Reserve Silica Corporation Site Cleanup Status Update Winter 2019

Solid Waste Management Program

Northwest Regional Office

DEPARTMENT OF ECOLOGY
State of Washington

Ecology Contacts

Co-Site managers

Alan Noell, PhD, PE

Tim O'Connor, LHG

Public participation coordinator

Nancy Lui

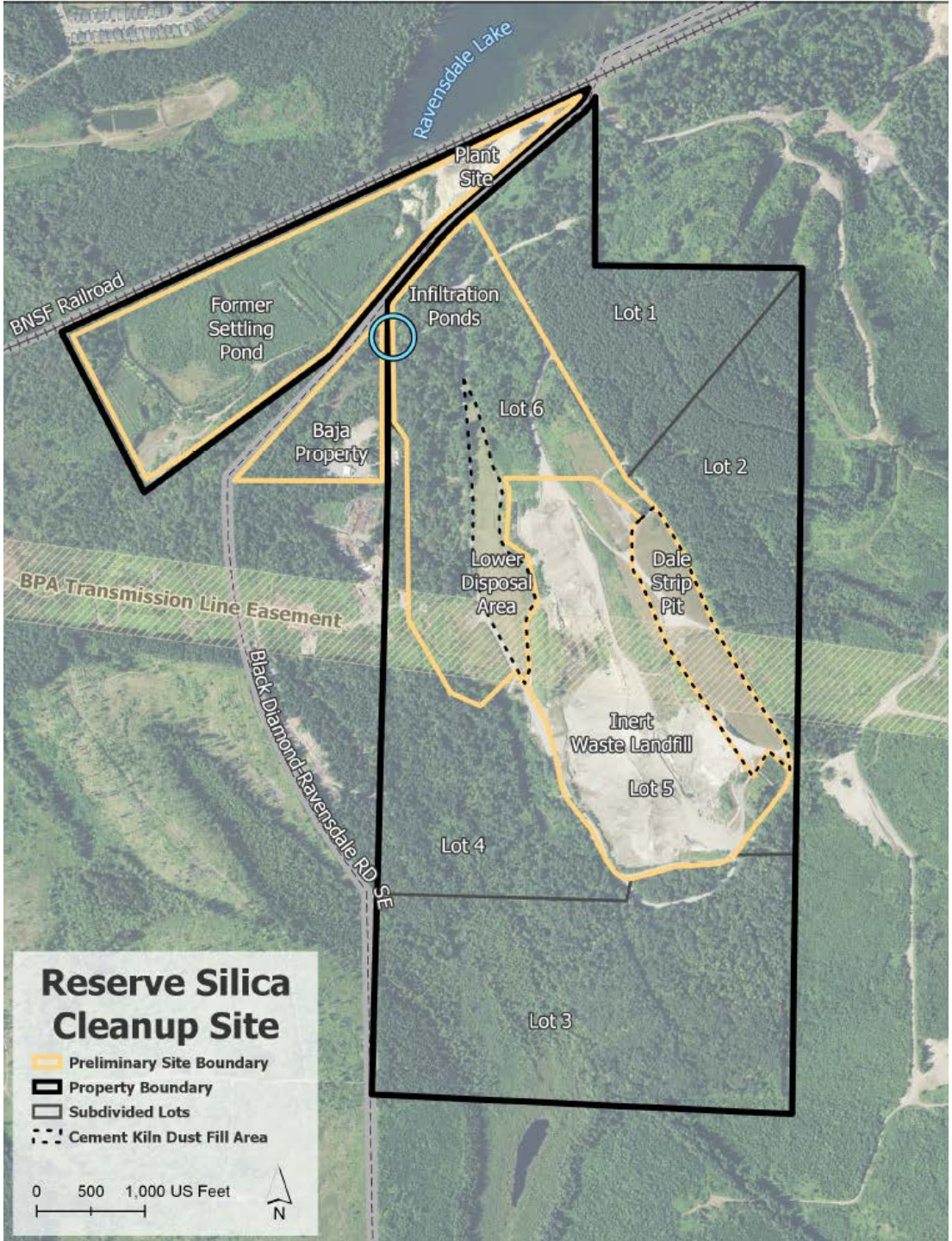
Communication Manager

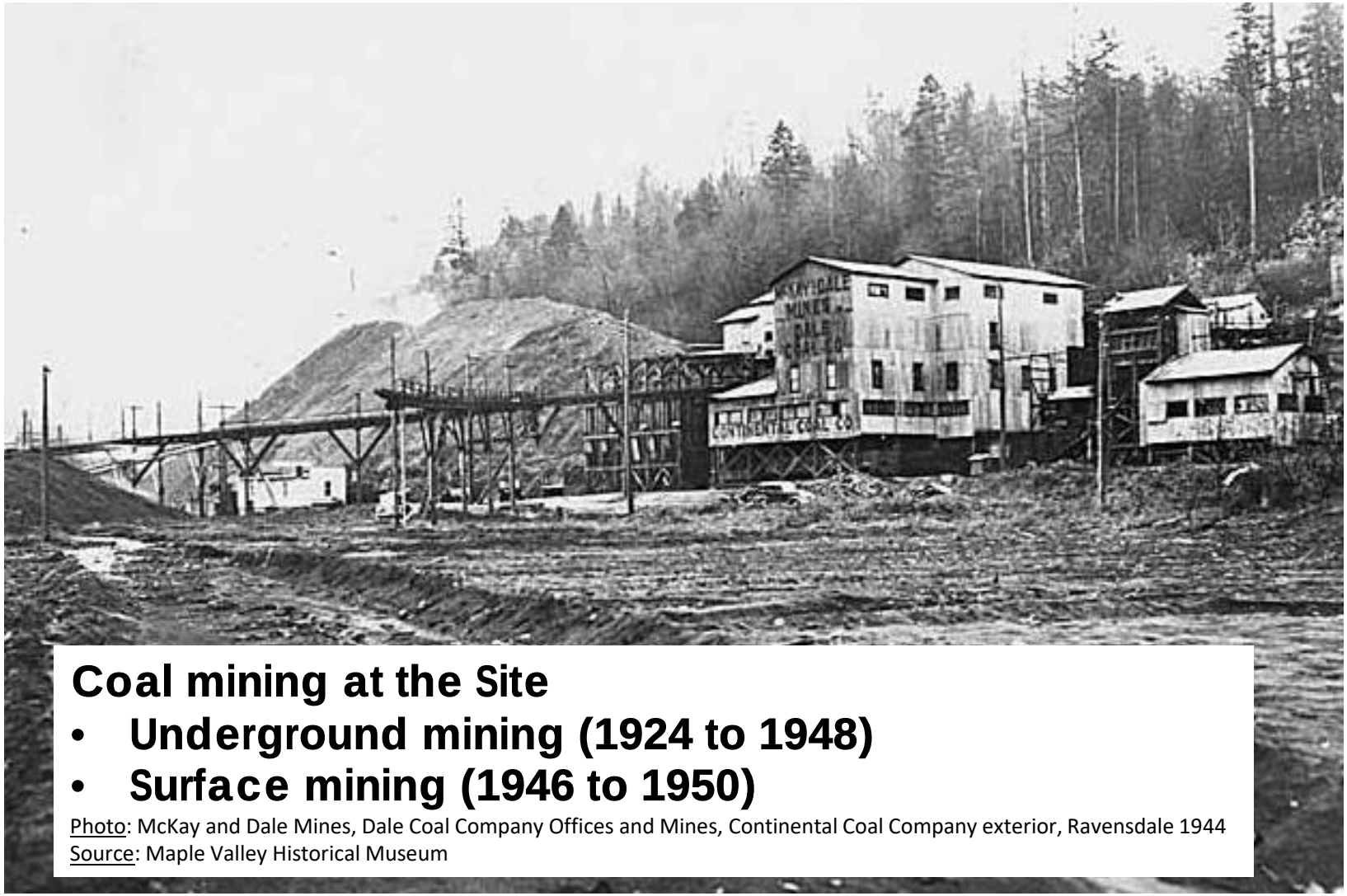
Dave Bennett

Potentially Liable Parties (PLPs)

