



Colstrip Steam Electric Station Coal Ash Ponds

Site Update

August 2016

Introduction

The Montana Department of Environmental Quality (DEQ) is issuing this update to keep you informed about the investigation and remediation of groundwater impacted by the Coal Combustion Residual (CCR) ponds at the Colstrip, Montana coal-fired power plant.



Colstrip Steam Electric Station.

CCR, also known as coal ash, is the waste product from coal combustion. The ash, mixed with water, is transported in pipelines to storage ponds and either stays mixed with the water or settles to the pond bottom. The ponds are located in three areas:

- Plant Site Area,
- Units 1 & 2 Area,
- Units 3 & 4 Area.

Some of the water has seeped out of the ponds and impacted groundwater with boron, chloride, and sulfate, as well as other constituents. Talen uses an extensive well network to monitor the impacts and to capture and return impacted water to the ponds.

In August 2012, DEQ and PPL Montana, subsequently renamed Talen Energy (Talen), entered into an Administrative Order on Consent (AOC) to address the pond seepage. The AOC involves a step-by-step plan for remediation of the groundwater downgradient of the CCR ponds. For each of the three sites, Talen will submit three reports to the DEQ:

- A Site Characterization Report
- A Cleanup Criteria & Risk Assessment Report
- A Remedy Evaluation Report

Additionally, a Work Plan will be submitted to the DEQ preceding each of these Reports. Per the AOC, the DEQ is required to make a good faith effort to respond to a Work Plan within 30 days, and a Report within 75 days with any comments or changes. In addition, DEQ is required to hold a public meeting to obtain comments on the submitted reports (see below for ways to access the Reports). After the Remedy Evaluation Report is approved by the DEQ, Talen is required to implement the selected remedy. Upon completion of site remediation, a final report will be submitted to the DEQ.



Holding Ponds.

Updates

Settlement Agreement

In 2012, the Montana Environmental Information Center (MEIC), the Sierra Club and the National Wildlife Federation (NWF), sued the Colstrip Owners and the DEQ regarding the AOC. The lawsuit was settled on July 21, 2016, and resulted in a commitment by the Colstrip Owners to convert to dry CCR storage in the Units 3 and 4 Effluent Holding Ponds (EHPs) by July of 2022. This settlement agreement does not affect the operation of Units 3 and 4 or the Unit 1 and 2 Stage I & II Evaporation Ponds.



An example of what dry stacking looks like.

Updated Background Screening Level Report

Neptune and Company, Inc., Talen's consultant, has re-evaluated Background Screening Levels (BSLs) to help determine the extent of contamination resulting from CCR pond seepage. BSLs represent levels of Constituents of Interest (COIs)

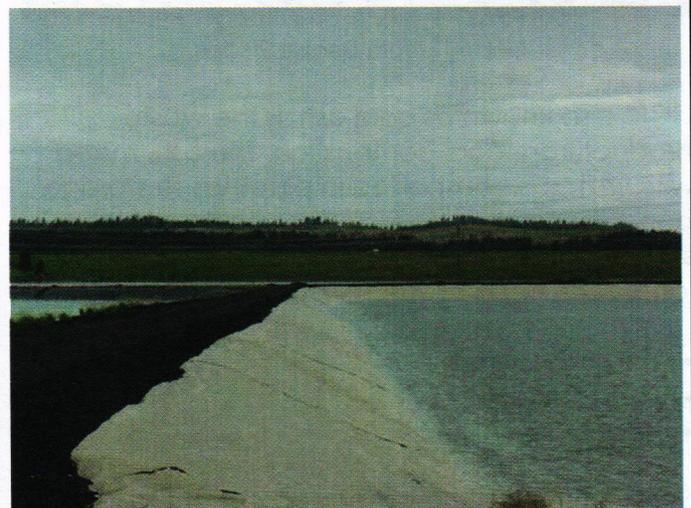


Units 3 and 4.

in un-impacted groundwater in the area, which help determine criteria for groundwater cleanup and will be used for analysis in the Remedy Evaluation Reports. BSLs were previously identified in 2004 and 2007, but a newer, state-of-the-art statistical method has been applied to the data to give a better representation of baseline water quality in the area. The report can be found at this link: deq.mt.gov/DEQAdmin/mfs/ColstripSteamElectricStation. DEQ and Weston Solutions, Inc., a DEQ consultant with statistics expertise, have reviewed the Report. DEQ will submit its comments as well as any public comments received and Talen will make corrections as necessary as directed by DEQ. Public comment on this Report is welcome from July 22 to August 22, 2016.

Site Characterization Reports for Units 1 and 2 SOEP/STEP sites and Units 3 and 4 EHPs

Talen submitted the Site Characterization Reports for the Units 1 and 2 ash disposal ponds and the Units 3 and 4 ash disposal ponds to the DEQ in March and June 2016, respectively. The Reports include groundwater models indicating the nature and extent of contamination, as well as descriptions of all remediation measures taken so far.



Unit 3 and 4 EHP Clearwell Lining.

