



Cumberland Fossil Plant Update

December 10, 2019

Agenda

- Site overview
- Beneficial reuse of gypsum and CCR
- Wet to dry initiative
- Improvements to gypsum wastewater treatment
- TDEC Order investigation/actions
- Continued operation

Cumberland Fossil Plant

Commissioning Date: 1972

Size of facility:

Approx 1,300 acres

Output: 2,470 megawatts

Number of homes

powered: 1.1 million

Amount of CCR material:

Approx 21.5 million cubic yards

CCR Beneficial Reuse:

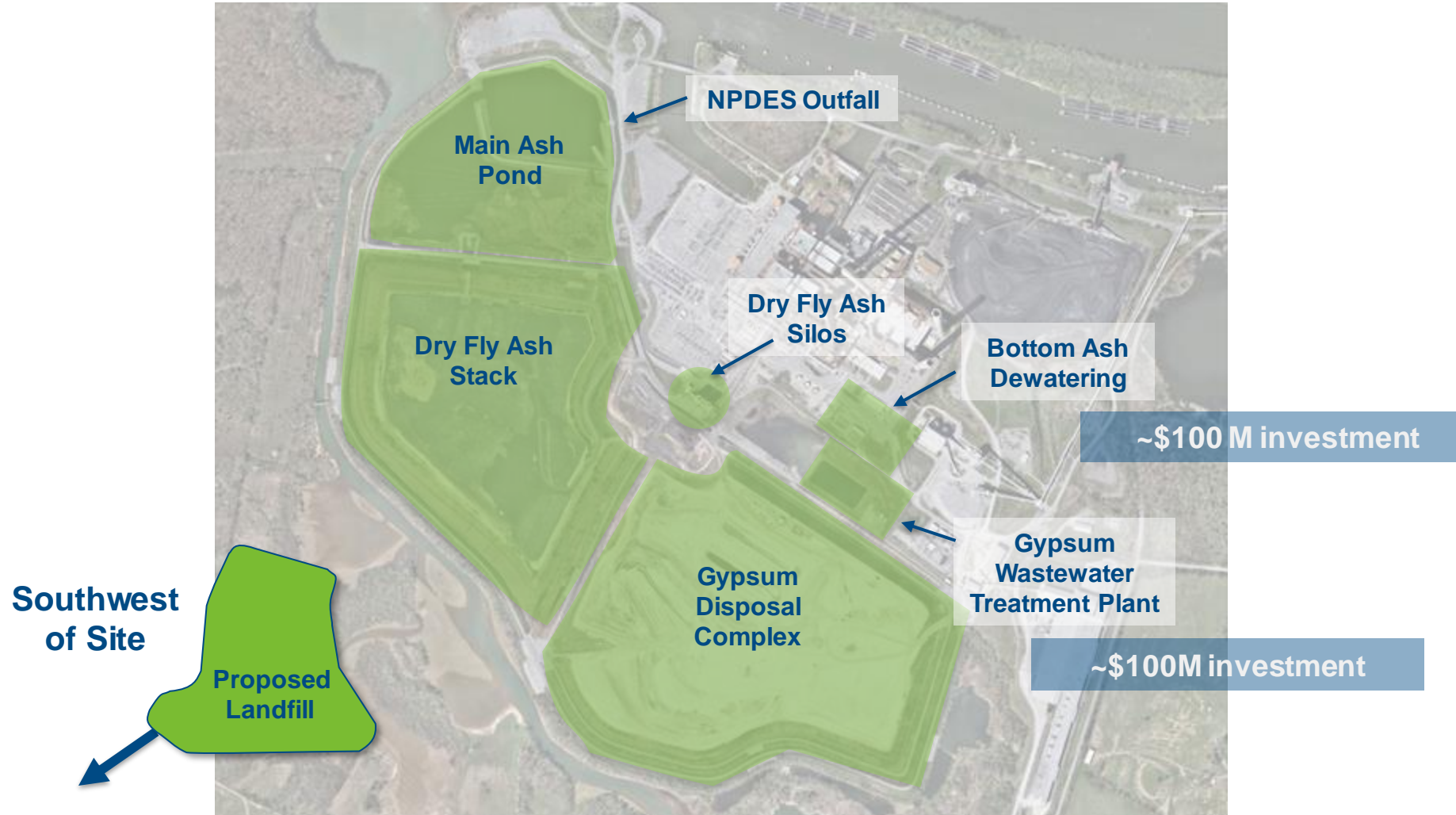
75% reuse of Fly Ash

90% reuse of Gypsum

Jobs in Clarksville Area: 446



Overview



Beneficial Reuse of Gypsum



Every year, **90% (750,000 tons)** of the gypsum produced is sold for reuse

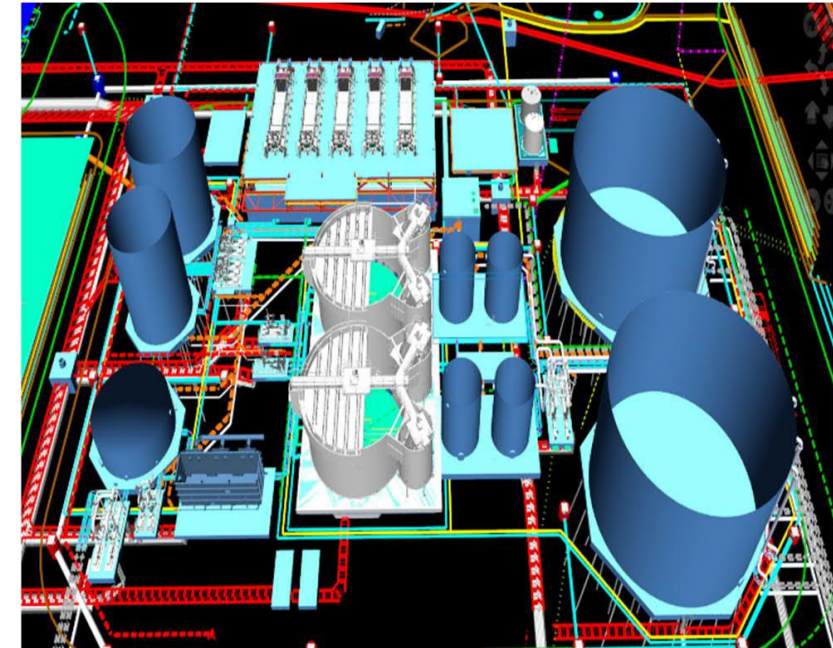
Adjacent wallboard plant utilizes **Cumberland's high quality gypsum** in its manufacturing process

The wallboard plant **employs 140 people** directly and created **306 indirect jobs**

Since the wallboard plant was constructed, **15+ million tons** have been **beneficially used**

Cumberland Water Treatment

- Supports ELG compliance and conversion of wet to dry CCR handling
- Adopted phased approach to construction
 - Focus on physical and chemical treatment
- Optimized scrubber to reduce selenium
- Investing \$100M to ensure TVA meets or exceeds permit standards



Beneficial Reuse of Fly Ash



