OLAC/VTCA Reclamation Awards

2022 Nominations

Charlottesville, Virginia

2021 Overall Winner

Quarry and Overall : Winner
Vulcan Construction Materials: Royal Stone Quarry



A wildlife seed mix was used to reclaim the Northeast Overburden Disposal Area. The seed mix contained Cereal Rye, Foxtail Millet, Red Clover, Appallo Lespedeza and wildflowers. Oaks, Hickory and Black Locust were planted on fill slopes with White Pine to re-establish cover for wildlife. The seed mix was intended to attract turkey and dove. In addition to attracting those game birds, Bobwhite Quail and a wide variety of songbirds have been seen and heard in the Northeast Overburden Disposal Area.





Glade Mountain Mine Reclamation

Nominated by: Sarah Hamm

Site Background

- Historic Glade Mountain Mine located near Atkins, Virginia.
- Site is currently on US Forest Service property
- Mined Manganese and iron ores intermittently between 1910 -1956
  - Material mined in the 1950s was all used for the US government's General Service Administration
- Site was reclaimed after mining in the 1950s
- Due to overgrowth of vegetation in the reclamation area, repairs were needed.
- As a part of this project a drainage channel was replaced, a drainage channel at a fishing pond was cleaned, and the fishing pond was treated with flocculant to clear sediment

The Problem

- Water from an existing drainage channel was bypassing a previously installed gabion mattress channel
- Water cut a path through old mine spoil, picking up sediment and depositing it into a pond down stream.
- The pond ultimately discharged into Killinger and Cripple Creeks, causing major pollution.



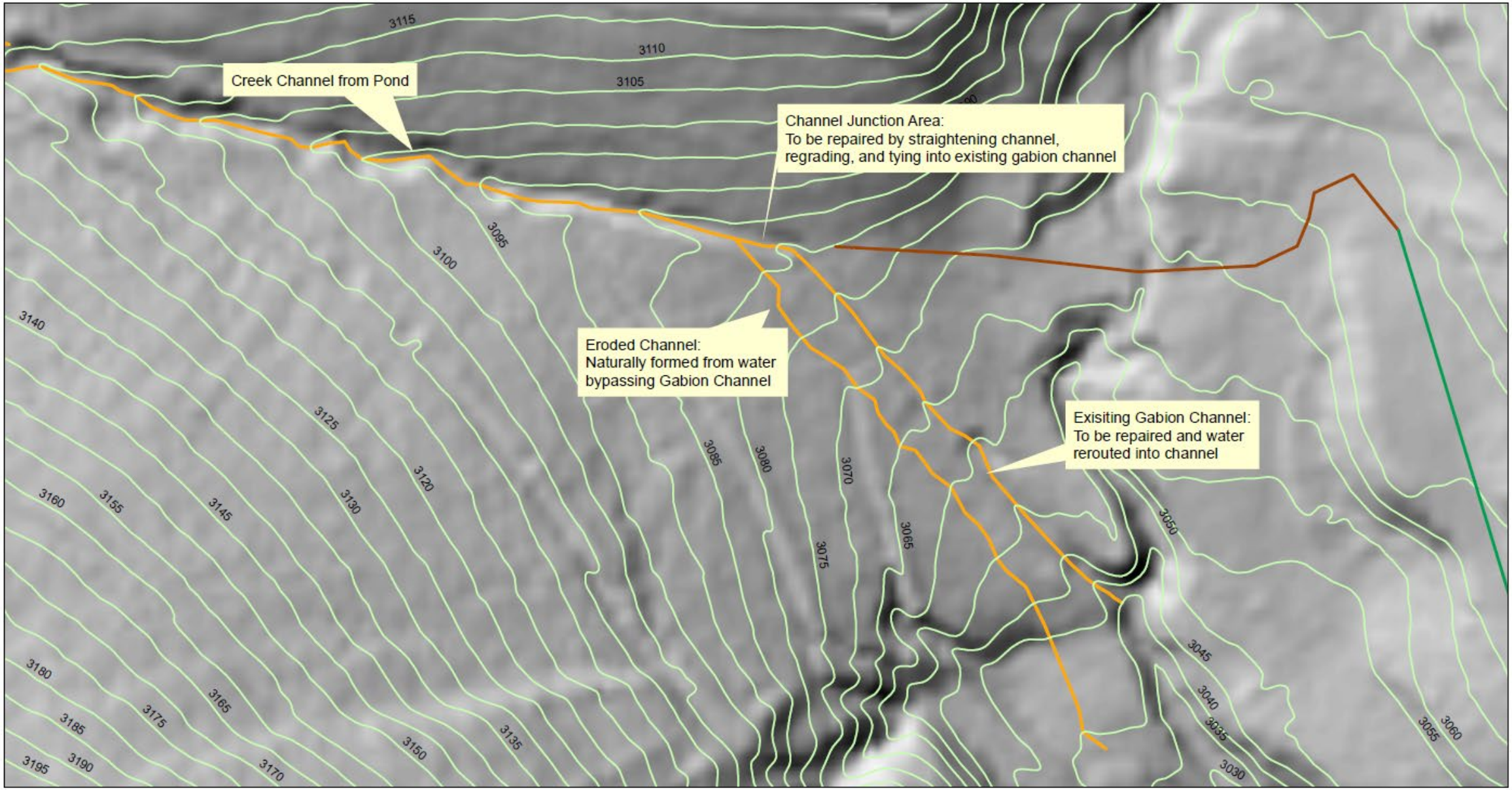
Killinger Creek (upper creek) joins White Rocks Furnace Creek (lower right) to form Cripple Creek (upper right). Water from the mine site was causing heavy sedimentation in Killinger Creek

