



# AOP Clearwater, LLC

## A Solution Provider

Presented to AWMA

Charleston WV

February 17, 2009



# Discussion Points

- WVOG/OOG operations in WV and OH
- Historic Oil & Gas Drilling WV
- Historic vs New Completion Process
- Marcellus Shale drilling/development
- Waste Water Generation
- Restrictions on discharge
- Waste Water disposition options/challenges
- AOP Clearwater, LLC recycle plant
  - Recycling Process (Patent Pending)
  - Products
  - Waste
  - Information Management
  - Staffing



# Who We Are

- West Virginia Oil Gathering
- Ohio Oil Gathering
- Oil and Brine
- Brine injection via disposal wells
- WV Oil
- Appalachian Oil Purchasers



# Opportunity

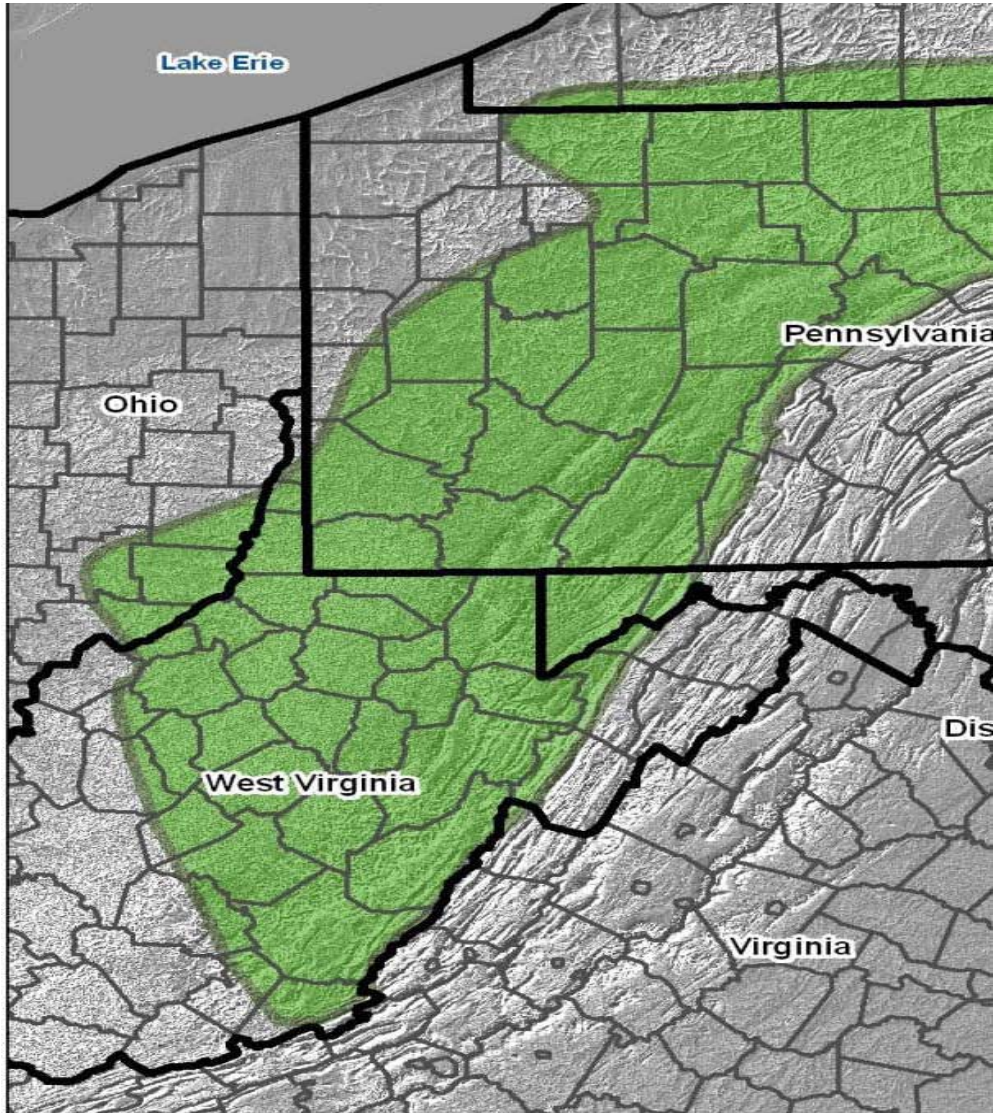
- Marcellus Shale drilling
- Search for Solutions
- AOP Clearwater



