mast arm is left up and reused or \$100 if the mast arm is removed and not reused. Under Option 3, the Company's Compatible Unit Estimator (CUE) will be used to estimate the removal fee with a true-up of actual costs once the work is completed.

SCHEDULE OF CHARGES

Applicable in conjunction with Service Conditions paragraph 6.

Labor and vehicle charges per the applicable rate as stated in the Company's Accounting Manual at the time the charge was incurred. Charges for materials used per the Company's cost for lighting replacement equipment plus the then current Materials Handling expense and A&G expense per Company's Accounting Manual.

Filing Date	November 2, 2016 <u>April 23, 2020</u>	MPUC Docket No.	<u>E015/GR-16-664/E015/M-20-429</u>
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MINNESOTA POWER
ELECTRIC RATE BOOK - VOLUME I

SECTION V **PAGE NO.** 37.0
REVISION 15

OUTDOOR AND AREA LIGHTING SERVICE

RATE CODES

Outdoor Lighting Service 76
 Area Lighting Service 77

APPLICATION

To all classes of retail customers for outdoor lighting purposes (Rate Codes 76) and to persons other than governmental subdivisions for the purpose of lighting streets, alleys, roads, driveways and parking lots (Rate Code 77) subject to any applicable Riders. Rate Code 76 is not available on a seasonal or temporary basis.

RATE

<u>Lamp Type & Size</u> Sub rate code	<u>CIS Code</u>	<u>Rate Per Lamp Per Month</u>			
		<u>Option 1</u> __A	<u>Option 2</u> __B	<u>Option 3</u> __C	<u>Option 4</u> __D
Mercury Vapor Lamps			(Option 2 Closed to New Installation)	(Option 3 Closed to New Installation)	
7,000 Lumens (175 watts)	MV175W	\$11.88	\$9.63		
20,000 Lumens (400 watts)	MV400W	\$18.65	\$12.87		
55,000 Lumens (1,000 watts)	MV1000W	\$34.89	\$24.90		
Sodium Vapor Lamps					
8,500 Lumens (100 watts)	SV100W	\$12.05	\$6.97	\$6.97	
14,000 Lumens (150 watts)	SV150W	\$13.91	\$8.89		
23,000 Lumens (250 watts)	SV250W2	\$16.93	\$11.84	\$10.53	
45,000 Lumens (400 watts)	SV400W	\$22.58	\$15.93	\$11.75	
Metal Halide Lamps					
17,000 Lumens (250 watts)	MH250W	\$19.53			
28,800 Lumens (400 watts)	MH400W	\$20.73		\$12.11	
88,000 Lumens (1,000 watts)	MH1000W	\$33.88		\$22.70	
Light Emitting Diodes (LED)					
5,000 Lumens (48 watts or less)	LED48W	\$10.79			
10,000 Lumens (71 watts or less)	LED71W	\$13.06			
24,000 Lumens (184 watts or less)	LED184W	\$19.73			
43,000 Lumens (316 watts or less)	LED316W	\$28.36			

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MINNESOTA POWER
ELECTRIC RATE BOOK - VOLUME I

SECTION V **PAGE NO.** 37.1
REVISION 15

OUTDOOR AND AREA LIGHTING SERVICE

Pole Charge					
Each pole used for service under this schedule only	MPPOLE	\$11.00	\$6.64	\$11.00	
Monthly Service Charge		Included	Included	Included	\$3.34
Energy Charge - Per kWh		Included	Included	Included	6.020¢
Plus any applicable adjustments					

ADJUSTMENTS

1. There shall be added to or deducted from the monthly bill, as computed above, a fuel and purchased energy adjustment determined in accordance with the Rider for Fuel and Purchased Energy Charge.

The monthly fuel and purchased energy adjustment per lamp shall be determined as the above fuel and purchased energy adjustment per kWh multiplied by the monthly kWh per lamp shown in the Energy Table below for the respective lamps.

2. There shall be added to the monthly bill, as computed above, a transmission investment adjustment determined in accordance with the Rider for Transmission Cost Recovery.

3. There shall be added to the monthly bill, as computed above, a renewable resources adjustment determined in accordance with the Rider for Renewable Resources.

4. There shall be added to the monthly bill, as computed above, a conservation program adjustment determined in accordance with the Rider for Conservation Program Adjustment.

5. There shall be added to the monthly bill, as computed above, an emissions-reduction adjustment determined in accordance with the Rider for Boswell Unit 4 Emission Reduction.

6. There shall be added to or deducted from the monthly billing, as computed above, a solar energy adjustment determined in accordance with the Rider for Solar Energy Adjustment.

7. Plus the applicable proportionate part of any taxes and assessments imposed by any governmental authority which are assessed on the basis of meters or customers, or the price of or revenues from electric energy or service sold, or the volume of energy generated, transmitted or purchased for sale or sold.

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Senior Attorney & Director of Regulatory Compliance

MINNESOTA POWER
ELECTRIC RATE BOOK - VOLUME I

SECTION V **PAGE NO.** 37.2
REVISION 15

OUTDOOR AND AREA LIGHTING SERVICE

8. Bills for service within the corporate limits of the applicable city shall include an upward adjustment as specified in the applicable Rider for the city's Franchise Fee.

9. The combination of applicable Riders may be shown on Customer's bills as the Minnesota Policy Adjustment.

PAYMENT

Bills are due and payable 15 days following the date the bill is rendered or such later date as may be specified on the bill.

BURNING SCHEDULE

Burning schedule is from dusk until dawn each night for a total of approximately 4,200 hours per year.

ENERGY TABLE

Filing Date November 1, 2019 **MPUC Docket No.** E015/GR-19-442
Effective Date _____ **Order Date** _____

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MINNESOTA POWER
ELECTRIC RATE BOOK - VOLUME I

SECTION V PAGE NO. 37.3
REVISION 15

OUTDOOR AND AREA LIGHTING SERVICE

Lamp CIS Code	Days Month		31	28	31	30	31	30	31	31	30	31	30	31
	Total	Daily Estimates	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Burning Hours	4,200		462	379	367	302	264	233	252	294	336	401	435	475
Monthly kWh usage per fixture by type														
MV175W	2	888	98	80	78	64	56	49	53	62	71	85	92	100
MV400W	5	1,932	213	174	169	139	121	107	116	135	155	184	200	219
MV1000W	13	4,620	508	417	404	332	290	256	277	323	370	441	479	523
SV100W	1	504	56	46	44	36	32	28	30	35	40	48	52	57
SV150W	2	756	83	68	66	54	48	42	45	53	60	72	78	87
SV250W	3	1,224	135	110	107	88	77	68	73	86	98	117	127	138
SV400W	6	2,016	222	182	176	145	127	112	121	141	161	192	209	228
MH250W	3	1,260	139	114	110	91	79	70	76	88	101	120	130	142
MH400W	5	1,932	213	174	169	139	121	107	116	135	155	184	200	219
MH1000W	12	4,410	485	398	385	317	277	245	264	309	353	421	457	499
LED48W	1	207	23	19	18	15	13	11	12	14	17	20	21	24
LED71W	1	298	33	27	26	21	19	17	18	21	24	28	31	34
LED184W	2	701	85	70	68	54	49	43	46	54	64	74	80	87
LED316W	4	1,327	146	120	116	95	83	74	80	93	106	127	137	150

Company shall furnish all electric energy required for service under this schedule.