- Holcim (US) Inc.
- Reserve Silica Corporation
- BNSF Railway

Site Background

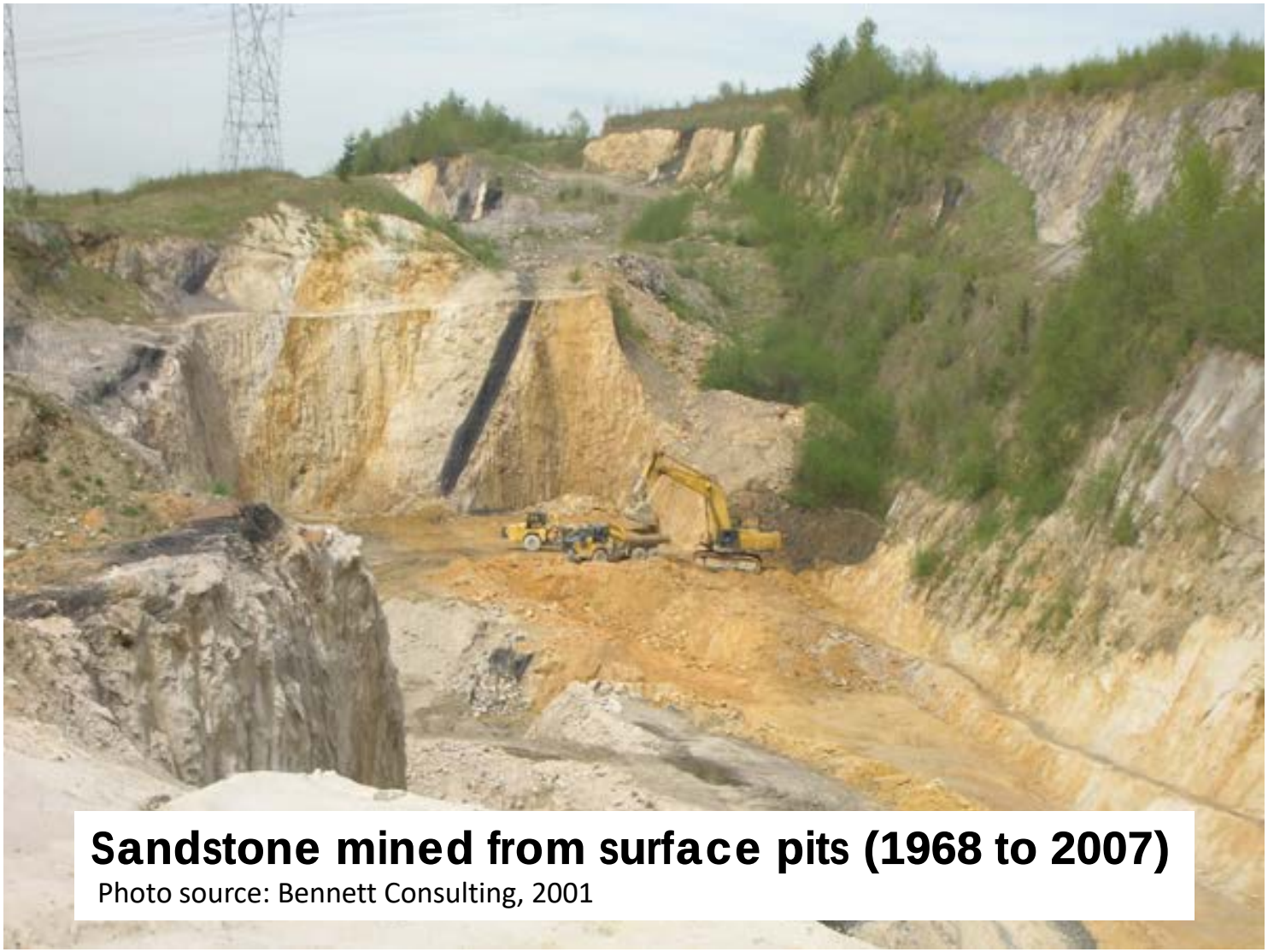

Ravensdale Lake
Plant Site
BNSF Railroad
Former Settling Pond
Infiltration Ponds
Lot 1
Lot 6
Baja Property
Lot 2
Lower Disposal Area
Dale Strip Pit
BPA Transmission Line Easement
Black Diamond-Ravensdale RD SE
Inert Waste Landfill
Lot 5
Lot 4
Lot 3
Reserve Silica Cleanup Site
Preliminary Site Boundary
Property Boundary
Subdivided Lots
Cement Kiln Dust Fill Area
0 500 1,000 US Feet
N



Coal mining at the Site

- **Underground mining (1924 to 1948)**
- **Surface mining (1946 to 1950)**

Photo: McKay and Dale Mines, Dale Coal Company Offices and Mines, Continental Coal Company exterior, Ravensdale 1944
Source: Maple Valley Historical Museum



Sandstone mined from surface pits (1968 to 2007)

Photo source: Bennett Consulting, 2001


Surface reclamation (1979 to present)