# Marcellus Shale Potential

- 31 million acres spanning NY, PA, WV & Ohio

- Formation Depth 5,000 –8,000 ft



# Drilling & Fracturing

- Drilling since 1900's
- ~73,000 active wells
- Target Zones
- Drilling above 6,500'
- What is a "FRAC"



# Drilling & Fracturing

- Frac techniques
- Nitrogen and water
- 1990 < 2,000 Bbl
- 2008 50,000 to 100,000+ Bbl
- “A drop in the bucket”



# Post Frac Operations

- Fluid returns to the surface location
- ~50% flow back in the first 30 days
- Remainder over time
- “Production Brine”



# Where Does the Water Go?

- Pre Treatment Plant for processing
- Public Owned Treatment Works (POTW)

“Dilution is the Solution for Pollution”

- Disposal Well



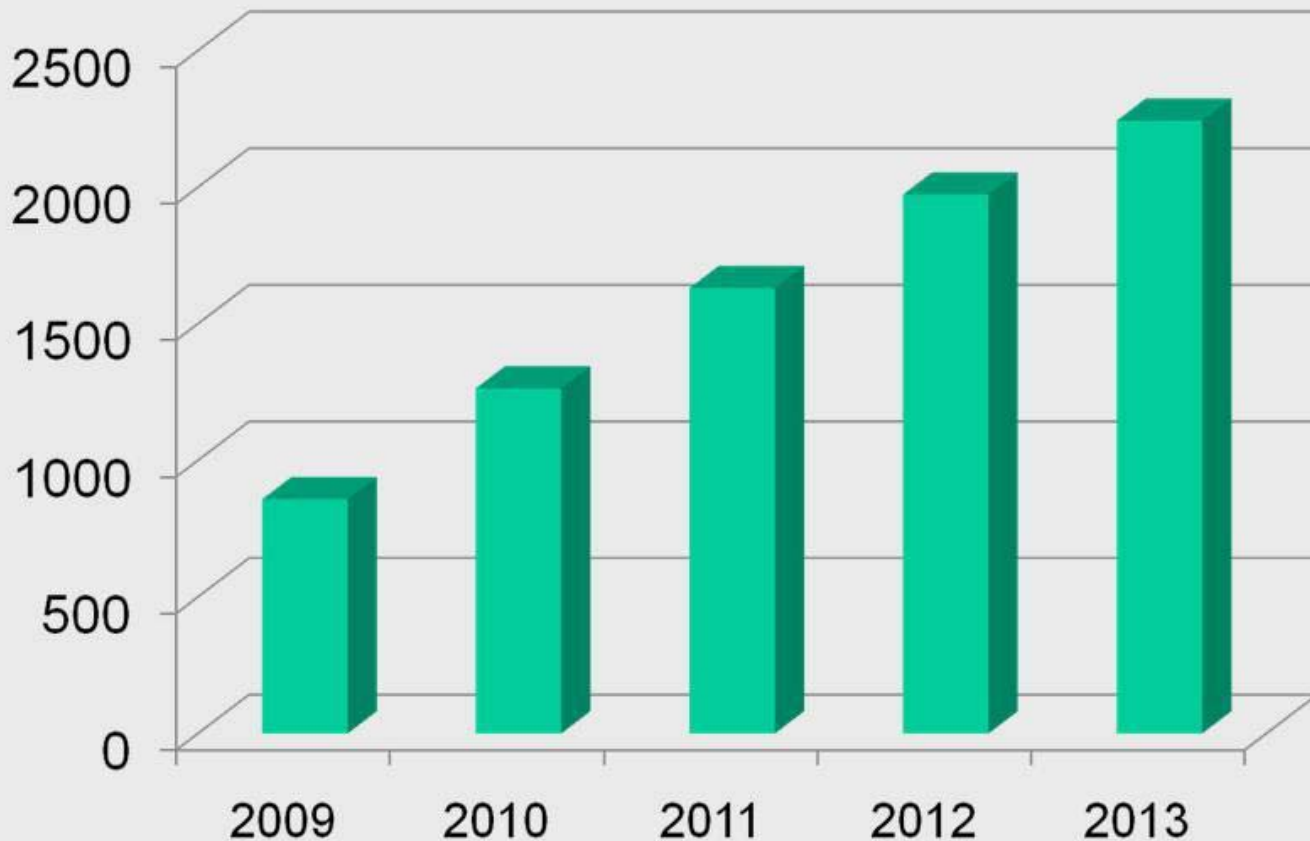
# Where Does the Water Go?