EQUIPMENT OWNERSHIP, OPERATION AND MAINTENANCE

New Customer must select Option 1 or Option 4 only for each account served under this schedule.

Option 1

COMPANY TO OWN AND MAINTAIN:

1. The Company shall install, own, operate and provide normal maintenance to all equipment necessary for the above service including the Lighting Equipment beyond the point of attachment to Company's facilities consisting of, but not limited to, the fixture, lamp, ballast, photo-electric control and wiring.

Option 2

1. The Customer shall own all equipment for service under this schedule beyond the point of attachment with Company's pole or pad-mounted transformer. The equipment shall include, but not be limited to, the fixture, mounting bracket, lamp, ballast, photo-electric

Filing Date November 1, 2019 MPUC Docket No. E015/GR-19-442
 Effective Date _____ Order Date _____

Approved by: David R. Moeller
David R. Moeller
Senior Attorney & Director of Regulatory Compliance

OUTDOOR AND AREA LIGHTING SERVICE

control and all minor materials. All customer-owned equipment must meet Company's specifications.

2. The Company shall install and operate all equipment necessary for service under this schedule and Company will own all equipment necessary for service under this Option, including poles, except for that equipment as specified in paragraph 1. All Customer owned Lighting Equipment will be installed at Customer's expense. The Company shall perform all normal maintenance on equipment necessary for service under this schedule and furnish and replace all burned out lamps and photo-electric controls Option 2 is closed to new installations.

Option 3

1. The Customer shall own, install and maintain all equipment necessary for service under this schedule beyond the point of attachment with Company's pole or pad-mounted transformer. The equipment shall include but not be limited to the poles, fixture, mounting bracket, lamp, ballast, photo-electric control and all minor materials. In addition, Customer must furnish and install a master disconnect switch at the point of attachment to isolate Customer's equipment from Company's electrical system. All Customer owned equipment must meet Company's specifications. Customer is responsible for providing lighting poles.

2. The Company shall own all equipment necessary for service under this Option except for that equipment as specified in paragraph 1. No maintenance will be provided by the Company on Customer owned equipment except as specified in a separate agreement. Option 3 is closed to new installations.

Option 4

CUSTOMER TO OWN AND MAINTAIN:

1. The Customer shall own, install and maintain all equipment necessary for service under this schedule beyond the point of attachment with Company's electrical system. The equipment shall include but not be limited to the poles, fixture, mounting bracket, lamp, ballast, photo-electric control and all minor materials. In addition, Customer must furnish and install a master disconnect switch at the point of attachment to isolate Customer's equipment from Company's electrical system. Customer's disconnect switch must meet Company's specifications. Company's point of delivery shall be on the Company's side of disconnect switch either at the weather head for overhead service or at the pad mount transformer for underground service.

2. Customer is responsible for all maintenance on all equipment beyond Company's

Filing Date November 1, 2019 **MPUC Docket No.** E015/GR-19-442
Effective Date _____ **Order Date** _____

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Senior Attorney & Director of Regulatory Compliance

OUTDOOR AND AREA LIGHTING SERVICE

point of delivery. Standard safety procedures followed by the Company on Company-owned lighting facilities shall be followed by Customer when maintaining its lighting equipment. Company reserves the right to disconnect Customer equipment from Company's electrical system if in the Company's opinion Customer's lighting equipment is operated or maintained in an unsafe or improper condition.

CONTRACT PERIOD

Six months, automatically renewable for six month periods unless canceled by 30 days written notice by either party to the other.

SERVICE CONDITIONS

1. Lights shall be located at sites designated and authorized by Customer. Customer shall provide in writing suitable right-of-way and right-of-occupancy for the facilities which the Company deems necessary to render service under the option chosen. The location shall be readily accessible to Company's equipment used for servicing and/or supplying service under the option chosen.

2. Service will normally be from standard distribution facilities typical of those in the area surrounding the point of service. If it is necessary to provide non-standard distribution facilities, Customer shall pay Company for all costs in excess of standard facility costs.

3. Company will, at Customer's expense, relocate or change the position of any poles, circuits or lights owned by the Company as may be requested in writing and duly authorized by Customer.

4. For Area Lighting Service purposes, no more than four lights will be mounted on a single distribution pole used for other utility purposes. If more than one light is mounted on a single pole, Company's investment in additional facilities, over and above those which would be required for a single standard bracket mounting, shall not exceed \$15.00 per light. Additional required investment will be at Customer's expense.

5. Company shall provide as standard a service extension of up to the equivalent of one pole span to provide service under this schedule without cost to the Customer. No additional transformer capacity shall be provided as standard for Area Lighting Service. All necessary costs for providing service under this schedule in excess of standard costs shall be paid by Customer.

6. For lamps which satisfy the conditions as set forth in Options 1 or 2 under Equipment Ownership, Operation and Maintenance, Company will absorb the cost of replacing a lamp and photo-electric control devices damaged by a first act of vandalism at

Filing Date November 1, 2019 **MPUC Docket No.** E015/GR-19-442
Effective Date _____ **Order Date** _____

Approved by: David R. Moeller
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MINNESOTA POWER
ELECTRIC RATE BOOK - VOLUME I

SECTION V **PAGE NO.** 37.6
REVISION 15

OUTDOOR AND AREA LIGHTING SERVICE

each location during each calendar year. In addition, Company will absorb the cost of replacing a lighting unit damaged by a first act of vandalism at each location during each calendar year if served under Option 1. All subsequent and other costs due to vandalism are at Customer's expense. For those locations served under Option 1 or 2, Company will repair equipment (not covered above) damaged by vandalism and will bill customer for appropriate costs.

SCHEDULE OF CHARGES

Applicable in conjunction with Service Conditions paragraph 6.

Labor and vehicle charges per the applicable rate as stated in the Company's Accounting Manual at the time the charge was incurred. Materials charges per the Company's cost for lighting replacement equipment plus the then current Material Handling Expense and A&G expense per Company's Accounting Manual.

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**MINNESOTA POWER
 ELECTRIC RATE BOOK - VOLUME I**

**SECTION V PAGE NO. 46.0
 REVISION 18**

STREET AND HIGHWAY LIGHTING SERVICE

RATE CODES

Highway Lighting Service	80
Overhead Street Lighting Service	83
Ornamental Street Lighting Service	84

TERRITORY

Applicable in all territories served at retail by the Company. Highway Lighting Service is subject to individual review for each point of delivery.

APPLICATION

To any governmental subdivision taking all of its street or highway lighting requirements for service within the Company's service territory under the Company's standard contract for such service, subject to any applicable Riders. Highway Lighting Service is limited to the State of Minnesota, Department of Highways exclusively for public highway lighting.