The report can be found at this link: deq.mt.gov/DEQAdmin/mfs/ColstripSteamElectricStation. Reports are currently being evaluated by the DEQ and its consultant. DEQ will submit its

comments as well as any public comments received and Talen will make corrections as necessary as directed by DEQ. Public comment on these Reports is welcome from July 22 to August 22, 2016.

What's Ahead?

By mid-2017, the Colstrip Owners and the DEQ will complete the following:

- Talen will submit a revised Cleanup Criteria and Risk Assessment Work Plan for the Plant Site Area.
- Talen will submit a Cleanup Criteria and Risk Assessment Report and a Remedy Evaluation Report for the Plant Site Area.
- Talen will submit a Remedy Evaluation Work Plan for Units 3&4 Effluent Holding Ponds.
- Talen will submit a Remedy Evaluation Work Plan for Units 1&2 SOEP/STEP sites.
- Talen will submit a Cleanup Criteria & Risk Assessment Work Plan for the Units 1&2 SOEP/STEP sites.
- Talen will submit a Cleanup Criteria & Risk Assessment Report and Remedy Evaluation Report for Units 1&2 SOEP/STEP sites.
- Talen will submit a Cleanup Criteria & Risk Assessment Work Plan for the Units 3&4 Effluent Holding Ponds.
- Talen will submit a Cleanup Criteria & Risk Assessment Report and a Remedy Evaluation Report for the Units 3&4 Effluent Holding Ponds.

For more details on this process, please view the AOC agreement between Talen and the DEQ, available on the DEQ Colstrip website: <http://deq.mt.gov/DEQAdmin/mfs/ColstripSteamElectricStation>.



Colstrip Units 1 and 2 Closed and Reclaimed Stage One Evaporation Pond

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Name
Address
City, State Zip

Upcoming DEQ Public Meeting Announcement

DEQ will hold a public meeting at the Colstrip City Hall, 12 Cherry St., Colstrip, Montana, on August 11, 2016 at 7 p.m. to 1) provide information about the AOC process, including overviews and updates of reports submitted to the DEQ; 2) provide an update on the settlement between the DEQ, the Colstrip Owners, and the MEIC/Sierra Club/NWF regarding remediation of the fly ash ponds; and 3) obtain public comment on the Updated Background Screening Level Report, the Units 1 and 2 Stage I and II Evaporation Pond Site Report, and the Units 3 and 4 Effluent Holding Pond Site Report. In addition, Talen will provide an update on their CCR Rule compliance activities. DEQ and Talen will answer questions related to the presentations at the meeting prior to taking public comments on the three reports.

A public comment period to respond to the Updated Background Screening Level Report, the Units 1 and 2 Stage I and II Evaporation Pond Site Report, and the Units 3 and 4 Effluent Holding Pond Site Report is open from July 22 to August 22. All Reports are available at DEQ's office at 1520 E. 6th Ave., Helena, Montana; Talen Montana's office at 303 N. Broadway, Suite 400, in Billings, Montana; the Bicentennial Library, 419 Willow Ave., Colstrip, Montana; or electronically at deq.mt.gov/DEQAdmin/mfs/ColstripSteamElectricStation. Written comments may be submitted to Sara Edinberg, DEQ—Waste Management and Remediation Division, PO Box 200901, Helena, MT 59620-0901, or electronically to DEQColstrip@mt.gov. DEQ will also accept verbal comments during the formal public hearing portion of the public meeting beginning at 8:00 pm. Responses to public comments will be available after the close of the comment period, and will be posted on the DEQ Colstrip website and emailed to the Colstrip mailing list.

Colstrip Administrative Order on Consent Settlement and Cleanup September 2016



Aimee Reynolds
Waste Management and Remediation
Division

Agenda

- Site Overview
- Concerns
- What's being done?
- Administrative Order on Consent
- Coal Combustion Residual Rule
- Settlement Agreements
- Questions