Landfilled Areas

Closed Limited Purpose Landfill

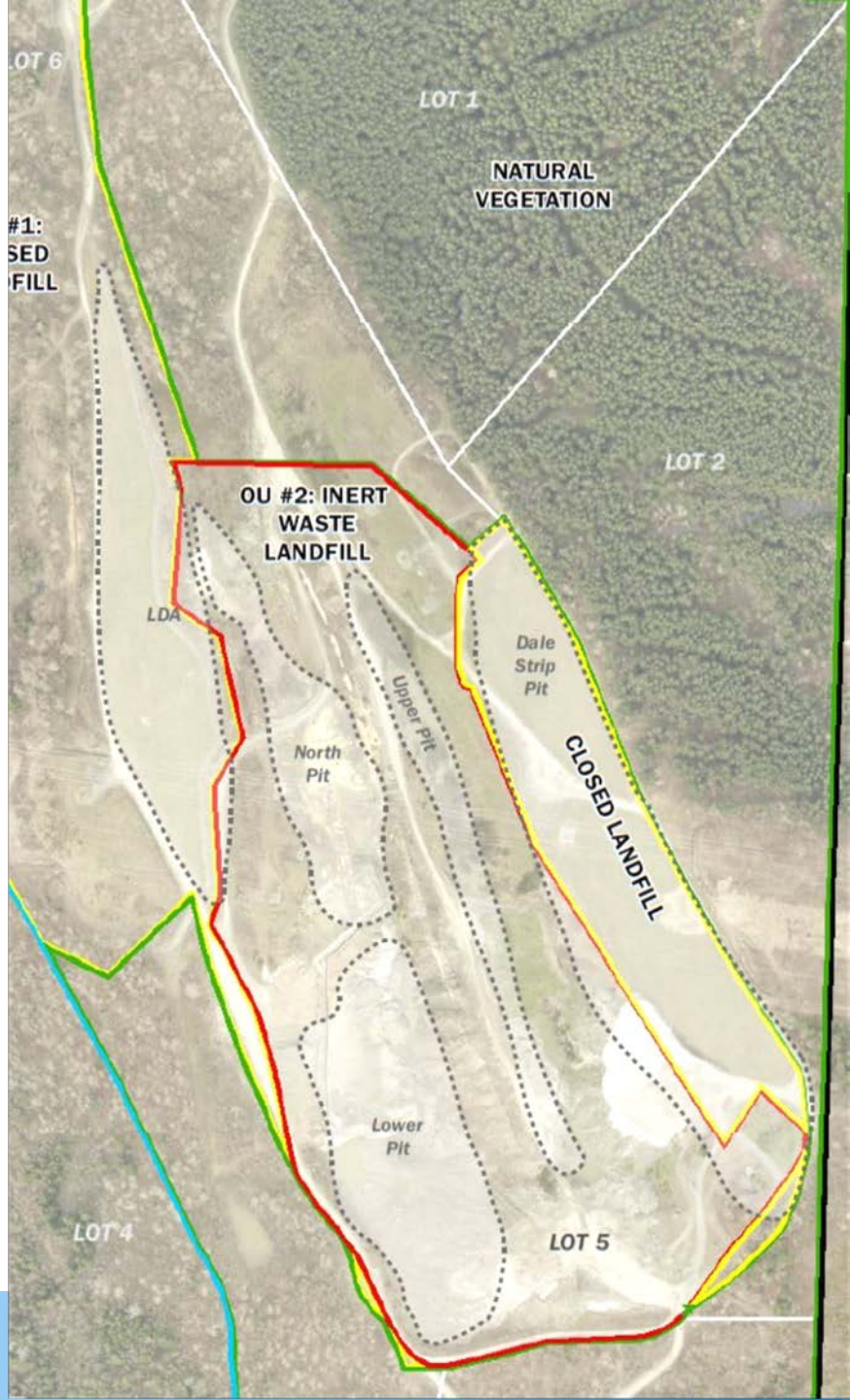
- Lower Disposal Area
- Dale Strip Pit

Inert Fill, completed

- Upper Pit

Inert Waste Landfill

- North Pit
- Lower Pit



Release of high pH water

Cement Kiln Dust

By-product of cement manufacturing

- Recovered emissions dust
- Primarily consists of $CaCO_3$ and SiO_2

Landfilled behavior

- Partially cemented material
- Low permeability

Impacts groundwater

- Increases pH
- Mobilizes naturally occurring metals

Lower Disposal Area Leachate

- Leachate seeps to surface water documented since 1986
- Elevated pH and arsenic concentrations in south pond and infiltration pond
- Interceptor trenches installed at the time

Independent Remedial Actions

Independent Remedial Actions

- Upgrade of Lower Disposal Area (LDA) and Dale Strip Pit covers
- Seepage collection trench for LDA
- Interceptor trench for LDA
- Seepage treatment system

