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TABLE A2
WETLAND R-24-9 WATER BALANCE CALCULATIONS
Three Cell System (Upland-UG, Wetland & DG-Cell) with Daily Time Steps

	Primary	Fringe (if present)
WETLAND NUMBER:	R-24-9	
WETLAND TYPE:	Wet Prairie	
MINE NAME	Wingate East Mine	
Permit Name:		
COUNTY:	Manatee County, Florida	

By: ECT
Date: April 30, 2015

VERSION 2.1

CONSTANT & INITIAL/STARTING CONDITION INPUT PARAMETERS

UPLAND-UG INPUTS		Symbol
Upland-UG Acres:	**31.08**	
Upland-UG Area (ft2):	1,353,845	Au-UG
Highest Upland-UG Elevation (ft, NGVD):	116.5	El
Average Upland-UG Elevation (ft, NGVD):	115.5	
Initial Starting Depth to Water at Upland-UG (ft):	0.5	
Initial Starting Water Table Elevation at Upland-UG (ft, NGVD):	115.0	
Specific Yield [Sy]/Porosity [n] (ND):	0.27	Pu
Distance between Centers of Upland-UG and Wetland (ft):	679	
Horizontal Hydraulic Conductivity [Kh] (ft/day):	5	Ku
Initial Upland Horizontal Hydraulic Gradient [ihu] (ft/ft):	0.0003	Gu
Upland-UG Saturated Thickness [bu] (ft):	75	Tuug
Upland-UG Ground Width entering Wetland [Wu] (ft):	2,000	Wu

WETLAND INPUTS		Symbol
Wetland Acres:	**10.51**	
Wetland Area (ft2):	457,816	Aw
Top of Bank Elevation (ft, NGVD):	115.8	TOB
Wetland Outflow Elevation (ft, NGVD):	115.0	OUT
Wetland Bottom Elevation (ft, NGVD):	114.5	BOT
Initial Starting Depth to Water at Wetland (ft):	-0.3	Dsw
Initial Starting Water Table Elevation at Wetland (ft, NGVD):	114.8	
Specific Yield [Sy]/Porosity [n] (ND):	0.27	Pu
Distance between Centers of Wetland and DG-Cell (ft):	865	
Wetland Discharge Horizontal Hydraulic Conductivity [Kh] (ft/day):	5	Kw
Initial Wetland Horizontal Hydraulic Gradient [ihw] (ft/ft):	0.0050	Gw
Wetland/Downgradient Saturated Thickness [bd] (ft):	80	Tw
Wetland Ground Width exiting Wetland [Wd] (ft):	600	Ww
Vertical Hydraulic Conductivity Confining Unit [Kv] (ft/day):	0.0025	
Vertical Distance Separating Surficial/Int. Aquifers [dv] (ft):	70	
Wetland Outflow Channel Width (ft):	100.0	
Wetland Outflow Channel Slope (ft/ft):	0.010	
Wetland Outflow Channel Manning Coeff (ND):	0.035	
Depth to Check for Wet Soil Conditions:	0.5	
Distance to Wetland Fringe Inner Boundary*:		
Distance to Wetland Fringe Center*:		
Distance to Wetland Fringe Outer Boundary*:		
Elevation of Wetland Fringe Inner Boundary:	115	
Elevation of Wetland Fringe Center:	115	
Elevation of Wetland Fringe Outer Boundary:	115	

* distance from wetland centroid

DG-CELL INPUTS		Symbol
DG-Cell Acres:	**9.58**	
DG-Cell Area (ft2):	417,305	
Highest DG-Cell Elevation (ft, NGVD):	115	
Average DG-Cell Elevation (ft, NGVD):	112.5	
Initial Starting Depth to Water at DG-Cell (ft):	2.0	
Initial Starting Water Table Elevation at DG-Cell (ft, NGVD):	110.5	
Specific Yield [Sy]/Porosity [n] (ND):	0.27	
Distance between DG-Cell and DG Boundary (ft):	843	
Horizontal Hydraulic Conductivity [Kh] (ft/day):	5	Ku
Water Table Elevation at DG Boundary Control Point (ft):	104.0	
Initial DG-Cell Horizontal Hydraulic Gradient [ihu] (ft/ft):	0.0077	Gu
DG-Cell Saturated Thickness [bu] (ft):	80	Tuug
DG-Cell Ground Width exiting system [Wu] (ft):	500	Wu