**Stage I and II Evaporation
Pond Area**

**Westmoreland Coal Company
Rosebud Mine
AREA D**

**Units 1-4
Plant Site Area**

**Surge
Pond**

Cow Creek

**COLSTRIP
TOWNSITE**

Units 3 & 4 EHP Area

**Westmoreland Coal Company
Rosebud Mine
AREA A**

**Westmoreland Coal Company
Rosebud Mine
AREA E**

East Fork Armells Creek

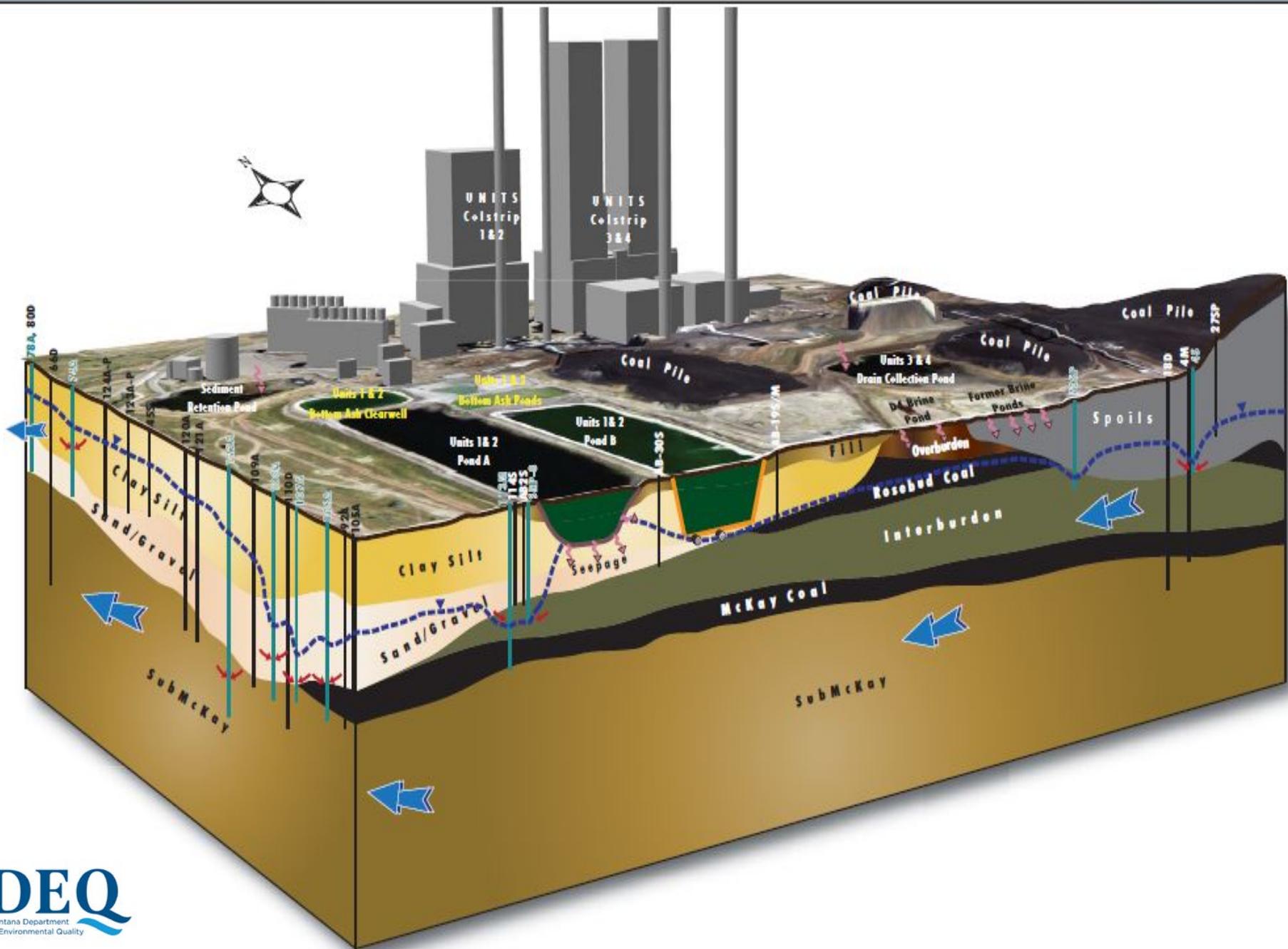
Westmoreland Coal Company Rosebud Mine AREA B

**Site
Overview**

Geology Overview

- Part of the Powder River Basin
- Fort Union Formation
 - Ancient river deposits
- Complex hydrogeology
 - Separate units
 - Flow paths