RATE

Lamp Type & Size Sub rate code	CIS Code	Rate Per Fixture Per Month			
		Option 1 __A	Option 2 __B	Option 3 __C	Option 4 __D
			(Option 2 Closed to New Installation)	Option 3 Closed to New Installation)	
Mercury Vapor Lamps (Closed to New Installations)					
7,000 Lumens (175 watts)	MV175W	\$16.21	\$9.95	\$9.63	
10,000 Lumens (250 watts)	MV250W			\$10.94	
20,000 Lumens (400 watts)	MV400W	\$21.67	\$14.44	\$13.96	
55,000 Lumens (1,000 watts)	MV1000W2			\$25.56	
Sodium Vapor Lamps					
8,500 Lumens (100 watts)	SV100W	\$16.07	\$8.11	\$7.69	
14,000 Lumens (150 watts)	SV150W	\$18.60	\$10.23	\$9.93	
14,000 Lumens (150 watts)	SV150W-P			\$9.21	
20,500 Lumens (200 watts)	SV200W	\$19.65	\$12.06	\$11.90	
23,000 Lumens (250 watts)	SV250W	\$20.11	\$13.21	\$12.78	
45,000 Lumens (400 watts)	SV400W	\$24.62	\$17.70	\$14.30	
Metal Halide Lamps					
28,800 Lumens (400 watts)	MH400W		\$15.76		

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 Effective Date _____ Order Date _____

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**MINNESOTA POWER
 ELECTRIC RATE BOOK - VOLUME I**

**SECTION V PAGE NO. 46.1
 REVISION 18**

STREET AND HIGHWAY LIGHTING SERVICE

Light Emitting Diode (LED)			
4,000 Lumens (54 watts or less)	LED54W		\$14.98
8,800 Lumens (118 watts or less, but more than 54 watts)	LED118W		\$19.56
23,000 Lumens (219 watts or less, but more than 118 watts)	LED219W		\$24.60
30,000 Lumens (278 watts or less)	LED278W		\$24.43

Monthly Service Charge	Included	Included	Included	\$3.34
Energy Charge - Per kWh	Included	Included	Included	6.020¢
Plus any applicable adjustments				

ADJUSTMENTS

1. There shall be added to or deducted from the monthly bill, as computed above, a fuel and purchased energy adjustment determined in accordance with the Rider for Fuel and Purchased Energy Charge.
2. The monthly fuel and purchased energy adjustment per fixture shall be determined as the above fuel and purchased energy adjustment per kWh multiplied by the monthly kWh per fixture shown in the Energy Table below for the respective fixtures.
3. There shall be added to the monthly bill, as computed above, a transmission investment adjustment determined in accordance with the Rider for Transmission Cost Recovery.
4. There shall be added to the monthly bill, as computed above, a renewable resources adjustment determined in accordance with the Rider for Renewable Resources.
5. There shall be added to the monthly bill, as computed above, a conservation program adjustment determined in accordance with the Rider for Conservation Program Adjustment.
6. There shall be added to the monthly bill, as computed above, an emissions-reduction adjustment determined in accordance with the Rider for Boswell Unit 4 Emission Reduction.
7. There shall be added or deducted from the monthly billing, as computed above, a solar energy adjustment determined in accordance with the Rider for Solar Energy Adjustment.

Filing Date November 1, 2019 **MPUC Docket No.** E015/GR-19-442
Effective Date _____ **Order Date** _____

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**MINNESOTA POWER
ELECTRIC RATE BOOK - VOLUME I**

SECTION V **PAGE NO.** 46.2
REVISION 18

STREET AND HIGHWAY LIGHTING SERVICE

8. Plus the applicable proportionate part of any taxes and assessments imposed by any governmental authority which are assessed on the basis of meters or customers, or the price of or revenues from electric energy or service sold, or the volume of energy generated, transmitted or purchased for sale or sold.

9. Bills for service to parties within the corporate limits of the applicable city shall include an upward adjustment as specified in the applicable Rider for city's Franchise Fee.

10. The combination of applicable Riders may be shown on Customer's bills as the Minnesota Policy Adjustment.

PAYMENT

Bills are due and payable 15 days following the date the bill is rendered or such later date as may be specified on the bill.

BURNING SCHEDULE

Burning schedule is from dusk until dawn each night for a total of approximately 4,200 hours per year.

ENERGY TABLE

Filing Date November 1, 2019 **MPUC Docket No.** E015/GR-19-442
Effective Date _____ **Order Date** _____

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STREET AND HIGHWAY LIGHTING SERVICE

Lamp CIS Code	Days Month		31	28	31	30	31	30	31	31	30	31	30	31
	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Burning Hours	Daily Estimates	4,200	462	379	367	302	264	233	252	294	336	401	435	475
Monthly kWh usage per fixture by type														
MV175W	2	888	98	80	78	64	56	49	53	62	71	85	92	100
MV250W	3	1,224	135	110	107	88	77	68	73	86	98	117	127	138
MV400W	5	1,932	213	174	169	139	121	107	116	135	155	184	200	219
MV1000W2	13	4,620	508	417	404	332	290	256	277	323	370	441	479	523
SV100W	1	504	56	46	44	36	32	28	30	35	40	48	52	57
SV150W	2	756	83	68	66	54	48	42	45	53	60	72	78	87
SV150W/P	1	468	51	42	41	34	29	26	28	33	37	45	48	54
SV200W	3	1,140	125	103	100	82	72	63	68	80	91	109	118	129
SV250W	3	1,224	135	110	107	88	77	68	73	86	98	117	127	138
SV400W	6	2,016	222	182	176	145	127	112	121	141	161	192	209	228
MH400W	5	1,932	213	174	169	139	121	107	116	135	155	184	200	219
LED54W	1	227	25	20	20	16	14	13	14	16	18	22	23	25
LED118W	1	496	55	45	43	36	31	27	30	35	40	47	51	57
LED219W	3	920	101	83	80	66	58	51	55	64	74	88	95	104
LED278W	3	1,095	120	99	96	79	69	61	66	77	88	105	113	124

Company shall furnish all electric energy required for service under this schedule.

EQUIPMENT OWNERSHIP, OPERATION AND MAINTENANCE

New Customers with new installations must select Option 1 or Option 4 only for each account served under this schedule. Options 2 and 3 are closed to new installations. Options 1 or 4 are available for Overhead Lighting Service and for Highway or Ornamental Lighting Service.

Option 1

COMPANY TO OWN AND MAINTAIN.

1. The Company shall install, own, operate and provide normal maintenance to all equipment necessary for the above service including the Lighting Equipment beyond the point of attachment to Company's facilities consisting of, but not limited to, the fixture, standard brackets or mast arms not exceeding 14 feet in length, fixture, ballast, photo-electric control, driver, and wiring.