Every year **75% (300,000 tons)** of fly ash is reused

About **20,000 tons** of ash went into the new Hankook Tire plant in Clarksville

Cumberland Fossil Plant supplies over **200 concrete plants** in the U.S.

In concrete, every ton of fly ash that replaces Portland cement **reduces carbon emissions** by **1 ton**.

Cumberland Environmental Stewardship



Cumberland Fossil Plant
construction began

1968

1940 1945 1950 1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005 2010 2015 2020 2025

Cumberland Environmental Stewardship



Ash Disposal Area complete
and sluicing began

1972

1940 1945 1950 1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005 2010 2015 2020 2025

Cumberland Environmental Stewardship



Cumberland Environmental Stewardship



TDEC Solid Waste Permit operational:

- Landfills constructed
- Dry Fly Ash placement began

1996

1940 1945 1950 1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005 2010 2015 2020 2025

Cumberland Environmental Stewardship



24/7 Operation of gypsum dewatering plant
Gypsum flow diverted to dewatering plant
Dry stacking gypsum began

2009

1940 1945 1950 1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005 2010 2015 2020 2025

Cumberland Environmental Stewardship



Bottom Ash
Dewatering

Bottom Ash Dewatering and
gypsum wastewater treatment
systems construction started
Target completion for dry
handling conversion 2020