Colstrip Coal Ash Storage – Plant Site Area



Colstrip Coal Ash Storage – Units 1 & 2 Area



← 2000 feet

Stage 2

Stage 1

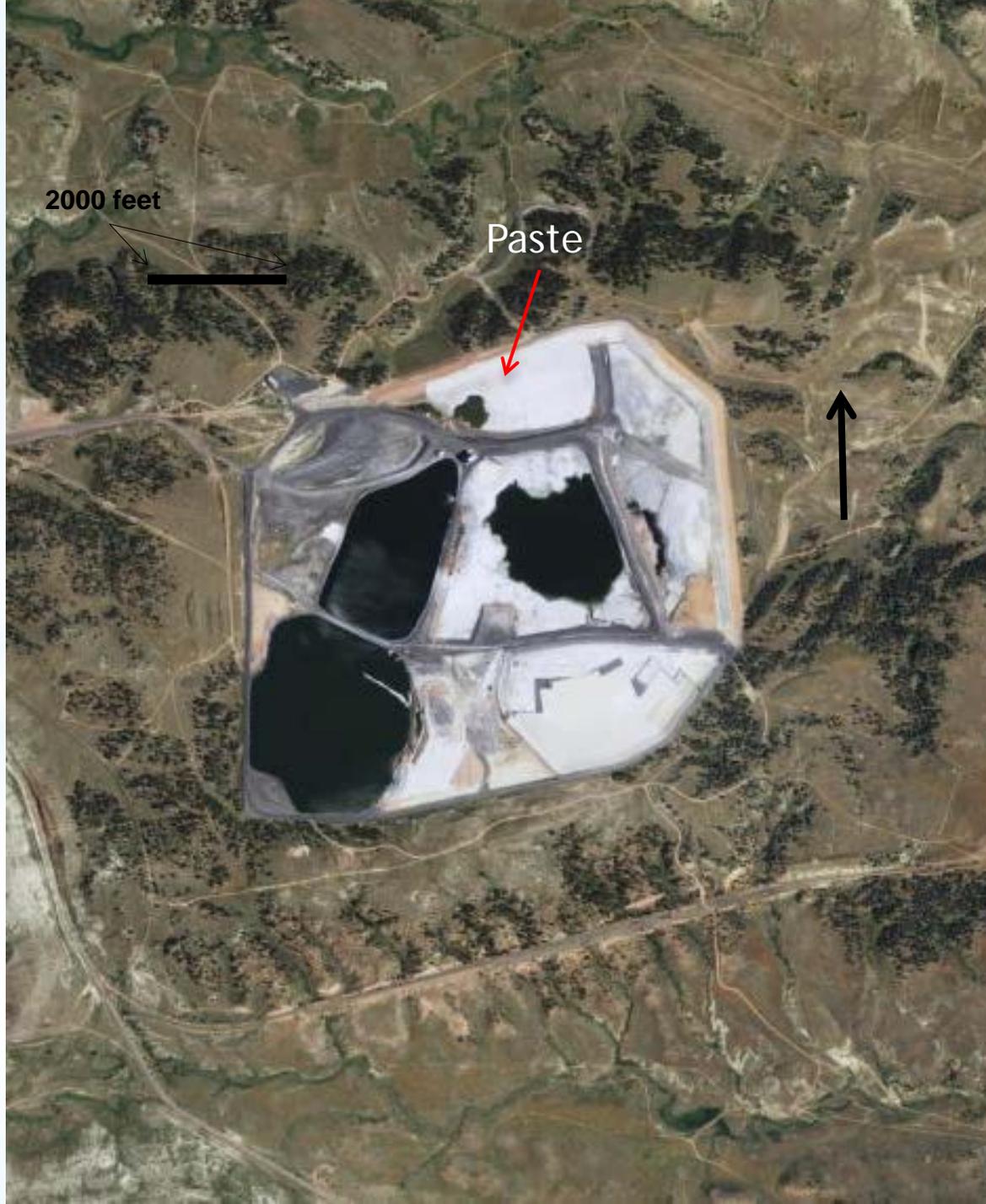
Surge Pond

Active Mining

Fly ash deposition only

Colstrip Coal Ash Storage – Units 3 & 4 Area

Fly ash deposition only



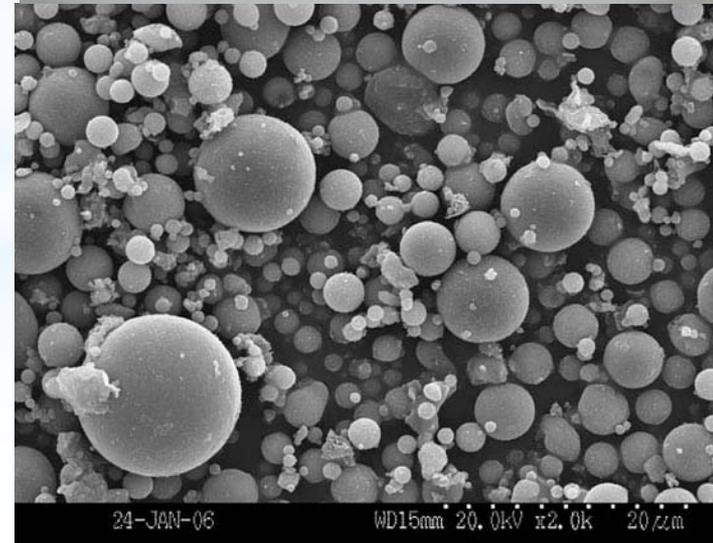
Concerns

What is coal ash?

Solids left over after coal is burned

- Two forms

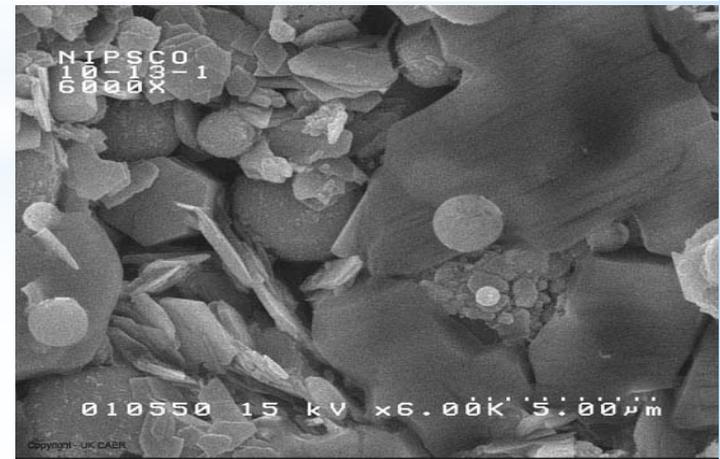
Fly Ash (caught by scrubbers)