Option 2

Filing Date November 1, 2019 MPUC Docket No. E015/GR-19-442
 Effective Date _____ Order Date _____

Approved by: David R. Moeller
David R. Moeller
Senior Attorney & Director of Regulatory Compliance

STREET AND HIGHWAY LIGHTING SERVICE

The Customer shall own all equipment for service under this schedule beyond the point of attachment with Company's facilities. The equipment shall include, but not be limited to, the fixture, standard brackets or mast arms not exceeding 14 feet in length, lamp, ballast, photo-electric control and all minor materials. All customer-owned equipment must meet Company's specifications. In all cases, poles are owned by Company.

The Company shall install and operate all equipment necessary for service under this schedule and Company will own all equipment necessary for service under this Option except for that equipment as specified in paragraph 1. All Customer owned Lighting Equipment will be installed at Customer's expense. The Company shall perform all normal maintenance on equipment necessary for service under this schedule and furnish and replace all burned out lamps and photo-electric controls. Option 2 is closed to new installations.

Option 3

The Customer shall own, install and maintain all equipment necessary for service under this schedule beyond the point of attachment with Company's lines used to deliver power to Customer's system. The equipment shall include, but not be limited to, the posts, fixture, mounting bracket, lamp, ballast and all minor materials. In addition, Customer must furnish and install a master disconnect switch at the point of attachment to isolate Customer's equipment from Company's electrical system. All Customer owned equipment must meet Company's specifications.

The Company shall own all equipment necessary for service under this Option except for that equipment as specified in paragraph 1. The Company will furnish and replace all burned out lamps and photo-electric controls and will clean or replace glassware at the time of lamp replacement. Customer shall be responsible for providing replacement glassware. No maintenance will be provided by the Company on customer owned equipment except as specified in a separate agreement. Option 3 is closed to new installations.

Option 4
CUSTOMERS TO OWN AND MAINTAIN:

1. The Customer shall own, install and maintain all equipment necessary for service under this schedule beyond the point of attachment with Company's lines used to deliver power to Customer's system. The equipment shall include but not be limited to the poles, fixture, mounting bracket, lamp, ballast, photo-electric control and all minor materials. In addition, Customer must furnish and install in master disconnect switch at the point of attachment to isolate Customer's equipment from Company's electrical system. Customer's disconnect switch must meet Company's specifications.

2. Customer is responsible for all maintenance on all equipment beyond Company's point of attachment. Standard safety procedures followed by the Company on Company-

Filing Date November 1, 2019 **MPUC Docket No.** E015/GR-19-442
Effective Date _____ **Order Date** _____

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Senior Attorney & Director of Regulatory Compliance

STREET AND HIGHWAY LIGHTING SERVICE

owned lighting facilities shall be followed by Customer when maintaining its lighting equipment. Company reserves the right to disconnect Customer equipment from Company's electrical system if in the Company's opinion Customer's lighting equipment is operated or maintained in an unsafe or improper condition.

CONTRACT PERIOD

Six months, automatically renewable for six month periods unless canceled by 30 days written notice by either party to the other.

SERVICE CONDITIONS

1. Customers will contract for service under this schedule for the number of fixtures of each size installed at the time of the contract.

2. Lights shall be located at sites designated and authorized by Customer. Customer shall provide in writing suitable right-of-way and right-of-occupancy for the facilities which the Company deems necessary to render service under the option chosen. The location shall be readily accessible to Company's equipment used for servicing and/or supplying service under the option chosen. The Company shall have the right to use and occupy the street and highway rights-of-way for the purpose of performing any act of service in connection with service under this schedule.

3. Service will normally be from standard distribution facilities typical of those in the area surrounding the point of service. If it is necessary to provide non-standard distribution facilities, Customer shall pay Company for all costs in excess of standard facility costs.

4. Company will, at Customer's expense, relocate or change the position of any poles, circuits or lights owned by the Company as may be requested in writing and duly authorized by Customer.

5. Company will install at its expense such additional street lights served under Option 1 as may be requested in writing and duly authorized by Customer from time to time during the period of the contract. Company shall provide as standard a service extension of up to the equivalent of one pole span to provide service under this schedule without cost to the Customer. No additional transformer capacity shall be provided as standard for Option 4 Lighting Service. All necessary costs for providing service under this schedule in excess of standard costs shall be paid by Customer.

6. For fixtures which satisfy the conditions as set forth in Options 1 or 2 under Equipment Ownership, Operation and Maintenance, Company will absorb the cost of replacing a lamp and photo-electric control devices damaged by a first act of vandalism at each location during each calendar year. In addition, Company will absorb the cost of

Filing Date November 1, 2019 **MPUC Docket No.** E015/GR-19-442
Effective Date _____ **Order Date** _____

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STREET AND HIGHWAY LIGHTING SERVICE

replacing a lighting unit damaged by a first act of vandalism at each location during each calendar year if served under Option 1.

7. All subsequent and other costs due to vandalism are at Customer's expense. For those locations served under Option 1 or 2, Company will repair equipment (not covered above) damaged by vandalism and will bill customer for appropriate costs.

8. Existing Option 1 Customers who wish to replace Sodium Vapor fixtures that are less than ten years old and not in need of significant maintenance or repair with LED street lights will pay Company the remaining un-depreciated facility cost. Under Option 2, Customers who convert to LED street lights will be assessed a removal fee of \$50 if the mast arm is left up and reused or \$100 if the mast arm is removed and not reused. Under Option 3, the Company's Compatible Unit Estimator (CUE) will be used to estimate the removal fee with a true-up of actual costs once the work is completed.

SCHEDULE OF CHARGES

Applicable in conjunction with Service Conditions paragraph 6.

Labor and vehicle charges per the applicable rate as stated in the Company's Accounting Manual at the time the charge was incurred. Charges for materials used per the Company's cost for lighting replacement equipment plus the then current Materials Handling expense and A&G expense per Company's Accounting Manual.

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**PUBLIC DOCUMENT
 TRADE SECRET DATA EXCISED**

MINNESOTA POWER
 COMPARISON OF OPERATING REVENUES
 PRESENT VS. GENERAL RATES
 TEST YEAR 2020
 LIGHTING

****Excluding Riders that will remain outside of Base Rates****

<u>Residential</u>	<u>Operating Revenues</u>		<u>Increase</u>	
	<u>Present</u>	<u>General</u>	<u>(\$)</u>	<u>(%)</u>
1 Outdoor Lighting	\$25,167	\$26,236	\$1,068	4.25%
2 Area Lighting	\$1,206,869	\$1,268,982	\$62,113	5.15%
3 Ornamental Street & Highway Lighting	\$428,312	\$451,604	\$23,292	5.44%
4 Overhead Street Lighting	\$1,851,297	\$1,947,038	\$95,741	5.17%
5 TOTAL LIGHTING CLASS	\$3,511,645	\$3,693,860	\$182,215	5.19%