Soil Type & Moisture Condition		AMC I	AMC II	AMC III	Cap. Suct. [CS]-(in)	Sat. Hyd Cd [Ks]-(ft/day)
Upland-UG -	Sand	0.404	0.375	0.346	-1.950	9.276
Wetland -	Sand	0.404	0.375	0.346	-1.950	9.276
DG-Cell -	Sand	0.404	0.375	0.346	-1.950	9.276

	Upland-UG	Wetland	DG-Cell
Evapotranspiration Extinction Depth (ft):	5	4	5
Minimum ET Rate (in/day):	0	0	0

	Input Variables - site specific conditions
	Input Variables - represent more regional/seasonal conditions
	Input Variables - site specific conditions, but limited range of variation

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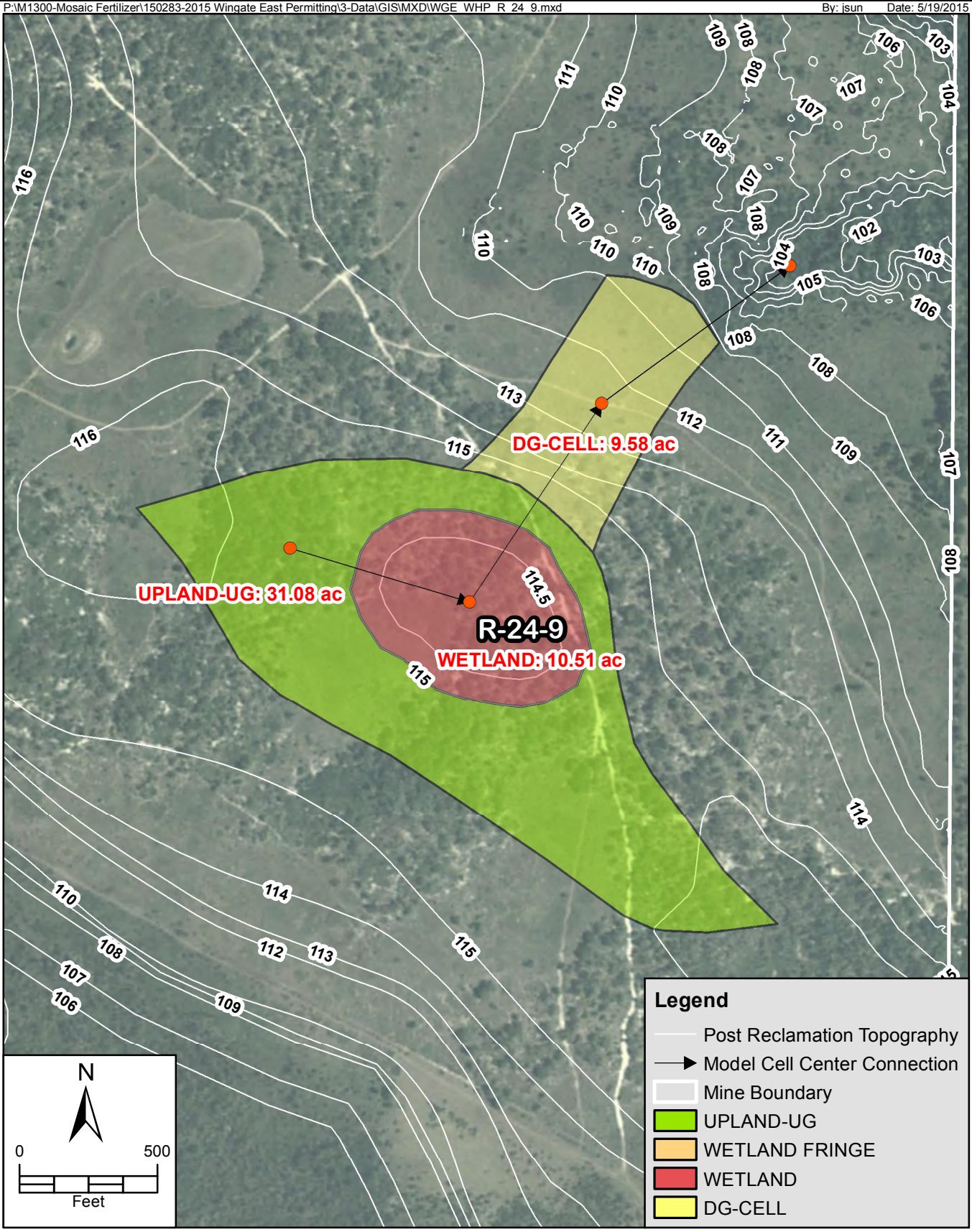