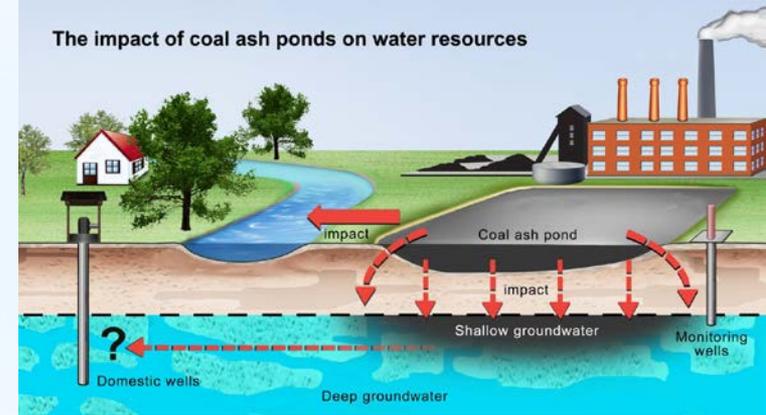
What is coal ash?

Bottom Ash (bottom of boiler)

- Both are stored in ponds as a slurry
- About 10% of coal volume burned



What are the concerns?



- Coal ash contains chemicals or constituents
- Constituents may dissolve in pond water
- Pond water seeps into groundwater
- Groundwater concentrations of “constituents of interest” become elevated
 - Background screening levels used for comparison
 - For example: chloride, boron, sulfate, and specific conductivity

