MISO Regional Issues Review

MISO-PJM IPSAC

MTEP Reliability Projects

MTEP15 Report

- MTEP15 Finalized in December 2015
- Full Report and Appendices Posted
  - Includes reliability and economic studies

MTEP16 Active Projects – Reliability

- 328 Projects Targeted for Appendix A
- 137 Projects Targeted for Appendix B
- Complete MTEP16 Active Project List
- Additional Project Information in December Subregional Planning Meetings
  - East
  - Central
  - South
  - West

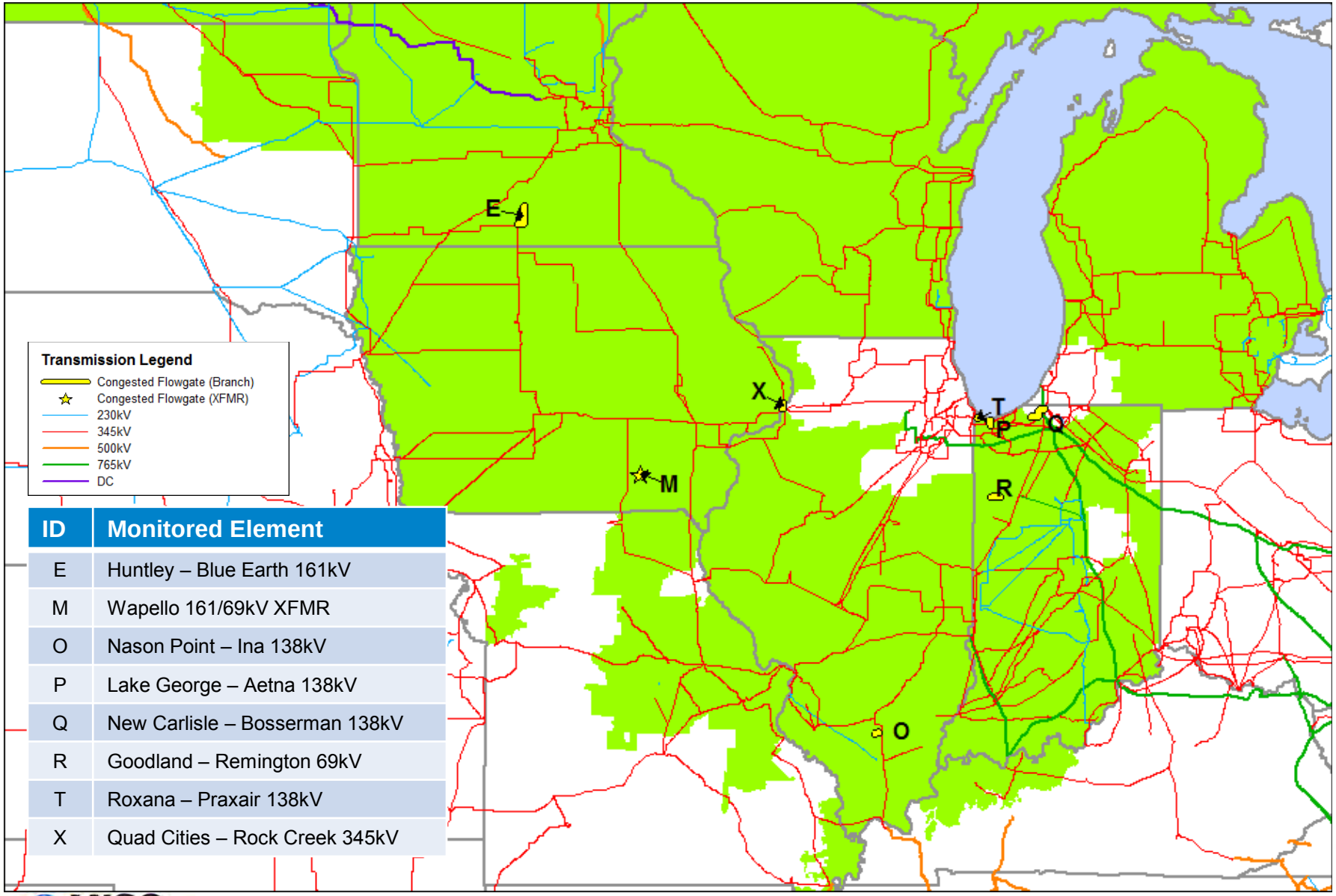
Market Congestion Planning Study

Market Congestion Planning Study (MCPS)

- MTEP16 MCPS Need Identification
  - North/Central Region
  - South Region
- Latest Info from 1/21/16 Economic Planning Users Group (EPUG)
  - Meeting Material