MINNESOTA POWER
 COMPARISON OF OPERATING REVENUES
 PRESENT VS. GENERAL RATES
 TEST YEAR 2020
 LIGHTING

****Including Riders****

Residential	Operating Revenues		Increase	
	Present	General	(\$)	(%)
1 Outdoor Lighting	\$25,152	\$26,221	\$1,068	4.25%
2 Area Lighting	\$1,206,326	\$1,268,439	\$62,113	5.15%
3 Ornamental Street & Highway Lighting	\$427,782	\$451,074	\$23,292	5.44%
4 Overhead Street Lighting	\$1,850,503	\$1,946,244	\$95,741	5.17%
5 TOTAL LIGHTING CLASS	\$3,509,763	\$3,691,978	\$182,215	5.19%

PUBLIC DOCUMENT
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MINNESOTA POWER
 COMPARISON OF OPERATING REVENUES
 PRESENT VS. GENERAL RATES
 TEST YEAR 2020
 LIGHTING

Rate Schedules 76
 Outdoor Lighting

Type of Lamp	Option	Basis or Unit Upon Which Rates Are Applied	Total Billing Units			Unit Charge		Operating Revenues		Increase	
			Present	General	Lamp kWh	Present	General	Present	General	(\$)	(%)
1 Service Charge	IV	# of Bills	36	36		\$2.09	\$3.34	\$75.24	\$120.24	\$45.00	59.81%
Mercury Vapor											
2 7000 Lumen (175W)	I	per lamp	11	11	74	\$12.99	\$11.77	\$1,715	\$1,554	(\$161)	-9.39%
3 7000 Lumen (175W)	II	per lamp	2	2	74	\$9.45	\$8.23	\$227	\$198	(\$29)	-12.91%
4 20,000 Lumen (400W)	I	per lamp	4	4	161	\$21.39	\$18.73	\$1,027	\$899	(\$128)	-12.44%
Sodium Vapor											
5 8,500 Lumen (100W)	I	per lamp	27	27	42	\$10.98	\$10.32	\$3,558	\$3,344	(\$214)	-6.01%
6 14,000 Lumen (150W)	I	per lamp	2	2	63	\$12.92	\$11.90	\$310	\$286	(\$24)	-7.89%
7 23,000 Lumen (250W)	I	per lamp	12	12	102	\$18.57	\$16.88	\$2,674	\$2,431	(\$243)	-9.10%
8 45,000 Lumen (400W)	I	per lamp	6	6	168	\$25.38	\$22.60	\$1,827	\$1,627	(\$200)	-10.95%
Metal Halide											
9 17,000 Lumen (250W)	I	per lamp	1	1	1260	\$18.42	\$16.69	\$221	\$200	(\$21)	-9.39%
10 28,800 Lumen (400 W)	I	per lamp	30	30	1932	\$23.15	\$20.33	\$8,334	\$7,319	(\$1,015)	-12.18%
11 Pole Charge		per pole	18	18		\$6.64	\$10.50	\$1,434	\$2,268	\$834	58.13%
12 Energy Charge		kWh	51,437	51,437		\$0.07142	\$0.05990	\$3,674	\$3,081	(\$593)	-16.13%
13 Base Cost of Fuel		kWh	171,838	171,838		\$0.00000	\$0.00000	\$0	\$0		
14 Total Base Revenue								\$25,075	\$23,326	(\$1,750)	-6.98%
15 Total Annual Energy Usage		kWh			171,838						
16 Fuel Adjustment					171,838	\$0.00276	\$0.01930	\$475	\$3,317	\$2,842	
<u>Adjustments for Riders Included in Base Rates</u>											
17 Boswell 4 Environmental Adjustment		kWh			171,838	\$0.00000000	\$0.00000000	\$0	\$0	\$0	
18 Renewable Resource Adjustment		kWh			171,838	\$0.00000000	\$0.00000000	\$0	\$0	\$0	
19 Transmission Adjustment (\$)		kWh			171,838	\$0.00000000	\$0.00000000	\$0	\$0	\$0	
21 Excess ADIT Credit		%				-0.015259	-0.015259	-\$383	-\$407	(\$24)	
22 Subtotal Revenue								\$25,167	\$26,236	\$1,068	4.25%
23 Boswell 4 Environmental Adjustment		kWh			171,838	\$0.00000000	\$0.00000000	\$0	\$0	\$0	
24 Renewable Resource Adjustment		kWh			171,838	\$0.00000000	\$0.00000000	\$0	\$0	\$0	
25 Transmission Adjustment (\$)		kWh			171,838	\$0.00000000	\$0.00000000	\$0	\$0	\$0	
26 Solar Energy Adjustment		kWh			171,838	-\$0.0001517	-\$0.0001517	-\$26	-\$26	\$0	
27 Conservation Program Adjustment		kWh			171,838	\$0.00006257	\$0.00006257	\$11	\$11	\$0	
28 TOTAL REVENUE								\$25,152	\$26,221	\$1,068	4.25%

