Publicly Funded Mine Drainage Treatment or Abatement Project Information Sheet

General Project Information

Project Name and or No.: Cucumber Run PA-052
Location: Municipality and County: Stewart Fayette
Watershed: North Branch Cucumber Run to Cucumber Run to Youghiogheny River
USGS Quadrangle: Fort Necessity
Latitude and Longitude: 39.860833 -79.515277999999995

Contact Information

Contact Organization: PADEP BAMR
Contact Person: SCOTT HORRELL
Contact Address: 286 INDUSTRIAL PARK ROAD
EBENSBURG
PA
15931
Contact Telephone Number: 814.472.1800
Contact Email: pmilavec@state.pa.us

Organization Currently Responsible For Project Operations, Monitoring and Maintenance

Is this organization different from Contact Organization? NO
Organization Name:
Organization Contact Name:
Organization Contact Address:
Organization Telephone Number:
Organization Email:

Site Information

Who owns the property the project is constructed upon?
PA DCNR BUREAU OF STATE PARKS - Ohiopyle State Park

Driving Directions to the Project Site (from an easily identifiable reference point):
PA Route 381 South to Ohiopyle State Park. Turn right on to Kentuck Road proceed 0.25 miles. Turn left on to Middle Ridge Road proceed approximately 1.5 miles to gated access road adjacent to Cucumber Run picnic area. Park at gated access. Walk access road approximately 0.25 miles ayatem is located on the right hand side of the North Branch of Cucumber Run.

Special instructions for entry to the site (gates, keys, notifications or permissions, etc.):
Walk from gated access road.

Is there a perpetual access agreement for monitoring and O&M?	☐ Yes ☒ No
Is the site readily accessible (by 2WD vehicle)?	☐ Yes ☒ No
Was project completed as part of an overall watershed restoration plan?	☒ Yes ☐ No
Is the plan available electronically?	☒ Yes ☐ No
Could you provide the DEP a copy of the plan?	☒ Yes ☐ No
Is a copy of the plan attached?	☒ Yes ☐ No

Project Description (Describe the treatment system including each individual component):
This passive treatment system consists of two (2) Anoxic Limestone Drains (ALD) both discharging to an existing constructed Aerobic Wetland designated as Wetland No.1 . Both ALDs are uncharacteristic in

that they are highly sloped drains instead of the normal level or near level profile. Both drains were covered with two layers of 6 mil polyethylene liner on the top and sides only. The seams of adjacent liner sheets were staggered so that 2 seams did not occur on top of each other between the layers. Adjacent sheets were overlapped 2 feet at seams and laid loose and unsealed. Top cover over each drain was specified as a minimum 2.5 ft. of impervious soil cover.

ALD1

ALD 1 is the larger and principal treatment unit of the system. Average treated effluent rate from ALD1 has been 15 GPM. ALD1 has an elongated teardrop configuration approximately 305 ft. long. The wider area, which is approximately 65 ft. wide by 5 ft. deep, is at the head of the ALD covering 3 deep mine discharges that developed after the SL 138-3-101.1 Deep Mine Sealing Project in 1980. It is unclear whether the ALD was constructed over these 3 discharges to enter as upwellings from beneath through the unlined bottom of the ALD or if the ALD was constructed over manholes and mine seal piping from the SL 138-3-101.1 Project. This wider head area of the ALD was constructed with R3 (6" to 2") limestone. ALD 1 then tapers and falls 14 ft. over its length at approximately 4.6% slope to a 10 ft. wide by 4 ft. deep cross section at its effluent end. The tapered portion of ALD1 was constructed with AASHTO 1 (4" to ¾") limestone. Due to the highly sloped profile of ALD1, two clay barriers were constructed across the width of the drain to promote inundation of the limestone. The first barrier was placed 200 ft. downstream in the drain and the second at 293 ft. near the outlet. Each barrier has 1 ft. of stone over the top to allow for flow through the drain. ALD1 is impounded at the effluent end by a concrete endwall with a 1 ft. section of 18" PVC discharge pipe installed flush with the outside face of the endwall. This pipe had a 2 ft. x 2 ft. piece of stainless steel 2 in. wire mesh placed over the end inside of the ALD. Flow measurement for ALD1 is provided by a 90o v-notch aluminum plate weir installed on a concrete headwall located 10 ft. downstream from the ALD endwall. Below the weir a ditch coveys the ALD effluent to the existing constructed aerobic wetland. This ditch falls steeply some 35 ft. in elevation over an approximate 130 ft. length providing aeration of the ALD effluent prior to entering the aerobic wetland at its northeast corner. At the surface, rock lined diversion ditches were installed along each side of the ALD to intercept surface water. Each ditch runs the length of the ALD and they then converge downstream of the weir into the ditch conveying the ALD effluent to the aerobic wetland.