FIGURE A2-1
WETLAND R-24-9 - HYDROPERIOD MODEL DIAGRAM
WINGATE EAST MINE
MANATEE COUNTY, FLORIDA

Sources: ESRI, 2015; Mosaic, 2015; ECT, 2015.

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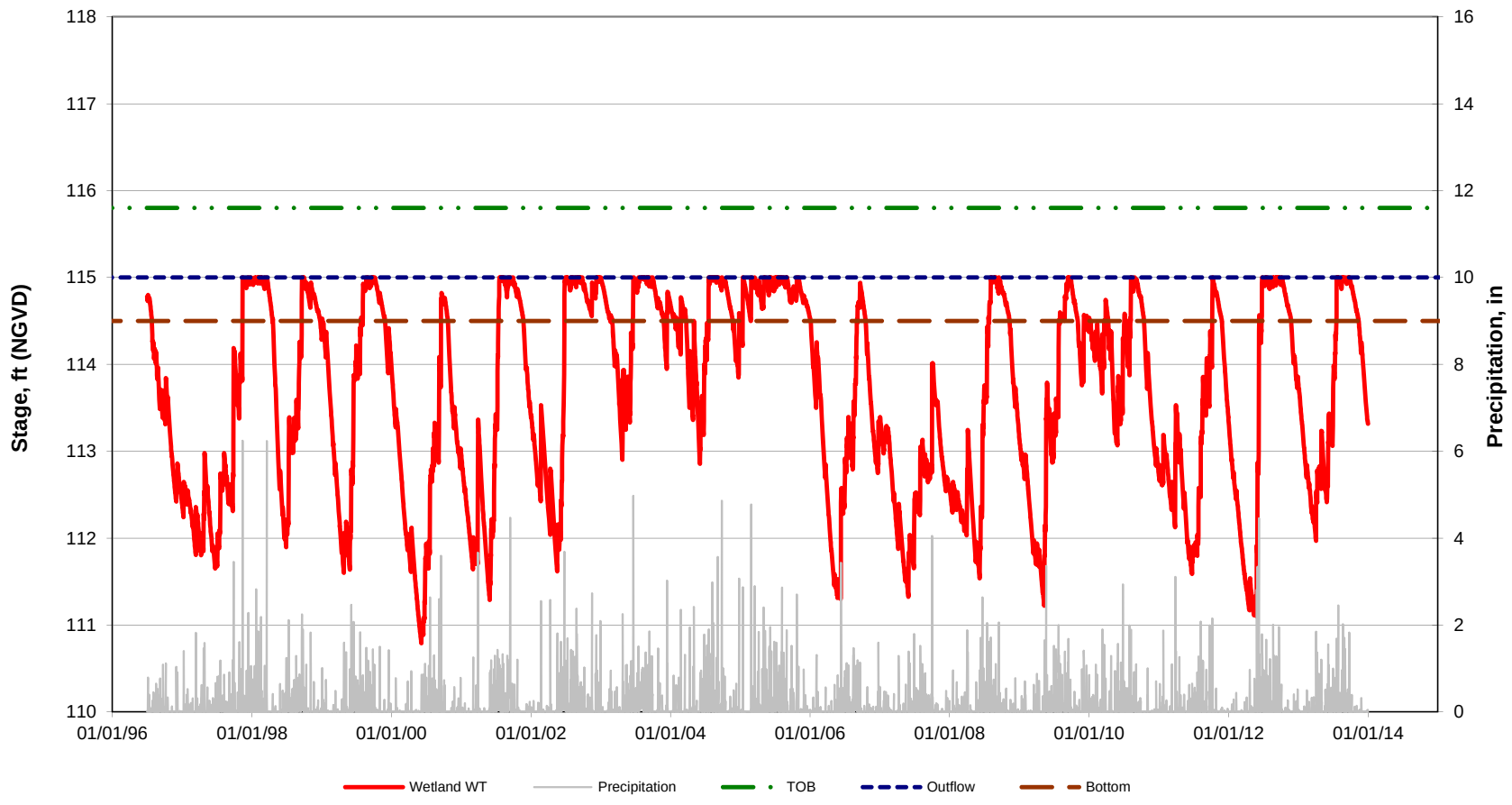