Plant Site Area

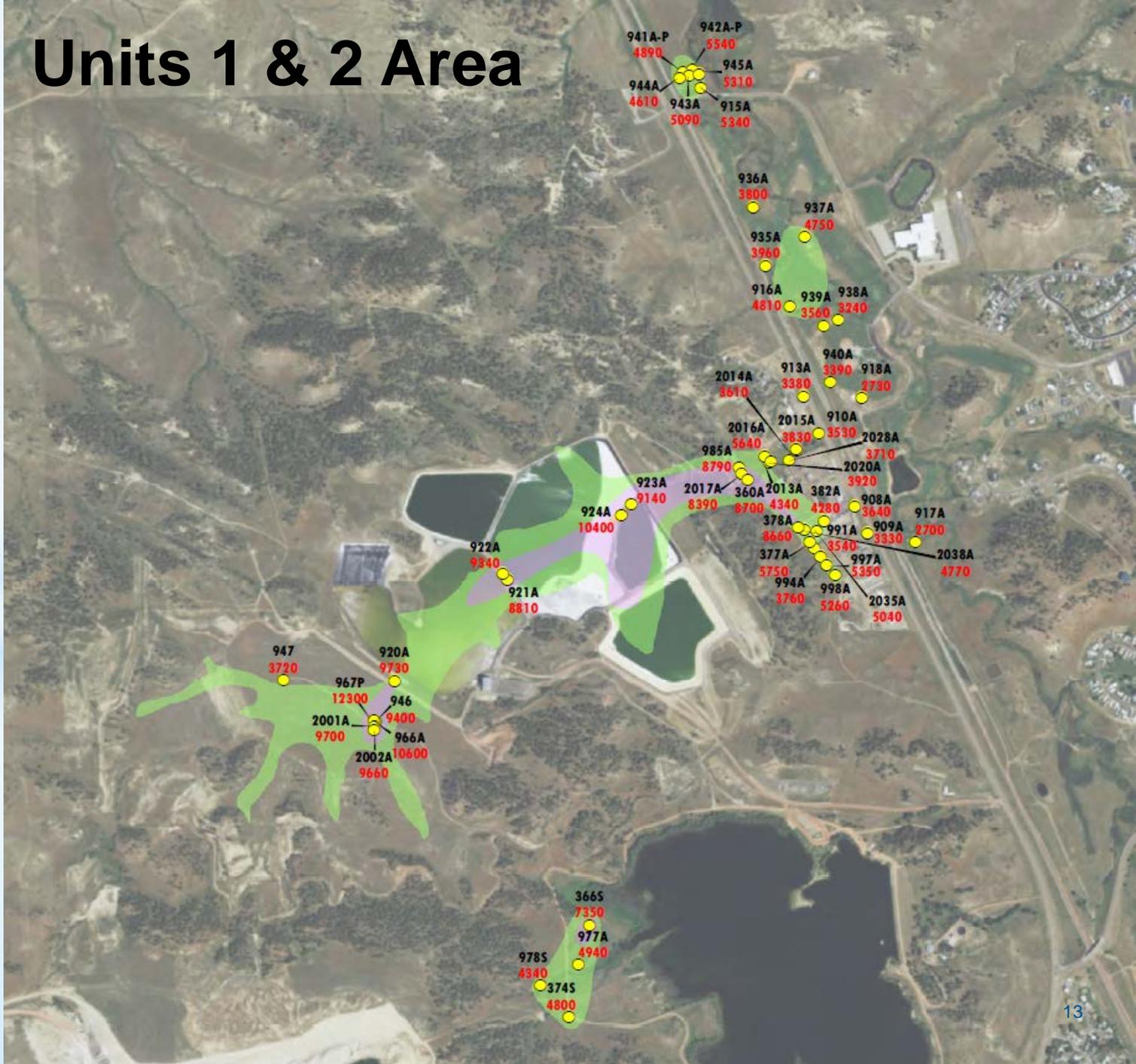


Background screening level exceedance in shallow groundwater

Green: lower
Purple: medium
Orange: highest

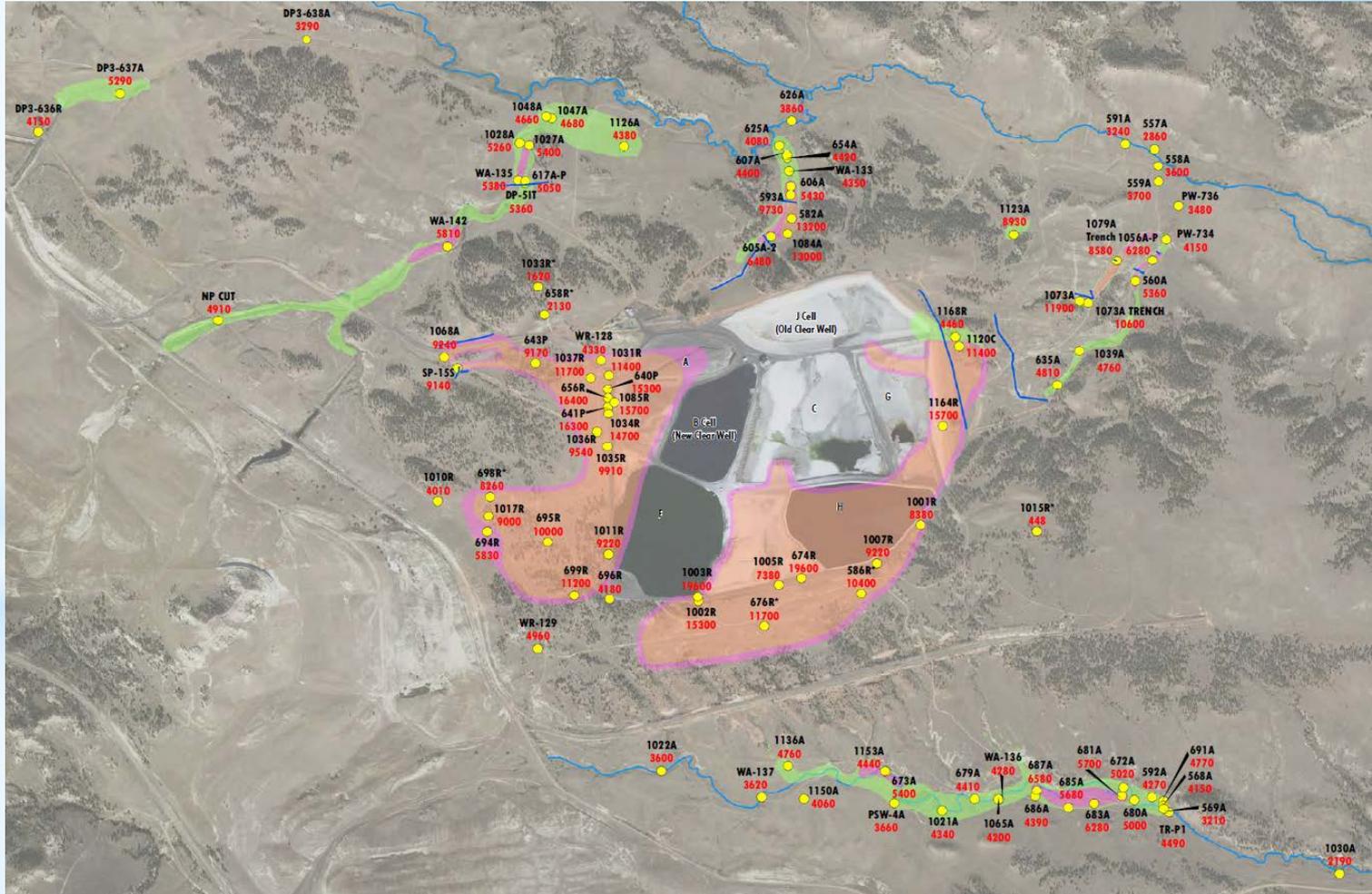
Background
Screening
Level
Exceedance
in Shallow
Groundwater