North/Central MCPS

MCPS North Central Congested Flowgates

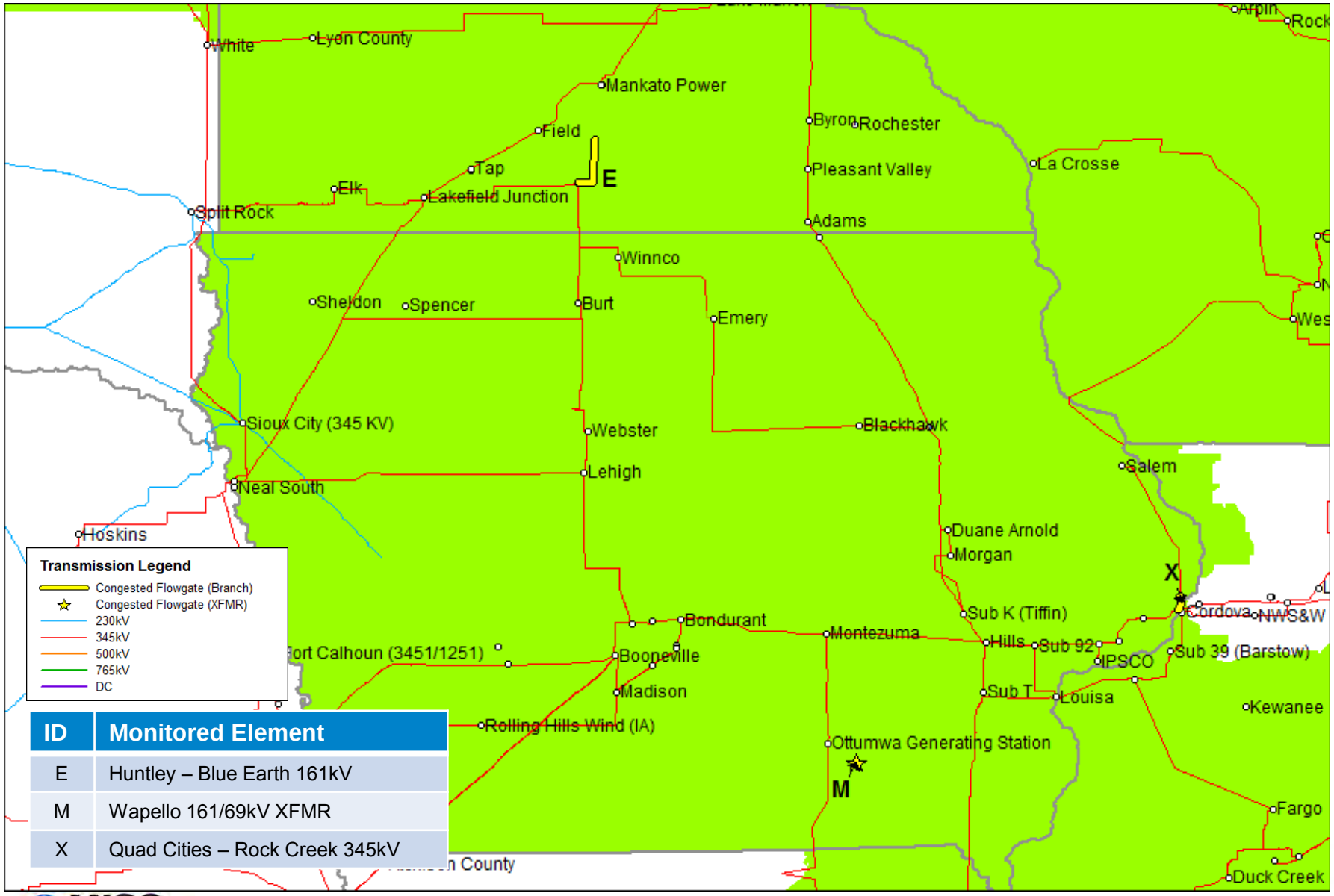


ID	Monitored Element
E	Huntley – Blue Earth 161kV
M	Wapello 161/69kV XFMR
O	Nason Point – Ina 138kV
P	Lake George – Aetna 138kV
Q	New Carlisle – Bosserman 138kV
R	Goodland – Remington 69kV
T	Roxana – Praxair 138kV
X	Quad Cities – Rock Creek 345kV

MCPS North/Central Congested Flowgates

- **North/Central Congested Flowgates Selected for MTEP16 MCPS Study:**
  - E: Huntley – Blue Earth 161kV
  - M: Wapello 161/69kV XFMR
  - O: Nason Point – Ina 138kV
  - P: Lake George – Aetna 138kV
  - Q: New Carlisle – Bosserman 138kV
  - R: Goodland – Remington 69kV
  - T: Roxana – Praxair 138kV
  - X: Quad Cities – Rock Creek 345kV

West (MN/IA) Congested Flowgates



ID	Monitored Element
E	Huntley – Blue Earth 161kV
M	Wapello 161/69kV XFMR
X	Quad Cities – Rock Creek 345kV

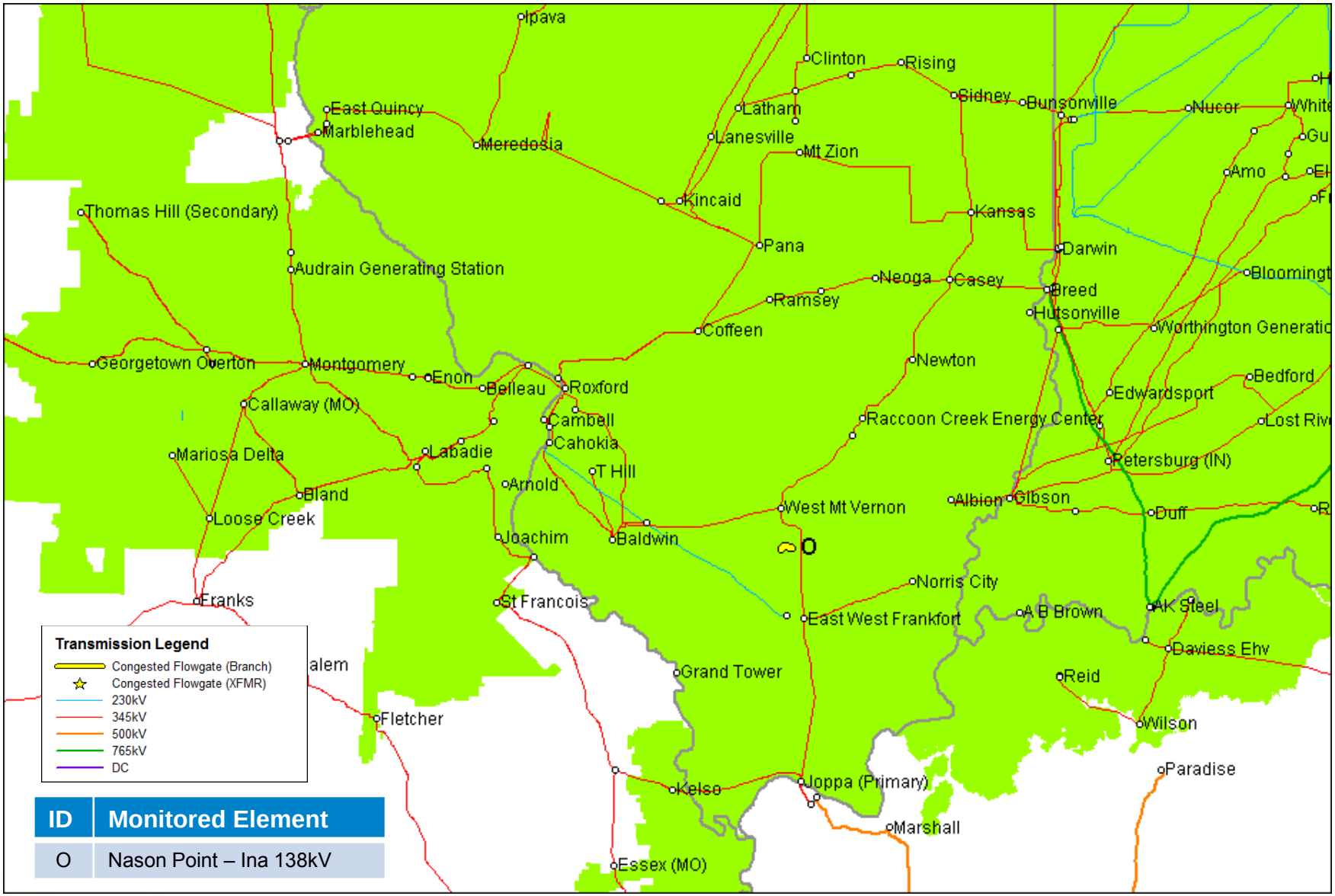
West (MN/IA) Congested Flowgates: PROMOD Annual Shadow Price in 2030