Work Areas

Upper drainage channel work area

Lower fishing pond work area





Worksite Drainage Overview

Legend

Road Type C
Road Type D
Drainage Flow

Scale

1 inch = 50 feet

0 5 10 20 30 Feet

Glade Mountain Reclamation Project

Sheet No. 4 of 8

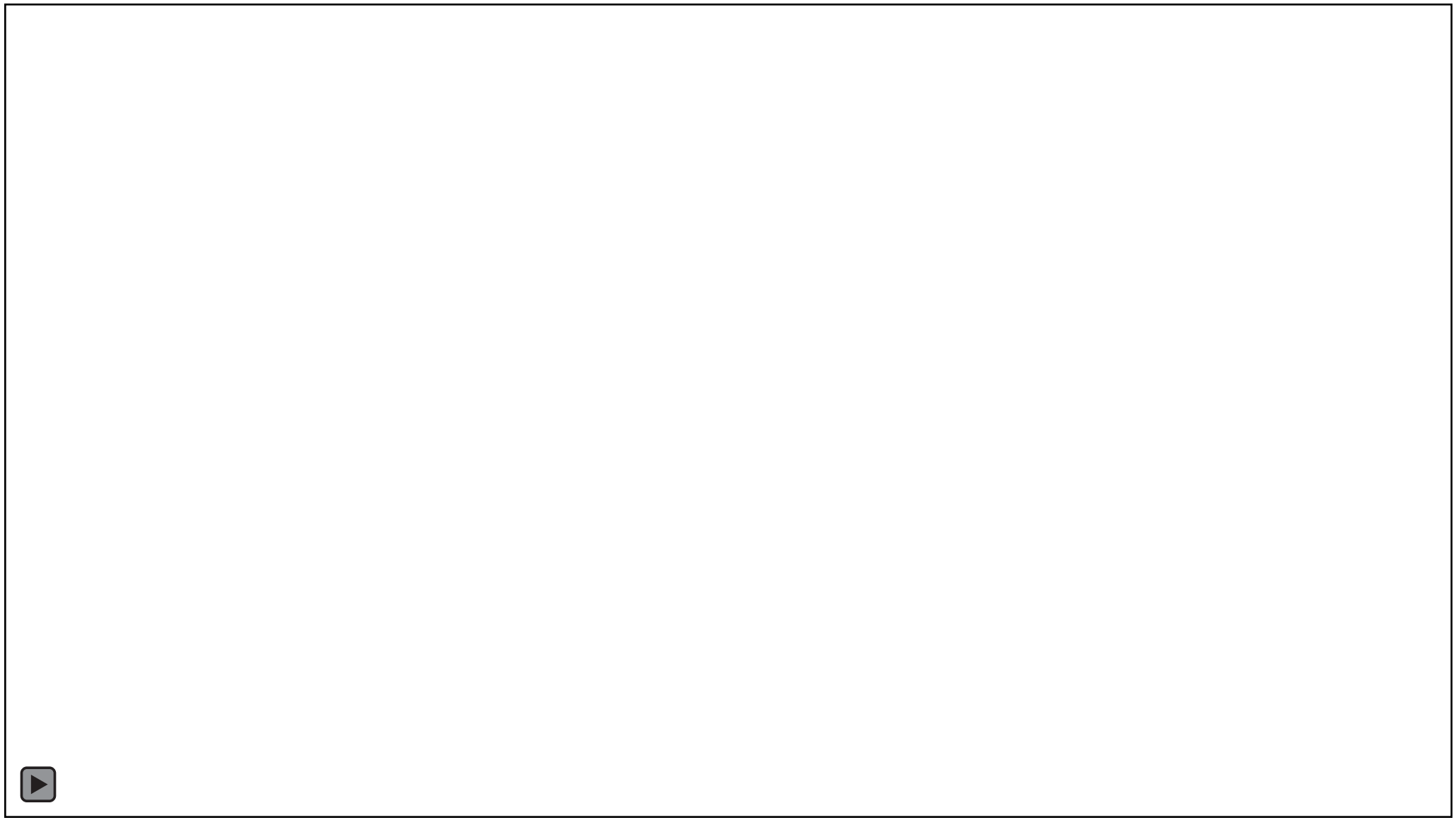
Drawn by: SSH

Date: 04/13/2020

Existing Gabion Mattress Channel



Overgrowth of vegetation caused major issues with the original reclamation



Video from initial site visit showing problem (before additional erosion). Watch first 30 seconds.

Water Comparison



Entering Eroded Channel



Exiting Eroded Channel

Additional Erosion





After the initial set of plans were completed, a large rain event caused major erosion in the reclamation area, causing engineering plans to be revised.

Replacement of Gabion Channel

- Old gabion Channel was replaced with a new stone lined channel.
- The channel was extended on the upper and lower ends and gabion baskets were added along the steeper banks for additional stability and protection.





Additional Photos of Channel Replacement



Looking upstream towards upper pond



Looking downstream

Channel Now





Work at Lower Pond



Edge of existing drainage channel. Channel was blocked, so water overflowed and washed out a new path.



Existing channel after cleaning and repair

Work at Lower Pond



Sediment laden pond at initial site inspection



Pond after drainage channels restored and flocculant treatment. Pond remains clear today.

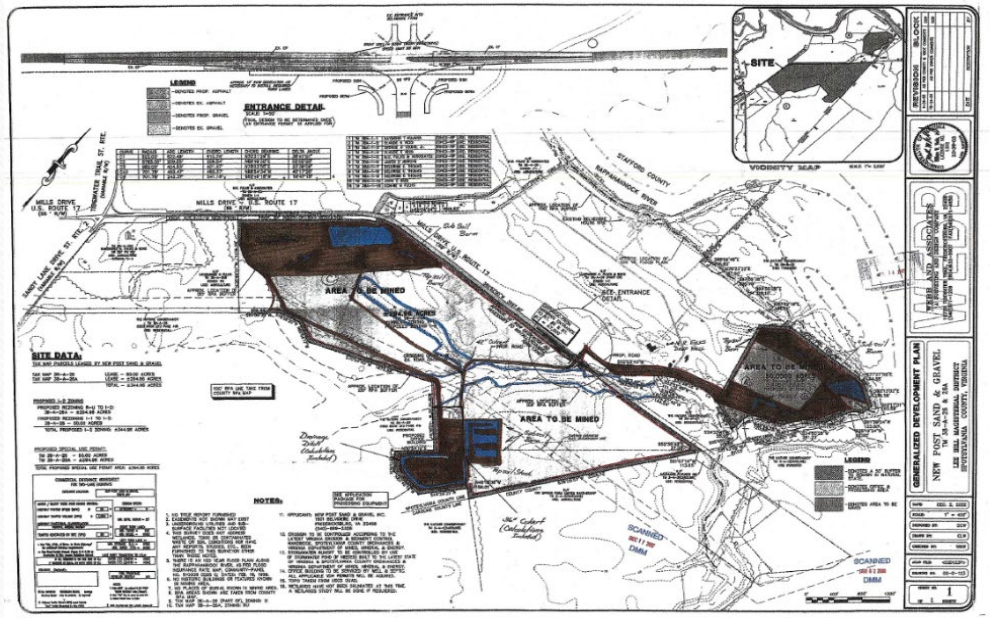
Thank You!