Units 1 & 2 Area



Background
Screening
Level
Exceedance
in Shallow
Groundwater

Units 3 & 4 Area

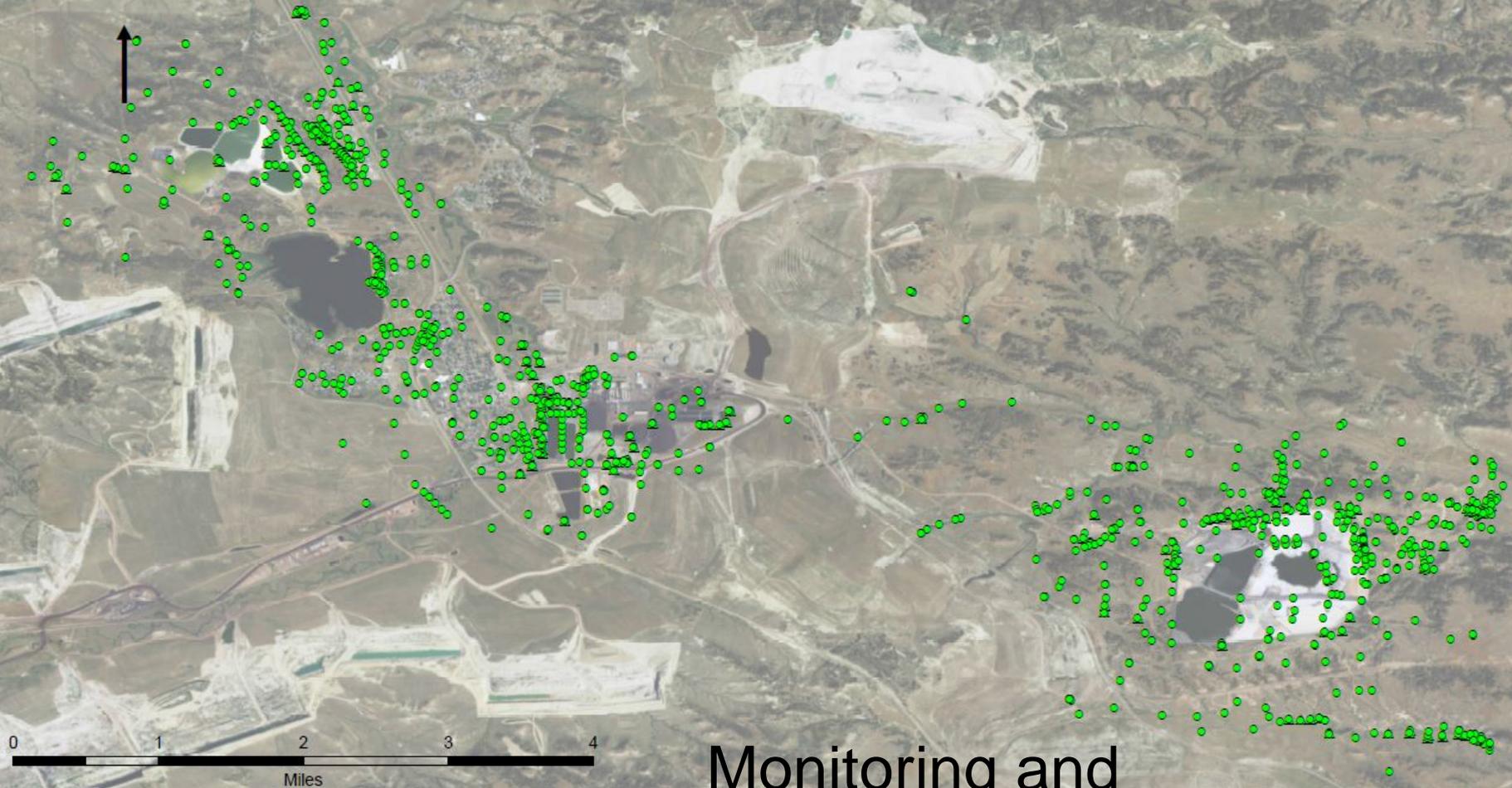


What is being done?

- All active storage ponds now lined (clay/bentonite or geomembrane)
- Some ponds have been closed
- Extensive capture systems
 - Capture wells pump groundwater back to the ponds
 - Dam capture system