ID	Monitored Element	Contingency Element(s)	Area (From - To)	2030 Total Annual Shadow Price (k$/MW-year)				
				BAU	HD	LD	RCPP	SRCPP
E	Huntley – Blue Earth 161kV	Wilmarth – Fieldon 345kV	ALTW – NSP	225.2	576.3	64.4	1,173.2	2,318.2
M	Wapello 161/69kV XFMR	Wapello 161/69kV XFMR	ALTW - ALTW	185.0	284.4	1.2	40.3	31.3
X	Quad Cities – Rock Creek 345kV*Δ	Quad Cities – Sub 91 345kV	COMED - ALTW	100.12	90.45	42.34	7.75	4.62
		No Outage						

*Binding under multiple contingencies

Δ New top flowgate since 12112015 EPUG meeting

Southern Illinois Congested Flowgates



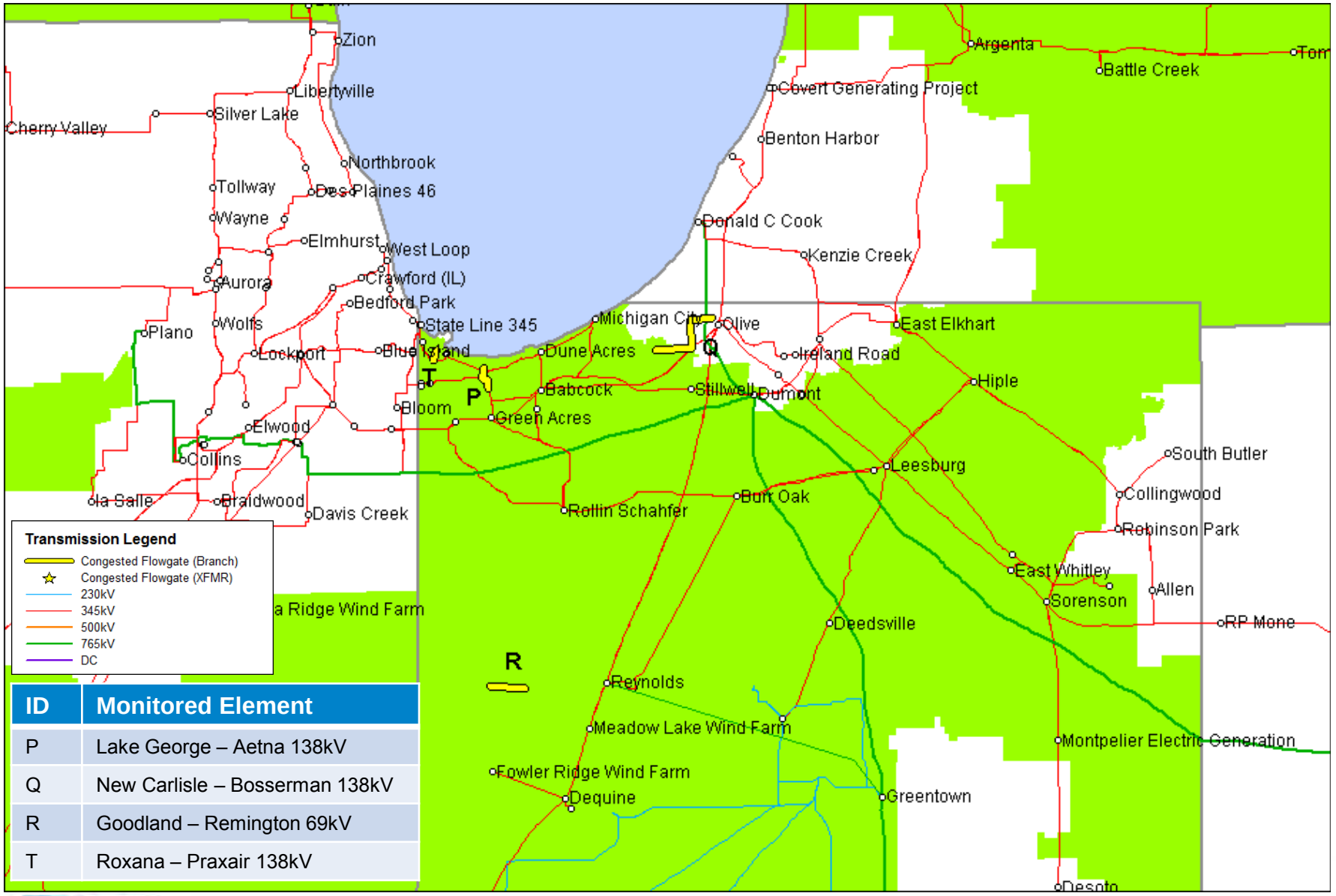
ID	Monitored Element
O	Nason Point – Ina 138kV

Southern Illinois Congestion:
PROMOD Annual Shadow Price in 2030

ID	Monitored Element	Contingency Element(s)	Area (From - To)	2030 Total Annual Shadow Price (k$/MW-year)				
				BAU	HD	LD	RCPP	SRCPP
O	Nason Point – Ina 138kV	East West Frankfort – West Mt Vernon 345kV	AMIL - AMIL	726.8	534.3	552.6	775.0	1,237.1

- **90% of the congestion on Nason Point – Ina 138kV can be relieved by a ~$50k terminal equipment upgrade that increases ratings from 143/143 MVA to 159/204 MVA**
- **Solution ideas that seek to address this flowgate will be studied with this upgrade in their base case**

Northern Indiana Congested Flowgates



ID	Monitored Element
P	Lake George – Aetna 138kV
Q	New Carlisle – Bosserman 138kV
R	Goodland – Remington 69kV
T	Roxana – Praxair 138kV