Bardon Inc.-Fulks Pit Reclamation Award

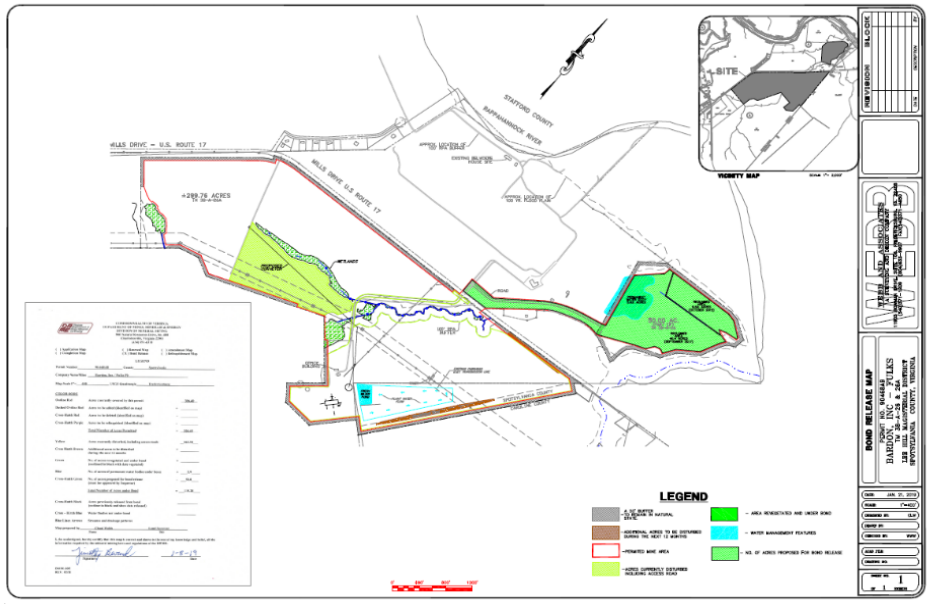


Mine Maps Then and Now

2005 Original Permit Map

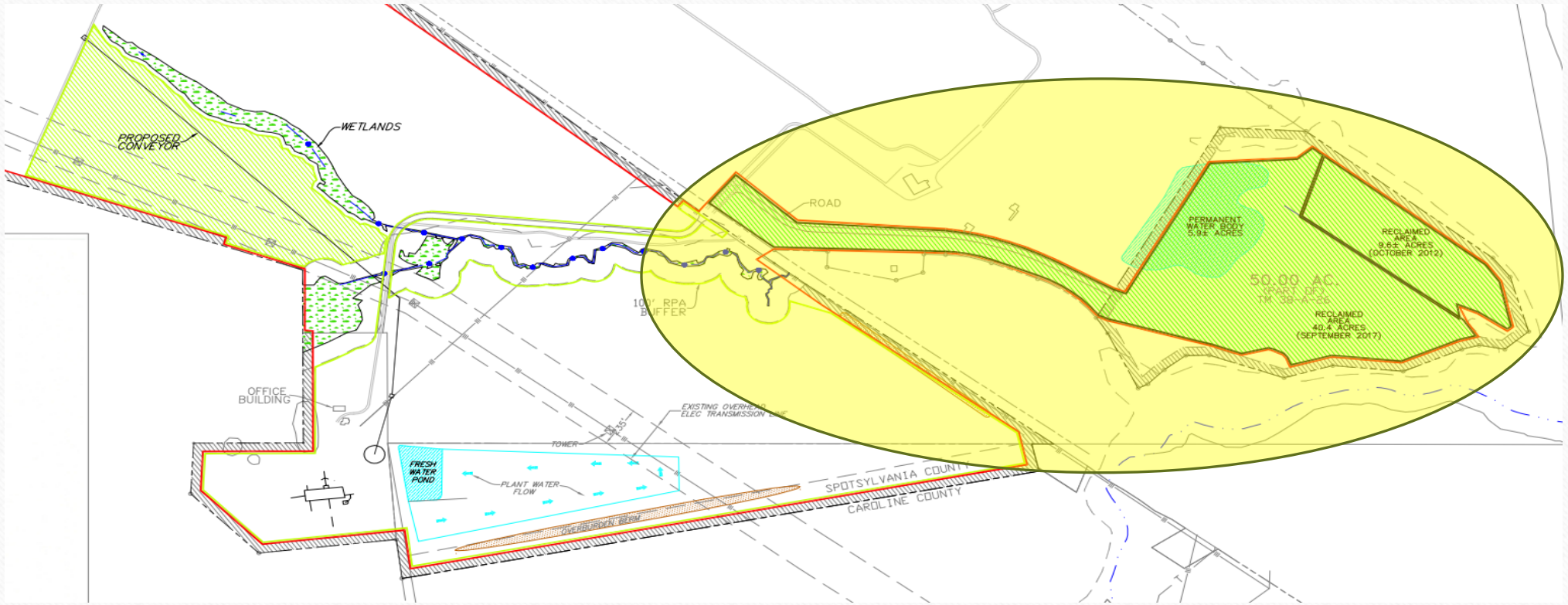


2019 Amendment Permit Map



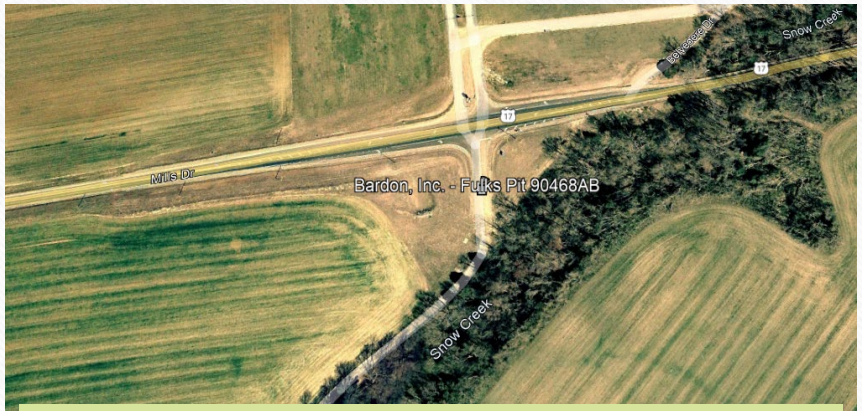
Reclaimed Area of Mine

Amendment for bond release filed on 1/21/2019



MINE PROGRESSION

2005



Original permit granted to Ennstone Inc.