ALD2

Located approximately 350 ft. southwest of ALD1, ALD2 is smaller in terms of mass of stone and treated flow although longer than ALD1. Average treated effluent rate from ALD2 has been 3 GPM. ALD2 has a consistent cross section of 4 ft. wide by 4 ft. deep throughout its extent. ALD2 consists first of an L-shaped main section, designated as ALD2A, which has a long 450 ft. main stem and short 70 ft. upstream leg end branch. 40 ft. downstream from the ALD2A leg end branch, a lateral branch, ALD2B 90 ft. long, enters and 80 ft. downstream from this a second lateral branch, ALD2C 50 ft. long, enters. At their upstream ends, the three branches of ALD2 each intercept one of three deep mine discharges that developed after the SL 138-3-101.1 Deep Mine Sealing Project. As with ALD1, it is unclear how each of these three discharges is intercepted and enters ALD2. The three branches of ALD2, on average, drop 10 ft. in elevation at 13% slope. The main stem of ALD2A drops 59 ft. in elevation again at 13% slope. The three branches and 220 ft. of the upstream main stem of ALD2A are constructed with R3 (6" to 2") limestone. The remaining 230 ft. downstream length of the ALD2A main stem is constructed with AASHTO 1 (4" to ¾") limestone. No internal clay barriers are indicated in the design or construction files for ALD2 as was the case in ALD1. The alignment of the main stem of ALD2A follows the original project construction access road for the site which drops steeply to the western edge of the existing aerobic wetland where ALD2 discharges directly into the northwest corner of the wetland via two 12 in. corrugated polyethylene plastic pipes, each 6 ft. long and set side-by-side. No flow measurement capability was provided under the project for ALD2. BAMR personnel hand-dug a small impoundment downstream of the ALD2 outlet and installed a small discharge pipe for bucket and stopwatch flow measurement.

Existing Constructed Aerobic Wetland No.1

Project SL 1015-103.1, completed in 1989, constructed four aerobic wetlands along the North Branch of Cucumber Run to treat discharges that developed after the 1980 SL 138-3-101.1 Deep Mine Sealing Project. Wetland No.1 from this project receives the effluent from ALD1 and ALD2. Wetland No.1 is

approximately 0.4 Acres with average dimensions of 240 ft. long by 70 ft. wide. The influent end (east) of Wetland No.1 originally received raw mine discharge water and now receives the effluent from ALD1 at the northeast corner of the wetland. At this end of the wetland an open water area was constructed approximately 5 ft. deep by 55 ft. wide by 65 ft. long to serve as an initial sedimentation area. The rest of the wetland was constructed as a vegetated aerobic treatment area with 2 ft. of mushroom compost and no freestanding water depth. This area was vegetated with cattails as the dominant plant accompanied by rushes and sedges. Two 12 in. PVC pipes were installed side-by-side at the southwest corner of the wetland, diagonally opposite from the wetland influent point. These wetland effluent pipes discharge directly to the North Branch. An emergency spillway was constructed at the southwest end of the wetland. Effluent from ALD2 enters Wetlands No.1 at its northwest corner. At the time of design for the subject ALD project, Wetland No.1 was found to be short-circuiting directly through the center of the wetland and the western end, where effluent from ALD2 was to enter the wetland, was dry. The project constructed three R3 (6" to 2") stone baffles within the wetland to eliminate short-circuiting. These were designed and constructed as filter-through baffles, running the full width of the wetland with their tops six inches above the water surface. Also as part of the project, the wetland embankment was raised 12 inches to submerge existing dry areas, 90o PVC elbows were installed on both of the wetland discharge pipes and turned up to accommodate the increased water level, ALD2 effluent was channeled around and upstream of the last baffle to prevent short-circuiting directly to the wetland discharge pipes and the emergency spillway had stone placed on the embankment invert. There are no wetland influent or effluent flow measurement capabilities in place.