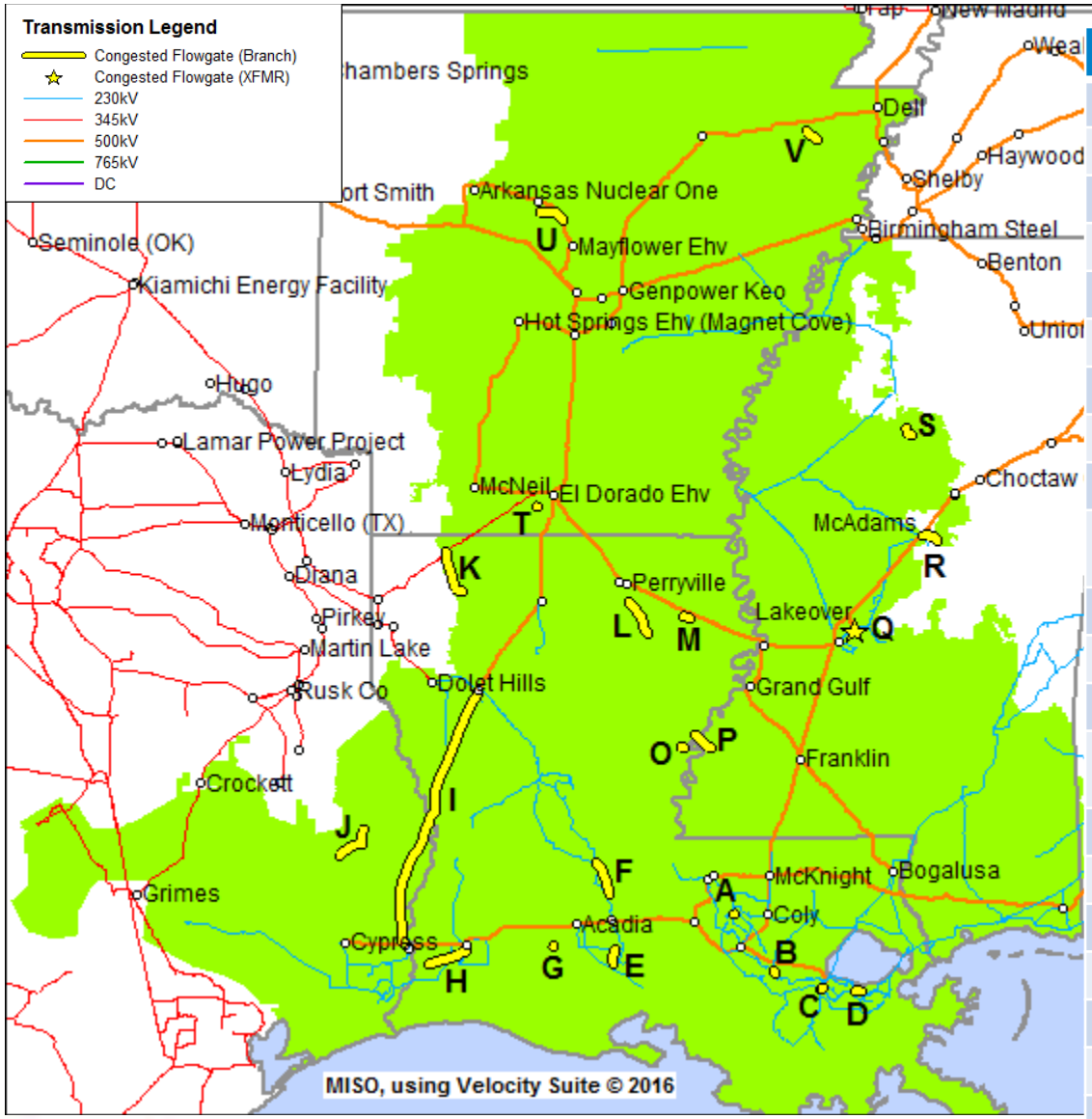
Northern Indiana Congested Flowgates: PROMOD Annual Shadow Price in 2030

ID	Monitored Element	Contingency Element(s)	Area (From - To)	2030 Total Annual Shadow Price (k$/MW-year)				
				BAU	HD	LD	RCPP	SRCPP
P	Lake George – Aetna 138kV	Lake George – Miller 138kV	NIPS - NIPS	391.8	479.1	196.7	348.6	64.8
Q	New Carlisle – Bosserman 138kV	Olive – Bosserman 138kV	AEP - AEP	165.6	578.4	91.1	481.5	1,155.6
R	Goodland – Remington 69kV	Goodland – Reynolds 138kV	NIPS - NIPS	69.7	117.2	44.5	146.7	148.5
T	Roxana – Praxair 138kV$^{\Delta}$	Dumont – Wilton 765kV	NIPS - NIPS	50.3	8.5	70.0	43.1	133.5