	Elev. Ft.
Wetland Bottom =	114.5
Outflow =	115

Wetland Hydroperiod

Starting WLE = 114.8

Figure A2-2
Modeled Hydrograph of Wetland R-24-9
Wingate East Mine
Manatee County, Florida

Wet Prairie
By: *ECT*
Date: *4/30/2015*

Source: Mosaic, 2015; ECT, 2015.

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WETLAND DESCRIPTION: R-24-9 Wet Prairie
PROJECT& LOCATION: Wingate East Min Manatee County, Florida

Top of Bank Elevation (ft, NGVD):	115.8
Wetland Outflow Elevation (ft, NGVD):	115.0
Wetland Bottom Elevation (ft, NGVD):	114.5

Average	113.6 ft, NGVD	Range	4.2 ft
Maximum	115.0 ft, NGVD	Step Size	0.3 ft
Minimum	110.8 ft, NGVD	No. of Steps	14
Median	113.8 ft, NGVD		

Data Range	Exceedance Frequency	Cumulative Exceedance Frequency	Elevation Range (ft, NGVD)	Percentage of Time Elevation is Exceeded (%)
115.30			115.30	
115.00	0	0	115.00	0.00%
114.70	1721	1721	114.70	26.92%
114.40	655	2376	114.40	37.17%
114.10	368	2744	114.10	42.92%
113.80	399	3143	113.80	49.16%
113.50	370	3513	113.50	54.95%
113.20	421	3934	113.20	61.54%
112.90	434	4368	112.90	68.32%
112.60	515	4883	112.60	76.38%
112.30	466	5349	112.30	83.67%
112.00	354	5703	112.00	89.21%
111.70	402	6105	111.70	95.50%
111.40	166	6271	111.40	98.09%
111.10	90	6361	111.10	99.50%
110.80	31	6392	110.80	99.98%
110.50	1	6393	110.50	100.00%
110.20	0	6393	110.20	100.00%