- Current capacity
- Now what do we do?
  - Build
  - Drill
  - Create



# Marcellus Drilling Forecast Appalachian Basin

## Number of Shale Wells Planned from 2009 to 2013



# Potential Volumes for Disposal

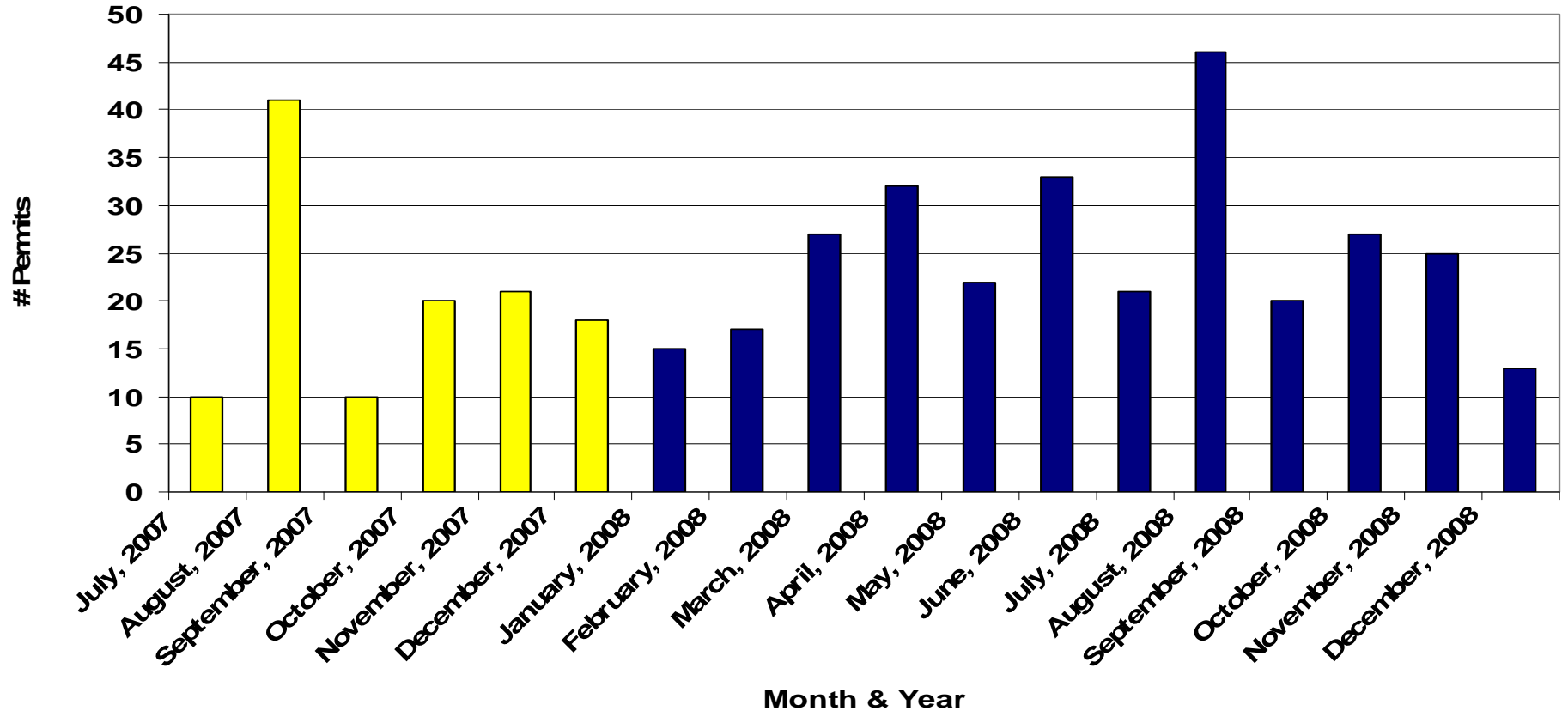
- 5 State Region
- 30% “Reality Factor”