2012



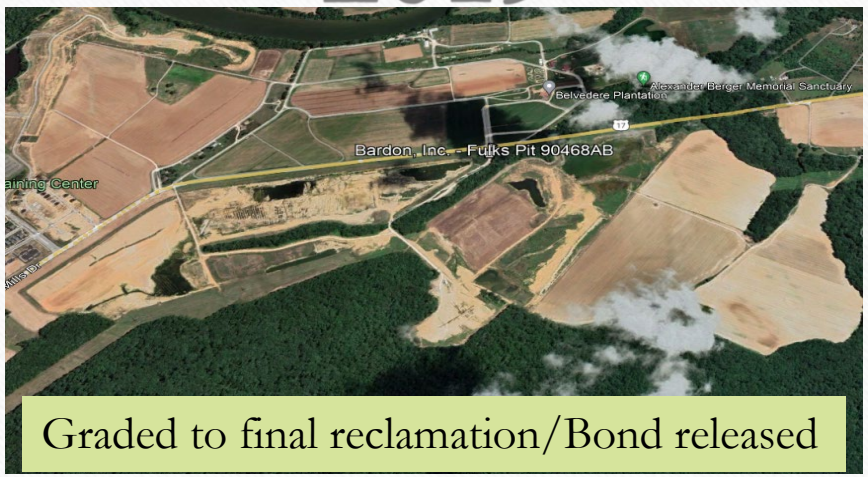
Permit transferred to Bardon Inc.

2015



Mining begins in reclaimed area

2019



Graded to final reclamation/Bond released

Reclamation Progress

Mining is nearing completion



Reclamation in progress



Reclamation Progress Cont.

Reclaimed to final grade



Reclaimed mine after harvest of winter wheat



Reclamation Progress Cont.

Reclaimed mine after harvest of winter wheat



Reclaimed mine after harvest of winter wheat



Kyanite Mining Corporation
2022 DMM / VTCA Reclamation Award Nomination



The East Ridge Plant began operations in 1978 and is one of two quarries operated by Kyanite Mining Corporation (KMC) at its Willis Mountain Complex. The Plant is the world's most technologically advanced producer of the industrial mineral kyanite. Since 1993, plant refuse has been deposited at the East Ridge Hollow Fill. Now, 30 years after its inception, the Hollow Fill has been completed.





Northeast slopes viewed toward the west.

East Ridge Hollow Fill

In this aerial photo from the mid-1990's, the Hollow Fill can be seen a few years into its lifespan. The Hollow Fill was developed as a 15-acre tailings disposal area north of the East Ridge Plant.

The fill was started behind a sediment control dam. One of the first sediment control dams can be seen in the aerial photo impounding storm water behind the northeastern slope.

Concurrent reclamation began in the mid-1990's, shortly after the structure was started. As each level of the waste disposal area was completed, another control dam was constructed. These dams evolved into drainage benches used to convey runoff, via riprap groin ditches, to sediment basins below the toe. The top of each sediment control dam became the drainage bench on the terraced slope shown here.



Fill Placement and Concurrent Reclamation Continue

Sediment control dams, constructed downgradient of every phase of fill expansion, ensured that KMC captured runoff and prevented the loss of eroded material.

In the early 2000's, KMC extended the perimeter dam around the west side of the fill and continued to raise the height of the fill.

As the upper slopes reached capacity, they were graded down to the interior crest of the control dams, on maximum 3:1 grades.

The reclaimed outslopes evolved into the terraced slopes seen here on the northeastern face of the fill.

Sediment Control Dams

Fill placement began with construction of sediment control dams around the perimeter of the fill.

The starter dams were constructed of select native soil that was spread and compacted in lifts on a clean and competent substrate. Keyways were excavated under the dams prior to ent





Sediment Control and Material Placement

The starter dams provided perimeter drainage and sediment control, diverting runoff to perimeter sediment basins. Care was taken to place coarser, drier tails near the working face of the fill. Finer, wetter tails were placed further from the working face to allow more drying time before being incorporated into the rest of the fill.







Slope Drainage

To shed water, KMC first tried open channel, rock-lined drains, but found them prone to erosion and difficult to navigate with maintenance equipment. The company then switched to pipe slope drains.

The surface area draining to each pipe determined the location and pipe size.

Whether armored by rip rap (top) or concrete (bottom), KMC prefers to bury their slope drains to facilitate long-term maintenance of the fill.









Westward Expansion

In the late 2000's, KMC expanded the fill farther to the west with a new sediment control dam at the fill's far, western edge.

The terraced, northeastern slopes have been completed and reclaimed.

KMC began to experiment with the long slope reclamation method on the northern ridge of the fill.

KMC began discussing vertical expansion with the Division of Mineral Mining.



Southwest Expansion

In 2012, KMC expanded the fill to the southwest behind another sediment control dam. By now, the fill had expanded to 55 acres.

In addition to annual fertilization, KMC amends the reclaimed areas with Class A wood ash, sourced from a local paper mill. As seen here, a healthy vegetative cover is the result.

In late 2011, KMC commissioned a geotechnical study, complete with cone penetrometer soundings, to ensure the foundation could support a 40-foot height increase.

The foundation proved solid. This photo shows the first of two, 20-foot height increases under construction behind the original northeastern slope.

Long Slope Reclamation

In 2011, KMC proposed the use of a long slope above the northwestern starter dam.

Through appropriate planning and careful implementation, an 80 foot tall long slope was completed without stability problems or excessive erosion.