Pre-Construction Discharge Flow and Monitoring Data

Is data available electronically? ☒Yes ☐ No

In what format? Microsoft Excel ☒ Access Database ☐ Other (specify) _____

Indicate how flow was measured: BAMR staff

Indicate laboratory that analyzed samples (or whether field kits were used)

DEP LAB

Could you provide this data to the DEP? ☒Yes ☐ No

Is a copy of the data attached? ☒Yes ☐ No

Pre-Construction Receiving Stream Flow and Monitoring Data

Is data available electronically? ☒Yes ☐ No

In what format? Microsoft Excel ☒ Access Database ☐ Other (specify) _____

Indicate how flow was measured: BAMR staff weirs and timed volumes

Indicate laboratory that analyzed samples

DEP LAB

Were any biological or fish surveys completed? ☒Yes ☐ No

Could you provide this data to the DEP? ☒Yes ☐ No

Is a copy of the data attached? ☒Yes ☐ No

Treatment System Design Information and Criteria

Who or what firm completed project design? (Include name, address, phone, email and contact person, if available): •Project was a consultant design by CET Engineering Services, 1240 North Mountain Road, Harrisburg, PA 17112, (717) 541-0622. Contact: Pete Lusardi, Project Designer.

Are digital photographs of the site before, during and/or after construction available? ☒Yes ☐ No

Was there a Specific Restoration or Treatment Goal for this treatment system? ☒Yes ☐ No

If yes, please describe the goal: The project is located on the North Branch of Cucumber Run within the popular and heavily used Ohiopyle State Park. Cucumber Run flows over Cucumber Falls which is a very popular scenic attraction publicized in the park literature. A side branch of the park's Great Gorge Trail follows Cucumber Run from its mouth at the Youghiogheny River, past Cucumber Falls for approximately ¾ mile to the junction of the North Branch. Mine drainage from abandoned deep and surface mines, primarily on the North Branch, have degraded water quality and caused iron staining

Publicly Funded Mine Drainage Treatment or Abatement Project Information Sheet

within the main stem of Cucumber Run below the North Branch and at Cucumber Falls detracting from the appearance and aesthetics of this area within the park. The project was undertaken with the goal of improving general water quality within Cucumber Run below the North Branch and improving aesthetics at Cucumber Falls and along Great Gorge Trail.

What is the Design Flow Rate? 60 gpm

Other design criteria (retention time, acidity loading or removal rate, metals loading or removal rate, alkalinity generation rate, etc.) Design Methodology - Sizing Equation For Required Amount Of Limestone:

$M = Q \times d \times t + Q \times C \times T$

Design Constants For Both ALDs:

d =
100 Lb/CF

t =
15 Hours

V =
0.5

C =
250 Mg/L as CaCO3

T =
20 Years

X =
0.8

ALD1 Specific Design Parameters:

Q =
50 GPM

M =
1,285 Tons = 25,700 CF

Actual Amount Of Limestone Used Due To Required Length Of ALD1 At Site:

M =
1,582 Tons = 31,635 CF

ALD2 Specific Design Parameters:

Q =
10 GPM

M =
257 Tons = 5,100 CF

Publicly Funded Mine Drainage Treatment or Abatement Project Information Sheet

Actual Amount Of Limestone Used Due To Required Length Of ALD2 At Site:

M=
520 Tons = 10,400 CF

Does the treatment system take all of the flow or is some of the flow bypassed?
All

Publicly Funded Mine Drainage Treatment or Abatement Project Information Sheet

Plans and Specifications:

As-Bid Project Drawings and Technical Specifications

Is this information available electronically? ☒Yes ☐ No

Could you provide the DEP a copy of the plan? ☒Yes ☐ No

Is a copy attached? ☒Yes ☐ No

As-Built Drawings

Is this information available electronically? ☒Yes ☐ No

Could you provide the DEP a copy of the plan? ☒Yes ☐ No

Is a copy attached? ☒Yes ☐ No

Construction and Project Funding Information

What year was the project constructed? 1997

When (specific date) did project construction begin? March 1997

When (specific date) was project construction completed? July 8, 1997

Who was the Construction Contractor? (Name, Address, Phone, email, contact person)

Casselman Enterprises, Inc

140 West Union Street, Somerset, PA 15501

When (specific date) did the treatment system go on-line? June 1997

Primary Funding Partners, and funding provided:

Source	True or false	Amount
Title IV, Appalachian Clean Streams	____	____
PADEP Growing Greener	____	____
10% AMD Set Aside Funds	True	$166,059.86
EPA Section 319	____	____
OSM Watershed Cooperative Assistance Program	____	____
NRCS	____	____
EPA Watershed Protection	____	____
USCOE	____	____
University	____	____
Private/Foundation	____	____

How or by whom was treatment system construction funded or other funding not included in the table?

Source	Amount
PADEPBAMR	$166,059.86
____	____
____	____

Post Construction Operation, Monitoring and Maintenance

Is there a Sampling and Monitoring Plan? ☒Yes ☐ No

Is the plan available electronically? ☒Yes ☐ No

Is a copy of the plan attached? ☒Yes ☐ No

Is treatment system currently being sampled and monitored? ☒Yes ☐ No

If so, by whom? PA DEP BAMR - Rich Beam

Approximately how many hours per year are spent doing O,M&M for this system? 20

Where are samples being analyzed? (Name, Address, Phone, email, contact person)

DEP LAB

Publicly Funded Mine Drainage Treatment or Abatement Project Information Sheet

If DEP Lab is being used, what is the project ID and the Sample Information System (SIS) monitoring point IDs?

Project ID - PA2768 Monitoring Point IDs - CR1, CR2, CR3, CR4, CR5, CR6, CR7, CR8, CR9, CRUS

Is there an Operation and Maintenance Plan? ☒ Yes ☐ No
Is the plan available electronically? ☒ Yes ☐ No
Could you provide the DEP a copy of this information? ☒ Yes ☐ No
Is a copy of the information attached? ☒ Yes ☐ No

Comments on the treatment system: Summary of Current System Status:

At the head end of ALD1, leakage in the form of surface upwellings is present around the perimeter of the ALD. Due to the high metals content of the discharge treated by ALD1, it is generally presumed that these leaks are due to area-wide plugging of the limestone within the upstream end of the drain. Indications are that ALD1 was constructed with broken or open pvc pipes from the SL 138-3-101.1 Deep Mine Sealing Project covered and embedded in the limestone at the head end of the ALD. These same leaks may therefore be due in part to these pipes being plugged also.

Heavy iron precipitate has accumulated in the stilling area behind the ALD1 weir and may be causing erroneous flow readings for ALD1 effluent.

A 2nd ALD2 effluent pipe is indicated to exist and may be buried in wetland sediment or embankment material.

The influent end of Wetland No.1 was constructed with a 5 ft. deep sedimentation area. This area is currently near full of sediment.

OMR work is planned for this system in the spring/summer of 2009

Post- Construction Discharge Flow and Monitoring Data

Is the data available electronically? ☒ Yes ☐ No
In what format? Microsoft Excel ☒ Access Database ☐ Other(specify) _____
Indicate how flow was measured: Weirs and volumetric measurments
Could you provide the DEP a copy of this information? ☒ Yes ☐ No
Is a copy of the information attached? ☒ Yes ☐ No

Post-Construction Receiving Stream Flow and Monitoring Data

Is the data available electronically? ☒ Yes ☐ No
In what format? Microsoft Excel ☒ Access Database ☐ Other(specify) _____
Indicate how flow was measured: Stream flow by
Could you provide the DEP a copy of this information? ☒ Yes ☐ No
Is a copy of the information attached? ☒ Yes ☐ No
Were any biological or fish surveys that were completed on the receiving stream? ☒ Yes ☐ No

Treatment System Maintenance and/or Rehabilitation

Has rehabilitation work been performed at the site? ☒ Yes ☐ No
True(yes) or false(no): Yes

If yes, please list the rehabilitation activity. SYSTEM MAINTENANCE

No routine maintenance is performed on this system.