Δ New top flowgate since 12112015 EPUG meeting

South MCPS

MTEP16 MCPS South Congested Flowgates

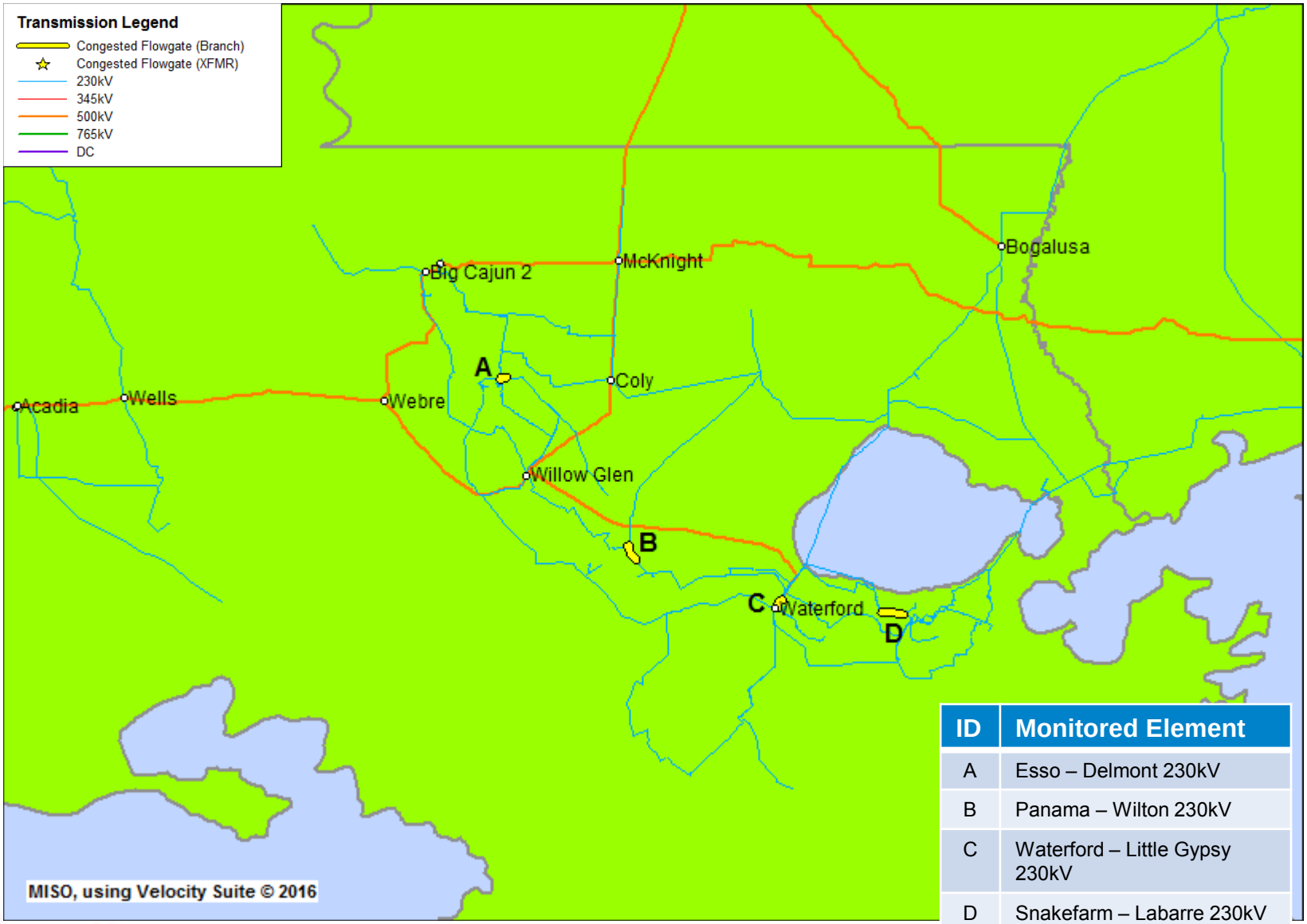


ID	Monitored Element
A	Esso – Delmont 230kV
B	Panama – Wilton 230kV
C	Waterford – Little Gypsy 230kV
D	Snakefarm – Labarre 230kV
E	Scott – Judice 138kV
F	Coughlin – Plaisance 138kV
G	Bayou Cove – Hebert 138kV
H	Mossville – Marshall 138kV
I	Layfield – Hartburg 500kV
J	Sam Rayburn – Fork Creek 138kV
K	Sarepta – Minden 115kV
L	Swartz – Alto 115kV
M	Carson Rd – Delhi 115kV
O	Plantation – S. Ferriday Tap 115kV
P	Red Gum – Natchez 115kV
Q	Lakeover 500/115kV XFMR T1
R	Attala – Conehoma 115kV
S	S. Grenada – Elliott 115kV
T	Wyatt – Parnell Rd 115kV
U	Morrilton East – Gleason 161kV
V	Trumann West – Trumann 161kV

MCPS South Congested Flowgates

- **South Congested Flowgates Selected for MTEP16 MCPS Study:**
  - A: Esso – Delmont 230kV
  - B: Panama – Wilton 230kV
  - C: Waterford – Little Gypsy 230kV
  - D: Snakefarm – Labarre 230kV
  - E: Scott – Judice 138kV
  - F: Coughlin – Plaisance 138kV
  - G: Bayou Cove – Hebert 138kV
  - H: Mossville – Marshall 138kV
  - I: Layfield – Hartburg 500kV
  - J: Sam Rayburn – Fork Creek 138kV
  - K: Sarepta – Minden 115kV
  - L: Swartz – Alto 115kV
  - M: Carson Rd – Delhi 115kV
  - O: Plantation – S. Ferriday Tap 115kV
  - P: Red Gum – Natchez 115kV
  - Q: Lakeover 500/115kV XFMR T1
  - R: Attala – Conehoma 115kV
  - S: S. Grenada – Elliott 115kV
  - T: Wyatt – Parnell Rd 115kV
  - U: Morrilton East – Gleason 161kV
  - V: Trumann West – Trumann 161kV

Amite South/DSG Congested Flowgates



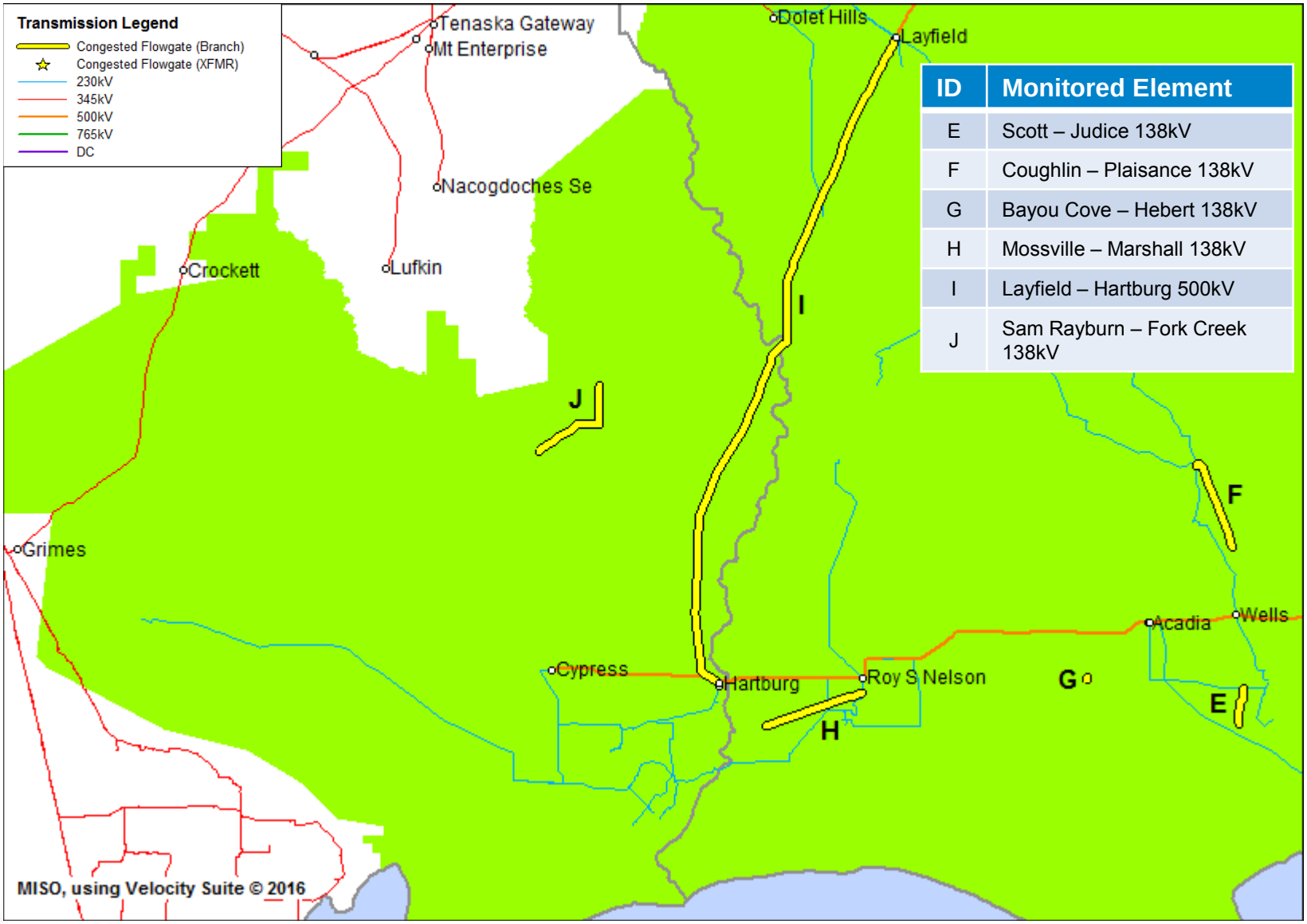
ID	Monitored Element
A	Esso – Delmont 230kV
B	Panama – Wilton 230kV
C	Waterford – Little Gypsy 230kV
D	Snakefarm – Labarre 230kV