Cover Restoration

Lower Disposal Area

September to October 2007

Dale Strip Pit

November 2010 to July 2011

Lower Disposal Area

2008 – Test trenches

2009–2012 – Monitoring and hydrogeological studies

2013 – Seepage collection and diversion trenches

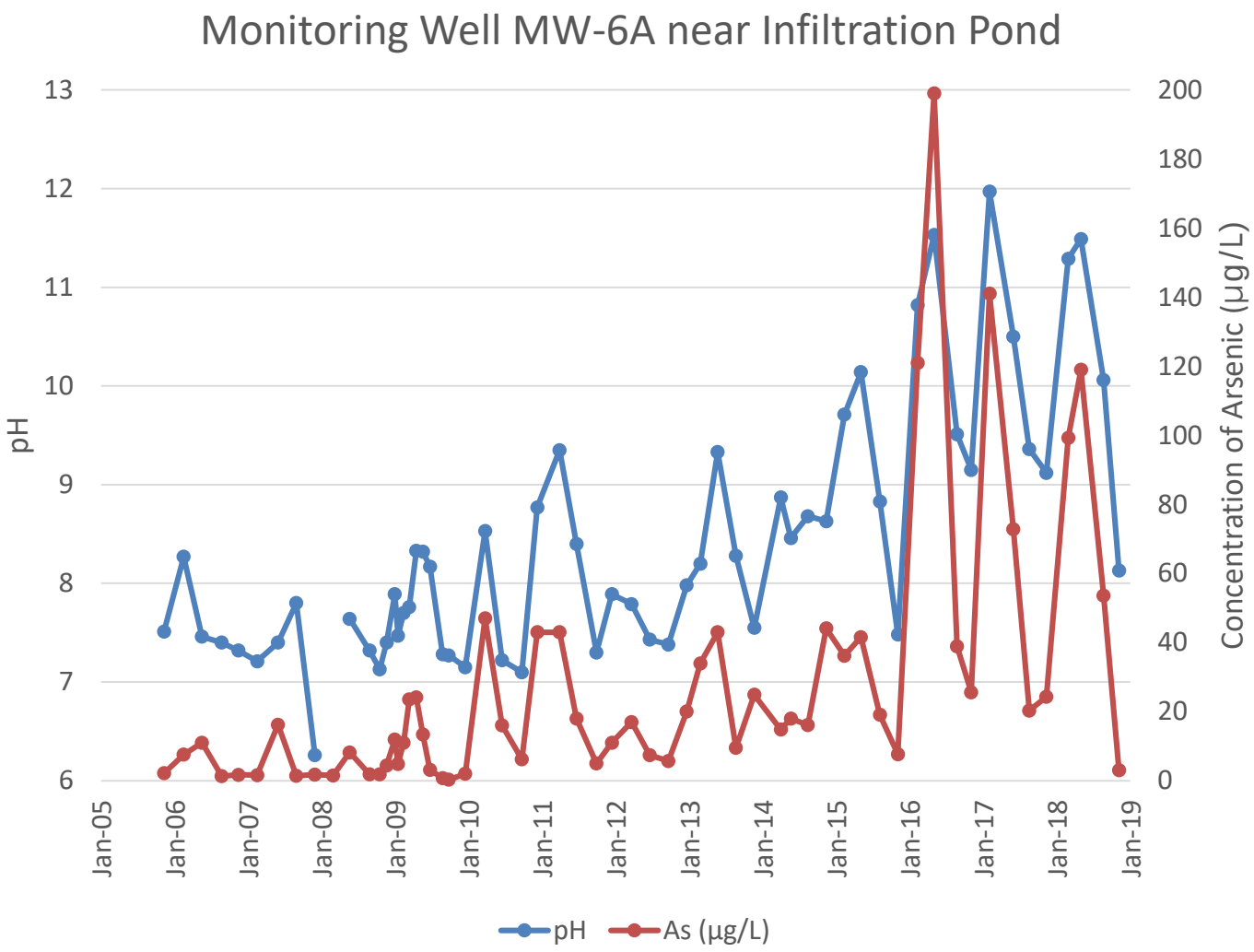
2017 – Trench extension and conveyance upgrades

2018 - Seepage treatment system

2018 Seepage Treatment System

- CO_2 Sparging System – Neutralizes pH, lowers arsenic and lead concentrations
- Iron filings – Adsorbs residual arsenic

Treatment System Improvement



Plant Site

Historical mining activities for coal and sand

- Coal mining ended 1950
- Sand mining ended 2007

Decommissioning started 2015

Investigations of environmental conditions

Agreed Order and Next Steps

Agreed Order

- Formal agreement between Ecology and PLPs to cleanup the Site per Model Toxics Control Act

- Ongoing negotiation with Reserve Silica Corporation and Holcim (US) Inc.

Public Participation

Public comment request

- Draft Agreed Order and Draft Public Participation Plan
- Meeting held Nov 16, 2018
- Comments received by Dec 7, 2018

Quarterly updates to GMVUAC

Check our website

https://fortress.wa.gov/ecy/gsp/Sitepage.aspx?csid=4728

Next Steps


RI Work Plan
RI Field Work Complete
RI Report
FS Report
Draft Cleanup Action Plan
2019
2020
2021
2022
2023

Questions and Answers