6393 Days
17.5 Years

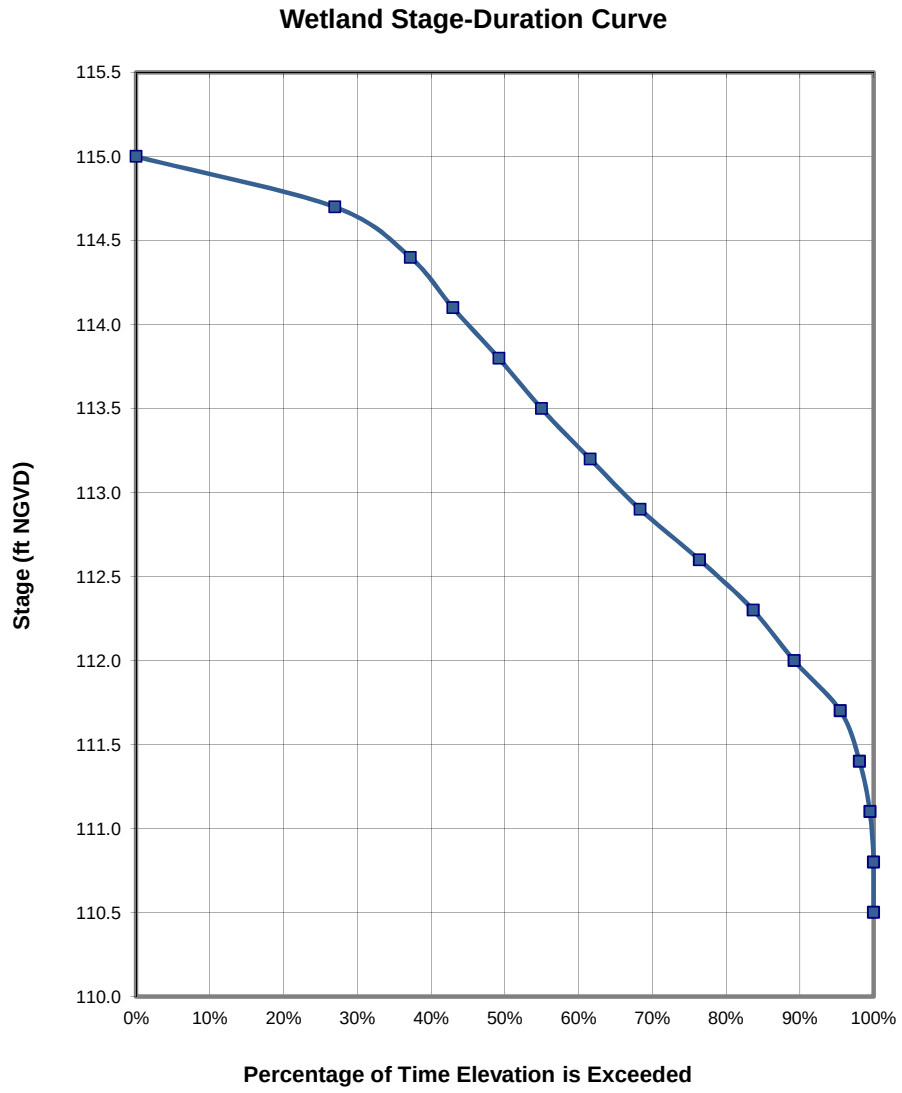

Figure A2-3
Modeled Stage-Duration Curve of Wetland R-24-9
Wingate East Mine
Manatee County, Florida

Wet Prairie
By: *ECT*
Date: *4/30/2015*

Source: Mosaic, 2015; ECT, 2015.