Amite South/DSG Congested Flowgates: PROMOD Annual Shadow Price in 2030

ID	Monitored Element	Contingency Element(s)	Area (From - To)	2030 Total Annual Shadow Price (k$/MWh)				
				BAU	HD	LD	RCPP	SRCPP
A	Esso – Delmont 230kV*	Big Cajun – Webre 500kV Exxon – Downtown 230kV Willow Glen – Coly 500kV Willow Glen – Pecue 230kV	EES-LA	74.2	402.3	34.2	32.6	34.9
B	Panama – Wilton 230kV	Willow Glen – Waterford 500kV + Waterford:3	EES-LA	136.1	29.5	193.8	36.0	32.0
C	Waterford – Little Gypsy 230kV*	Waterford – Little Gypsy 230kV + Little Gypsy:2/3 Waterford – Little Gypsy 230kV + Nine Mile:4/5/6	EES-LA	64.6	330.2	173.0	255.2	279.8
D	Snakefarm – Labarre 230kV	Little Gypsy – Wesco 230kV + Nine Mile:4/5/6	EES-LA	34.1	105.0	17.9	171.3	275.5

*Binding for multiple contingencies

WOTAB/Western Congested Flowgates



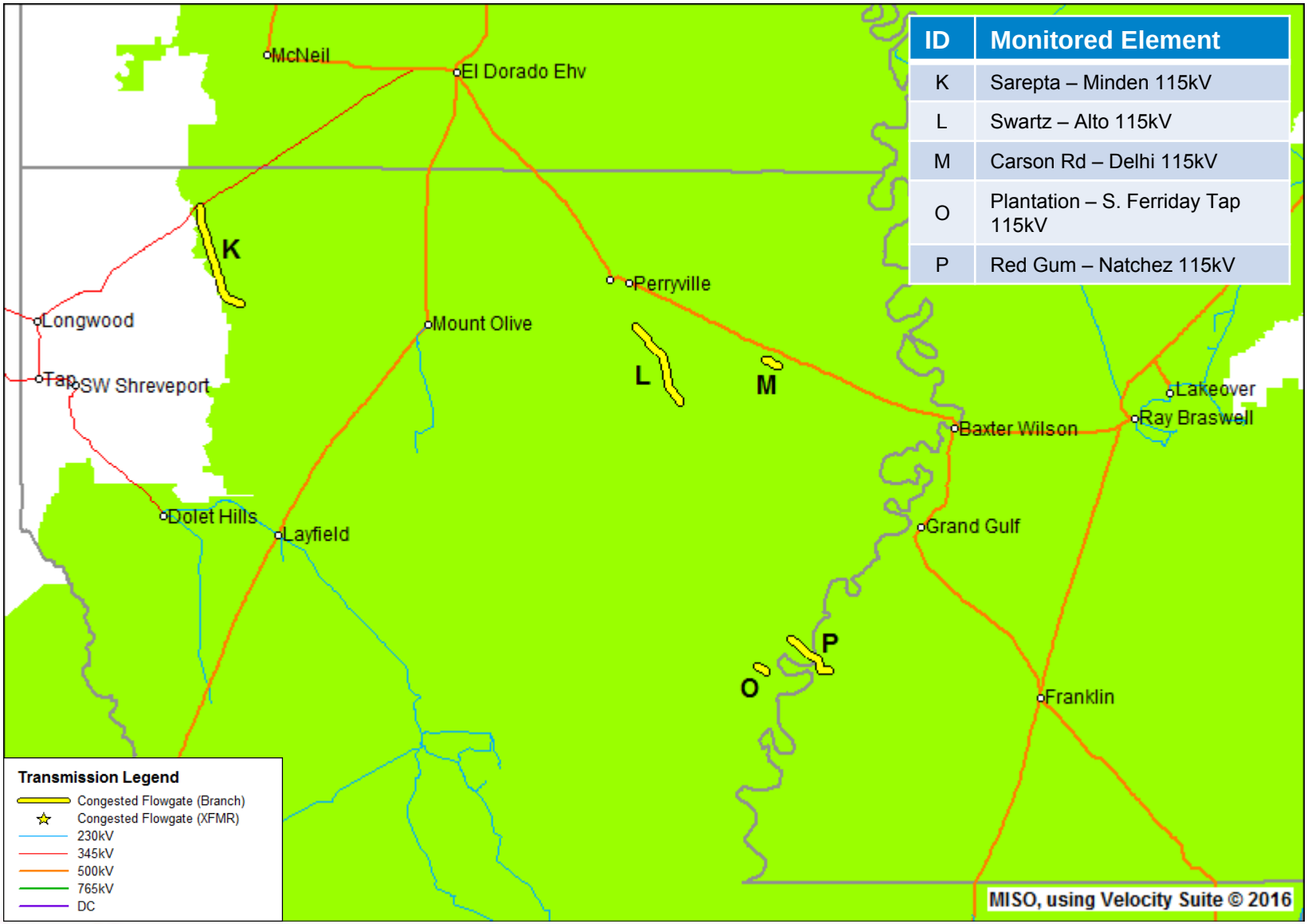
ID	Monitored Element
E	Scott – Judice 138kV
F	Coughlin – Plaisance 138kV
G	Bayou Cove – Hebert 138kV
H	Mossville – Marshall 138kV
I	Layfield – Hartburg 500kV
J	Sam Rayburn – Fork Creek 138kV