As a result, another request was granted, in 2015, to extend the long slope along the entire western slope of the fill.

The long slopes aid in maintenance of the fill by increasing mower stability, reducing mower scalp on the underlying vegetation, aiding in annual lime application, and eliminating differential settling and water retention in drainage benches.





Evolution of a long slope

Long slopes on the western side of the East Ridge Hollow Fill resist erosion just as well as the benched, northeastern slopes.

To minimize erosion during final grading and topsoil placement, KMC constructed the long slopes in two levels, or phases. As soon as the first level was roughed in, slopes were placed on grade, covered with topsoil, and seeded. When the next level of the long slope was completed, it was tied into the lower level on the same grade.



Material placement behind starter dam.



First phase is completed. Second has started.

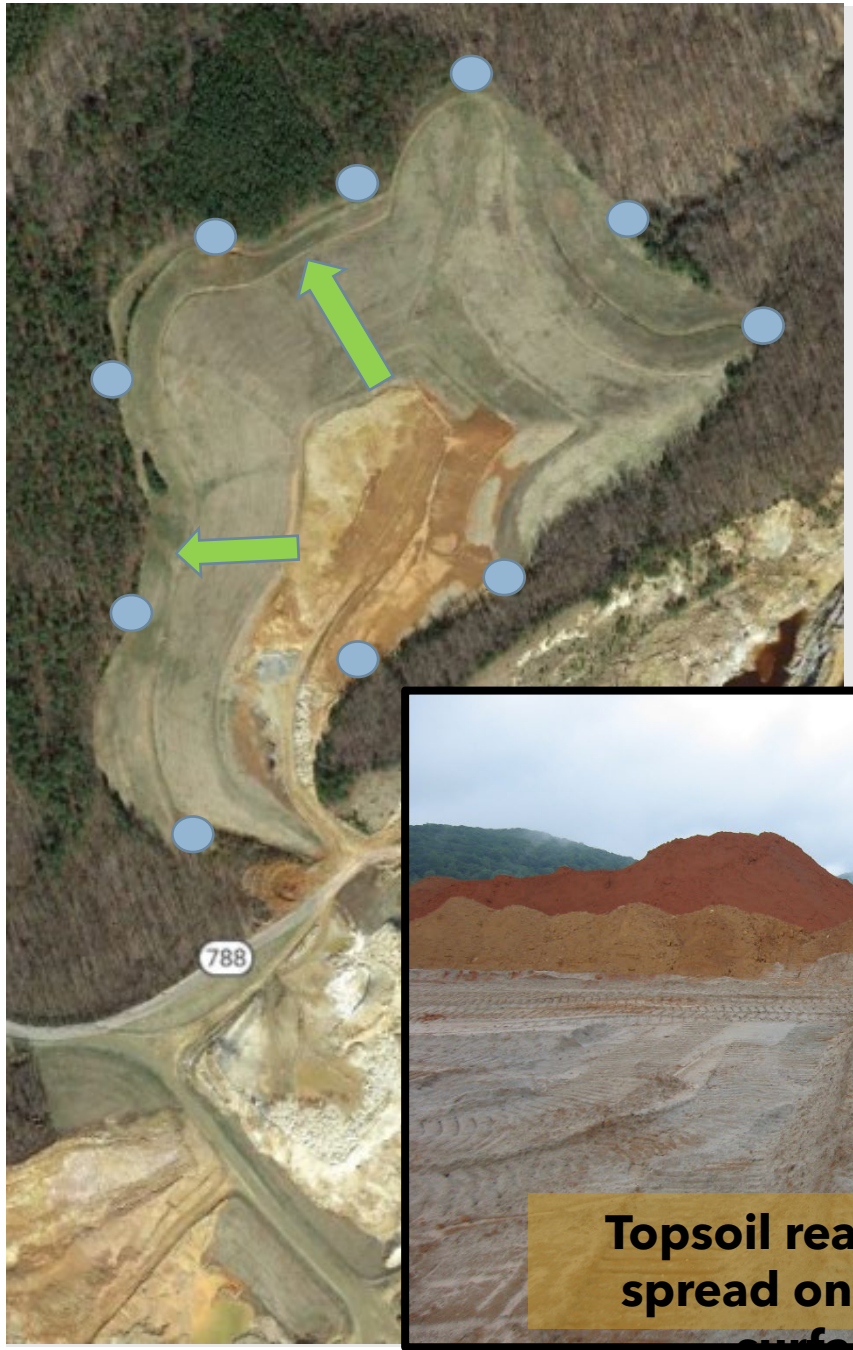


Second phase graded and capped with topsoil.



Second phase reclaimed. Setback started before additional height added to fill.

Outslopes Completed



KMC reclaimed the remaining western slopes using the long slope method.

Load limitations required KMC to complete the northeastern slopes using the terraced setbacks.

Seen here in 2019, the surface of the fill has reached its maximum height. Top surface grading has been completed and topsoil spreading has begun.

Storm water runoff is diverted to the sediment control structures by the crest of the former sediment control dams. Multiple sediment traps were embedded around the perimeter of the fill to capture runoff from the outslopes and top surface of the fill.

Topsoil ready to be spread on the top surface.



FILL COMPLETION

Using sound construction practices, careful material placement, good drainage and sediment control, topsoil replacement, and good seeding practices, KMC has achieved a reclamation milestone 30 years in the making.