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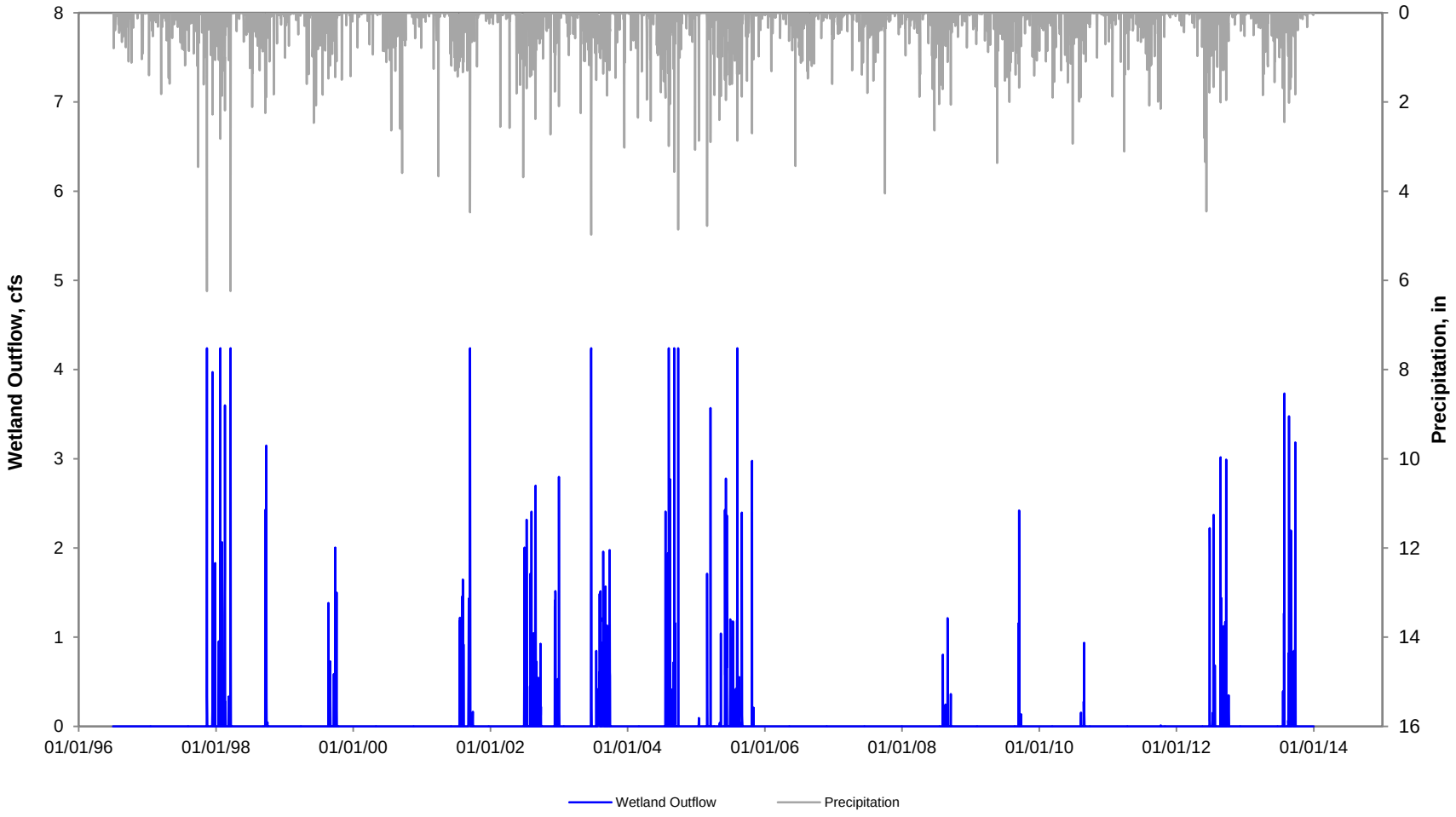

Wetland Surface Water Outflow

Figure A2-4
Modeled Outflow of Wetland R-24-9
Wingate East Mine
Manatee County, Florida

Wet Prairie
By: *ECT*
Date: *4/30/2015*

Source: Mosaic, 2015; ECT, 2015.