WOTAB/Western Congested Flowgates: PROMOD Annual Shadow Price in 2030

ID	Monitored Element	Contingency Element(s)	Area (From - To)	2030 Total Annual Shadow Price (k$/MWh)				
				BAU	HD	LD	RCPP	SRCPP
E	Scott – Judice 138kV	Meaux – Sellers Rd 230kV	EES-LA – LAGN	190.0	163.2	16.8	46.0	46.4
F	Coughlin – Plaisance 138kV	Cocodrie – Ville Platte 230kV	CLEC	15.3	35.5	24.9	157.3	180.4
G	Bayou Cove – Hebert 138kV	Nelson – Richard 500kV + Nelson:4/6	LAGN – EES-LA	17.4	59.2	41.4	46.6	49.4
H	Mossville – Marshall 138kV*	Hartburg – Cypress 500kV + Sabine:4	EES-LA	14.8	188.8	35.4	49.9	28.1
		Hartburg – Cypress 500kV + SRW Cogen						
		Hartburg – Sulphur Lane 500kV						
		Hollywood – Nelson 138kV + SRW Cogen						
I	Layfield – Hartburg 500kV*	Nelson – Richard 500kV + Nelson:4/6	EES-LA – EES-TX	32.2	51.4	63.1	88.6	78.2
		Webre – Wells 500kV + Nelson:4/6						
J	Sam Rayburn – Fork Creek 138kV*	Hartburg – Cypress 500kV + Frontier	EES-TX	72.9	56.7	54.5	103.6	141.5
		Hartburg – Cypress 500kV + Lewis Creek:1/2						
		Hartburg – Cypress 500kV + Sabine:3/4/5						
		Hartburg – Cypress 500kV + SRW Cogen						
		Hartburg – Layfield 500kV + SRW Cogen						
		Urland – Woodville 138kV + Lewis Creek:2						

*Binding for multiple contingencies

Remainder of LRZ9 Congested Flowgates



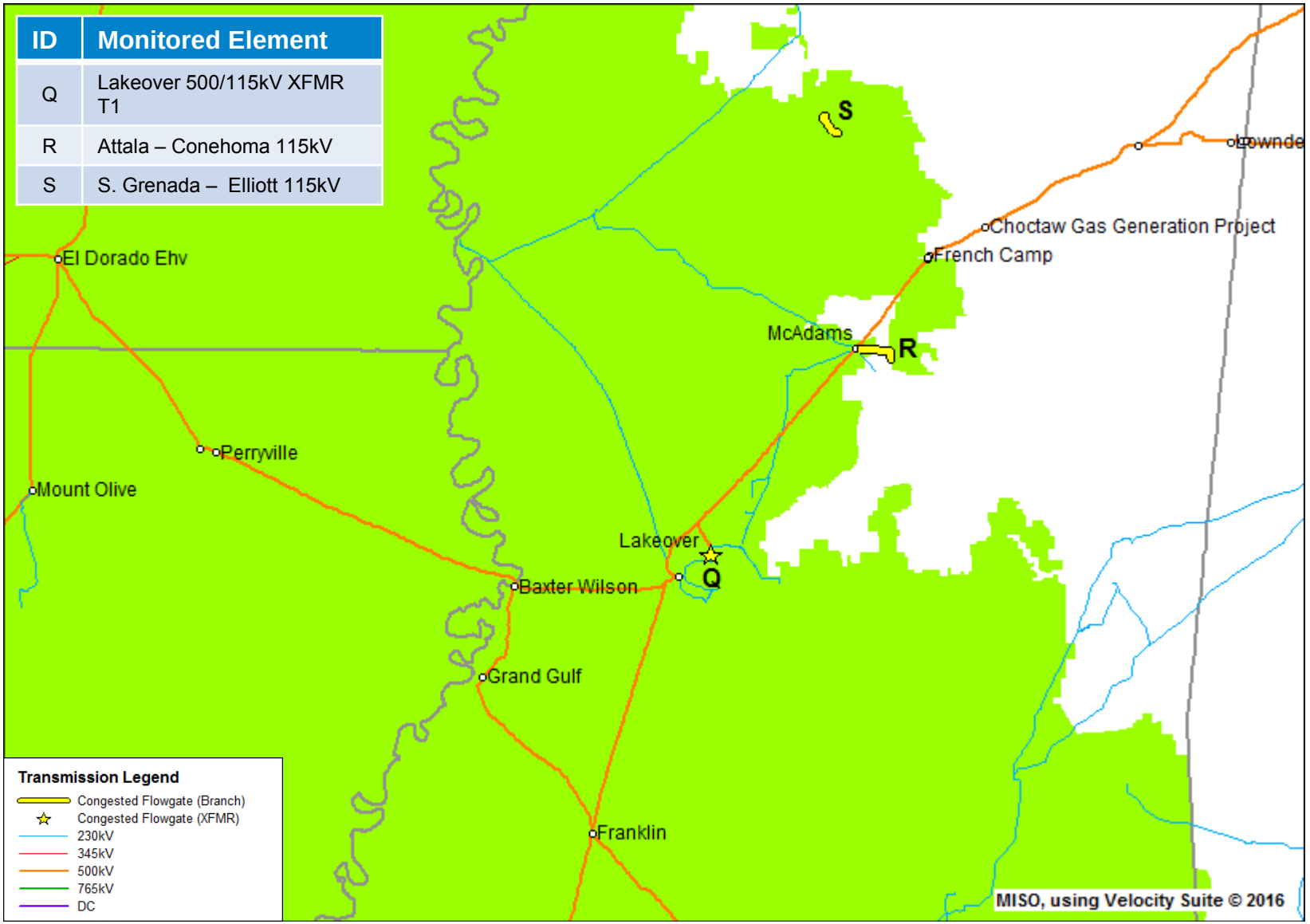
ID	Monitored Element
K	Sarepta – Minden 115kV
L	Swartz – Alto 115kV
M	Carson Rd – Delhi 115kV
O	Plantation – S. Ferriday Tap 115kV
P	Red Gum – Natchez 115kV