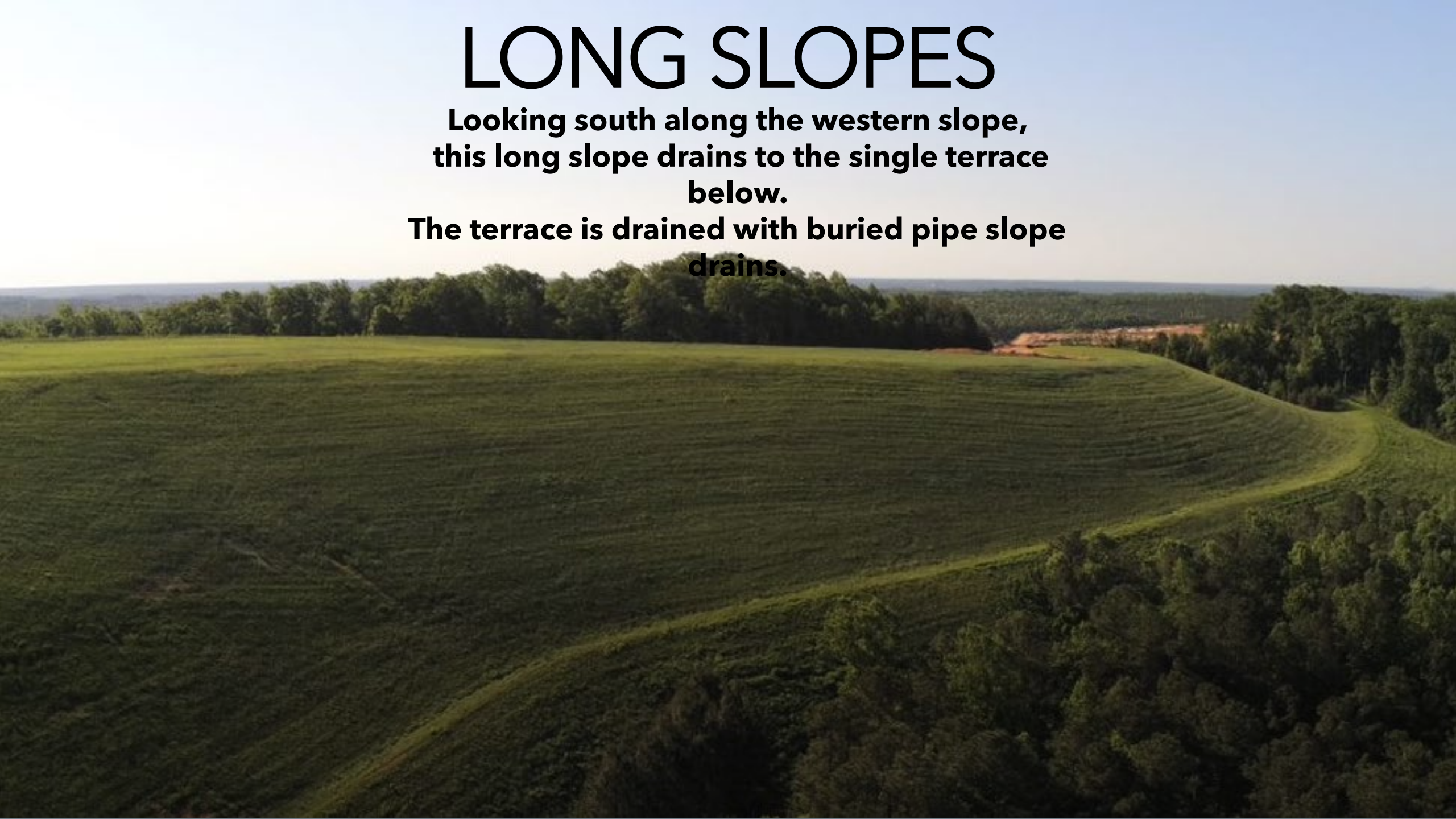
TERRACED SLOPES



Looking north, this photo captures the remnants of each sediment dam that KMC built.
As the height increased, these control structures became the terraces seen here.
These terraces drain to a rock-lined groin ditch and buried pipe slope drains.

LONG SLOPES

Looking south along the western slope, this long slope drains to the single terrace below.
The terrace is drained with buried pipe slope drains.







Two photos from the same perspective with the East Ridge in the background.

KMC'S ENVIRONMENTAL STEWARDSHIP… A MINING SUCCESS STORY, WORTHY OF RECOGNITION

Luck Stone Corporation
Greene Plant

Permit # 12954AA
Greene County

NOMINATION FOR THE MINERAL MINING PROGRAM/

VIRGINIA TRANSPORTATION CONSTRUCTION ALLIANCE

2022 RECLAMATION AWARD

It Begins……







The Dirt Work 2020….

Approximately 275,000 yds. Of dirt/overburden were moved









The Dirt Work 2021….









The Blasting….



Shot In Progress!



Approximately 65,000 yds. of rock blasted/moved



The Basin In Progress





Originally meant to be temporary, in the end expanded and made a permanent storm control structure.



The Basin/Storm Control Structure



Grading….





Seeding….







Fencing….





Finishing….



Maturing in 2022





End

Mineral Mining Program and the Virginia Transportation Construction Alliance 2022 Reclamation Award Nomination

For

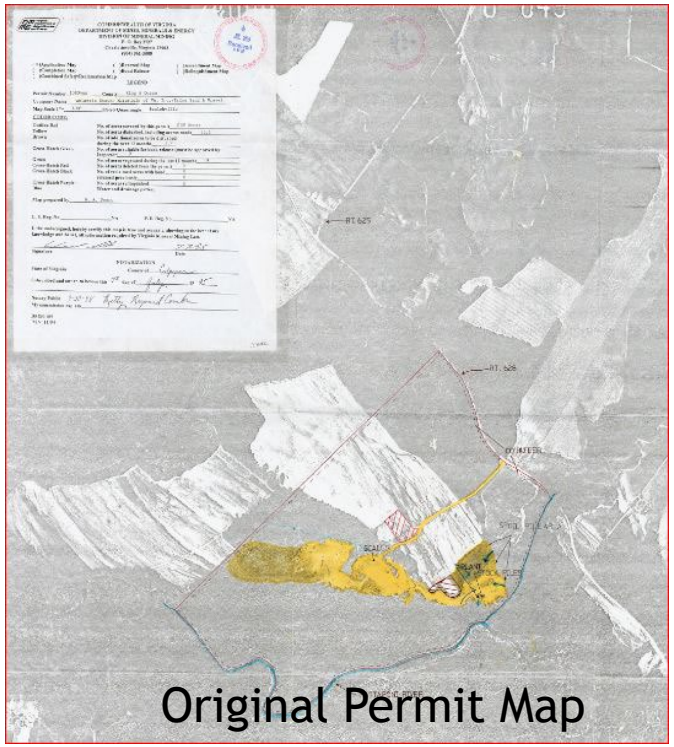
Virginia Sand & Stone
Permit Number 10804AC
King and Queen County, Va



The site was original permitted in May of 1996 by Ennstone INC for 250 acres and 25 acres to be disturbed for mining.
In 2010 the site was transferred to the current operator, Virginia Sand & Stone. The site has been operated by Virginia Sand & Stone continuously since then.
Originally 25 acres were disturbed for mining, today the site consists of 600 acres under permit and 210 bonded for mine related activities.