Cumberland Environmental Stewardship



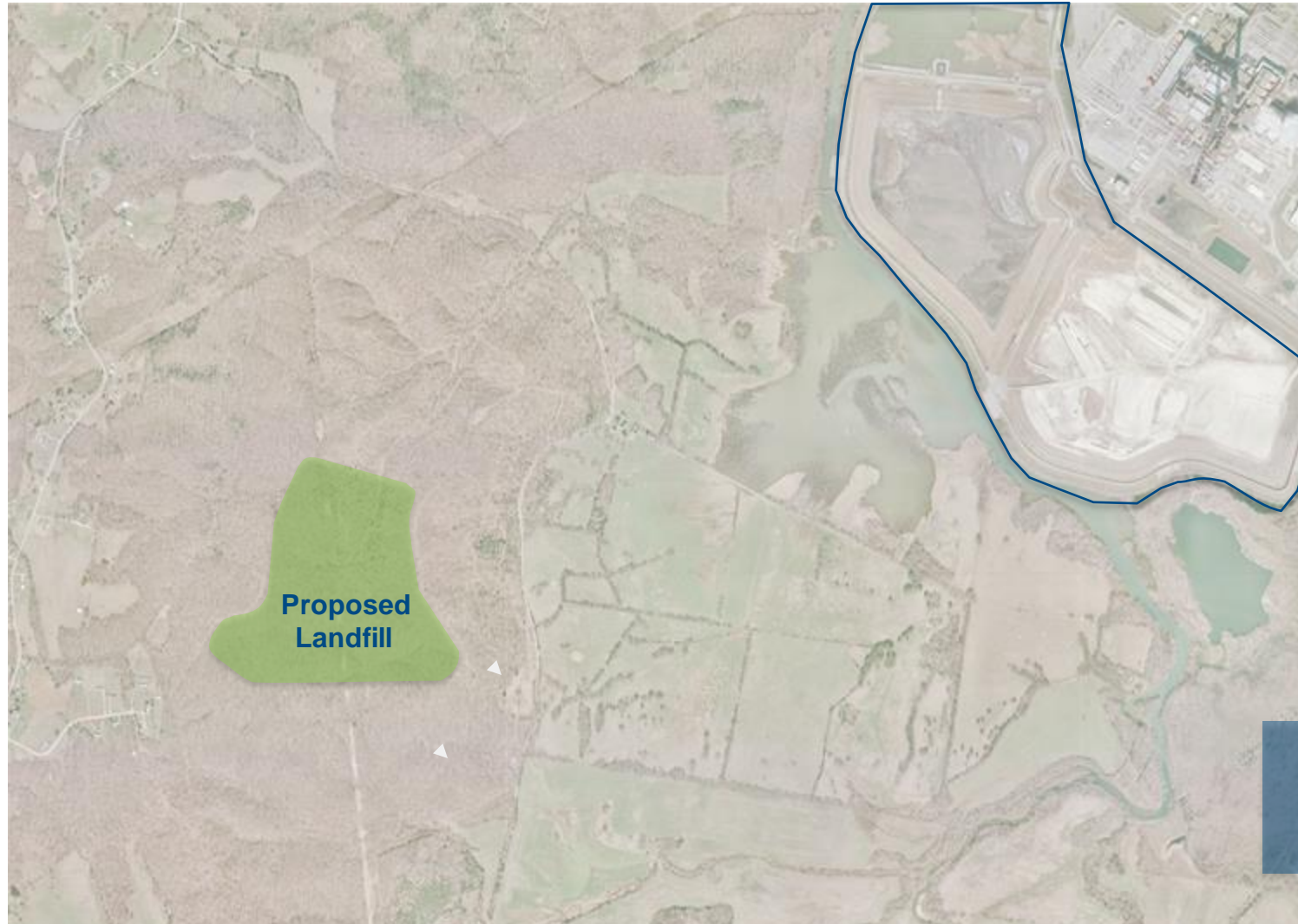
Temporary
lined basin
installed



Cumberland Environmental Stewardship



Cumberland Environmental Stewardship



Planned start of
Proposed Landfill
construction



Cumberland Environmental Stewardship



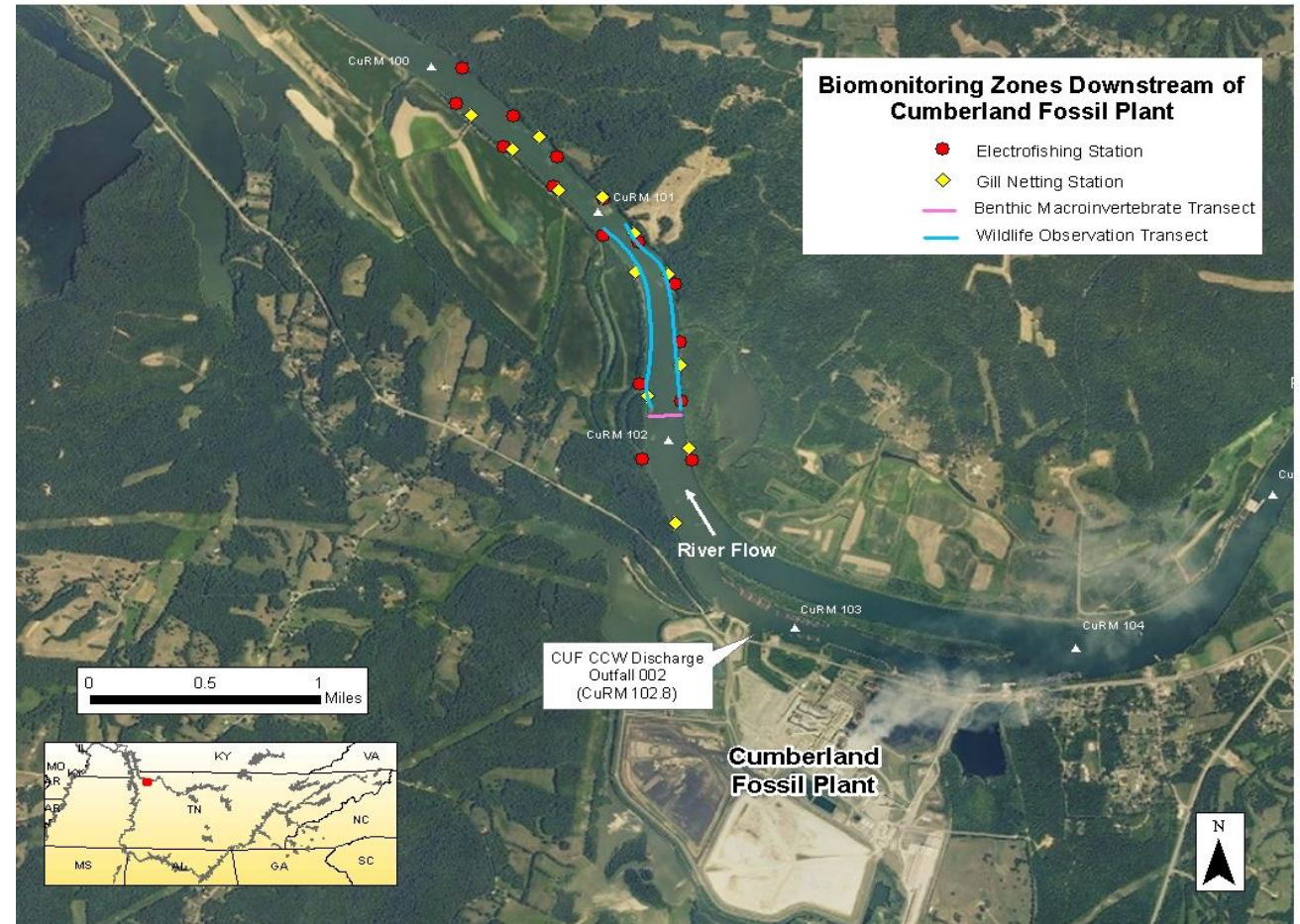
Planned completion of
Corrective Action/Risk
Assessment (CARA) Plan





Reservoir Health and Water Supply

- Water Quality Supports TDEC-Designated Uses for:
 - Water Supply
 - Fish & Aquatic Life
 - Recreation
 - Livestock Watering & Wildlife
 - Irrigation
 - Navigation
- Long-term Monitoring Program
 - Began monitoring in 1991
 - Fish and benthic communities healthy