PUBLIC DOCUMENT
TRADE SECRET DATA EXCISED

MINNESOTA POWER
 COMPARISON OF OPERATING REVENUES
 PRESENT VS. GENERAL RATES
 TEST YEAR 2020
 LIGHTING

Rate Schedules 77
 Area Lighting

Type of Lamp	Option	Basis or Unit Upon Which Rates Are Applied	Total Billing Units		Lamp kWh	Unit Charge		Operating Revenues		Increase	
			Present	General		Present	General	Present	General	(\$)	(%)
1 Service Charge	IV	# of Bills	108	108		\$2.09	\$3.34	\$225.72	\$360.72	\$135.00	
Mercury Vapor											
2 7,000 Lumen (175W)	I	per lamp	966	966	74	\$12.99	\$11.77	\$150,580	\$136,438	(\$14,142)	-9.39%
3 7,000 Lumen (175W)	II	per lamp	105	105	74	\$9.45	\$8.23	\$11,907	\$10,370	(\$1,537)	-12.91%
4 20,000 Lumen (400W)	I	per lamp	101	101	161	\$21.39	\$18.73	\$25,925	\$22,701	(\$3,224)	-12.44%
5 20,000 Lumen (400W)	II	per lamp	5	5	161	\$15.72	\$12.40	\$943	\$744	(\$199)	-21.12%
6 55,000 Lumen (1,000W)	I	per lamp	1	1	385	\$41.63	\$34.89	\$500	\$419	(\$81)	-16.19%
7 55,000 Lumen (1,000W)	II	per lamp	1	1	385	\$31.82	\$24.58	\$382	\$295	(\$87)	-22.75%
Sodium Vapor											
8 8,500 Lumen (100W)	I	per lamp	2,495	2,495	42	\$10.98	\$10.32	\$328,741	\$308,981	(\$19,760)	-6.01%
9 8,500 Lumen (100W)	II	per lamp	40	40	42	\$6.65	\$5.96	\$3,192	\$2,861	(\$331)	-10.38%
10 8,500 Lumen (100W)	III	per lamp	1	1	42	\$6.65	\$5.96	\$80	\$72	(\$8)	-10.38%
11 14,000 Lumen (150W)	I	per lamp	334	334	63	\$12.92	\$11.90	\$51,783	\$47,695	(\$4,088)	-7.89%
12 14,000 Lumen (150W)	II	per lamp	2	2	63	\$8.63	\$7.60	\$207	\$182	(\$25)	-11.94%
13 23,000 Lumen (250W)	I	per lamp	886	886	102	\$18.57	\$16.88	\$197,436	\$179,468	(\$17,968)	-9.10%
14 23,000 Lumen (250W)	II	per lamp	20	20	102	\$11.81	\$10.12	\$2,834	\$2,429	(\$406)	-14.31%
15 23,000 Lumen (250W)	III	per lamp	0	0	102	\$11.88	\$10.19	\$0	\$0	\$0	
16 45,000 Lumen (400W)	I	per lamp	646	646	168	\$25.38	\$22.60	\$196,746	\$175,195	(\$21,551)	-10.95%
17 45,000 Lumen (400W)	II	per lamp	12	12	168	\$16.39	\$14.89	\$2,360	\$2,144	(\$216)	-9.15%
Metal Halide											
18 17,000 Lumen (250W)	I	per lamp	158	158	105	\$18.42	\$16.69	\$34,924	\$31,644	(\$3,280)	-9.39%
19 17,000 Lumen (250W)	II	per lamp	0	0	105	\$0.00	\$0.00	\$0	\$0	\$0	
20 28,800 Lumen (400W)	I	per lamp	203	203	161	\$23.15	\$20.33	\$56,393	\$49,524	(\$6,870)	-12.18%
21 28,800 Lumen (400W)	II	per lamp	0	0	161	\$14.87	\$12.05	\$0	\$0	\$0	
22 28,800 Lumen (400W)	III	per lamp	0	0	161	\$0.00	\$0.00	\$0	\$0	\$0	
23 88,000 Lumen (1,000W)	I	per lamp	63	63	368	\$40.31	\$33.87	\$30,474	\$25,606	(\$4,869)	-15.98%
24 88,000 Lumen (1,000W)	II	per lamp	0	0	368	\$29.34	\$22.00	\$0	\$0	\$0	
25 88,000 Lumen (1,000W)	III	per lamp	0	0	368	\$0.00	\$0.00	\$0	\$0	\$0	
26 Pole Charge		per pole	1,342	1,342		\$6.64	\$10.500000	\$106,931	\$169,092	\$62,161	58.13%
27 Energy Charge		kWh	83,261	83,261		\$0.07142	\$0.05990	\$5,947	\$4,987	(\$959)	-16.13%
28 Base Cost of Fuel		kWh	6,085,086	6,085,086		\$0.000000	\$0.000000	\$0	\$0		
29 Total Base Revenue								\$1,208,511	\$1,171,207	(\$37,304)	-3.09%
30 Fuel Adjustment					6,085,086	\$0.00276	\$0.01930	\$16,798	\$117,439	\$100,640	
<u>Adjustments for Riders Included in Base Rates</u>											
31 Boswell 4 Environmental Adjustment		kWh			6,085,086	\$0.00000000	\$0.00000000	\$0	\$0	\$0	
32 Renewable Resource Adjustment		kWh			6,085,086	\$0.00000000	\$0.00000000	\$0	\$0	\$0	
33 Transmission Adjustment (\$)		kWh			6,085,086	\$0.00000000	\$0.00000000	\$0	\$0	\$0	
34 Conservation Program Adjustment		kWh			6,085,086	\$0.00000000	\$0.00000000	\$0	\$0	\$0	
35 Excess ADIT Credit		%				-0.015259	-0.015259	(\$18,441)	(\$19,663)	(\$1,223)	
36 Subtotal Revenue								\$1,206,869	\$1,268,982	\$62,113	5.15%
37 Boswell 4 Environmental Adjustment		kWh			6,085,086	\$0.00000000	\$0.00000000	\$0	\$0	\$0	
38 Renewable Resource Adjustment		kWh			6,085,086	\$0.00000000	\$0.00000000	\$0	\$0	\$0	
39 Transmission Adjustment (\$)		kWh			6,085,086	\$0.00000000	\$0.00000000	\$0	\$0	\$0	
40 Solar Energy Adjustment		kWh			6,085,086	-\$0.00015161	-\$0.00015161	(\$923)	(\$923)	\$0	
41 Conservation Program Adjustment		kWh			6,085,086	\$0.00006243	\$0.00006243	\$380	\$380	\$0	
42 TOTAL REVENUE								\$1,206,326	\$1,268,439	\$62,113	5.15%

PUBLIC DOCUMENT
TRADE SECRET DATA EXCISED

MINNESOTA POWER
 COMPARISON OF OPERATING REVENUES
 PRESENT VS. GENERAL RATES
 TEST YEAR 2020
 LIGHTING

Rate Schedules 80 & 84
 Highway and Ornamental Street Lighting

Type of Lamp	Option	Basis or Unit Upon Which Rates Are Applied	Total Billing Units		Lamp kWh	Unit Charge		Operating Revenues		Increase	
			Present	General		Present	General	Present	General	(\$)	(%)
1 Service Charge	IV	# of Bills	3,060	3,060		\$2.09	\$3.34	\$6,395.40	\$10,220.40	\$3,825.00	59.81%
Mercury Vapor											
2 7,000 Lumen (175W)	III	per lamp	7	7	74	\$9.45	\$8.10	\$794	\$680	(\$113)	-14.29%
3 10,000 Lumen (250W)	III	per lamp	8	8	102	\$12.10	\$10.29	\$1,162	\$988	(\$174)	-14.96%
4 20,000 Lumen (400W)	III	per lamp	26	26	161	\$16.79	\$13.90	\$5,238	\$4,337	(\$902)	-17.21%
5 55,000 Lumen (1,000W)	III	per lamp	0	0	385	\$32.47	\$25.00	\$0	\$0	\$0	
Sodium Vapor											
6 8,500 Lumen (100W)	III	per lamp	47	47	42	\$7.27	\$6.50	\$4,100	\$3,666	(\$434)	-10.59%
7 14,000 Lumen (150W)	I	per lamp	4	4	63	\$16.92	\$15.88	\$812	\$762	(\$50)	-6.15%
8 14,000 Lumen (150W)	III	per lamp	0	0	63	\$9.78	\$8.92	\$0	\$0	\$0	
9 14,000 Lumen (150W)	IIIA	per lamp	102	102	39	\$9.52	\$8.30	\$11,652	\$10,159	(\$1,493)	-12.82%
10 20,500 Lumen (200W)	III	per lamp	77	77	95	\$11.74	\$10.00	\$10,848	\$9,240	(\$1,608)	-14.82%
11 23,000 Lumen (250W)	I	per lamp	1	1	102	\$21.69	\$19.78	\$260	\$237	(\$23)	-8.81%
12 23,000 Lumen (250W)	III	per lamp	211	211	102	\$12.67	\$10.80	\$32,080	\$27,346	(\$4,735)	-14.76%
13 45,000 Lumen (400W)	I	per lamp	0	0	168	\$27.38	\$24.30	\$0	\$0	\$0	
14 45,000 Lumen (400W)	III	per lamp	107	107	168	\$17.25	\$13.00	\$22,149	\$16,692	(\$5,457)	-24.64%
Light Emitting Diode (LED)											
15 4,000 Lumens (54 W or Less)	I	per lamp	2	2	19	\$13.10	\$13.60	\$314	\$326	\$12	3.82%
16 Energy Charge					4,552,062	\$0.07142	\$0.05990	\$325,108	\$272,669	(\$52,440)	-16.13%
17 Base Cost of Fuel		kWh	5,285,559	5,285,559		\$0.00000	\$0.00000	\$0	\$0		
18 Total Base Revenue								\$420,914	\$357,323	(\$63,592)	-15.11%
19 Total Annual Energy Usage		kWh			5,285,559						
20 Fuel Adjustment					5,285,559	\$0.00261	\$0.01916	\$13,820	\$101,279	\$87,459	
<u>Adjustments for Riders Included in Base Rates</u>											
21 Boswell 4 Environmental Adjustment		kWh			5,285,559	\$0.00000000	\$0.00000000	\$0	\$0	\$0	
22 Renewable Resource Adjustment		kWh			5,285,559	\$0.00000000	\$0.00000000	\$0	\$0	\$0	
23 Transmission Adjustment (\$)		kWh			5,285,559	\$0.00000000	\$0.00000000	\$0	\$0	\$0	
25 Conservation Program Adjustment		kWh			5,285,559	\$0.00000000	\$0.00000000	\$0	\$0	\$0	
26 Excess ADIT Credit		%				-0.015259	-0.015259	-\$6,423	-\$6,998	-\$575	
27 Subtotal Revenue								\$428,312	\$451,604	\$23,292	5.44%
28 Boswell 4 Environmental Adjustment		kWh			5,285,559	\$0.00000000	\$0.00000000	\$0	\$0	\$0	
29 Renewable Resource Adjustment		kWh			5,285,559	\$0.00000000	\$0.00000000	\$0	\$0	\$0	
30 Transmission Adjustment (\$)		kWh			5,285,559	\$0.00000000	\$0.00000000	\$0	\$0	\$0	
31 Solar Energy Adjustment		kWh			5,285,559	-\$0.0001478	-\$0.0001478	-\$781	-\$781		
32 Conservation Program Adjustment		kWh			5,285,559	\$0.00004766	\$0.00004766	\$252	\$252	\$0	
33 TOTAL REVENUE								\$427,782	\$451,074	\$23,292	5.44%