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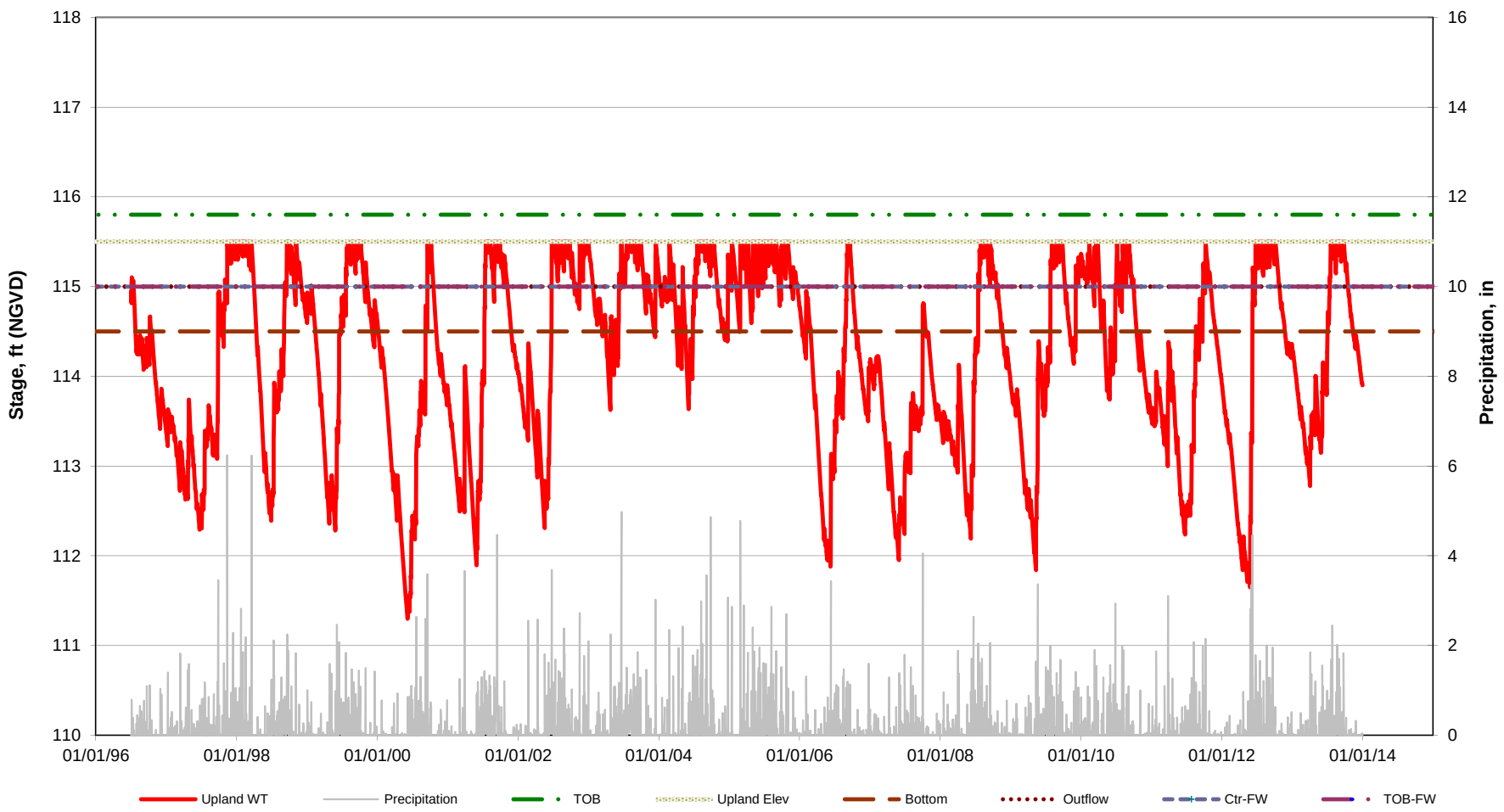

	Elev. Ft.
Wetland Bottom =	114.5
Outflow =	115

Upland Hydroperiod

Figure A2-5
Modeled Upland Hydrograph of Wetland R-24-9
Wingate East Mine
Manatee County, Florida

Wet Prairie
By: *ECT*
Date: *4/30/2015*

Source: Mosaic, 2015; ECT, 2015.

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