Remainder of LRZ9 Congested Flowgates: PROMOD Annual Shadow Price in 2030

ID	Monitored Element	Contingency Element(s)	Area (From - To)	2030 Total Annual Shadow Price (k$/MWh)				
				BAU	HD	LD	RCPP	SRCPP
K	Sarepta – Minden 115kV*	Dolet Hills 345/230kV XFMR El Dorado – Mt. Olive 500kV	EES-LA	230.4	708.0	179.6	532.6	865.8
L	Swartz – Alto 115kV	Baxter Wilson – Perryville 500kV	EES-LA	113.5	128.0	50.8	159.9	138.7
M	Carson Rd – Delhi 115kV	Baxter Wilson – Perryville 500kV	EES-LA	61.5	86.6	43.9	255.1	312.1
O	Plantation – S. Ferriday Tap 115kV	Plantation – Vidalia 115kV	EES-LA	208.7	269.3	158.2	180.3	218.1
P	Red Gum – Natchez 115kV	Plantation – Vidalia 115kV	EES-LA – EES-MS	31.1	28.8	25.7	389.0	519.3

*Binding for multiple contingencies

LRZ10 Congested Flowgates

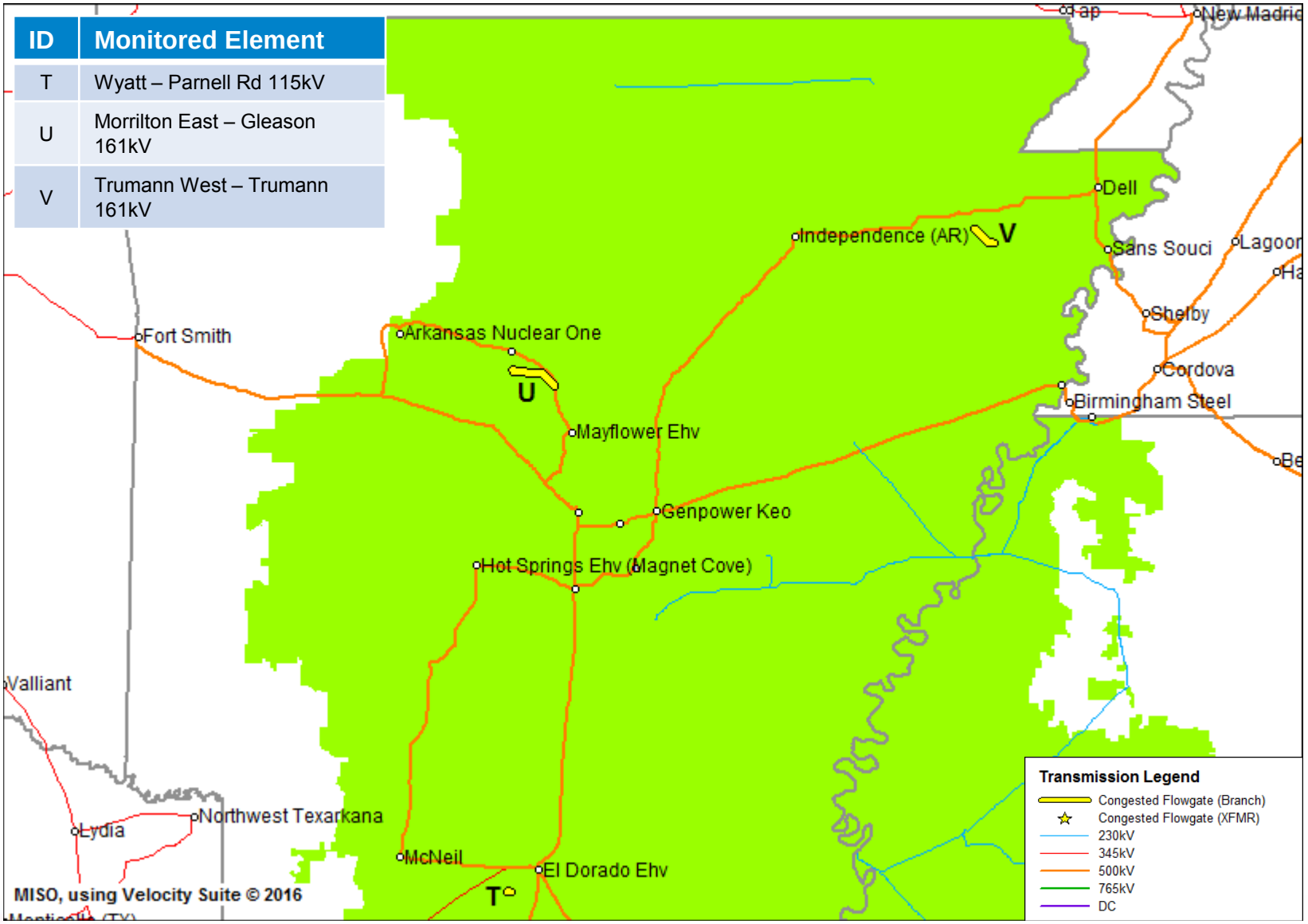


LRZ10 Congested Flowgates:
PROMOD Annual Shadow Price in 2030

ID	Monitored Element	Contingency Element(s)	Area (From - To)	2030 Total Annual Shadow Price (k$/MWh)				
				BAU	HD	LD	RCPP	SRCPP
Q	Lakeover 500/115kV XFMR T1	Ray Braswell – Lakeover 500kV	EES-MS	96.2	93.7	65.5	71.5	65.5
R	Attala – Conehoma 115kV	Lakeover – McAdams 500kV	EES-MS	60.0	58.6	22.7	84.9	85.6
S	S. Grenada – Elliott 115kV	McAdams – Wolf Creek 500kV	EES-MS	196.6	256.1	107.2	155.9	129.8

LRZ8 Congested Flowgates

ID	Monitored Element
T	Wyatt – Parnell Rd 115kV
U	Morrilton East – Gleason 161kV
V	Trumann West – Trumann 161kV



LRZ8 Congested Flowgates:
PROMOD Annual Shadow Price in 2030

ID	Monitored Element	Contingency Element(s)	Area (From - To)	2030 Total Annual Shadow Price (k$/MWh)				
				BAU	HD	LD	RCPP	SRCPP
T	Wyatt – Parnell Rd 115kV	Mt. Olive – El Dorado 500kV	EES-ARK	50.4	63.5	7.7	169.1	152.5
U	Morrilton East – Gleason 161kV	Pleasant Hill – Mayflower 500kV	EES-ARK	45.0	132.9	12.1	1,125	1,840
V	Trumann West – Trumann 161kV*	Dell – Sans Souci 500kV Sans Souci – Driver 500kV	EES-ARK	1,393	1,695	1,242	2,861	2,993

*Binding for multiple contingencies

Generation Interconnection

MISO Generation Study Impacts on PJM

- **MISO and PJM Coordinate Generation Interconnection Queues**
- **Each RTO Tests the Impact of New Generation on the Other's Area**
- **Latest Information: http://www.miso-pjm.com/coordinated-queue-studies.aspx**