PUBLIC DOCUMENT
TRADE SECRET DATA EXCISED

MINNESOTA POWER
 COMPARISON OF OPERATING REVENUES
 PRESENT VS. GENERAL RATES
 TEST YEAR 2020
 LIGHTING

Rate Schedules 83
 Overhead Street Lighting

Type of Lamp	Option	Basis or Unit Upon Which Rates Are Applied	Total Billing Units		Lamp kWh	Unit Charge		Operating Revenues		Increase	
			Present	General		Present	General	Present	General	(\$)	(%)
1 Service Charge	IV	# of Bills	432	432		\$2.09	\$3.34	\$902.88	\$1,442.88	\$540.00	59.81%
Mercury Vapor											
2 7,000 Lumen (175W)	I	per lamp	972	972	74	\$17.33	\$16.25	\$202,137	\$189,540	-\$12,597	-6.23%
3 7,000 Lumen (175W)	II	per lamp	1,375	1,375	74	\$9.72	\$9.70	\$160,380	\$160,050	-\$330	-0.21%
4 20,000 Lumen (400W)	I	per lamp	27	27	161	\$24.36	\$22.10	\$7,893	\$7,160	-\$732	-9.28%
5 20,000 Lumen (400W)	II	per lamp	47	47	161	\$17.26	\$15.00	\$9,735	\$8,460	-\$1,275	-13.09%
6 8,500 Lumen (100W)	I	per lamp	1,158	1,158	42	\$14.41	\$14.35	\$200,241	\$199,408	-\$834	-0.42%
7 8,500 Lumen (100W)	II	per lamp	3,101	3,101	42	\$7.62	\$7.62	\$283,555	\$283,555	\$0	0.00%
8 14,000 Lumen (150W)	I	per lamp	1,188	1,188	63	\$16.92	\$15.88	\$241,212	\$226,385	-\$14,826	-6.15%
9 14,000 Lumen (150W)	II	per lamp	1,188	1,188	63	\$9.78	\$8.92	\$139,424	\$127,164	-\$12,260	-8.79%
10 14,000 Lumen (150W)	III	per lamp	0	0	63	\$9.52	\$9.15	\$0	\$0	\$0	
11 20,500 Lumen (200W)	I	per lamp	1	1	95	\$20.11	\$19.65	\$241	\$236	-\$6	-2.29%
12 20,500 Lumen (200W)	II	per lamp	4	4	95	\$11.87	\$12.06	\$570	\$579	\$9	1.60%
13 23,000 Lumen (250W)	I	per lamp	501	501	102	\$21.69	\$19.78	\$130,400	\$118,917	-\$11,483	-8.81%
14 23,000 Lumen (250W)	II	per lamp	987	987	102	\$12.97	\$12.70	\$153,617	\$150,419	-\$3,198	-2.08%
15 23,000 Lumen (250W)	III	per lamp	1	1	102	\$12.67	\$10.80	\$152	\$130	-\$22	
16 45,000 Lumen (400W)	I	per lamp	24	24	168	\$27.38	\$24.30	\$7,885	\$6,998	-\$887	-11.25%
17 45,000 Lumen (400W)	II	per lamp	34	34	168	\$18.11	\$17.98	\$7,389	\$7,336	-\$53	-0.72%
Metal Halide											
18 28,800 Lumen (400W)	II	per lamp	0	0	161	\$16.14	\$15.90	\$0	\$0	\$0	-1.49%
Light Emitting Diode (LED)											
19 4,000 Lumen (54 W or Less)	I	per lamp	1,177	1,177	19	\$13.10	\$13.60	\$185,024	\$192,086	\$7,062	3.82%
20 8,800 Lumen (118 W or Less but > 54W)	I	per lamp	516	516	43	\$17.39	\$18.10	\$107,679	\$112,075	\$4,396	4.08%
21 Pole Charge		per pole	0	0		\$0.00	\$0.00	\$0	\$0	\$0	
22 Energy Charge		kWh	233,914	233,914		\$0.07142	\$0.05990	\$16,706	\$14,011	-\$2,695	-16.13%
23 Base Cost of Fuel		kWh	8,875,556	8,875,556		\$0.00000	\$0.00000	\$0	\$0		
24 Total Base Revenue								\$1,855,143	\$1,805,953	-\$49,190	-2.65%
25 Total Annual Energy Usage		kWh			8,875,556						
26 Fuel Adjustment		kWh			8,875,556	\$0.00276	\$0.01930	\$24,461	\$171,255	\$146,794	
<u>Adjustments for Riders Included in Base Rates</u>											
27 Boswell 4 Environmental Adjustment		kWh			8,875,556	\$0.00000000	\$0.00000000	\$0	\$0	\$0	
28 Renewable Resource Adjustment		kWh			8,875,556	\$0.00000000	\$0.00000000	\$0	\$0	\$0	
29 Transmission Adjustment (\$)		kWh			8,875,556	\$0.00000000	\$0.00000000	\$0	\$0	\$0	
30 Conservation Program Adjustment		kWh			8,875,556	\$0.00000000	\$0.00000000	\$0	\$0	\$0	
31 Excess ADIT Credit		%				-0.015259	-0.015259	-\$28,308	(\$30,170)	(\$1,863)	
32 Subtotal Revenue								\$1,851,297	\$1,947,038	\$95,741	5.17%
33 Boswell 4 Environmental Adjustment		kWh			8,875,556	\$0.00000000	\$0.00000000	\$0	\$0	\$0	
34 Renewable Resource Adjustment		kWh			8,875,556	\$0.00000000	\$0.00000000	\$0	\$0	\$0	
35 Transmission Adjustment (\$)		kWh			8,875,556	\$0.00000000	\$0.00000000	\$0	\$0	\$0	
36 Solar Energy Adjustment		kWh			8,875,556	-\$0.00015147	-\$0.00015147	(\$1,344)	(\$1,344)	\$0	
37 Conservation Program Adjustment		kWh			8,875,556	\$0.00006199	\$0.00006199	\$550	\$550	\$0	
38 TOTAL REVENUE								\$1,850,503	\$1,946,244	\$95,741	5.17%