Year	AOPC Forecast New Wells		Water Barrels per Frac	=	Annual Flowback for Disposal/Bbls	=	Daily Flowback for Disposal/Bbls	Gallons/Day Equivalent
2009	250	X	75,000	=	18,750,000	=	51,370	2,157,534
2010	350	X	75,000	=	26,250,000	=	71,918	3,020,548
2011	500	X	75,000	=	37,500,000	=	102,740	4,315,068
2012	600	X	75,000	=	45,000,000	=	123,288	5,178,082
2013	700	X	75,000	=	52,500,000	=	143,836	6,041,096



# Marcellus Drilling Permits

WV New Permits - Marcellus  
July 2007 - December 2008



# WV Potential

New Marcellus Permits	All Permits Issued			
	Bbls/Well	3 Years in days	Bbl/Day	Gallons/Day
418	75,000	1095	28,630	1,202,466
	30% "Reality Factor"			
125	75,000	1095	8,589	360,740



# AOP Clearwater Solution

- Multiple Solutions
- Disposal Wells
- Recycling
- Reuse



# AOPC Recycling Process

- Raw Water Receipt
- Unload
- Proprietary Pretreatment
- Impoundment

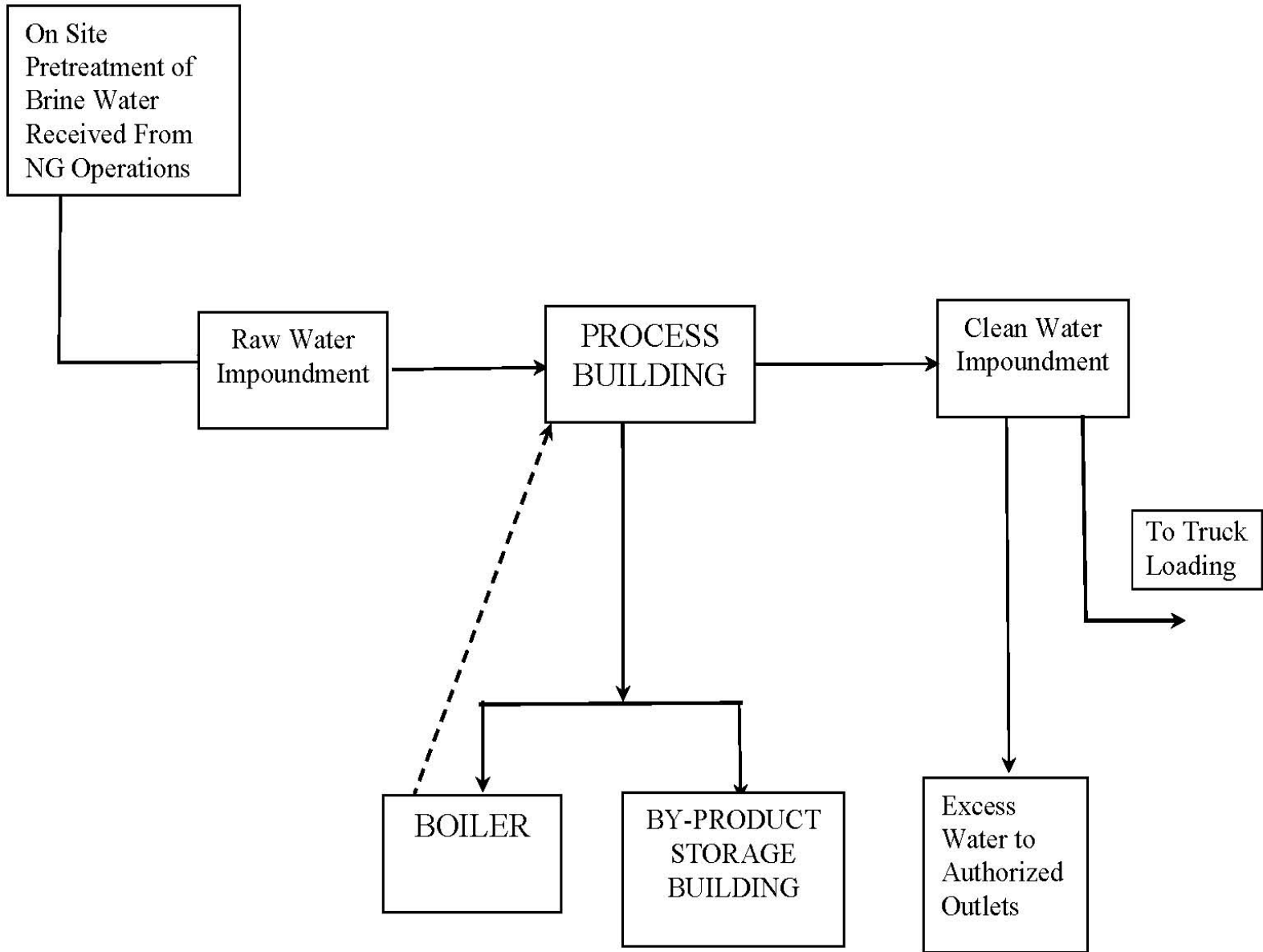


# AOPC Recycling Process

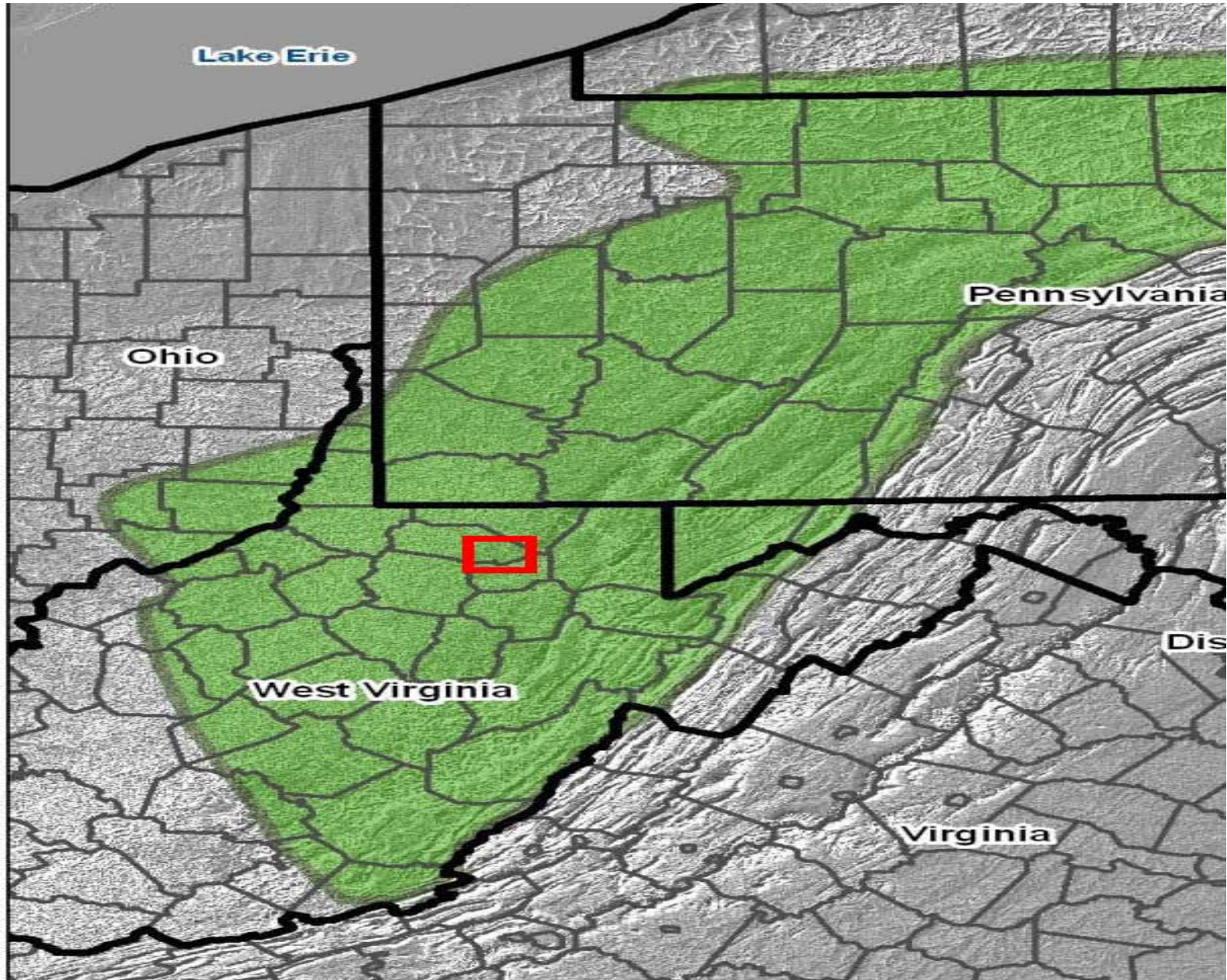
- 9,000 gallons per hour
- 5,000 Bbl/Day (210,000 gallons/day)
- Distilled water and salt
- Solids are stockpiled
- 160 tons of salts per day
- 24/7 Operation
- 10 WV Employees