For More Information

Cumberland Fossil Plant

<https://www.tva.gov/Energy/Our-Power-System/Coal/Cumberland-Fossil-Plant>

Air Quality – Water Quality – Ash Storage

<https://www.tva.com/Environment/Environmental-Stewardship>

TDEC Order

<https://www.tva.com/tdec>

Groundwater Monitoring

www.tva.com/ccr



Environmental Investigation

- Groundwater Study
 - Over 30 Wells
- Geology
- Residential Wells
- Coal Ash & Soils
- Cumberland River/Wells Creek
 - Sediment
 - Water
 - Aquatic Life
- Structural Integrity

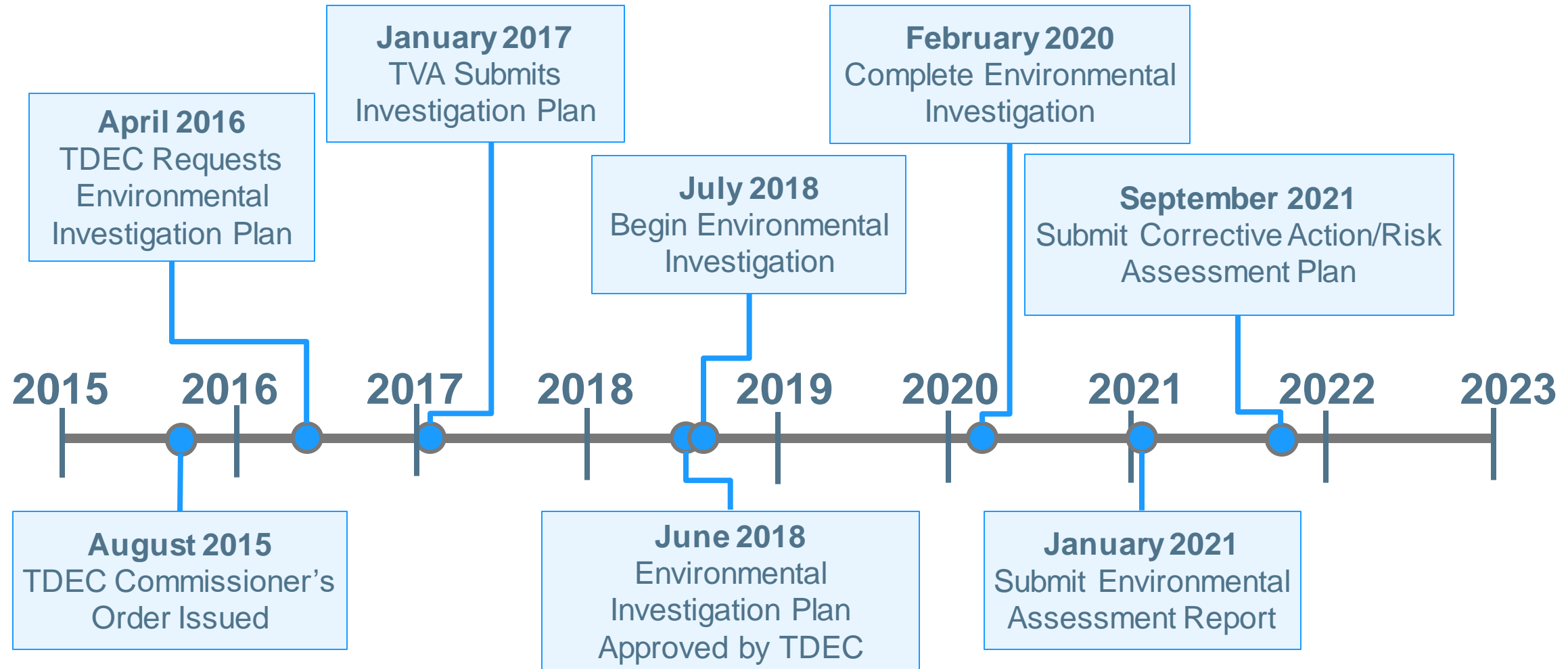


Groundwater

- No offsite groundwater impacts
- Collecting additional data for State and Federal programs to evaluate corrective actions



TDEC Order Environmental Investigation Timeline



Slope Stability

CCR Unit	Normal	Earthquake
Bottom Ash Pond	✓	✓
Stilling Pond (including Retention Pond)	✓	✓
Dry Ash Stack	✓	✓
Gypsum Storage Area	✓	✓