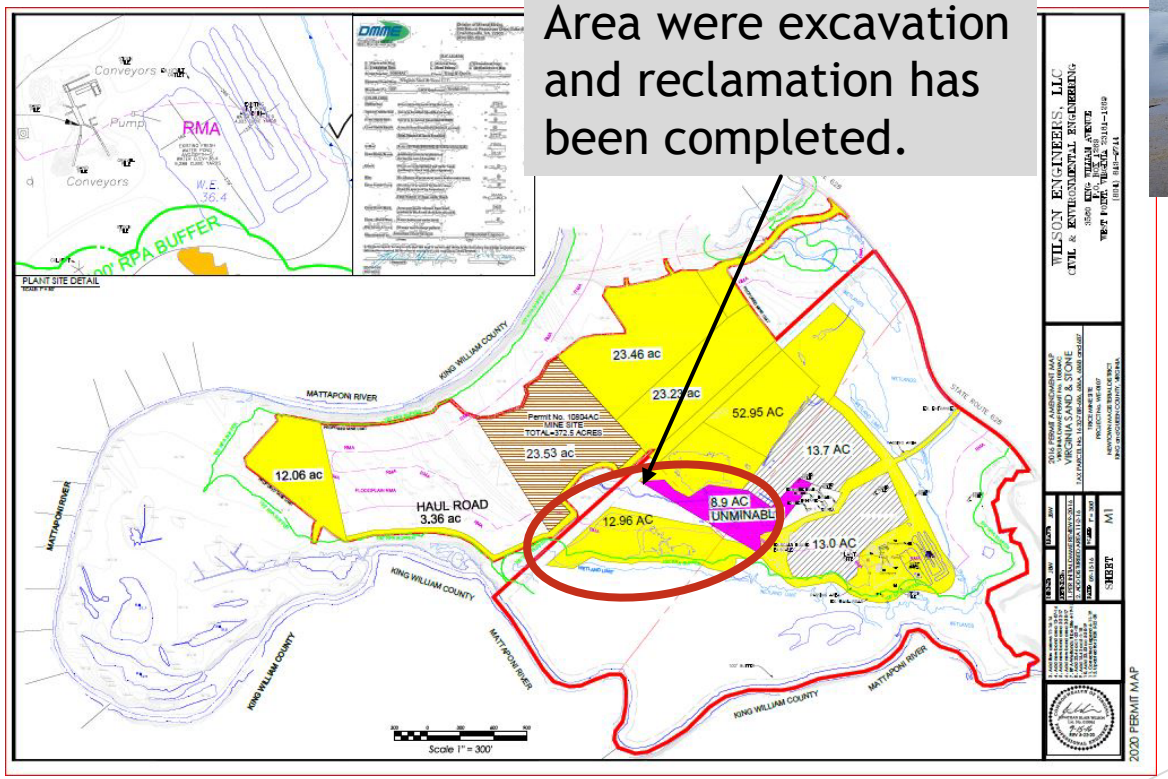


Virginia Sand & Stone has made protecting the environment a priority.





Area were excavation and reclamation has been completed.





The reclaimed area is fully vegetated and the operator has created a recreation area with a stocked pond for fishing and attracting wildlife.







Glover Materials, Inc. Rogers Quarter Pit Permit #13772AA

2022 RECLAMATION AWARDS NOMINATION

CALE MOORE



Rogers Quarter Pit - 1999



Rogers Quarter Pit - 2003



Rogers Quarter Pit - 2011



Rogers Quarter Pit - 2022







Power Line Easement Peninsula





Grading and Vegetation of Banks





Diversity of Vegetation

2020 DMM/VTCA RECLAMATION AWARD NOMINATION

Permit Number – 05588AA

Boxley Materials Company

Bedford/Botetourt

Mining Overview

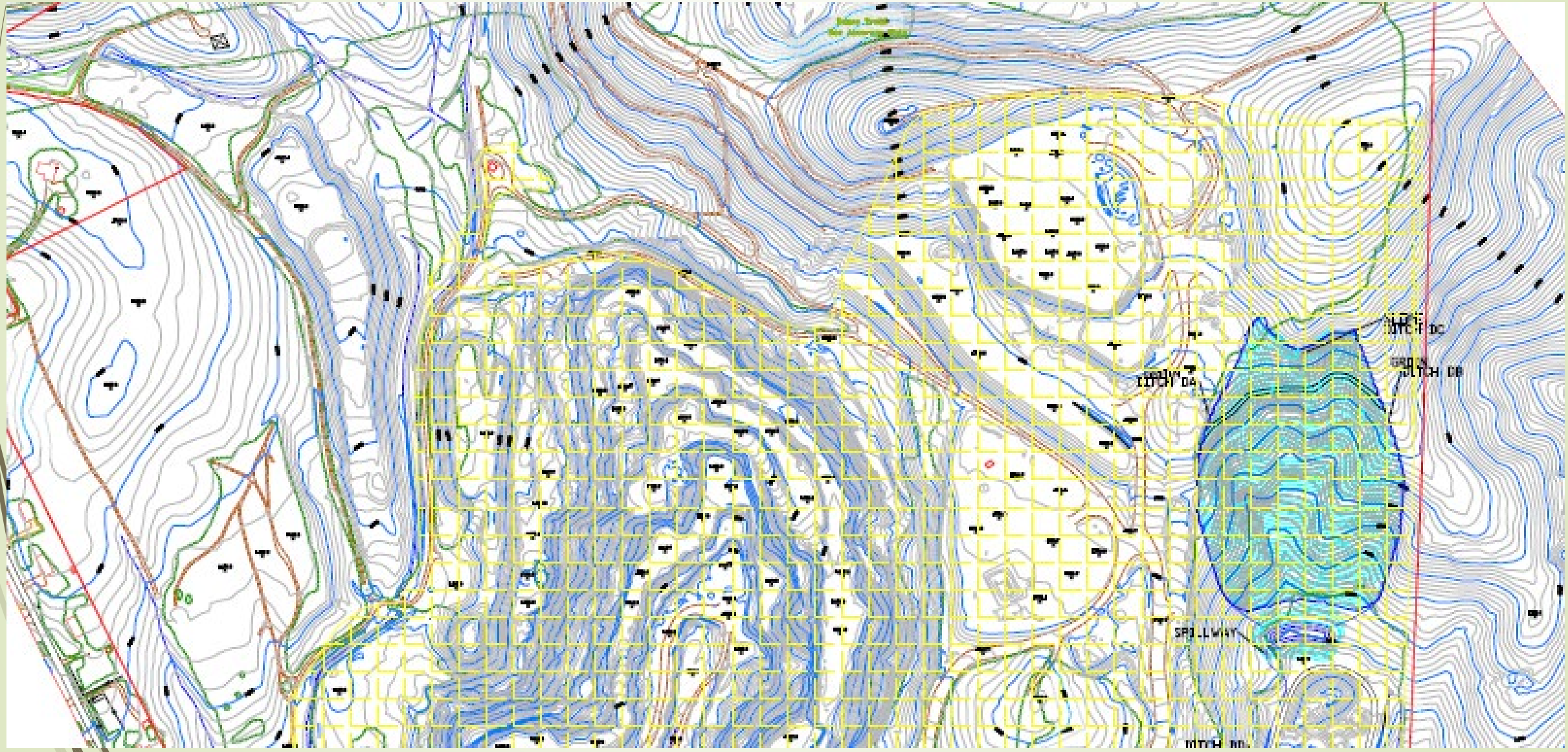
- Been in Operation since Pre-Regulation
- Total Permitted Acreage – 419.32
- Total Bonded Acreage – 288.47
- Maximum Annual Production - > 1.3M tons
- Estimated Total Production since 1988 - ~31M tons