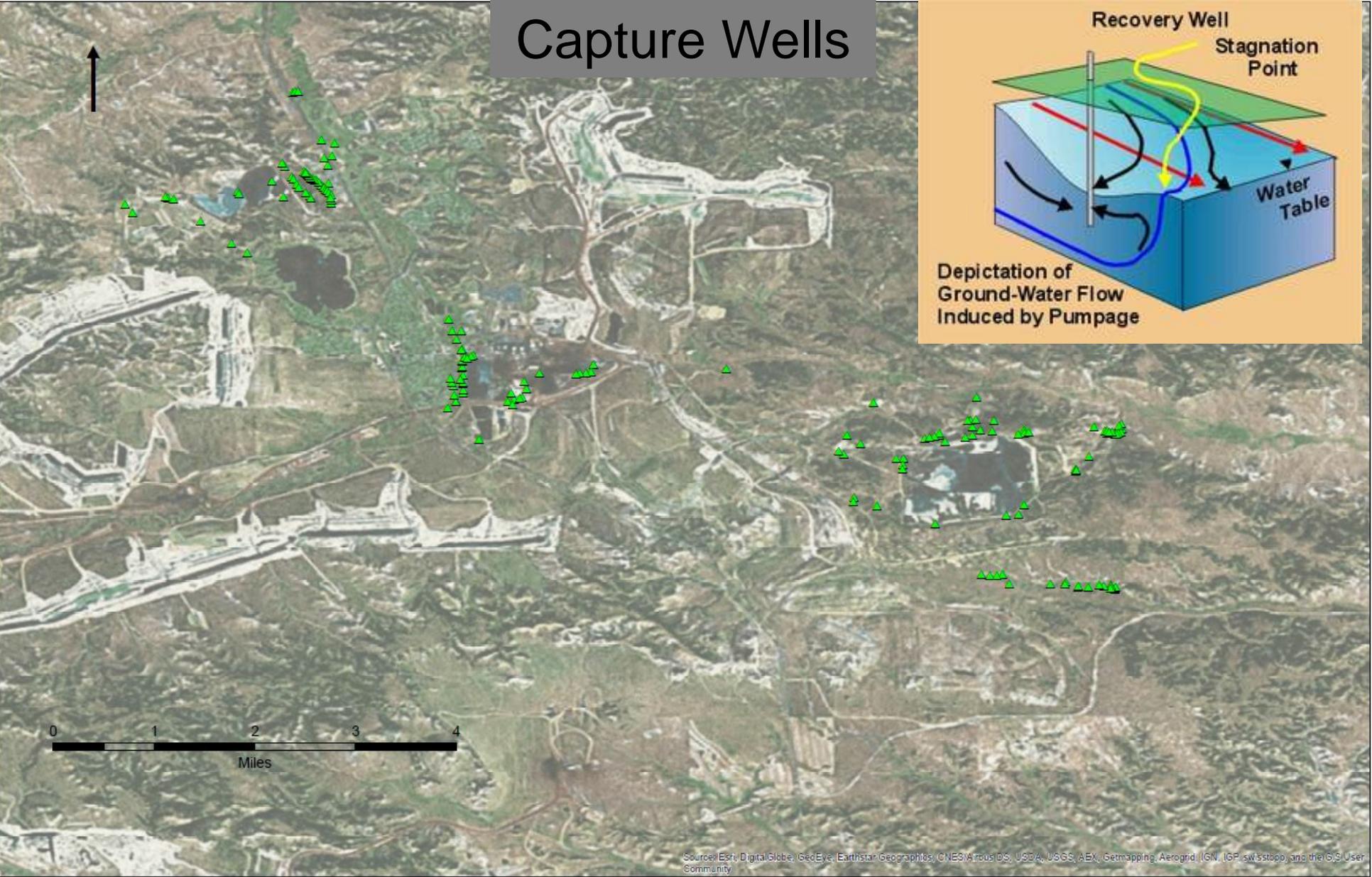
Colstrip Well Network



Monitoring and
Capture Wells

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Capture Wells



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Administrative Order on Consent Process

- AOC – Administrative Order on Consent
- Enforcement agreement between DEQ and Talen to address groundwater contamination
- Effective Date: August 3, 2012



AOC Process

- All ash storage and transport
- Background screening levels
- Montana water quality standards
- Where no standards - risk based assessment
- Adaptive management practices
- Legal basis in Montana Major Facility Siting Act and Water Quality Act
- Financial assurance
- Public participation

AOC Process

Site Characterization – Plant Site complete, Units 1&2 and 3&4 Reports under review



Risk Assessment and Cleanup Criteria Development – Plant Site



Remedy Evaluation – Plant Site and Units 1&2



Remedy Selection by DEQ



AOC Process

Remedial Design



Remedy Implementation



Facility Closure (ponds, groundwater)



Maintenance and Monitoring

Move of Colstrip AOC process to DEQ Waste Management and Remediation

- From Environmental Management Bureau to Waste Management and Remediation – January 2015
- New Project Manager – July 2016

Disposal of Coal Combustion Residuals from Electric Utilities (CCR Rule)



- Final Rule Promulgated 4/17/15
- Non-hazardous waste
- Self-implementing

Requirements

- **Structural Integrity**
- **Location**
- **Liner**
- **Operational**
- **Groundwater Monitoring**



CCR Closure Requirements

- Structural/Location/Liner
- Groundwater above Federal maximum contaminant levels or background
- Clean close
- Close in place – dewater & final cap
- Ponds closed before 10/19/15 not regulated under CCR but still under AOC
- Ponds that don't receive CCR after 10/19/15 not regulated under CCR but still under AOC

Federal Settlement Agreement

- Associated with air impacts
- Results in closure of Units 1 & 2
- DEQ not a party
- Units 1 & 2 ponds will still be addressed under the AOC
- As much water as possible will be removed
- No new water will be added



Administrative Order on Consent Settlement Agreement

- Prior to Court ruling, Talen and Earth Justice settled
- DEQ approved
- Requires Units 3 & 4 switch to dry stacking by July 1, 2022
- Likely would have been evaluated
- Enforceable through Court, not the AOC
- Additional drying of paste to moisture content of soil
- Much less water
- Managed like a landfill

Dry Stacking



Dry Stacking



Questions?