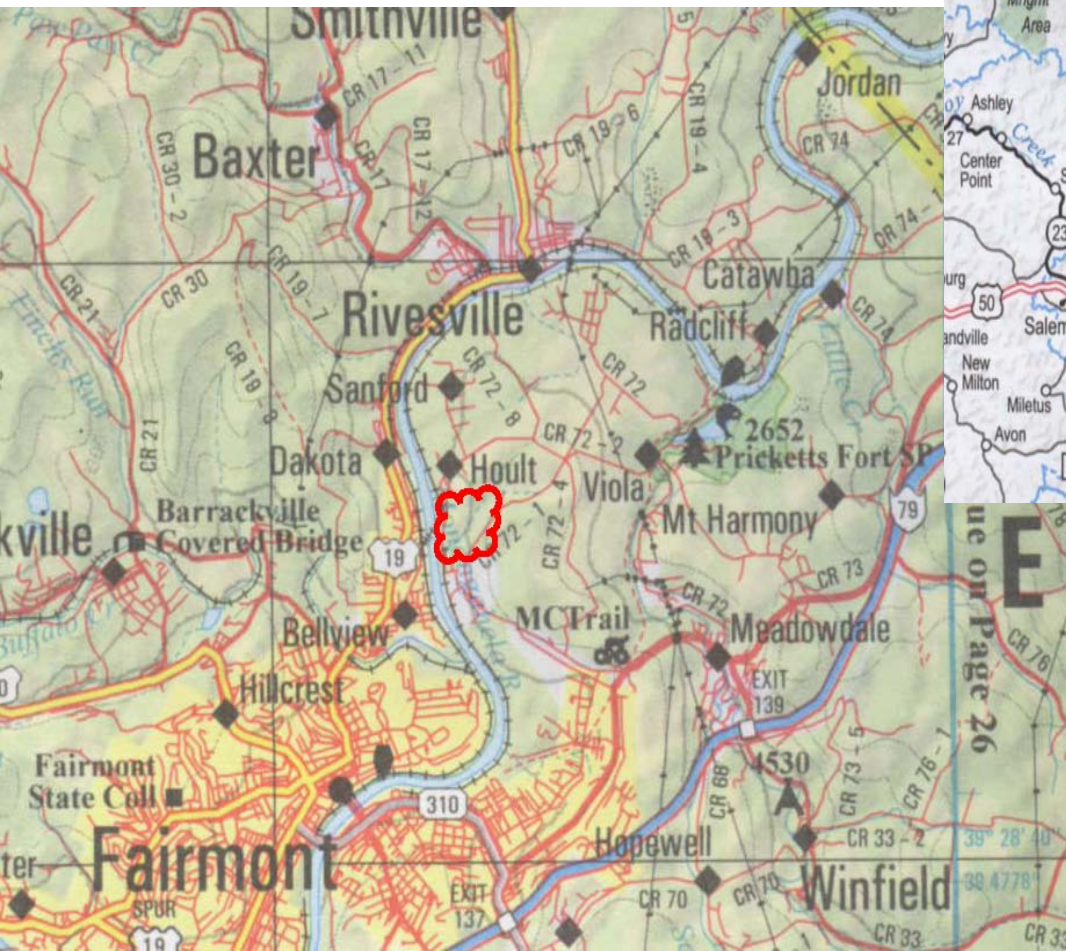
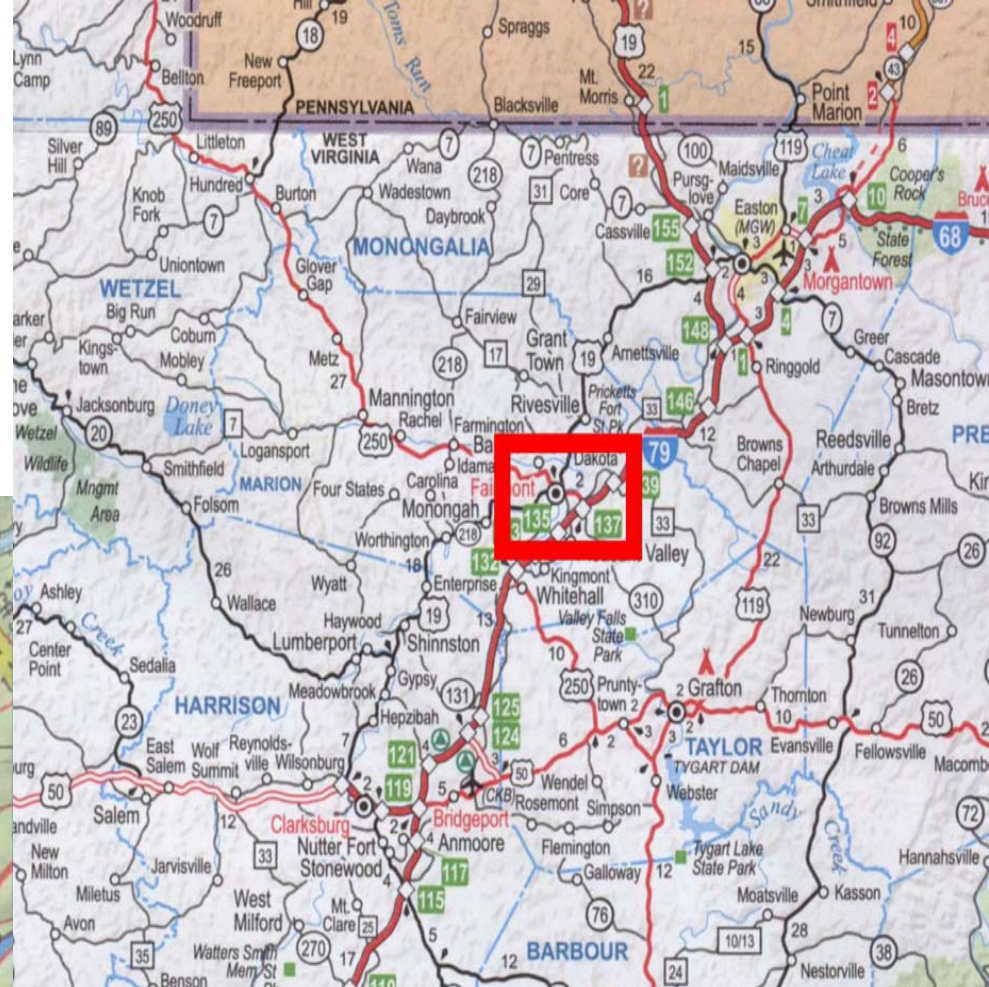
**AOP CLEARWATER, LLC  
BRINE WATER RECYCLE PLANT  
FAIRMONT, WEST VIRGINIA  
WATER FLOW DIAGRAM**



# AOP Clearwater Plant 1



# Plant 1 Location



# What AOPC Delivers

- Processed water for reuse
- Documentation
- Efficiency



# Byproduct Potential

- Exploration and Development



# Q & A

## **AOP Clearwater, LLC** **A Solution Provider**