Area and Outdoor Lighting (76 and 77)

	Initially Proposed	Final Approved	Ratio, Final/Initial
Mercury Vapor			
7000 Lumens Option 1	11.88	11.77	99.1%
7000 Lumens Option 2	9.63	8.23	85.5%
20,000 Lumens Option 1	18.65	18.73	100.4%
20,000 Lumens Option 2	12.87	12.4	96.3%
55,000 Lumens Option 1	34.89	34.89	100.0%
55,000 Lumens Option 2	24.9	24.58	98.7%
			96.7% MV Average
Sodium Vapor			
8500 Lumens Option 1	12.05	10.32	85.6%
8500 Lumens Option 2	6.97	5.96	85.5%
8500 Lumens Option 3	6.97	5.96	85.5%
14,000 Lumens Option 1	13.91	11.9	85.5%
14,000 Lumens Option 2	8.89	7.6	85.5%
23,000 Lumens Option 1	16.93	16.88	99.7%
23,000 Lumens Option 2	11.84	10.12	85.5%
23,000 Lumens Option 3	10.53	10.19	96.8%
45,000 Lumens Option 1	22.58	22.6	100.1%
45,000 Lumens Option 2	15.93	14.89	93.5%
45,000 Lumens Option 3	11.75	10.81	92.0%
			90.5% SV Average
Metal Halide			
17,00 Lumens Option 1	19.53	16.69	85.5%
28,800 Lumens Option 1	20.73	20.33	98.1%
28,800 Lumens Option 3	12.11	12.05	99.5%
88,000 Lumens Option 1	33.88	33.87	100.0%
88,000 Lumens Option 3	22.7	22	96.9%
			96.0% MH Average
LEDs			
5000 Lumens Option 2	10.79	9	83.4% LED Average
10,000 Lumens Option 2	13.06		
24,000 Lumens Option 2	19.73		
43,000 Lumens Option 2	28.36		
			91.6% 76 and 77 Average
Street and Highway Lighting (80, 83, 84)			
Mercury Vapor			
7000 Lumens Option 1	16.21	16.25	100.2%
7000 Lumens Option 2	9.95	9.7	97.5%
7000 Lumens Option 3	9.63	8.1	84.1%
10,000 Lumens Option 3	10.94	10.29	94.1%
20,000 Lumens Option 1	21.67	22.1	102.0%
20,000 Lumens Option 2	14.44	15	103.9%
20,000 Lumens Option 3	13.96	13.9	99.6%
55,000 Lumens Option 3	25.56	25	97.8%
			97.4% MV Average
Sodium Vapor			
8500 Lumens Option 1	16.07	14.35	89.3%
8500 Lumens Option 2	8.11	7.62	94.0%
8500 Lumens Option 3	7.69	6.5	84.5%
14,000 Lumens Option 1	18.6	15.88	85.4%
14,000 Lumens Option 2	10.23	8.92	87.2%
14,000 Lumens Option 3	9.93	9.15	92.1%
14,000 Lumens (P) Option 3	9.21	8.3	90.1%
20,500 Lumens Option 1	19.65	19.65	100.0%
20,500 Lumens Option 2	12.06	12.06	100.0%
20,500 Lumens Option 3	11.9	10	84.0%
23,000 Lumens Option 1	20.11	19.78	98.4%
23,000 Lumens Option 2	13.21	12.7	96.1%
23,000 Lumens Option 3	12.78	10.8	84.5%
45,000 Lumens Option 1	24.62	24.3	98.7%
45,000 Lumens Option 2	17.7	17.98	101.6%
45,000 Lumens Option 3	14.3	13	90.9%
			92.3% SV Average
Metal Halide			
28,800 Lumens Option 2	15.76	15.9	100.9% MH Average
LEDs			
4000 Lumens	14.98	13.6	90.8%
8,800 Lumens	19.56	18.1	92.5%
23,000 Lumens	24.6	22.5	91.5%
30,000 Lumens	24.43	22.5	92.1%
			91.7% LED Average
			95.6% 80, 83, 84 Average
			93.6% All lighting Average

CERTIFICATE OF SERVICE

I, Sharon Ferguson, hereby certify that I have this day, served copies of the following document on the attached list of persons by electronic filing, certified mail, e-mail, or by depositing a true and correct copy thereof properly enveloped with postage paid in the United States Mail at St. Paul, Minnesota.

**Minnesota Department of Commerce
Comments**

Docket No. E015/M-20-830

Dated this 14th day of April 2021

/s/Sharon Ferguson

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Generic Notice	Commerce Attorneys	commerce.attorneys@ag.state.mn.us	Office of the Attorney General-DOC	445 Minnesota Street Suite 1400 St. Paul, MN 55101	Electronic Service	Yes	OFF_SL_20-830_M-20-830
Sharon	Ferguson	sharon.ferguson@state.mn.us	Department of Commerce	85 7th Place E Ste 280 Saint Paul, MN 551012198	Electronic Service	No	OFF_SL_20-830_M-20-830
David	Moeller	dmoeller@allete.com	Minnesota Power	30 W Superior St Duluth, MN 558022093	Electronic Service	Yes	OFF_SL_20-830_M-20-830
Generic Notice	Residential Utilities Division	residential.utilities@ag.state.mn.us	Office of the Attorney General-RUD	1400 BRM Tower 445 Minnesota St St. Paul, MN 551012131	Electronic Service	Yes	OFF_SL_20-830_M-20-830
Will	Seuffert	Will.Seuffert@state.mn.us	Public Utilities Commission	121 7th PI E Ste 350 Saint Paul, MN 55101	Electronic Service	Yes	OFF_SL_20-830_M-20-830