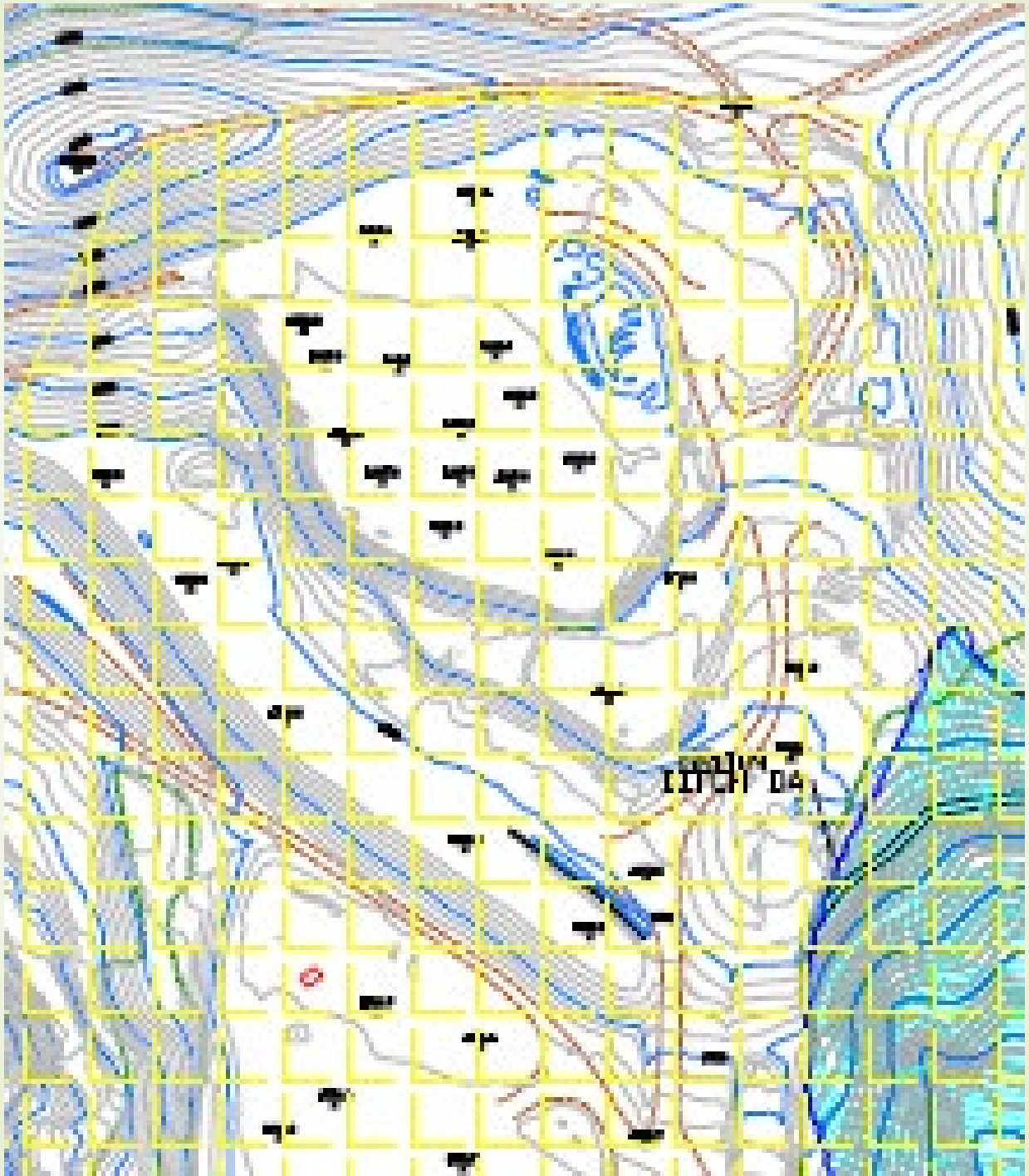


Fill Reclamation Overview

- Fill started in 2002
- Disturbed area covers ~ 23 acres
- Required Reclamation Work
  - Managing an area of frequent slope failure
  - Sloping & Seeding

Permit Map of Pit and Fill Area





Reclamation

July 2017



June 2019



Between 2019 and 2021, the slope began to fail frequently and it was ultimately decided that the slope would be put to a 3:1 slope to provide stabilization so that they could continue to initial reclamation.

July 2021



3:1 Slope



Thank You!

- They are all WINNERS!!