Past Maintenance:

BD 2333 (ER 2031)

Date: July 7, 1997. Project was completed in one day.

A custom fabricated ¼ in. aluminum plate air seal was ordered and installed by the BD Crew over the effluent opening in the concrete endwall of ALD1.

Total Cost: $834.96

BD 2442 (ER 2140)

Date: January 24, 2000. Project was completed in one day.

BD Crew cleaned iron precipitate from channel conveying effluent from ALD1 into Wetland No.1.

Total Cost: $448.01.96

If yes, please list the date of rehabilitation. see above

If yes, please list the rehabilitation cost. see above

What routine or non-routine maintenance issues have arisen since system was put online?
see above

How was maintenance work funded?
In House Construction Crew using 10% S.A. funding

What routine or non-routine maintenance is currently needed or anticipated in the next 1-3 years?
1.An initial drilling project is highly recommended for the area upslope of ALD1 to establish mine pool elevation and evaluate the potential for a possible blow-out during maintenance operations on ALD1. This recommendation is believed to be critical in consideration that any such blow-out would enter Cucumber Run and proceed over Cucumber Falls discharging into the Youghiogheny River all within Ohiopyle State Park.

2. Permanent site access should be established with road conditioning for use by construction trucks and equipment as and when needed. Such access should include a permanent stream crossing if required by the route selected. Similar access within-site to system main components and problematic areas, such as the ALD1 endwall, weir and discharge channel to wetland plus wetland embankment perimeter, should also be considered.

3. As discussed with BD Crew foremen, the specifics for the resolution of the leakage at ALD1 can only be determined after exploratory excavation within the problem area of the drain. Anticipated solutions discussed include unplugging existing mine drain pipes; piping discharges from points outside the ALD through the clogged area to areas of clean stone; removing clogged stone and replacing with clean stone; or all or a combination of any of these. If the mine seal drain pipes are functioning or can be rehabilitated, installation of clean-outs might be considered. It should be kept in mind that any excavation within the ALD will require destruction of the liner which will need to be replaced. In consideration of the site's location within Ohiopyle State park, special attention should be given to E&S control.

4. Some form of provision for sampling of the raw water into ALD1 should be installed. At present no sampling of ALD1 or ALD2 raw water is possible. The preferred method would be to install a tap or taps of small diameter piping into the mine seal drain pipes if functioning or rehabilitated. Such piping would

then run outside the drain with a small ball valve installed at the outlet for opening and sampling. Some sort of large diameter pipe could also be installed vertically to form a collection sump for raw water. An airtight cap could be installed to be removed for access and sampling. Similar provisions might be considered for ALD2 although three such devices would be required.

5. Accumulated iron precipitate should be removed from the area behind the ALD1 weir to re-establish this as a stilling area for the weir.

6. Exploration around the area of the ALD2 discharge into the wetland should be undertaken to see if a 2nd discharge pipe for ALD2 exists. If located the small embankment within the wetland should be modified to channel the discharge from both pipes along the wetland perimeter so as to enter upstream of the last stone baffle in the wetland. Some sort of more permanent flow measurement capability for ALD2 should be installed also, be it a weir or check dam with pipe, etc.

7. System monitoring after completion of all maintenance operations should be preformed on a more frequent basis, at least monthly, so that any affects can be detected and analyzed until the system has stabilized

Other Comments

Person(s) Completing this Form (Name, Address, Phone, email, Date Completed):

Richard L. Beam P.G.
PA DEP Bureau of Abandoned Mine Reclamation
286 Industrial Park Road Ebensburg PA 15931 (814)472-1853
Ribeam@state.pa.us

Is there any other person, company or organization that should be contacted for information about this treatment system or the information requested in this form?
(Include Name, Address, Phone, email, etc):

no